Name________________________________ Date_____________________

Math Mat
Master 1

Thinking Space

Name________________________________ Date_____________________

Math Mat Master 2

12 × 12 Multiplication Chart

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Name________________________________ Date_____________________

Math Mat
Master 3

2-Column Chart

Name________________________________ Date_____________________

Math Mat Master 4

3-Column Chart

Name________________________________ Date_____________________

Math Mat Master 5

Budget Sheet

Goal: ________________________ **Timeline:** ________________________

Earnings	Amount ($)
Total Earned	

Expenses	Amount ($)
Total Spent	

Savings (Total earned – Total spent):

Name________________________________ Date_____________________

Math Mat Master 6

Balance Sheet

Opening Balance: ______________________

Transaction	Credit	Debit	Balance

Name______________________________ Date____________________

Math Mat Master 7

Place-Value Mat

Representing

	Billions	Millions			Thousands			Units			Decimals		
		Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
Standard form													
Expanded form													
Word form													

Name________________________________ Date_____________________

Math Mat Master 8

Place-Value Mat

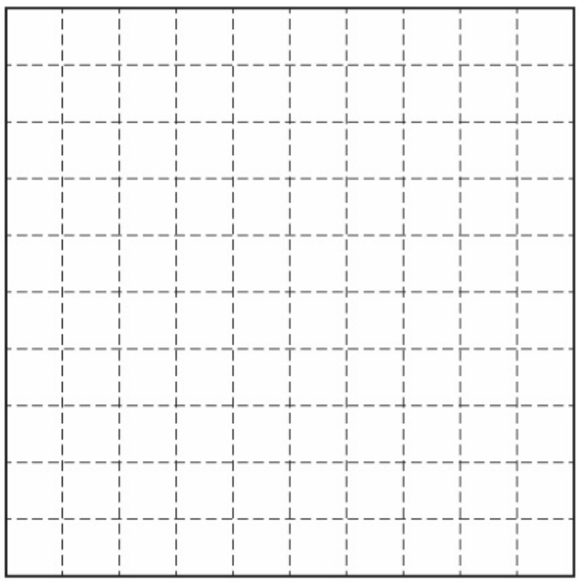
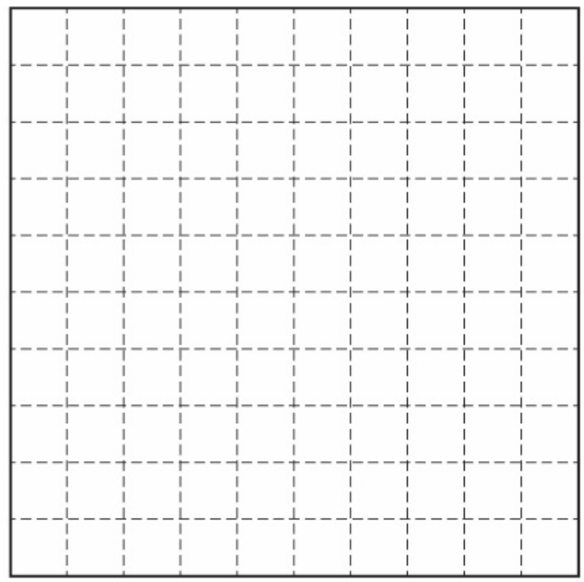
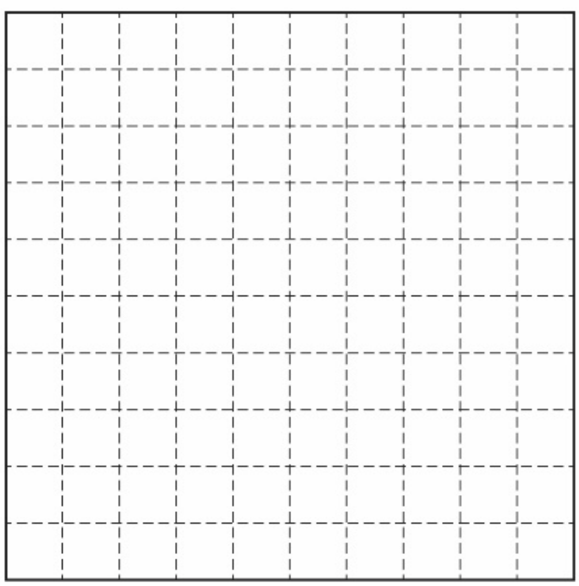
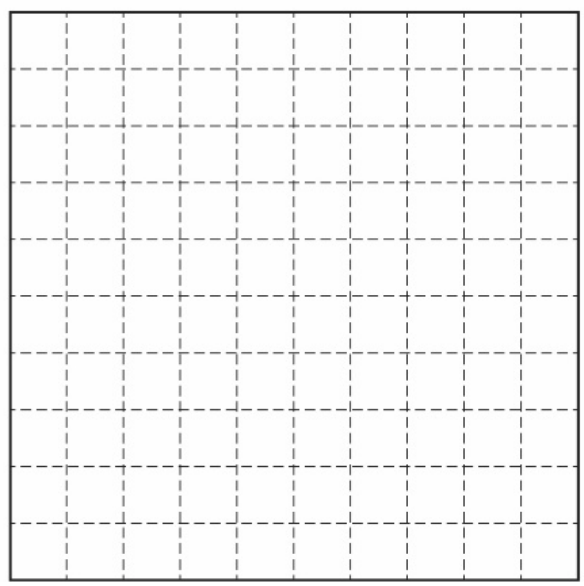
Comparing

Billions	Millions			Thousands			Units			Decimals		
	Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths

Name________________________________ Date_____________________

Math Mat
Master 9

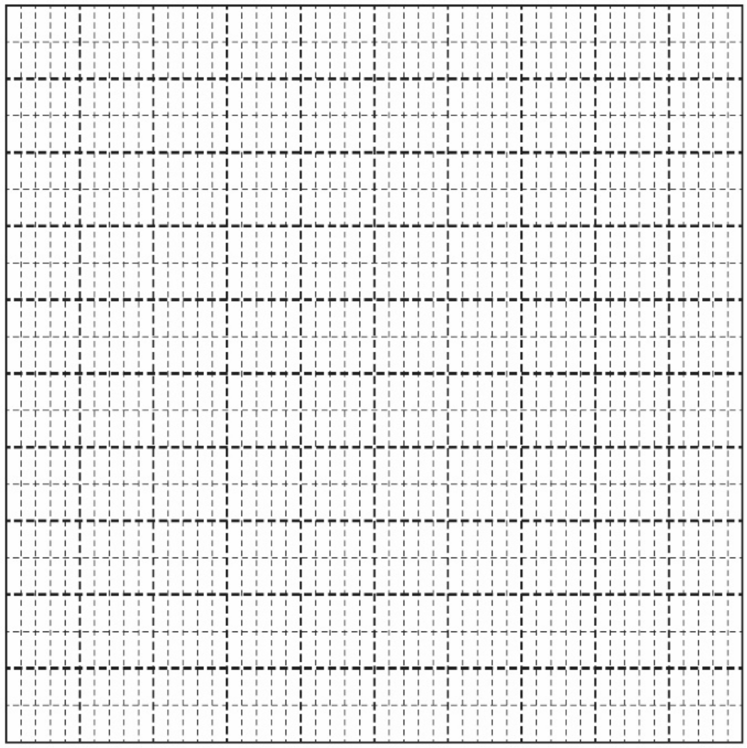
Hundredths Grids

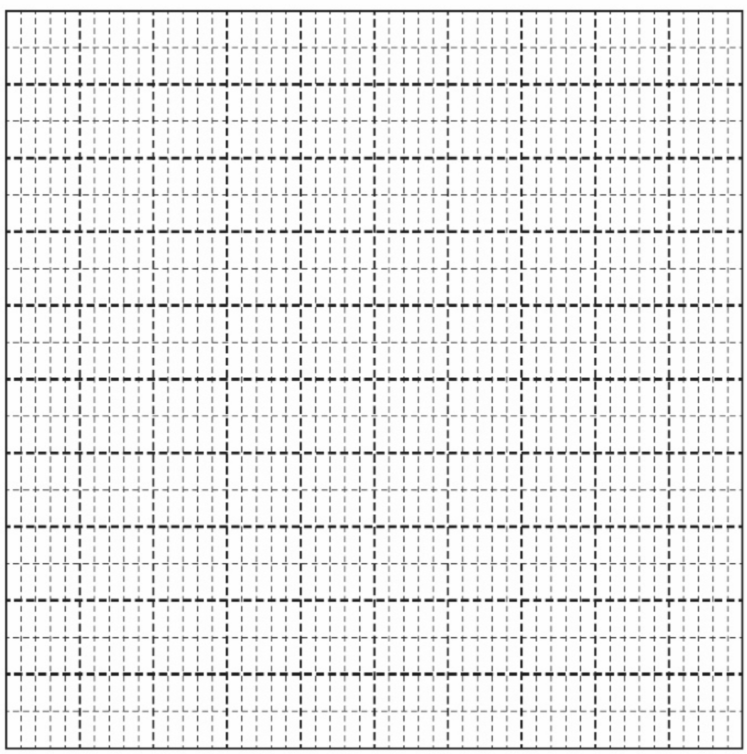





Name________________________________ Date_____________________

Math Mat Master 10

Thousandths Grids





Name________________________________ Date _____________________

Math Mat Master 11

0.5-cm Grid

Name________________________________ Date_____________________

Math Mat Master 12

1-cm Grid

Name________________________________ Date_____________________

Math Mat Master 13

Coding Grid

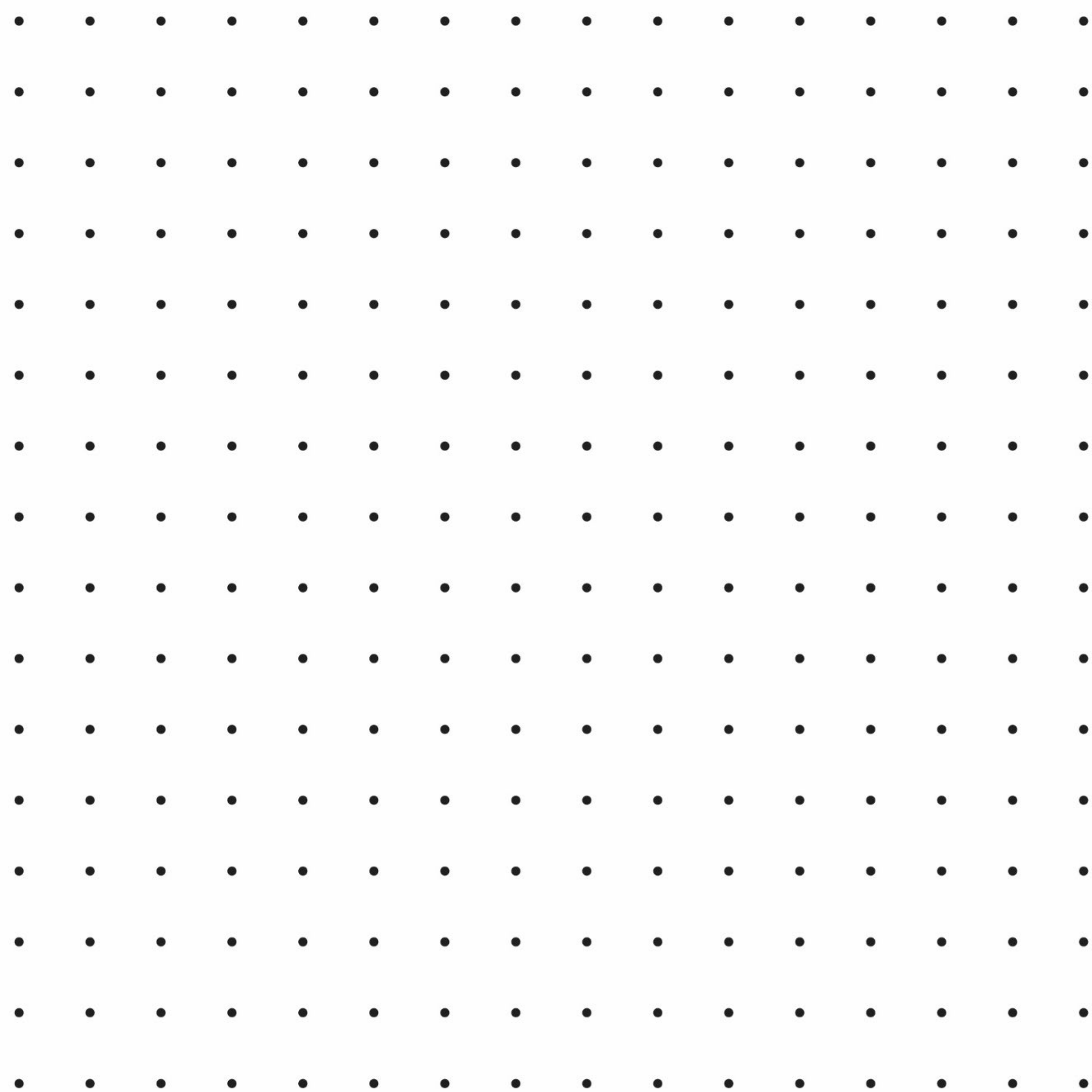
Code

Code

Name________________________________ Date _____________________

Math Mat Master 14

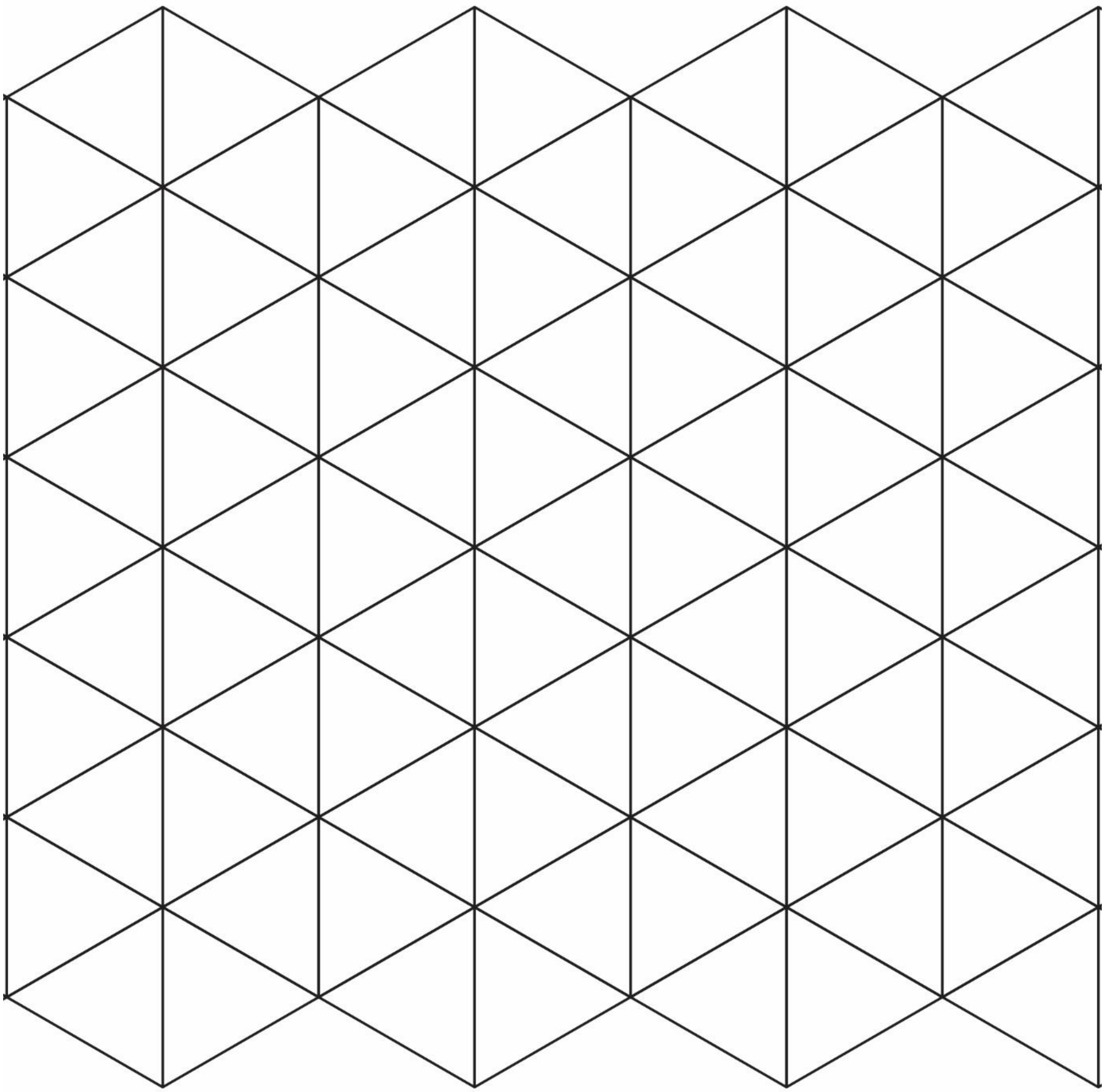
Square Dot Grid



Name________________________________ Date_____________________

Math Mat Master 15

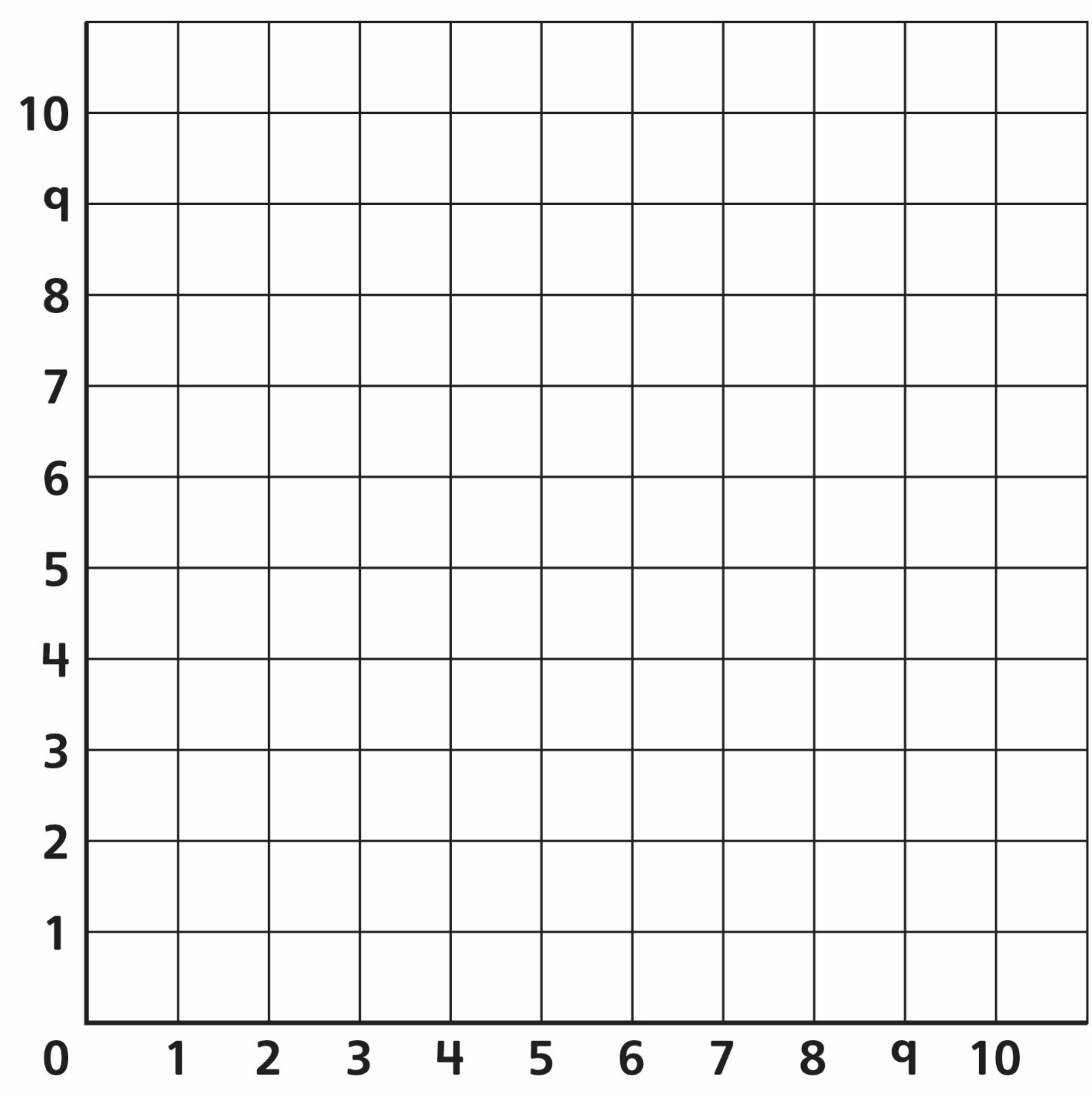
Triangular Grid



Name________________________________ Date_____________________

Math Mat Master 16

Coordinate Grid

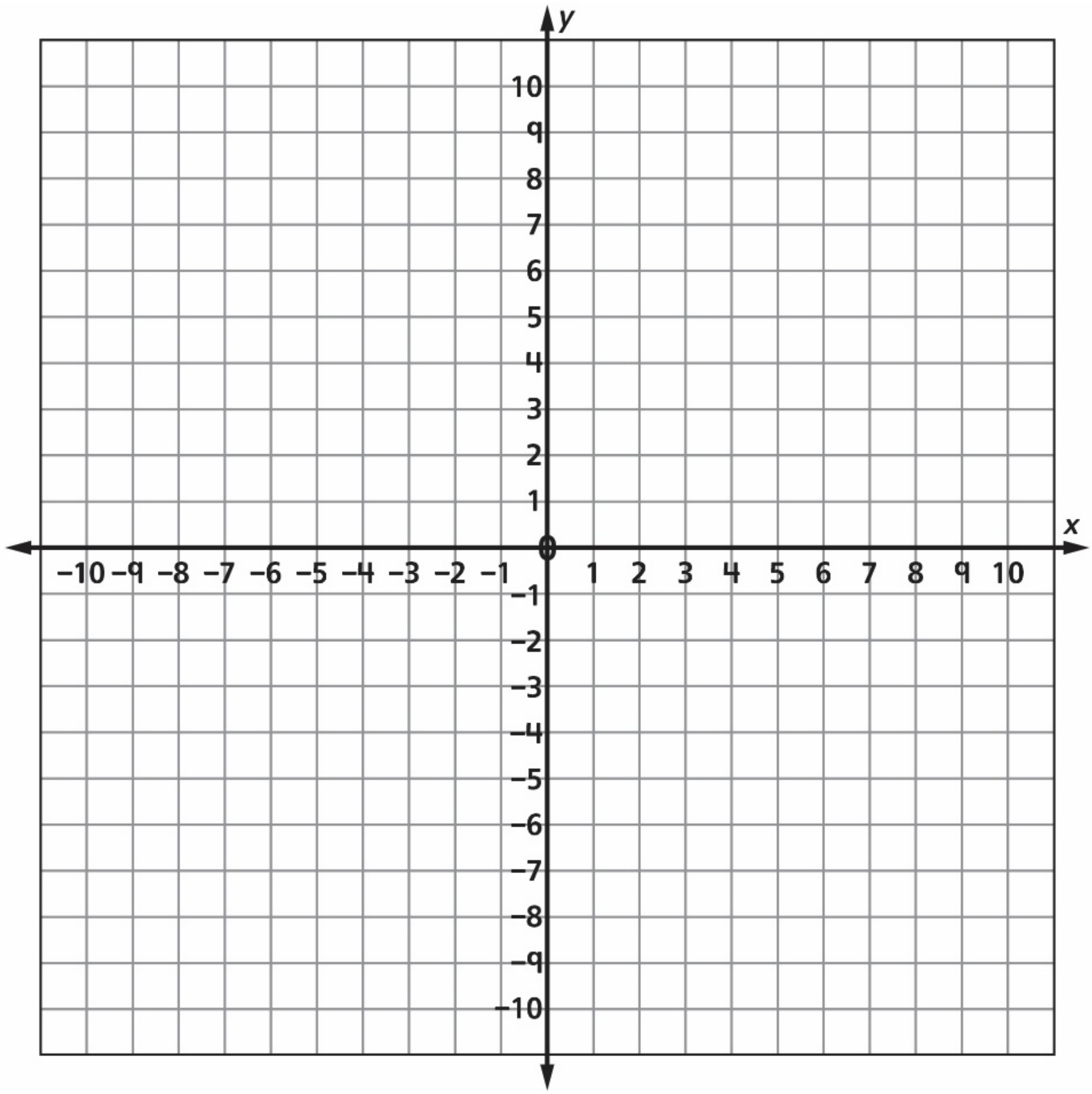


Name________________________________ Date_____________________

Math Mat Master 17

Coordinate Grid

4 Quadrants



Name________________________________ Date_____________________

Math Mat Master 18

Carroll Diagram

Name________________________________ Date_____________________

Math Mat Master 19

Coding Tables

Code:

Code:

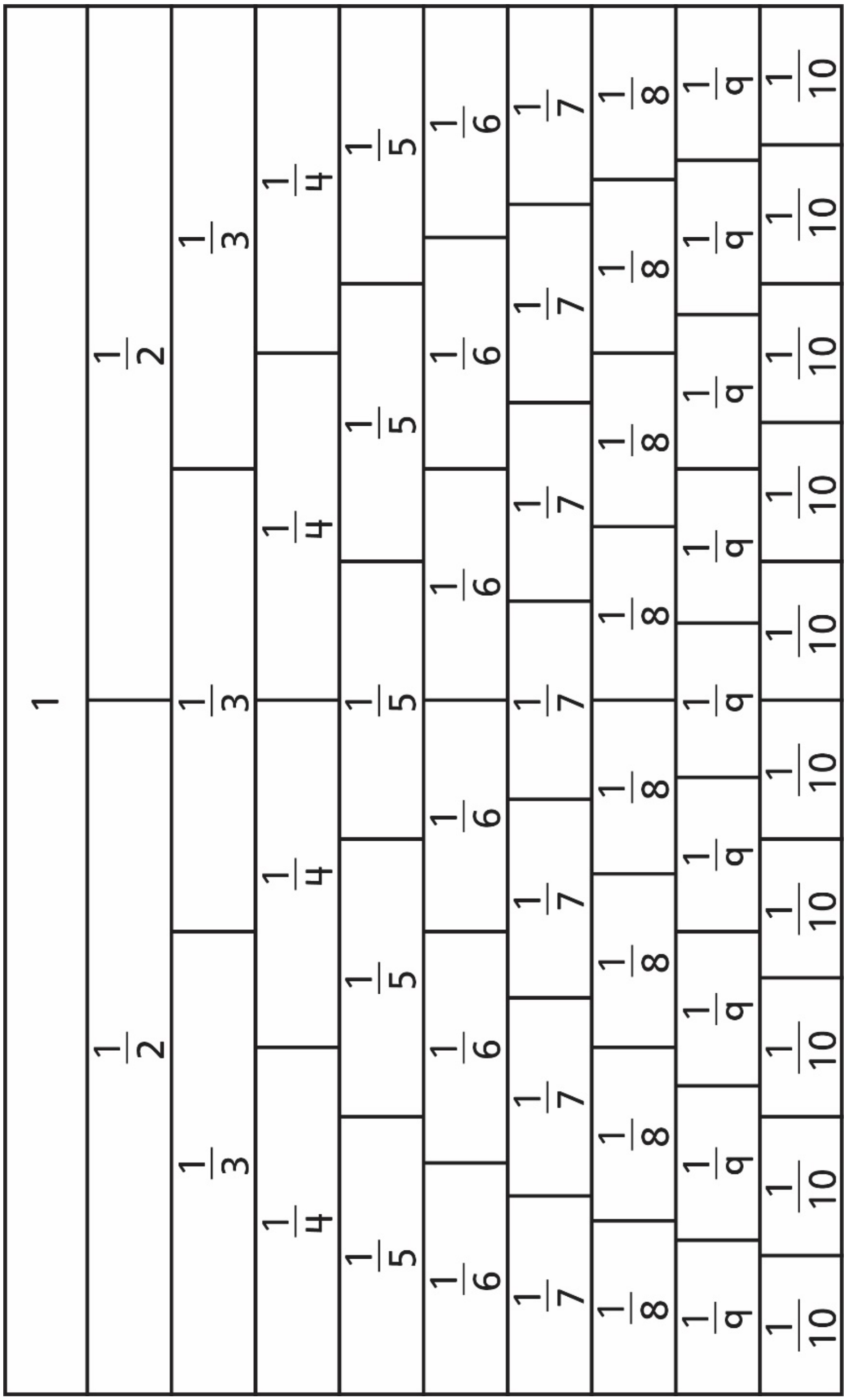
Code:

Code:

Name________________________________ Date_____________________

Math Mat Master 20

Fraction Strips

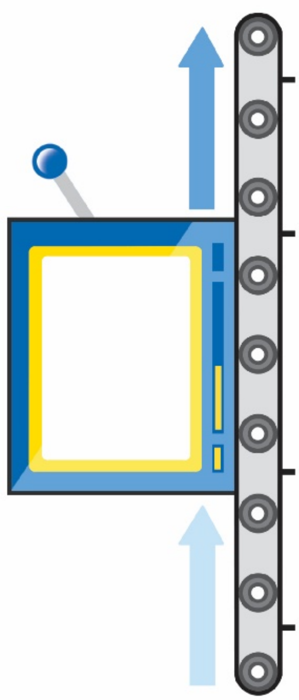


Name________________________________ Date_____________________

Math Mat Master 21

Input/Output Table

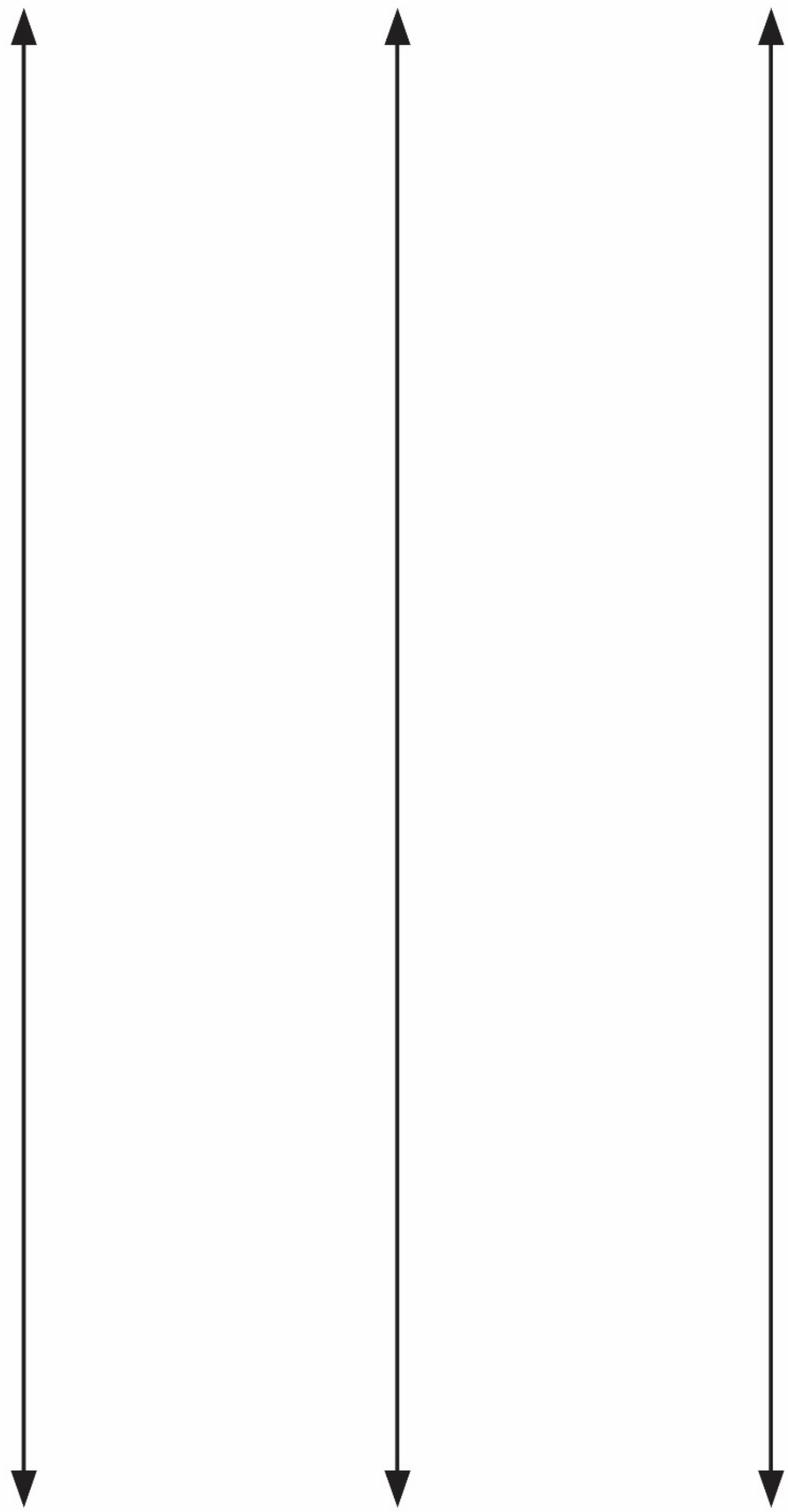
Input	Output



Name_________________________________ Date ______________________

Math Mat
Master 22

Open Number Lines



Name_________________________________ Date______________________

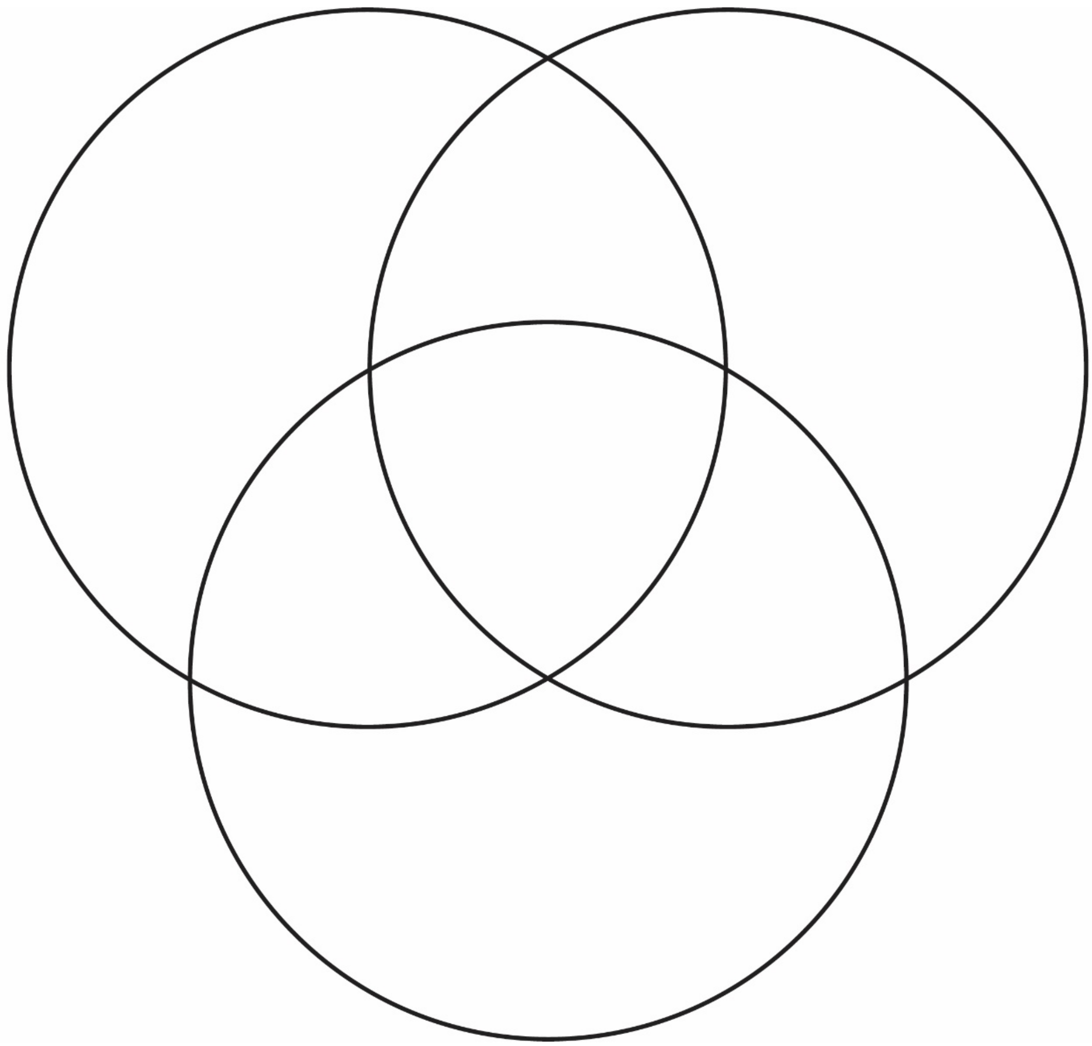
Math Mat Master 23

Ratio Tables

Name________________________________ Date_____________________

Math Mat Master 24

Venn Diagram



Activity 1 Assessment
Exploring First-Hand and Second-Hand Data

Collecting, Organizing, and Representing Data		
Differentiates between first-hand and second-hand data.   “First-hand data is when I survey the people on my street to see if they want a street party on Canada Day. Second-hand data is when my fitness tracker collects the number of steps I take.”	Formulates questions to make comparisons between two groups or events. Which type of music do you like to listen to the most: Country, Modern, Rock, Dance, Sounds of Nature? “I would ask two different grade 5 classes which type of music they prefer to listen to, then make a comparison.”	Chooses the most efficient sampling technique to collect data that is representative of a population. “I would collect first-hand data when finding out about classmates, friends, and family; people I can survey or talk to directly. It is better to collect second-hand data when finding out about Canada, Canadians, and large populations.”
Observations/Documentation		

Activity 1 Assessment

Exploring First-Hand and Second-Hand Data

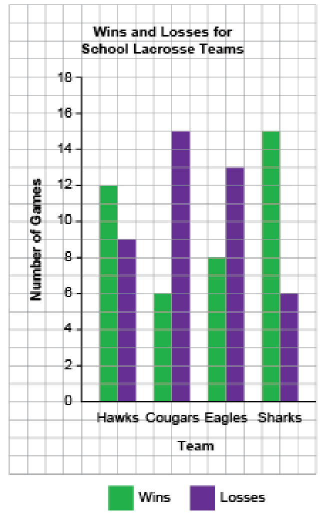
Collecting, Organizing, and Representing Data (cont'd)

Collects and displays two sets of data using appropriate organizers.

Team	Wins	Losses
Hawks	12	9
Cougars	6	15
Eagles	8	13
Sharks	15	6

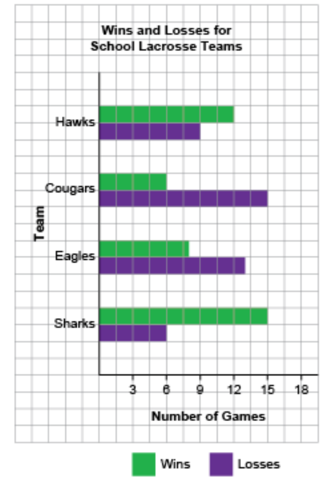
"I collected first-hand data from members of each of the 4 teams and displayed the data in a table."

Represents two sets of data on a double-bar graph using many-to-one correspondences.



"I used a scale of 2:1 to display the 2 sets of data because most of the numbers were even numbers and an odd number would end with half a square."

Creates double-bar graphs using first-hand and second-hand data using many-to-one correspondences.



"I decided to display the data using a horizontal double-bar graph because it is easier to read. It has a 3:1 scale because most of the numbers were multiples of 3."

Observations/Documentation

Activity 2 Assessment
Constructing Double-Bar Graphs

<table>
<tr><th colspan="3">Collecting, Organizing, and Representing Data</th></tr>
<tr>
<td>Differentiates between first-hand and second-hand data.

“First-hand data is when I survey the people on my street to see if they want a street party on Canada Day. Second-hand data is when my fitness tracker collects the number of steps I take.”</td>
<td>Formulates questions to make comparisons between two groups or events.
Which type of music do you like to listen to the most: Country, Modern, Rock, Dance, Sounds of Nature?
“I would ask two different grade 5 classes which type of music they prefer to listen to, then make a comparison.”</td>
<td>Chooses the most efficient sampling technique to collect data that is representative of a population.
“I would collect first-hand data when finding out about classmates, friends, and family; people I can survey or talk to directly. It is better to collect second-hand data when finding out about Canada, Canadians, and large populations.”</td>
</tr>
<tr><th colspan="3">Observations/Documentation</th></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Activity 2 Assessment
Constructing Double-Bar Graphs

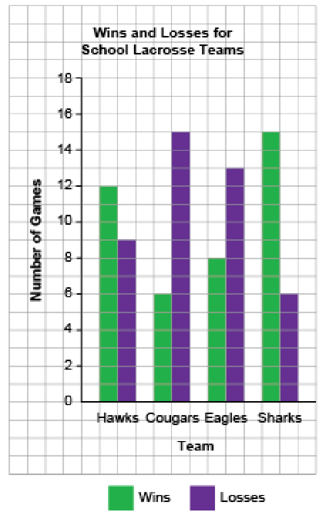
Collecting, Organizing, and Representing Data (cont'd)

Collects and displays two sets of data using appropriate organizers.

Team	Wins	Losses
Hawks	12	9
Cougars	6	15
Eagles	8	13
Sharks	15	6

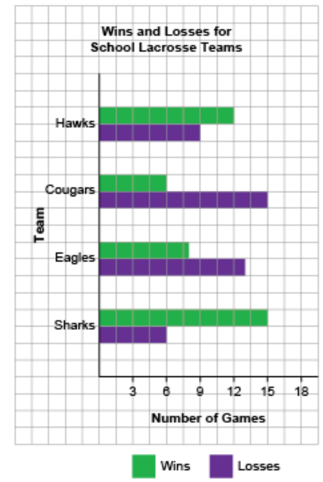
"I collected first-hand data from members of each of the 4 teams and displayed the data in a table."

Represents two sets of data on a double-bar graph using many-to-one correspondences.



"I used a scale of 2:1 to display the 2 sets of data because most of the numbers were even numbers and an odd number would end with half a square."

Creates double-bar graphs using first-hand and second-hand data using many-to-one correspondences.



"I decided to display the data using a horizontal double-bar graph because it is easier to read. It has a 3:1 scale because most of the numbers were multiples of 3."

Observations/Documentation

Activity 3 Assessment
Interpreting Double-Bar Graphs

Interpreting Double-Bar Graphs

Draws conclusions based on data presented.

Greenhouse Gas Emissions by Province

Province	2005 (Mt)	2019 (Mt)
Quebec	88	84
Ontario	206	163
Manitoba	21	23
Saskatchewan	68	75
Alberta	235	276
British Columbia	63	66

"Only Quebec and Ontario reduced their greenhouse gas emissions from 2005 to 2019. Alberta had the greatest increase and Manitoba had the smallest increase."

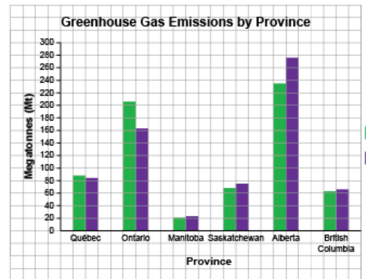
Uses inferences to make predictions about future events.

Greenhouse Gas Emissions by Province

Province	2005 (Mt)	2019 (Mt)
Quebec	88	84
Ontario	206	163
Manitoba	21	23
Saskatchewan	68	75
Alberta	235	276
British Columbia	63	66

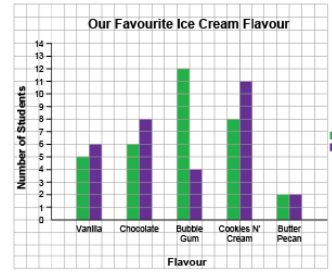
"Ontario has a large manufacturing industry and Alberta has a large oil and gas industry. It might help Alberta to talk to Ontario about ways to reduce emissions to help slow global warming."

Interprets the results of data presented graphically.



"Ontario reduced its emissions by about one-fifth because the lengths of the bars are about 10 squares and 8 squares."

Analyzes 2 sets of data to make convincing arguments and informed decisions.



"I noticed that Bubble Gum and Cookies N' Cream are the favourites for both classes. To sell more ice cream, the ice cream truck driver should have more of these flavours and less of Butter Pecan because it was the least favourite in both grades."

Observations/Documentation

Name________________________________ Date_____________________

Data Management
Unit 1B Line Master 1

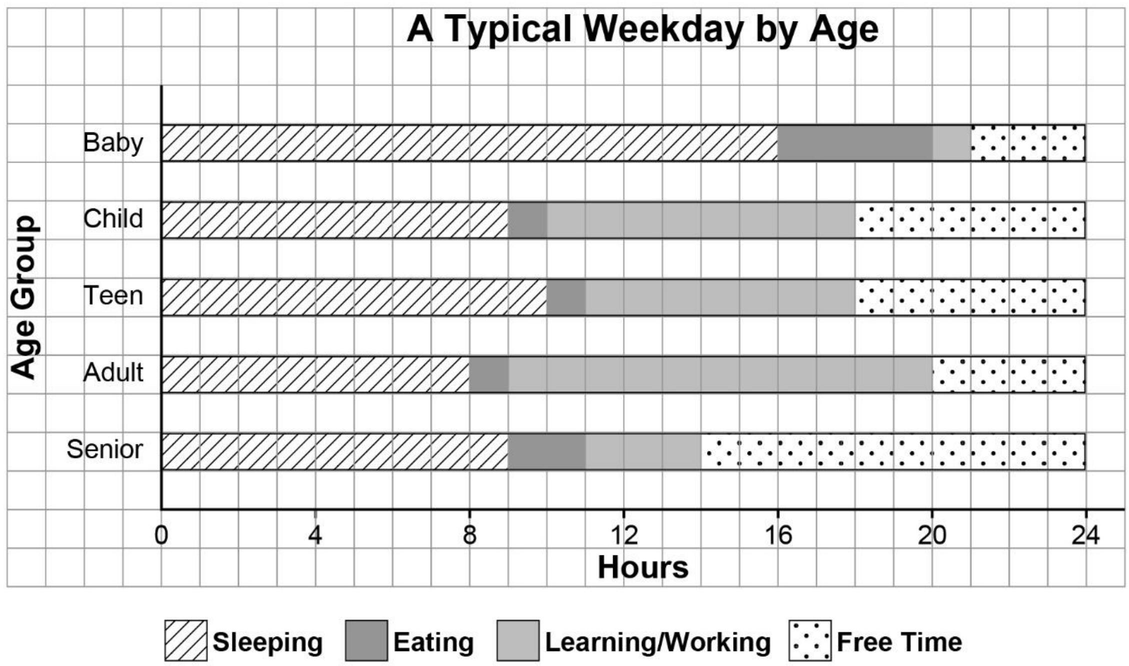
Relative-Frequency Table

	Tally	Frequency	Relative Frequency

Name________________________________ Date_____________________

Data Management
Unit 1B Line Master 2

A Typical Weekday



Name________________________________ Date_____________________

Data Management
Unit 1B Line Master 3

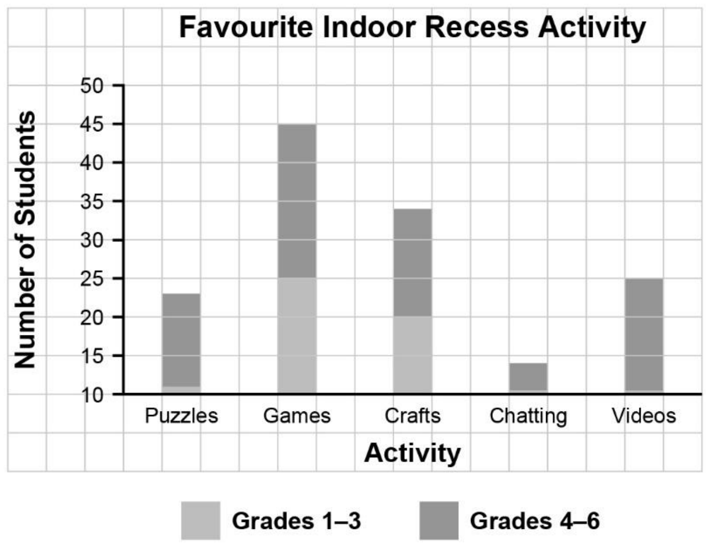
Relative-Frequency Table

Activity	Baby	Child	Teen	Adult	Senior

Name________________________________ Date_____________________

Data Management
Unit 1B Line Master 4

Indoor Recess



Name________________________________ Date_____________________

Data Management
Unit 1B Line Master 5

How Much Water Do We Drink?

Ten students in a Grade 1 class were surveyed to see how many glasses of water they drink in a day.
These data were collected:

3 3.5 2 4 2.5 2 2 1.5 1 3

Find the mode, median, and mean number of glasses for the Grade 1 class.

Name________________________________ Date_____________________

Data Management
Unit 1B Line Master 6

Water Usage Data

How a Typical Household Uses Water in One Day				
Toilet	**Bathing/ Showering**	**Brushing Teeth/ Washing Hands**	**Helping Cook/ Clean**	**Drinking**
40 L	70 L	40 L	46 L	4 L

Water Bills for Two Households Over One Year				
	Jan–Mar	**Apr–June**	**July–Sept**	**Oct–Dec**
Household A	$125.00	$155.50	$210.50	$145.00
Household B	$132.00	$146.00	$152.00	$166.00

Type of Drinking Water Used at Home by Grade Level			
Students	**Tap**	**Bottled**	**Filtered**
Grade 4	22	18	30
Grade 5	18	12	38
Grade 6	30	10	32

Data Management and Probability

Activity 1 Assessment
Exploring Sampling Techniques

<table>
<tr><th colspan="3">Collecting, Organizing, and Representing Data</th></tr>
<tr>
<td>Formulates questions to make comparison between two groups or events.

What volunteer activity would your family most like to do: food bank, helping seniors, park cleanup, animal shelter?

“I would survey 10 students from both grade 5 classes, then compare results.”</td>
<td>Chooses the most efficient sampling technique to collect data that is a representative of a population.

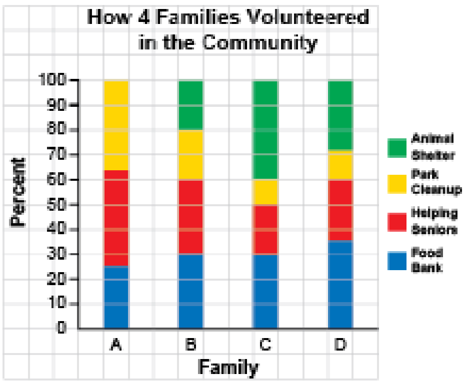
“I used systematic random sampling. I got a list of all families who volunteered and surveyed every fifth family on the list.”</td>
<td>Collects and displays data using appropriate organizers.

<table><tr><th>Volunteer Activity</th><th>Frequency</th><th>Relative Frequency</th></tr><tr><td>Food Bank (h)</td><td>12</td><td>$\frac{12}{50}$ = 0.24 = 24%</td></tr><tr><td>Helping Seniors (h)</td><td>20</td><td>$\frac{20}{50}$ = 0.40 = 40%</td></tr><tr><td>Park Cleanup (h)</td><td>18</td><td>$\frac{18}{50}$ = 0.36 = 36%</td></tr><tr><td>Animal Shelter (h)</td><td>0</td><td>$\frac{0}{50}$ = 0.00 = 0%</td></tr></table>
“I used a relative frequency table to record the data for each family.”</td>
</tr>
<tr><th colspan="3">Observations/Documentation</th></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Activity 1 Assessment
Exploring Sampling Techniques

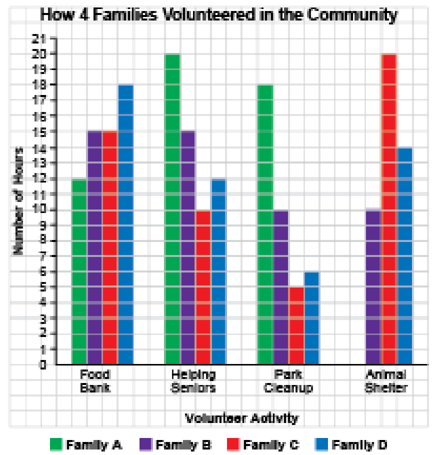
Collecting, Organizing, and Representing Data (cont’d)

Represents and analyzes collected data.



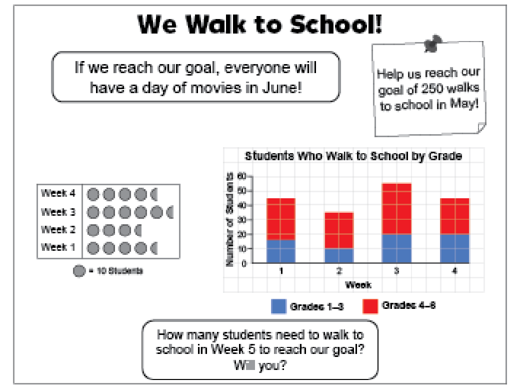
“I used a stacked bar graph because I can easily compare the heights of the different sections.”

Chooses appropriate visual representation to display data and justifies choice of graph.



“I used a multiple bar graph because I can quickly make comparisons to make convincing arguments and informed decisions.”

Creates infographic to tell a story about the data.



“The audience is students at the school. The message is that more students need to walk to school.”

Observations/Documentation

Activity 2 Assessment
Exploring Relative Frequency Tables

Collecting, Organizing, and Representing Data

Formulates questions to make comparison between two groups or events.

What volunteer activity would your family most like to do: food bank, helping seniors, park cleanup, animal shelter?

"I would survey 10 students from both grade 5 classes, then compare results."

Chooses the most efficient sampling technique to collect data that is a representative of a population.

"I used systematic random sampling. I got a list of all families who volunteered and surveyed every fifth family on the list."

Collects and displays data using appropriate organizers.

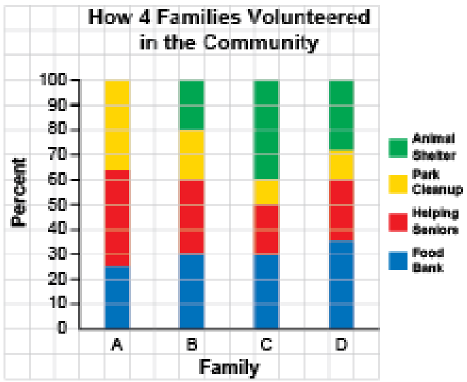
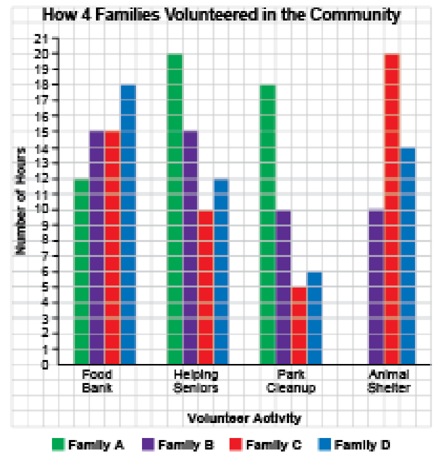
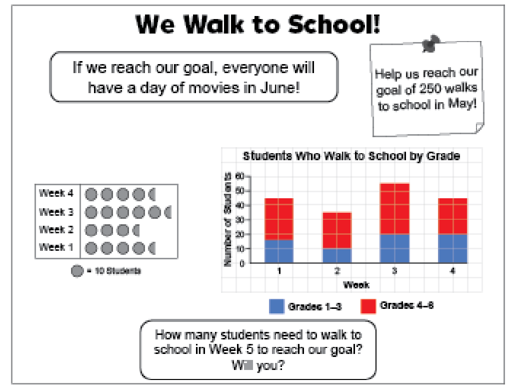
Volunteer Activity	Frequency	Relative Frequency
Food Bank (h)	12	$\frac{12}{50}$ = 0.24 = 24%
Helping Seniors (h)	20	$\frac{20}{50}$ = 0.40 = 40%
Park Cleanup (h)	18	$\frac{18}{50}$ = 0.36 = 36%
Animal Shelter (h)	0	$\frac{0}{50}$ = 0.00 = 0%

"I used a relative frequency table to record the data for each family."

Observations/Documentation

Activity 2 Assessment

Exploring Relative Frequency Tables

Collecting, Organizing, and Representing Data (cont'd)		
Represents and analyzes collected data.	Chooses appropriate visual representation to display data and justifies choice of graph.	Creates infographic to tell a story about the data.
 "I used a stacked bar graph because I can easily compare the heights of the different sections."	 "I used a multiple bar graph because I can quickly make comparisons to make convincing arguments and informed decisions."	 "The audience is students at the school. The message is that more students need to walk to school."
Observations/Documentation		

Activity 3 Assessment
Exploring Stacked Bar Graphs

Interpreting Data and Making Informed Decisions

Draws conclusions based on data presented.

Ingredients	Mr. Green's	Smoothie Palace	Green Machine	Super Smoothie
Mango	10%	10%	5%	20%
Spinach	50%	40%	45%	20%
Banana	15%	20%	15%	20%
Pineapple	5%	10%	5%	20%
Water	20%	20%	30%	20%

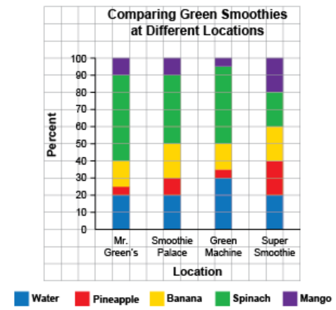
"Mr. Green's has the most spinach and Super Smoothies has equal parts of each ingredient."

Uses inferences to make predictions about future events.

Ingredients	Mr. Green's	Smoothie Palace	Green Machine	Super Smoothie
Mango	10%	10%	5%	20%
Spinach	50%	40%	45%	20%
Banana	15%	20%	15%	20%
Pineapple	5%	10%	5%	20%
Water	20%	20%	30%	20%

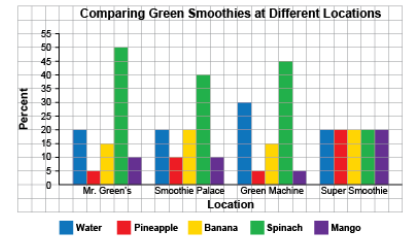
"It seems that the Green Machine uses the most water. I predict that Green Machine smoothies won't be very thick."

Interprets the results of data presented graphically, using different types of graphs.



"I like the stacked bar graph best because I can compare the parts easily. I think Super Smoothie will have the sweetest smoothie because there's lots of fruit."

Analyzes and interprets data to make convincing arguments and informed decisions.



"In the future, I am going to buy a smoothie from Super Smoothies because it has the most fruit."

Observations/Documentation

Data Management and Probability

Activity 4 Assessment
Analyzing Graphs

Interpreting Data and Making Informed Decisions

Draws conclusions based on data presented.

Ingredients	Mr. Green's	Smoothie Palace	Green Machine	Super Smoothie
Mango	10%	10%	5%	20%
Spinach	50%	40%	45%	20%
Banana	15%	20%	15%	20%
Pineapple	5%	10%	5%	20%
Water	20%	20%	30%	20%

"Mr. Green's has the most spinach and Super Smoothies has equal parts of each ingredient."

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Ingredients	Mr. Green's	Smoothie Palace	Green Machine	Super Smoothie
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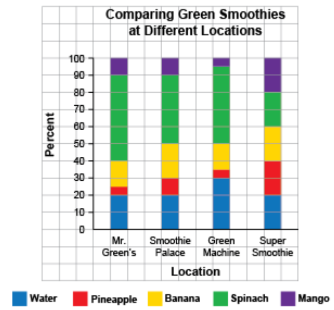
Banana	15%	20%	15%	20%
Pineapple	5%	10%	5%	20%
Water	20%	20%	30%	20%

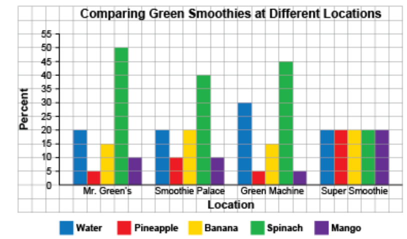
"It seems that the Green Machine uses the most water. I predict that Green Machine smoothies won't be very thick."

Interprets the results of data presented graphically, using different types of graphs.



"I like the stacked bar graph best because I can compare the parts easily. I think Super Smoothie will have the sweetest smoothie because there's lots of fruit."

Analyzes and interprets data to make convincing arguments and informed decisions.



"In the future, I am going to buy a smoothie from Super Smoothies because it has the most fruit."

Observations/Documentation

Activity 5 Assessment
Measures of Central Tendency

Determining the Measures of Central Tendency			
Reads and interprets data displays to determine mode and median Number of glasses of water students in a Grade 5 class drink in a day: 2, 3, 3, 3.5, 4, 4, 4, 4.5, 5.5, 6 • mode: 4 glasses • median: 4 glasses	Determines the mean value as the average measure Number of glasses of water students in a Grade 5 class drink in a day: 2, 3, 3, 3.5, 4, 4, 4, 4.5, 5.5, 6 2 + 3 + 3 + 3.5 + 4 + 4 + 4 + 4.5 + 5.5 + 6 = 39.5 39.5 ÷ 10 = 3.95 • mean: 3.95 glasses	Compares measures of central tendency for two related sets of data Grade 5: • the mode: 4 glasses • the median: 4 glasses • the mean: 3.95 glasses Grade 1: • mode: 2 glasses • median: 2.25 glasses • mean: 2.45 glasses "Grade 5 students drink more glasses of water per day than Grade 1 students."	Fluently and flexibly finds the mode, mean, and median and explains what each indicates • mode: 4.5 glasses • median: 4.25 glasses • mean: 4.05 glasses "The mode is the most frequent number; the median is the middle number, and the mean is the average number. All measures are very close. Any of the measures can represent the data."
Observations/Documentation			

Activity 6 Assessment
Creating an Infographic

Collecting, Organizing, and Representing Data

Formulates questions to make comparison between two groups or events.

What volunteer activity would your family most like to do: food bank, helping seniors, park cleanup, animal shelter?

"I would survey 10 students from both grade 5 classes, then compare results."

Chooses the most efficient sampling technique to collect data that is a representative of a population.

"I used systematic random sampling. I got a list of all families who volunteered and surveyed every fifth family on the list."

Collects and displays data using appropriate organizers.

Volunteer Activity	Frequency	Relative Frequency
Food Bank (h)	12	$\frac{12}{50} = 0.24 = 24\%$
Helping Seniors (h)	20	$\frac{20}{50} = 0.40 = 40\%$
Park Cleanup (h)	18	$\frac{18}{50} = 0.36 = 36\%$
Animal Shelter (h)	0	$\frac{0}{50} = 0.00 = 0\%$

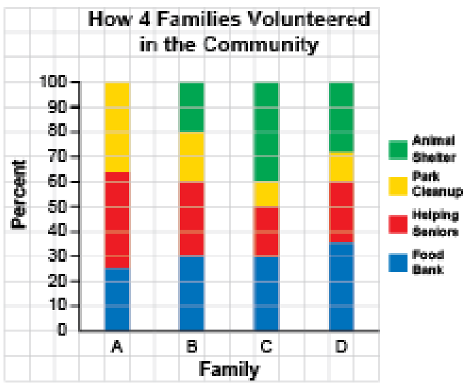
"I used a relative frequency table to record the data for each family."

Observations/Documentation

Activity 6 Assessment
Creating an Infographic

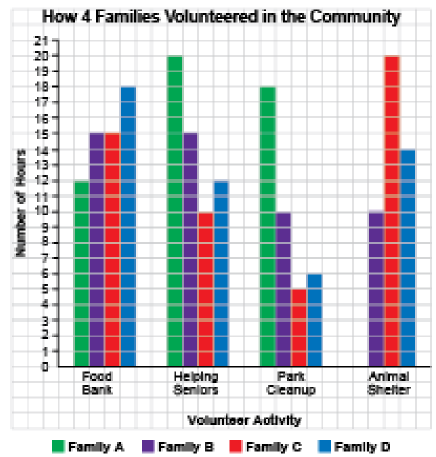
Collecting, Organizing, and Representing Data (cont'd)

Represents and analyzes collected data.



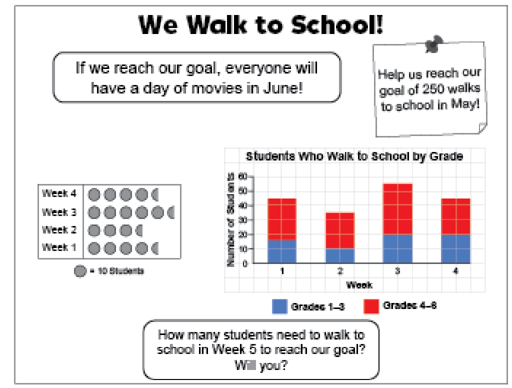
"I used a stacked bar graph because I can easily compare the heights of the different sections."

Chooses appropriate visual representation to display data and justifies choice of graph.



"I used a multiple bar graph because I can quickly make comparisons to make convincing arguments and informed decisions."

Creates infographic to tell a story about the data.



"The audience is students at the school. The message is that more students need to walk to school."

Observations/Documentation

Name______________________________ Date____________________

Data Management
Unit 2 Line Master 1

Event Cards

Likelihood Cards

Impossible	**Unlikely**	**Equally Likely**	**Likely**	**Certain**

Event Cards

You will fly in a spaceship tonight.	A square has four sides.	A leaf will fall from a tree in the forest today.	It will be dark tonight.
You will talk to someone today.	You will have a dream tonight.	If you enter a contest, you will win or not win.	You will see a whale in a swimming pool.
You will walk home from school.	You will get heads when you toss a coin.	After a rainstorm, you will see a rainbow.	You will pull a red marble from a bag that has 1 red marble and 3 blue marbles.
You will do something with your family on the weekend.	Snow will melt when it is brought inside.	You will roll an 8 using a number cube labelled from 1 to 6.	A ladybug will land on your hand today.

Name________________________________ Date_____________________

Data Management
Unit 2 Line Master 2a

My Events

My Events

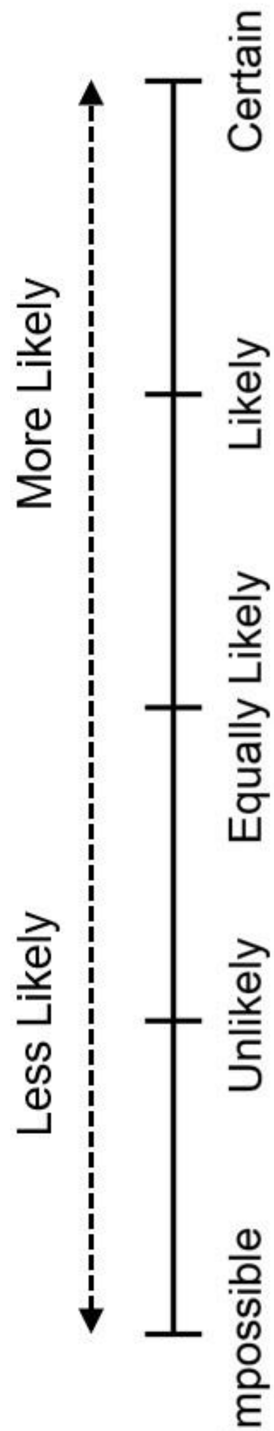
A	B	C
D	E	F

Name________________________________ Date_____________________

Data Management
Unit 2 Line Master 2b

My Events (cont’d)

Probability Line



Name______________________________ Date____________________

Data Management
Unit 2 Line Master 3

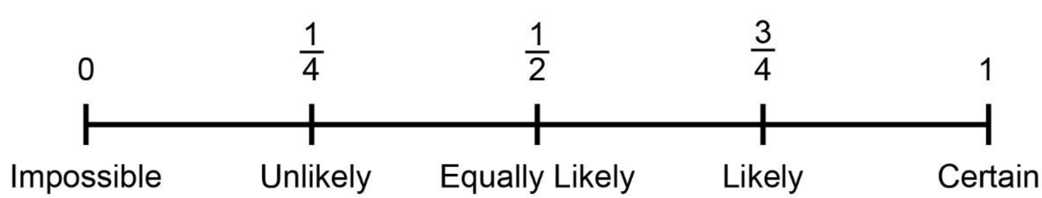
Representing Probabilities with Fractions

The pointer on this spinner is spun.
Represent the probability of each event below as a fraction.

Event	Probability
A: landing on 2	
B: landing on 3	
C: landing on 4	
D: landing on 5	
E: landing on 6	
F: landing on 2, 3, 4, or 5	
G: landing on an even number	
H: landing on 3, 4, or 5	

Probability Line

Place each outcome on the probability line to show how likely it is to happen.



Name________________________________ Date_____________________

Data Management
Unit 2 Line Master 4

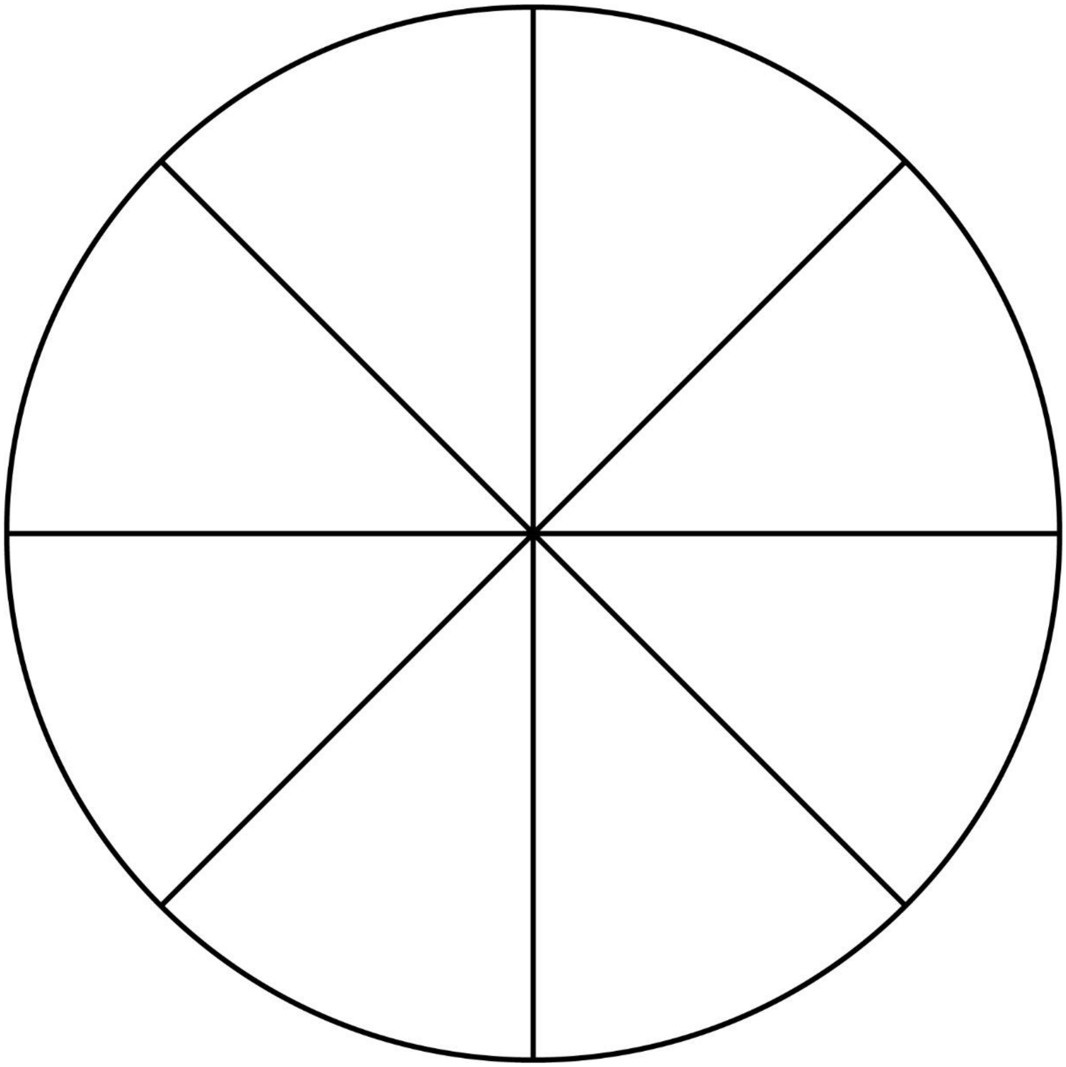
Experiment Recording Sheet

Possible Outcomes	Likelihood	Prediction	Results	Combined Results

Name________________________________ Date_____________________

Data Management
Unit 2 Line Master 5

Large Spinner



Name________________________________ Date_____________________

Data Management
Unit 2 Line Master 6

Number Cards

(1 to 12)

1	2	3
4	5	6
7	8	9
10	11	12

Name________________________________ Date_____________________

Data Management
Unit 2 Line Master 7a

Our Experiments

Experiment 1: taking an even number is less likely than taking an odd number.

Cards in the Bag	Results of Experiment	Are results what you expected? Explain.

Or

Cards in the Bag	Likelihood	Results of Experiment	Experimental Probability	Are results what you expected? Explain.

Name________________________________ Date_____________________

Data Management
Unit 2 Line Master 7b

Our Experiments (cont'd)

Experiment 2: taking an even number and taking an odd number are equally likely.

Cards in the Bag	Results of Experiment	Are results what you expected? Explain.

Or

Cards in the Bag	Likelihood	Results of Experiment	Experimental Probability	Are results what you expected? Explain.

Name________________________________ Date_____________________

Data Management
Unit 2 Line Master 7c

Our Experiments (cont'd)

Experiment 3: taking a number from 1 to 6 is more likely than taking a number from 7 to 12.

Cards in the Bag	Results of Experiment	Are results what you expected? Explain.

Or

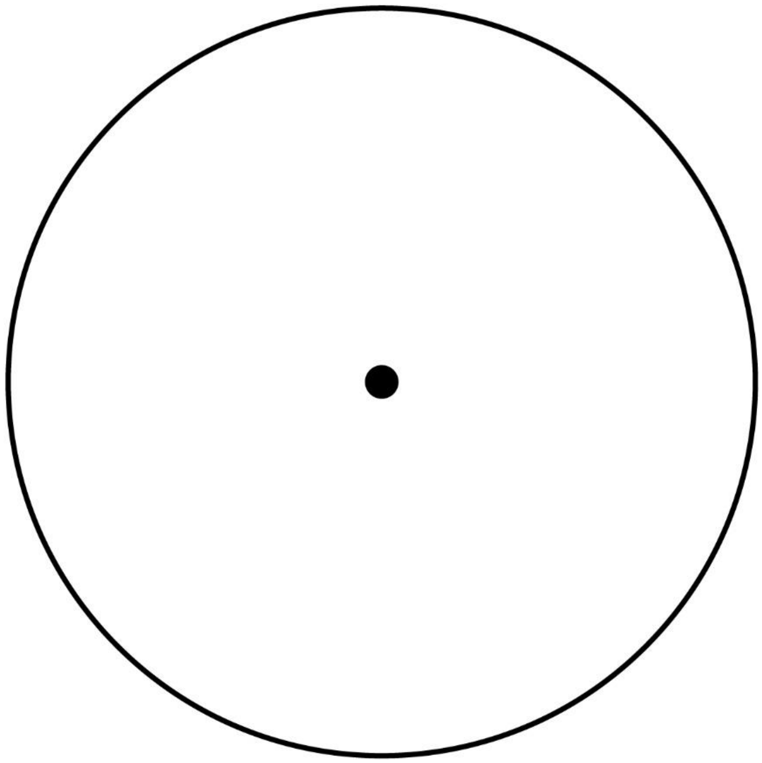
Cards in the Bag	Likelihood	Results of Experiment	Experimental Probability	Are results what you expected? Explain.

Name________________________________ Date_____________________

Data Management
Unit 2 Line Master 8a

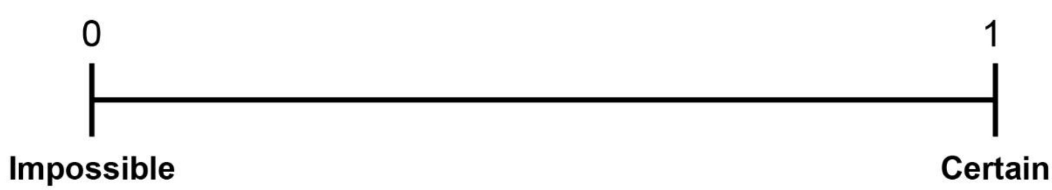
Is This What We Expected?

- Our Spinner



- Theoretical Probabilities of Favourable Outcomes

- Probability Line



Name________________________________ Date_____________________

Data Management
Unit 2 Line Master 8b

Comparing Predictions with Results

Number of Trials: _________

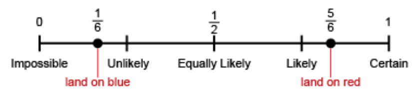
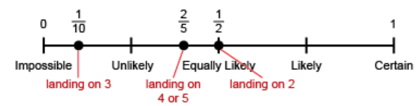
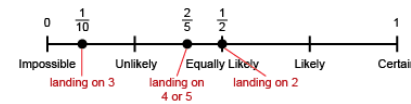
- Predictions

- Results of Experiment

- Experimental Probabilities

- Comparing Results with Predictions

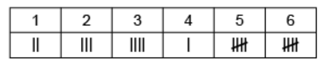
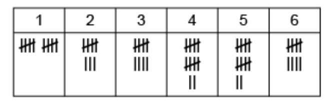
Activity 5 Assessment
Describing Likelihood of Outcomes

Representing Outcomes using Fractions			
Uses likelihood terms to describe probability of events and make predictions.  “The spinner is likely to land on red because all but 1 sector is red.”	Makes predictions benchmark fractions on a probability line.  “I can see from the line that it is much more likely for the pointer to land on red. In 60 spins, I predict the pointer will land on blue 50 times.”	Makes predictions for combined outcomes on a probability line.   “The probability of landing on 4 or 5 is less than the probability of landing on 2. I would predict that the pointer is more likely to land on 2 than on 4 or 5.”	Uses fractions to express probability using benchmarks and make informed decisions.  “If this spinner was at a carnival game, I would always choose the pointer landing on 2 because it is the most likely outcome. I would never choose the pointer landing on 3.”
Observations/Documentation			

Activity 6 Assessment

Conducting Experiments

<table>
<tr><th colspan="4">Making Predictions and Conducting Experiments</th></tr>
<tr>
<td>Makes predictions and performs experiments.

“The probability of getting 2 tails when tossing 2 coins is $\frac{1}{4}$. That isn’t what happened in the experiment. I’m not sure why.”</td>
<td>Performs experiment, records results, and compares predictions to results.

“If I roll a number cube 20 times, I expect to roll each number about 3 times. The results weren’t close to my predictions because I only rolled a 4 once.”</td>
<td>Knows that with more trials, the closer the actual results may be to predicted results.

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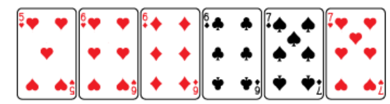
<td>Performs experiments, analyzes results, and compares and justifies predictions.

“The probability of drawing a 6 or a 7 is $\frac{5}{6}$. So, when I conduct the experiment 60 times, I would expect to get a 6 or 7 about 50 times. I got 6 or 7 forty-four times. I have to do more trials.”</td>
</tr>
<tr><th colspan="4">Observations/Documentation</th></tr>
<tr><td></td><td></td><td>perform the experiment to check.</td><td></td></tr>
</table>

Data Management and Probability

Activity 6 Assessment
Conducting Experiments

Theoretical Probability of Independent Events			
Predicts likelihood of favored outcomes based on personal preferences or experiences.  “I think I will get the blue marble because last time I got a blue marble.”	Represents probability using words/fractions and predicts the likelihood of future events.  “I think I will get a blue marble because $\frac{6}{12}$ or $\frac{1}{2}$ of the marbles are blue.”	Represents probability using ‘odds in favour’ and predicts likelihood of future events.  “The probability of getting a red marble is $\frac{1}{4}$. The probability of not getting a red marble is $\frac{3}{4}$. The ‘odds in favour’ of a red marble are 1:3. It is not likely that I will get a red marble.”	Fluently makes and justifies predictions about the likelihood of future events. “Knowing the likelihood of events can help me make decisions in real life. For example, weather forecasts are created by comparing the likelihood of different weather conditions.”
Observations/Documentation			

Data Management and Probability

Activity 7 Assessment
Designing Experiments

Making Predictions and Conducting Experiments

Makes predictions and performs experiments.

“The probability of getting 2 tails when tossing 2 coins is $\frac{1}{4}$. That isn’t what happened in the experiment. I’m not sure why.”

Performs experiment, records results, and compares predictions to results.

1	2	3	4	5	6
II	III	IIII	I	卌	卌

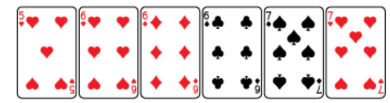
“If I roll a number cube 20 times, I expect to roll each number about 3 times. The results weren’t close to my predictions because I only rolled a 4 once.”

Knows that with more trials, the closer the actual results may be to predicted results.

1	2	3	4	5	6
卌 卌	卌 III	卌 IIII	卌 卌 II	卌 卌 II	卌 IIII

“When I conducted more trials (100), I noticed that the results got closer to my predictions. But they still didn’t match exactly.”

Performs experiments, analyzes results, and compares and justifies predictions.

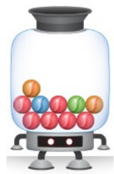
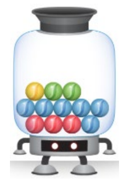


“The probability of drawing a 6 or a 7 is $\frac{5}{6}$. So, when I conduct the experiment 60 times, I would expect to get a 6 or 7 about 50 times. I got 6 or 7 forty-four times. I have to do more trials.”

Observations/Documentation

Data Management and Probability

Activity 7 Assessment
Designing Experiments

Theoretical Probability of Independent Events			
Predicts likelihood of favored outcomes based on personal preferences or experiences.  "I think I will get the blue marble because last time I got a blue marble."	Represents probability using words/fractions and predicts the likelihood of future events.  "I think I will get a blue marble because $\frac{6}{12}$ or $\frac{1}{2}$ of the marbles are blue."	Represents probability using 'odds in favour' and predicts likelihood of future events.  "The probability of getting a red marble is $\frac{1}{4}$. The probability of not getting a red marble is $\frac{3}{4}$. The 'odds in favour' of a red marble are 1:3. It is not likely that I will get a red marble."	Fluently makes and justifies predictions about the likelihood of future events. "Knowing the likelihood of events can help me make decisions in real life. For example, weather forecasts are created by comparing the likelihood of different weather conditions."
Observations/Documentation			

Activity 8 Assessment
Describing Likelihood of Outcomes

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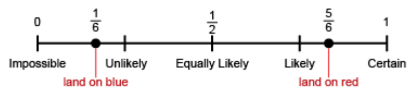
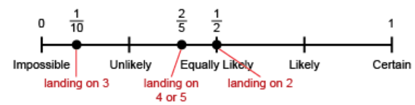


“I can see from the line that it is much more likely for the pointer to land on red. In 60 spins, I predict the pointer will land on blue 50 times.”</td>
<td>Makes predictions for combined outcomes on a probability line.

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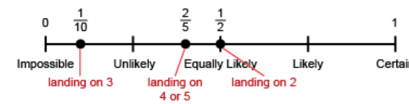

“If this spinner was at a carnival game, I would always choose the pointer landing on 2 because it is the most likely outcome. I would never choose the pointer landing on 3.”</td>
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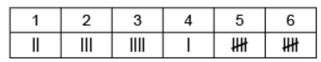
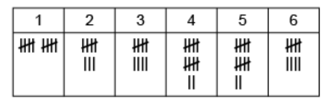
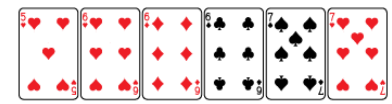
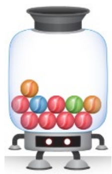
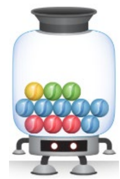
Activity 9 Assessment
Conducting Experiments

Making Predictions and Conducting Experiments			
Makes predictions and performs experiments.  "The probability of getting 2 tails when tossing 2 coins is $\frac{1}{4}$. That isn't what happened in the experiment. I'm not sure why."	Performs experiment, records results, and compares predictions to results.  "If I roll a number cube 20 times, I expect to roll each number about 3 times. The results weren't close to my predictions because I only rolled a 4 once."	Knows that with more trials, the closer the actual results may be to predicted results.  "When I conducted more trials (100), I noticed that the results got closer to my predictions. But they still didn't match exactly."	Performs experiments, analyzes results, and compares and justifies predictions.  "The probability of drawing a 6 or a 7 is $\frac{5}{6}$. So, when I conduct the experiment 60 times, I would expect to get a 6 or 7 about 50 times. I got 6 or 7 forty-four times. I have to do more trials."
Observations/Documentation			

Activity 9 Assessment
Conducting Experiments

Theoretical Probability of Independent Events			
Predicts likelihood of favored outcomes based on personal preferences or experiences.  “I think I will get the blue marble because last time I got a blue marble.”	Represents probability using words/fractions and predicts the likelihood of future events.  “I think I will get a blue marble because $\frac{6}{12}$ or $\frac{1}{2}$ of the marbles are blue.”	Represents probability using ‘odds in favour’ and predicts likelihood of future events.  “The probability of getting a red marble is $\frac{1}{4}$. The probability of not getting a red marble is $\frac{3}{4}$. The ‘odds in favour’ of a red marble are 1:3. It is not likely that I will get a red marble.”	Fluently makes and justifies predictions about the likelihood of future events. “Knowing the likelihood of events can help me make decisions in real life. For example, weather forecasts are created by comparing the likelihood of different weather conditions.”
Observations/Documentation			

Data Management and Probability

Activity 10 Assessment

Designing Experiments

Making Predictions and Conducting Experiments

Makes predictions and performs experiments.

"The probability of getting 2 tails when tossing 2 coins is $\frac{1}{4}$. That isn't what happened in the experiment. I'm not sure why."

Performs experiment, records results, and compares predictions to results.

1	2	3	4	5	6
𝍷𝍷	𝍷𝍷𝍷	𝍷𝍷𝍷𝍷	𝍷	𝍸	𝍸

"If I roll a number cube 20 times, I expect to roll each number about 3 times. The results weren't close to my predictions because I only rolled a 4 once."

Knows that with more trials, the closer the actual results may be to predicted results.

1	2	3	4	5	6
𝍸 𝍸	𝍸 𝍷𝍷𝍷	𝍸 𝍷𝍷𝍷𝍷	𝍸 𝍸 𝍷𝍷	𝍸 𝍸 𝍷𝍷	𝍸 𝍷𝍷𝍷𝍷

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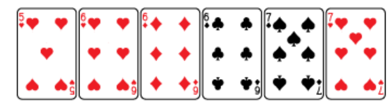
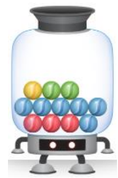


"The probability of drawing a 6 or a 7 is $\frac{5}{6}$. So, when I conduct the experiment 60 times, I would expect to get a 6 or 7 about 50 times. I got 6 or 7 forty-four times. I have to do more trials."

Observations/Documentation

Activity 10 Assessment
Designing Experiments

Theoretical Probability of Independent Events			
Predicts likelihood of favored outcomes based on personal preferences or experiences.  "I think I will get the blue marble because last time I got a blue marble."	Represents probability using words/fractions and predicts the likelihood of future events.  "I think I will get a blue marble because $\frac{6}{12}$ or $\frac{1}{2}$ of the marbles are blue."	Represents probability using 'odds in favour' and predicts likelihood of future events.  "The probability of getting a red marble is $\frac{1}{4}$. The probability of not getting a red marble is $\frac{3}{4}$. The 'odds in favour' of a red marble are 1:3. It is not likely that I will get a red marble."	Fluently makes and justifies predictions about the likelihood of future events. "Knowing the likelihood of events can help me make decisions in real life. For example, weather forecasts are created by comparing the likelihood of different weather conditions."
Observations/Documentation			

Name________________________________ Date_____________________

Geometry
Unit 1A Line Master 1a

Scavenger Hunt Recording Sheet

Shapes

Sketch of Shape	Attributes

Name________________________________ Date_____________________

Geometry
Unit 1A Line Master 1b

Scavenger Hunt Recording Sheet (cont'd)

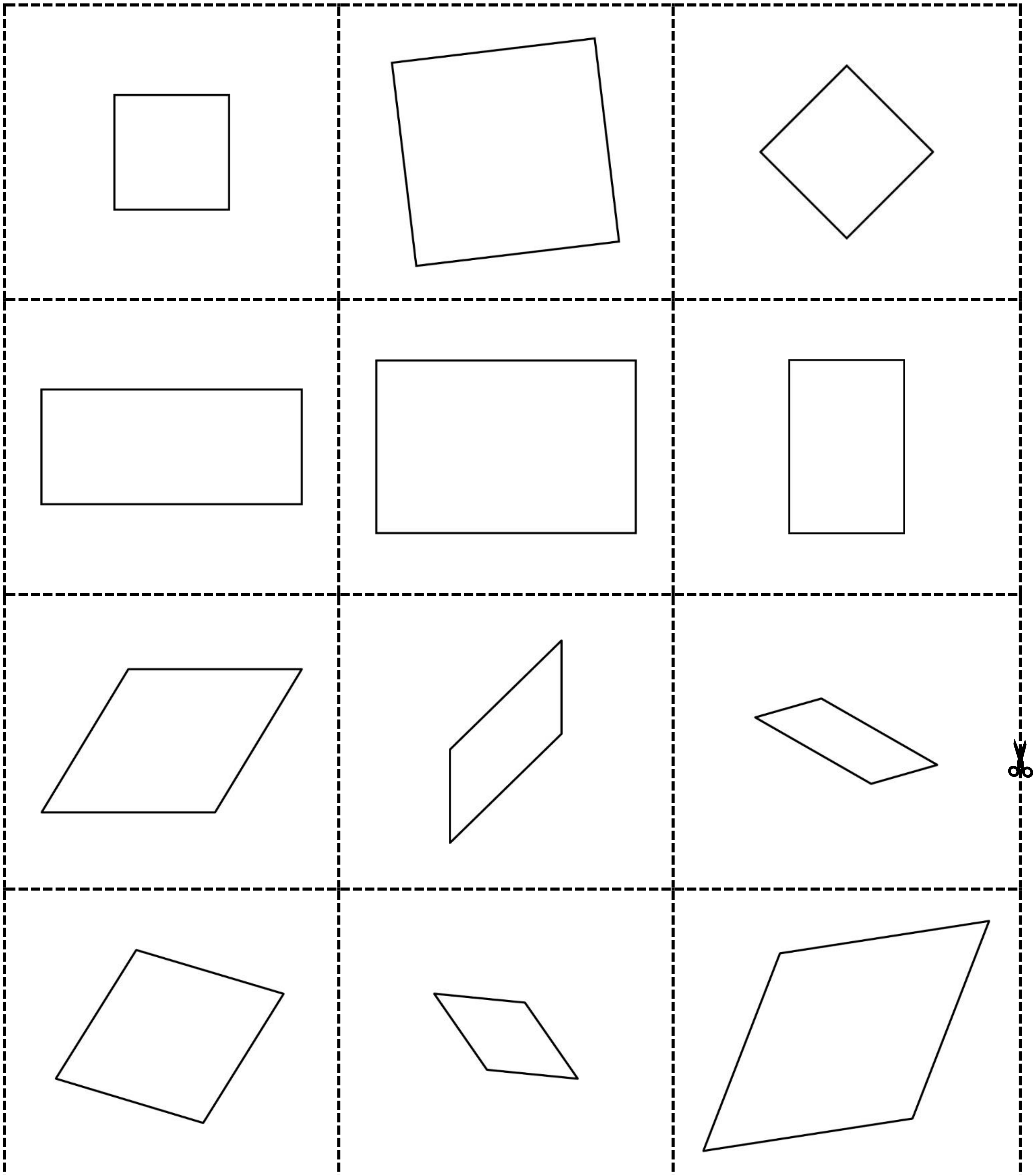
Objects

Sketch of Object	Attributes

Name________________________________ Date_____________________

Geometry
Unit 1A Line Master 2a

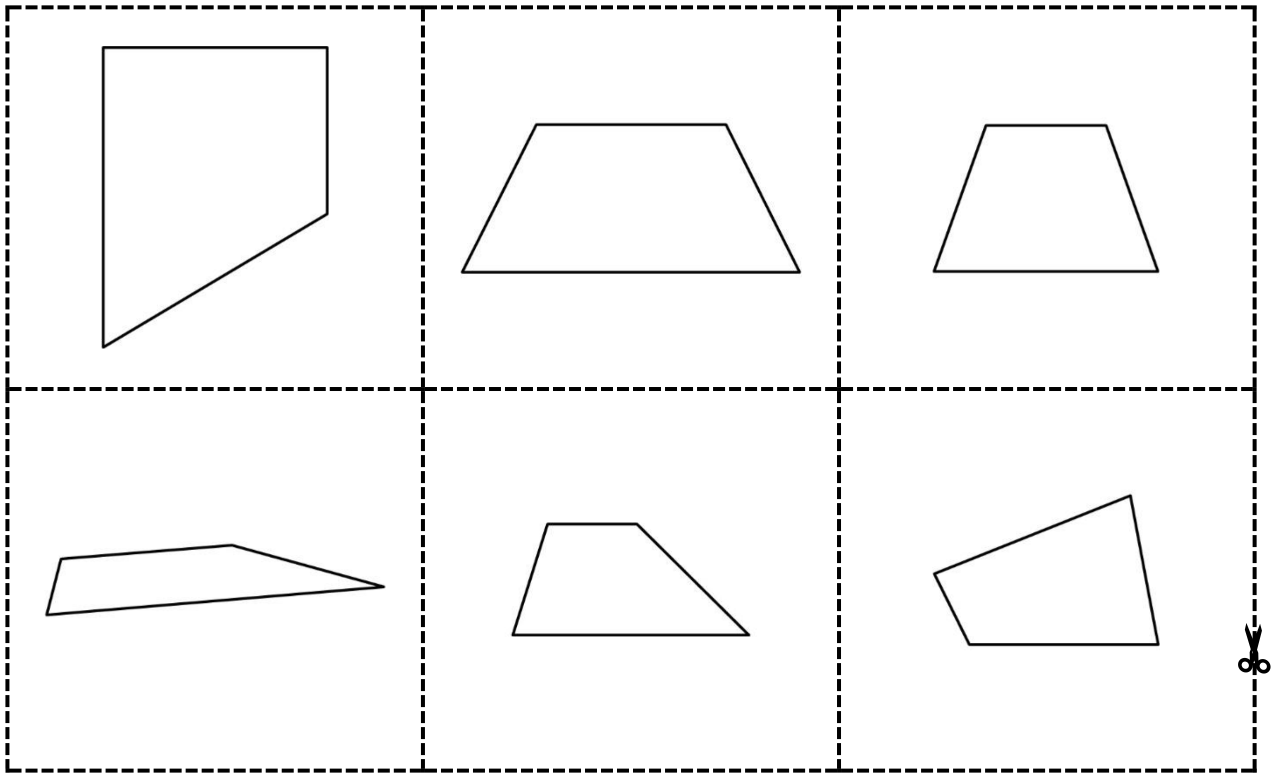
Quadrilaterals



Name________________________________ Date_____________________

Geometry
Unit 1A Line Master 2b

Quadrilaterals (cont'd)



Name________________________________ Date_____________________

Geometry
Unit 1A Line Master 3

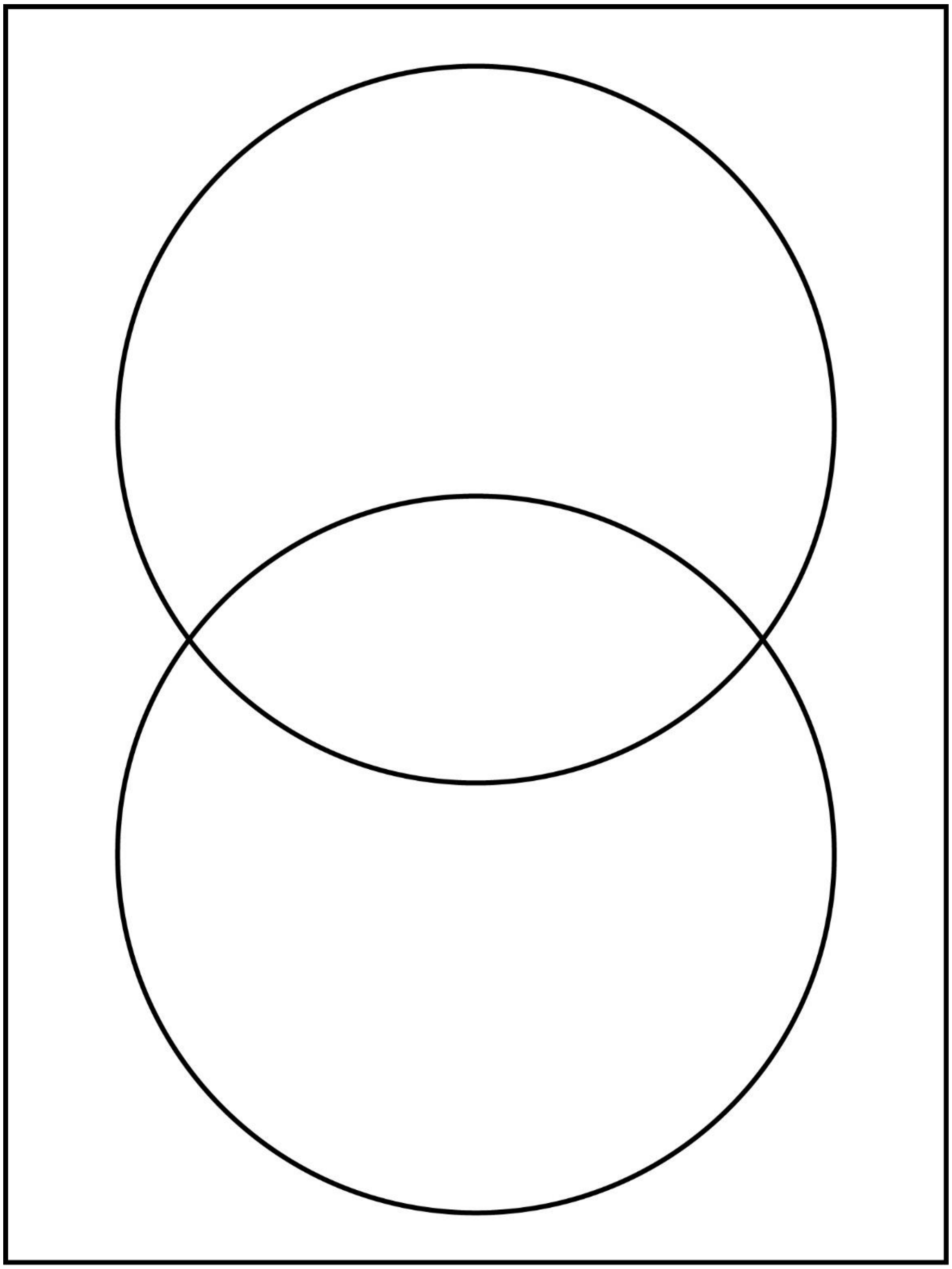
Attribute Cards

Has 2 equal sides	Has opposite angles equal
Has 4 right angles	Has equal diagonals
Has 1 pair of parallel sides	Has 2 pairs of parallel sides
Has perpendicular sides	Has 4 equal sides
Has 1 line of symmetry	Has 2 lines of symmetry
Has 4 lines of symmetry	Has opposite sides equal

Name________________________________ Date_____________________

Geometry
Unit 1A Line Master 4

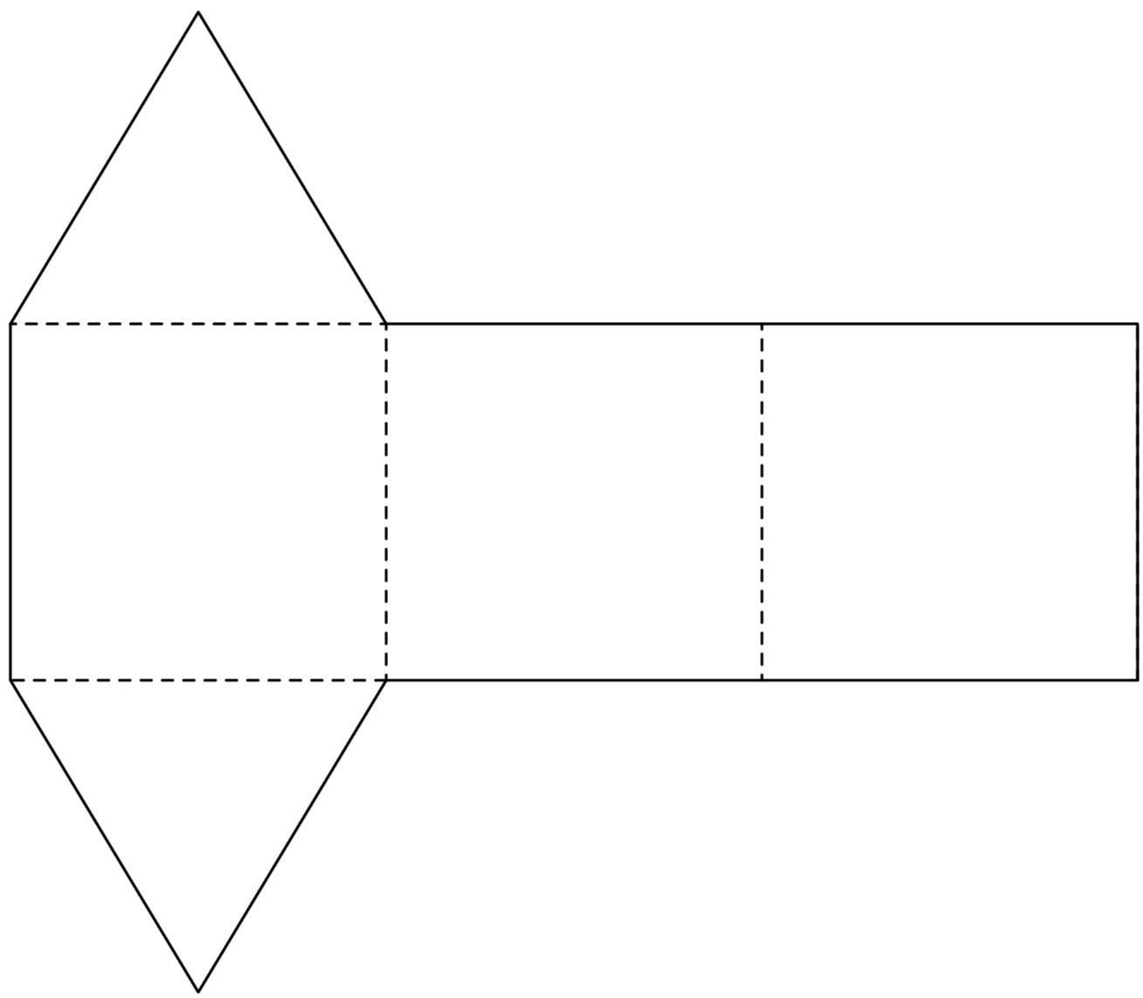
Venn Diagram



Name________________________________ Date_____________________

Geometry
Unit 1A Line Master 5

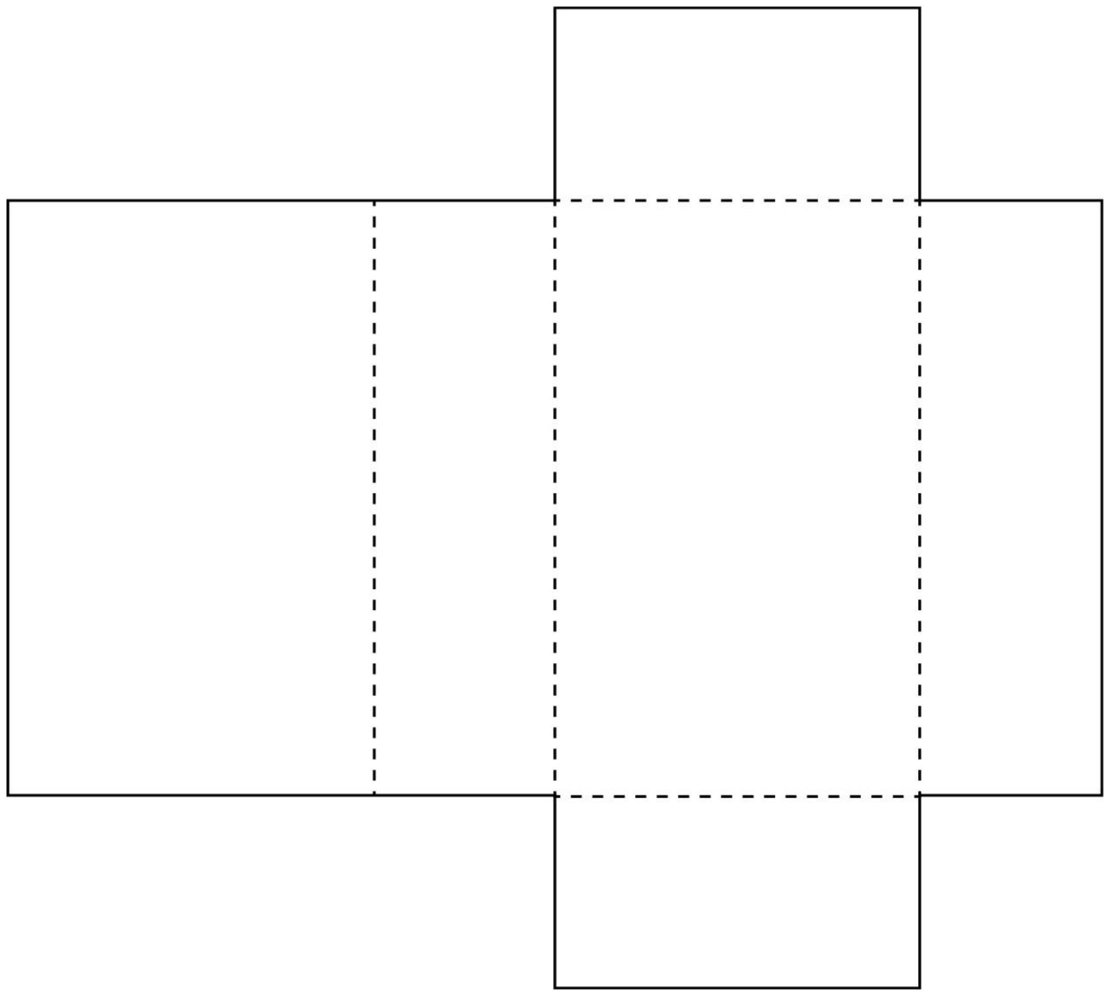
Net of a Triangular Prism



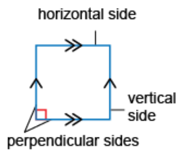
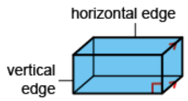
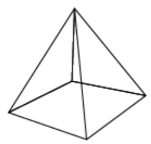
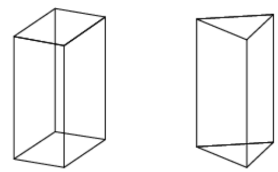
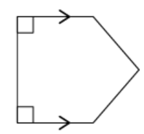
Name________________________________ Date_____________________

Geometry
Unit 1A Line Master 6

Net of a Rectangular Prism

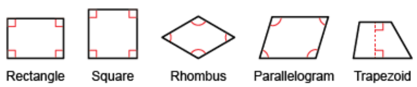
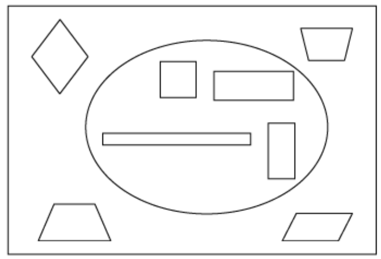
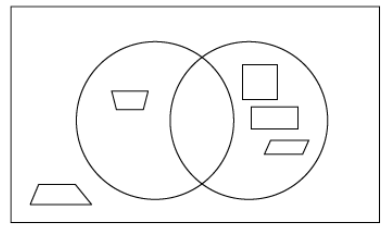
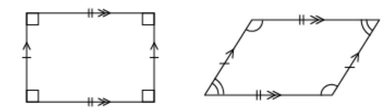


Activity 1 Assessment
Properties of 2-D Shapes and 3-D Objects

Properties of 2-D Shapes and 3-D Objects			
Recognizes that 2-D shapes and 3-D objects have different attributes.	Identifies and describes 2-D shapes and 3-D objects by their attributes.	Compares and describes pairs of 2-D shapes and 3-D objects.	Flexibly identifies, sketches, and describes a 2-D shape or 3-D object from its attributes. Sketch and name a shape with: - 5 sides - 2 pairs of perpendicular sides - 1 pair of parallel and horizontal sides
 "Square: - opposite sides parallel - adjacent sides perpendicular Rectangular prism: - opposite edges and faces parallel - adjacent faces and edges perpendicular."	 "Square pyramid: - 1 horizontal face, which is its base - base intersects each triangular face - adjacent edges of base are perpendicular."	 "Both objects have: - vertical faces and edges perpendicular to 2 horizontal faces and edges - horizontal faces that are parallel - intersecting faces and edges Rectangular prism has parallel vertical faces."	 "I drew a pentagon that has all of the attributes."
Observations/Documentation			

Activity 2 Assessment

Investigating Quadrilaterals

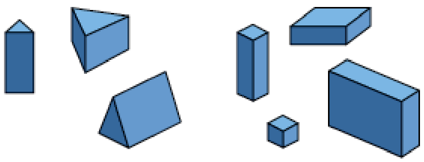
Investigating Quadrilaterals			
Recognizes and names different quadrilaterals.  “These are all quadrilaterals because they have 4 sides. Each one has a special name.”	Identifies and describes attributes used to sort a set of quadrilaterals.  “All the quadrilaterals inside the loop have: opposite sides equal and parallel, 4 right angles, and at least 2 lines of symmetry.”	Sorts a given set of quadrilaterals and explains the sorting rule.  “In the left loop, I placed quadrilaterals with 1 pair of equal sides (an isosceles trapezoid). In the right loop, I placed quadrilaterals with opposite sides parallel (square, rectangle, parallelogram).”	Flexibly analyzes attributes of quadrilaterals to determine how they are alike.  “A rectangle is a parallelogram because it has opposite sides equal and parallel, and opposite angles equal.”
Observations/Documentation			

Geometry

Activity 3 Assessment
Constructing Prisms

Describes and Constructs Regular and Triangular Prisms

Recognizes and names common attributes of rectangular and triangular prisms.

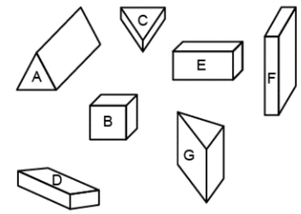


“Triangular prisms have some faces that are triangles. Rectangular prisms have faces that are rectangles.”

Describes attributes of rectangular and triangular prisms.

Rectangular Prism	Triangular Prism
6 rectangular faces	2 triangular faces
8 vertices	3 rectangular faces
12 edges	6 vertices
opposite faces congruent	9 edges
	triangular faces congruent

Sorts a set of rectangular and triangular prisms using the shape of the base.

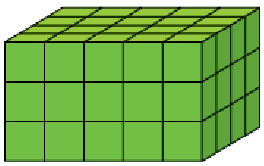
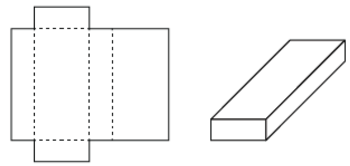


“When the shape of the base is a triangle, it’s a triangular prism.”

Observations/Documentation

Activity 3 Assessment
Constructing Prisms

Geometry

Describes and Constructs Regular and Triangular Prisms (cont'd)		
Constructs and describes models of rectangular and triangular prisms using various materials.  "I made a rectangular prism using linking cubes. All the faces are rectangles and there are 8 vertices."	Constructs rectangular and triangular prisms from their nets.  "I knew this would make a rectangular prism because there are 3 pairs of congruent rectangles and when I visualized folding the net, they were opposite each other."	Makes and applies generalizations about rectangular and triangular prisms to objects in the environment.  "A tent shaped like a triangular prism only needs one pole in the centre to support it and there is easy access through the triangular-faced door. The rectangular faces make it sturdy."
Observations/Documentation		

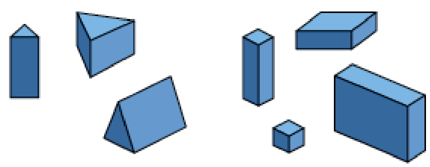
Geometry

Activity 3 Assessment

Constructing Prisms

Describes and Constructs Regular and Triangular Prisms

Recognizes and names common attributes of rectangular and triangular prisms.

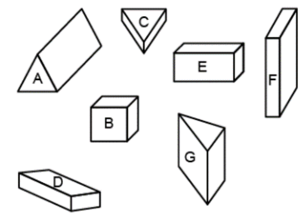


“Triangular prisms have some faces that are triangles. Rectangular prisms have faces that are rectangles.”

Describes attributes of rectangular and triangular prisms.

Rectangular Prism	Triangular Prism
6 rectangular faces 8 vertices 12 edges opposite faces congruent	2 triangular faces 3 rectangular faces 6 vertices 9 edges triangular faces congruent

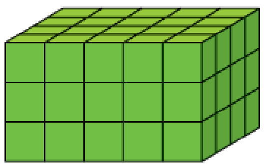
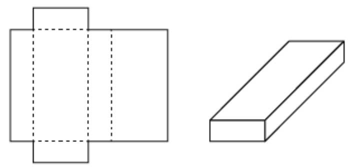
Sorts a set of rectangular and triangular prisms using the shape of the base.



“When the shape of the base is a triangle, it’s a triangular prism.”

Observations/Documentation

Activity 3 Assessment
Constructing Prisms

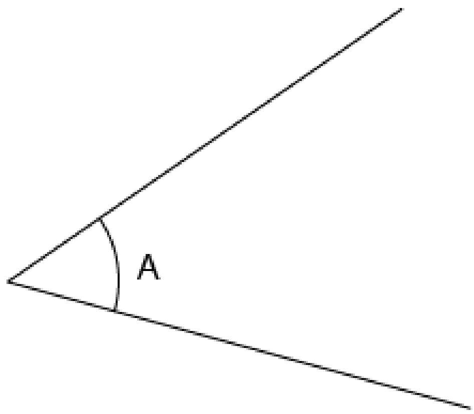
Describes and Constructs Regular and Triangular Prisms (cont'd)		
Constructs and describes models of rectangular and triangular prisms using various materials.  "I made a rectangular prism using linking cubes. All the faces are rectangles and there are 8 vertices."	Constructs rectangular and triangular prisms from their nets.  "I knew this would make a rectangular prism because there are 3 pairs of congruent rectangles and when I visualized folding the net, they were opposite each other."	Makes and applies generalizations about rectangular and triangular prisms to objects in the environment.  "A tent shaped like a triangular prism only needs one pole in the centre to support it and there is easy access through the triangular-faced door. The rectangular faces make it sturdy."
Observations/Documentation		

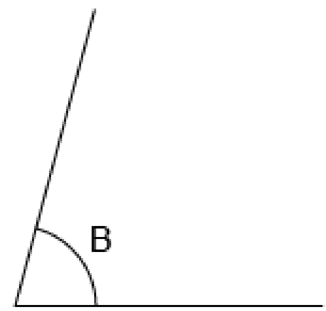
Name________________________________ Date_____________________

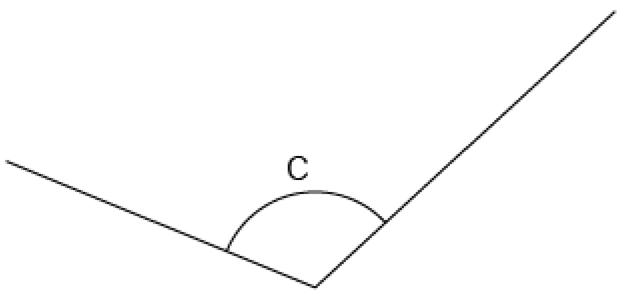
Geometry
Unit 1B Line Master 1

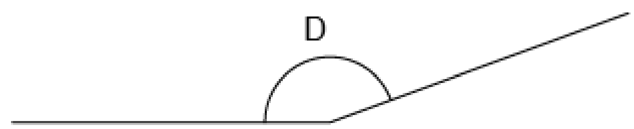
What's My Measure?

Measure each angle.

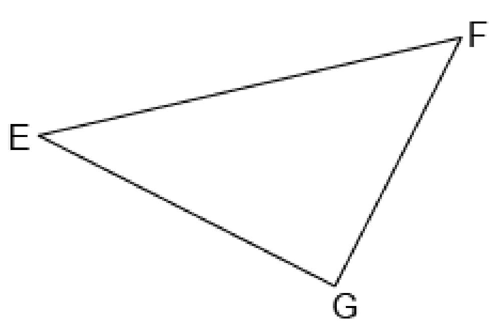


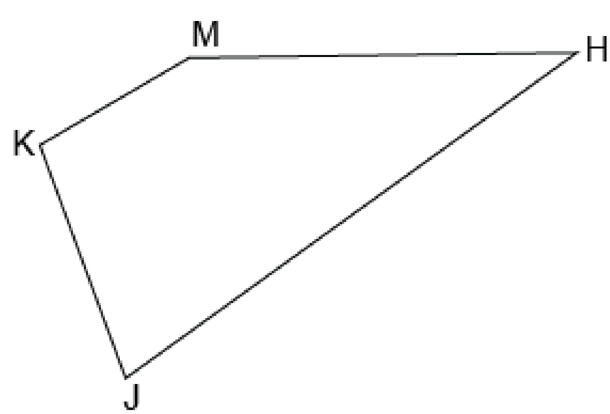






Measure the angles in each shape.

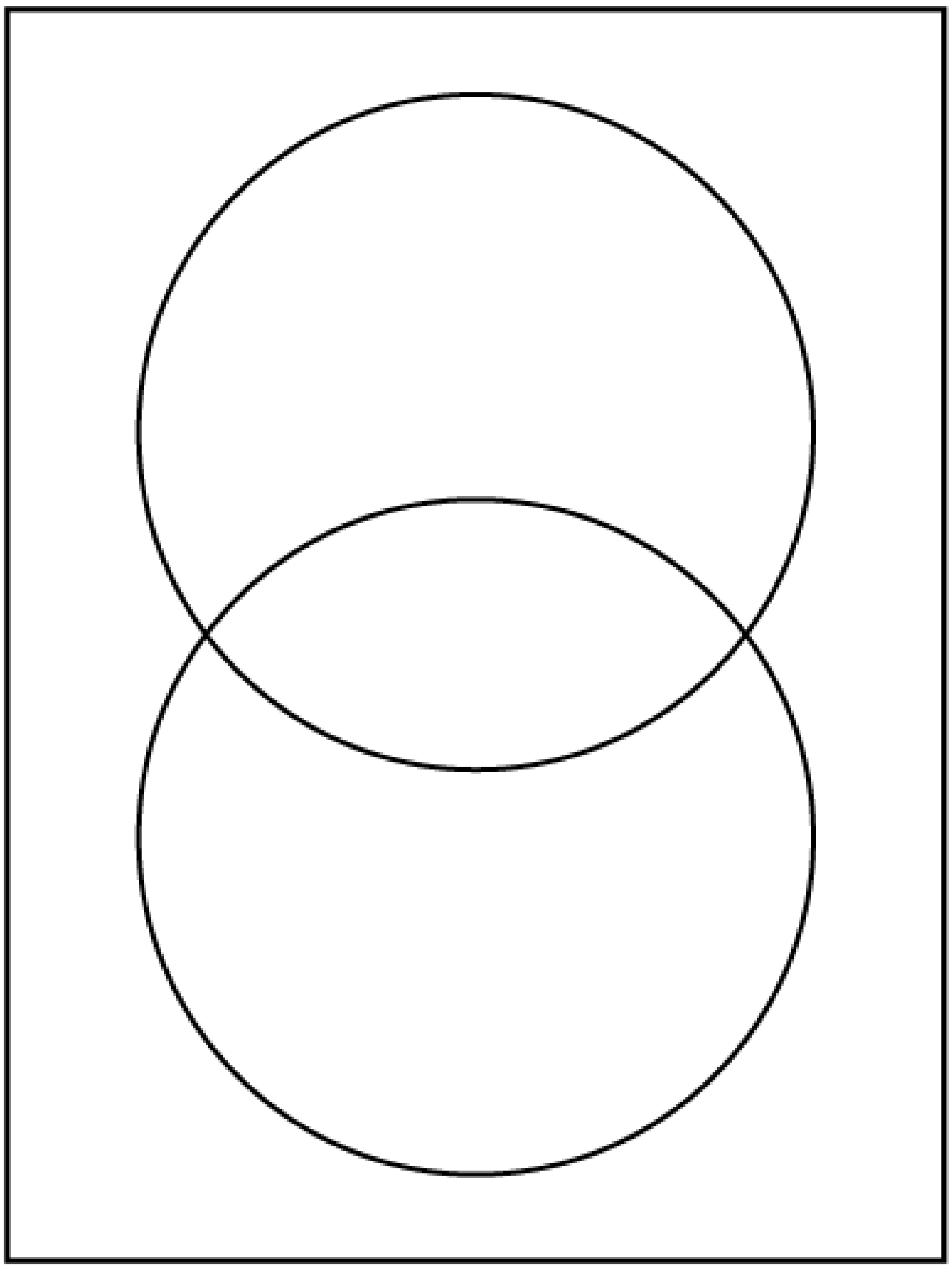




Name_________________________________ Date______________________

Geometry
Unit 1B Line Master 2

Venn Diagram



Name________________________________ Date_____________________

Geometry
Unit 1B Line Master 3

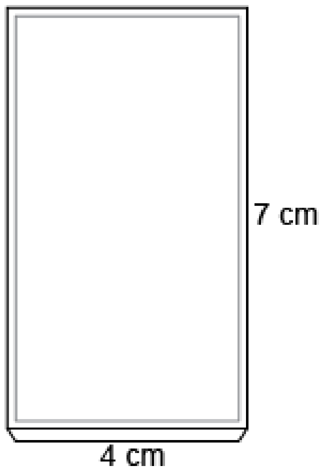
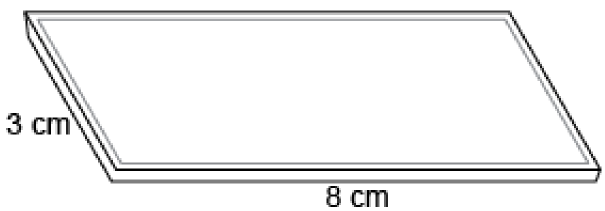
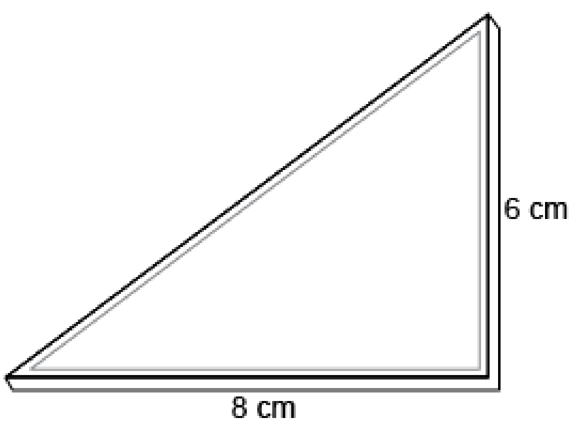
Which Type of Triangle Am I?

ΔABC AB = 5 cm BC = 7 cm $\angle B = 55°$	ΔDEF FE = 6 cm $\angle F = 50°$ $\angle E = 50°$
ΔGHJ GH = 4 cm GJ = 7 cm $\angle G = 90°$	ΔKMN KM = 8 cm KN = 6 cm $\angle K = 130°$
ΔPQR PQ = 5 cm PR = 5 cm $\angle P = 110°$	ΔSTU ST = 5 cm SU = 6 cm TU = 7 cm

Name________________________________ Date_____________________

Geometry
Unit 1B Line Master 4a

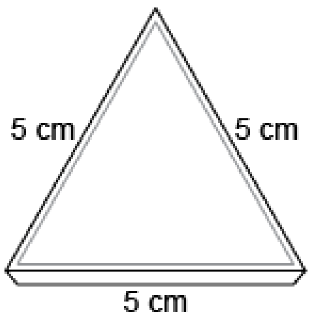
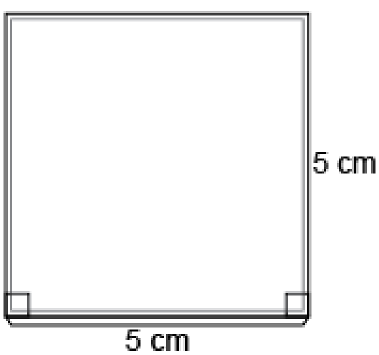
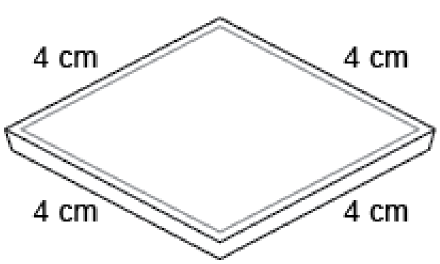
Shapes at the Chocolate Factory

Mould	Congruent Shape
	
	
	

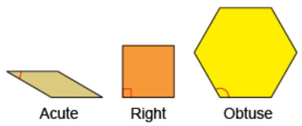
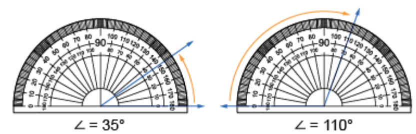
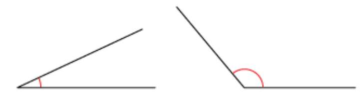
Name________________________________ Date_____________________

Geometry
Unit 1B Line Master 4b

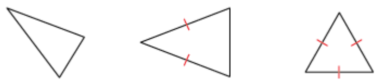
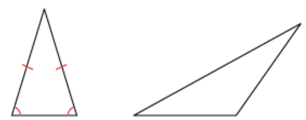
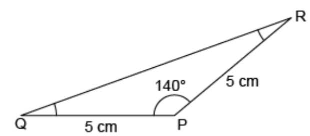
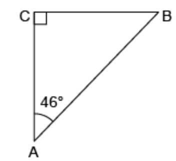
Shapes at the Chocolate Factory (cont'd)

Mould	Congruent Shape
	
	
	

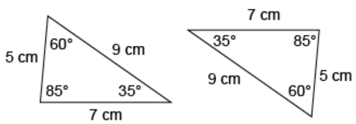
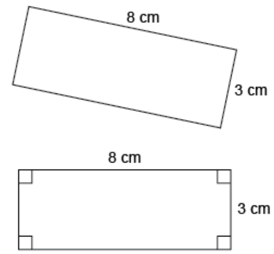
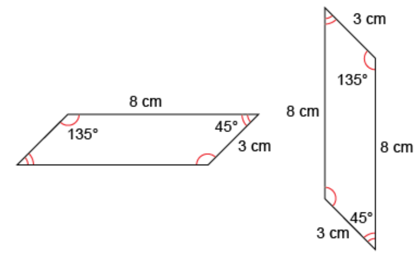
Activity 1 Assessment
Measuring and Comparing Angles

Measuring and Comparing Angles			
Identifies and compares different types of angles using the benchmark of 90°.  “This is an acute angle because it is less than 90°. This is an obtuse angle because it is greater than 90°.”	Compares and measures angles using appropriate non-standard units.  “The acute angle in the trapezoid equals 2 acute angles in the tan parallelogram, or 60°; the obtuse angle equals 4 of the acute angles, or 120°.”	Compares and measures angles using a protractor.  “I can use the protractor to compare and measure angles. The two scales on the protractor make it easier to measure acute and obtuse angles.”	Flexibly estimates, compares and measures angles using standard units and benchmarks.  “The first angle is about halfway between 0° and 45°, so it is about 25°. The second angle is less than halfway between 90° and 180°, so it’s about 130°.”
Observations/Documentation			

Activity 2 Assessment
Properties of Triangles

Properties of Triangles			
Recognizes various triangles by the number of equal sides.  "I know the first is scalene, the second is isosceles, and the third is equilateral by looking at the number of equal sides."	Understands that triangles can be classified by side lengths and/or angle measures.  "The first triangle is an acute isosceles triangle because it has 2 equal sides and all acute angles. The second triangle is an obtuse scalene triangle because it has no equal sides and an obtuse angle."	Constructs and identifies triangles given some side and angle measures. $\triangle PQR$, with PR = 5 cm, PQ = 5 cm, $\angle P = 140°$  "I drew PQ = 5 cm and used a protractor to make a 140° angle at P. I drew PR = 5 cm, then connected R to Q to make the third side. Angles Q and R are each 20° because the interior angles must add to 180°.This is an obtuse isosceles triangle."	Uses various geometric properties to determine unknown side and angle measures.  "This is an isosceles right triangle. $\angle B = 90° – 46°$ so $\angle B = 44°$. The interior angles must add to 180°. I know that side AC and CB are the same."
Observations/Documentation			

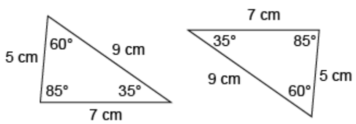
Activity 3 Assessment
Identifying and Constructing Triangles

Identifying and Constructing Congruent 2-D Shapes			
Recognizes that congruent shapes have matching sides and equal angles.  “Matching sides and angles are equal. When I place one shape on top of the other, they match exactly.”	Applies properties of shapes and conditions of congruence to identify congruent shapes.  “These parallelograms have the same side lengths but different angles, so they are not congruent.”	Constructs congruent 2-D shapes and explains why they are congruent.  “I used the side lengths given and the fact that rectangles have right angles to construct a congruent rectangle.”	Flexibly identifies, constructs, and describes congruent 2-D shapes.  “I constructed a congruent parallelogram using a ruler and a protractor. For two parallelograms to be congruent, matching sides and angles must be equal.”
Observations/Documentation			

Activity 4 Assessment
Identifying and Constructing Congruent 2-D Shapes

Identifying and Constructing Congruent 2-D Shapes

Recognizes that congruent shapes have matching sides and equal angles.

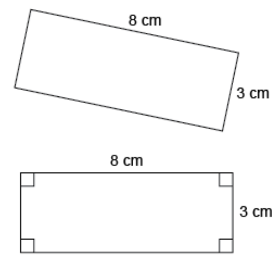


"Matching sides and angles are equal. When I place one shape on top of the other, they match exactly."

Applies properties of shapes and conditions of congruence to identify congruent shapes.

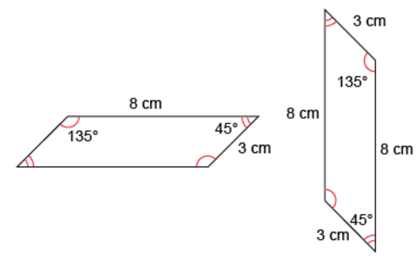
"These parallelograms have the same side lengths but different angles, so they are not congruent."

Constructs congruent 2-D shapes and explains why they are congruent.



"I used the side lengths given and the fact that rectangles have right angles to construct a congruent rectangle."

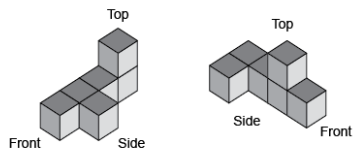
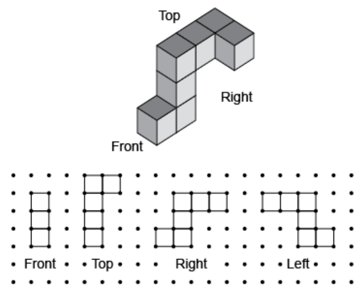
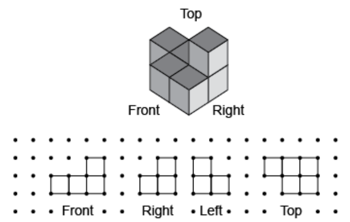
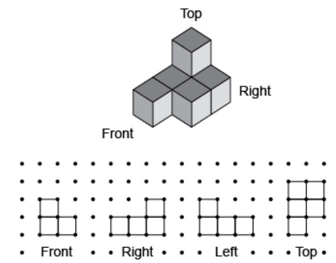
Flexibly identifies, constructs, and describes congruent 2-D shapes.



"I constructed a congruent parallelogram using a ruler and a protractor. For two parallelograms to be congruent, matching sides and angles must be equal."

Observations/Documentation

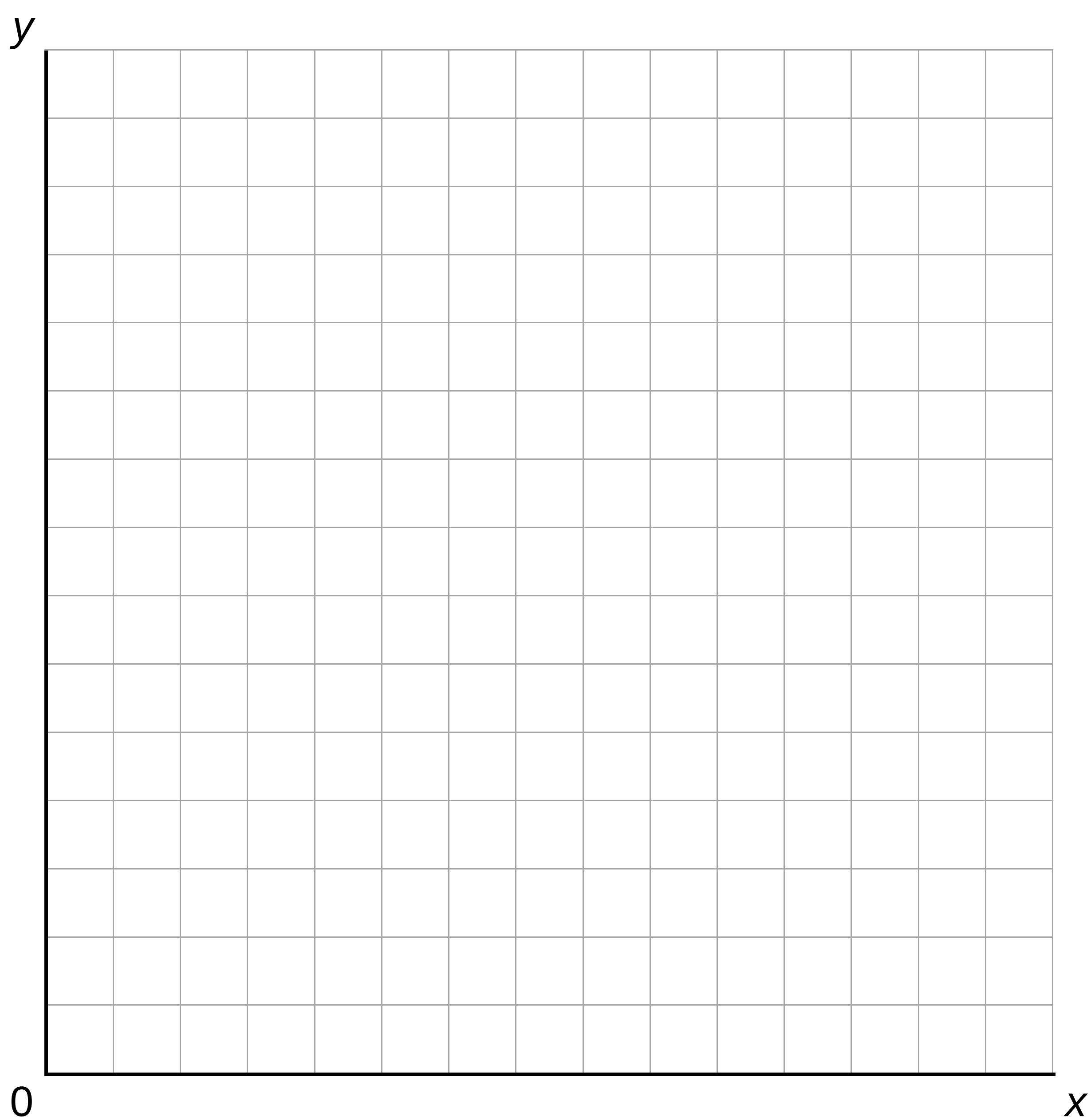
Activity 5 Assessment
Drawing Views

<table>
<tr><th colspan="4">Drawing Views</th></tr>
<tr>
<td>Recognizes that views of a 3-D object will vary according to the orientation.

“When you change the orientation of the object, you change the views.”</td>
<td>Understands that 3-D objects can be represented in two dimensions with different views.

“I looked at the object from each view to find the matching drawing of that view.”</td>
<td>Draws top, front, and side views of objects and matches views to 3-D object.

“I used square dot paper to draw and label each view of the object.”</td>
<td>Builds 3-D objects using given views, then changes the orientation and draws new views.

“I visualized the object by looking at each view and then built it. When I change the orientation of the object, the perspective changes the views.”</td>
</tr>
<tr><th colspan="4">Observations/Documentation</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>

Name________________________________ Date_____________________

Geometry
Unit 2A Line Master 1

Coordinate Grid

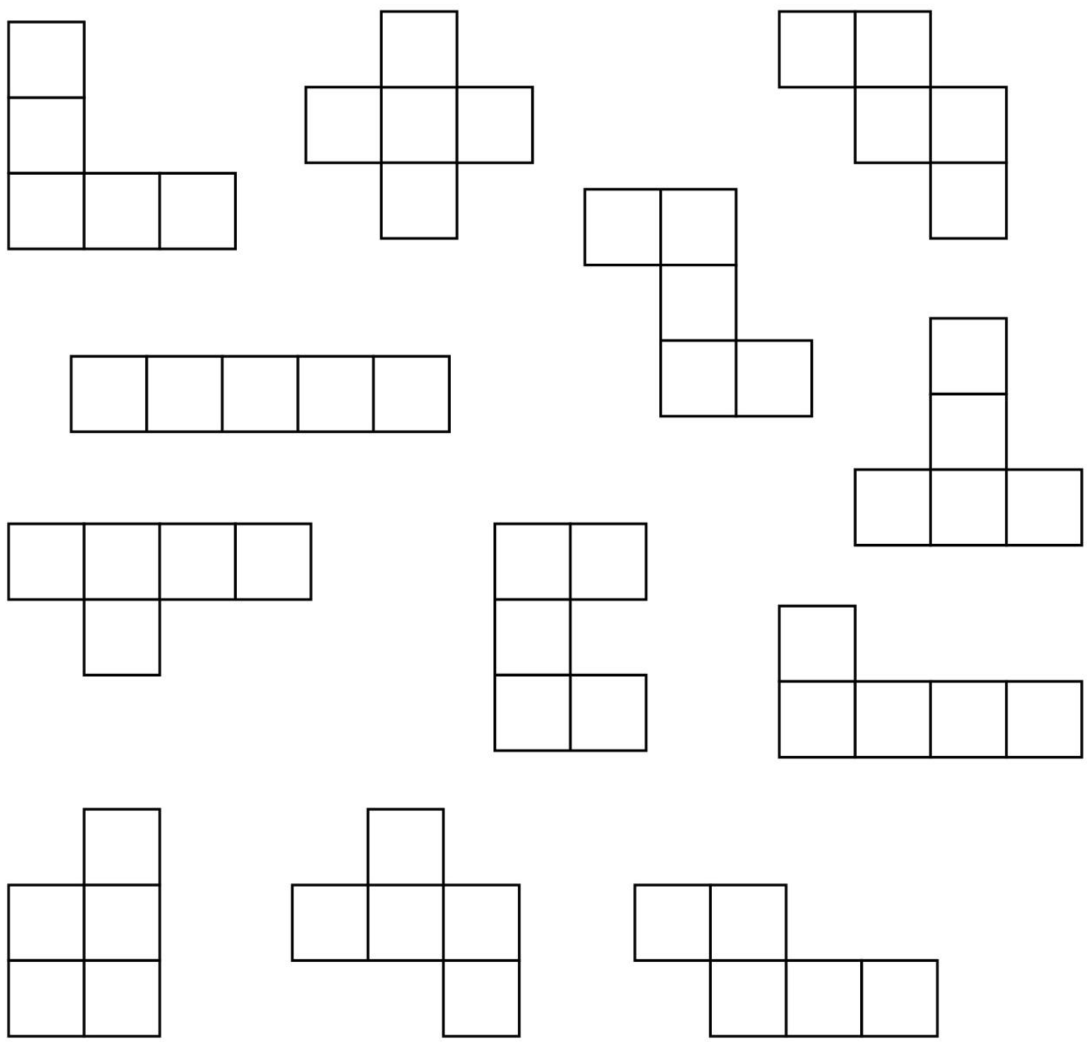


Name________________________________ Date_____________________

Geometry
Unit 2A Line Master 2

Pentominoes

A **pentomino** is a geometric shape made from 5 squares, connected at the sides.

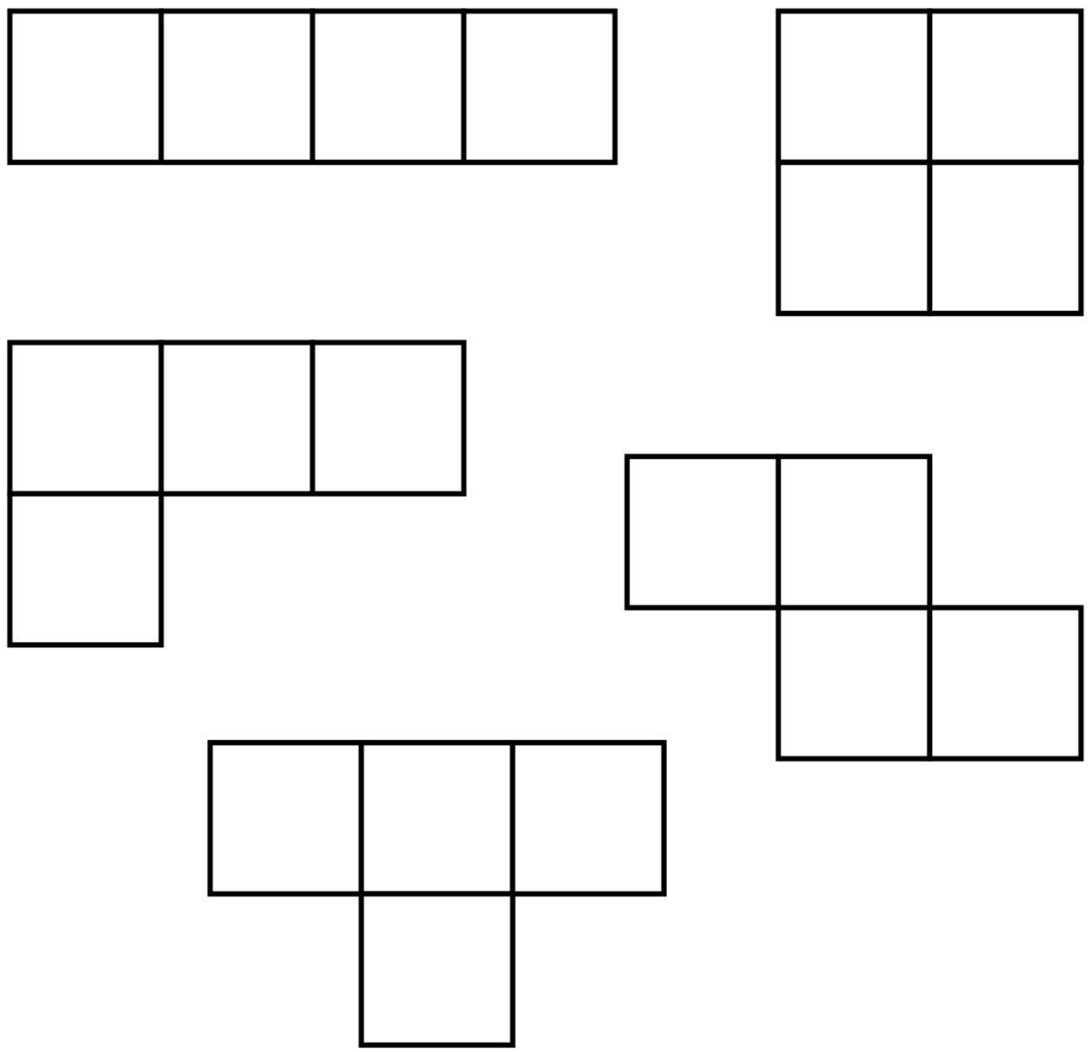


Name________________________________ Date_____________________

Geometry
Unit 2A Line Master 3

Tetrominoes

A **tetromino** is a geometric shape made from 4 squares, connected at the sides.

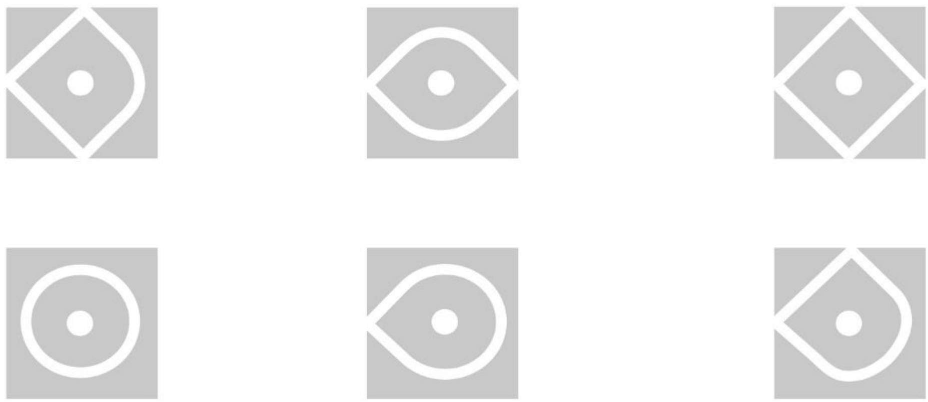


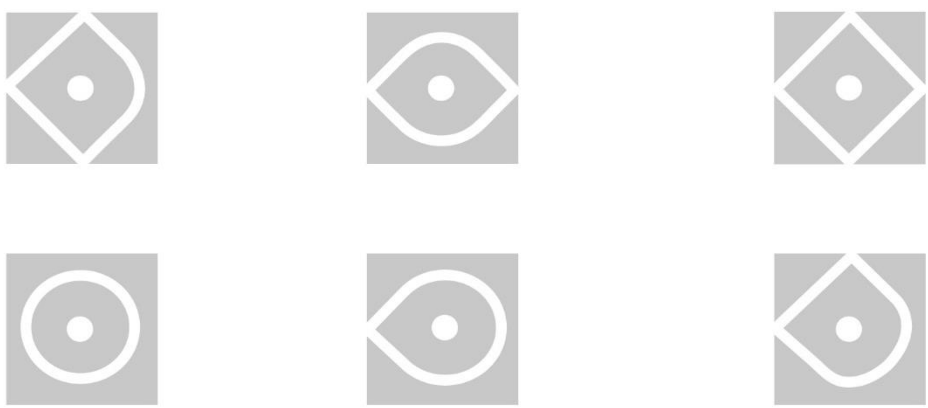
Name________________________________ Date_____________________

Geometry
Unit 2A Line Master 4

Kolam Tiles

A **Kolam** is an Indian art form of geometric patterns, used as a sign of welcome.



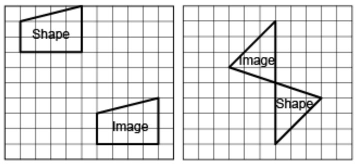
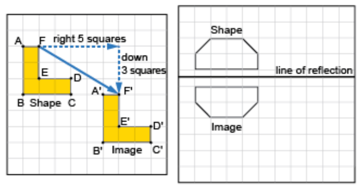
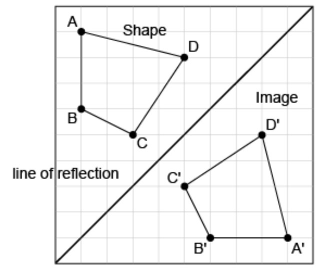
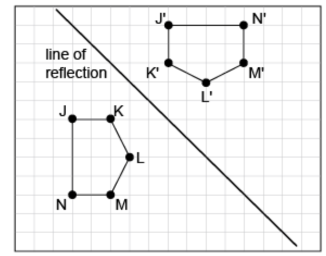


Name________________________________ Date_____________________

Geometry
Unit 2A Line Master 5

2-cm Grid Paper

Activity 5 Assessment
Investigating Translations

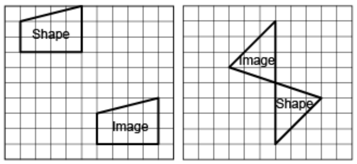
<table>
<tr><th colspan="4">Applying and Visualizing Translations and Reflections</th></tr>
<tr>
<td>Identifies translations and reflections of 2-D shapes on a grid.

"The first image shows a translation, and the second grid shows a reflection."</td>
<td>Identifies the translation/reflection used to move a shape and the line of reflection.

"The shape has been translated 5 squares right and down 3 squares. The hexagon was reflected because the shape and the image are the same distance from the line of reflection."</td>
<td>Describes and performs translations and reflections on a grid using labelled vertices.

"The image is a reflection of the shape because matching vertices on the shape and its image are the same distance from the line of reflection. The vertices on the image are labelled in the opposite direction."</td>
<td>Visualizes, predicts, and describes image of a shape after a translation or reflection.

"The hexagons are congruent and matching vertices are the same distance from the line of reflection. The line of reflection is the diagonal line halfway between the two hexagons."</td>
</tr>
<tr><th colspan="4">Observations/Documentation</th></tr>
<tr><td></td><td></td><td></td><td>.</td></tr>
</table>

Activity 6 Assessment

Investigating Reflections

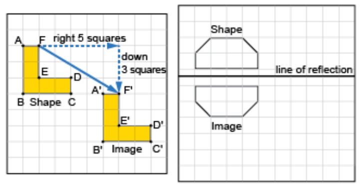
Applying and Visualizing Translations and Reflections

Identifies translations and reflections of 2-D shapes on a grid.



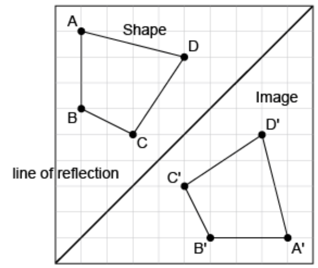
"The first image shows a translation, and the second grid shows a reflection."

Identifies the translation/reflection used to move a shape and the line of reflection.



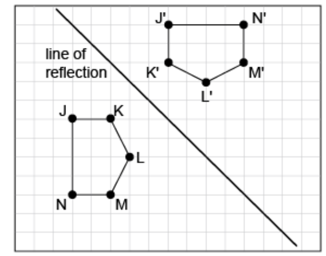
"The shape has been translated 5 squares right and down 3 squares. The hexagon was reflected because the shape and the image are the same distance from the line of reflection."

Describes and performs translations and reflections on a grid using labelled vertices.



"The image is a reflection of the shape because matching vertices on the shape and its image are the same distance from the line of reflection. The vertices on the image are labelled in the opposite direction."

Visualizes, predicts, and describes image of a shape after a translation or reflection.



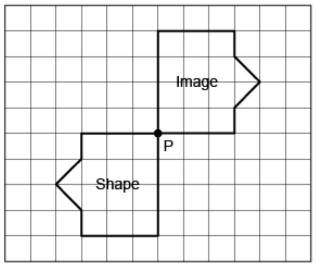
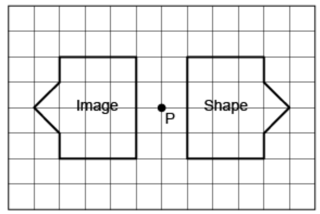
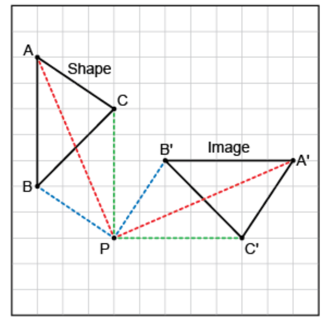
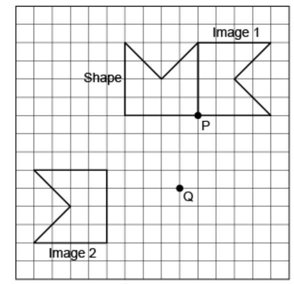
"The hexagons are congruent and matching vertices are the same distance from the line of reflection. The line of reflection is the diagonal line halfway between the two hexagons."

Observations/Documentation

Geometry

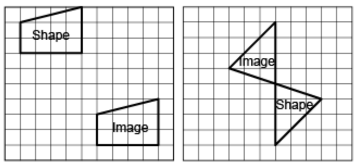
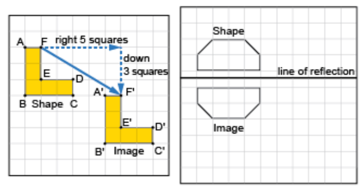
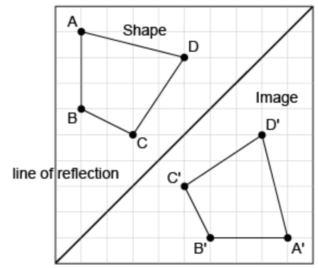
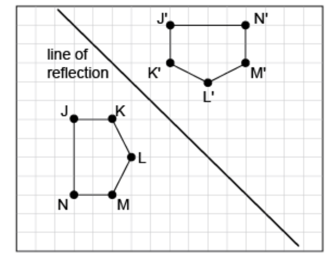
Activity 7 Assessment

Investigating Rotations

Applying and Visualizing Rotations on a Grid			
Identifies rotated 2-D shapes on a grid with a point of rotation on the shape.  "This grid shows a rotation of a $\frac{1}{2}$ tun about vertex P."	Identifies rotated 2-D shapes on a grid with a point of rotation outside the shape.  "The shape has been rotated a $\frac{1}{2}$ turn around the point of rotation P, located outside the shape."	Describes and performs rotations/turns, both clockwise and counterclockwise.  "The shape was rotated by a $\frac{3}{4}$ turn counterclockwise about P. The matching vertices on the shape and its image are the same distance from the point of rotation."	Visualizes, predicts, and describes where the image of a shape will be after a rotation.  "I visualized and predicted where the images of the pentagon would be after a rotation of a $\frac{1}{4}$ turn clockwise about P (on the shape) and after a rotation of a $\frac{1}{4}$ turn counterclockwise about Q (off the shape). I rotated the shape to check. I know each image is correct because corresponding points are the same distance from the point of rotation."
Observations/Documentation			

Geometry

Activity 8 Assessment
Identifying Transformations

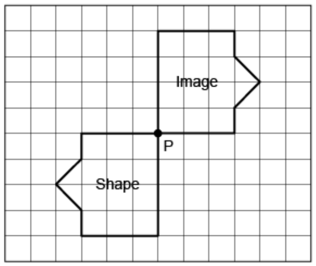
Applying and Visualizing Translations and Reflections			
Identifies translations and reflections of 2-D shapes on a grid.  "The first image shows a translation, and the second grid shows a reflection."	Identifies the translation/reflection used to move a shape and the line of reflection.  "The shape has been translated 5 squares right and down 3 squares. The hexagon was reflected because the shape and the image are the same distance from the line of reflection."	Describes and performs translations and reflections on a grid using labelled vertices.  "The image is a reflection of the shape because matching vertices on the shape and its image are the same distance from the line of reflection. The vertices on the image are labelled in the opposite direction."	Visualizes, predicts, and describes image of a shape after a translation or reflection.  "The hexagons are congruent and matching vertices are the same distance from the line of reflection. The line of reflection is the diagonal line halfway between the two hexagons."
Observations/Documentation			

Geometry

Activity 8 Assessment

Identifying Transformations

<table>
<tr><th colspan="4">Applying and Visualizing Rotations on a Grid (cont’d)</th></tr>
<tr>
<td>Identifies rotated 2-D shapes on a grid with a point of rotation on the shape.



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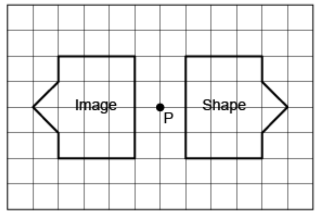

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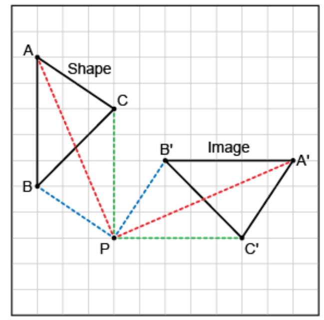

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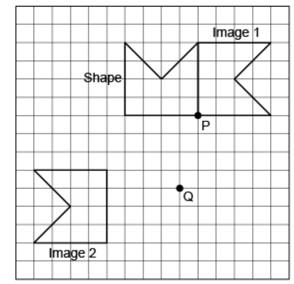

“I visualized and predicted where the images of the pentagon would be after a rotation of a $\frac{1}{4}$ turn clockwise about P (on the shape) and after a rotation of a $\frac{1}{4}$ turn counterclockwise about Q (off the shape). I rotated the shape to check. I know each image is correct because corresponding points are the same distance from the point of rotation.”</td>
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Geometry

Activity 8 Assessment
Identifying Transformations

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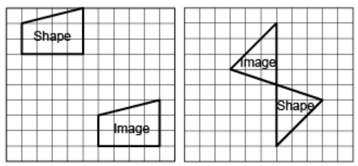

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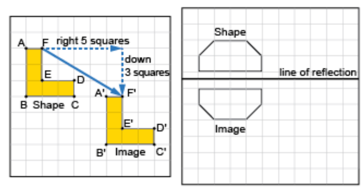

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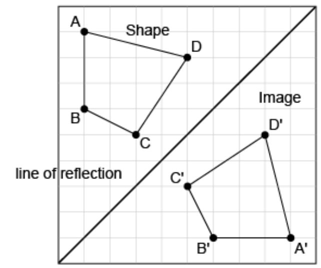

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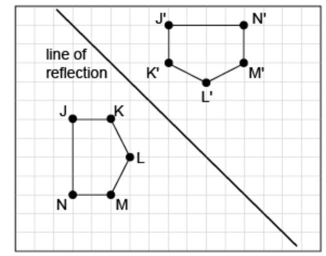

“The hexagons are congruent and matching vertices are the same distance from the line of reflection. The line of reflection is the diagonal line halfway between the two hexagons.”</td>
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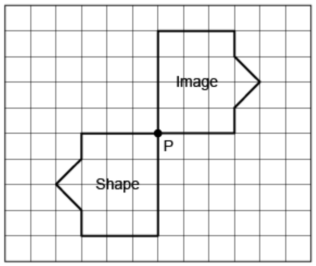
</table>

Geometry

Activity 8 Assessment
Identifying Transformations

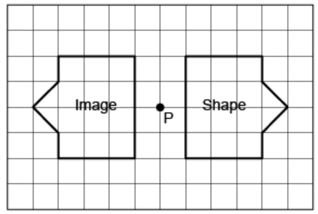
Applying and Visualizing Rotations on a Grid (cont'd)

Identifies rotated 2-D shapes on a grid with a point of rotation on the shape.



"This grid shows a rotation of a $\frac{1}{2}$ tun about vertex P."

Identifies rotated 2-D shapes on a grid with a point of rotation outside the shape.



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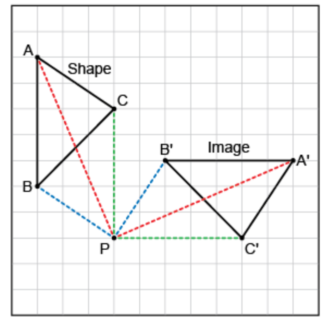

"The shape was rotated by a $\frac{3}{4}$ turn counterclockwise about P. The matching vertices on the shape and its image are the same distance from the point of rotation."

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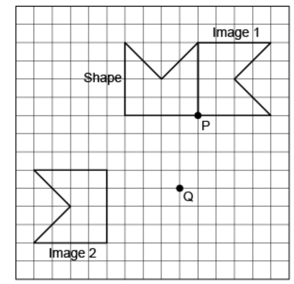


"I visualized and predicted where the images of the pentagon would be after a rotation of a $\frac{1}{4}$ turn clockwise about P (on the shape) and after a rotation of a $\frac{1}{4}$ turn counterclockwise about Q (off the shape). I rotated the shape to check. I know each image is correct because corresponding points are the same distance from the point of rotation."

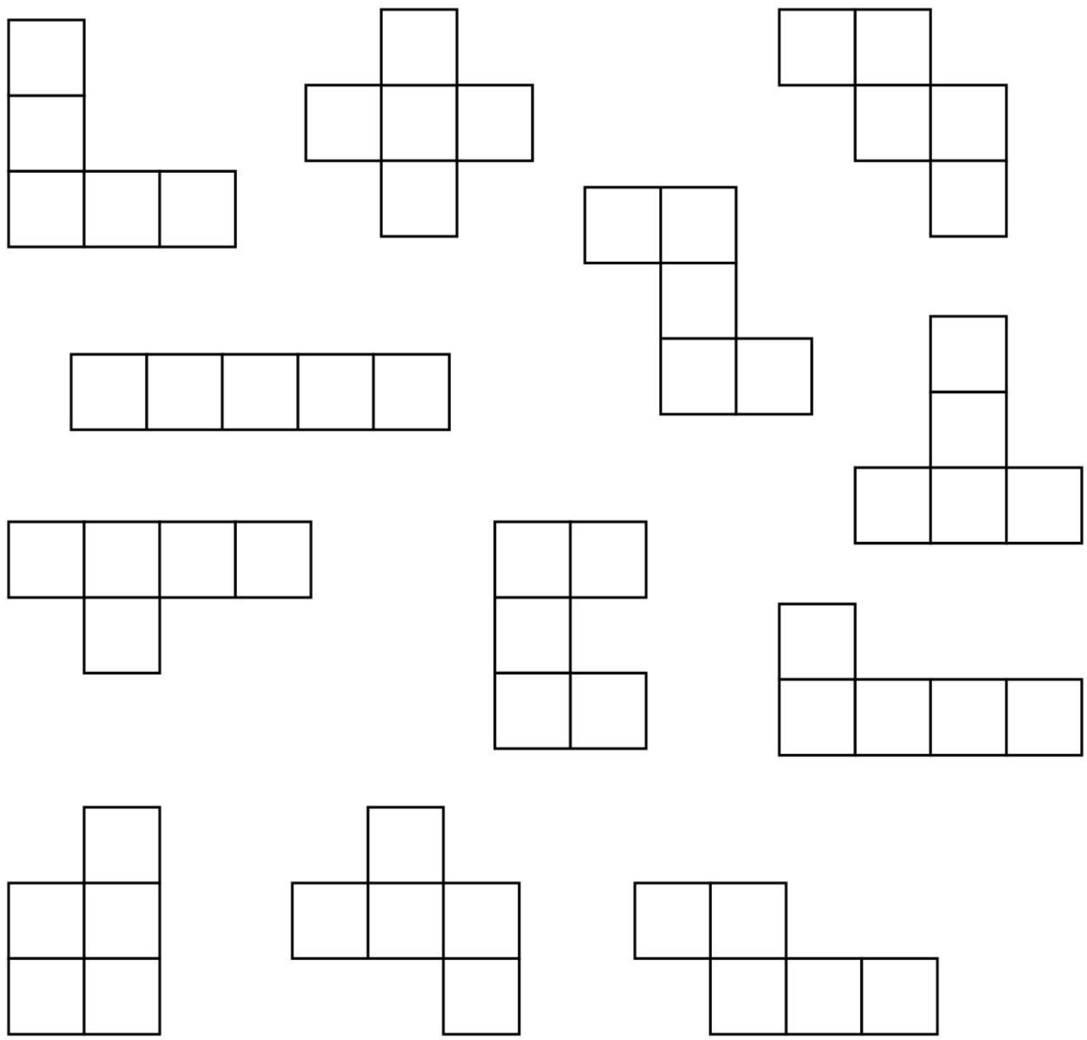
Observations/Documentation

Name_________________________________ Date______________________

Geometry
Unit 2B Line Master 1

Pentominoes

A **pentomino** is a geometric shape made from 5 squares, connected at the sides.



Name________________________________ Date_____________________

Geometry
Unit 2B Line Master 2

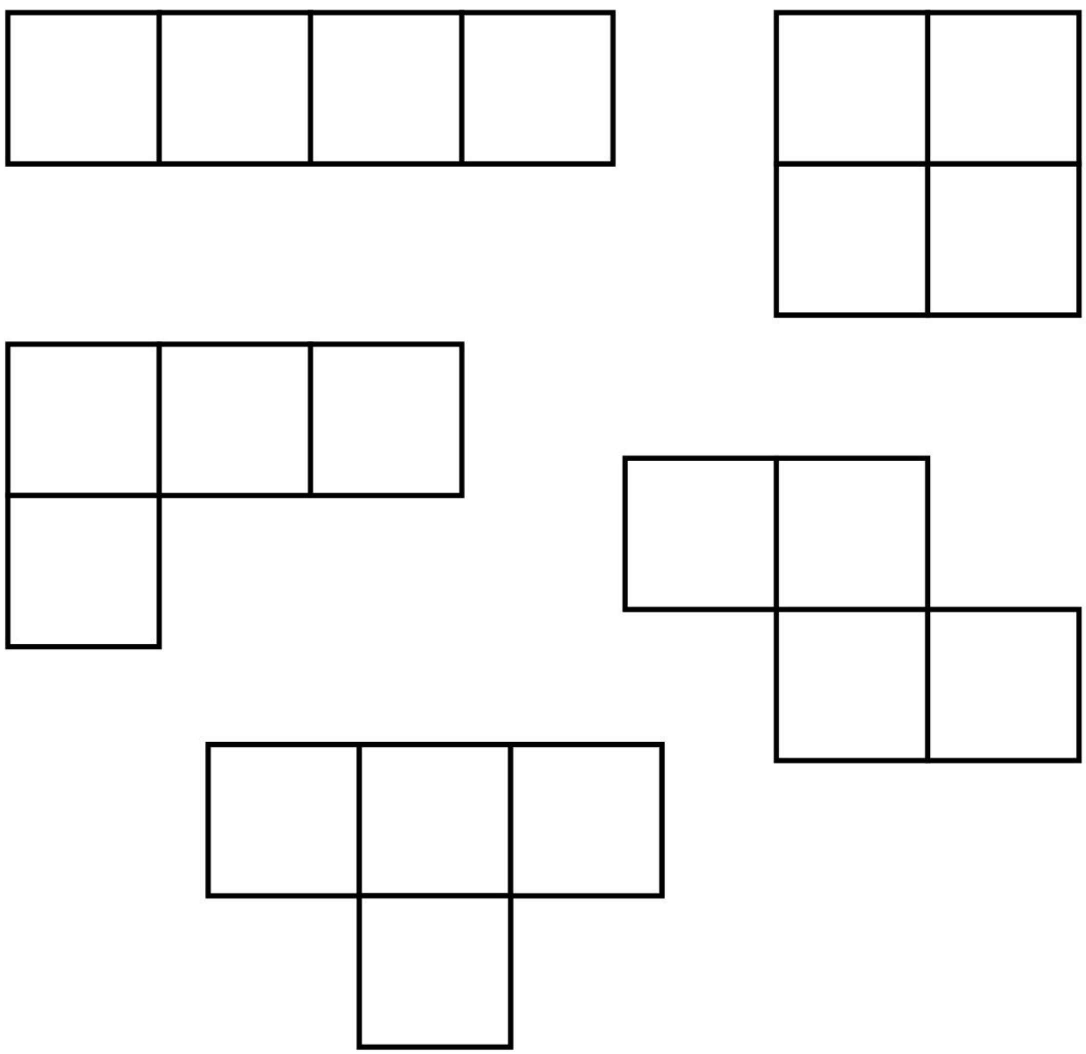
2-cm Grid Paper

Name________________________________ Date_____________________

Geometry
Unit 2B Line Master 3

Tetrominoes

A **tetromino** is a geometric shape made from 4 squares, connected at the sides.

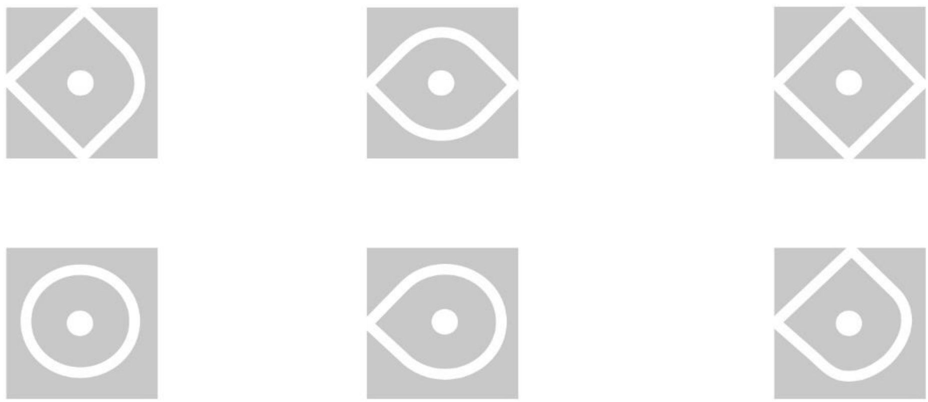


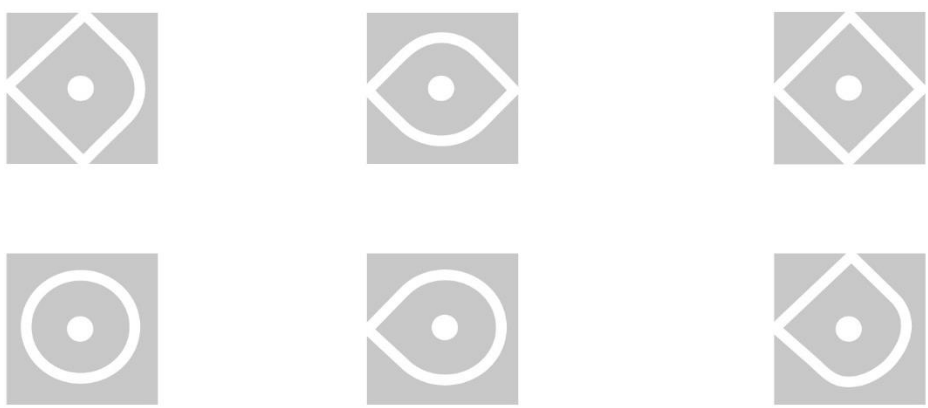
Name________________________________ Date_____________________

Geometry
Unit 2B Line Master 4

Kolam Tiles

A **Kolam** is an Indian art form of geometric patterns, used as a sign of welcome.

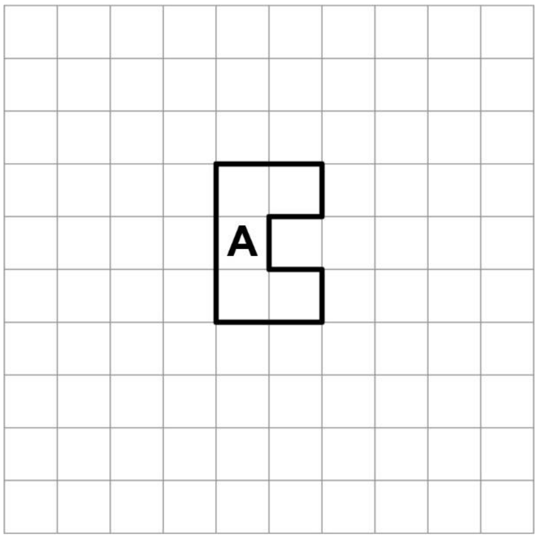


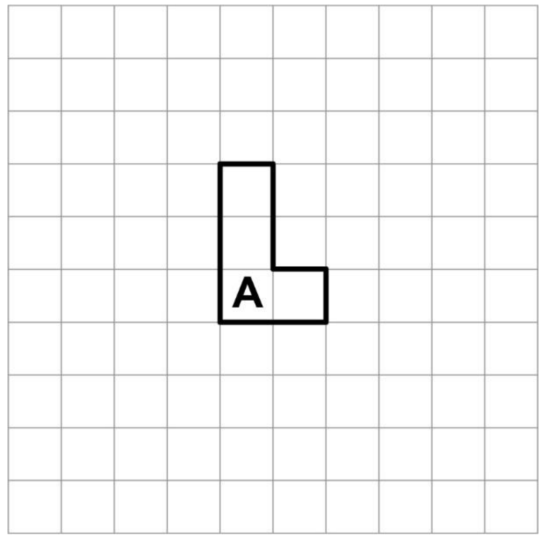


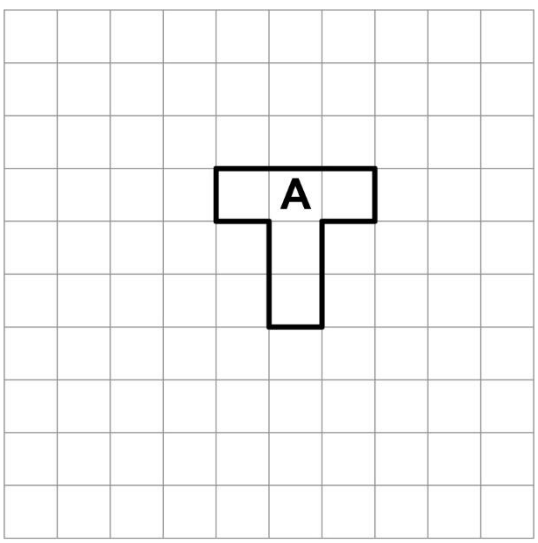
Name________________________________ Date_____________________

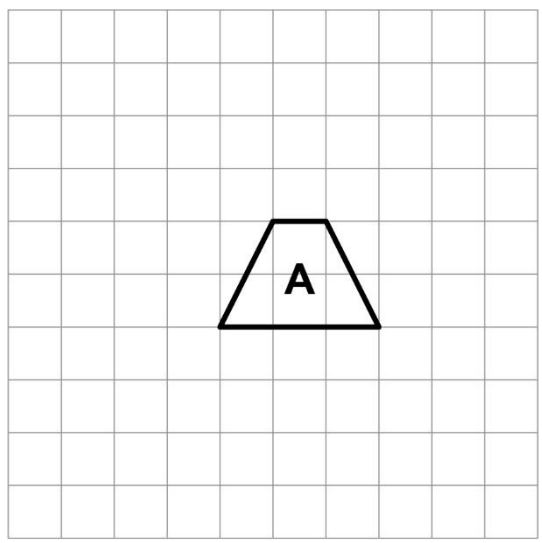
Geometry
Unit 2B Line Master 5a

Playing Grids





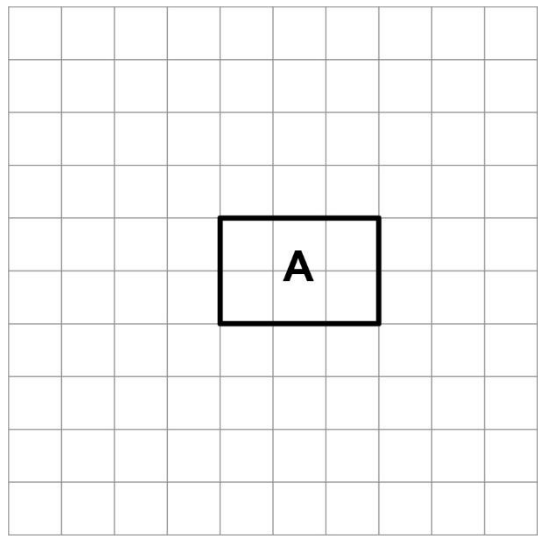


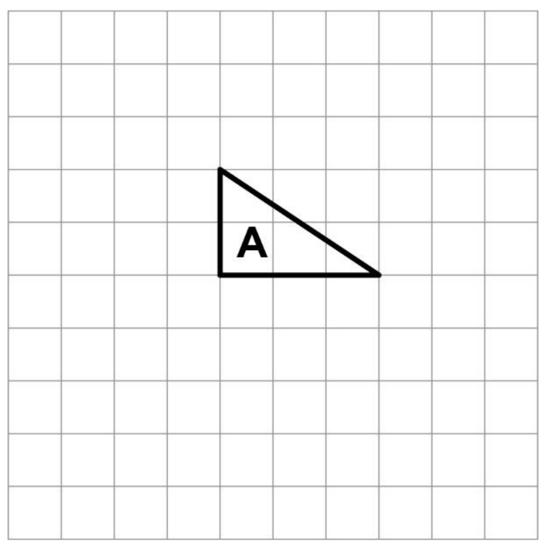


Name________________________________ Date_____________________

Geometry
Unit 2B Line Master 5b

Playing Grids (cont'd)

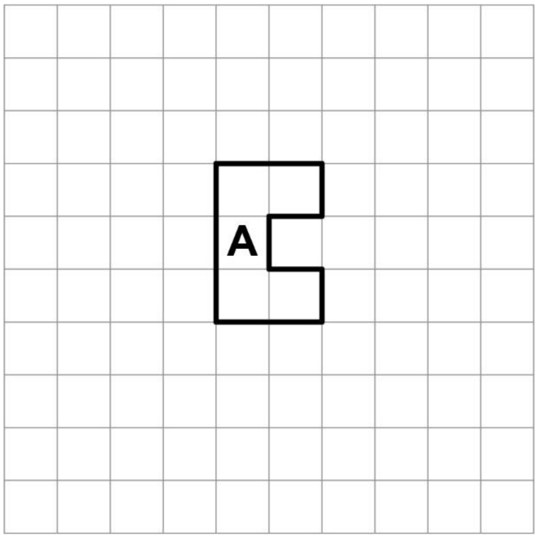


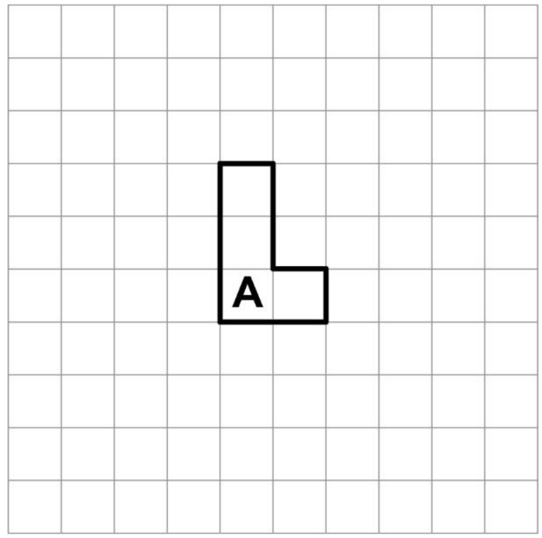


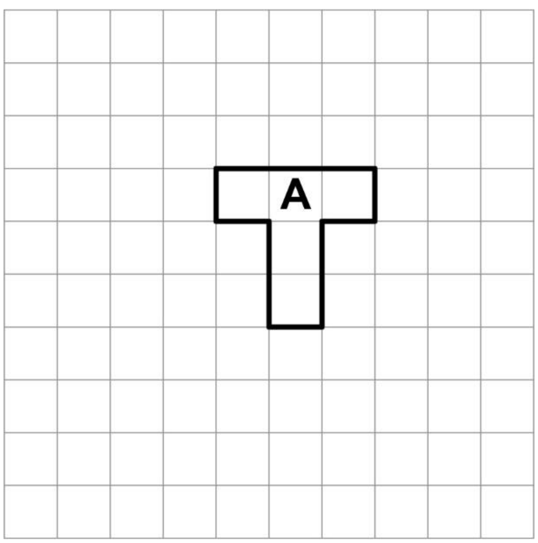
Name________________________________ Date_____________________

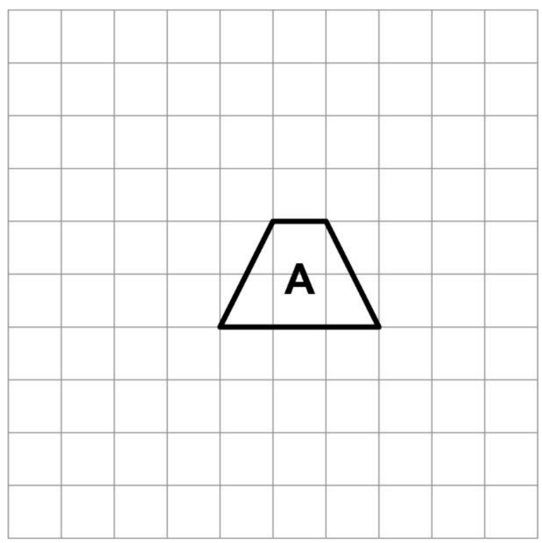
Geometry
Unit 2B Line Master 6a

Playing Grids





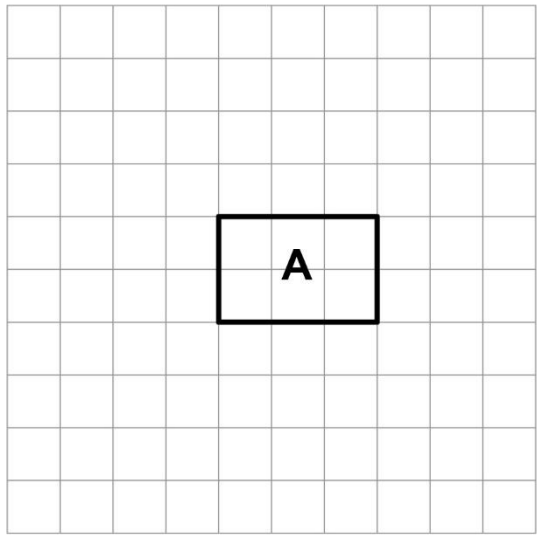


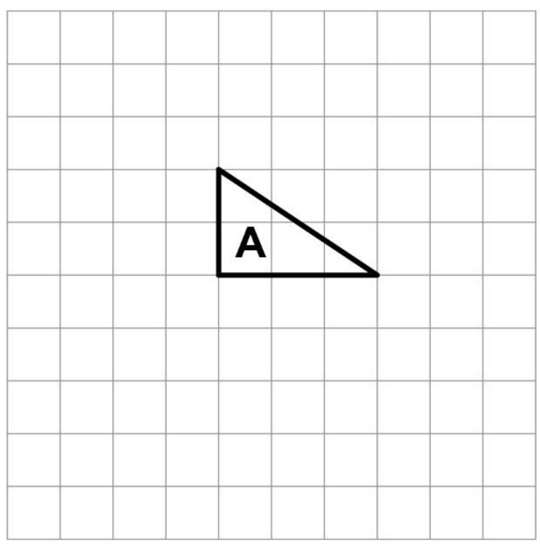


Name________________________________ Date_____________________

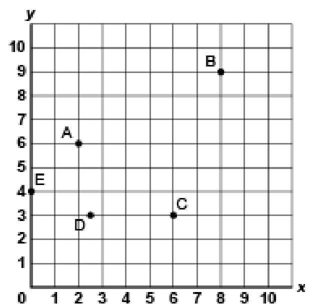
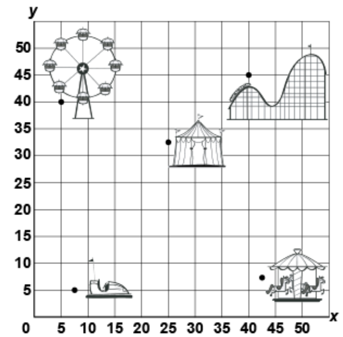
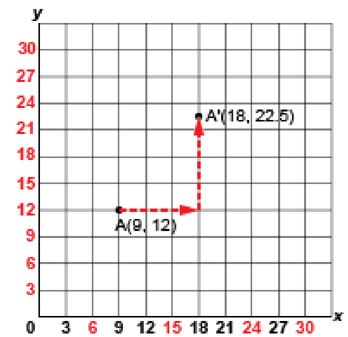
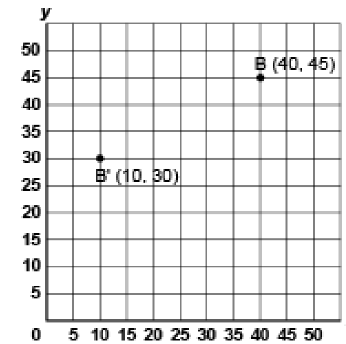
Geometry
Unit 2B Line Master 6b

Playing Grids (cont'd)





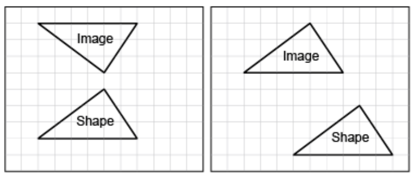
Activity 7 Assessment
Plotting and Reading Coordinates

Locating and Plotting Points in First Quadrant of Cartesian Plane			
Uses coordinates to describe the location of points on a grid.  "The coordinates of Point A are (2, 6)."	Plots and identifies points with decimal coordinates on a grid with various scales.  "The bumper cars are at (7.5, 5)."	Translates a point and identifies coordinates of its image.  "I translated Point A right 9 units and up 10.5 units to A'(18, 22.5)."	Flexibly predicts the location and coordinates of a point after a translation.  "The translation was left 30 units and down 15 units. So, I subtracted 30 from the *x*-coordinate and 15 from the *y*-coordinate: (40 – 30, 45 – 15) → B'(10, 30)."
Observations/Documentation			

Activity 7 Assessment
Plotting and Reading Coordinates

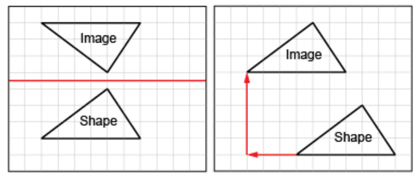
Applying and Visualizing Translations and Reflections

Identifies translations and reflections of 2-D shapes on a grid.



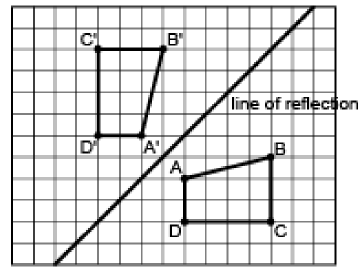
"The first image shows a reflection and the second image shows a translation."

Identifies the translation/reflection used to move a shape and line of reflection.



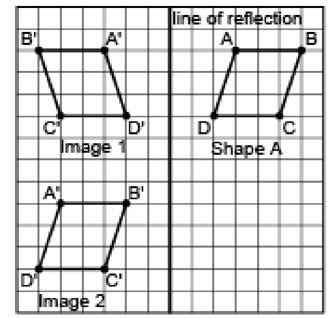
"The first shape was reflected in a horizontal line midway between the shape and its image. The second shape was translated left 3 squares and up 5 squares."

Describes and performs translations and reflections on a grid using labelled vertices.



"I labelled matching vertices with the same letter. The vertices of the image have prime symbols."

Visualizes and predicts where image of a shape will be after a translation/reflection.

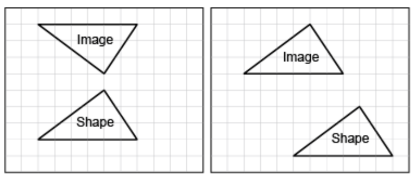
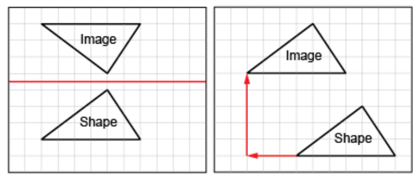
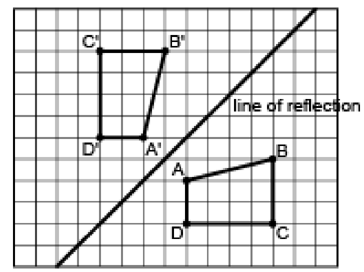
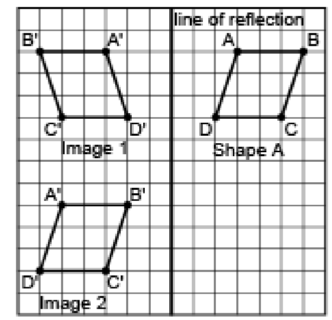


"I can picture Shape A's reflection Image 1 on the other side of the line, with matching vertices the same distance from the line of reflection. I can picture moving Shape A left 8 squares and down 7 squares to Image 2."

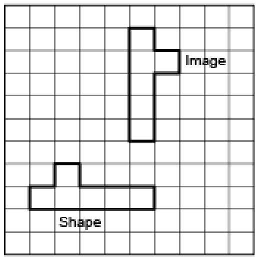
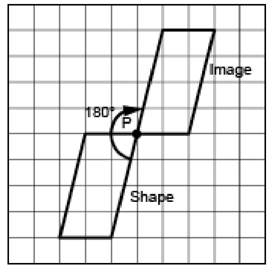
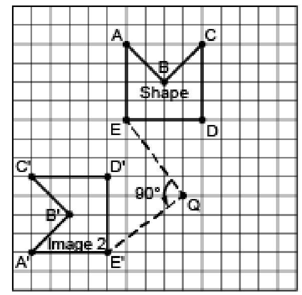
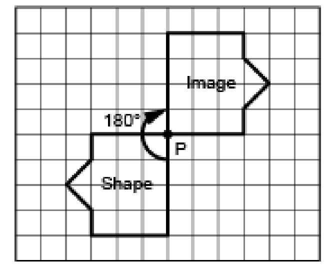
Observations/Documentation

Geometry

Activity 8 Assessment
Translating and Reflecting 2-D Shapes

<table>
<tr><th colspan="4">Applying and Visualizing Translations and Reflections</th></tr>
<tr>
<td>Identifies translations and reflections of 2-D shapes on a grid.

“The first image shows a reflection and the second image shows a translation.”</td>
<td>Identifies the translation/reflection used to move a shape and line of reflection.

“The first shape was reflected in a horizontal line midway between the shape and its image. The second shape was translated left 3 squares and up 5 squares.”</td>
<td>Describes and performs translations and reflections on a grid using labelled vertices.

“I labelled matching vertices with the same letter. The vertices of the image have prime symbols.”</td>
<td>Visualizes and predicts where image of a shape will be after a translation/reflection.

“I can picture Shape A’s reflection Image 1 on the other side of the line, with matching vertices the same distance from the line of reflection. I can picture moving Shape A left 8 squares and down 7 squares to Image 2.”</td>
</tr>
<tr><th colspan="4">Observations/Documentation</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>

Activity 9 Assessment
Rotating 2-D Shapes

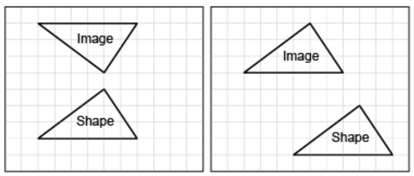
Applying and Visualizing Rotations on a Grid			
Identifies rotated 2-D shapes on a grid.  "I know the shape was rotated because the shape and its image are congruent, but the orientation is different."	Identifies the rotation used to move a shape and the point of rotation.  "The shape was rotated 180° about the common vertex P."	Describes and performs rotations with angles up to 180°.  "I used tracing paper to rotate the shape 90° counterclockwise about Point Q. I labelled matching vertices with the same letter. The vertices of the image have prime symbols."	Visualizes, predicts, and describes where the image of a shape will be after a rotation.  "I can picture rotating the shape in my mind. The image would face the opposite way and share Vertex P with the shape."
Observations/Documentation			

Geometry

Activity 10 Assessment
Identifying Transformations

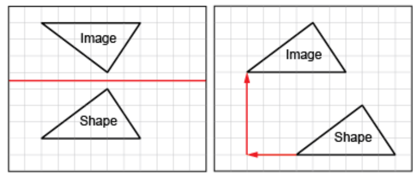
Applying and Visualizing Translations and Reflections

Identifies translations and reflections of 2-D shapes on a grid.



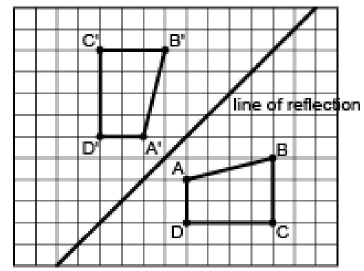
“The first image shows a reflection and the second image shows a translation.”

Identifies the translation/reflection used to move a shape and line of reflection.



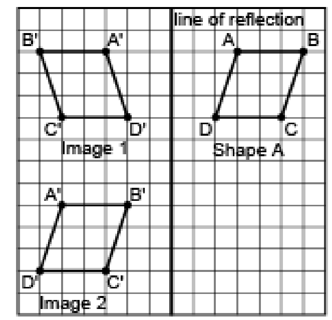
“The first shape was reflected in a horizontal line midway between the shape and its image. The second shape was translated left 3 squares and up 5 squares.”

Describes and performs translations and reflections on a grid using labelled vertices.



“I labelled matching vertices with the same letter. The vertices of the image have prime symbols.”

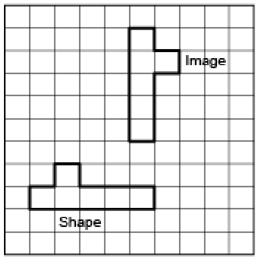
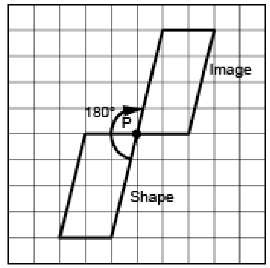
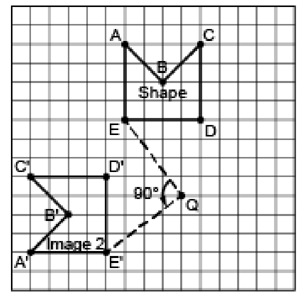
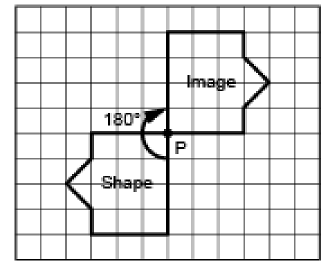
Visualizes and predicts where image of a shape will be after a translation/reflection.



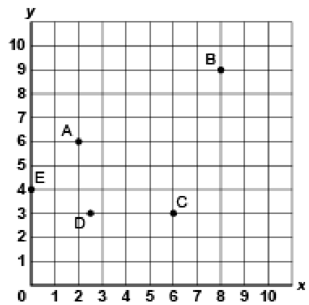
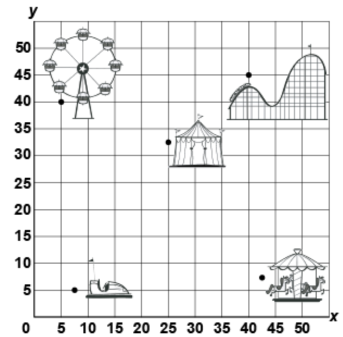
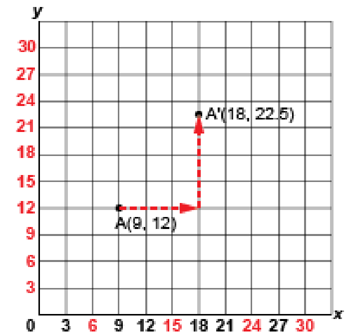
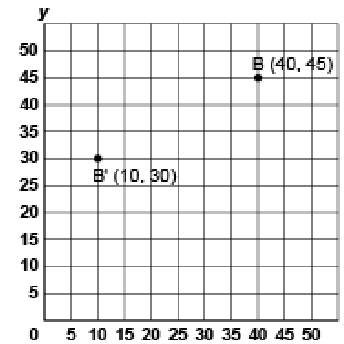
“I can picture Shape A’s reflection Image 1 on the other side of the line, with matching vertices the same distance from the line of reflection. I can picture moving Shape A left 8 squares and down 7 squares to Image 2.”

Observations/Documentation

Activity 10 Assessment
Identifying Transformations

Applying and Visualizing Rotations on a Grid			
Identifies rotated 2-D shapes on a grid.	Identifies the rotation used to move a shape and the point of rotation.	Describes and performs rotations with angles up to 180°.	Visualizes, predicts, and describes where the image of a shape will be after a rotation.
 "I know the shape was rotated because the shape and its image are congruent, but the orientation is different."	 "The shape was rotated 180° about the common vertex P."	 "I used tracing paper to rotate the shape 90° counterclockwise about Point Q. I labelled matching vertices with the same letter. The vertices of the image have prime symbols."	 "I can picture rotating the shape in my mind. The image would face the opposite way and share Vertex P with the shape."
Observations/Documentation			

Activity 11 Assessment
Grids and Transformations Consolidation

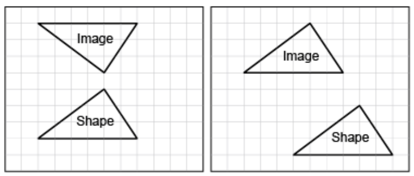
Locating and Plotting Points in First Quadrant of Cartesian Plane			
Uses coordinates to describe the location of points on a grid.  "The coordinates of Point A are (2, 6)."	Plots and identifies points with decimal coordinates on a grid with various scales.  "The bumper cars are at (7.5, 5)."	Translates a point and identifies coordinates of its image.  "I translated Point A right 9 units and up 10.5 units to A'(18, 22.5)."	Flexibly predicts the location and coordinates of a point after a translation.  "The translation was left 30 units and down 15 units. So, I subtracted 30 from the *x*-coordinate and 15 from the *y*-coordinate: (40 – 30, 45 – 15) → B'(10, 30)."
Observations/Documentation			

Geometry

Activity 11 Assessment
Grids and Transformations Consolidation

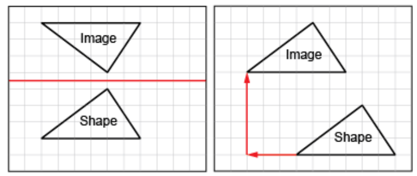
Applying and Visualizing Translations and Reflections

Identifies translations and reflections of 2-D shapes on a grid.



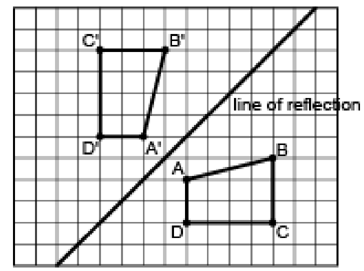
"The first image shows a reflection and the second image shows a translation."

Identifies the translation/reflection used to move a shape and line of reflection.



"The first shape was reflected in a horizontal line midway between the shape and its image. The second shape was translated left 3 squares and up 5 squares."

Describes and performs translations and reflections on a grid using labelled vertices.



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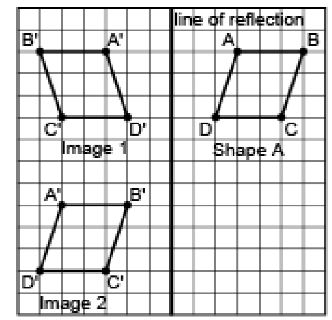


"I can picture Shape A's reflection Image 1 on the other side of the line, with matching vertices the same distance from the line of reflection. I can picture moving Shape A left 8 squares and down 7 squares to Image 2."

Observations/Documentation

Name______________________________ Date____________________

Measurement
Unit 1 Line Master 1

Our Measures

Object	Estimate (mm)	Measurement (mm)

Name________________________________ Date_____________________

Measurement
Unit 1 Line Master 2

Which Unit is Best?

Length of a shoe	Length of a new pencil	Width of a book	Height of a water bottle
Thickness of a nickel	Thickness of a cell phone	Width of the fingernail on a baby finger	Width of a shoelace
Length of a soccer field	Length of the class floor	Height of a door	Length of a hallway

Name________________________________ Date_____________________

Measurement
Unit 1 Line Master 3

Which Unit is Best?

Recording Sheet

Item	Referent	Estimate	Measure

Name________________________________ Date_____________________

Measurement
Unit 1 Line Master 4a

Perimeter and Area

Recording Sheets

My perimeter is: ___________

Width (m)	Length (m)	Area (m^2)

Name________________________________ Date_____________________

Measurement
Unit 1 Line Master 4b

Perimeter and Area (cont'd)

Recording Sheets

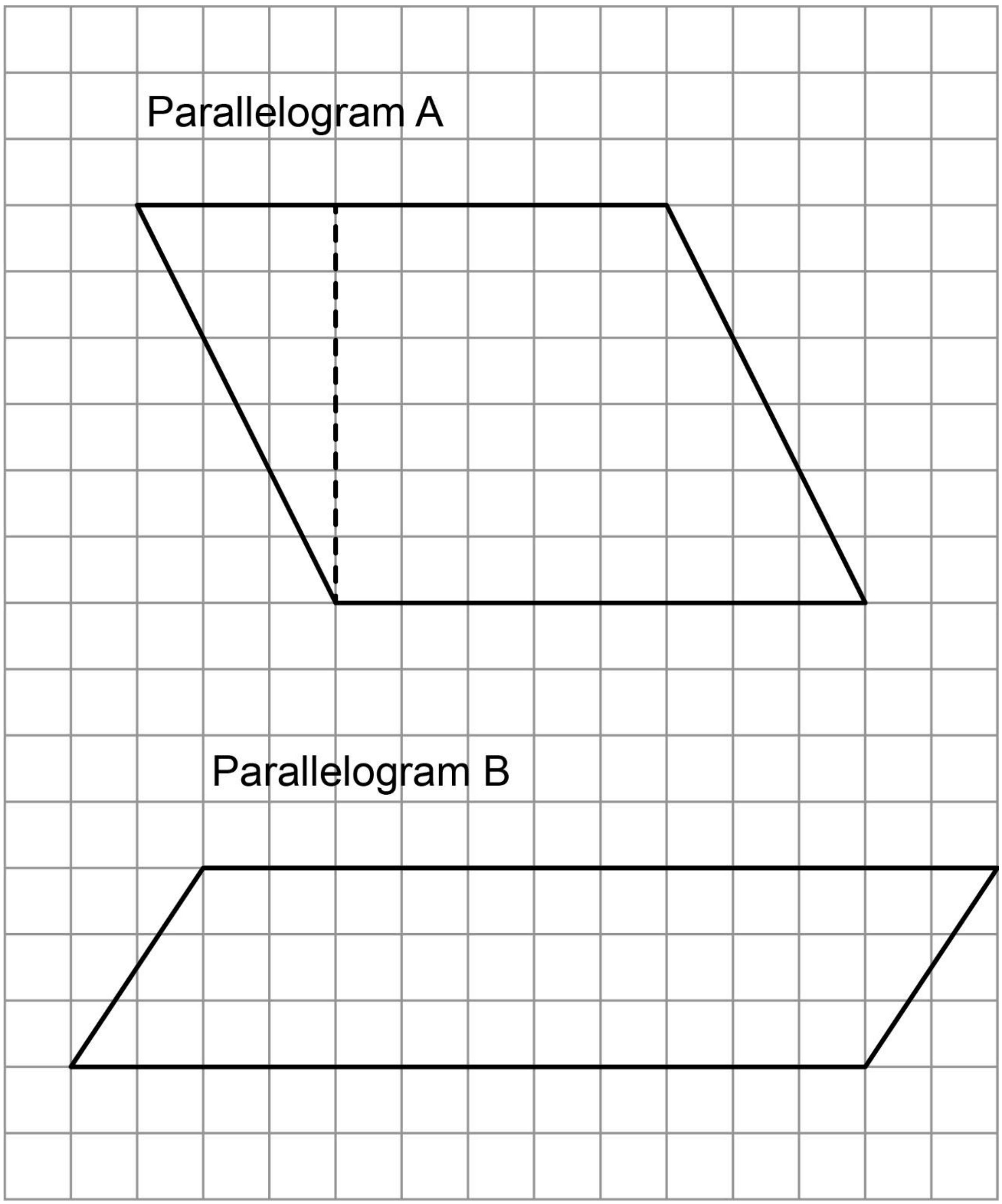
I have __________ knitted squares.

Width (number of squares)	Length (number of squares)	Perimeter (number of squares)	Perimeter (cm)

Name________________________________ Date_____________________

Measurement
Unit 1 Line Master 5

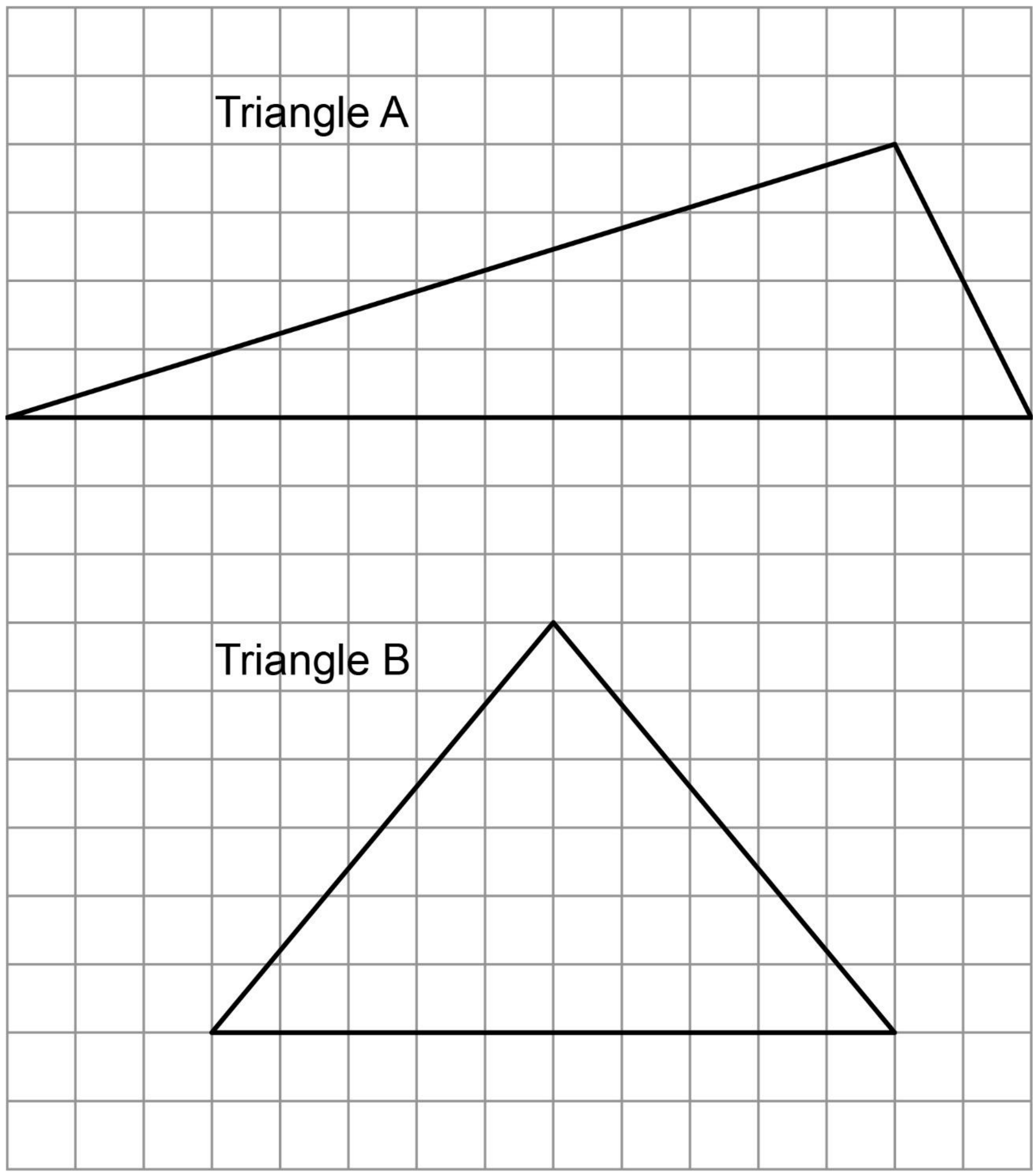
Area of Parallelograms



Name________________________________ Date_____________________

Measurement
Unit 1 Line Master 6

Area of Triangles



Measurement

Activity 1 Assessment
Estimating and Measuring in Millimetres

Investigating Length		
Identifies which metric unit (mm, cm, or m) should be used to measure the length of an object. A cm is the width of my finger. The thickness of a nickel is much less than 1 cm, so I would use millimetres to measure it.”	Uses benchmarks to estimate and measure length using metric units. “The paper clip is a little more than two fingertips long, so I estimate its length to be about 2 cm. I measured to check. It was about 2.5 cm long.”	Chooses an appropriate metric unit to estimate and measure lengths of objects and explains reasoning. A kangaroo can jump 750 cm in one leap. “To measure the length of the kangaroo’s jump, I would use metres because I can picture the length being between 7 and 8 metre sticks long.”
Observations/Documentation		

Activity 1 Assessment
Estimating and Measuring in Millimetres

Investigating Length (cont'd)		
Explains the relationships among mm, cm, m, and km and converts length measures. A kangaroo can jump 750 cm in one leap. "100 cm = 1 m; 750 ÷ 100 = 7.5, so 750 cm = 7.5 m; 1 cm = 10 mm; 750 × 10 = 7500, so 750 cm = 7500 mm. I would give the length of the jump in metres as it is more reasonable."	Compares and orders lengths when measures are given in different units. Lengths of jumps of different animals: Rabbit: 3000 mm Red Kangaroo: 12.2 m Chipmunk: 690 cm "I would convert the lengths to metres: 3000 mm = 3 m and 690 cm = 6.9 m. The animals ordered from longest to shortest jump: rabbit, 3 m; chipmunk, 6.9 m; red kangaroo, 12.2 m."	Flexibly uses the relationships among metric units to estimate, measure, and solve problems involving length. Dakota buys a spool of 200 m of fishing line. Dakota uses 950 cm of the line. How much line is left on the spool? "I convert 950 cm to metres. 1 m = 100 cm and 950 ÷ 100 = 9.5. Dakota used 9.5 m of fishing line. So, there is 200 m - 9.5 m = 190.5 m of line left on the spool."
Observations/Documentation		

Measurement

Activity 2 Assessment

Measuring Length in Different Units

Investigating Length		
Identifies which metric unit (mm, cm, or m) should be used to measure the length of an object. A cm is the width of my finger. The thickness of a nickel is much less than 1 cm, so I would use millimetres to measure it."	Uses benchmarks to estimate and measure length using metric units. "The paper clip is a little more than two fingertips long, so I estimate its length to be about 2 cm. I measured to check. It was about 2.5 cm long."	Chooses an appropriate metric unit to estimate and measure lengths of objects and explains reasoning. A kangaroo can jump 750 cm in one leap. "To measure the length of the kangaroo's jump, I would use metres because I can picture the length being between 7 and 8 metre sticks long."
Observations/Documentation		

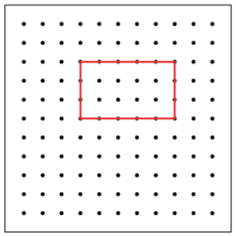
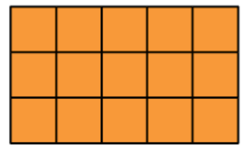
Measurement

Activity 2 Assessment
Measuring Length in Different Units

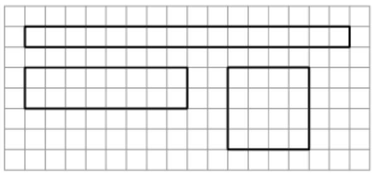
Investigating Length (cont'd)		
Explains the relationships among mm, cm, m, and km and converts length measures. A kangaroo can jump 750 cm in one leap. “100 cm = 1 m; 750 ÷ 100 = 7.5, so 750 cm = 7.5 m; 1 cm = 10 mm; 750 × 10 = 7500, so 750 cm = 7500 mm. I would give the length of the jump in metres as it is more reasonable.”	Compares and orders lengths when measures are given in different units. Lengths of jumps of different animals: Rabbit: 3000 mm Red Kangaroo: 12.2 m Chipmunk: 690 cm “I would convert the lengths to metres: 3000 mm = 3 m and 690 cm = 6.9 m. The animals ordered from longest to shortest jump: rabbit, 3 m; chipmunk, 6.9 m; red kangaroo, 12.2 m.”	Flexibly uses the relationships among metric units to estimate, measure, and solve problems involving length. Dakota buys a spool of 200 m of fishing line. Dakota uses 950 cm of the line. How much line is left on the spool? “I convert 950 cm to metres. 1 m = 100 cm and 950 ÷ 100 = 9.5. Dakota used 9.5 m of fishing line. So, there is 200 m - 9.5 m = 190.5 m of line left on the spool.”
Observations/Documentation		

Measurement

Activity 3 Assessment
Measuring the Area of Rectangles

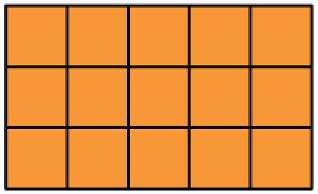
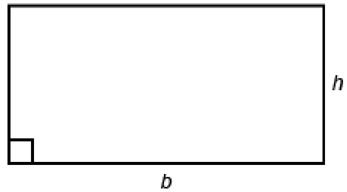
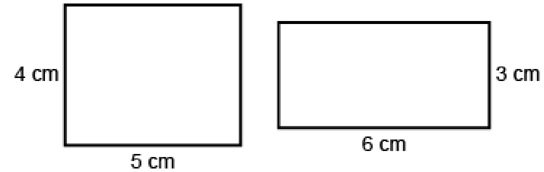
Measuring Area of Rectangles		
Recognizes that area is measured using square units.  “I made a rectangle on a geoboard and used 15 square tiles to cover it.”	Determines and records area by counting squares, using square metres and/or square centimetres.  “On the grid, each square represents 1 square centimetre. There are 15 squares, so the area of the rectangle is 15 cm^2.”	Uses the row and column structure of an array to determine the area of a rectangle.  “I traced the shape on a grid and let each square represent 1 m^2. The rectangle forms an array with 4 rows of 6 squares: $4 \times 6 = 24$; the area of the mural is 24 m^2.”
Observations/Documentation		

Activity 3 Assessment
Measuring the Area of Rectangles

Measuring Area of Rectangles (cont'd)		
Constructs different rectangles for a given area (square centimetres or square metres). Area of rectangle = 16 cm^2  "I constructed 3 different rectangles: A square with side length 4 cm: 4 cm × 4 cm = 16 cm^2. A 2-cm by 8-cm rectangle: 2 cm × 8 cm = 16 cm^2 A 1-cm by 16- cm rectangle: 1 cm × 16 cm = 16 cm^2"	Chooses the more reasonable unit (square centimetres or square metres) to measure an area.  Area of laptop screen "I would measure the area using square centimetres. I could trace the screen onto 1-cm grid paper, then multiply the number of rows by the number of columns to determine the area."	Flexibly determines the area of rectangles, solves problems, and identifies the more reasonable square unit. The floor has length 9 m and width 8 m. A square tile has area 1 m^2. How many tiles are needed to tile the floor? "I modelled the floor on a grid. The floor has 8 rows of 9 squares: 8 × 9 = 72; area = 72 m^2; so, 72 tiles are needed to cover the floor."
Observations/Documentation		

Activity 4 Assessment

Relating the Perimeter and Area of Rectangles

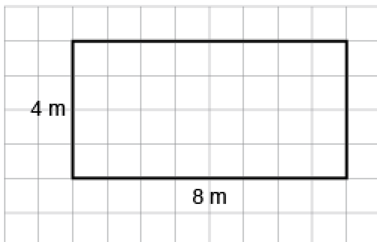
Measuring Area and Perimeter of Rectangles		
Recognizes that the perimeter of a rectangle is the distance around and area is the number of tiles that cover it.  “Perimeter of rectangle: 3 + 5 + 3 + 5 = 16, 16 units; Area: 3 × 5 = 15, 15 square units.”	Uses algebraic formulas to determine the perimeter and area of a rectangle.  “To determine the perimeter of a rectangle, I use the formula $P = 2b + 2h$ and to determine the area, I use the formula $A = b \times h$. For a rectangle with $b = 6$ m and $h = 3$ m: Perimeter: 2 × 6 m + 2 × 3 m = 18 m Area: 6 m × 3 m= 18 m^2.”	Compares the perimeters and areas of rectangles.  “Both rectangles have a perimeter of 18 cm: 2 × 4 + 2 × 5 = 18; 2 × 6 + 2 × 3 = 18. The rectangles have different areas: 4 cm × 5 cm = 20 cm^2 and 6 cm × 3 cm = 18 cm^2.”
Observations/Documentation		

Activity 4 Assessment
Relating the Perimeter and Area of Rectangles

Measuring Area and Perimeter of Rectangles (cont’d)

Constructs a rectangle with given perimeter/area and explains strategy used.

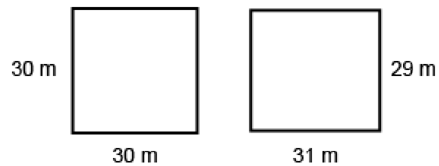
Perimeter = 24 m



“To construct a rectangle with perimeter 24 m, the sum of the base and height needs to be 24 m ÷ 2 = 12 m. I chose 8 m and 4 m.
To determine the area, I multiplied the base by the height: 8 m × 4 m = 32 m^2.”

Constructs different rectangles for a given perimeter/area and describes strategies used.

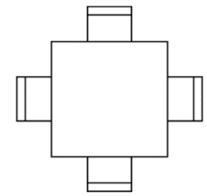
You have 120 m of fencing for a new school playground. Sketch 2 possible rectangles that would be a suitable shape



”I divided 120 m by 2 to get 60 m, the sum of the base and height. A square would have the greatest possible area, so I chose 2 dimensions close in value with a sum of 60 m:
30 m and 30 m; and 29 m and 31 m.

The first playground has area
30 m × 30 m = 900 m^2 and the second playground has area 31 m × 29 m = 899 m^2.”

Flexibly solves problems involving a given area and/or perimeter in a variety of contexts.



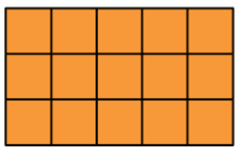
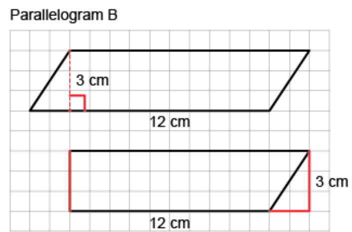
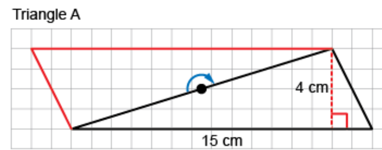
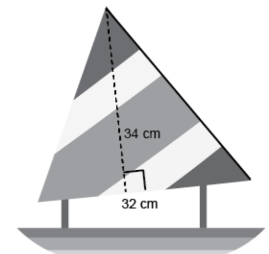
A square table can seat 1 student on each side. 24 tables are pushed together to make 1 large rectangular table. What is the greatest number of students who could be seated?

“For an area of 24 square units, the length and width can be: 1 and 24; 2 and 12; 3 and 8; 4 and 6. For the greatest number of students, the perimeter has to be the greatest, which means its width is the least, 1 unit, and the length is 24 units.
The perimeter is 50 units,
so 50 students can be seated.”

Observations/Documentation

Activity 5 Assessment
Areas of Parallelograms and Triangles

<table>
<tr><th colspan="4">Measuring Area of Parallelograms and Triangles</th></tr>
<tr>
<td>Determines the area of a rectangle.

“A rectangle is an array of squares. To find the area, I multiply the number of rows by the number of columns or use the formula A = b × h.
This rectangle has area
5 cm × 3 cm = 15 cm².”
</td>
<td>Partitions and rearranges a parallelogram to form a rectangle with the same base and height.

“I partitioned the parallelogram and moved the triangle to create a rectangle.
I then found the area of the rectangle:
A = b × h = 12 cm × 3 cm= 36 cm².
The area of the parallelogram is also 36 cm².”</td>
<td>Doubles a triangle to create a parallelogram (area of triangle is one-half that of parallelogram).

“I rotated the triangle to make a parallelogram with the same base and height. The area of the triangle is one-half the area of the parallelogram.
Area of parallelogram:
15 cm × 4 cm = 60 cm²
Area of triangle: 60 cm² ÷ 2 = 30 cm²
So, the formula for the area of a triangle is: A = b × h ÷ 2.”</td>
<td>Flexibly solves problems involving the areas of rectangles, parallelograms, and triangles.

What is the area of the sail on the toy boat?

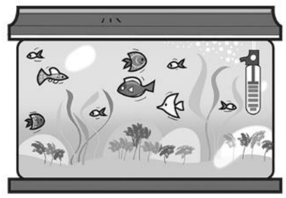
“I doubled the triangular sail to make a parallelogram with the same base and height. I found the area of the parallelogram: 34 cm × 32 cm = 1088 cm², then divided the area in half to find the area of the triangle: 1088 cm² ÷ 2 = 544 cm².”</td>
</tr>
<tr><th colspan="4">Observations/Documentation</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>

Name________________________________ Date_____________________

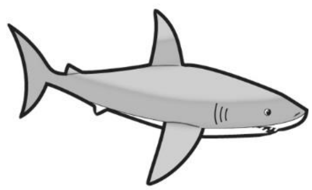
Measurement
Unit 2 Line Master 1

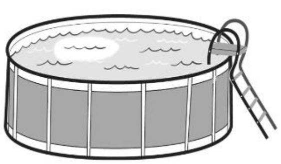
Rewriting Measures

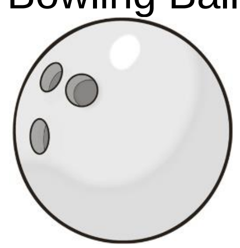
<table>
<tr>
<td>Niagara River

58 000 m</td>
<td>Fish Tank

208 L</td>
<td>Basketball Net

2.6 m</td>
</tr>
<tr>
<td>Desk

0.48 m</td>
<td>Great White Shark

522 kg</td>
<td>Water Bottle

0.5 L</td>
</tr>
<tr>
<td>Swimming Pool

375 000 L</td>
<td>Apple

0.08 kg</td>
<td>Bowling Ball

7260 g</td>
</tr>
</table>

Name________________________________ Date_____________________

Measurement
Unit 2 Line Master 2

Measuring Volume

Part A

Box	Estimate	Actual

Part B

Box	Estimate	Cubes in Bottom Layer	Number of Layers	Volume

Order from least to greatest volume:

Name________________________________ Date_____________________

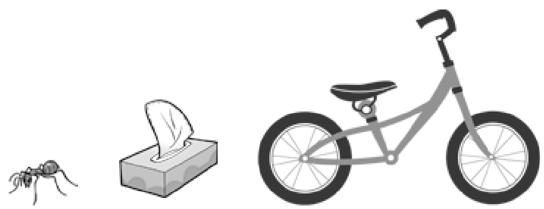
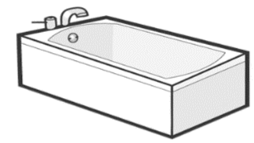
Measurement
Unit 2 Line Master 3

Volume of Rectangular Prisms

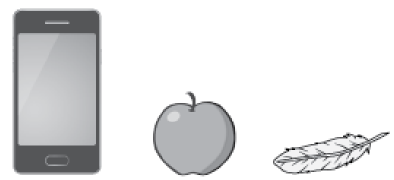
Length	Width	Height	Volume

Measurement

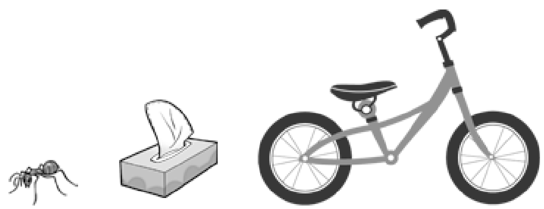
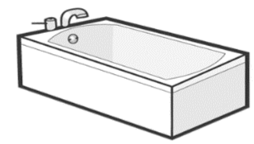
Activity 7 Assessment
Investigating Mass

Investigating Mass and Capacity		
Identifies which metric unit should be used to measure the mass and/or capacity of an object.	Uses benchmarks to estimate mass or capacity using metric units, then measures to check.	Chooses an appropriate metric unit to estimate and measure mass and/or capacity of object and explains reasoning.
 "I would use milligrams for the ant, grams for the tissue box, and kilograms for the bicycle."	 "A carton of milk has a capacity of about 1 L. I estimated that the paint can holds about 4 L. I measured to check: 3.8 L."	 "I would use litres to measure the capacity of the bathtub because I know it has a capacity much larger than a 1-L carton of milk. I think it would take about 180 L to fill the bathtub."
Observations/Documentation		

Activity 7 Assessment
Investigating Mass

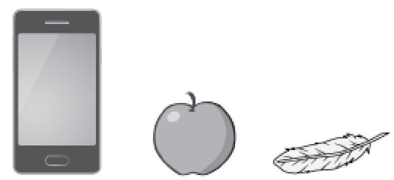
Investigating Mass and Capacity (cont'd)		
Explains the relationship between metric units of mass and/or capacity and converts between units. Rhianna drinks 1500 mL of milk at school in one week. How many litres does she drink? "I know 1000 mL = 1 L, so 500 mL = 0.5 L; 1 L + 0.5 L = 1.5 L."	Compares and orders items by mass and/or capacity when measures are given in different units.  0.17 kg 80 g 5 mg "I converted the mass of each object to grams: 0.17 × 1000 = 170 and 5 ÷ 1000 = 0.005. The order from least to greatest mass is feather (0.005 g), apple (80 g), and cell phone (170 g)."	Flexibly solves problems in various contexts where measures of mass and/or capacity are given in different units. One peach has a mass of 150 g. How much will it cost for 8 peaches if they sell for $5 per kg? "I found the mass of 8 peaches in kilograms: 8 × 150 g = 1200 g, or 1.2 kg; I kg costs $5; 0.2 kg is one-fifth of 1 kg and one-fifth of $5 is $1; $5 + $1 = $6."
Observations/Documentation		

Activity 8 Assessment
Investigating Capacity

Investigating Mass and Capacity		
Identifies which metric unit should be used to measure the mass and/or capacity of an object.  “I would use milligrams for the ant, grams for the tissue box, and kilograms for the bicycle.”	Uses benchmarks to estimate mass or capacity using metric units, then measures to check.  “A carton of milk has a capacity of about 1 L. I estimated that the paint can holds about 4 L. I measured to check: 3.8 L.“	Chooses an appropriate metric unit to estimate and measure mass and/or capacity of object and explains reasoning.  “I would use litres to measure the capacity of the bathtub because I know it has a capacity much larger than a 1-L carton of milk. I think it would take about 180 L to fill the bathtub.”
Observations/Documentation		

Measurement

Activity 8 Assessment
Investigating Capacity

Investigating Mass and Capacity (cont'd)		
Explains the relationship between metric units of mass and/or capacity and converts between units. Rhianna drinks 1500 mL of milk at school in one week. How many litres does she drink? "I know 1000 mL = 1 L, so 500 mL = 0.5 L; 1 L + 0.5 L = 1.5 L."	Compares and orders items by mass and/or capacity when measures are given in different units.  0.17 kg 80 g 5 mg "I converted the mass of each object to grams: 0.17 × 1000 = 170 and 5 ÷ 1000 = 0.005. The order from least to greatest mass is feather (0.005 g), apple (80 g), and cell phone (170 g)."	Flexibly solves problems in various contexts where measures of mass and/or capacity are given in different units. One peach has a mass of 150 g. How much will it cost for 8 peaches if they sell for $5 per kg? "I found the mass of 8 peaches in kilograms: 8 × 150 g = 1200 g, or 1.2 kg; I kg costs $5; 0.2 kg is one-fifth of 1 kg and one-fifth of $5 is $1; $5 + $1 = $6."
Observations/Documentation		

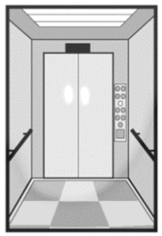
Measurement

Activity 9 Assessment

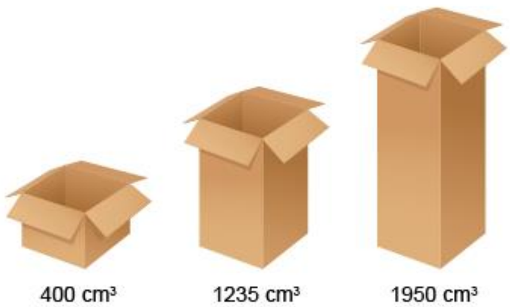
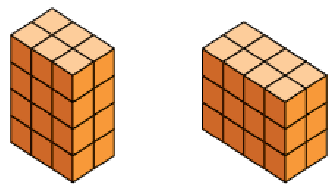
Investigating Relationships Among Units

Understanding Relationships Among Metric Units			
Understands some metric relationships: 1 kg = 1000 g, 1 L = 1000 mL, and 1 km = 1000 m. 1.88 kg of flour "I know that 1 kg = 1000 g, so 1.88 kg = 1000 g × 1.88 = 1880 g."	Uses metric relationships to convert between units (calculates in steps).  Write the height of the basketball net, 2.60 m, in millimetres. "I multiplied by 10 three times: 2.60 × 10 = 26; 26 × 10 = 260; 260 × 10 = 2600; 2.60 m = 2600 mm."	Uses metric relationships to convert between units efficiently.  Write the height of the basketball net, 2.60 m, in millimetres. "To convert from metres to millimetres, I multiplied by 1000: 2.60 × 1000 = 2600; 2.60 m = 2600 mm."	Flexibly and efficiently converts between metric units and solves problems. Fish Tank  208 L Rewrite the measure using 3 different units. "208 × 10 = 2080; 2080 dL 208 × 1000 = 208 000; 208 000 mL 208 ÷ 1000 = 0.208; 0.208 kL I think 208 L is most reasonable as it is a unit that people can easily relate to. A number such as 208 000 mL is difficult to visualize."
Observations/Documentation			

Activity 10 Assessment
Investigating Volume

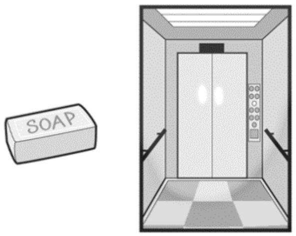
Investigating Volume		
Chooses an appropriate unit to estimate and measure volume of object and explains reasoning.  "I would use cubic centimetres for the bar of soap and cubic metres for the elevator."	Uses benchmarks to estimate volume using metric units.  playpen  cube puzzle "The playpen is about 1 m^3 and the cube puzzle is about 8 cm^3."	Measures the volume of objects using metric units and explains strategies.  "I covered the bottom of the box with centimetre cubes, counted the cubes in the bottom layer, then multiplied by the number of layers."
Observations/Documentation		

Activity 10 Assessment
Investigating Volume

Investigating Volume (cont'd)		
Compares and orders objects by volume using metric measures.  "I used centicubes to measure the volume of each box, then compared the volumes to order them from least to greatest."	Constructs different rectangular prisms for a given volume.  "Both of these prisms have volume 24 cm^3. I made a prism with 4 layers of 6 cubes: 6 cm^3 × 4 = 24 cm^3. I made a prism with 3 layers of 8 cubes: 8 cm^3 × 3 = 24 cm^3."	Flexibly solves problems in various contexts that involve the volume of rectangular prisms. Kyan used 50 centimetre cubes to make a rectangular prism. There are 10 cubes in the bottom layer. How many layers of cubes does the prism have? "There are 10 cubes in the bottom layer. I know 10 × 5 = 50, so there must be 5 layers of cubes."
Observations/Documentation		

Activity 11 Assessment

Investigating Volume with Rectangular Prisms

Investigating Volume		
Chooses an appropriate unit to estimate and measure volume of object and explains reasoning.  “I would use cubic centimetres for the bar of soap and cubic metres for the elevator.”	Uses benchmarks to estimate volume using metric units.  playpen  cube puzzle “The playpen is about 1 m^3 and the cube puzzle is about 8 cm^3.”	Measures the volume of objects using metric units and explains strategies.  “I covered the bottom of the box with centimetre cubes, counted the cubes in the bottom layer, then multiplied by the number of layers.”
Observations/Documentation		

Measurement

Activity 11 Assessment
Investigating Volume with Rectangular Prisms

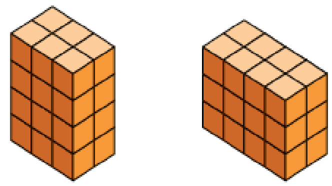
Investigating Volume (cont'd)

Compares and orders objects by volume using metric measures.

400 cm^3 1235 cm^3 1950 cm^3

"I used centicubes to measure the volume of each box, then compared the volumes to order them from least to greatest."

Constructs different rectangular prisms for a given volume.



"Both of these prisms have volume 24 cm^3. I made a prism with 4 layers of 6 cubes: 6 cm^3 × 4 = 24 cm^3. I made a prism with 3 layers of 8 cubes: 8 cm^3 × 3 = 24 cm^3."

Flexibly solves problems in various contexts that involve the volume of rectangular prisms.

Kyan used 50 centimetre cubes to make a rectangular prism. There are 10 cubes in the bottom layer. How many layers of cubes does the prism have?

"There are 10 cubes in the bottom layer. I know 10 × 5 = 50, so there must be 5 layers of cubes."

Observations/Documentation

Name_______________________________ Date____________________

Measurement
Unit 3 Line Master 1a

Day Planner

Here is Devon’s to-do list.

Name________________________________ Date_____________________

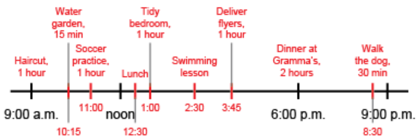
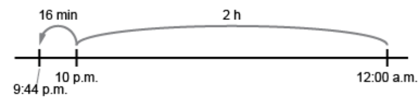
Measurement
Unit 3 Line Master 1b

Day Planner (cont’d)

Create a schedule for Devon that includes times and durations.

Time	Activity

Activity 13 Assessment
Exploring Elapsed Time

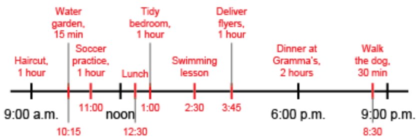
Using Measurement of Time			
Tells time and uses benchmarks to help schedule events.  "I used a timeline to record my daily activities using benchmarks rather than exact times."	Solves problems using elapsed time. Buses leave at 14:15, 14:26, 14:47, and 14:58. Each trip back takes 1 hour and 11 minutes. Dara needs to be back by 3:45 p.m. Which buses can Dara take? "I converted 3:45 p.m. to 24-hour time by adding 12 hours: 15:45. I added 1 hour and 11 minutes to each departure time to get the arrival time: 15:26, 15:37, 15:58, 16:09. Two of the buses arrive before 15:45. So, Dara can take the 14:15 or 14:26 bus."	Uses relationships among units of time to solve problems. It is New Year's Eve. The clock will strike midnight in 136 min. What time is it?  "I know 1 h = 60 min and 2 h = 120 min. 136 min = 120 min + 16 min = 2 h and 16 min. Midnight is 12:00 a.m. The time is 9:44 p.m."	Flexibly solves problems using various strategies and the relationships among units. How can you use the daily cycle of the moon to help you tell time? "There are 24 h in a day and the moon is visible for about 12 h. Divide the sky into fourths. For example, if the moon is about halfway across the sky, then it is about 6 hours past sundown."
Observations/Documentation			

Measurement

Activity 14 Assessment
Solving Problems Involving Time

Using Measurement of Time

Tells time and uses benchmarks to help schedule events.



"I used a timeline to record my daily activities using benchmarks rather than exact times."

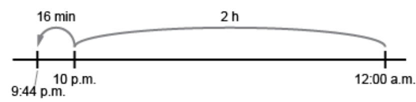
Solves problems using elapsed time.

Buses leave at 14:15, 14:26, 14:47, and 14:58. Each trip back takes 1 hour and 11 minutes. Dara needs to be back by 3:45 p.m. Which buses can Dara take?

"I converted 3:45 p.m. to 24-hour time by adding 12 hours: 15:45. I added 1 hour and 11 minutes to each departure time to get the arrival time: 15:26, 15:37, 15:58, 16:09. Two of the buses arrive before 15:45. So, Dara can take the 14:15 or 14:26 bus."

Uses relationships among units of time to solve problems.

It is New Year's Eve. The clock will strike midnight in 136 min. What time is it?



"I know 1 h = 60 min and 2 h = 120 min. 136 min = 120 min + 16 min = 2 h and 16 min. Midnight is 12:00 a.m. The time is 9:44 p.m."

Flexibly solves problems using various strategies and the relationships among units.

How can you use the daily cycle of the moon to help you tell time?

"There are 24 h in a day and the moon is visible for about 12 h. Divide the sky into fourths. For example, if the moon is about halfway across the sky, then it is about 6 hours past sundown."

Observations/Documentation

Name________________________________ Date_____________________

Number
Unit 1 Line Master 1

Place-Value Chart to Hundred Thousands

Thousands			Units		
Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

Thousands			Units		
Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

Name_________________________________ Date______________________

Number
Unit 1 Line Master 2

Open Number Line

Name_______________________________ Date____________________

Number
Unit 1 Line Master 3

Place-Value Relationships

Complete the chart.
Explain the relationships you see in the chart.

Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
How many ten thousands are in one hundred thousand?	How many thousands are in ten thousand?	How many hundreds are in one thousand?	How many tens are in one hundred?	How many ones are in one ten?	
How many thousands are in one hundred thousand?	How many hundreds are in ten thousand?	How many tens are in one thousand?	How many ones are in one hundred?		
How many hundreds are one hundred thousand?	How many tens are in ten thousand?	How many ones are in one thousand?			
How many tens are in one hundred thousand?	How many ones are in ten thousand?				
How many ones are in one hundred thousand?					

Name________________________________ Date_____________________

Number
Unit 1 Line Master 4a

Spin, Roll, and Add!

Play with a partner.

Materials:

- Spinner
- Open paperclip
- Number cube
- Place-value chart

What to Do

On the spinner, use a pencil point to hold the open paperclip as the pointer.
One player chooses a 6-digit number and records it.
The other player:

- Spins the pointer to see which digit will change.
- Rolls the number cube to see how many 1s, 10s, 100s, or 1000s to add.
- Records the addition and writes the number in a place-value chart.

Take turns spinning and rolling to build new numbers.

For example:

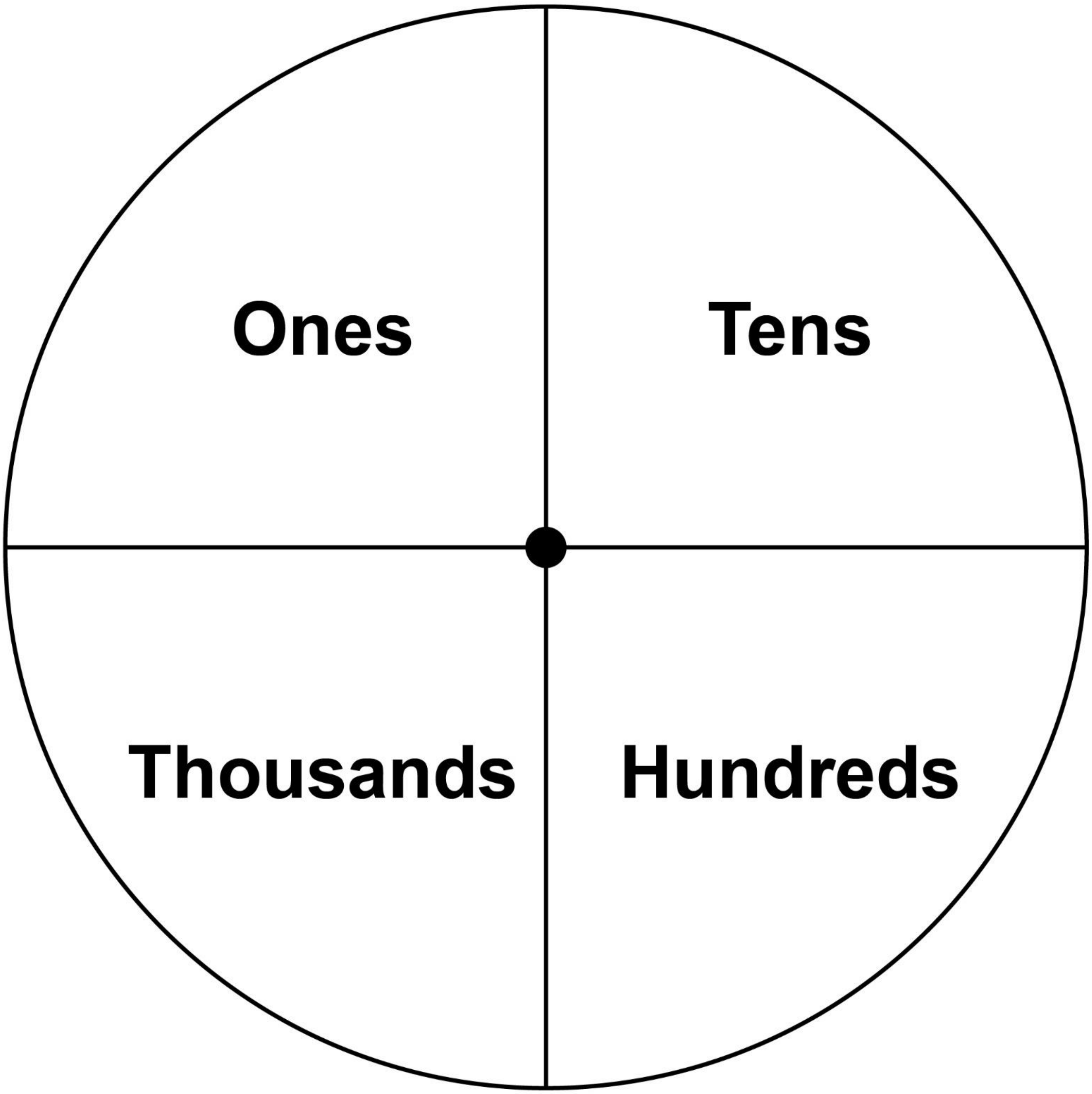
Rudy chose 215 488 to start.
Emmy spun Hundreds and rolled 1, so she added 100.
Then, Rudy spun Thousands and rolled 4, so he added 4000.

Start: 215 488
215 488 + 100 = 215 588
215 588 + 4000 = 219 588

Name________________________________ Date_____________________

Number
Unit 1 Line Master 4b

Spin, Roll, and Add! (cont'd)



Name________________________________ Date_____________________

Number
Unit 1 Line Master 5

Spin, Roll, and Subtract!

Play with a partner.

Materials:

- Spinner
- Open paperclip
- Number cube
- Place-value chart

What to Do

On the spinner, use a pencil point to hold the open paperclip as the pointer.
One player chooses a 6-digit number and records it.
The other player:

- Spins the pointer to see which digit will change.
- Rolls the number cube to see how many 1s, 10s, 100s, or 1000s to subtract.
- Records the subtraction and writes the number in a place-value chart.

Take turns spinning and rolling to build new numbers.

For example:

Rudy chose 215 488 to start.
Emmy spun Hundreds and rolled 1, so she subtracted 100.
Then, Rudy spun Thousands and rolled 4, so he subtracted 4000.

Start: 215 488
215 488 – 100 = 215 388
215 588 – 4000 = 211 588

Name________________________________ Date_____________________

Number
Unit 1 Line Master 6

Graphing Place Value

Play with a partner.

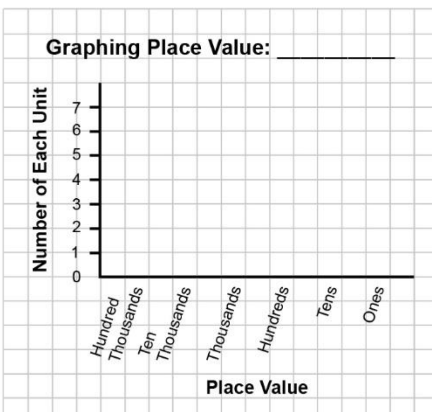
Materials:

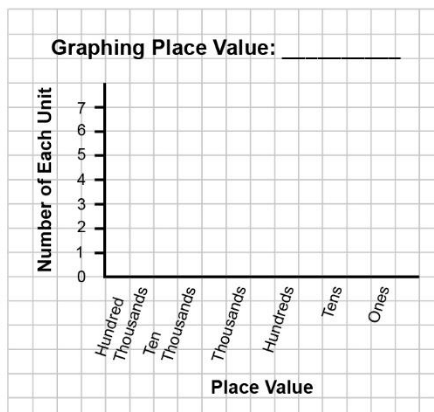
- Number cube

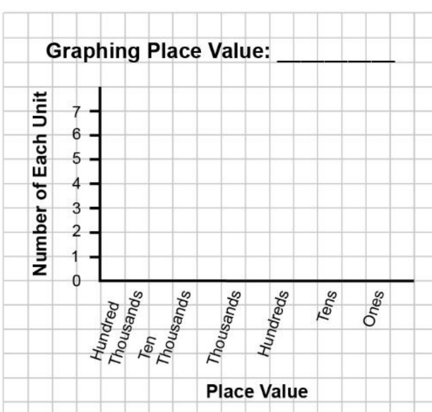
What to Do

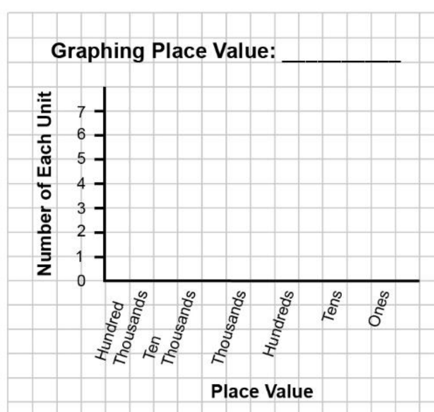
For each graph:

- Roll the number cube 6 times to get a 6-digit number.
- Write the number at the top of the graph.
- Draw a bar graph to represent your number.









Name________________________________ Date_____________________

Number
Unit 1 Line Master 7a

Spin and Compare

Play with a partner.

Materials:

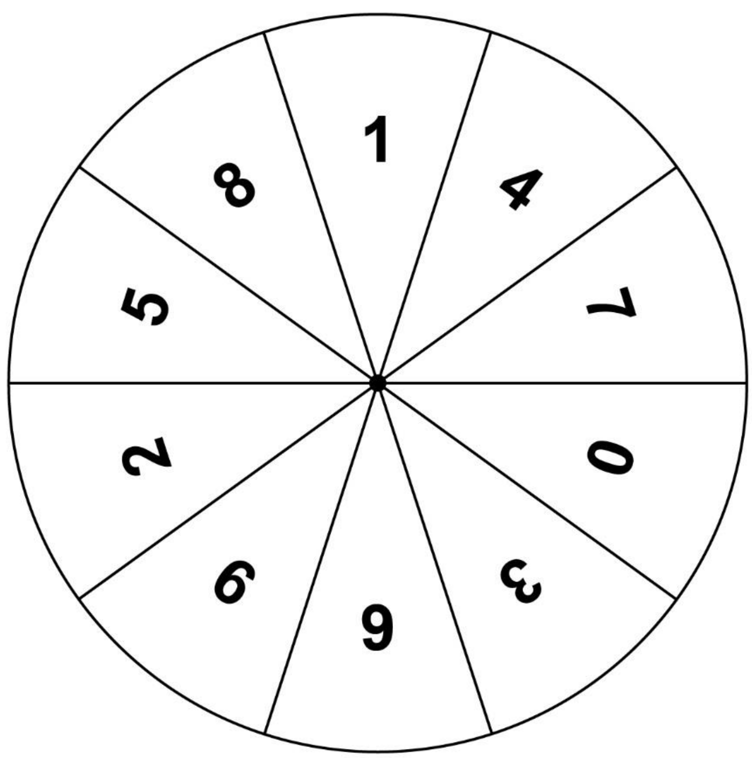
- Open paperclip as pointer

What to Do

Each of you spins the pointer to create a 5-digit or a 6-digit number.

or

Spin once for each digit.
You decide on its place-value position.
Try to create the greatest number you can.
Compare numbers with your partner.
The player with the greater number scores 1 point.
Play until one of you reaches 10 points.



Name________________________________ Date_____________________

Number
Unit 1 Line Master 7b

Spin and Compare (cont’d)

Player 1	or	Player 2

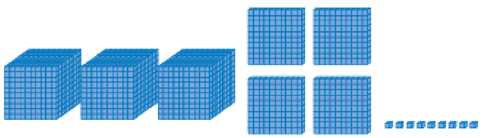
Variation:
Score a point when you make a smaller number than your partner.

Number

Activity 1 Assessment
Representing Larger Numbers

Representing Numbers Using Place Value

Models 4-digit number using Base Ten Blocks (decomposes in one way).



"2375: I used the digits of the number to tell me how many of each block I needed."

Represents 4-digit number on place-value chart (decomposes in one way).

Thousands	Hundreds	Tens	Ones
2	3	7	5

"2375 has 2 thousands, 3 hundreds, 7 tens, and 5 ones."

Represents 5-digit number on place-value chart (decomposes in one way).

Ten thousands	Thousands	Hundreds	Tens	Ones
7	1	2	8	3

"71 283: I used the digits of the number to tell me the number to write in each column."

Observations/Documentation

Activity 1 Assessment
Representing Larger Numbers

Representing Numbers Using Place Value (cont'd)

Uses relationships among place-value positions to read a number in more than one way.

Ten thousands	Thousands	Hundreds	Tens	Ones
7	1	2	8	3

"7 ten-thousands, 1 thousand, 2 hundreds, 8 tens, and 3 ones can also be 71 thousands, 2 hundreds, and 83 ones."

Represents numbers using expanded form.

Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones
6	3	9	5	8	7

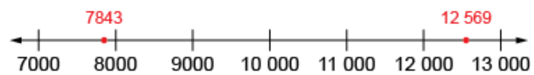
"639 587 =
600 000 + 30 000 + 9000 + 500 + 80 + 7"

Represents numbers flexibly using place-value relationships.

"639 587 =
600 000 + 30 000 + 9000 + 500 + 80 + 7
Or 600 000 + 39 000 + 400 + 180 + 7
Or 639 000 + 587"

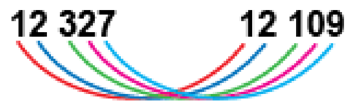
Observations/Documentation

Activity 2 Assessment
Comparing Larger Numbers

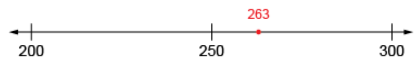
Comparing and Ordering Quantities		
Compares numbers using only the first digits. **7843 6587** “7843 is greater than 6587 because 7 is bigger than 6.”	Compares numbers with benchmarks.  “I compared the numbers to 10 000. 7348 is less than 10 000 and 12 569 is greater than 10 000. So, 12 569 is greater.”	Visualizes benchmarks on a number line to compare. “I picture 12 589 farther to the right on the line than 7843. So, 12 589 is greater than 7843.”
Observations/Documentation		

Number

Activity 2 Assessment
Comparing Larger Numbers

Comparing and Ordering Quantities (cont'd)		
Uses place value understanding to compare numbers, digit by digit.  "Both start with 12 thousands. 3 hundreds is greater than 1 hundred, 2 tens is greater than 0 tens, and 7 ones is less than 9 ones. So, 12 327 is greater than 12 109."	Compares and orders three or more numbers using a variety of strategies. **7407 36 104 36 455** "7407 has only 4 digits, so it's the least. To compare 36 104 and 36 455, I have to look at the hundreds place; 4 is greater than 1, so 36 455 is the greatest number."	Compares numbers flexibly and records comparisons symbolically (<, =, >). **37 867 < 49 328** "Both are 5-digit numbers. The first digit tells me that 37 867 is less than 49 328." **37 867 > 35 095** "For this pair, I have to check the thousands place."
Observations/Documentation		

Activity 3 Assessment
Estimating to Solve Problems

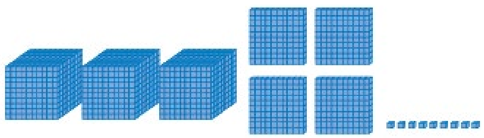
Estimating Quantities			
Uses front-end estimation (focuses on first digit of number). “This page has 263 words, so I think each page has about 200 words.”	Uses benchmarks to estimate.  “This page has 263 words, which is close to the benchmark 250. So, every group of 4 pages has about 1000 words.”	Gives estimate as a range. “These pages have 263, 289, and 274 words, so I think most pages have between 250 and 300 words.”	Uses place value understanding to round estimate (to nearest ten, hundred, or thousand). “I estimate about 50 275 words. I can round to the nearest: thousand: 50 000 hundred: 50 300 ten: 50 280.”
Observations/Documentation			

Activity 4 Assessment

Number Relationships and Place Value Consolidation

Representing Numbers Using Place Value

Models 4-digit number using Base Ten Blocks (decomposes in one way).



"2375: I used the digits of the number to tell me how many of each block I needed."

Represents 4-digit number on place-value chart (decomposes in one way).

Thousands	Hundreds	Tens	Ones
2	3	7	5

"2375 has 2 thousands, 3 hundreds, 7 tens, and 5 ones."

Represents 5-digit number on place-value chart (decomposes in one way).

Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones
	7	1	2	8	3

"71 283: I used the digits of the number to tell me the number to write in each column."

Observations/Documentation

Activity 4 Assessment
Number Relationships and Place Value Consolidation

Representing Numbers Using Place Value (con't)

Uses relationships among place-value positions to read a number in more than one way.	Represents numbers using expanded form.	Represents numbers flexibly using place-value relationships.
<table><tr><th>Hundred thousands</th><th>Ten thousands</th><th>Thousands</th><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td>7</td><td>1</td><td>2</td><td>8</td><td>3</td></tr></table> "7 ten-thousands, 1 thousand, 2 hundreds, 8 tens, and 3 ones can also be 71 thousands, 2 hundreds, and 83 ones."	<table><tr><th>Hundred thousands</th><th>Ten thousands</th><th>Thousands</th><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td>6</td><td>3</td><td>9</td><td>5</td><td>8</td><td>7</td></tr></table> "639 587 = 600 000 + 30 000 + 9000 + 500 + 80 + 7"	"639 587 = 600 000 + 30 000 + 9000 + 500 + 80 + 7 Or 600 000 + 39 000 + 400 + 180 + 7 Or 639 000 + 587"

Observations/Documentation

Number

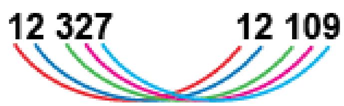
Activity 4 Assessment

Number Relationships and Place Value Consolidation

Comparing and Ordering Quantities		
Compares numbers using only the first digits. **7843 6587** "7843 is greater than 6587 because 7 is bigger than 6."	Compares numbers with benchmarks.  "I compared the numbers to 10 000. 7348 is less than 10 000 and 12 569 is greater than 10 000. So, 12 569 is greater."	Visualizes benchmarks on a number line to compare. "I picture 12 589 farther to the right on the line than 7843. So, 12 589 is greater than 7843."
Observations/Documentation		

Number

Activity 4 Assessment
Number Relationships and Place Value Consolidation

Comparing and Ordering Quantities (con't)		
Uses place value understanding to compare numbers, digit by digit.  "Both start with 12 thousands. 3 hundreds is greater than 1 hundred, 2 tens is greater than 0 tens, and 7 ones is less than 9 ones. So, 12 327 is greater than 12 109."	Compares and orders three or more numbers using a variety of strategies. **7407 36 104 36 455** "7407 has only 4 digits, so it's the least. To compare 36 104 and 36 455, I have to look at the hundreds place; 4 is greater than 1, so 36 455 is the greatest number."	Compares numbers flexibly and records comparisons symbolically (<, =, >). **37 867 < 49 328** "Both are 5-digit numbers. The first digit tells me that 37 867 is less than 49 328." **37 867 > 35 095** "For this pair, I have to check the thousands place."
Observations/Documentation		

Name________________________________ Date_____________________

Number
Unit 2 Line Master 1a

Terry Fox Run
Canadian School Sites

Province or Territory	Number of School Sites
Prince Edward Island	71
Nova Scotia	426
New Brunswick	247
Newfoundland and Labrador	285
Québec	395
Ontario	About 5100
Manitoba	822
Saskatchewan	774
Alberta	About 1800
British Columbia	About 2000
Nunavut	37
Northwest Territories	27
Yukon	36

1. Select two provinces/territories. Estimate how many school sites are in those two provinces/territories altogether.

Name________________________________ Date_____________________

Number
Unit 2 Line Master 1b

Terry Fox Run
Canadian School Sites (cont'd)

Territories (Yukon, Nunavut, Northwest Territories)	Ontario and Québec	Western Provinces (Manitoba, Saskatchewan, Alberta, British Columbia)	Atlantic Provinces (PEI, Nova Scotia, New Brunswick, Newfoundland and Labrador)

3. Select a province or territory besides Ontario:

____

4. Estimate how many more school sites are in Ontario than in your chosen province or territory.

Name________________________________ Date_____________________

Number
Unit 2 Line Master 2

Donation Cheques

#001 Pay to the order of **Fundraiser** $1250.00 **One thousand two hundred and fifty** Dollars	#002 Pay to the order of **Fundraiser** $867.00 **Eight hundred and sixty seven** Dollars
#003 Pay to the order of **Fundraiser** $195.00 **One hundred and ninety five** Dollars	#004 Pay to the order of **Fundraiser** $2050.00 **Two thousand and fifty** Dollars
#005 Pay to the order of **Fundraiser** $955.00 **Nine hundred and fifty five** Dollars	

Name________________________________ Date_____________________

Number
Unit 2 Line Master 3

Blank Cheques

Pay to the order of # ______________________________ ______________________________________ Dollars

Pay to the order of # ______________________________ ______________________________________ Dollars

Pay to the order of # ______________________________ ______________________________________ Dollars

Pay to the order of # ______________________________ ______________________________________ Dollars

Name_________________________________ Date______________________

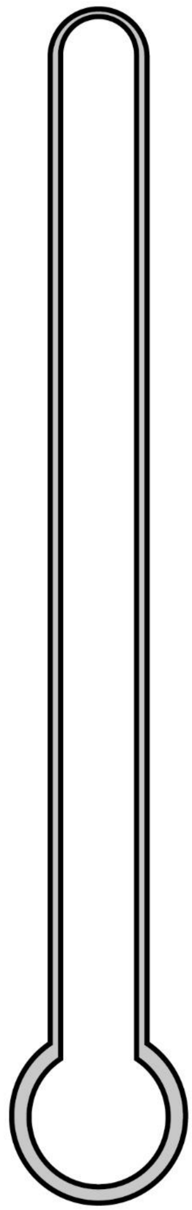
Number
Unit 2 Line Master 4

Our Fundraiser

Group or cause: ____

Total money raised: ____

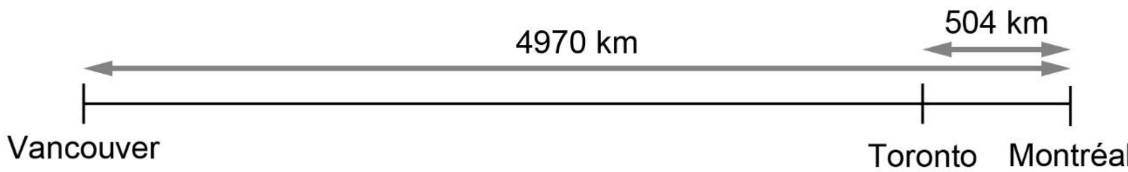
Goal: _______________



Name________________________________ Date_____________________

Number
Unit 2 Line Master 5

Distance Travelled



How far is it from Vancouver to Toronto?

Name________________________________ Date_____________________

Number
Unit 2 Line Master 6a

Game Cards

140 50	70 31	182 20
80 40	130 62	190 50
110 70	122 50	90 60
150 110	171 91	130 80

Name________________________________ Date_____________________

Number
Unit 2 Line Master 6b

Game Cards (cont'd)

180 50	7000 4000	905 805
1000 400	170 30	139 60
132 40	601 500	160 90
170 20	150 50	158 70

Name________________________________ Date_____________________

Number
Unit 2 Line Master 6c

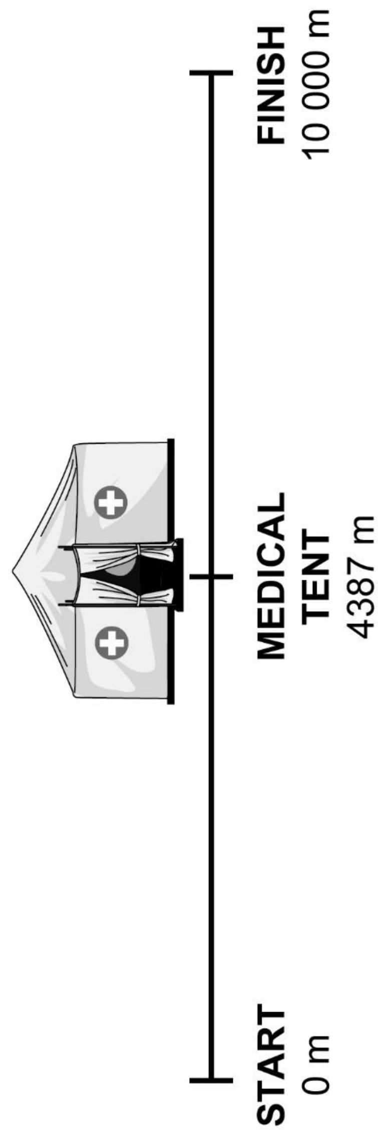
Game Cards (cont'd)

18 9	12 8	20 10
9 7	8 5	15 9
17 2	15 5	16 7
14 8	10 2	9 4

Name________________________________ Date_____________________

Number
Unit 2 Line Master 7

Walkathon Route Plan



Name________________________________ Date_____________________

Number
Unit 2 Line Master 8

Examining Your Route

1. Someone joins the walkathon at Checkpoint 2 and continues to the Finish.
   Estimate how far this person walked.

2. A participant walks the first 1450 m of your route before spraining their ankle.
   a) How far from the Medical Tent are they?

   b) At this point, how far away are they from the nearest checkpoint on your route?

3. Create a story problem based on your route and something that could happen on the day of your walkathon.

Number

Activity 5 Assessment
Estimating Sums and Differences

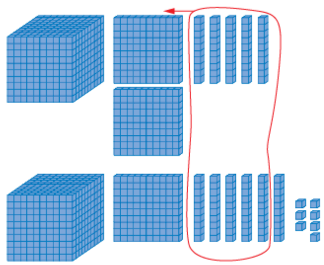
Estimating Sums and Differences			
Uses front-end estimation Estimate: 71 + 426 + 247 + 285 70 + 400 + 200 + 200 = 870 “I estimate about 870.”	Uses rounding to write each number to the nearest ten Estimate: 71 + 426 + 247 + 285 70 + 430 + 250 + 290 = 1040 “I estimate about 1040.”	Uses rounding and compensation Estimate: 71 + 426 + 247 + 285 I’ll round two up and two down. 70 + 430 + 250 + 280 = 400 “I estimate about 1030.”	Estimates flexibly to check reasonableness of solutions 623 + 248 + 369 + 450 = 1690 Estimate to check: 23 + 69 is about 100, so 623 + 369 is about 1000. 48 + 50 is about 100, so 248 + 450 is about 700. 1000 + 700 = 1700 Since 1690 is close to 1700, the solution seems reasonable.
Observations/Documentation			

Number

Activity 6 Assessment
Exploring Addition Strategies

Conceptual Meaning of Whole Number Addition and Subtraction

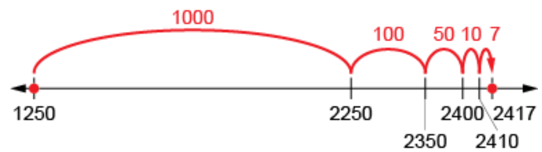
Recognizes addition and subtraction situations and sketches a picture to add or subtract to 10 000.



1250 + 1167 = 2417

Models and symbolizes ways to solve problems to 10 000.

1250 + 1167 = 2417



Uses an understanding of place value to decompose both numbers to solve problems to 100 000.

$$\begin{aligned} 1250 &= 1000 + 200 + 50 \\ 1167 &= 1000 + 100 + 60 + 7 \\ 1250 + 1167 &= 2000 + 300 + 110 + 7 \\ &= 2000 + 400 + 10 + 7 \\ &= 2417 \end{aligned}$$

$$\begin{array}{r} 1250 \\ +\ 1167 \\ \hline 2000 \\ 300 \\ 110 \\ +\ \quad 7 \\ \hline 2417 \end{array}$$

"I added the thousands, the hundreds, the tens, and then the ones."

Observations/Documentation

Activity 6 Assessment
Exploring Addition Strategies

Conceptual Meaning of Whole Number Addition and Subtraction (cont'd)		
Uses an understanding of place value to decompose one number to solve problems to 100 000. 14 365 − 2542 = 14 365 – 2000 – 500 – 40 − 2 = 12 365 – 500 – 40 – 2 = 11 865 – 40 − 2 = 11 823	Estimates to determine if answer to problem is reasonable. 14 365 – 2542 = 11 823 "I estimate 12 000 because 14 365 is close to 14 500, 2542 is close to 2500, and 14 500 – 2500 = 12 000. 12 000 is close to 11 823, so, my answer is reasonable."	Creates and solves multi-step addition and subtraction problems flexibly using a variety of strategies. 8134 bottles were collected by the school. 4612 were donated by the community. 1645 were not accepted at the recycling depot. How many bottles were recycled? "I added 8134 + 4612 = 12 746. Then, 12 746 – 1645 = 11 101. 11 101 bottles were recycled."
Observations/Documentation		

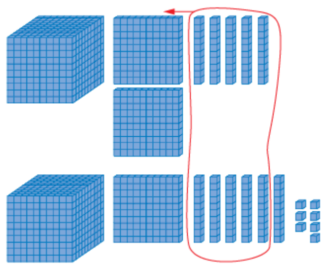
Number

Activity 7 Assessment

Exploring Subtraction Strategies

Conceptual Meaning of Whole Number Addition and Subtraction

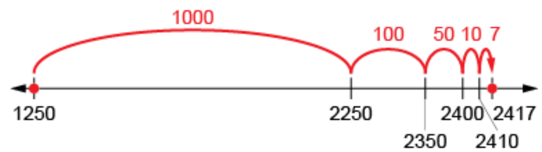
Recognizes addition and subtraction situations and sketches a picture to
add or subtract to 10 000.



1250 + 1167 = 2417

Models and symbolizes ways to solve problems to 10 000.

1250 + 1167 = 2417



Uses an understanding of place value to decompose both numbers to solve problems to 100 000.

$$
\begin{aligned}
1250 &= 1000 + 200 + 50\\
1167 &= 1000 + 100 + 60 + 7\\
1250 + 1167 &= 2000 + 300 + 110 + 7\\
&= 2000 + 400 + 10 + 7\\
&= 2417
\end{aligned}
$$

$$
\begin{array}{r}
1\ 2\ 5\ 0\\
+\ 1\ 1\ 6\ 7\\
\hline
2\ 0\ 0\ 0\\
3\ 0\ 0\\
1\ 1\ 0\\
+\qquad 7\\
\hline
2\ 4\ 1\ 7
\end{array}
$$

"I added the thousands, the hundreds, the tens, and then the ones."

Observations/Documentation

Number

Activity 7 Assessment
Exploring Subtraction Strategies

Conceptual Meaning of Whole Number Addition and Subtraction (cont'd)		
Uses an understanding of place value to decompose one number to solve problems to 100 000. 14 365 − 2542 = 14 365 – 2000 – 500 – 40 − 2 = 12 365 – 500 – 40 – 2 = 11 865 – 40 − 2 = 11 823	Estimates to determine if answer to problem is reasonable. 14 365 – 2542 = 11 823 "I estimate 12 000 because 14 365 is close to 14 500, 2542 is close to 2500, and 14 500 – 2500 = 12 000. 12 000 is close to 11 823, so, my answer is reasonable."	Creates and solves multi-step addition and subtraction problems flexibly using a variety of strategies. 8134 bottles were collected by the school. 4612 were donated by the community. 1645 were not accepted at the recycling depot. How many bottles were recycled? "I added 8134 + 4612 = 12 746. Then, 12 746 – 1645 = 11 101. 11 101 bottles were recycled."
Observations/Documentation		

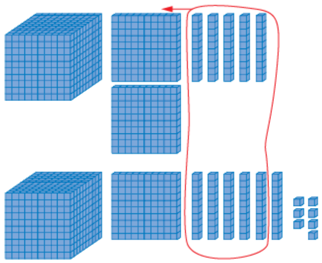
Number

Activity 7B Assessment

Adding and Subtracting Larger Numbers (BC)

Conceptual Meaning of Whole Number Addition and Subtraction

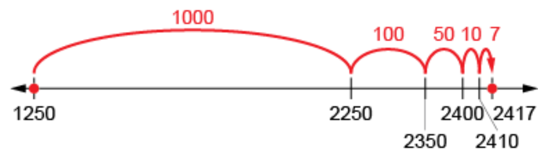
Recognizes addition and subtraction situations and sketches a picture to add or subtract to 10 000.



1250 + 1167 = 2417

Models and symbolizes ways to solve problems to 10 000.

1250 + 1167 = 2417



Uses an understanding of place value to decompose both numbers to solve problems to 100 000.

1250 = 1000 + 200 + 50
1167 = 1000 + 100 + 60 + 7
1250 + 1167 = 2000 + 300 + 110 + 7
= 2000 + 400 + 10 + 7
= 2417

```
  1 2 5 0
+ 1 1 6 7
---------
  2 0 0 0
    3 0 0
    1 1 0
+       7
---------
  2 4 1 7
```

"I added the thousands, the hundreds, the tens, and then the ones."

Observations/Documentation

Number

Activity 7B Assessment

Adding and Subtracting Larger Numbers (BC)

Conceptual Meaning of Whole Number Addition and Subtraction (cont’d)		
Uses an understanding of place value to decompose one number to solve problems to 100 000. 373 872 − 71 450 = 373 872 − 70 000 − 1000 − 400 − 50 = 303 872 − 1000 − 400 − 50 = 302 872 − 400 − 50 = 302 472 − 50 = 302 422	Estimates to determine if answer to problem is reasonable. 373 872 – 71 450 = 302 422 “I estimate 303 000 because 373 872 is close to 374 000, 71 450 is close to 71 000, and 374 000 – 71 000 = 303 000. 303 000 is close to 302 422, so, my answer is reasonable.”	Creates and solves multi-step addition and subtraction problems flexibly using a variety of strategies. Here are the populations of 3 Canadian cities in 2022: Kelowna, BC: 125 109; Regina, SK: 176 183; Winnipeg, MB: 632 063. How much greater is the population of Winnipeg than that of Kelowna and Regina combined? “I added 125 109 + 176 183 = 301 292. Then, 632 063 – 301 292 = 330 771. The population is greater by 330 771.”
Observations/Documentation		

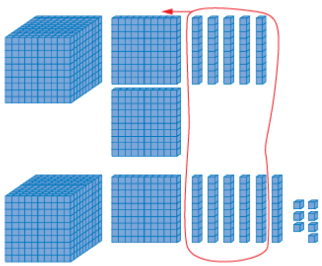
Number

Activity 7B Assessment

Adding and Subtracting Larger Numbers (ON)

Conceptual Meaning of Whole Number Addition and Subtraction

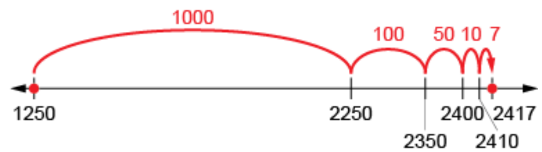
Recognizes addition and subtraction situations and sketches a picture to add or subtract to 10 000.



1250 + 1167 = 2417

Models and symbolizes ways to solve problems to 10 000.

1250 + 1167 = 2417



Uses an understanding of place value to decompose both numbers to solve problems to 100 000.

$$\begin{aligned} 1250 &= 1000 + 200 + 50 \\ 1167 &= 1000 + 100 + 60 + 7 \\ 1250 + 1167 &= 2000 + 300 + 110 + 7 \\ &= 2000 + 400 + 10 + 7 \\ &= 2417 \end{aligned}$$

$$\begin{array}{r} 1\ 2\ 5\ 0 \\ +\ 1\ 1\ 6\ 7 \\ \hline 2\ 0\ 0\ 0 \\ 3\ 0\ 0 \\ 1\ 1\ 0 \\ +\qquad 7 \\ \hline 2\ 4\ 1\ 7 \end{array}$$

"I added the thousands, the hundreds, the tens, and then the ones."

Observations/Documentation

Number

Activity 7B Assessment
Adding and Subtracting Larger Numbers (ON)

Conceptual Meaning of Whole Number Addition and Subtraction (cont'd)		
Uses an understanding of place value to decompose one number to solve problems to 100 000. $59\,366 - 8052 = 59\,366 - 8000 - 50 - 2$ $= 51\,366 - 50 - 2$ $= 51\,316 - 2$ $= 51\,314$	Estimates to determine if answer to problem is reasonable. 59 366 – 8052 = 51 314 "I estimate 51 000 because 59 366 is close to 59 000, 8052 is close to 8000, and 59 000 – 8000 = 51 000. 51 000 is close to 51 314, so, my answer is reasonable."	Creates and solves multi-step addition and subtraction problems flexibly using a variety of strategies. Two large charities held bottle drives. Charity A collected 28 134 bottles and Charity B collected 14 612 bottles. 1645 were not accepted at the recycling depot. How many bottles were recycled? "I added 28 134 + 14 612 = 42 746. Then, 42 746 – 1645 = 41 101. 41 101 bottles were recycled."
Observations/Documentation		

Number

Activity 8 Assessment
Using Knowledge of Basic Facts

Developing Fluency of Whole Number Addition and Subtraction		
Uses known sums and differences to fluently solve addition and subtraction problems to 1000. 435 + 578 = ? “I know 430 + 570 = 1000. Since 435 is 5 more than 430 and 578 is 8 more than 570, and 8 + 5 = 13, the answer is 1013.”	Purposefully uses properties and/or relationships to solve addition and subtraction problems. 226 + 435 + 574 + 375 = ? “I can rearrange the numbers to make it easier to add.” 226 + 574 + 435 + 375 = ? 226 + 574 = **800** 435 + 375 = **810** **800** + **810** = 1610	Understands the inverse relationship between addition and subtraction and uses it to solve problems. 1619 – 815 = ? “I can think addition: 815 + ? = 1619. I added on: 815 + **200** = 1015, 1015 + **600** = 1615, 1615 + **4** = 1619 The missing part is **200** + **600** + **4** = 804.”
Observations/Documentation		

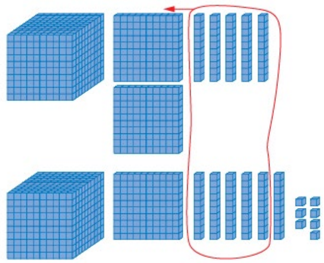
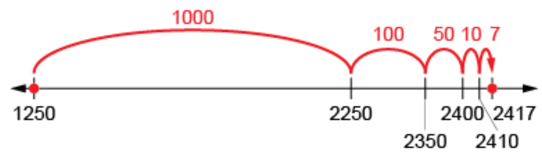
Number

Activity 8 Assessment
Using Knowledge of Basic Facts

Developing Fluency of Whole Number Addition and Subtraction (cont'd)		
Uses mental math strategies and algorithms (e.g. using benchmark numbers, known facts, partial sums). $\begin{array}{r} 4689 \\ +3714 \\ \hline 7000 \\ 1300 \\ 90 \\ 13 \\ \hline 8403 \end{array}$ $\quad$ $\begin{array}{r} {\scriptstyle 1\,1\,1\ \ } \\ 4689 \\ +3714 \\ \hline 8403 \end{array}$ "I could used partial sums or the standard algorithm."	Uses estimation to check the reasonableness of solutions. There are 648 French Immersion students. 174 more students plan to enroll in the Fall. The program can have 835 students. Is there enough space? "648 is close to 650 and 174 is close to 175. 650 + 175 = 825. 835 – 825 = 10; about 10 spaces. I overestimated because we want to make sure we have enough spaces for the students."	Flexibly creates and solves multi-operational problems and checks reasonableness of solutions. 7350 – 326 = ? 7350 – 300 = 7050 7050 – 26 = 7024 books in library. 7050 is close to 7024, so the solution is reasonable.
Observations/Documentation		

Number

Activity 9 Assessment
Fluency with Addition and Subtraction Consolidation

<table>
<tr><th colspan="3">Conceptual Meaning of Whole Number Addition and Subtraction</th></tr>
<tr>
<td>Recognizes addition and subtraction situations and sketches a picture to add or subtract to 10 000.

1250 + 1167 = 2417</td>
<td>Models and symbolizes ways to solve problems to 10 000.
1250 + 1167 = 2417

</td>
<td>Uses an understanding of place value to decompose both numbers to solve problems to 100 000.
1250 = 1000 + 200 + 50
1167 = 1000 + 100 + 60 + 7
1250 + 1167 = 2000 + 300 + 110 + 7
= 2000 + 400 + 10 + 7
= 2417

$\begin{array}{r} 1\,2\,5\,0 \\ +\ 1\,1\,6\,7 \\ \hline 2\,0\,0\,0 \\ 3\,0\,0 \\ 1\,1\,0 \\ +\qquad 7 \\ \hline 2\,4\,1\,7 \end{array}$

“I added the thousands, the hundreds, the tens, and then the ones.”</td>
</tr>
<tr><th colspan="3">Observations/Documentation</th></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Number

Activity 9 Assessment

Fluency with Addition and Subtraction Consolidation

Conceptual Meaning of Whole Number Addition and Subtraction (cont'd)		
Uses an understanding of place value to decompose one number to solve problems to 100 000. 14 365 − 2542 = 14 365 – 2000 – 500 – 40 − 2 = 12 365 – 500 – 40 – 2 = 11 865 – 40 − 2 = 11 823	Estimates to determine if answer to problem is reasonable. 14 365 – 2542 = 11 823 "I estimate 12 000 because 14 365 is close to 14 500, 2542 is close to 2500, and 14 500 – 2500 = 12 000. 12 000 is close to 11 823, so, my answer is reasonable."	Creates and solves multi-step addition and subtraction problems flexibly using a variety of strategies. 8134 bottles were collected by the school. 4612 were donated by the community. 1645 were not accepted at the recycling depot. How many bottles were recycled? "I added 8134 + 4612 = 12 746. Then, 12 746 – 1645 = 11 101. 11 101 bottles were recycled."
Observations/Documentation		

Activity 9 Assessment
Fluency with Addition and Subtraction Consolidation

Developing Fluency of Whole Number Addition and Subtraction		
Uses known sums and differences to fluently solve addition and subtraction problems to 1000. 435 + 578 = ? "I know 430 + 570 = 1000. Since 435 is 5 more than 430 and 578 is 8 more than 570, and 8 + 5 = 13, the answer is 1013."	Purposefully uses properties and/or relationships to solve addition and subtraction problems. 226 + 435 + 574 + 375 = ? "I can rearrange the numbers to make it easier to add." 226 + 574 + 435 + 375 = ? 226 + 574 = **800** 435 + 375 = **810** **800** + **810** = 1610	Understands the inverse relationship between addition and subtraction and uses it to solve problems. 1619 – 815 = ? "I can think addition: 815 + ? = 1619. I added on: 815 + **200** = 1015, 1015 + **600** = 1615, 1615 + **4** = 1619 The missing part is **200** + **600** + **4** = 804."
Observations/Documentation		

Number

Activity 9 Assessment
Fluency with Addition and Subtraction Consolidation

Developing Fluency of Whole Number Addition and Subtraction (cont'd)		
Uses mental math strategies and algorithms (e.g. using benchmark numbers, known facts, partial sums). $\begin{array}{r} 4689 \\ +3714 \\ \hline 7000 \\ 1300 \\ 90 \\ 13 \\ \hline 8403 \end{array}$ $\begin{array}{r} {}^{1\,1\,1} \\ 4689 \\ +3714 \\ \hline 8403 \end{array}$ "I could used partial sums or the standard algorithm."	Uses estimation to check the reasonableness of solutions. There are 648 French Immersion students. 174 more students plan to enroll in the Fall. The program can have 835 students. Is there enough space? "648 is close to 650 and 174 is close to 175. 650 + 175 = 825. 835 – 825 = 10; about 10 spaces. I overestimated because we want to make sure we have enough spaces for the students."	Flexibly creates and solves multi-operational problems and checks reasonableness of solutions. 7350 – 326 = ? 7350 – 300 = 7050 7050 – 26 = 7024 books in library. 7050 is close to 7024, so the solution is reasonable.
Observations/Documentation		

Name________________________________ Date_____________________

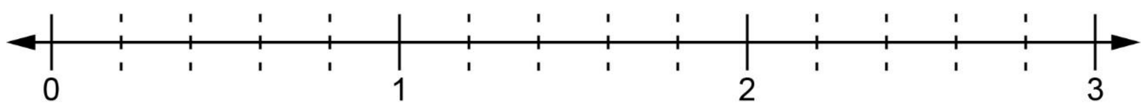
Number
Unit 3 Line Master 1a

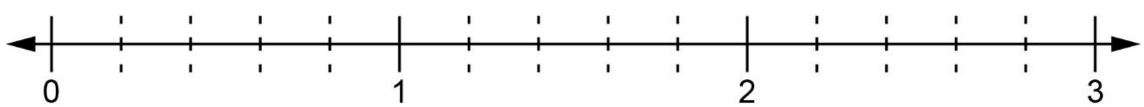
Filling Three

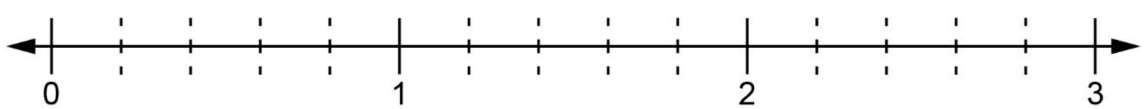
Goal: Counting by one-fifths to be the first to reach 3.

How to Play:

- **Player A:** Start at 0. Count 1, 2, or 3 one-fifths.
  Draw jumps on the line and write a fraction to label where you land.
- **Player B:** Start where Player A ended.
  Count on 1, 2, or 3 one-fifths.
- Draw the jumps and label where you land.
  If you land beyond 1, record the fraction as a mixed number.
- Continue to take turns until one player reaches 3.
- Play again.







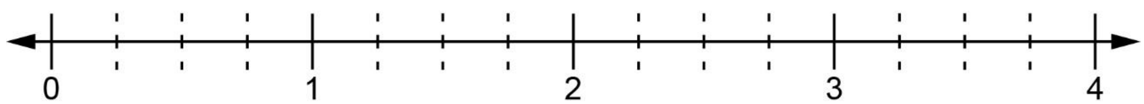
Name________________________________ Date_____________________

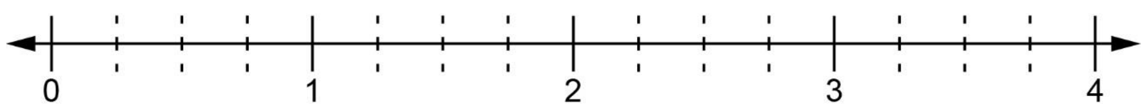
Number
Unit 3 Line Master 1b

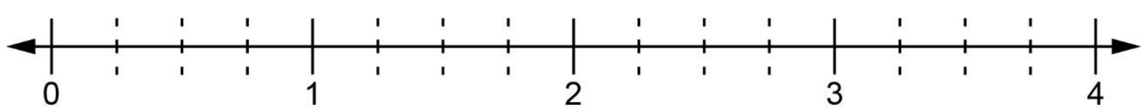
Filling Four

How to Play:

- **Player A:** Start at 0. Count 1, 2, or 3 one-fourths.
  Draw jumps on the line and write a fraction to label where you land.
- **Player B:** Start where Player A ended.
  Count on 1, 2, or 3 one-fourths. Draw the jumps and label where you land. If you land beyond 1, record the fraction as a mixed number.
- Continue to take turns until one player reaches 4.
- Play again.



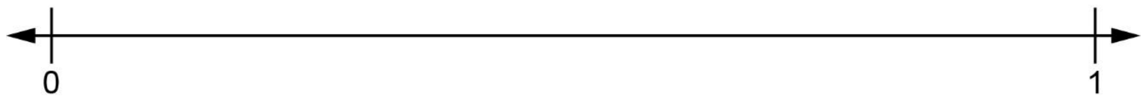


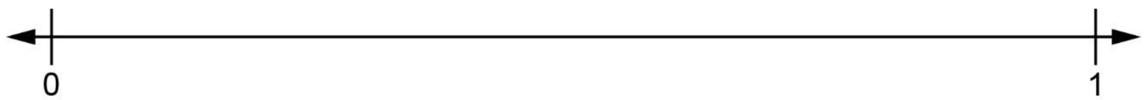


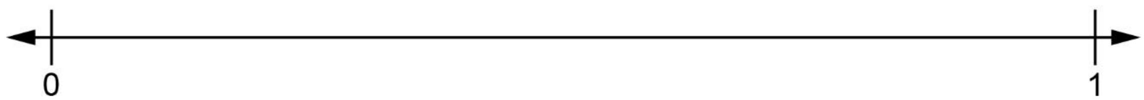
Name________________________________ Date_____________________

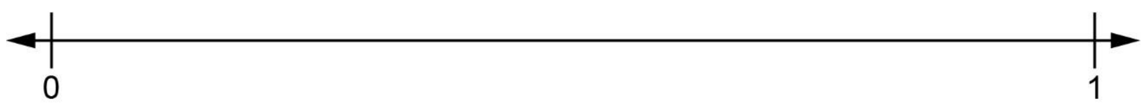
Number
Unit 3 Line Master 2a

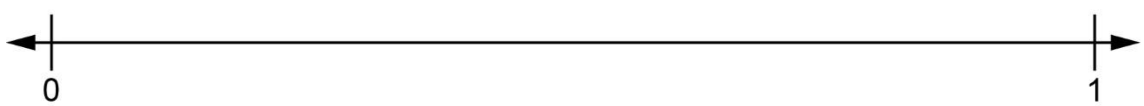
Number Lines (0 to 1)







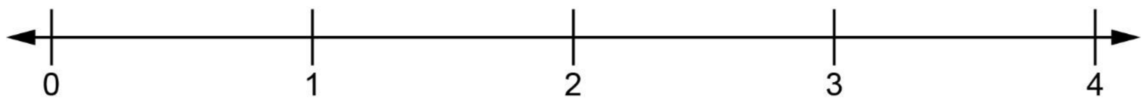


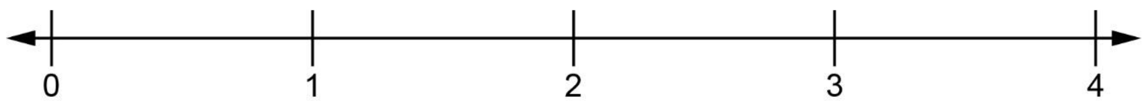


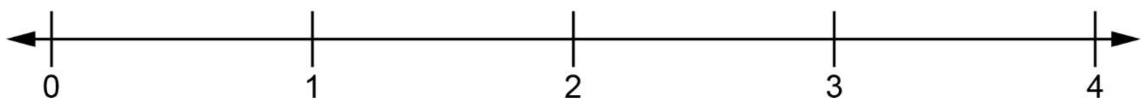
Name________________________________ Date_____________________

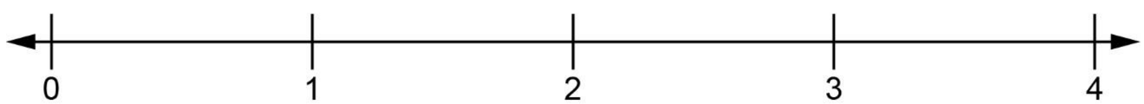
Number
Unit 3 Line Master 2b

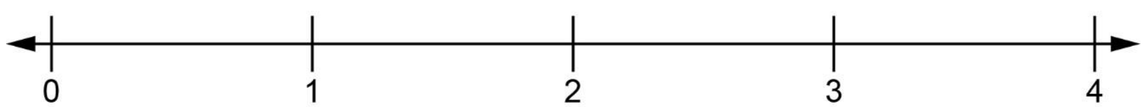
Number Lines (0 to 4)







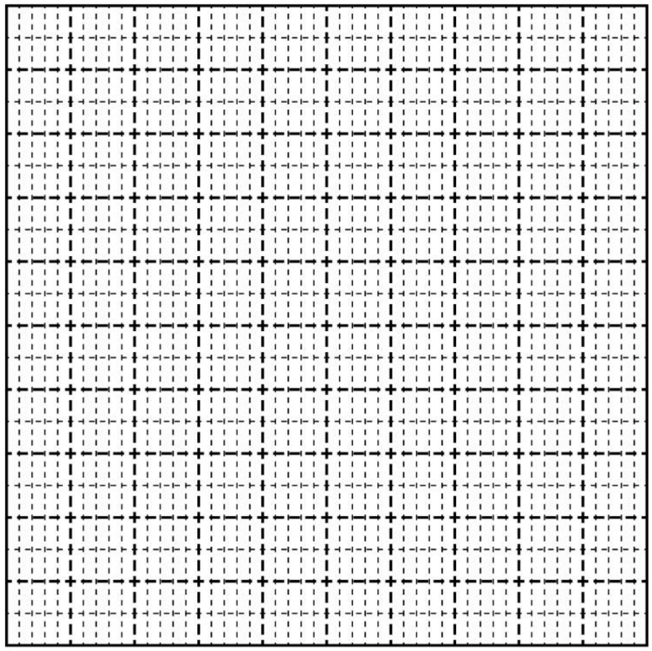


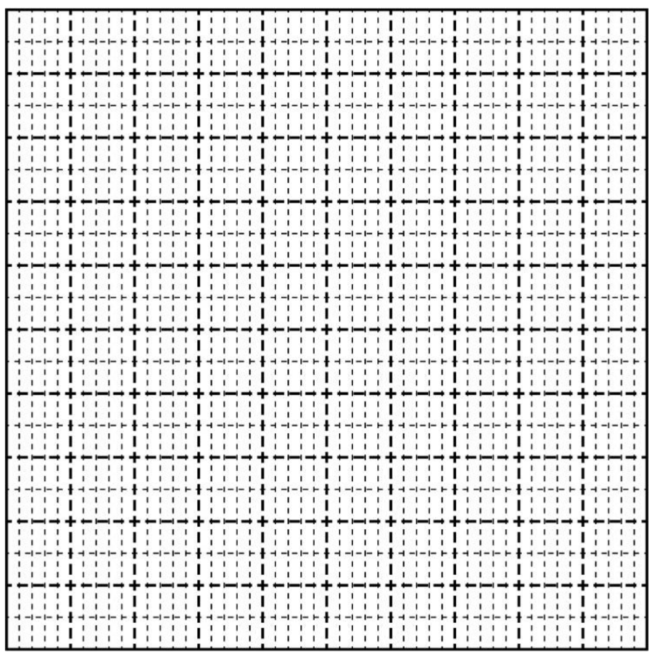


Name________________________________ Date_____________________

Number
Unit 3 Line Master 3

Thousandths Grids





Name________________________________ Date_____________________

Number
Unit 3 Line Master 4

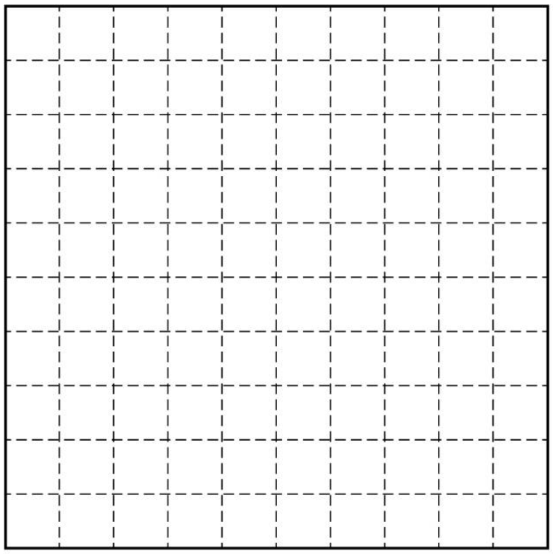
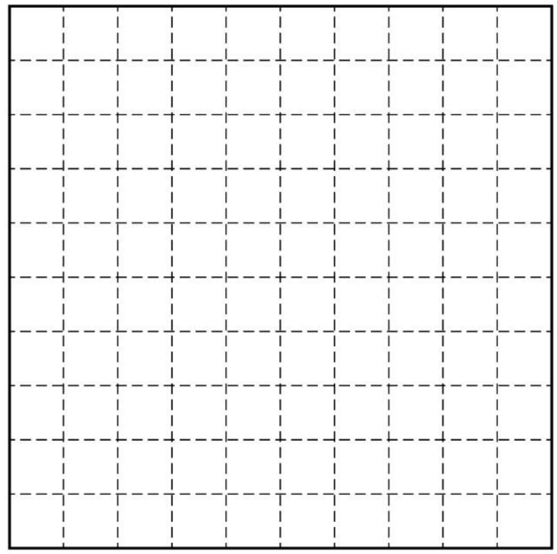
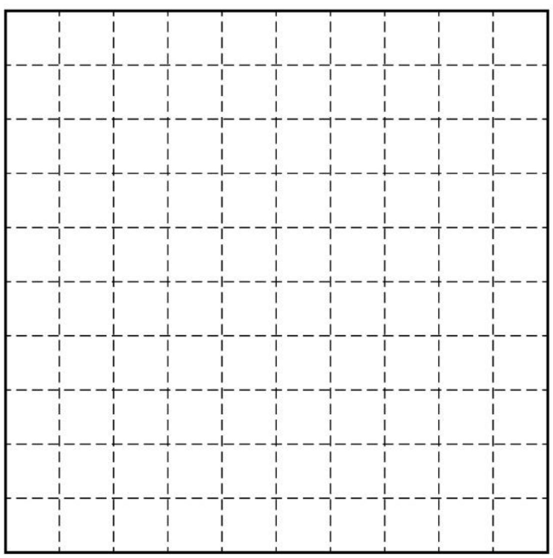
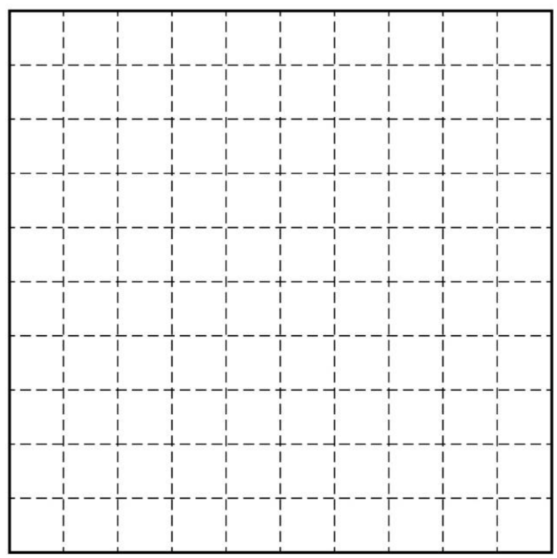
Place-Value Mat (Thousandths)

Thousandths	**My Number**
Hundredths	
Tenths	
•	
Ones	
Tens	
Hundreds	
Thousands	

Name________________________________ Date_____________________

Number
Unit 3 Line Master 5

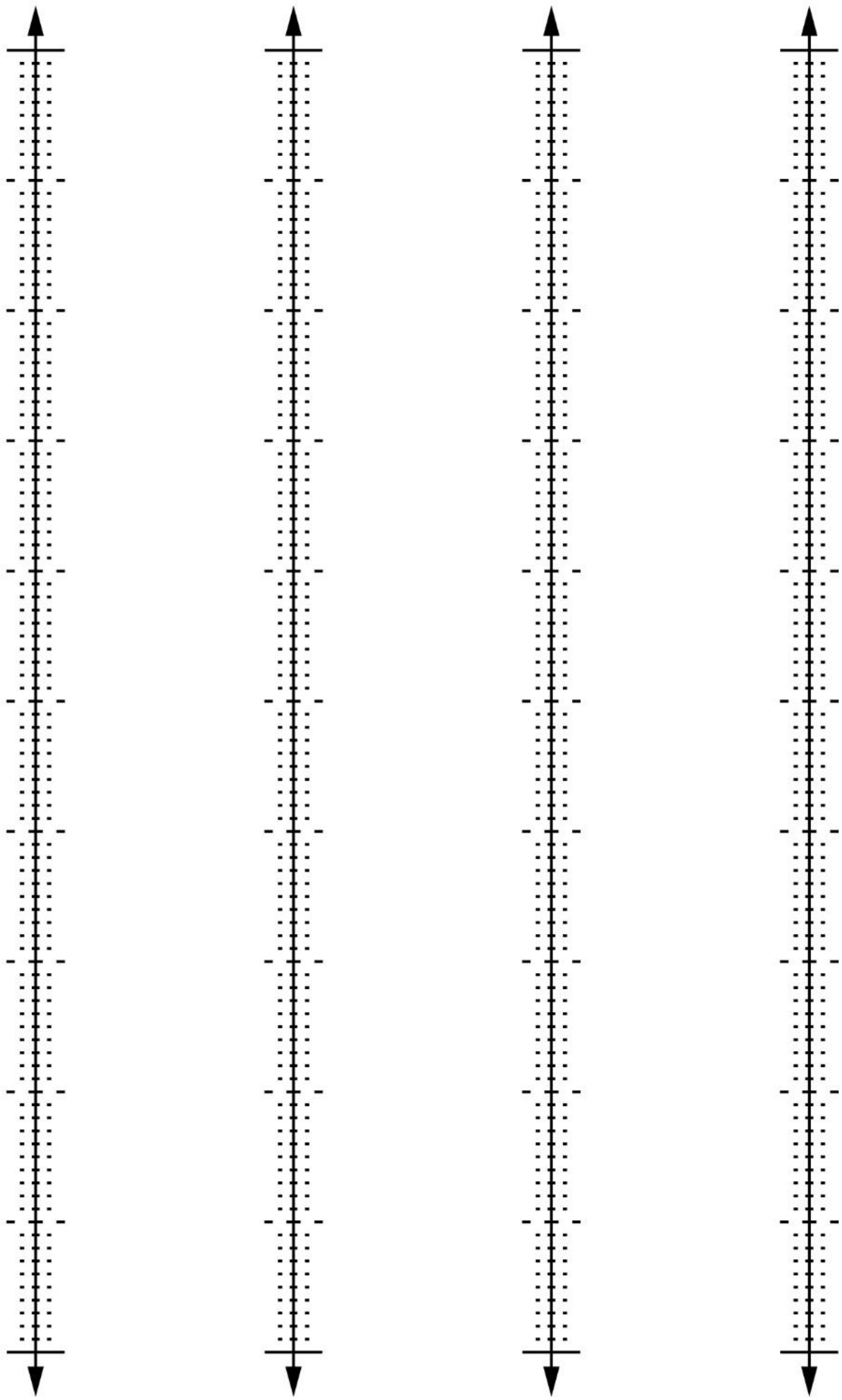
Hundredths Grids

Name________________________________ Date_____________________

Number
Unit 3 Line Master 6

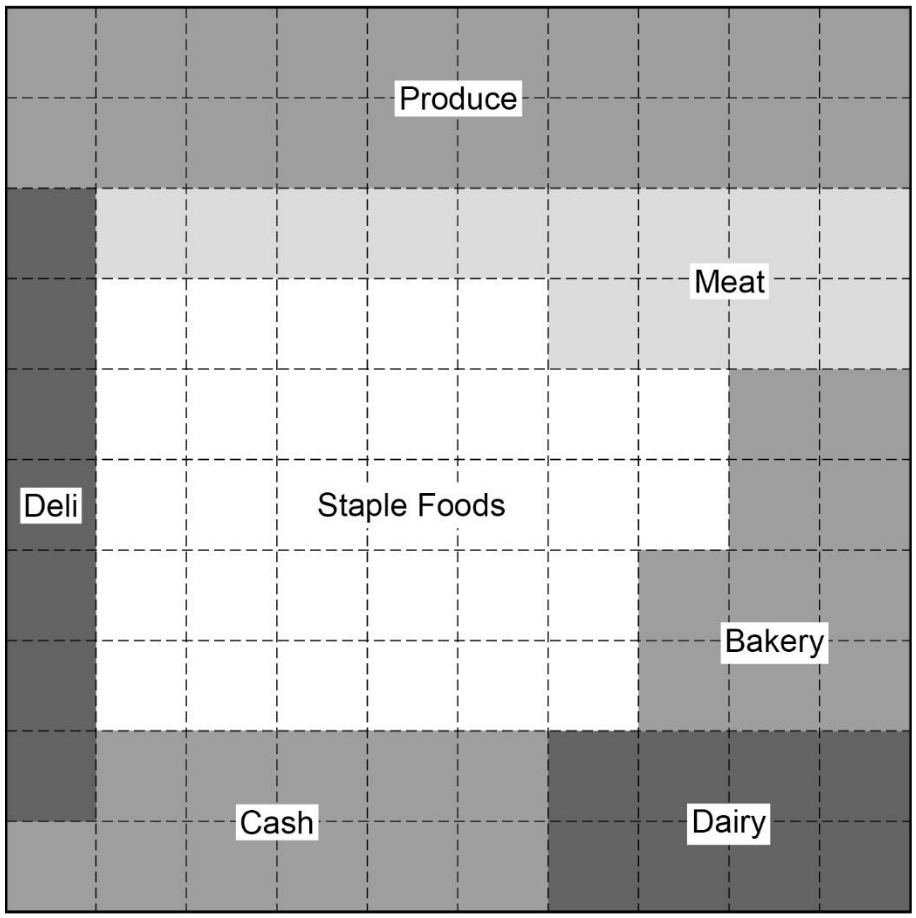
Hundredths Lines



Name________________________________ Date_____________________

Number
Unit 3 Line Master 7a

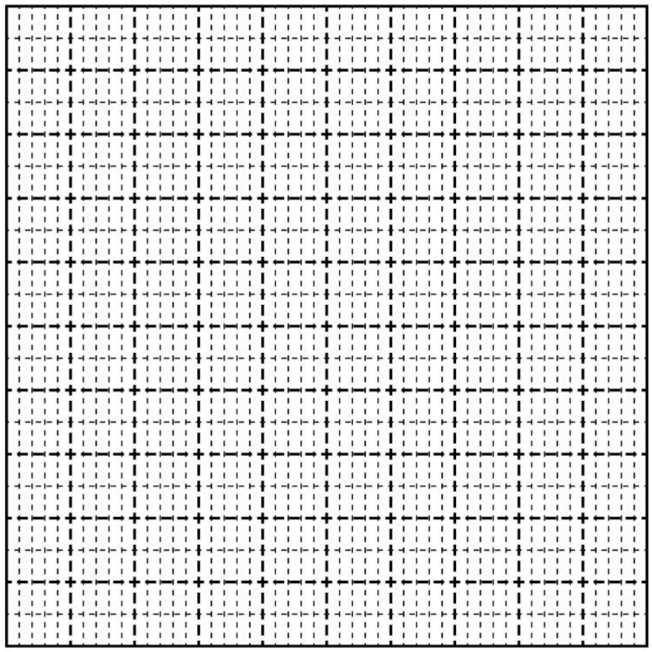
The Grocery Store

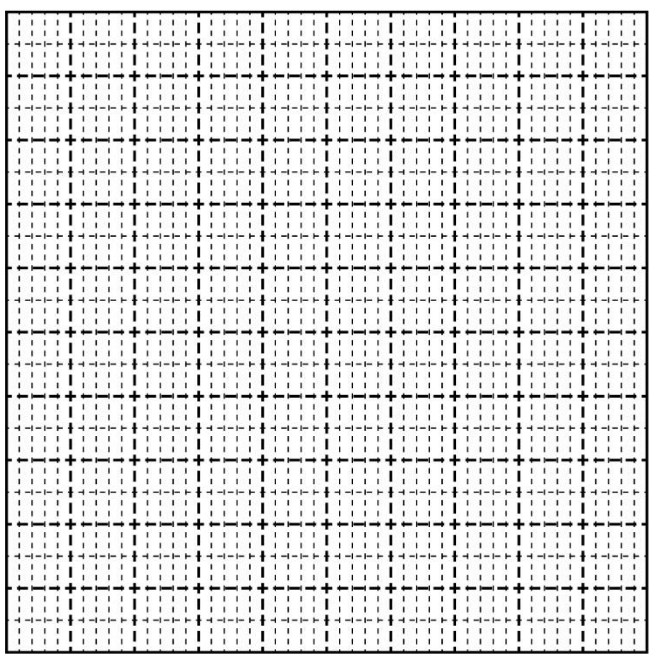


Name________________________________ Date_____________________

Number
Unit 3 Line Master 7a

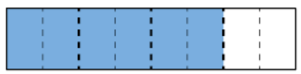
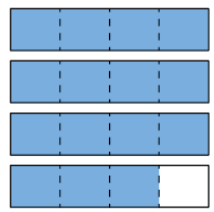
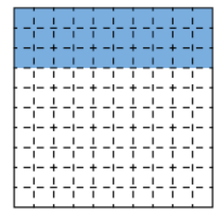
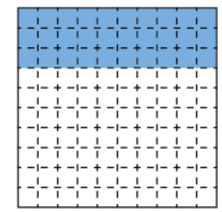
The Grocery Store (cont’d)





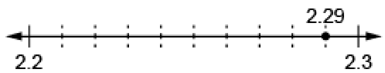
Number

Activity 10 Assessment
Equivalent Fractions

Exploring Fractions, Decimals, and Percents			
Recognizes that equivalent fractions name the same quantity  “If I partition each fourth into 2 equal parts, I see $\frac{3}{4} = \frac{6}{8}$.”	Uses counting to determine improper fractions and mixed numbers  “I counted 15 one-fourths. Each four-fourths is one whole, so $\frac{15}{4} = 3\frac{3}{4}$.”	Represents decimal numbers as fractions  “0.3 is read three-tenths, so I shade 3 of the 10 rows on a hundredths grid and write $\frac{3}{10}$.”	Recognizes and writes equivalent decimals  “This model shows three-tenths which is the same as thirty-hundredths.”
Observations/Documentation			

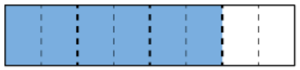
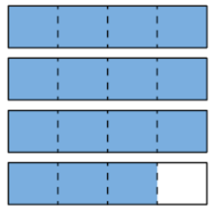
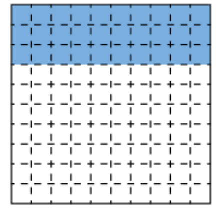
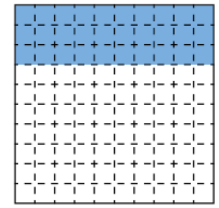
Number

Activity 10 Assessment
Equivalent Fractions

Exploring Fractions, Decimals, and Percents (cont'd)			
Rounds decimals to a specified place value (e.g., nearest tenth)  "2.29 is closer to 2.3 than to 2.2, so I round up to 2.3."	Compares and orders fractions and decimals using a variety of strategies "$\frac{5}{8}$, $\frac{8}{9}$, $\frac{2}{6}$: $\frac{5}{8}$ is a little more than $\frac{1}{2}$; $\frac{8}{9}$ is close to 1, but a little less; $\frac{2}{6}$ is close to $\frac{1}{2}$, but a little less. From least to greatest: $\frac{2}{6}$, $\frac{5}{8}$, $\frac{8}{9}$."	Understands connection between fractions and decimals (and percents for denominators of 100) "I know that all decimals represent fractions with a denominator of 10, 100, 1000, and they are read the same way."	Flexibly connects quantities across number systems "I know that $\frac{2}{5}$ is the same as four-tenths, which is the same as 0.4, 0.40, and 40%."
Observations/Documentation			

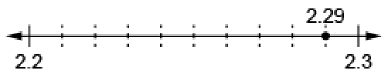
Number

Activity 11 Assessment
Exploring Improper Fractions and Mixed Numbers

Exploring Fractions, Decimals, and Percents			
Recognizes that equivalent fractions name the same quantity  “If I partition each fourth into 2 equal parts, I see $\frac{3}{4} = \frac{6}{8}$.”	Uses counting to determine improper fractions and mixed numbers  “I counted 15 one-fourths. Each four-fourths is one whole, so $\frac{15}{4} = 3\frac{3}{4}$.”	Represents decimal numbers as fractions  “0.3 is read three-tenths, so I shade 3 of the 10 rows on a hundredths grid and write $\frac{3}{10}$.”	Recognizes and writes equivalent decimals  “This model shows three-tenths which is the same as thirty-hundredths.”
Observations/Documentation			

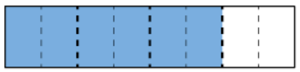
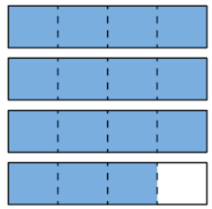
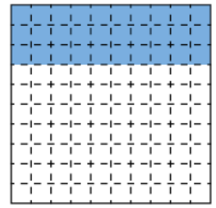
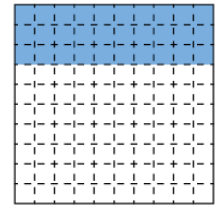
Number

Activity 11 Assessment
Exploring Improper Fractions and Mixed Numbers

Exploring Fractions, Decimals, and Percents (cont’d)			
Rounds decimals to a specified place value (e.g., nearest tenth)  “2.29 is closer to 2.3 than to 2.2, so I round up to 2.3.”	Compares and orders fractions and decimals using a variety of strategies “$\frac{5}{8}$, $\frac{8}{9}$, $\frac{2}{6}$: $\frac{5}{8}$ is a little more than $\frac{1}{2}$; $\frac{8}{9}$ is close to 1, but a little less; $\frac{2}{6}$ is close to $\frac{1}{2}$, but a little less. From least to greatest: $\frac{2}{6}$, $\frac{5}{8}$, $\frac{8}{9}$.”	Understands connection between fractions and decimals (and percents for denominators of 100) “I know that all decimals represent fractions with a denominator of 10, 100, 1000, and they are read the same way.”	Flexibly connects quantities across number systems “I know that $\frac{2}{5}$ is the same as four-tenths, which is the same as 0.4, 0.40, and 40%.”
Observations/Documentation			

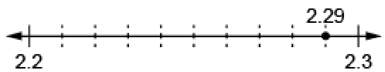
Number

Activity 12 Assessment
Comparing and Ordering Fractions

Exploring Fractions, Decimals, and Percents			
Recognizes that equivalent fractions name the same quantity	Uses counting to determine improper fractions and mixed numbers	Represents decimal numbers as fractions	Recognizes and writes equivalent decimals
			
“If I partition each fourth into 2 equal parts, I see $\frac{3}{4} = \frac{6}{8}$.”	“I counted 15 one-fourths. Each four-fourths is one whole, so $\frac{15}{4} = 3\frac{3}{4}$.”	“0.3 is read three-tenths, so I shade 3 of the 10 rows on a hundredths grid and write $\frac{3}{10}$.”	“This model shows three-tenths which is the same as thirty-hundredths.”
Observations/Documentation			

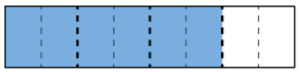
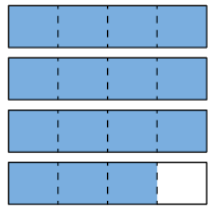
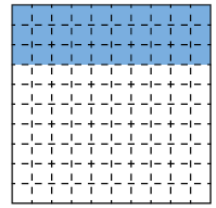
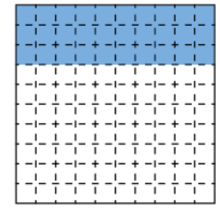
Number

Activity 12 Assessment
Comparing and Ordering Fractions

Exploring Fractions, Decimals, and Percents (cont’d)			
Rounds decimals to a specified place value (e.g., nearest tenth)  “2.29 is closer to 2.3 than to 2.2, so I round up to 2.3.”	Compares and orders fractions and decimals using a variety of strategies “$\frac{5}{8}$, $\frac{8}{9}$, $\frac{2}{6}$: $\frac{5}{8}$ is a little more than $\frac{1}{2}$; $\frac{8}{9}$ is close to 1, but a little less; $\frac{2}{6}$ is close to $\frac{1}{2}$, but a little less. From least to greatest: $\frac{2}{6}$, $\frac{5}{8}$, $\frac{8}{9}$.”	Understands connection between fractions and decimals (and percents for denominators of 100) “I know that all decimals represent fractions with a denominator of 10, 100, 1000, and they are read the same way.”	Flexibly connects quantities across number systems “I know that $\frac{2}{5}$ is the same as four-tenths, which is the same as 0.4, 0.40, and 40%.”
Observations/Documentation			

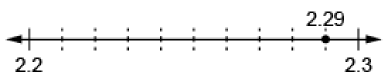
Number

Activity 13 Assessment
Representing Decimals

Exploring Fractions, Decimals, and Percents			
Recognizes that equivalent fractions name the same quantity  “If I partition each fourth into 2 equal parts, I see $\frac{3}{4} = \frac{6}{8}$.”	Uses counting to determine improper fractions and mixed numbers  “I counted 15 one-fourths. Each four-fourths is one whole, so $\frac{15}{4} = 3\frac{3}{4}$.”	Represents decimal numbers as fractions  “0.3 is read three-tenths, so I shade 3 of the 10 rows on a hundredths grid and write $\frac{3}{10}$.”	Recognizes and writes equivalent decimals  “This model shows three-tenths which is the same as thirty-hundredths.”
Observations/Documentation			

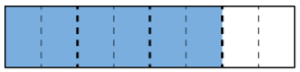
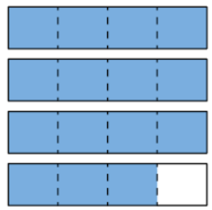
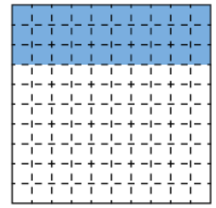
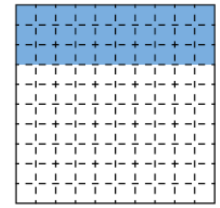
Number

Activity 13 Assessment
Representing Decimals

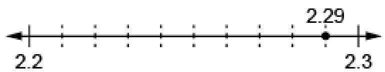
Exploring Fractions, Decimals, and Percents (cont’d)			
Rounds decimals to a specified place value (e.g., nearest tenth)  “2.29 is closer to 2.3 than to 2.2, so I round up to 2.3.”	Compares and orders fractions and decimals using a variety of strategies “$\frac{5}{8}$, $\frac{8}{9}$, $\frac{2}{6}$: $\frac{5}{8}$ is a little more than $\frac{1}{2}$; $\frac{8}{9}$ is close to 1, but a little less; $\frac{2}{6}$ is close to $\frac{1}{2}$, but a little less. From least to greatest: $\frac{2}{6}$, $\frac{5}{8}$, $\frac{8}{9}$.”	Understands connection between fractions and decimals (and percents for denominators of 100) “I know that all decimals represent fractions with a denominator of 10, 100, 1000, and they are read the same way.”	Flexibly connects quantities across number systems “I know that $\frac{2}{5}$ is the same as four-tenths, which is the same as 0.4, 0.40, and 40%.”
Observations/Documentation			

Number

Activity 14 Assessment
Rounding Decimals

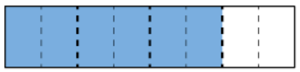
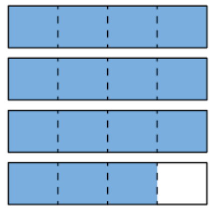
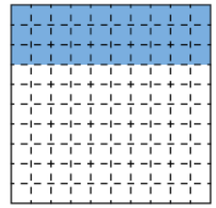
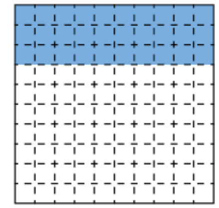
Exploring Fractions, Decimals, and Percents			
Recognizes that equivalent fractions name the same quantity  “If I partition each fourth into 2 equal parts, I see $\frac{3}{4} = \frac{6}{8}$.”	Uses counting to determine improper fractions and mixed numbers  “I counted 15 one-fourths. Each four-fourths is one whole, so $\frac{15}{4} = 3\frac{3}{4}$.”	Represents decimal numbers as fractions  “0.3 is read three-tenths, so I shade 3 of the 10 rows on a hundredths grid and write $\frac{3}{10}$.”	Recognizes and writes equivalent decimals  “This model shows three-tenths which is the same as thirty-hundredths.”
Observations/Documentation			

Activity 14 Assessment
Rounding Decimals

Exploring Fractions, Decimals, and Percents (cont'd)			
Rounds decimals to a specified place value (e.g., nearest tenth)  “2.29 is closer to 2.3 than to 2.2, so I round up to 2.3.”	Compares and orders fractions and decimals using a variety of strategies “$\frac{5}{8}$, $\frac{8}{9}$, $\frac{2}{6}$: $\frac{5}{8}$ is a little more than $\frac{1}{2}$; $\frac{8}{9}$ is close to 1, but a little less; $\frac{2}{6}$ is close to $\frac{1}{2}$, but a little less. From least to greatest: $\frac{2}{6}$, $\frac{5}{8}$, $\frac{8}{9}$.”	Understands connection between fractions and decimals (and percents for denominators of 100) “I know that all decimals represent fractions with a denominator of 10, 100, 1000, and they are read the same way.”	Flexibly connects quantities across number systems “I know that $\frac{2}{5}$ is the same as four-tenths, which is the same as 0.4, 0.40, and 40%.”
Observations/Documentation			

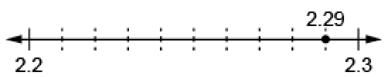
Number

Activity 15 Assessment
Comparing and Ordering Decimals

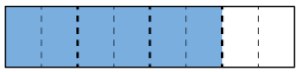
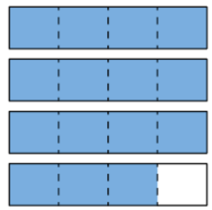
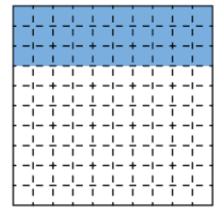
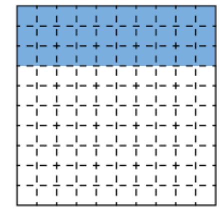
Exploring Fractions, Decimals, and Percents			
Recognizes that equivalent fractions name the same quantity	Uses counting to determine improper fractions and mixed numbers	Represents decimal numbers as fractions	Recognizes and writes equivalent decimals
 “If I partition each fourth into 2 equal parts, I see $\frac{3}{4} = \frac{6}{8}$.”	 “I counted 15 one-fourths. Each four-fourths is one whole, so $\frac{15}{4} = 3\frac{3}{4}$.”	 “0.3 is read three-tenths, so I shade 3 of the 10 rows on a hundredths grid and write $\frac{3}{10}$.”	 “This model shows three-tenths which is the same as thirty-hundredths.”
Observations/Documentation			

Number

Activity 15 Assessment
Comparing and Ordering Decimals

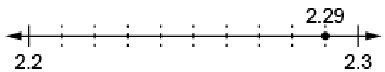
Exploring Fractions, Decimals, and Percents (cont'd)			
Rounds decimals to a specified place value (e.g., nearest tenth)  "2.29 is closer to 2.3 than to 2.2, so I round up to 2.3."	Compares and orders fractions and decimals using a variety of strategies "$\frac{5}{8}, \frac{8}{9}, \frac{2}{6}$: $\frac{5}{8}$ is a little more than $\frac{1}{2}$; $\frac{8}{9}$ is close to 1, but a little less; $\frac{2}{6}$ is close to $\frac{1}{2}$, but a little less. From least to greatest: $\frac{2}{6}, \frac{5}{8}, \frac{8}{9}$."	Understands connection between fractions and decimals (and percents for denominators of 100) "I know that all decimals represent fractions with a denominator of 10, 100, 1000, and they are read the same way."	Flexibly connects quantities across number systems "I know that $\frac{2}{5}$ is the same as four-tenths, which is the same as 0.4, 0.40, and 40%."
Observations/Documentation			

Activity 16 Assessment
Relating Fractions and Decimals

Exploring Fractions, Decimals, and Percents			
Recognizes that equivalent fractions name the same quantity  "If I partition each fourth into 2 equal parts, I see $\frac{3}{4} = \frac{6}{8}$."	Uses counting to determine improper fractions and mixed numbers  "I counted 15 one-fourths. Each four-fourths is one whole, so $\frac{15}{4} = 3\frac{3}{4}$."	Represents decimal numbers as fractions  "0.3 is read three-tenths, so I shade 3 of the 10 rows on a hundredths grid and write $\frac{3}{10}$."	Recognizes and writes equivalent decimals  "This model shows three-tenths which is the same as thirty-hundredths."
Observations/Documentation			

Activity 16 Assessment

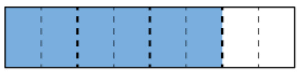
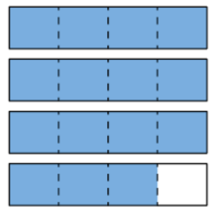
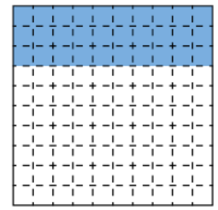
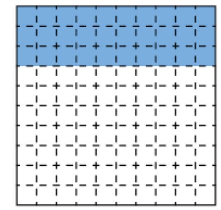
Relating Fractions and Decimals

Exploring Fractions, Decimals, and Percents (cont'd)			
Rounds decimals to a specified place value (e.g., nearest tenth)  "2.29 is closer to 2.3 than to 2.2, so I round up to 2.3."	Compares and orders fractions and decimals using a variety of strategies "$\frac{5}{8}$, $\frac{8}{9}$, $\frac{2}{6}$: $\frac{5}{8}$ is a little more than $\frac{1}{2}$; $\frac{8}{9}$ is close to 1, but a little less; $\frac{2}{6}$ is close to $\frac{1}{2}$, but a little less. From least to greatest: $\frac{2}{6}$, $\frac{5}{8}$, $\frac{8}{9}$."	Understands connection between fractions and decimals (and percents for denominators of 100) "I know that all decimals represent fractions with a denominator of 10, 100, 1000, and they are read the same way."	Flexibly connects quantities across number systems "I know that $\frac{2}{5}$ is the same as four-tenths, which is the same as 0.4, 0.40, and 40%."
Observations/Documentation			

Number

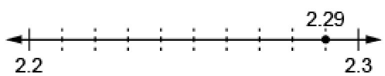
Activity 17 Assessment

Relating Fractions, Decimals, and Percents

Exploring Fractions, Decimals, and Percents			
Recognizes that equivalent fractions name the same quantity  “If I partition each fourth into 2 equal parts, I see $\frac{3}{4} = \frac{6}{8}$.”	Uses counting to determine improper fractions and mixed numbers  “I counted 15 one-fourths. Each four-fourths is one whole, so $\frac{15}{4} = 3\frac{3}{4}$.”	Represents decimal numbers as fractions  “0.3 is read three-tenths, so I shade 3 of the 10 rows on a hundredths grid and write $\frac{3}{10}$.”	Recognizes and writes equivalent decimals  “This model shows three-tenths which is the same as thirty-hundredths.”
Observations/Documentation			

Number

Activity 17 Assessment
Relating Fractions, Decimals, and Percents

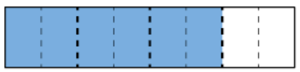
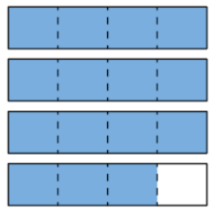
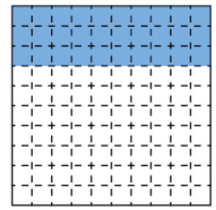
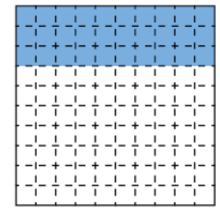
Exploring Fractions, Decimals, and Percents (cont’d)			
Rounds decimals to a specified place value (e.g., nearest tenth)  “2.29 is closer to 2.3 than to 2.2, so I round up to 2.3.”	Compares and orders fractions and decimals using a variety of strategies “$\frac{5}{8}, \frac{8}{9}, \frac{2}{6}$: $\frac{5}{8}$ is a little more than $\frac{1}{2}$; $\frac{8}{9}$ is close to 1, but a little less; $\frac{2}{6}$ is close to $\frac{1}{2}$, but a little less. From least to greatest: $\frac{2}{6}, \frac{5}{8}, \frac{8}{9}$.”	Understands connection between fractions and decimals (and percents for denominators of 100) “I know that all decimals represent fractions with a denominator of 10, 100, 1000, and they are read the same way.”	Flexibly connects quantities across number systems “I know that $\frac{2}{5}$ is the same as four-tenths, which is the same as 0.4, 0.40, and 40%.”
Observations/Documentation			

Number

Activity 18 Assessment

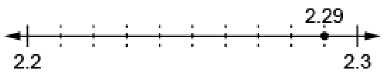
Fractions and Decimals Consolidation

Exploring Fractions, Decimals, and Percents

Recognizes that equivalent fractions name the same quantity	Uses counting to determine improper fractions and mixed numbers	Represents decimal numbers as fractions	Recognizes and writes equivalent decimals
 "If I partition each fourth into 2 equal parts, I see $\frac{3}{4} = \frac{6}{8}$."	 "I counted 15 one-fourths. Each four-fourths is one whole, so $\frac{15}{4} = 3\frac{3}{4}$."	 "0.3 is read three-tenths, so I shade 3 of the 10 rows on a hundredths grid and write $\frac{3}{10}$."	 "This model shows three-tenths which is the same as thirty-hundredths."

Observations/Documentation

Activity 18 Assessment
Fractions and Decimals Consolidation

Exploring Fractions, Decimals, and Percents			
Rounds decimals to a specified place value (e.g., nearest tenth)  “2.29 is closer to 2.3 than to 2.2, so I round up to 2.3.”	Compares and orders fractions and decimals using a variety of strategies “$\frac{5}{8}$, $\frac{8}{9}$, $\frac{2}{6}$: $\frac{5}{8}$ is a little more than $\frac{1}{2}$; $\frac{8}{9}$ is close to 1, but a little less; $\frac{2}{6}$ is close to $\frac{1}{2}$, but a little less. From least to greatest: $\frac{2}{6}$, $\frac{5}{8}$, $\frac{8}{9}$.”	Understands connection between fractions and decimals (and percents for denominators of 100) “I know that all decimals represent fractions with a denominator of 10, 100, 1000, and they are read the same way.”	Flexibly connects quantities across number systems “I know that $\frac{2}{5}$ is the same as four-tenths, which is the same as 0.4, 0.40, and 40%.”
Observations/Documentation			

Name________________________________ Date_____________________

Number
Unit 4 Line Master 1a

Four in a Row

56	8	60	12	49	5	28	7	45	20
40	32	6	18	36	10	30	15	72	12
9	42	14	5	70	21	35	8	24	40
12	90	24	20	10	50	6	48	16	80
64	40	2	30	12	20	27	3	54	8
10	4	50	15	70	25	63	6	36	18
45	7	21	54	1	80	14	30	4	48
16	36	8	35	72	9	2	24	32	9
18	63	3	27	30	90	20	40	56	10
60	24	28	6	100	16	81	4	42	4

Name________________________________ Date_____________________

Number
Unit 4 Line Master 1b

Three in a Row

49	**2**	**7**	**4**	**30**	**6**	**24**
24	**6**	**5**	**20**	**14**	**18**	**30**
9	**25**	**3**	**6**	**21**	**7**	**3**
2	**8**	**42**	**1**	**28**	**4**	**10**
18	**15**	**12**	**36**	**10**	**35**	**12**
12	**4**	**35**	**14**	**6**	**5**	**20**
8	**16**	**21**	**15**	**28**	**12**	**42**

Name_______________________________ Date____________________

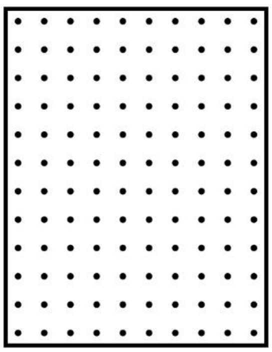
Number
Unit 4 Line Master 2

Who is Correct?

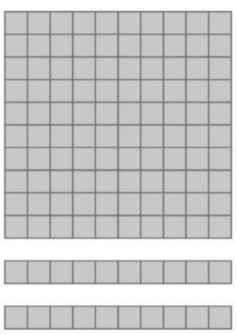
An egg farmer took 10 cartons of eggs to the market.
Each carton had 12 eggs.
How many eggs did the farmer take?

To solve the problem:

- Ronica outlined an array on dot paper.



- Patrick made an array using Base Ten Blocks.



Whose solution is correct? Explain.
How are the solution strategies the same?
How are they different?

Name________________________________ Date_____________________

Number
Unit 4 Line Master 3a

How Much Do They Eat?

Part A

For each problem, determine how much food each animal gets.
Show your work.
Record your solution on grid paper or dot paper.

Problem 1

There are 6 grizzly bears at a wildlife park.
Each day, they receive a 120-kg bag of food.
The food is shared equally among them.

Name________________________________ Date_____________________

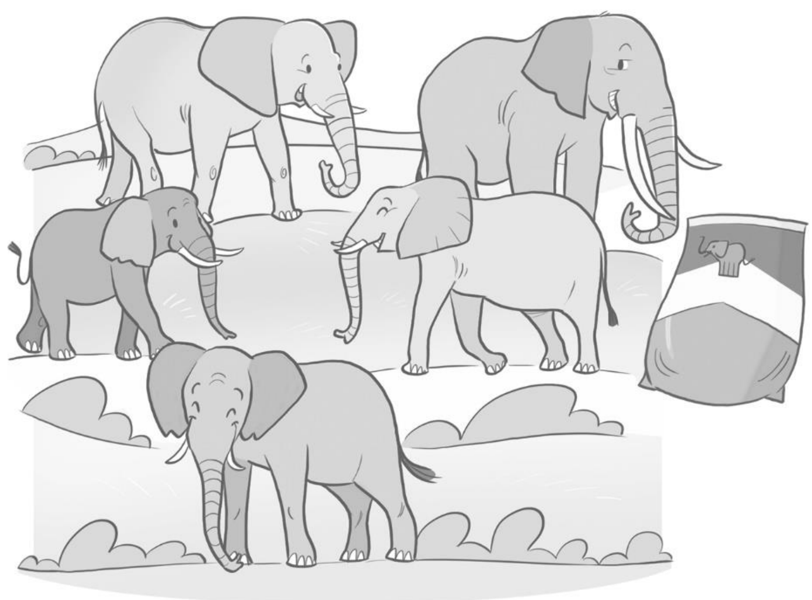
Number
Unit 4 Line Master 3b

How Much Do They Eat? (cont'd)

Part A

Problem 2

There are 5 elephants at a safari park.
Each day, they receive a 150-kg bag of food.
The food is shared equally among them.



Name________________________________ Date_____________________

Number
Unit 4 Line Master 4a

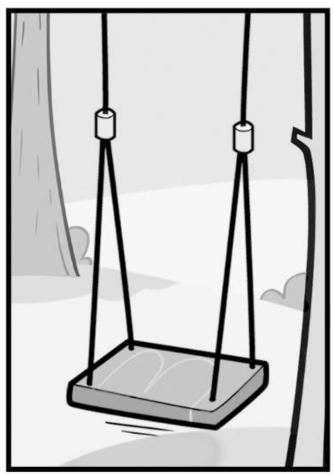
How Much Do It Cost?

Part B

Solve each story problem. Show your strategy.

Problem 3

A school raised money to buy swings for some local playgrounds.



Plastic Swing

★★★★★ 20 reviews

$?

Free Shipping

− 25 +

Total Cost: $500

What is the cost of 1 swing?

Name________________________________ Date_____________________

Number
Unit 4 Line Master 4b

How Much Do It Cost? (cont'd)

Part B

Problem 4

A school raised money to buy some soccer balls.

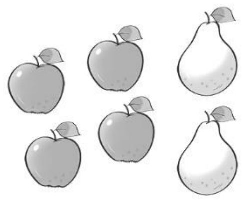
What is the cost of 1 soccer ball?

Name________________________________ Date_____________________

Number
Unit 4 Line Master 5

How Many Pears?

Jonah is making a large fruit salad for the class.
The recipe uses apples and pears in this ratio:

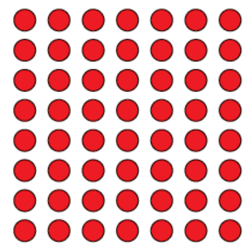


Jonah uses 12 apples.
How many pears does Jonah need?

Number of apples	4					
Number of pears	2					

Number

Activity 19 Assessment
Relating Multiplication and Division Facts

Fluency with Multiplication and Division Facts		
Recalls multiplication and division facts to demonstrate and fluently recall facts to 100. 8 × 7 = 56 “I know my facts up to 10 × 10.”	Uses inverse operation to find multiplication and division facts. 56 ÷ 8 = ? 8 × ? = 56  “I can use multiplication to solve division problems.”	Applies estimation strategies to multiply and divide larger numbers. Gardeners planted 236 plants in rows of 5. Estimate how many rows were planted. 236 ÷ 5 = ? “I know 100 ÷ 5 = 20, so 200 ÷ 5 = 40. Because 236 is close to 200, I estimate about 40 rows.”
Observations/Documentation		

Activity 19 Assessment

Relating Multiplication and Division Facts

Fluency with Multiplication and Division Facts (cont'd)

Uses mental math strategies and properties of operations to multiply and divide larger numbers.

5 × 47 = ?

"I can decompose the numbers to make it easier to multiply:
5 × 40 = 200, 5 × 7 = 35,
and 200 + 35 = 235."

Applies properties of operations and partial products and connects to algorithms.

16 × 12 = ?

	10	6
10	10 × 10	6 × 10
2	10 × 2	6 × 2

16 × 12 = (10 × 10) + (10 × 2) + (6 × 10) + (6 × 2)
= 100 + 20 + 60 + 12
= 192

Flexibly and fluently selects strategies and properties of operations to solve problems involving larger numbers.

375 students are going on a field trip. Each bus holds 25 students. How many buses are needed?

$$\begin{array}{r|l} 25\overline{)375} & \\ \underline{250} & 10 \\ 125 & \\ \underline{125} & \underline{5} \\ 0 & 15 \end{array}$$

"I subtracted multiples of 25, then added."

Observations/Documentation

Number

Activity 20 Assessment

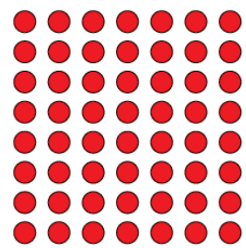
Using Estimation for Multiplication and Division

<table>
<tr><th colspan="3">Fluency with Multiplication and Division Facts</th></tr>
<tr>
<td>Recalls multiplication and division facts to demonstrate and fluently recall facts to 100.

$8 \times 7 = 56$

“I know my facts up to 10 × 10.”</td>
<td>Uses inverse operation to find multiplication and division facts.

$56 \div 8 = ?$
$8 \times ? = 56$



“I can use multiplication to solve division problems.”</td>
<td>Applies estimation strategies to multiply and divide larger numbers.

Gardeners planted 236 plants in rows of 5. Estimate how many rows were planted.

$236 \div 5 = ?$

“I know 100 ÷ 5 = 20, so 200 ÷ 5 = 40. Because 236 is close to 200, I estimate about 40 rows.”</td>
</tr>
<tr><th colspan="3">Observations/Documentation</th></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Activity 20 Assessment
Using Estimation for Multiplication and Division

Fluency with Multiplication and Division Facts (cont'd)

Uses mental math strategies and properties of operations to multiply and divide larger numbers.

5 × 47 = ?

"I can decompose the numbers to make it easier to multiply:
5 × 40 = 200, 5 × 7 = 35,
and 200 + 35 = 235."

Applies properties of operations and partial products and connects to algorithms.

16 × 12 = ?

	10	6
10	10 × 10	6 × 10
2	10 × 2	6 × 2

16 × 12 = (10 × 10) + (10 × 2) + (6 × 10) + (6 × 2)
= 100 + 20 + 60 + 12
= 192

Flexibly and fluently selects strategies and properties of operations to solve problems involving larger numbers.

375 students are going on a field trip. Each bus holds 25 students. How many buses are needed?

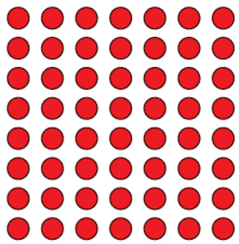
$$\begin{array}{r|l} 25\overline{)375} & \\ \underline{250} & 10 \\ 125 & \\ \underline{125} & \underline{\ 5} \\ 0 & 15 \end{array}$$

"I subtracted multiples of 25, then added."

Observations/Documentation

Activity 21 Assessment

Strategies for Multiplying Larger Numbers

Fluency with Multiplication and Division Facts		
Recalls multiplication and division facts to demonstrate and fluently recall facts to 100. $8 \times 7 = 56$ "I know my facts up to 10 × 10."	Uses inverse operation to find multiplication and division facts. $56 \div 8 = ?$ $8 \times ? = 56$  "I can use multiplication to solve division problems."	Applies estimation strategies to multiply and divide larger numbers. Gardeners planted 236 plants in rows of 5. Estimate how many rows were planted. $236 \div 5 = ?$ "I know 100 ÷ 5 = 20, so 200 ÷ 5 = 40. Because 236 is close to 200, I estimate about 40 rows."
Observations/Documentation		

Activity 21 Assessment

Strategies for Multiplying Larger Numbers

Fluency with Multiplication and Division Facts (cont'd)

Uses mental math strategies and properties of operations to multiply and divide larger numbers.

$5 \times 47 = ?$

"I can decompose the numbers to make it easier to multiply:
$5 \times 40 = 200$, $5 \times 7 = 35$,
and $200 + 35 = 235$."

Applies properties of operations and partial products and connects to algorithms.

$16 \times 12 = ?$

	10	6
10	10 × 10	6 × 10
2	10 × 2	6 × 2

$$\begin{aligned} 16 \times 12 &= (10 \times 10) + (10 \times 2) + (6 \times 10) + (6 \times 2) \\ &= 100 + 20 + 60 + 12 \\ &= 192 \end{aligned}$$

Flexibly and fluently selects strategies and properties of operations to solve problems involving larger numbers.

375 students are going on a field trip. Each bus holds 25 students. How many buses are needed?

$$\begin{array}{r|l} 25\overline{)375} & \\ \underline{250} & 10 \\ 125 & \\ \underline{125} & \underline{\ \ 5} \\ 0 & 15 \end{array}$$

"I subtracted multiples of 25, then added."

Observations/Documentation

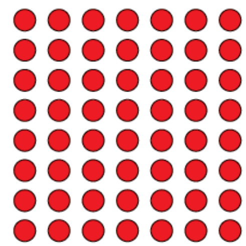
Activity 22 Assessment
Multiplying Whole Numbers

<table>
<tr><th colspan="3">Fluency with Multiplication and Division Facts</th></tr>
<tr>
<td>Recalls multiplication and division facts to demonstrate and fluently recall facts to 100.

8 × 7 = 56

“I know my facts up to 10 × 10.”</td>
<td>Uses inverse operation to find multiplication and division facts.

56 ÷ 8 = ?
8 × ? = 56



“I can use multiplication
to solve division problems.”</td>
<td>Applies estimation strategies to multiply and divide larger numbers.

Gardeners planted 236 plants in rows of 5.
Estimate how many rows were planted.

236 ÷ 5 = ?

“I know 100 ÷ 5 = 20, so 200 ÷ 5 = 40.
Because 236 is close to 200,
I estimate about 40 rows.”</td>
</tr>
<tr><th colspan="3">Observations/Documentation</th></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Number

Activity 22 Assessment
Multiplying Whole Numbers

Fluency with Multiplication and Division Facts (cont'd)

Uses mental math strategies and properties of operations to multiply and divide larger numbers.

$5 \times 47 = ?$

"I can decompose the numbers to make it easier to multiply: $5 \times 40 = 200$, $5 \times 7 = 35$, and $200 + 35 = 235$."

Applies properties of operations and partial products and connects to algorithms.

$16 \times 12 = ?$

	10	6
10	10 × 10	6 × 10
2	10 × 2	6 × 2

$$\begin{aligned} 16 \times 12 &= (10 \times 10) + (10 \times 2) + (6 \times 10) + (6 \times 2) \\ &= 100 + 20 + 60 + 12 \\ &= 192 \end{aligned}$$

Flexibly and fluently selects strategies and properties of operations to solve problems involving larger numbers.

375 students are going on a field trip. Each bus holds 25 students. How many buses are needed?

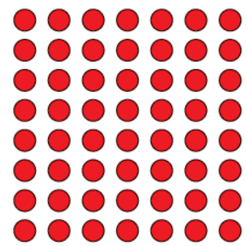
$$\begin{array}{r|l} 25\overline{)375} & \\ \underline{250} & 10 \\ 125 & \\ \underline{125} & \underline{5} \\ 0 & 15 \end{array}$$

"I subtracted multiples of 25, then added."

Observations/Documentation

Number

Activity 23 Assessment
Dividing Larger Numbers

Fluency with Multiplication and Division Facts		
Recalls multiplication and division facts to demonstrate and fluently recall facts to 100. 8 × 7 = 56 “I know my facts up to 10 × 10.”	Uses inverse operation to find multiplication and division facts. 56 ÷ 8 = ? 8 × ? = 56  “I can use multiplication to solve division problems.”	Applies estimation strategies to multiply and divide larger numbers. Gardeners planted 236 plants in rows of 5. Estimate how many rows were planted. 236 ÷ 5 = ? “I know 100 ÷ 5 = 20, so 200 ÷ 5 = 40. Because 236 is close to 200, I estimate about 40 rows.”
Observations/Documentation		

Number

Activity 23 Assessment
Dividing Larger Numbers

Fluency with Multiplication and Division Facts (cont'd)

Uses mental math strategies and properties of operations to multiply and divide larger numbers.

5 × 47 = ?

"I can decompose the numbers
to make it easier to multiply:
5 × 40 = 200, 5 × 7 = 35,
and 200 + 35 = 235."

Applies properties of operations and partial products and connects to algorithms.

16 × 12 = ?

	10	6
10	10 × 10	6 × 10
2	10 × 2	6 × 2

16 × 12 = (10 × 10) + (10 × 2) + (6 × 10) + (6 × 2)
= 100 + 20 + 60 + 12
= 192

Flexibly and fluently selects strategies and properties of operations to solve problems involving larger numbers.

375 students are going on a field trip. Each bus holds 25 students. How many buses are needed?

$$\begin{array}{r|l} 25\overline{)375} & \\ \underline{250} & 10 \\ 125 & \\ \underline{125} & \underline{5} \\ 0 & 15 \end{array}$$

"I subtracted multiples of 25, then added."

Observations/Documentation

Number

Activity 24 Assessment
Equivalent Ratios and Rates

Representing Equivalent Ratios and Rates

Uses multiplicative relationships to represent and create ratios and rates (ratio table).

It takes 6 cups of blueberries to make a pie.
How many cups of blueberries will I need to make 5 pies?

×5

Number of cups	6	12	18	24	30
Number of pies	1	2	3	4	5

×5

"I use a ratio table to see patterns to help me solve problems."

Represents and records ratios and rates symbolically.

×5

Number of cups	6	12	18	24	30
Number of pies	1	2	3	4	5

×5

6:1, 12:2, 18:3, 24:4, 30:5

Represents and creates equivalent ratios and rates.

The ratio of cups of blueberries to pies is 30:5. Identify equivalent ratios.

"I multiply or divide each term by the same number. Equivalent ratios:

$30:5 \xrightarrow{\div 5} 6:1 \xrightarrow{\times 9} 54:9 \xrightarrow{\times 2} 108:18$

Flexibly represents and creates equivalent ratios and rates.

A baker sells 2 pies for $15. How much did the baker make if 7 pies were sold?

7

Number sold	2	4	6	8
Earnings ($)	15	30	45	60

$52.50

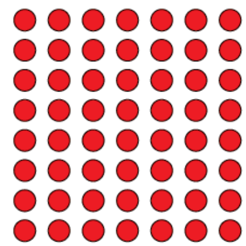
"7 is halfway between 6 and 8, so I find the number halfway between 45 and 60, which is $52.50."

Observations/Documentation

Number

Activity 25 Assessment

Fluency with Multiplication and Division Consolidation

Fluency with Multiplication and Division Facts		
Recalls multiplication and division facts to demonstrate and fluently recall facts to 100. 8 × 7 = 56 “I know my facts up to 10 × 10.”	Uses inverse operation to find multiplication and division facts. 56 ÷ 8 = ? 8 × ? = 56  “I can use multiplication to solve division problems.”	Applies estimation strategies to multiply and divide larger numbers. Gardeners planted 236 plants in rows of 5. Estimate how many rows were planted. 236 ÷ 5 = ? “I know 100 ÷ 5 = 20, so 200 ÷ 5 = 40. Because 236 is close to 200, I estimate about 40 rows.”
Observations/Documentation		

Activity 25 Assessment

Fluency with Multiplication and Division Consolidation

Fluency with Multiplication and Division Facts (cont’d)

Uses mental math strategies and properties of operations to multiply and divide larger numbers.

$5 \times 47 = ?$

“I can decompose the numbers to make it easier to multiply: $5 \times 40 = 200$, $5 \times 7 = 35$, and $200 + 35 = 235$.”

Applies properties of operations and partial products and connects to algorithms.

$16 \times 12 = ?$

	10	6
10	10 × 10	6 × 10
2	10 × 2	6 × 2

$$\begin{aligned} 16 \times 12 &= (10 \times 10) + (10 \times 2) + (6 \times 10) + (6 \times 2) \\ &= 100 + 20 + 60 + 12 \\ &= 192 \end{aligned}$$

Flexibly and fluently selects strategies and properties of operations to solve problems involving larger numbers.

375 students are going on a field trip. Each bus holds 25 students. How many buses are needed?

$$\begin{array}{r|l} 25\overline{)375} & \\ \underline{250} & 10 \\ 125 & \\ \underline{125} & \underline{5} \\ 0 & 15 \end{array}$$

“I subtracted multiples of 25, then added.”

Observations/Documentation

Number

Activity 25 Assessment

Fluency with Multiplication and Division Consolidation

Representing Equivalent Ratios and Rates

Uses multiplicative relationships to represent and create ratios and rates (ratio table).

It takes 6 cups of blueberries to make a pie.
How many cups of blueberries will I need to make 5 pies?

×5

Number of cups	6	12	18	24	30
Number of pies	1	2	3	4	5

×5

"I use a ratio table to see patterns to help me solve problems."

Represents and records ratios and rates symbolically.

×5

Number of cups	6	12	18	24	30
Number of pies	1	2	3	4	5

×5

6:1, 12:2, 18:3, 24:4, 30:5

Represents and creates equivalent ratios and rates.

The ratio of cups of blueberries to pies is 30:5. Identify equivalent ratios.

"I multiply or divide each term by the same number. Equivalent ratios:

$30:5 \xrightarrow{\div 5} 6:1 \xrightarrow{\times 9} 54:9 \xrightarrow{\times 2} 108:18$

Flexibly represents and creates equivalent ratios and rates.

A baker sells 2 pies for $15. How much did the baker make if 7 pies were sold?

7

Number sold	2	4	6	8
Earnings ($)	15	30	45	60

$52.50

"7 is halfway between 6 and 8, so I find the number halfway between 45 and 60, which is $52.50."

Observations/Documentation

Name________________________________ Date_____________________

Number
Unit 5 Line Master 1a

Decimal Cards

To hundredths

12.73	32.48	20.91	30.53
41.46	28.53	17.01	33.09
11.47	46.76	35.19	22.81
19.05	52.30	10.70	26.30

Name________________________________ Date_____________________

Number
Unit 5 Line Master 1b

Decimal Cards (cont'd)

To hundredths

31.74	27.39	24.92	28.51
19.16	25.03	30.07	13.08
19.27	2.76	32.14	28.89
17.45	24.36	37.74	49.33

Name_________________________________ Date______________________

Number
Unit 5 Line Master 1c

Decimal Cards (cont'd)

To thousandths

12.735	42.481	20.912	30.530
26.066	32.081	34.013	26.039
33.472	32.763	21.194	42.128
18.055	12.323	30.756	20.324

Name________________________________ Date_____________________

Number
Unit 5 Line Master 1d

Decimal Cards (cont'd)

To thousandths

15.735	16.482	22.912	23.503
41.065	16.085	24.013	33.186
32.478	41.753	18.891	24.722
34.015	42.345	13.743	15.358

Name________________________________ Date_____________________

Number
Unit 5 Line Master 1e

Decimal Cards (cont’d)

To tenths

41.7	12.4	50.9	20.5
17.0	28.8	20.1	40.4
16.9	26.7	13.1	23.8
16.5	2.3	10.7	14.3

Name________________________________ Date_____________________

Number
Unit 5 Line Master 1f

Decimal Cards (cont'd)

To tenths

11.7	12.4	21.9	24.5
31.0	32.8	26.1	27.4
17.9	23.7	14.1	25.8
21.5	32.3	25.7	32.6

Name________________________________ Date_____________________

Number
Unit 5 Line Master 2

Decimal Gotcha!

Recording Sheet

Player 1			Gotcha!	Player 2		
Cards		Estimate		Cards		Estimate
21.5	32.3	22 + 32 = 54	Player 2	25.7	32.6	23 + 33 = 59

Name________________________________ Date_____________________

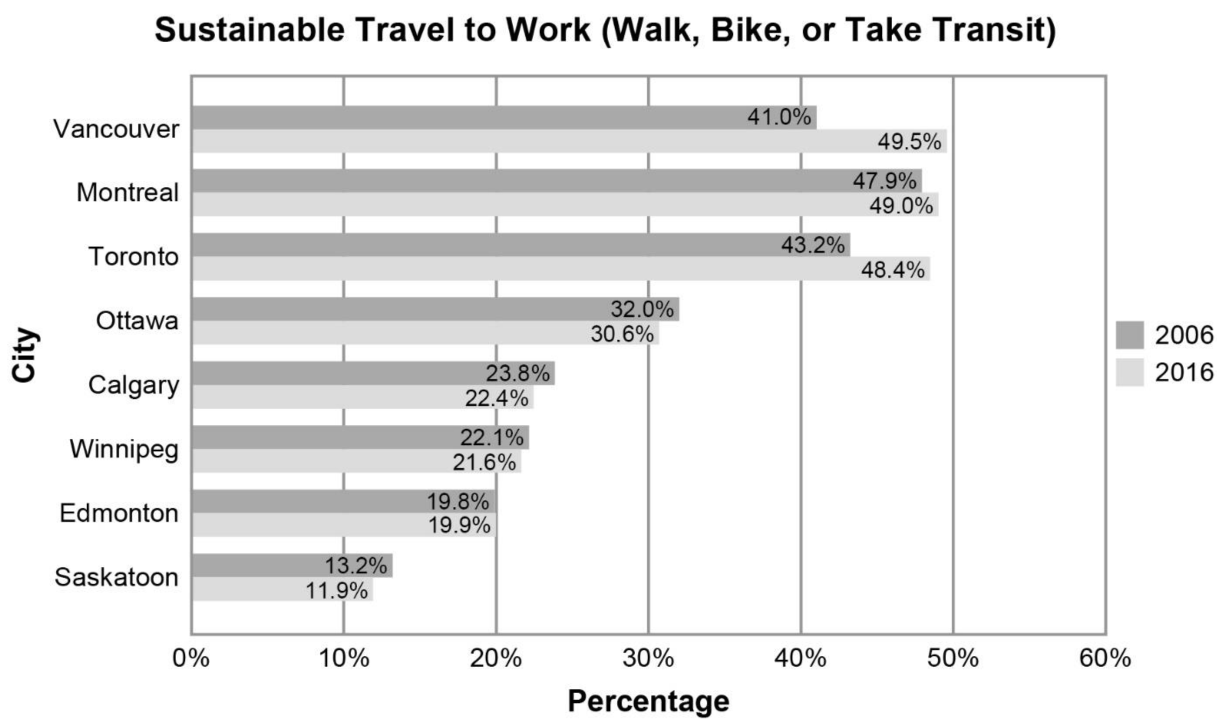
Number
Unit 5 Line Master 3

Sustainable Travel to Work

Tenths

The ways we move around our neighbourhoods affect our health as individuals and communities. They also affect our environment.

Choose two cities.
Compare the percents of people who choose to walk, bike, or take transit to work.
Which city travels more sustainably?
Estimate, then calculate to find exactly by how much.



Adapted from [Walking + Cycling in Vancouver (2017 Report Card)]

Name________________________________ Date_____________________

Number
Unit 5 Line Master 4a

Fractions Action!

Gameboard

$\frac{2}{5}$	$\frac{4}{6}$	$\frac{2}{3}$	$1\frac{1}{5}$	$\frac{8}{3}$
$1\frac{2}{7}$	$\frac{5}{8}$	$2\frac{1}{5}$	$\frac{2}{6}$	$\frac{6}{8}$
$2\frac{1}{8}$	$1\frac{1}{4}$	**FREE**	$\frac{6}{15}$	$\frac{5}{6}$
$\frac{9}{7}$	$\frac{3}{4}$	$\frac{1}{6}$	$\frac{4}{10}$	$\frac{2}{12}$
$\frac{1}{3}$	$\frac{7}{8}$	$\frac{6}{9}$	$\frac{17}{8}$	$\frac{5}{4}$

Name________________________________ Date_____________________

Number
Unit 5 Line Master 4b

Fractions Action! (cont'd)

Game Cards

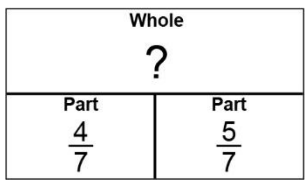
$\frac{3}{6} + \frac{2}{6}$	Alexa mixes $\frac{2}{9}$ of lemonade with $\frac{4}{9}$ of water. How much liquid does she have altogether?	$2\frac{2}{8} - 1\frac{3}{8}$
Gerome has a full tray of brownies. He and his sister both ate $\frac{1}{6}$ of the brownies. How much is left?	$\frac{1}{5} + \frac{1}{5}$	Aleshia needs $\frac{7}{5}$ of soil and $\frac{4}{5}$ of fertilizer for her garden. How much planting mixture will she have in total?
$3 - \frac{7}{8}$	For one recipe, Lenor needs 1 cup of flour. For another, she needs $\frac{2}{3}$ of a cup of flour. What's the difference in flour needed?	$\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3}$
Jabar walked $\frac{5}{7}$ of a kilometre and then $\frac{4}{7}$ of a kilometre to the library. How many kilometres did he walk altogether?	$1\frac{3}{6} - \frac{7}{6}$	Orange juice comes in 2 L-bottles. You use $\frac{3}{4}$ L of juice for a smoothie. How much juice is left?

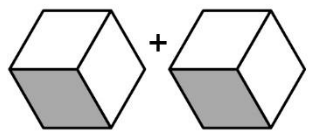
Name________________________________ Date_____________________

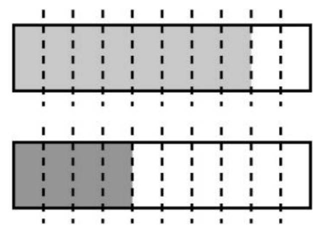
Number
Unit 5 Line Master 4c

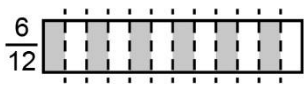
Fractions Action! (cont'd)

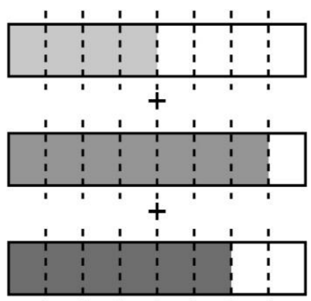
Game Cards

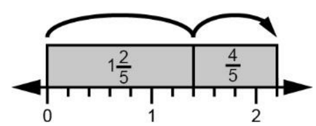


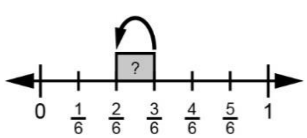


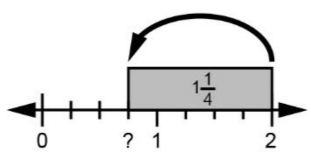


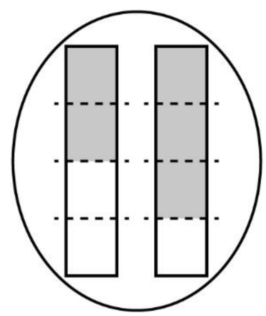


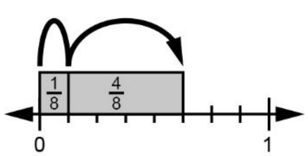


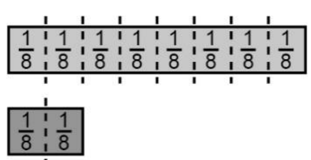


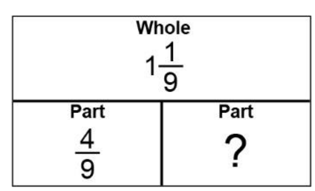












Name________________________________ Date_____________________

Number
Unit 5 Line Master 4d

Fractions Action! (cont'd)

Gameboard

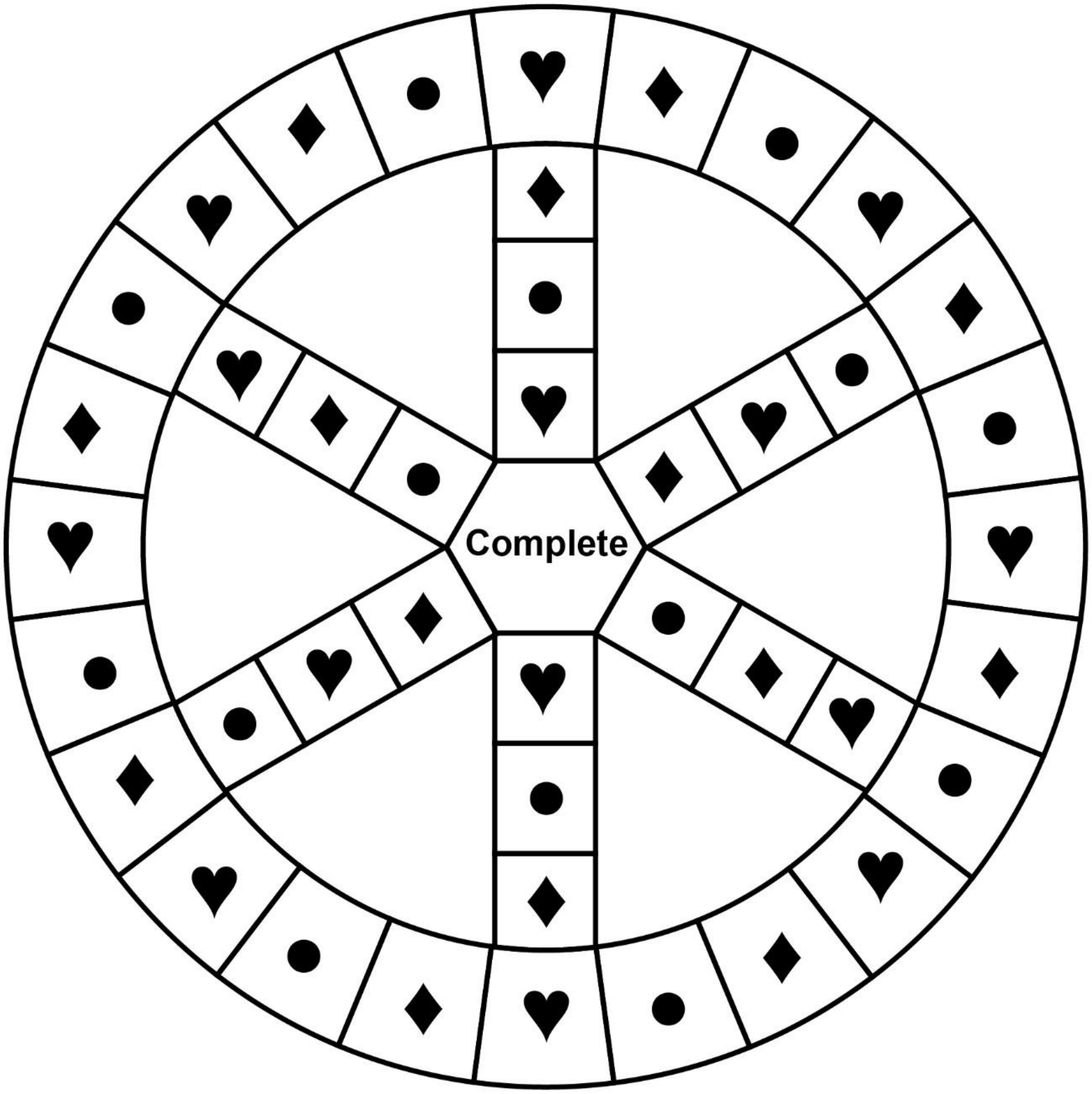
$\frac{1}{6}$	$\frac{2}{5}$	$\frac{6}{9}$
$\frac{2}{3}$	**FREE**	$\frac{2}{6}$
$\frac{1}{3}$	$\frac{4}{10}$	$\frac{5}{6}$

Name________________________________ Date_____________________

Number
Unit 5 Line Master 5a

Complete the Chase!

Gameboard



Legend

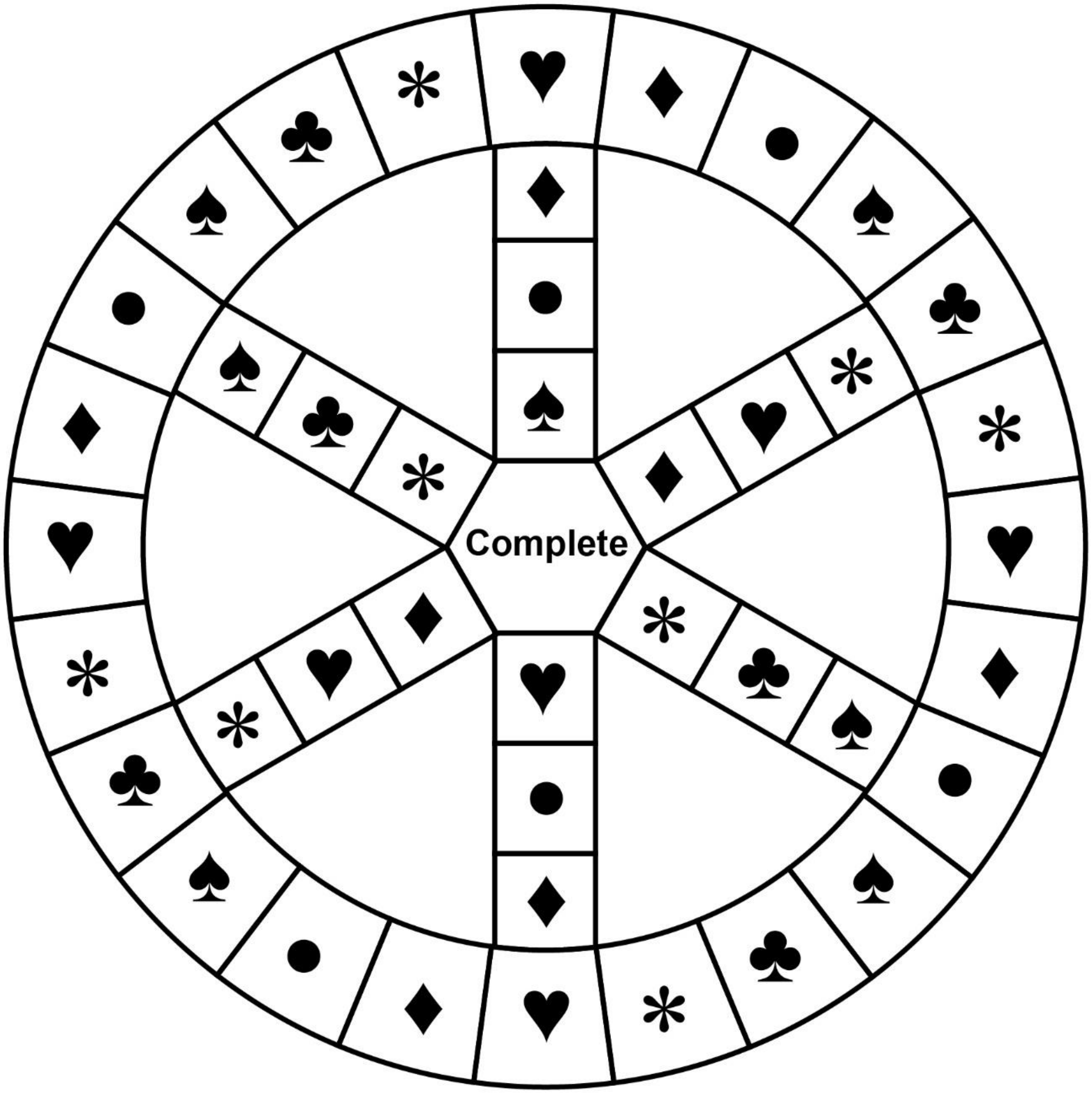
♥ Estimating ♦ Adding decimals • Subtracting decimals

Name________________________________ Date_____________________

Number
Unit 5 Line Master 5b

Complete the Chase!

Gameboard (ON only)



Legend

♥ Estimating

♦ Adding decimals

● Subtracting decimals

♠ Adding/subtracting fractions

♣ Multiplying unit fractions

∗ Multiplying by 0.1 and 0.01

Name________________________________ Date_____________________

Number
Unit 5 Line Master 6a

Complete the Chase!

Game Cards

♥ Estimate: 25.73 + 32.15 ♥ Estimate: 72.694 – 18.951 ♦ 32.56 + 16.04 ♦ 18.295 + 13.045 • 83.59 – 20.04 • 23.955 – 6.309	♥ Estimate: 9.344 + 7.202 ♥ Estimate: 45.89 – 15.20 ♦ 28.423 + 52.970 ♦ 103.84 + 29.16 • \$74.25 – \$19.33 • 66.232 – 64.989
♥ Estimate: 18.621 + 19.33 ♥ Estimate: 23.111 – 16.07 ♦ \$12.54 + \$61.50 ♦ 81.825 + 3.405 • 13.059 – 6.198 • 32.599 – 3.906	♥ Estimate: 17.19 + 19.76 ♥ Estimate: 27.075 – 11.888 ♦ 102.41 + 19.35 ♦ 64.307 + 5.04 • 112.73 – 13.64 • 99.44 – 39.440
♥ Estimate: 27.36 + 12.23 ♥ Estimate: 4.255 – 1.386 ♦ 5.24 + 6.99 ♦ 26.7 + 33.247 • 6.04 – 3.78 • 2.763 – 3.789	♥ Estimate: 32.014 + 43.213 ♥ Estimate: 16.593 – 4.991 ♦ 0.62 + 1.9 ♦ 20.48 + 9 • 73.40 – 54.23 • 76.045 – 7.03

Name________________________________ Date_____________________

Number
Unit 5 Line Master 6b

Complete the Chase! (cont'd)

Game Cards

♥ Estimate: 24.405 + 12.167 ♥ Estimate: 8.737 – 5.837 ♦ 17.36 + 43.02 ♦ 7.5 + 28.11 • 0.8 – 0.36 • 12.265 – 3.911	♥ Estimate: 15.278 + 0.732 ♥ Estimate: 0.456 – 0.214 ♦ 135.2 + 12.056 ♦ 38.92 + 27.005 • \$73.40 – \$54.23 • 10.622 – 4.07
♥ Estimate: 36.112 + 27.351 ♥ Estimate: 44.32 – 10.245 ♦ \$19.99 + \$17.49 ♦ 3.251 + 8.96 • 9.123 – 2.45 • 41.999 – 13.99	♥ Estimate: 56.204 + 3.009 ♥ Estimate: 3.104 – 0.8 ♦ 17.324 + 9.167 ♦ 0.58 + 15.736 • 15.942 – 8.641 • 83.200 – 16.199
♥ Estimate: 2.225 + 6.95 ♥ Estimate: 58.37 – 22.845 ♦ 0.14 + 14.038 ♦ 35.042 + 13.152 • 3.84 – 1.001 • 56.543 – 24.897	♥ Estimate: 4.219 + 38.604 ♥ Estimate: 83.1 – 34.016 ♦ 29.123 + 12.234 ♦ 6.7 + 2.451 • 71.987 – 61.876 • 43.223 – 23.22

Name________________________________ Date_____________________

Number
Unit 5 Line Master 6c

Complete the Chase! (cont'd)

Game Cards (ON only)

♥ Estimate: 24.40 + 12.16 ♦ 17.36 + 43.02 • 0.8 – 0.36 ♠ $\frac{1}{6} + \frac{5}{6}$ ♣ $5 \times \frac{1}{6}$ * 175 × 0.1	♥ Estimate: 0.45 – 0.21 ♦ 13.2 + 12.05 • \$73.40 – \$54.23 ♠ $1\frac{3}{8} - \frac{5}{8}$ ♣ $2 \div \frac{1}{4}$ * 136 × 0.01
♥ Estimate: 36.11 + 27.35 ♦ \$19.99 + \$17.49 • 9.12 – 2.45 ♠ $4 - \frac{2}{5}$ ♣ $8 \times \frac{1}{10}$ * \$25 × 0.3	♥ Estimate: 3.10 – 0.8 ♦ 17.32 + 9.16 • 15.94 – 8.64 ♠ $2\frac{7}{10} + \frac{8}{10}$ ♣ $3 \div \frac{1}{5}$ * 6 × 0.6
♥ Estimate: 2.22 + 6.95 ♦ 0.14 + 14.03 • 3.84 – 1.01 ♠ $\frac{3}{4} + 1\frac{3}{4}$ ♣ $4 \times \frac{1}{4}$ * 3 × 0.07	♥ Estimate: 83.1 – 34.01 ♦ 29.12 + 12.23 • 71.98 – 61.87 ♠ $3\frac{3}{10} - \frac{9}{10}$ ♣ $2 \div \frac{1}{10}$ * 12 × 0.05

Name________________________________ Date_____________________

Number
Unit 5 Line Master 6d

Complete the Chase! (cont'd)

Game Cards (ON only)

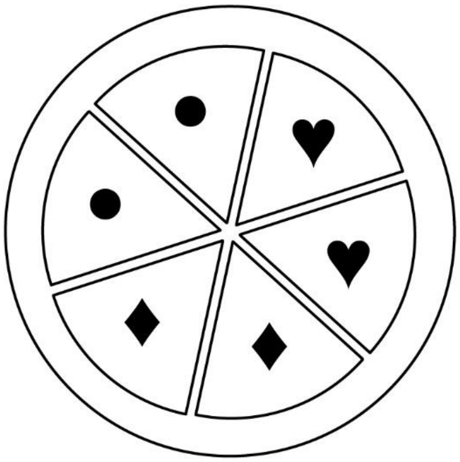
♥ Estimate: 24.40 + 12.16 ♦ 17.36 + 43.02 ● 0.8 – 0.36 ♠ $\frac{3}{8} + \frac{5}{8}$ ♣ $5 \times \frac{1}{6}$ * 4 × 0.2	♥ Estimate: 0.45 – 0.21 ♦ 135.2 + 12.05 ● \$73.40 – \$54.23 ♠ $1 - \frac{4}{4}$ ♣ $6 \div \frac{1}{3}$ * 50 × 0.06
♥ Estimate: 36.11 + 27.35 ♦ \$19.99 + \$17.49 ● 9.12 – 2.45 ♠ $\frac{2}{5} + \frac{2}{5}$ ♣ $4 \times \frac{1}{5}$ * 4 × 0.4	♥ Estimate: 3.04 – 0.8 ♦ 17.32 + 9.67 ● 15.94 – 8.64 ♠ $2 - \frac{2}{3}$ ♣ $3 \div \frac{1}{2}$ * 300 × 0.3
♥ Estimate: 2.22 + 6.95 ♦ 0.14 + 14.03 ● 3.84 – 1.01 ♠ $\frac{5}{10} + \frac{6}{10}$ ♣ $1 \div \frac{1}{10}$ * 8 × 0.04	♥ Estimate: 83.1 – 34.01 ♦ 29.12 + 12.23 ● 71.98 – 61.8 ♠ $2\frac{1}{3} + 3\frac{2}{3}$ ♣ $3 \times \frac{1}{8}$ * 45 × 0.02

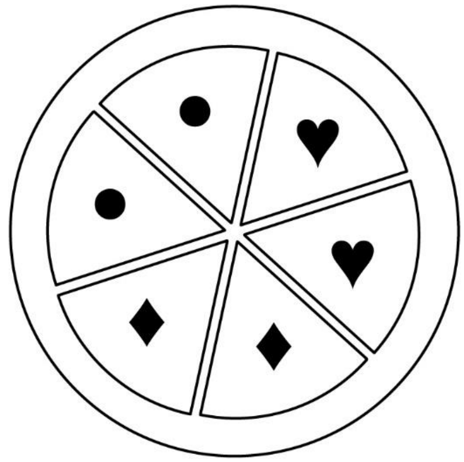
Name______________________________ Date____________________

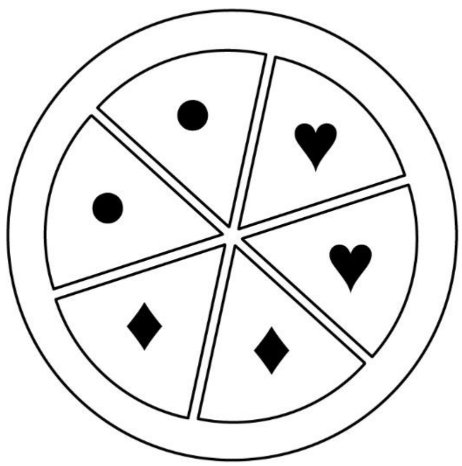
Number
Unit 5 Line Master 7a

Complete the Chase!

Game Pieces





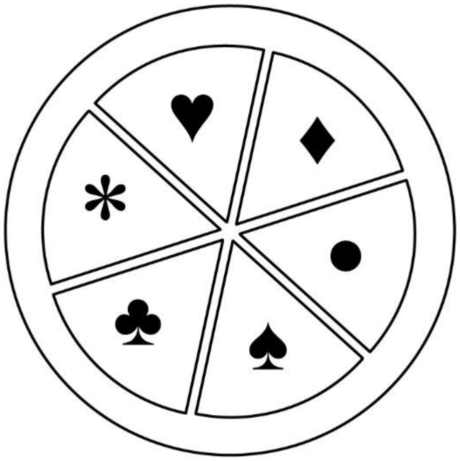


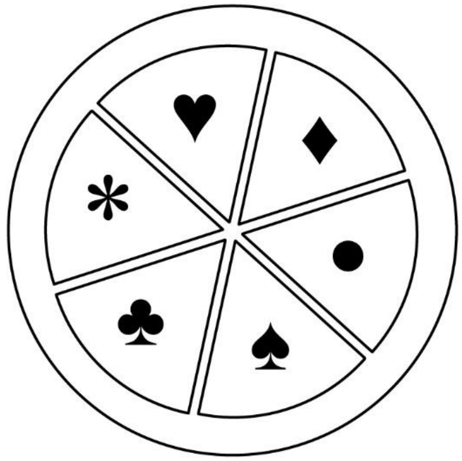
Name_________________________________ Date_____________________

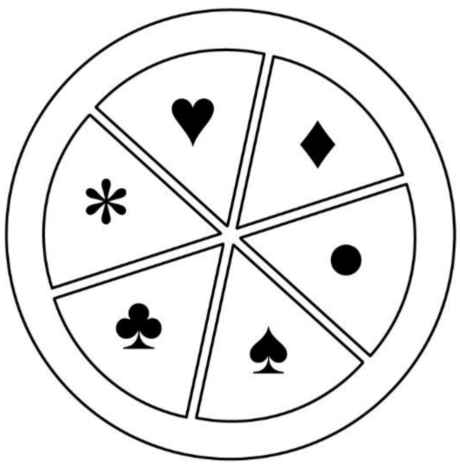
Number
Unit 5 Line Master 7b

Complete the Chase!

Game Pieces (ON only)





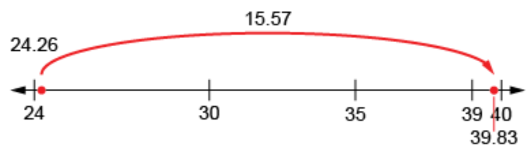


Number

Activity 26 Assessment

Estimating Sums and Differences with Decimals

<table>
<tr><th colspan="3">Conceptual Meaning of Addition and Subtraction of Decimals</th></tr>
<tr>
<td>Recognizes addition and subtraction situations and models concretely to add or subtract to hundredths

24.26 + 15.57 = 39.83</td>
<td>Models and symbolizes ways to solve problems using an open number line.
24.26 + 15.57 = ?
</td>
<td>Uses an understanding of place value to add or subtract decimals with hundredths (decomposes both numbers).
24.26 + 15.57 = ?
24 + 15 = 39 (whole numbers)
0.26 + 0.57 = 0.83 (decimals)
39 + 0.83 = 39.83
“I decomposed both numbers, added the whole numbers, then added the hundredths.”</td>
</tr>
<tr><th colspan="3">Observations/Documentation</th></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Activity 26 Assessment
Estimating Sums and Differences with Decimals

Conceptual Meaning of Addition and Subtraction of Decimals (cont'd)

Uses an understanding of place value to decompose one number.

24.26 + 15.57 = ?

15.57 = 15 + 0.57
24.26 + 15 = 39.26
39.26 + 0.57 = 39.83

"I used place value to add on the second number."

Uses estimation and mental math strategies to check reasonableness of solutions.

4.497 + 7.299 + 3.512 =?

"I used compatible numbers to estimate. 4.497 is close to 5, 7.299 is close to 7, and 3.512 is close to 3; 7 + 3 + 5 = 15. I calculated 15.308, so my answer is reasonable."

Solves addition and subtraction problems flexibly, using a variety of strategies.

36.462 – 25.108 = ?
36.462 – 25 = 11.462
11.462 – 0.108 = 11.354

Tens	Ones	Tenths	Hundredths	Thousandths
3	6.	4	$^{5}\cancel{6}$	$^{1}2$
2	5.	1	0	8
1	1.	3	5	4

Observations/Documentation

Activity 27 Assessment
Adding with Decimal Numbers

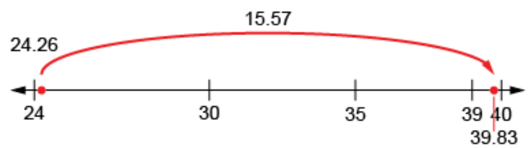
Conceptual Meaning of Addition and Subtraction of Decimals

Recognizes addition and subtraction situations and models concretely to add or subtract to hundredths

24.26 + 15.57 = 39.83

Models and symbolizes ways to solve problems using an open number line.

24.26 + 15.57 = ?



Uses an understanding of place value to add or subtract decimals with hundredths (decomposes both numbers).

24.26 + 15.57 = ?

24 + 15 = 39 (whole numbers)
0.26 + 0.57 = 0.83 (decimals)
39 + 0.83 = 39.83

"I decomposed both numbers, added the whole numbers, then added the hundredths."

Observations/Documentation

Number

Activity 27 Assessment
Adding with Decimal Numbers

Conceptual Meaning of Addition and Subtraction of Decimals (cont’d)

Uses an understanding of place value to decompose one number.

24.26 + 15.57 = ?

15.57 = 15 + 0.57
24.26 + 15 = 39.26
39.26 + 0.57 = 39.83

“I used place value to add on the second number.”

Uses estimation and mental math strategies to check reasonableness of solutions.

4.497 + 7.299 + 3.512 =?

“I used compatible numbers to estimate. 4.497 is close to 5, 7.299 is close to 7, and 3.512 is close to 3; 7 + 3 + 5 = 15. I calculated 15.308, so my answer is reasonable.”

Solves addition and subtraction problems flexibly, using a variety of strategies.

36.462 – 25.108 = ?
36.462 – 25 = 11.462
11.462 – 0.108 = 11.354

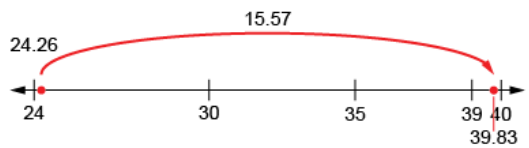
Tens	Ones	Tenths	Hundredths	Thousandths
3	6.	4	$^{5}\cancel{6}$	$^{1}2$
2	5.	1	0	8
1	1.	3	5	4

Observations/Documentation

Number

Activity 28 Assessment
Subtracting with Decimal Numbers

Conceptual Meaning of Addition and Subtraction of Decimals

Recognizes addition and subtraction situations and models concretely to add or subtract to hundredths	Models and symbolizes ways to solve problems using an open number line.	Uses an understanding of place value to add or subtract decimals with hundredths (decomposes both numbers).
 **24.26 + 15.57 = 39.83**	**24.26 + 15.57 = ?** 	**24.26 + 15.57 = ?** 24 + 15 = 39 (whole numbers) 0.26 + 0.57 = 0.83 (decimals) 39 + 0.83 = 39.83 "I decomposed both numbers, added the whole numbers, then added the hundredths."

Observations/Documentation

Number

Activity 28 Assessment
Subtracting with Decimal Numbers

Conceptual Meaning of Addition and Subtraction of Decimals (cont’d)

Uses an understanding of place value to decompose one number.

24.26 + 15.57 = ?

15.57 = 15 + 0.57
24.26 + 15 = 39.26
39.26 + 0.57 = 39.83

“I used place value to add on the second number.”

Uses estimation and mental math strategies to check reasonableness of solutions.

4.497 + 7.299 + 3.512 =?

“I used compatible numbers to estimate. 4.497 is close to 5, 7.299 is close to 7, and 3.512 is close to 3; 7 + 3 + 5 = 15. I calculated 15.308, so my answer is reasonable.”

Solves addition and subtraction problems flexibly, using a variety of strategies.

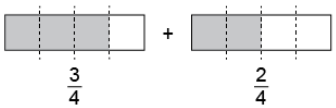
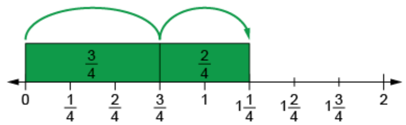
36.462 – 25.108 = ?
36.462 – 25 = 11.462
11.462 – 0.108 = 11.354

Tens	Ones	Tenths	Hundredths	Thousandths
3	6.	4	$^{5}\cancel{6}$	$^{1}2$
2	5.	1	0	8
1	1.	3	5	4

Observations/Documentation

Activity 29 Assessment

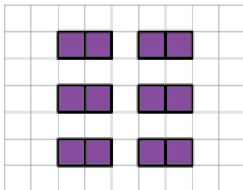
Adding and Subtracting Fractions with Like Denominators

Adding and Subtracting Fractions with Like Denominators			
Concretely solves problems. $\frac{3}{4} + \frac{2}{4} = ?$  “Because each whole is divided into fourths, I can add the parts. 3 fourths + 2 fourths = 5 fourths. 5 fourths make 1 whole and $\frac{1}{4}$.”	Models pictorially to solve problems.  $\frac{3}{4} + \frac{2}{4} = \frac{5}{4} = 1\frac{1}{4}$ “I modelled on the number line, then counted on from $\frac{3}{4}$: 4 fourths, 5 fourths.”	Models symbolically to solve problems. $3\frac{1}{8} - \frac{6}{8} = ?$ $3\frac{1}{8} = \frac{25}{8}$ $\frac{25}{8} - \frac{6}{8} = \frac{19}{8}$, or $2\frac{3}{8}$ “I converted $3\frac{1}{8}$ to $\frac{25}{8}$, then subtracted. I checked my answer using addition.”	Fluently and flexibly solves addition and subtraction problems. $1\frac{3}{10} + \frac{8}{10} + ? = 2\frac{7}{10}$ $1\frac{3}{10} + \frac{8}{10} = 1\frac{11}{10} = 2\frac{1}{10}$ $2\frac{7}{10} - 2\frac{1}{10} = \frac{6}{10}$ $2\frac{1}{10} + \frac{6}{10} = 2\frac{7}{10}$ “$\frac{6}{10}$ needs to be added to the other fractions to equal $2\frac{7}{10}$.”
Observations/Documentation			

Activity 30 Assessment
Multiplication and Division with Unit Fractions

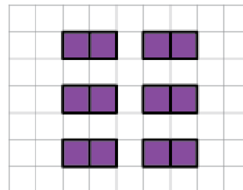
Multiplication and Division with Unit Fractions

Recognizes multiplication and division situations.



"I see multiplication: 12 parts of one half.
I also see division:
6 wholes divided into one-half parts."

Writes an equation to represent a multiplication or division situation.

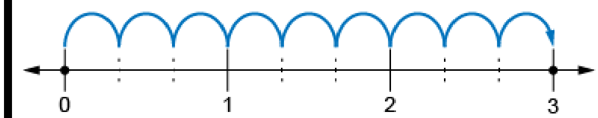


"I can represent this situation using a multiplication and a division equation."

$12 \times \frac{1}{2} = 6$; $6 \div \frac{1}{2} = 12$

Models situations involving a whole partitioned into unit fractions in many ways.

$3 \div \frac{1}{3} = ?$



"I used a number line from 0 to 3, partitioned each whole into thirds, then counted the thirds: 1 one-third, 2 one-thirds, 3 one-thirds, …, 8 one-thirds, 9 one-thirds. $3 \div \frac{1}{3} = 9$."

Observations/Documentation

Activity 30 Assessment
Multiplication and Division with Unit Fractions

Multiplication and Division with Unit Fractions (cont'd)		
Solves equations using addition or subtraction. $6 \times \frac{1}{5} = ?$ "I added $\frac{1}{5}$ 6 times: $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{6}{5}$"	Solves using the properties of multiplication or division, extends to a variety of contexts. Valentina and her abuela are making empanadas. They used $\frac{1}{3}$ of the recipe and the recipe called for 6 cups of flour. How much flour did they need? "I found $\frac{1}{3}$ of 6 cups: $6 \times \frac{1}{3} = \frac{6}{3}$, or 2. They needed 2 cups of flour."	Solves multiplication and division problems flexibly, using a variety of strategies. Ha-jun hikes $\frac{1}{2}$ km every day. How long will it be before Ha-jun has hiked 18 km? 18 ÷ 1/2 = ? "If Ha-jun hikes $\frac{1}{2}$ km in one day, he will hike 1 km in 2 days. So, he will hike 18 km in 18 × 2 = 36 days."
Observations/Documentation		

Number

Activity 31 Assessment
Multiplication with 0.01 and 0.1

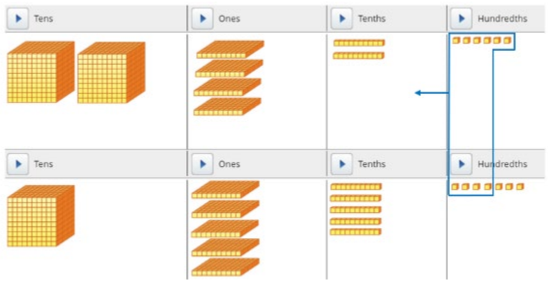
Multiplication with 0.01 and 0.1			
Explores and generalizes patterns using place-value relationships. 21 × 0.01 21 × 0.1 21 ×1 21 × 10 21 × 100 What patterns do you notice? “I see a growing pattern. The multiplier is 10 times bigger than the previous multiplier each time.”	Uses place-value patterns and multiplication properties to solve equations. 21 × 0.01 = ? 43 × 0.1 = ? “I know that to multiply by 0.01, I move the digits two place-value positions to the right: 21 x 0.01 = 0.21. To multiply by 0.1, I move the digits one place-value position to the right: 43 x 0.1 = 4.3.”	Uses mental math to solve multiplication problems. Jeremiah wants to add a 20% tip to the bill. Use this equation to calculate how much money Jeremiah will leave as a tip: \$48 × 0.20 = ? “I know how to multiply by 0.1, so I rewrote the equation as: \$48 × 0.1 × 2. \$48 × 0.1 = \$4.80 and \$4.80 × 2 = \$9.60. Jeremiah will leave \$9.60 as a tip.”	Solves multiplication problems flexibly, using a variety of strategies. Determine 4 × 0.6. “I used doubles: 4 × 0.6 = 4 × 0.3 × 2 4 × 0.3 = 1.2 1.2 × 2 = 2.4 So, 4 × 0.6 = 2.4”
Observations/Documentation			

Activity 32 Assessment

Operations with Fractions and Decimals Consolidation

Conceptual Meaning of Addition and Subtraction of Decimals

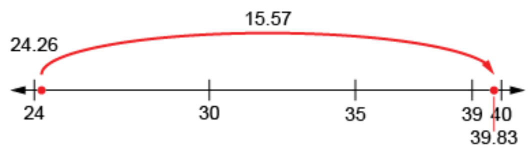
Recognizes addition and subtraction situations and models concretely to add or subtract to hundredths



24.26 + 15.57 = 39.83

Models and symbolizes ways to solve problems using an open number line.

24.26 + 15.57 = ?



Uses an understanding of place value to add or subtract decimals with hundredths (decomposes both numbers).

24.26 + 15.57 = ?

24 + 15 = 39 (whole numbers)
0.26 + 0.57 = 0.83 (decimals)
39 + 0.83 = 39.83

"I decomposed both numbers, added the whole numbers, then added the hundredths."

Observations/Documentation

Activity 32 Assessment

Operations with Fractions and Decimals Consolidation

Conceptual Meaning of Addition and Subtraction of Decimals (con't)

Uses an understanding of place value to decompose one number.

24.26 + 15.57 = ?

15.57 = 15 + 0.57
24.26 + 15 = 39.26
39.26 + 0.57 = 39.83

"I used place value to add on the second number."

Uses estimation and mental math strategies to check reasonableness of solutions.

4.497 + 7.299 + 3.512 =?

"I used compatible numbers to estimate. 4.497 is close to 5, 7.299 is close to 7, and 3.512 is close to 3; 7 + 3 + 5 = 15. I calculated 15.308, so my answer is reasonable."

Solves addition and subtraction problems flexibly, using a variety of strategies.

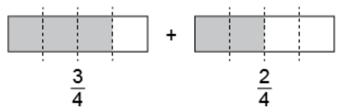
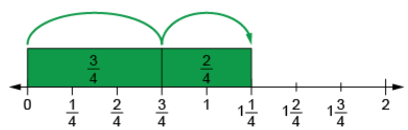
36.462 – 25.108 = ?
36.462 – 25 = 11.462
11.462 – 0.108 = 11.354

Tens	Ones	Tenths	Hundredths	Thousandths
3	6.	4	$\overset{5}{\cancel{6}}$	$^{1}2$
2	5.	1	0	8
1	1.	3	5	4

Observations/Documentation

Number

Activity 32 Assessment
Operations with Fractions and Decimals Consolidation

Adding and Subtracting Fractions with Like Denominators			
Concretely solves problems. $\frac{3}{4} + \frac{2}{4} = ?$  "Because each whole is divided into fourths, I can add the parts. 3 fourths + 2 fourths = 5 fourths. 5 fourths make 1 whole and $\frac{1}{4}$."	Models pictorially to solve problems.  $\frac{3}{4} + \frac{2}{4} = \frac{5}{4} = 1\frac{1}{4}$ "I modelled on the number line, then counted on from $\frac{3}{4}$: 4 fourths, 5 fourths."	Models symbolically to solve problems. $3\frac{1}{8} - \frac{6}{8} = ?$ $3\frac{1}{8} = \frac{25}{8}$ $\frac{25}{8} - \frac{6}{8} = \frac{19}{8}$, or $2\frac{3}{8}$ "I converted $3\frac{1}{8}$ to $\frac{25}{8}$, then subtracted. I checked my answer using addition."	Fluently and flexibly solves addition and subtraction problems. $1\frac{3}{10} + \frac{8}{10} + ? = 2\frac{7}{10}$ $1\frac{3}{10} + \frac{8}{10} = 1\frac{11}{10} = 2\frac{1}{10}$ $2\frac{7}{10} - 2\frac{1}{10} = \frac{6}{10}$ $2\frac{1}{10} + \frac{6}{10} = 2\frac{7}{10}$ "$\frac{6}{10}$ needs to be added to the other fractions to equal $2\frac{7}{10}$."
Observations/Documentation			

Name________________________________ Date_____________________

Number
Unit 6 Line Master 1a

Who Pays for What?

Gameboards

Municipal Tax	**Provincial Tax**	**Federal Tax**
Provincial Tax	**Federal Tax**	**Municipal Tax**
Federal Tax	**Municipal Tax**	**Provincial Tax**

Municipal Tax	**Provincial Tax**	**Federal Tax**
Provincial Tax	**Federal Tax**	**Municipal Tax**
Federal Tax	**Municipal Tax**	**Provincial Tax**

Name________________________________ Date_____________________

Number
Unit 6 Line Master 1a

Who Pays for What? (cont’d)

Gameboards

Municipal Tax	**Provincial Tax**	**Federal Tax**
Provincial Tax	**Federal Tax**	**Municipal Tax**

Municipal Tax	**Provincial Tax**	**Federal Tax**
Provincial Tax	**Federal Tax**	**Municipal Tax**

Name________________________________ Date_____________________

Number
Unit 6 Line Master 2a

Who Pays for What?

Game Cards

Schools	Doctor's Visit	Banff National Park
CBC Television	Libraries	National Debt
Neighbourhood Parks	Algonquin Provincial Park	Fire Trucks
Road Repairs	Royal Canadian Mounted Police (RCMP)	Recycling
Naval Ships	Ontario Provincial Police (OPP)	Border Patrol
Blood Tests	Tourism	Long-term Care Facilities

Name________________________________ Date_____________________

Number
Unit 6 Line Master 2b

Who Pays for What? (cont'd)

Game Cards

Schools	Doctor's Visit	Banff National Park
CBC Television	Fire Trucks	Road Repairs
Ontario Provincial Police (OPP)	Algonquin Provincial Park	Libraries
Naval Ships	Royal Canadian Mounted Police (RCMP)	Blood Tests

Name________________________________ Date_____________________

Number
Unit 6 Line Master 2c

Who Pays for What? (cont’d)

Answers

Federal Government:

Banff National Park
National debt
Royal Canadian Mounted Police (RCMP)
CBC Television
Naval ships
Border patrol
Tourism

Provincial Government:

Schools
Doctor’s visit
Algonquin Provincial Park
Ontario Provincial Police (OPP)
Blood tests
Long-Term Care Facilities

Municipal Government:

Libraries
Neighbourhood parks
Road repairs
Fire trucks
Recycling

Name________________________________ Date_____________________

Number
Unit 6 Line Master 3a

Warm Up the Community

Gloves Cost: $10.00 a pair Number of pairs bought: ______________________________ Total cost (including sales tax):	**Socks** Cost: $8.00 a pair Number of pairs bought: ______________________________ Total cost (including sales tax):
Toque Cost: $7.00 Number bought: ______________________________ Total cost (including sales tax):	**Scarf** Cost: $12.00 Number bought: ______________________________ Total cost (including sales tax):

Name________________________________ Date_____________________

Number
Unit 6 Line Master 3b

Warm Up the Community (cont'd)

What is the total cost of all the items?
Show your thinking.

Which strategies did you use to help calculate the sales tax?

How did you estimate to make sure the total cost was no more than $800?

Name________________________________ Date_____________________

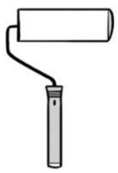
Number
Unit 6 Line Master 4

What Can I Buy?

Paint can
$27.99

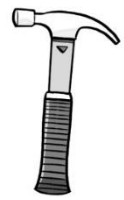
Paint brushes
$21.78

Paint tray
$8.90

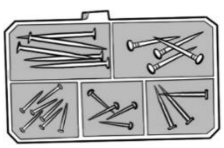


Paint roller
$9.57

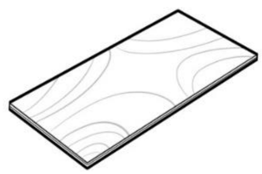
Ladder
$108.65



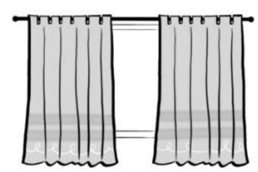
Hammer
$25.98



Box of nails
$33.33

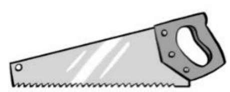


Sheet of plywood
$62.40



Curtains
$26.56

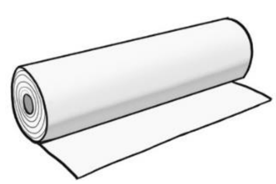
Lamp
$17.87



Saw
$19.99

Tablecloth
$25.96

Staple gun with staples
$39.95



Roll of kraft paper
$45.99

Name________________________________ Date_____________________

Number
Unit 6 Line Master 5

Credit or Debt?

Liam borrowed money from his sister to set up a lemonade stand. She used e-Transfer© to send him money so he could buy a sign, paper cups, and lemonade. Unfortunately, it rained all weekend. Liam will not be able to pay his sister back until the next sunny weekend.	Create your own scenario involving credit or debt involving an e-Transfer©.
For delivering newspapers, Davon gets paid by automatic deposit every other Friday. On the same day, Davon has an automatic withdrawal to a savings account.	Create your own scenario involving debt where you borrow money using a credit card.
Vicky received a new pair of boots as a gift. The boots didn’t fit, so she returned them to the store. Vicky was given a store gift card.	Create your own scenario involving credit where you are part of a loyalty program.

Name_______________________________ Date_____________________

Number
Unit 6 Line Master 6

Which Is the Best Value?

Healthy snack: ____

Package Description	Cost of Package	Number of Items	Unit Rate

The best value is ____

because ____

Healthy snack: ____

Package Description	Cost of Package	Number of Items	Unit Rate

The best value is ____

because ____

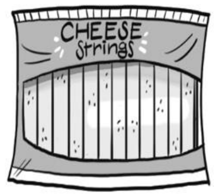
Name________________________________ Date_____________________

Number
Unit 6 Line Master 7a

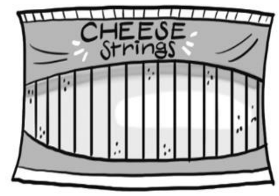
Healthy Snacks

Cheese Strings

A: 8 for $4.47



B: 12 for $5.97



C: 16 for $6.27

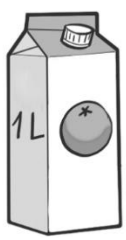
Granola Bars

A: 6 for $2.98

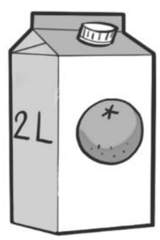
B: 10 for $4.47

C: 24 for $10.49

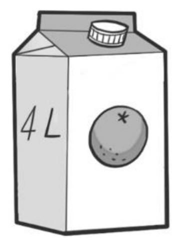
Orange Juice



A: 1 L for $2.57



B: 2 L for $2.87



C: 4 L for $5.99

Single Serving of Yogurt

A: 4 for $3.97

B: 8 for $4.78

C: 12 for $5.97

Name________________________________ Date_____________________

Number
Unit 6 Line Master 7b

Healthy Snacks (cont'd)

Answers

Cheese Strings

A: 8 for $4.47	$0.56 per string
B: 12 for $5.97	$0.50 per string
C: 16 for $6.27	$0.39 per string; option C is the best value.

Granola Bars

A: 6 for $2.98	$0.50 per bar
B: 10 for $4.47	$0.45 per bar
C: 24 for $10.49	$0.44 per bar; option C is the best value.

Orange Juice

A: 1 L for $2.57	$2.57 per litre
B: 2 L for $2.87	$1.44 per litre
C: 4 L for $5.99	$1.50 per litre; option B is the best value.

Single Serving of Yogurt

A: 4 for $3.97	$0.99 per serving
B: 8 for $4.78	$0.60 per serving
C: 12 for $5.97	$0.50 per serving; option C is the best value.

Name________________________________ Date_____________________

Number
Unit 6 Line Master 8

Bubbly Budgeting

Weekly Action Plans	Income	Expenses
What will you do each week?		
Week 1 Parents' group donates money to help with expenses for the car wash.	$50.00	
Week 2		
Week 3		
Week 4		
Car Wash Day Cost per car: Cost per van: Cost per truck:		
Totals:		

Name________________________________ Date_____________________

Number
Unit 6 Line Master 9

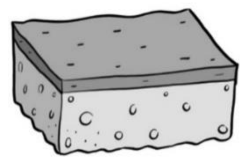
Expenses for the Car Wash

Cleaning Supplies

Plastic bucket
$4.99

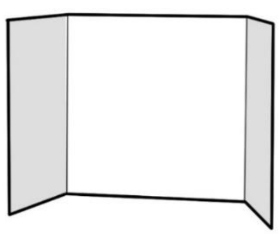
Package of 4 cloths
$2.47

3 L of soap
$9.97

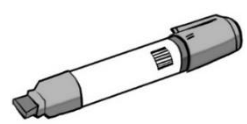


Sponge
$2.97

Advertising



Poster board
$4.98



Marker
$1.49

Other Expenses

____

____

____

Name_______________________________ Date____________________

Number
Unit 6 Line Master 10a

Budget Makeover!

Monty, a university student, is having trouble saving for a goal of purchasing a bicycle.

$229.99

Here are Monty's earning and spending habits.

Earnings

- Gets paid $305 per week from a part-time job

Spending

- Buys a hot chocolate every weekday morning for $1.75
- Buys lunch from a fast-food restaurant daily ($8–$12 each time)
- Goes out with friends on Friday and Saturday nights, spending about $25 each time
- Goes shopping for clothes/shoes, spending about $70 per week
- Subscribes to a streaming service for $119.40 per year
- Purchases a bus pass: $120 for 4 months (unlimited use)
- Buys essentials (e.g., laundry, milk, shampoo, soap): $20 per week

About how much money does Monty spend per week?

About how much money does Monety have left from his pay each week?

What is the cost of the bicycle, including tax?

Name________________________________ Date_____________________

Number
Unit 6 Line Master 10b

Budget Makeover! (cont'd)

What suggestions might you make to help Monty get closer to his goal?

Design a budget for Monty.

If Monty follows your budget, when will they be able to purchase the bicycle?
What key factors did you consider? What tradeoffs would you suggest?

Name_______________________________ Date____________________

Number
Unit 6 Line Master 10c

Budget Makeover! (cont'd)

Monty, a university student, is having trouble saving for a goal of purchasing a bicycle.

$230

Here are Monty's earning and spending habits.

Earnings

- Gets paid $305 per week from a part-time job

Spending

- Buys a hot chocolate every weekday morning: $10 per week
- Buys lunch from a fast-food restaurant daily: $70 per week
- Goes out with friends on Friday and Saturday nights: $50 each weekend
- Goes shopping for clothes/shoes, spending about $70 per week
- Subscribes to a streaming service: $3 per week
- Purchases a bus pass: $8 per week (unlimited use)
- Buys essentials (e.g., laundry, milk, shampoo, soap): $20 per week

About how much money does Monty spend per week?

About how much money does Monety have left from his pay each week?

What is the cost of the bicycle, including tax?

Name________________________________ Date_____________________

Number
Unit 6 Line Master 10d

Budget Makeover! (cont'd)

What suggestions might you make to help Monty get closer to his goal?

Design a budget for Monty.

If Monty follows your budget, when will they be able to purchase the bicycle?
What key factors did you consider? What tradeoffs would you suggest?

Number

Activity 33 Assessment

Exploring Taxes

Exploring Taxes			
Identifies the 3 levels of government in Canada that collect taxes. "I know that Canada has federal, provincial, and municipal governments that collect taxes."	Identifies which level of government pays for different services. "Municipal government: libraries; Provincial government: provincial police; federal government: child benefits"	Estimates the total cost of items, including tax. "The two items cost about \$20. 10% of \$20 is \$2, 1% of \$20 is 20¢, so 3% is 60¢. The total cost is about \$22.60."	Calculates the total cost of items, including tax. "The two items cost \$18.99. \$18.99 × 1.13 = \$21.4587. The items cost \$21.46, including tax."
Observations/Documentation			

Activity 34 Assessment
Problem Solving with Money (BC)

Problem Solving with Money (Without Sales Tax)			
Recognizes prices involving dollars and cents. “The price of a bag of apples is $3.85.”  	Estimates the cost of transactions involving several items. “I made friendly numbers to estimate the total cost: $10 + $10 + $46 = $66. The total cost is about $66.”  	Calculates the cost of several items with prices in dollars and cents. “I made friendly numbers: $8.90 + $9.57 + $45.99 = $8.90 + $9.56 + $46 = $9 + $9.46 + $46 = $9 + $9 + $46 + $0.46 = $64.46.”  	Uses mental math strategies to estimate, calculate total cost, and determine change “To find the change from a $100 bill, I would add on from $64.45 as the amount would be rounded to the nearest 5¢. $64.45 + $0.05 =$64.50 $64.50 + $0.50 = $65 $65 + $5 = $70 $70 + $30 = $100. $0.05 + $0.50 + $5 + $30 = $35.55.”
Observations/Documentation			

Activity 34 Assessment
Problem Solving with Money (ON)

Problem Solving with Money (Including Sales Tax)			
Recognizes prices involving dollars and cents and identifies which items require sales tax. “The price of a bag of apples is $3.85. Apples don’t have sales tax added.” 	Estimates the cost of transactions involving several items, including sales tax. “I made friendly numbers to estimate the total cost: $10 + $10 + $46 = $66. Then for tax, 10% is about $7 and 3% is about $2. The total cost is about $75.”  Paint tray: $8.90 Paint roller: $9.57 Roll of kraft paper: $45.99	Calculates the cost of several items with prices in dollars and cents, including sales tax. “I made friendly numbers: $8.90 + $9.57 + $45.99 = $9 + $9.46 + $46 = $64.46. Then I used a calculator and multiplied by 1.13 to get total cost including tax: $72.84.”  Paint tray: $8.90 Paint roller: $9.57 Roll of kraft paper: $45.99	Uses mental math strategies to estimate, calculate total cost including sales tax, and determine change “To find the change from a $100 bill, I would add on from $72.85 as the amount would be rounded to the nearest 5¢. $72.85 + $0.15 =$73.00 $73 + $7 = $80 $80 + $20 = $100 $0.15 + $7 + $20 = $27.15.”
Observations/Documentation			

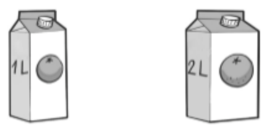
Number

Activity 35 Assessment
Credit, Debt, and Transfers

Credit, Debt, and Transfers			
Identifies ways money can be transferred. "I can transfer money in many ways such as using cash, a debit card, a gift card, and an e-Transfer." 	Explains the difference between credit and debt. "Credit is the ability to borrow money, while debt is the result of borrowing money." 	Identifies a situation as involving credit or debt and provides reasoning. Vicky received a new pair of boots as a gift. The boots didn't fit, so she returned them to the store. She was given a store gift card. "It involves credit because the store put money on a card that I can apply later to another purchase. I have money available to use."	Creates situations involving credit or debt and understands the impact of financial decisions "We needed a car, so my dad took out a loan to pay for it as we didn't have enough money in the bank. We went into debt."
Observations/Documentation			

Number

Activity 36 Assessment
Finding Best Value (Unit Rates)

Finding Best Value			
Identifies the better value by comparing prices of two sizes of the same product. “The 2-L size is the better value because it is costs just a little more than the 1-L size and you get twice as much juice.”  1 L for \$2.57 2 L for \$2.87	Identifies the better value by comparing the unit rates for two options of same product. “I divided the price by the number of bars in each package to get the price of one bar. \$2.98 ÷ 6 is about \$0.50 and \$4.47 ÷ 10 is about \$0.45. The package of 10 is the better value.”  6 for \$2.98 10 for \$4.47	Identifies the best value by comparing unit rates for several options of the same product. “Option A: \$2.98 ÷ 6 is about \$0.50. Option B: \$4.47 ÷ 10 is about \$0.45. Option C: \$10.49 ÷ 24 is about \$0.44. Option C is the best value.”  6 for \$2.98 10 for \$4.47 24 for \$10.49	Identifies the best value and realizes that the best value is not always the best option. “The best value is the box of 24 granola bars, but I live alone and 24 bars is too many for me. They would go to waste.”
Observations/Documentation			

Number

Activity 37 Assessment
Designing a Basic Budget

Designing a Basic Budget			
Identifies a financial goal. "I want to save enough money to buy a new bicycle."	Considers some factors involved in designing a budget. "I know it is important to consider how much money I earn, and how I spend money."	Designs a basic budget recognizing the importance of several factors "I know that I need to think about when I need the money, other jobs that I can do to earn more money, and any expenses that I have."	Applies key factors to design a basic budget to manage finances and inform decisions. "I want to buy a new bicycle in 2 months. I can walk my neighbour's dog to earn more money, but I need to pay back $5 a week to my Mom."
Observations/Documentation			

Activity 38 Assessment
Financial Literacy Consolidation

<table>
<tr><th colspan="4">Problem Solving with Money (Including Sales Tax)</th></tr>
<tr>
<td>Recognizes prices involving dollars and cents and identifies which items require sales tax.

“The price of a bag of apples is $3.85.
Apples don’t have sales tax added.”
</td>
<td>Estimates the cost of transactions involving several items, including sales tax.

“I made friendly numbers to estimate the total cost: $10 + $10 + $46 = $66. Then for tax, 10% is about $7 and 3% is about $2. The total cost is about $75.”
</td>
<td>Calculates the cost of several items with prices in dollars and cents, including sales tax.

“I made friendly numbers:
$8.90 + $9.57 + $45.99
= $9 + $9.46 + $46
= $64.46.
Then I used a calculator and multiplied by 1.13 to get total cost including tax: $72.84.”
</td>
<td>Uses mental math strategies to estimate, calculate total cost including sales tax, and determine change

“To find the change from a $100 bill, I would add on from $72.85 as the amount would be rounded to the nearest 5¢.
$72.85 + $0.15 =$73.00
$73 + $7 = $80
$80 + $20 = $100
$0.15 + $7 + $20 = $27.15.”</td>
</tr>
<tr><th colspan="4">Observations/Documentation</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>

Activity 38 Assessment
Financial Literacy Consolidation

Designing a Basic Budget			
Identifies a financial goal. "I want to save enough money to buy a new bicycle."	Considers some factors involved in designing a budget. "I know it is important to consider how much money I earn, and how I spend money."	Designs a basic budget recognizing the importance of several factors "I know that I need to think about when I need the money, other jobs that I can do to earn more money, and any expenses that I have."	Applies key factors to design a basic budget to manage finances and inform decisions. "I want to buy a new bicycle in 2 months. I can walk my neighbour's dog to earn more money, but I need to pay back $5 a week to my Mom."
Observations/Documentation			

Name________________________________ Date_____________________

Patterning and Algebra
Unit 1 Line Master 1

How Much Does Diego Need?

Number of Children	Number of Paper Towel Rolls	Number of Feathers	Number of Pieces of Craft Paper	Number of Dried Beans
1	1	4	3	10
2	2	8		
3	3		9	
4	4		12	40

Complete the table.

Identify the pattern rule for each type of material.

Write a mathematical expression for each pattern.

Use each expression to determine how much of each material is needed for 50 children.

Name_______________________________ Date____________________

Patterning and Algebra
Unit 1 Line Master 2a

Patterning Problems

Problem A

Dev records the time that his cricket team practises each week.
Dev forgot to record the time for Week 5.
There is a pattern in the practice times.

Week	Practice Time (min)
1	25
2	35
3	50
4	70
5	
6	125

Identify the pattern rule.

What was the practice time in Week 5? How did you find out?

Suppose the pattern continues.
What would be the practice time in Week 10?
Is this reasonable? Explain.

Name________________________________ Date_____________________

Patterning and Algebra
Unit 1 Line Master 2b

Patterning Problems (cont'd)

Problem B

Jenna's mom is training to be the soccer coach for Jenna's team. She must read the **429-page** book *The Ultimate Guide to Coaching Soccer* before the season starts on **May 16th**.
Jenna records how many pages her mom reads each day and notices a pattern.

May						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 89 pages read	2 76 pages read	3 64 pages read	4 53 pages read	5 43 pages read	6	7 26 pages read
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Identify the pattern rule.

Jenna accidentally erased the number of pages her mom read on May 6th. How many pages is this?

Suppose this pattern continues.
Will Jenna's mom finish the book in time? Explain.

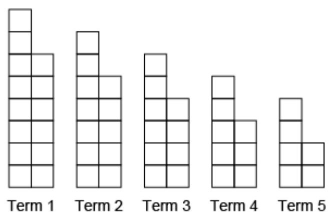
Patterning and Algebra

Activity 1 Assessment

Investigating Geometric Patterns

Generalizing and Representing Patterns

Identifies how a pattern repeats, increases, or decreases and describes pattern rule.



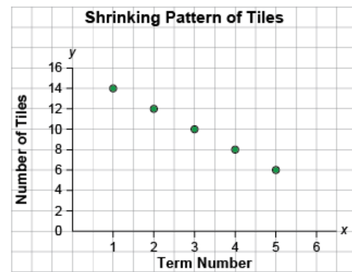
"This is a decreasing pattern. The pattern rule is: Start with 14 red tiles and take away 2 tiles each time."

Represents patterns using tables or charts and describes the pattern rule.

Term Number	Number of Tiles
1	14
2	12
3	10
4	8
5	6

"The table shows the number of tiles decreases by 2 each time."

Represents patterns using graphs and describes the pattern rule.



"By looking at the graph, I see that the number of tiles starts at 14 and decreases by 2 with each term."

Represents patterns symbolically and writes the pattern rule.

18, 17, 15, 12, 8, …

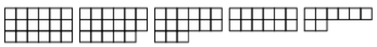
"Pattern rule: Start at 18 and take away 1. Increase the number taken away by 1 each time."

Observations/Documentation

Activity 1 Assessment
Investigating Geometric Patterns

Generalizing and Representing Patterns (cont'd)

Extends patterns using repeated addition/subtraction, multiplication, and division.



18, 17, 15, 12, 8, …

"The next term would have 8 – 5 = 3 squares. It would be the last term because I cannot take 6 away from 3. Decreasing patterns end but repeating and increasing patterns don't."

Creates patterns and explains the pattern rule.

Term Number	Picture	Number of Counters
1		1
2		4
3		9
4		16

"I created an increasing pattern with the pattern rule: Start at 1. Multiply the term number by itself."

Uses patterns to solve problems.

Term Number	Picture	Number of Counters
1		1
2		4
3		9
4		16

How many counters are in Term 8?

"64 counters; I used the rule and multiplied the term number by itself: 8 × 8 = 64."

Fluently identifies, creates, and extends various patterns to solve real-life problems.

Number of Bracelets	Number of Plain Beads	Number of Patterned Beads
1	4	12
2	8	24
3	12	36
…	…	…
8	32	96

Naomi beaded bracelets using 4 plain and 12 patterned beads.

"Plain beads: Multiply the number of bracelets by 4: 4*n*
Patterned beads: Multiply the number of bracelets by 8: 8*b*."

Observations/Documentation

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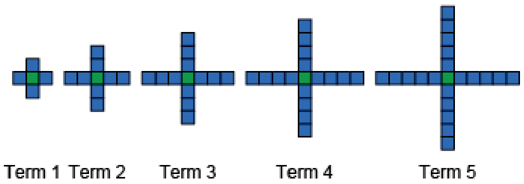
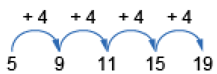
Activity 2 Assessment

Investigating Number Patterns

Number Pattern Relationships

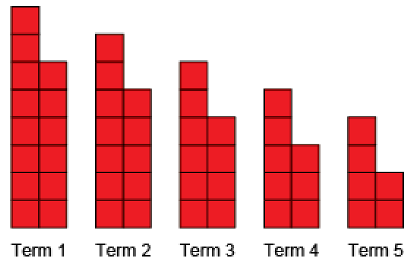
Recognizes pattern relationships in increasing patterns.

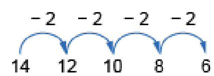




"I see a skip-counting by 4 forward relationship in the pattern. The rule is: Start with 5 tiles and add 4 tiles each time."

Recognizes pattern relationships in decreasing patterns.





"I see a skip-counting by 2 backward relationship in the pattern. The rule is: Start with 14 tiles and take away 2 tiles each time."

Identifies and describes pattern relationships in tables, charts, and diagrams.

Number of Bracelets	Number of Plain Beads	Number of Patterned Beads
1	4	12
2	8	24
3	12	36
4	16	48

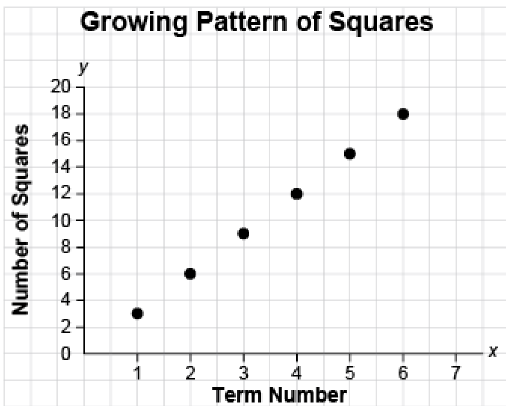
"The rule for the number of plain beads is: Multiply the number of bracelets by 4: 4*n*.
I see number relationships:
1 × 4 = 4, 2 × 4 = 8, 3 × 4 = 12, 4 × 4 = 16."

Observations/Documentation

Activity 2 Assessment
Investigating Number Patterns

Number Pattern Relationships (cont'd)

Identifies and describes pattern relationships on graphs.



"The graph shows the pattern rule: Start with 3 squares.
Multiply the term number by 3 each time.
The expression 3*t* describes the pattern relationship."

Describes patterns to illustrate the relationships among whole numbers and decimals with tenths and hundredths.

$9.00 + 0.5 + 0.06 = 9.56$

$9.00 + 0.4 + 0.16 = 9.56$

$9.00 + 0.3 + 0.26 = 9.56$

$9.00 + 0.2 + 0.36 = 9.56$

$9.00 + 0.1 + 0.46 = 9.56$

$9.00 + 0.0 + 0.56 = 9.56$

"I noticed a pattern: As the second addend decreases by 0.1, the third addend increases by 0.10, so the sum stays the same."

Fluently identifies and describes different patterns in a variety of representations.

Day	Number of Pushups	Number of Star Jumps
1	10	12
2	13	15
3	16	20
4	19	27
5	22	36
6	25	47

On which day will 40 pushups be completed?

"I wrote an expression for the pattern rule using multiplication: 3*d* + 7, where d is the day number. I substituted values for d until I got 40: 3 × 11 + 7 = 40; Day 11."

Observations/Documentation

Activity 3 Assessment

Using Pattern Rules to Solve Problems

Extending Patterns to Solve Problems

Determines the pattern rule.

100, 97, 91, 86, 70, 55, 37, 16

"The pattern rule is: Start at 100 and subtract 3. Increase the number subtracted by 3 each time."

Uses pattern rule to determine missing values.

How would you determine the missing value for week 5?

Week	Practice Time (min)
1	25
2	35 = 25 + 10
3	50 = 35 + 15
4	70 = 50 + 20
5	
6	125 = 95 + 30

"The pattern rule is: Start at 25 and add 10. Then increase the amount added by 5 each time. Week 5 is 70 + 25 = 95."

Extends patterns using mathematical expressions.

3, 8, 13, 18, 23, 28

"I can use the expression $5n - 2$ to extend the pattern, where n represents the term number. The seventh term would be $5 \times 7 - 2 = 33$."

Flexibly describes and solves problems using mathematical expressions and properties.

Input	Output
10	19
9	17
8	15
7	13
6	11
5	
4	

"To determine the output number, multiply the input number by 2 and subtract 1. I would use the expression $2n - 1$, where n is the term number, to find the missing values: $2 \times 5 - 1 = 9$, $2 \times 4 - 1 = 7$."

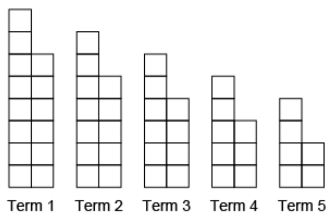
Observations/Documentation

Activity 4 Assessment

Patterning Consolidation

Generalizing and Representing Patterns

Identifies how a pattern repeats, increases, or decreases and describes pattern rule.



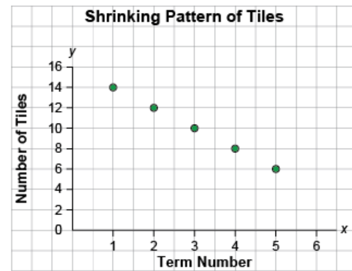
"This is a decreasing pattern. The pattern rule is: Start with 14 red tiles and take away 2 tiles each time."

Represents patterns using tables or charts and describes the pattern rule.

Term Number	Number of Tiles
1	14
2	12
3	10
4	8
5	6

"The table shows the number of tiles decreases by 2 each time."

Represents patterns using graphs and describes the pattern rule.



"By looking at the graph, I see that the number of tiles starts at 14 and decreases by 2 with each term."

Represents patterns symbolically and writes the pattern rule.

18, 17, 15, 12, 8, …

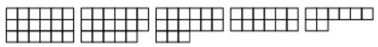
"Pattern rule: Start at 18 and take away 1. Increase the number taken away by 1 each time."

Observations/Documentation

Activity 4 Assessment
Patterning Consolidation

Generalizing and Representing Patterns (con't)

Extends patterns using repeated addition/subtraction, multiplication, and division.



18, 17, 15, 12, 8, …

"The next term would have 8 – 5 = 3 squares. It would be the last term because I cannot take 6 away from 3. Decreasing patterns end but repeating and increasing patterns don't."

Creates patterns and explains the pattern rule.

Term Number	Picture	Number of Counters
1		1
2		4
3		9
4		16

"I created an increasing pattern with the pattern rule: Start at 1. Multiply the term number by itself."

Uses patterns to solve problems.

Term Number	Picture	Number of Counters
1		1
2		4
3		9
4		16

How many counters are in Term 8?

"64 counters; I used the rule and multiplied the term number by itself: 8 × 8 = 64."

Fluently identifies, creates, and extends various patterns to solve real-life problems.

Number of Bracelets	Number of Plain Beads	Number of Patterned Beads
1	4	12
2	8	24
3	12	36
…	…	…
8	32	96

Naomi beaded bracelets using 4 plain and 12 patterned beads.

"Plain beads: Multiply the number of bracelets by 4: 4*n*
Patterned beads: Multiply the number of bracelets by 8: 8*b*."

Observations/Documentation

Activity 4 Assessment

Patterning Consolidation

Extending Patterns to Solve Problems

Determines the pattern rule.

100, 97, 91, 86, 70, 55, 37, 16

“The pattern rule is: Start at 100 and subtract 3. Increase the number subtracted by 3 each time.”

Uses pattern rule to determine missing values.

How would you determine the missing value for week 5?

Week	Practice Time (min)
1	25
2	35 = 25 + 10
3	50 = 35 + 15
4	70 = 50 + 20
5	
6	125 = 95 + 30

“The pattern rule is: Start at 25 and add 10. Then increase the amount added by 5 each time.
Week 5 is 70 + 25 = 95.”

Extends patterns using mathematical expressions.

3, 8, 13, 18, 23, 28

“I can use the expression $5n – 2$ to extend the pattern, where n represents the term number.
The seventh term would be $5 \times 7 - 2 = 33$.”

Flexibly describes and solves problems using mathematical expressions and properties.

Input	Output
10	19
9	17
8	15
7	13
6	11
5	
4	

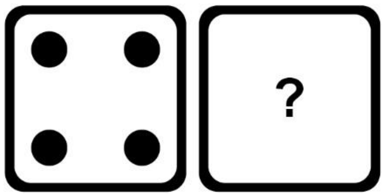
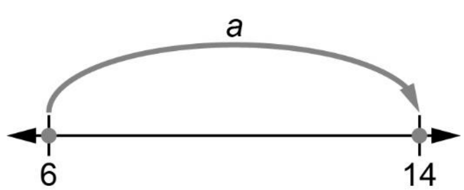
“To determine the output number, multiply the input number by 2 and subtract 1. I would use the expression $2n$-1, where n is the term number, to find the missing values:
$2 \times 5 - 1 = 9$, $2 \times 4 - 1 = 7$.”

Observations/Documentation

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 1

Using Variables

Problem or Picture	Equation
Janie rolled 10 with two number cubes.  What number was on the other cube?	
There are 12 cars in the parking lot. The cars are parked in rows of 4. How many rows are there?	
	$3a = 15$
	

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 2a

Working on It Answers

For example:

Part A

- $20 \div r = 5$
- $19 + s = 34$
- $20 = 5z$
- $20 + a = 36$
- Josie went to the dollar store to buy some craft sticks for art class.
  She needs 40 sticks and they come in packages of 8.
  How many packages should Josie buy?
- At the school's Spring Clean Up Day, 72 volunteers showed up.
  The principal arranged them onto 9 teams.
  How many volunteers are on each team?
- There is an 89-step staircase at the hiking trail.
  Edam climbed 23 steps.
  How many more steps does Edam need to take to reach the top?
- Ali counted 52 crackers left in the box.
  His siblings ate 37 crackers yesterday.
  How many crackers were there in the box to start with?

Part B

- Square: $s = 3$; Perimeter = $3 + 3 + 3 + 3 = 12$ units,
  Area = $3 \times 3 = 9$ square units
- Rectangle: $l = 2$, $w = 6$; Perimeter = $2 \times 2 + 2 \times 6 = 16$ units,
  Area = $2 \times 6 = 12$ square units

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 2b

Working on It **Answers** (cont'd)

Accommodation

- $10 = 3 + n$
- $12 \div r = 4$
- I gave 15 pencils to my 3 friends.
  I gave each friend the same number of pencils.
  How many pencils did I give to each friend?
- $6 + a = 14$

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 3

Solving Equations

$n + 3 = 10$
$12 - p = 9$
$9 = 3 + r$
$10 = s - 8$

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 4

Working on It Answers

Part A

$n = 6$

$t = 11$

$p = 20$

$d = 5$

Part B

$n = 18$

$p = 27$

$q = 24$

$r = 14$

Accommodation

$n = 7$

$p = 3$

$r = 6$

$s = 18$

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 5a

Tic-Tac-Toe Gameboard 1

(One-Step Equations)

$m = 24 \div 3$	$6 \times c = 42$	$5p = 50$
$6 = n \div 5$	$49 = 7 \times k$	$b = 72 \div 9$
$36 = 4 \times t$	$35 \div s = 5$	$11e = 44$

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 5b

Tic-Tac-Toe Gameboard 2

(Two-Step Equations)

$m + 2 = 24 \div 3$	$26 - 6c = 4$	$4p - 6 = 38$
$5 = \frac{d}{4}$	$49 = 2n - 3$	$4b = 72 \div 9$
$40 = 4t + 8$	$s \div 3 = 8$	$\frac{k}{5} - 6 = 1$

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 5c

Tic-Tac-Toe Gameboard 3

$a = 6 \div 3$	$4 \times b = 12$	$15 = 3 \times c$
$2 = d \div 4$	$16 = 8 \times e$	$f = 6 \times 2$
$9 \div g = 3$	$h \div 2 = 5$	$12 \div 3 = k$

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 5d

Tic-Tac-Toe Gameboard 4

$t = 6$	$n = 24$	$e = 10$
$y = 8$	$x = 36$	$r = 12$
$v = 21$	$p = 7$	$w = 9$

Name________________________________ Date______________________

Master 6

Working on It Answers

On-Grade (One-Step Equations)

$m = 24 \div 3$; $m = 8$
$6 \times c = 42$; $c = 7$
$5p = 50$; $p = 10$
$6 = n \div 5$; $n = 30$
$49 = 7 \times k$; $k = 7$
$b = 72 \div 9$; $b = 8$
$36 = 4 \times t$; $t = 9$
$35 \div s = 5$; $s = 7$
$11e = 44$; $e = 4$

On-Grade (Two-Step Equations)

$m + 2 = 24 \div 3$; $m = 6$
$28 - 6c = 4$; $c = 4$
$4p - 6 = 38$; $p = 11$
$5 = \frac{d}{4}$; $d = 20$
$49 = 2n - 3$; $n = 26$
$4b = 72 \div 9$; $b = 2$
$40 = 4t + 8$; $t = 8$
$s \div 3 = 8$; $s = 24$
$\frac{k}{5} - 6 = 1$; $k = 35$

Accommodation

$a = 6 \div 3$; $a = 2$
$4 \times b = 12$; $b = 3$
$15 = 3 \times c$; $c = 5$
$2 = d \div 4$; $d = 8$
$16 = 8 \times e$; $e = 2$
$f = 6 \times 2$; $f = 12$
$9 \div g = 3$; $g = 3$
$h \div 2 = 5$; $h = 10$
$12 \div 3 = k$; $k = 4$

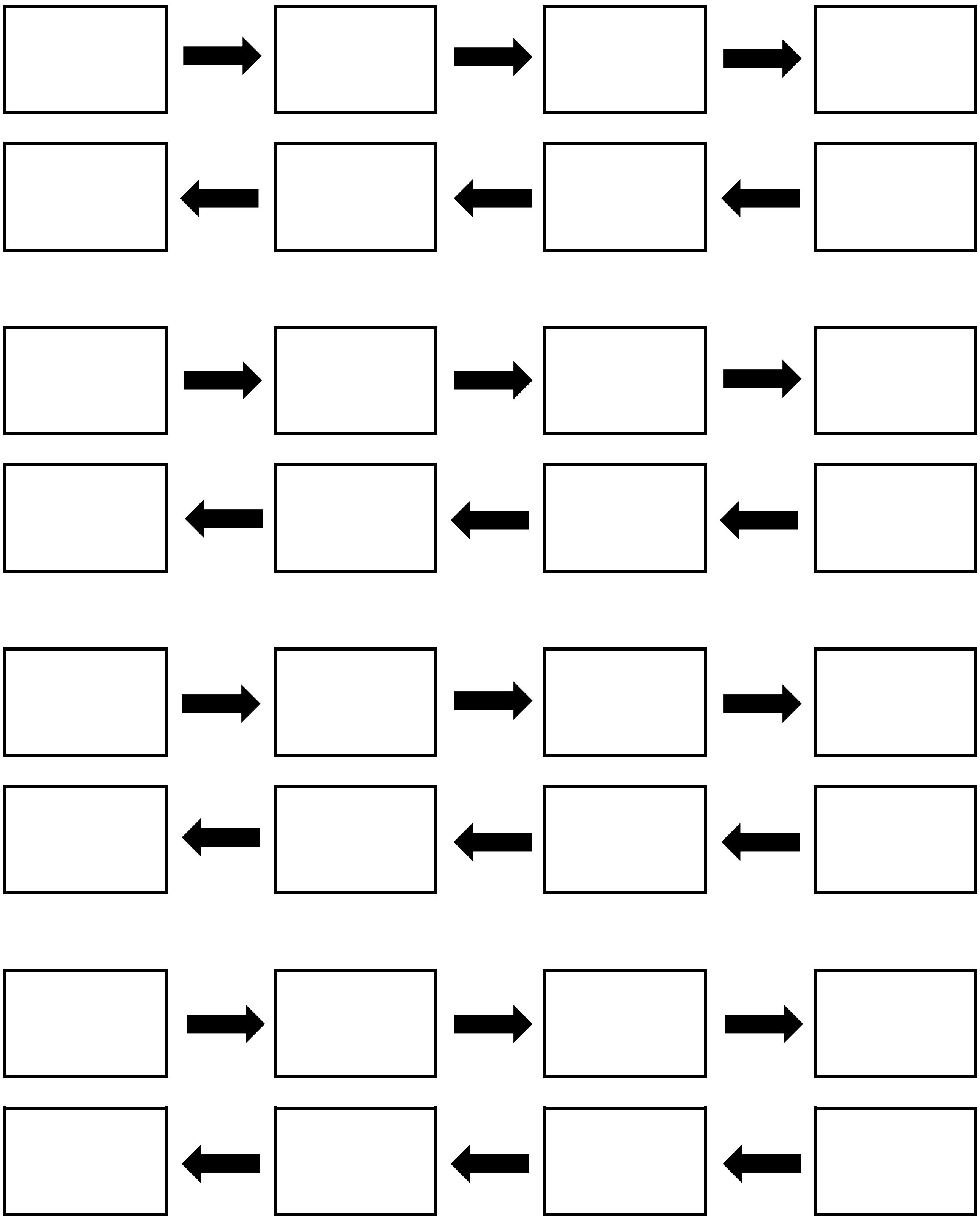
Extension

For example:
$t = 6$; $66 \div t = 11$
$n = 24$; $n \div 4 = 6$
$e = 10$; $10e = 100$
$y = 8$; $96 = 12y$
$x = 36$; $18 = x \div 2$
$r = 12$; $3r = 42 - 6$
$v = 21$; $3 \times 7 = v$
$p = 7$; $\frac{p}{7} = 1$
$w = 9$; $35 - 8 = 3w$

Name________________________________ Date______________________

Master 7

Flow Charts



Name________________________________ Date_____________________

Master 8

Story Problems

Accommodation

Amy will be 10 years old in 2 years.
How old is Amy now?

Devon had 12 tickets to play games at the fun fair.
All games cost the same number of tickets.
Devon played 3 games.
How many tickets are needed to play 1 game?

Cary woke up to 9 text messages.
He replied to some of them.
There are still 5 unread texts.
How many texts did Cary reply to?

In 5 days, Dani packed 15 lunch boxes for a charity.
Each day, she packed the same number of boxes.
How many lunch boxes did Dani pack in 1 day?

Name______________________________ Date____________________

Master 9

Working on It Answers

For example:

On-Grade

$a + 5 = 16$, $a = 11$; Amy is 11 years old now.

$36 \div t = 9$, $t = 4$; 4 tickets are needed to play one game.

$23 - n = 11$, $n = 12$; Cary replied to 12 text messages.

$42 \div b = 6$, $b = 7$; Dani packed 7 lunch boxes in one day.

Accommodation

$a + 2 = 10$; $a = 8$, Amy is 8 years old now.

$12 \div t = 3$, $t = 4$; 4 tickets are needed to play one game.

$9 - n = 5$, $n = 4$; Cary replied to 4 text messages.

$15 \div b = 5$, $b = 3$; Dani packed 3 lunch boxes in one day.

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 10a

Inequality Cards

$a + 4 \geq 5$	$15 - b \leq 6$	$12c > 48$	$\frac{d}{4} < 2$
$7 < e + 2$	$9 > f - 2$	$44 > 11g$	$3 < \frac{h}{5}$
$2 + i \leq 8$	$2 < 12 - j$	$9k \leq 63$	$5 \leq \frac{m}{4}$
$10 > 9 + n$	$p - 2 \geq 12$	$27 \leq 3q$	$\frac{r}{7} \leq 2$

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 10b

Inequality Cards (cont'd)

$a + 4 \geq 5$	$7 - b \leq 3$	$2c > 6$
$\frac{d}{2} < e + 2$	$6 > f - 2$	$14 > 12g$
$7 < e + 2$	$1 < \frac{h}{5}$	$2 + i \leq 8$

Name_________________________________ Date______________________

Patterning and Algebra
Unit 2 Line Master 11a

Inequality Gameboard

1	10	20	9
14	2	13	8
18	19	3	12
17	7	11	4

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 11b

Inequality Gameboard (cont'd)

1	2	7
4	2	6
8	9	3

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 12

Working on It Answers

On-Grade

$a + 4 \geq 5$; $a \geq 1$

$15 - b \leq 6$; $b \geq 9$

$12c > 48$; $c > 4$

$\frac{d}{4} < 2$; $d < 8$

$7 < e + 2$; $e > 5$

$9 > f - 2$; $f < 11$

$44 > 11g$; $g < 4$

$3 < \frac{h}{5}$; $h > 15$

$2 + i \leq 8$; $i \leq 6$

$2 < 12 - j$; $j < 10$

$9k \leq 63$; $k \leq 7$

$5 \leq \frac{m}{4}$; $m \geq 20$

$10 > 9 + n$; $n < 1$

$p - 2 \geq 12$; $p \geq 14$

$27 \leq 3q$; $q \geq 9$

$\frac{r}{7} \leq 2$; $r \leq 14$

Accommodation

$\mathrm{a} + 4 \geq 5$; $a \geq 1$

$7 - b \leq 3$; $b \geq 4$

$2c > 6$; $c > 3$

$\frac{d}{2} < 3$; $d < 6$

$6 > f - 2$; $f < 8$

$14 \geq 2g$; $g \leq 7$

$7 < e + 2$; $e > 5$

$1 < \frac{h}{5}$; $h > 5$

$2 + i \leq 8$; $i \leq 6$

Name________________________________ Date_____________________

Patterning and Algebra
Unit 2 Line Master 13a

One-Step Equations
Answers

$4x = 44$ $x = 11$	$37 - y = 18$ $y = 19$
$p + 19 = 41$ $p = 22$	$8 = n \div 7$ $n = 56$

$r \times 9 = 63$ $r = 7$	$s - 11 = 38$ $s = 49$
$27 = 14 + t$ $t = 13$	$96 \div v = 12$ $v = 8$

$75 = 5u$ $u = 15$	$25 = 49 - w$ $w = 24$
$13 + y = 42$ $y = 29$	$80 \div m = 16$ $m = 5$

Name________________________________ Date______________________

Patterning and Algebra
Unit 2 Line Master 13b

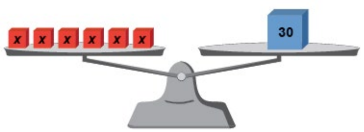
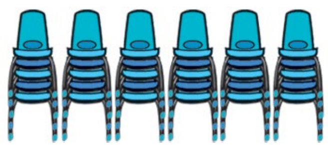
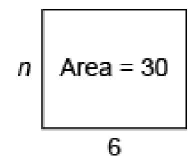
Two-Step Equations and Inequalities Answers

$3x + 2 = 32$ $x = 10$	$47 - y = 15 + 7$ $y = 25$
$45 - h < 14$ $h > 31$	$5 = n \div 15$ $n = 75$

$7a = 42$ $a = 6$	$24 + 39 = 9 \times b$ $b = 7$
$6n \geq 25 + 11$ $n \geq 6$	$51 - 21 = c + 18$ $c = 12$

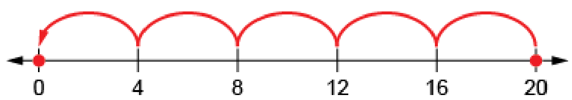
$39 = 7e + 4$ $e = 5$	$g - 13 = 42 \div 6$ $g = 20$
$48 \div d < 4$ $d > 12$	$78 = 13 \times h$ $h = 6$

Activity 5 Assessment
Using Variables

Using Variables to Represent a Problem as an Equation			
Interprets word problems/pictures and identifies the unknown part. Our class needs to set up rows of 6 chairs for a presentation. There are 30 chairs altogether. How many rows do we need?  "The unknown is the number of rows of 6 chairs needed to make an array of 30 chairs."	Translates word problems into equations using variables, operations, and numbers.  "The unknown, *n*, is the number of rows. I know there are 6 chairs in each row and a total of 30 chairs. So, $6n = 30$."	Interprets and uses visual representations to describe equivalent relationships using more than one equation (including formulas).  "I know the area of a rectangle is base multiplied by height, which is 30. If the base is 6, then the height must be *n*. I could write the equation $30 = 6n$ or $30 \div 6 = n$."	Flexibly writes algebraic equations using a variety of strategies. $6n = 30$ $30 \div n = 6$ "I can use the inverse operation to rewrite the equation."
Observations/Documentation			

Patterning and Algebra

Activity 6 Assessment
Solving Addition and Subtraction Equations

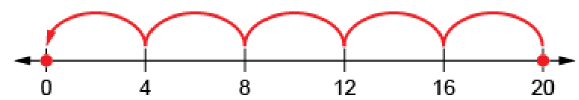
Solving for Unknowns in Equations		
Uses 'guess and check.' $3n = 72$ "I know 3 times 20 is 60. So, n must be more than 20. $3 \times 30 = 90$ (too high) $3 \times 25 = 75$ (too high, but close) $3 \times 24 = 72$ So, $n = 24$ because $3 \times 24 = 72$."	Uses the balance model. $3n = 72$ $72 \div 3 = n$ or $27 + n = 45$ $45 - 27 = n$ "I used a balance model. I moved the numbers and variable around until the equations were equivalent and I could find the solution."	Uses relationships among operations (inverse operations, associative property).  "I rewrote the equation as a division equation: $20 \div 4 = ■$."
Observations/Documentation		

Activity 6 Assessment
Solving Addition and Subtraction Equations

Solving for Unknowns in Equations (cont'd)		
Uses a flow chart to solve by decomposing and recomposing numbers. *n* → Multiply by 3 → 72 24 ← Divide by 3 ← 72 "I can decompose the equation into parts using the flow chart, then reverse the flow using the inverse operation to solve for the unknown."	Interprets and writes a statement for a given equation and solves for the unknown. $n \div 5 = 8$ "I collected a jar full of shells. I shared the shells with 5 of my friends. Each person got 8 shells. How many shells did I collect for my friends?	Flexibly uses multiple strategies to solve equations. $54 \div n - 6 = 3$ "$54 \div n = 3 + 6$ so, $54 \div n = 9$. I then rearranged the equation: $n \times 9 = 54$, so $n = 6$ because $6 \times 9 = 54$."
Observations/Documentation		

Patterning and Algebra

Activity 7 Assessment
Solving Multiplication and Division Equations

Solving for Unknowns in Equations		
Uses 'guess and check.' $3n = 72$ "I know 3 times 20 is 60. So, *n* must be more than 20. 3 × 30 = 90 (too high) 3 × 25 = 75 (too high, but close) 3 × 24 = 72 So, *n* = 24 because 3 × 24 =72."	Uses the balance model. $3n = 72$ $72 \div 3 = n$ or $27 + n = 45$ $45 - 27 = n$ "I used a balance model. I moved the numbers and variable around until the equations were equivalent and I could find the solution."	Uses relationships among operations (inverse operations, associative property).  "I rewrote the equation as a division equation: 20 ÷ 4 = ■."
Observations/Documentation		

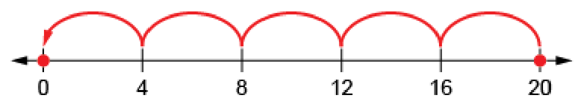
Activity 7 Assessment
Solving Multiplication and Division Equations

Solving for Unknowns in Equations (cont'd)		
Uses a flow chart to solve by decomposing and recomposing numbers. n → Multiply by 3 → 72 24 ← Divide by 3 ← 72 "I can decompose the equation into parts using the flow chart, then reverse the flow using the inverse operation to solve for the unknown."	Interprets and writes a statement for a given equation and solves for the unknown. $n \div 5 = 8$ "I collected a jar full of shells. I shared the shells with 5 of my friends. Each person got 8 shells. How many shells did I collect for my friends?	Flexibly uses multiple strategies to solve equations. $54 \div n - 6 = 3$ "$54 \div n = 3 + 6$ so, $54 \div n = 9$. I then rearranged the equation: $n \times 9 = 54$, so $n = 6$ because $6 \times 9 = 54$."
Observations/Documentation		

Patterning and Algebra

Activity 8 Assessment

Using Equations to Solve Problems

Solving for Unknowns in Equations		
Uses 'guess and check.' $3n = 72$ "I know 3 times 20 is 60. So, n must be more than 20. $3 \times 30 = 90$ (too high) $3 \times 25 = 75$ (too high, but close) $3 \times 24 = 72$ So, $n = 24$ because $3 \times 24 = 72$."	Uses the balance model. $3n = 72$ $72 \div 3 = n$ or $27 + n = 45$ $45 - 27 = n$ "I used a balance model. I moved the numbers and variable around until the equations were equivalent and I could find the solution."	Uses relationships among operations (inverse operations, associative property).  "I rewrote the equation as a division equation: $20 \div 4 = \blacksquare$."
Observations/Documentation		

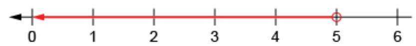
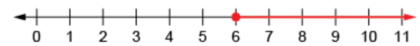
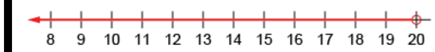
Activity 8 Assessment

Using Equations to Solve Problems

Solving for Unknowns in Equations (cont’d)		
Uses a flow chart to solve by decomposing and recomposing numbers. n → Multiply by 3 → 72 24 ← Divide by 3 ← 72 “I can decompose the equation into parts using the flow chart, then reverse the flow using the inverse operation to solve for the unknown.”	Interprets and writes a statement for a given equation and solves for the unknown. $n \div 5 = 8$ “I collected a jar full of shells. I shared the shells with 5 of my friends. Each person got 8 shells. How many shells did I collect for my friends?	Flexibly uses multiple strategies to solve equations. $54 \div n - 6 = 3$ “$54 \div n = 3 + 6$ so, $54 \div n = 9$. I then rearranged the equation: $n \times 9 = 54$, so $n = 6$ because $6 \times 9 = 54$.”
Observations/Documentation		

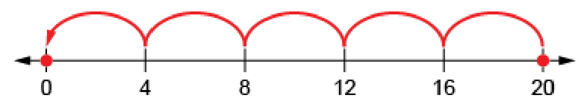
Patterning and Algebra

Activity 9 Assessment
Solving and Graphing Inequalities

Solving and Graphing for Inequalities			
Recognizes inequality symbols and their meanings in various inequality equations. $3m > 18$ $3m \geq 18$ "Each time, the unknown can be any number greater than 6. In the second equation, it could also be 6. There are many quantities that would work."	Represents solutions by graphing on a number line and tests values to check solutions. $25 > 5m$  "The unknown multiplied by 5 must be less than 25. I can count by groups of 5 to get to 25. So, the unknown is 1, 2, 3, or 4."	Verifies the solution by thinking of related equality and testing numbers. $3m \geq 18$  "I can use the number line to graph the solution. I know 3 × 6 = 18. So, the unknown can be any number equal to or greater than 6."	Flexibly solves inequalities, then verifies and graphs the solutions. $5 > \frac{n}{4}$  "What number can I divide by 4 so that the answer is less than 5? I can rearrange the equation to find the unknown: 5 × 4 > *n*"
Observations/Documentation			

Patterning and Algebra

Activity 10 Assessment
Variables and Equations Consolidation

Solving for Unknowns in Equations		
Uses ‘guess and check.’ 3n = 72 “I know 3 times 20 is 60. So, n must be more than 20. 3 × 30 = 90 (too high) 3 × 25 = 75 (too high, but close) 3 × 24 = 72 So, *n* = 24 because 3 × 24 =72.”	Uses the balance model. 3*n* = 72 72 ÷ 3 = *n* or 27 + *n* = 45 45 – 27 = *n* “I used a balance model. I moved the numbers and variable around until the equations were equivalent and I could find the solution.”	Uses relationships among operations (inverse operations, associative property).  “I rewrote the equation as a division equation: 20 ÷ 4 = ■.”
Observations/Documentation		

Activity 10 Assessment
Variables and Equations Consolidation

<table>
<tr><th colspan="3">Solving for Unknowns in Equations (con't)</th></tr>
<tr>
<td>Uses a flow chart to solve by decomposing and recomposing numbers.

n → Multiply by 3 → 72
24 ← Divide by 3 ← 72

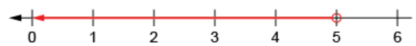
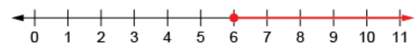
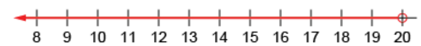
"I can decompose the equation into parts using the flow chart, then reverse the flow using the inverse operation to solve for the unknown."</td>
<td>Interprets and writes a statement for a given equation and solves for the unknown.

$n \div 5 = 8$

"I collected a jar full of shells. I shared the shells with 5 of my friends. Each person got 8 shells. How many shells did I collect for my friends?</td>
<td>Flexibly uses multiple strategies to solve equations.
$54 \div n - 6 = 3$

"$54 \div n = 3 + 6$ so, $54 \div n = 9$.
I then rearranged the equation:
$n \times 9 = 54$, so $n = 6$ because $6 \times 9 = 54$."</td>
</tr>
<tr><th colspan="3">Observations/Documentation</th></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Activity 10 Assessment
Variables and Equations Consolidation

Solving and Graphing for Inequalities			
Recognizes inequality symbols and their meanings in various inequality equations. $3m > 18$ $3m \geq 18$ "Each time, the unknown can be any number greater than 6. In the second equation, it could also be 6. There are many quantities that would work."	Represents solutions by graphing on a number line and tests values to check solutions. $25 > 5m$  "The unknown multiplied by 5 must be less than 25. I can count by groups of 5 to get to 25. So, the unknown is 1, 2, 3, or 4."	Verifies the solution by thinking of related equality and testing numbers. $3m \geq 18$  "I can use the number line to graph the solution. I know 3 × 6 = 18. So, the unknown can be any number equal to or greater than 6."	Flexibly solves inequalities, then verifies and graphs the solutions. $5 > \frac{n}{4}$  "What number can I divide by 4 so that the answer is less than 5? I can rearrange the equation to find the unknown: 5 × 4 > *n*"
Observations/Documentation			

Name________________________________ Date_____________________

Master 1a

Coding Routines

What is this code sequence for?

Code
Start machine
Put in detergent
Choose water temperature
Load washing machine
Open lid
Close lid
Unload washing machine
Open lid

If this code was for doing a load of laundry at your home, would it be in the correct order?

How might you reorganize the steps in the code so that it is accurate? Is more than one sequence possible? Explain.

When we are looking for mistakes/errors in code, we are **debugging**.

Do Part A of the activity.
Use the coding templates on the next page.

Name________________________________ Date_____________________

Master 1b

Coding Routines (cont'd)

Code: Reading a book

Code:

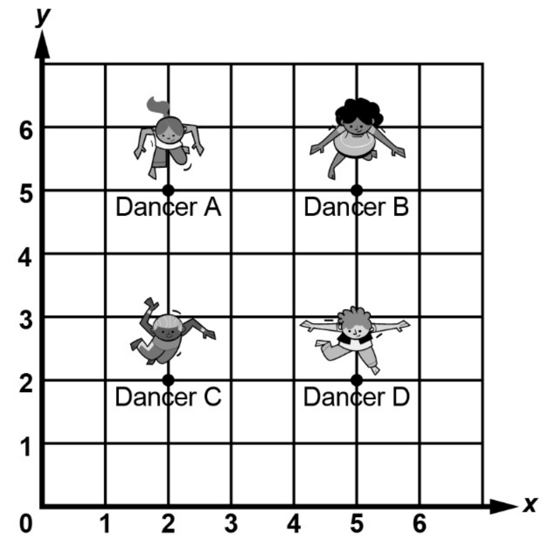
Name______________________________ Date____________________

Master 2a

Dance Code Sequences

Dance 1: Whole Class

Face upward on the grid. For example, Dancer A will start facing towards location (2,6).



Repeat 2

Glide 1 step forward.

Glide 1 step to the left.

Dance your way 2 steps back.

Glide 2 steps to the right.

Repeat 2

Dance your way 1 step forward.

Dance your way 1 step back.

End Repeat

Glide 1 step to the left.

End Repeat

Crisscross.

Jump a half turn.

Visualize and dance the code.

Will Dancer A ever be on (3,3) on the coordinate grid?

Where will Dancer D be after “Dance your way 2 steps back”?

Will Dancer C ever be where Dancer B started?

Name________________________________ Date_____________________

Master 2b

Dance Code Sequences (cont'd)

How is each coding event incorporated into the dance routine?

Sequential events: the dance is a sequence.

Concurrent events: all dancers are doing the same moves, so they'll always be the same distance away from each other.

Repeats: the sequence repeats 2 times, which gets the dancers back to the beginning and has them doing the dance 3 times in total

Nested events: the step forward and back within the repeat of the whole dance sequence is a nested repeating event.

Name______________________________ Date____________________

Master 2c

Dance Code Sequences (cont'd)

Dance 2: Whole Class or Groups of Four

Code: Dancer A	Code: Dancer B	Code: Dancer C	Code: Dancer D
Face forward (as if you are moving higher on the *y*-axis).	Face forward (as if you are moving higher on the *y*-axis).	Face forward (as if you are moving higher on the *y*-axis).	Face forward (as if you are moving higher on the *y*-axis).
Dance 1 step back.	Move 1 step forward.	Dance 1 step back.	Move 1 step forward.
Glide 1 step left.	Glide 1 step right.	Glide 1 step left.	Glide 1 step right.
Move 1 step forward.	Dance 1 step back.	Move 1 step forward.	Dance 1 step back.
Glide 2 steps right.	Glide 2 steps left.	Glide 2 steps right.	Glide 2 steps left.
Jump a half turn.	Jump a half turn.	Crisscross.	Crisscross.
Crisscross.	Crisscross.	Jump up.	Jump up.
Dance 1 step forward.	Dance 1 step forward.	Dance 1 step forward.	Dance 1 step forward.

Visualize the dance. Talk about how the dancers are moving in relation to one another. What visualizing and tracking strategies are you using?

In groups of four, dance the code sequence.
Talk about what you notice.

Name________________________________ Date_____________________

Master 2d

Dance Code Sequences (cont'd)

Dance 3: Whole Class or Groups of Four

Code: Dancer A	**Code: Dancer B**	**Code: Dancer C**	**Code: Dancer D**
Face forward (as if you are moving higher on the *y*-axis).	Face forward (as if you are moving higher on the *y*-axis).	Face forward (as if you are moving higher on the *y*-axis).	Face forward (as if you are moving higher on the *y*-axis).
Dance 1 step back.	Dance 1 step back.	Move 1 step forward.	Move 1 step forward.
Glide 1 step right.	Glide 1 step right.	Glide 1 step left.	Glide 1 step left.
Dance 1 step back.	Dance 1 step back.	Crisscross.	Crisscross.
Glide 2 steps right.	Glide 2 steps left.	Glide 2 steps right.	Glide 2 steps left.
Dance 1 step forward.	Dance 1 step forward.	Dance 1 step forward.	Dance 1 step forward.

Predict the dancers' movements.
Will the dance work? Will any dancers be in the same location on the coordinate grid at the same time? Explain.

Dance the code to check.

Name______________________________ Date____________________

Master 2e

Dance Code Sequences (cont'd)

Alter the Code: Groups of Four

Alter the code for Dance 3 to make it your own.
Make sure that dancers don't bump into each other on the "dance floor!"

At some point in your dance, all the dancers should:

- all be doing different moves
- all be doing the same move

You might:

- adjust the sequence
- add new blocks
- change the numbers of the existing blocks
- add repeats
- alter the starting location of the dancers.

Talk about the changes you are considering and what impact they will have on your dance.

It is important to work back and forth between the code sequence and the outcome of the code (the dance itself).

Name_______________________________ Date____________________

Master 2f

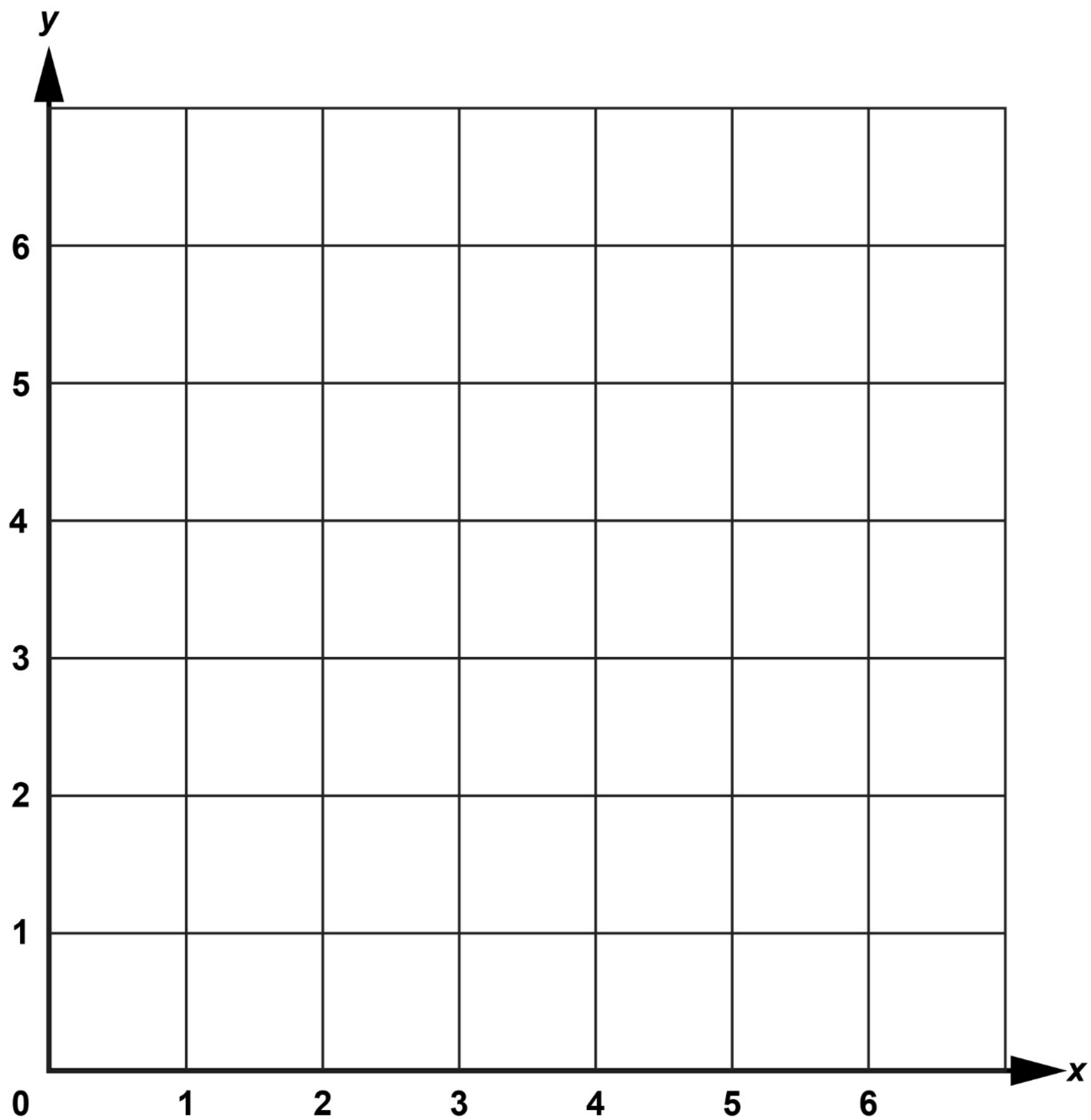
Dance Code Sequences (cont'd)

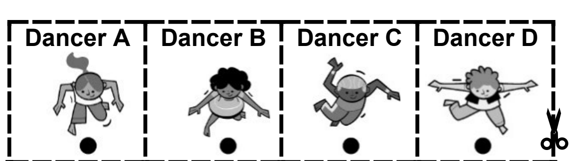
Code: Dancer A	**Code: Dancer B**	**Code: Dancer C**	**Code: Dancer D**
Face forward (as if you are moving higher on the *y*-axis).	Face forward (as if you are moving higher on the *y*-axis).	Face forward (as if you are moving higher on the *y*-axis).	Face forward (as if you are moving higher on the *y*-axis).
Dance 1 step back.	Dance 1 step back.	Move 1 step forward.	Move 1 step forward.
Glide 1 step right.	Glide 1 step right.	Glide 1 step left.	Glide 1 step left.
Dance 1 step back.	Dance 1 step back.	Crisscross.	Crisscross.
Glide 2 steps right.	Glide 2 steps left.	Glide 2 steps right.	Glide 2 steps left.
Dance 1 step forward.	Dance 1 step forward.	Dance 1 step forward.	Dance 1 step forward.

Name________________________________ Date_____________________

Master 3

Coordinate Grid and Dancers





Name________________________________ Date_____________________

Master 4

Dance Code

Recording Sheet

Dancer D							
Dancer C							
Dancer B							
Dancer A							

Name________________________________ Date_____________________

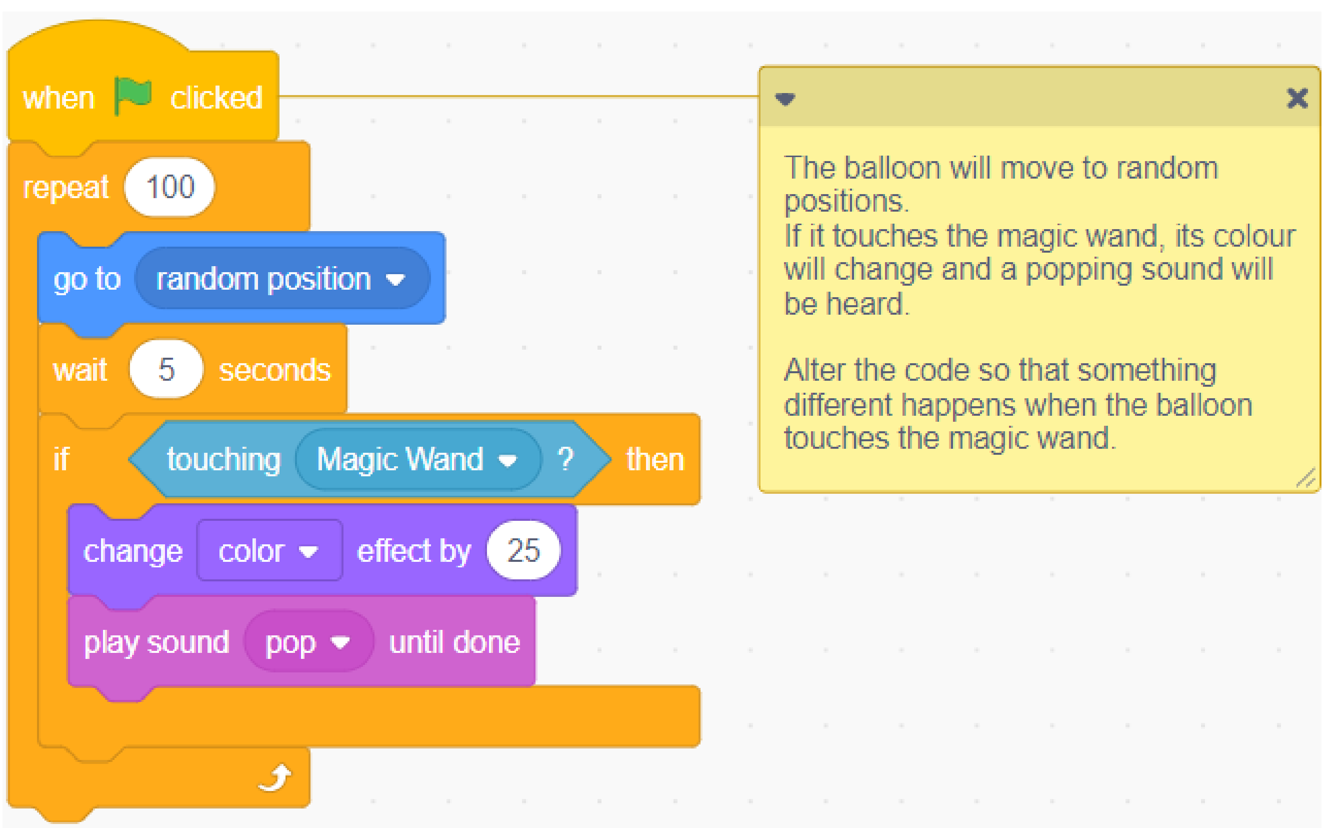
Master 5a

Conditional Statement in Action

Check out this Scratch application that contains a simple conditional statement as a class. Click on the link to access the application.
https://scratch.mit.edu/projects/681175170/editor/

In this application, when the green flag is clicked to execute the code, a balloon moves to random positions around the stage. It does this 100 times, as the repeat is set to 100.

The conditional statement is inside of a repeated event, so we have something called a “nested event”, where one event – a conditional statement - is inside of another – a repeat.



Name______________________________ Date____________________

Master 5b

Conditional Statement in Action

Here is the conditional statement that we see in the Scratch code written in *pseudocode:

If the balloon is touching the magic wand then
the balloon will change colour
and a pop sound will be heard.

*Pseudocode is often used by computer programmers when they plan out their code. It is an intermediary between everyday language and coding language.

1. How might you alter the code so that something different happens when the balloon touches the magic wand?

2. How else might you alter the code?

Name________________________________ Date_____________________

Master 6a

Naming Quadrilaterals

Chart: Rules for naming quadrilaterals

Conditions	**Closed shape and 4 sides**	**Opposite sides are equal**	**All angles are 90°**	**All sides are equal**
Open Shape	False	False	False	False
Quadrilateral	True	False	False	False
Parallelogram	True	True	False	False
Rectangle	True	True	True	False
Square	True	True	True	True

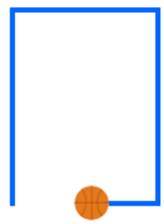
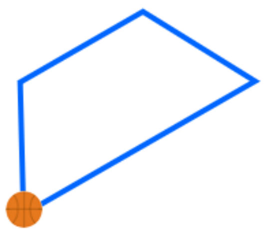
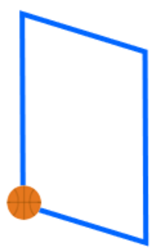
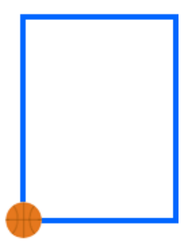
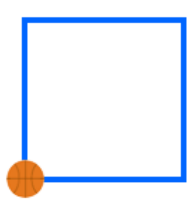
List of Terms:
Open Shape, Quadrilateral, Parallelogram, Rectangle, Square

Name________________________________ Date_____________________

Master 6b

Naming Quadrilaterals

Label the shapes based on the information in the chart.

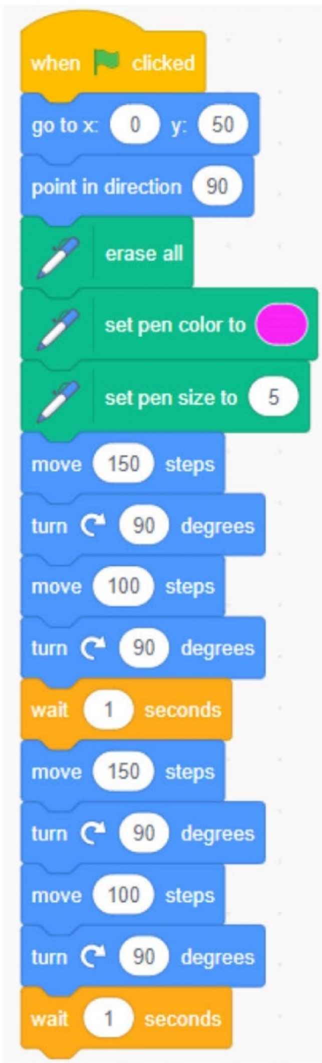
Name________________________________ Date_____________________

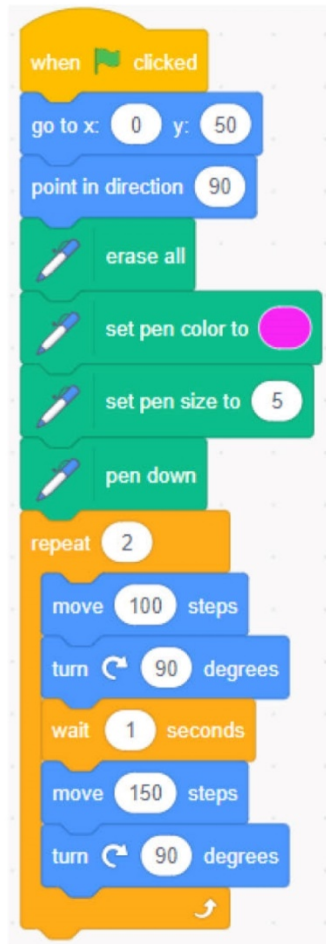
Master 7a

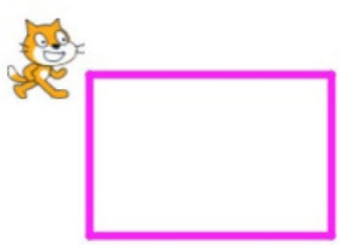
Making Shapes

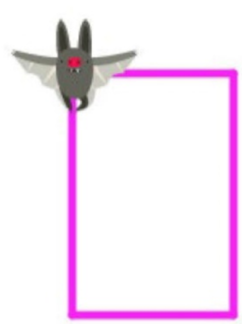
Using a Block-Coding Program

Which of the images below did each set of block code create?
How do you know?









Name________________________________ Date_____________________

Master 7b

Making Shapes

Using a Block-Coding Program

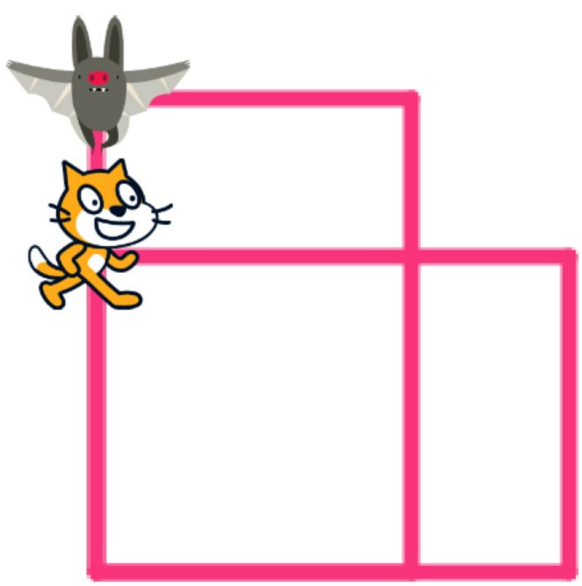
How are the code sequences alike? How are they different?

What do you think *move*, *turn*, *repeat*, and *point in direction* might mean?

Notice the colour coding that is used to organize blocks according to function: blue indicates Motion blocks; orange indicates Control blocks, and dark green indicates Pen.

Click on the link: https://scratch.mit.edu/projects/481518787/ ,

then click  at the top of the page to run both code sequences concurrently. Discuss what happens.
Does this help you decide which code goes with which sprite (Cat or Bat)? Explain.



Name________________________________ Date_____________________

Master 7c

Making Shapes

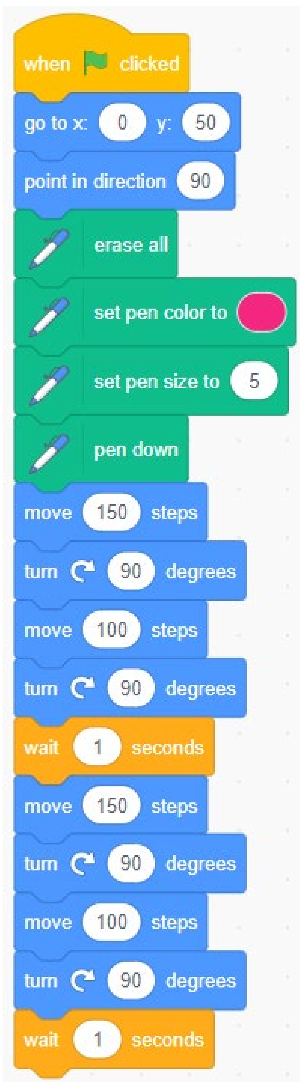
Using a Block-Coding Program

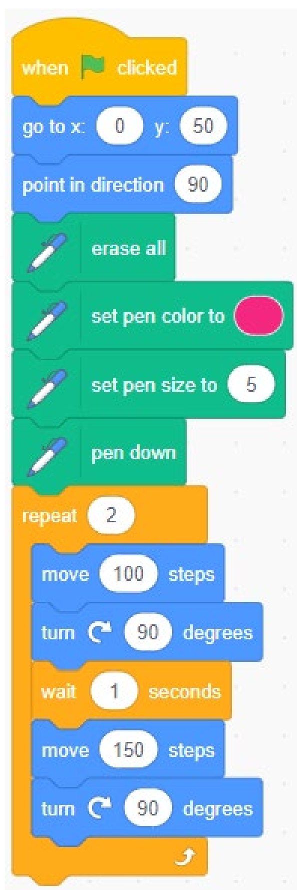
Part A: Altering Code to Make Matching Rectangles

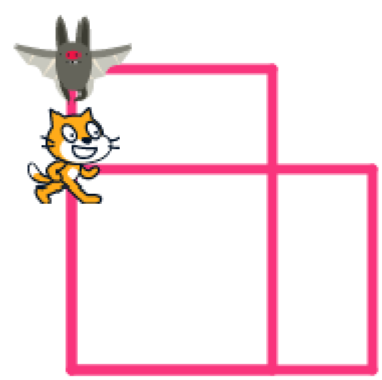
In the program you looked at as a class, Cat and Bat are drawing rectangles.

When both code sequences are run at the same time, the rectangles overlap.

You are going to investigate how you might alter the code so the rectangles match exactly.







Name________________________________ Date_____________________

Master 7d

Making Shapes (cont'd)

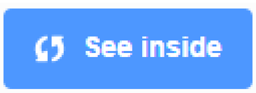
Using a Block-Coding Program

What to Do

Work with your partner.

Modify this existing project:
https://scratch.mit.edu/projects/481518787/

- Log in if your teacher would like you to.
- Click **See Inside** to alter the code

  or, if you've logged into Scratch, click **Remix** to get your own copy of this project.

- Alter the code so that the rectangles overlap and match exactly.
- Change some of the numbers, then see how your changes impact the outcome (what Cat or Bat draws).
- Talk about what you're changing and why.
  Change just 1 thing at a time!

Did you use a Repeat Block to make the code more efficient? Explain.

Challenge:

Alter the code to make different overlapping quadrilaterals.

Name________________________________ Date_____________________

Master 7e

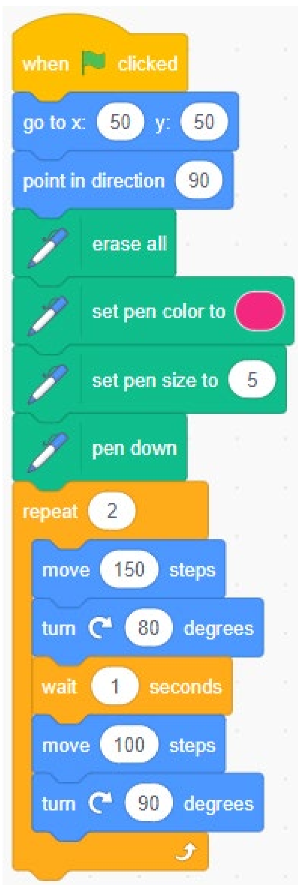
Making Shapes (cont'd)

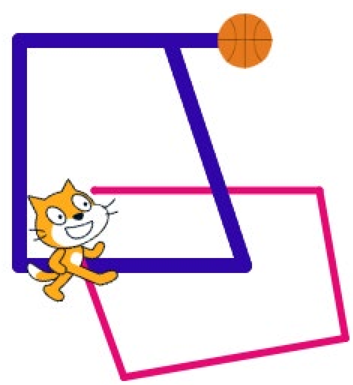
Using a Block-Coding Program

Part B: Altering Code to Make Different Quadrilaterals

Modify this existing project:
https://scratch.mit.edu/projects/552699263/

Cat and Basketball are trying to create quadrilaterals.





What do you notice about these code sequences?
How do you change the pen colour? Thickness?
Notice the repeat and the glide to (x,y).

Name______________________________ Date____________________

Master 7f

Making Shapes (cont'd)

Using a Block-Coding Program

Are both shapes actual quadrilaterals?

Alter the code sequences to create different quadrilaterals.

Then, alter the code so that Cat's quadrilateral and Basketball's quadrilateral don't overlap.

When altering concurrent code that incorporates the **erase all** block,

you might find it easier to remove the erase all block and put it to the side. You can always click it in between executing (running) the code each time.

Challenge:

Create different quadrilaterals or try making triangles.

Name_______________________________ Date____________________

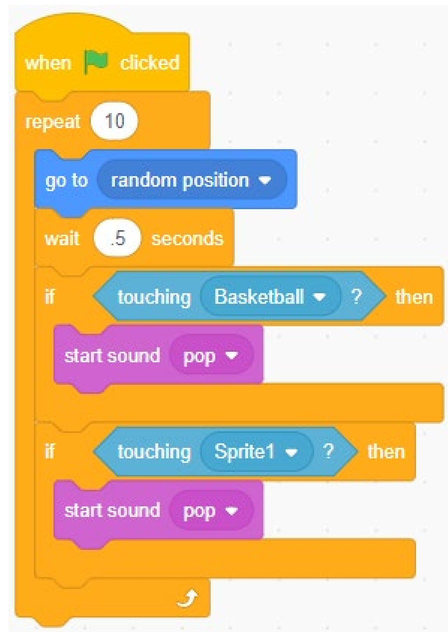
Master 7g

Making Shapes (cont'd)

Using a Block-Coding Program

Part C: Using Conditional Statements to Make Parallelograms

Modify this existing project:
https://scratch.mit.edu/projects/552702669/



Alter the code to make parallelograms for Cat and Basketball.

Alter the code so the parallelograms don't intersect.

Adjust the Balloon code in different ways to get used to the Conditional Statements. Consider changing the sound,
the action that occurs when the balloon is touching each sprite,
the frequency (wait time) of the balloon moving,
the number of repeats…

Challenge:
Create additional new parallelograms or triangles that don't intersect.

Name________________________________ Date_____________________

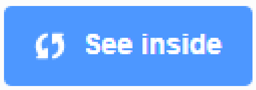
Master 7h

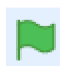
Making Shapes (cont'd)

Using a Block-Coding Program

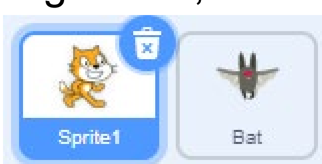
Tips

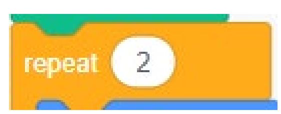
- You may wish to get an account and be logged in so that everything can be saved.
- If you are logged in, when you are looking at samples, or at your My Stuff, click **See Inside** to see or edit the code.



- When you click , the code executes, or "runs".
- You can click the values in the code and change them.

- You can click and drag any of the blocks of code out of the script and leave them out or change their order.
- To see the code for Bat you need to click on the Bat sprite. Right now, the code would be shown for the Cat.



- You can move the blocks in the code  to different spots in the code to change the repeating action of your sprite (Cat or Bat).

Name_______________________________ Date____________________

Master 7i

Making Shapes (cont'd)

Using a Block-Coding Program

Self-check in

What have you learned about block coding so far?

Did you get stuck? If so, what did you do?

Did you turn to your classmates for help? If so, how did they help?

What are you doing to help the learning of others?

This is "hard fun." What do you think we mean by "hard fun"?
What other activities do you do that are "hard fun"?

Name________________________________ Date_____________________

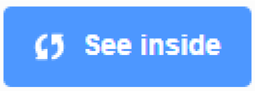
Master 8a

Classifying Triangles by Side Lengths

Using a Block-Coding Program

Follow the link to access the file: What type of triangle?
https://scratch.mit.edu/projects/552987916/

Click **See Inside**.



The code for this application is incomplete.

Here is a description of the application:

- Cat asks the user to enter the number of EQUAL sides on the triangle.
- The application checks to make sure the user doesn't enter a value greater than 3. If a value greater than 3 is entered, it can't be a triangle.
  - If 0 is entered, then the triangle will be scalene.
  - If 2 is entered, then the triangle will be isosceles.
  - If 3 is entered, then the triangle will equilateral.

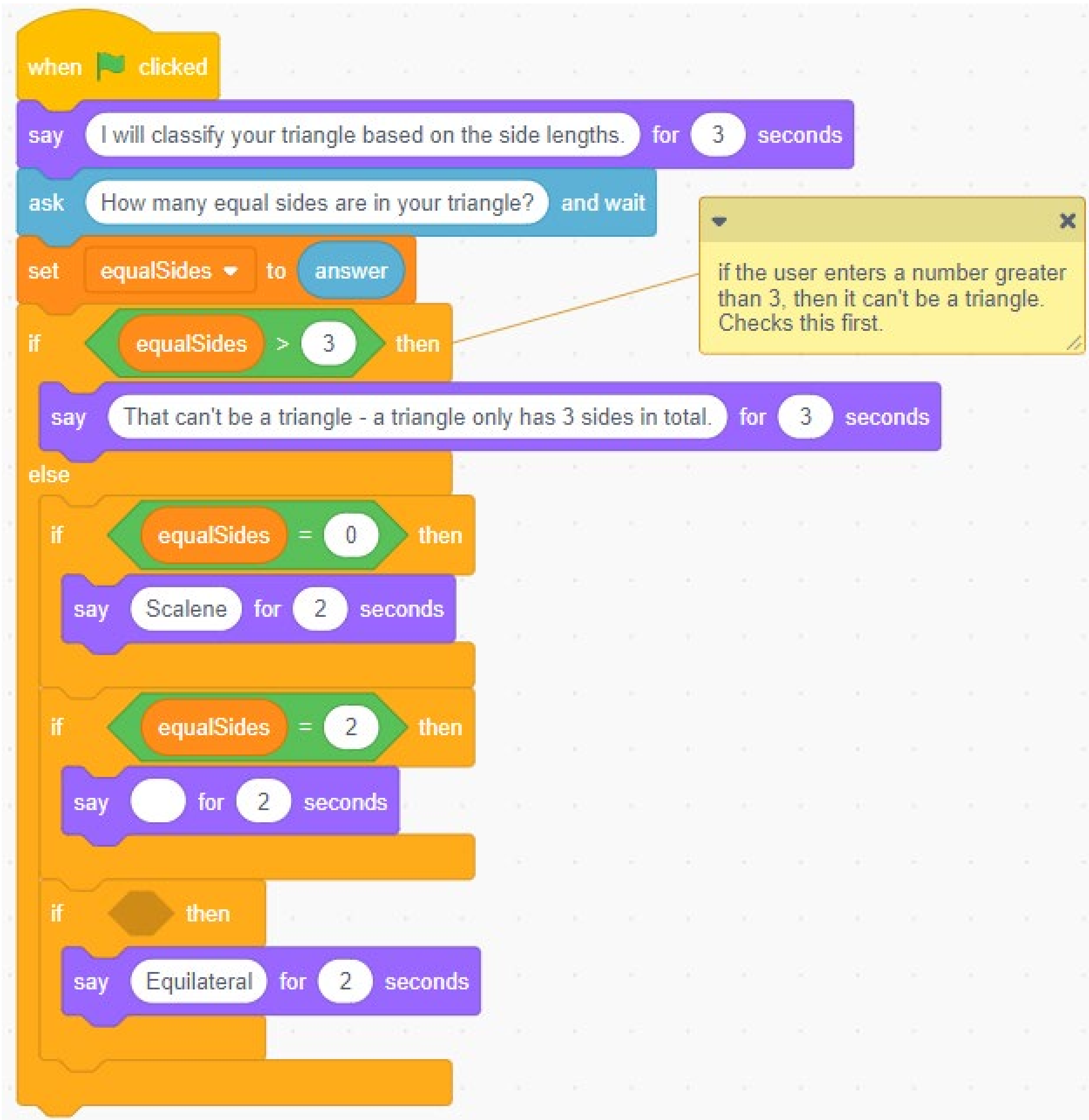
Name________________________________ Date______________________

Master 8b

Classifying Triangles by Side Lengths (cont'd)

Using a Block-Coding Program

Here is the code for the partially completed application:



Name________________________________ Date_____________________

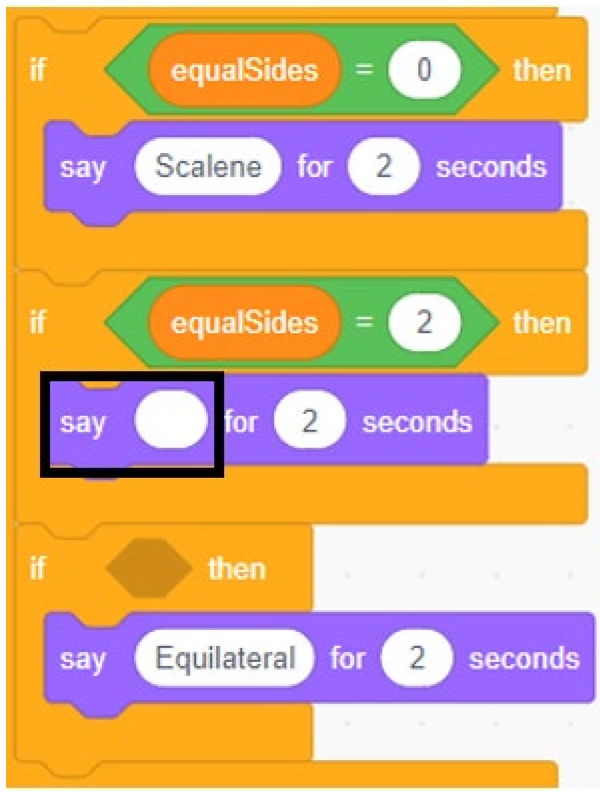
Master 8c

Classifying Triangles by Side Lengths (cont'd)

Using a Block-Coding Program

Your task is to complete the code for the application:

Complete the **Say** block to indicate the type of triangle if the user enters 2 for number of equal sides.



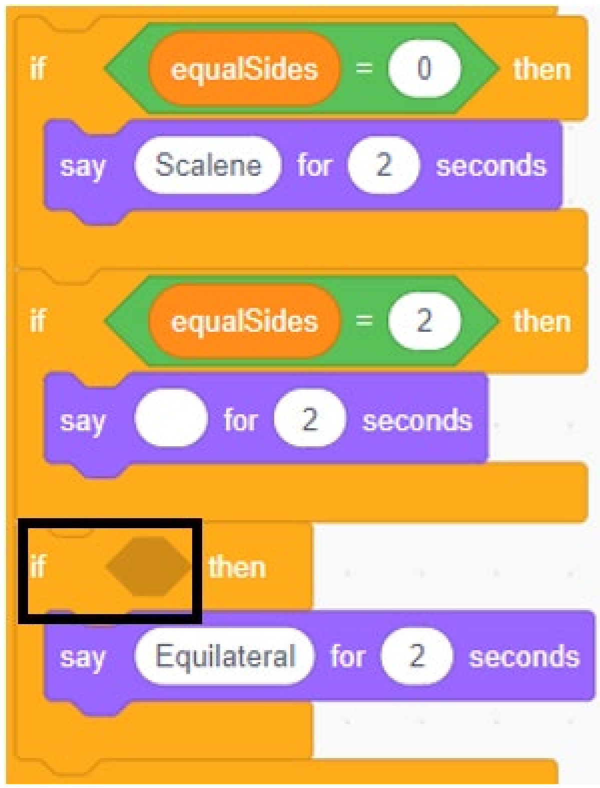
Name________________________________ Date_____________________

Master 8d

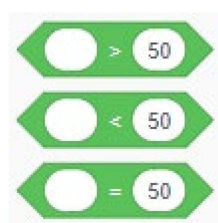
Classifying Triangles by Side Lengths (cont'd)

Using a Block-Coding Program

Provide the correct condition for the equilateral triangle in the **If** statement shown:



Tips:

- The **conditional operator** blocks (

) can be found under **Operators** (

).
- The variable **equalSides** block can be found under **Variables** (

).

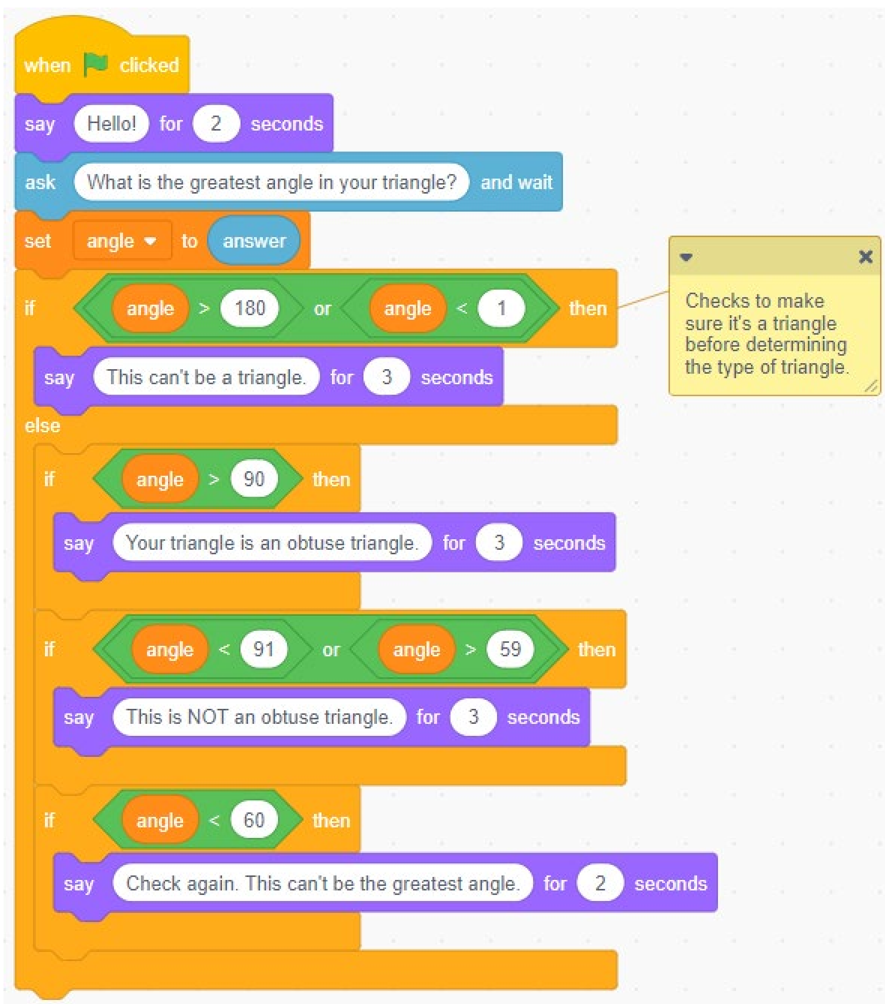
Name________________________________ Date_____________________

Master 8e

Classifying Triangles by Side Lengths (cont'd)

Using a Block-Coding Program

Follow the link to access the file: What type of triangle?
https://scratch.mit.edu/projects/552694138/
Test out the application by executing the code.
Click the green flag.
What do think this application does?



Name______________________________ Date____________________

Master 8f

Classifying Triangles by Side Lengths (cont'd)

Using a Block-Coding Program

Currently, the application shows if the triangle is obtuse or not obtuse, based on the measure of the greatest interior angle.

The greatest interior angle must be greater than a certain measure for the triangle to be considered obtuse. What is that measure?

How does the application know that the user has entered a measure that can't possibly be the greatest interior angle?
Consider what the interior angles in a triangle add to.

Try to make sense of the program by testing different measures to see what happens.

Name________________________________ Date______________________

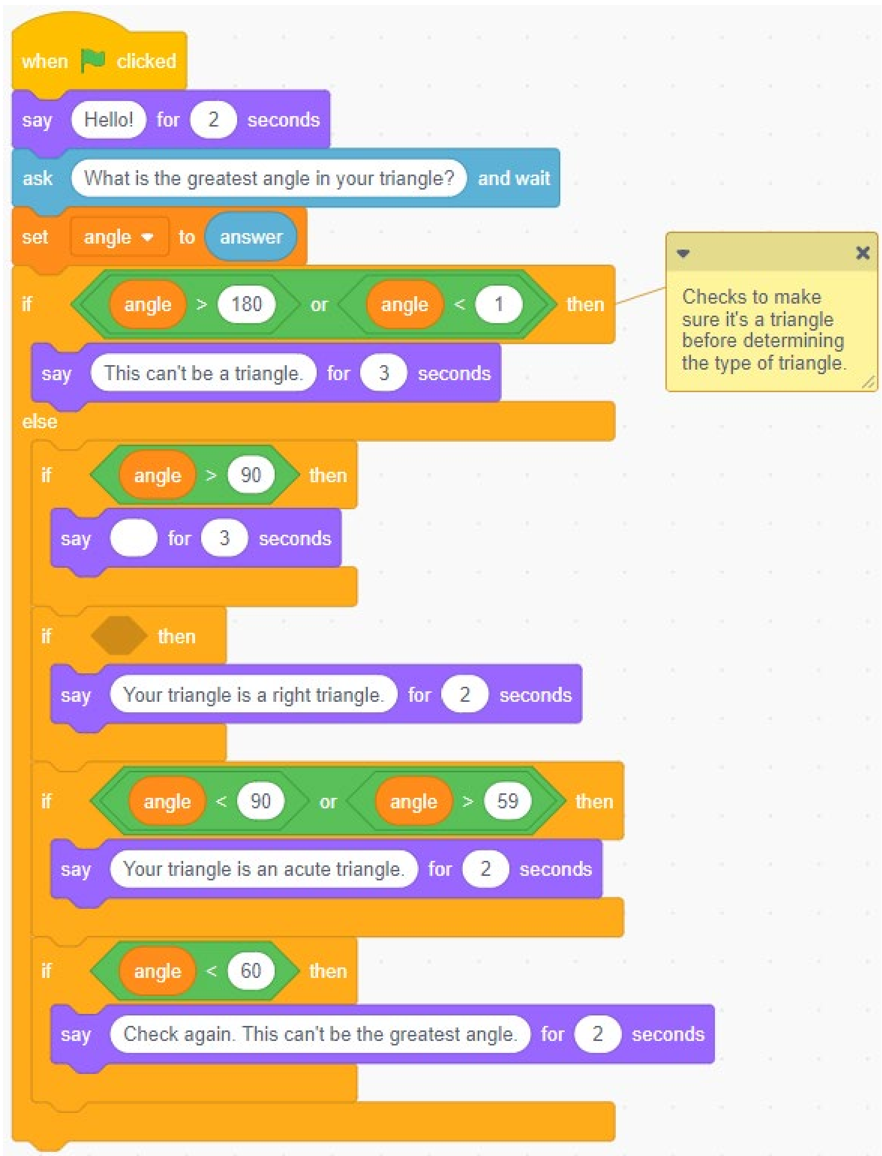
Master 8g

Classifying Triangles by Side Lengths (cont'd)

Using a Block-Coding Program

Follow the link to access the file: What type of triangle?
https://scratch.mit.edu/projects/552997968/

Notice that additional conditional statements (**If … then**) have now been added, but the program is incomplete.



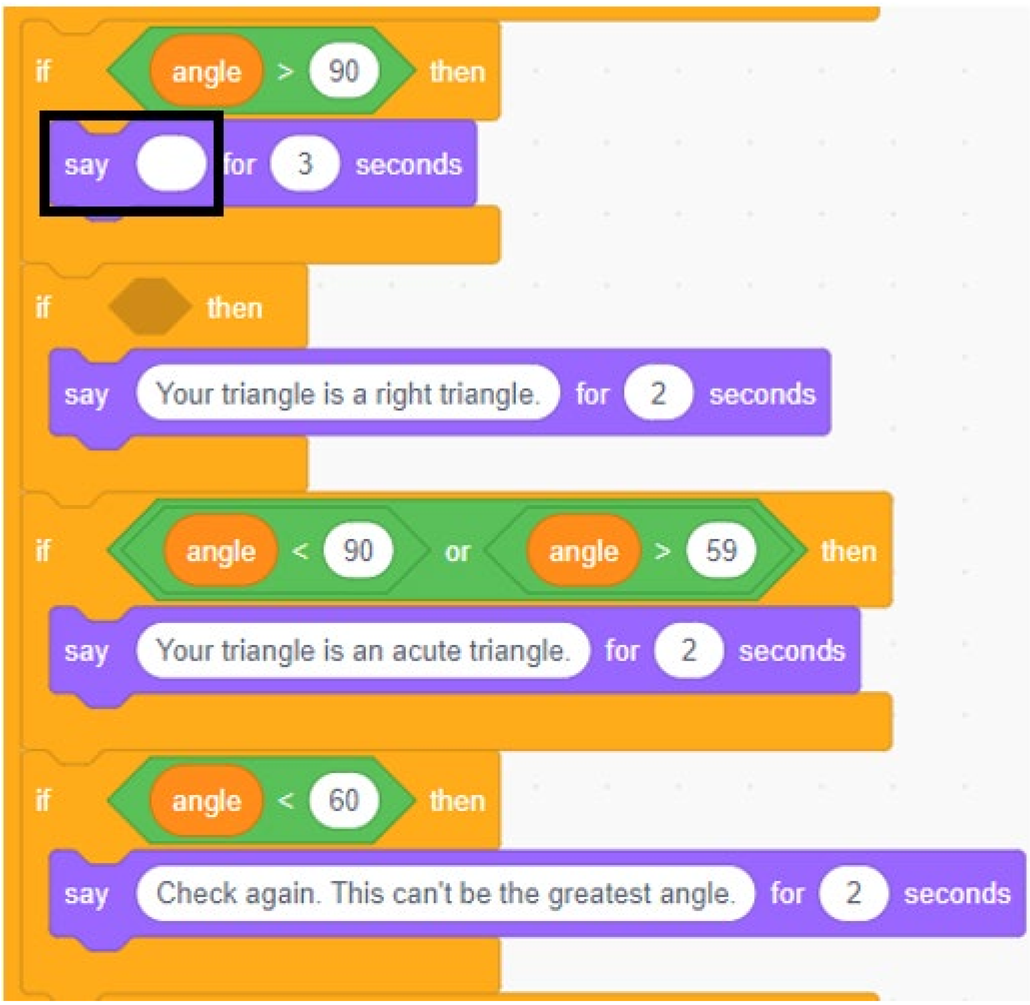
Name________________________________ Date_____________________

Master 8h

Classifying Triangles by Side Lengths (cont’d)

Using a Block-Coding Program

Your task is to complete the code for the application:



Complete the **Say** block to indicate the type of triangle if the user enters a measure greater than 90 for the greatest interior angle:

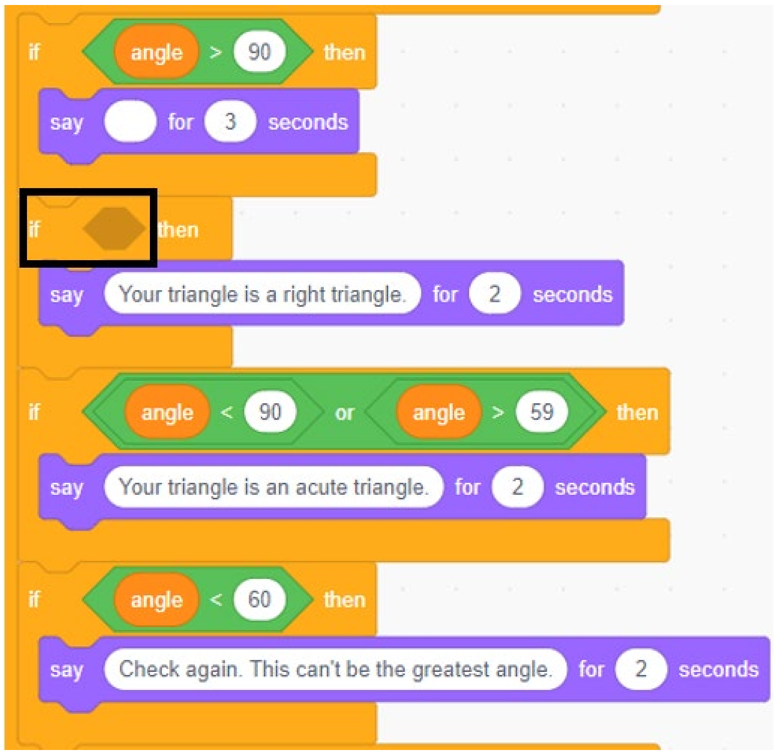
Name________________________________ Date_____________________

Master 8i

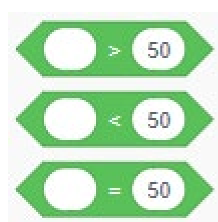
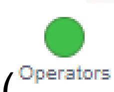
Classifying Triangles by Side Lengths (cont'd)

Using a Block-Coding Program

Provide the correct condition for the Right triangle in the **If** statement shown:



Tips:

- The **conditional operator** blocks () can be found under **Operators** ().
- The variable **equalSides** block can be found under **Variables** ().

Name________________________________ Date_____________________

Master 8j

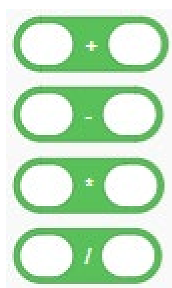
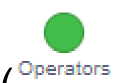
Classifying Triangles by Side Lengths (cont'd)

Using a Block-Coding Program

Challenge A

Alter the code in the *Classifying Triangles* based on Angles program (https://scratch.mit.edu/projects/552694138/) so that it determines the sum of the other two angles.

Tips:

- You will need to use an operator variable to subtract the measure of the greatest angle from 180 to determine what is left for the other two angles.
- The operators blocks () are located under **Operators** (

).
- The variable angle block can be found under **Variables** (

).
- You can output this information using a **Say** block, found under **Looks** (

).

Name______________________________ Date____________________

Master 8k

Classifying Triangles by Side Lengths (cont'd)

Using a Block-Coding Program

Challenge B

Alter the code to draw the type of triangle (scalene, isosceles, or equilateral) based on the number of equal sides entered by the user for the Classifying Triangles by Side Length application. (https://scratch.mit.edu/projects/552987916/)
It might take a few tries to draw isosceles and scalene triangles so that they are closed completely.

Challenge C

Alter the code to draw each type of triangle (right, obtuse, or acute) based on the angle entered by the user for the *Classifying Triangles by Angle* application (https://scratch.mit.edu/projects/552997968/).
It might take a few tries to draw the right, obtuse and acute triangles so that they are closed completely. You do not have to draw the exact triangles based on the greatest angle measures, but be sure to draw examples of each type of triangle.

Self-check in

What have you learned about conditions so far?

Did you get stuck? If so, what did you do?

Did you turn to your classmates for help? If so, how did they help?

What are you doing to help the learning of others?

This is "hard fun." What do you think we mean by "hard fun"?
What other activities do you do that are "hard fun"?

Go on "spy walks" to see what your classmates have done.

Patterning and Algebra

Activity 11 Assessment
Altering Dance Code

Writing, Reading, and Altering Code on a Coordinate Grid		
Writes, reads, and alters code involving sequential events but struggles with perspective of dancers “They danced 2 steps forward, then a glide to the left. Or is it right? Which way are they facing now?”	Visualizes and predicts movements involving sequential events “I’m going to move 3 steps back, jump a $\frac{1}{4}$ turn clockwise, then glide 2 more steps forward. If I jump a $\frac{1}{4}$ turn counterclockwise first, then I could glide 2 steps forward, jump a $\frac{1}{4}$ turn counterclockwise, then move 3 steps forward. Either way, I’ll still end the dance at (1, 2).”	Tests the movement of two different characters at the same time involving concurrent events “Dancer A is going to glide 3 steps to the right. Dancer B is going to dance 2 steps back. Oops. They are on the same spot.”
Observations/Documentation		

Activity 11 Assessment
Altering Dance Code

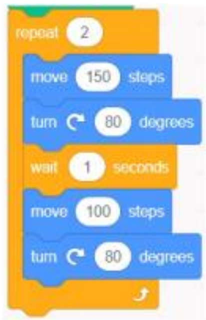
Writing, Reading, and Altering Code on a Coordinate Grid (cont'd)		
Visualizes the relative position of two characters involving concurrent events "If Dancer A dances 3 steps forward, then Dancer B can glide 1 step to the left first, then dance 3 steps back. That way they will be facing each other. But I will need to add a Criss Cross to Dancer A, so they are moving at the same time."	Tests the repeated movement on a coordinate grid involving repeating and nested events "I wrote this dance code but when my partner acted it out, it didn't work as I thought it would. I think this part of the code repeats, but my partner says that the way I wrote it, this whole part repeats."	Visualizes the repeating nature of the movements involving repeating and nested events) "I decided to repeat the whole dance code because those movements around the dance floor would repeat in the dance. But I also used a repeat in this part because lots of dances have repeating movements within a bigger repeating pattern."
Observations/Documentation		

Patterning and Algebra

Activity 12 Assessment
Making Shapes

Analyzing and Classifying 2-D Shapes and Using Algebraic Thinking

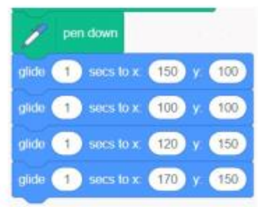
Reads and alters code by testing out various values or blocks until desired outcome is attained.



"I'm going to change the steps to 50 and the wait to 2 and the degrees to 100."

Reads and alters code by visualizing and explaining the impact of changes until desired outcome is achieved.

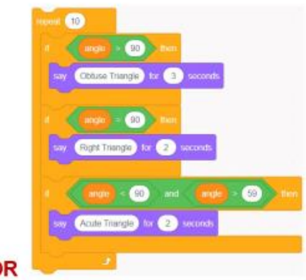
OR



"I'll change the steps to 50 and the degrees to 120, so they add to 180 and it's a rhombus. I'll delete the wait because it doesn't impact the end image."
OR
"This is going to make a narrow parallelogram because I can visualize the vertices."

Reads and flexibly alters code and makes sense of conditional statements related to outcomes of code when classifying shapes.

OR



"I'm going to make the condition that if Balloon is touching Basketball, it 'pops,' but if it's touching the edge, it gets bigger." OR "I've created conditions for the 3 types of triangles based on the greatest angle, but now I still need to account for any other values like 0, 160, and 180 or more."

Observations/Documentation

Patterning and Algebra

Activity 12 Assessment
Making Shapes

Analyzing and Classifying 2-D Shapes and Using Algebraic Thinking (cont'd)		
Uses basic blocks to write code for a desired outcome. "I tried using these blocks in this order, but it didn't make what I wanted."	Uses more complex blocks (including repeat and conditional statements) to write code for a desired outcome. "I wrote code, but it used so many blocks. I can see that these blocks repeat. So, I used the repeat block instead and deleted these other blocks. I put it inside the 'If, then' because if it has 3 sides, it will draw this triangle."	Uses conditional statement blocks to flexibly write different code related to outcomes and the classification of shapes. "Writing code with conditional statements is like creating a flow chart. All the possibilities must be accounted for. If the condition isn't met, then we need to have other options, with the 'else' block defining the other situations"
Observations/Documentation		

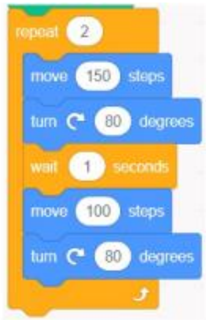
Patterning and Algebra

Activity 13 Assessment

Classifying Triangles

Analyzing and Classifying 2-D Shapes and Using Algebraic Thinking

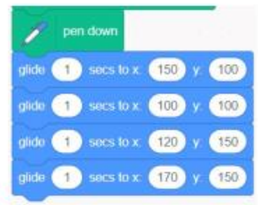
Reads and alters code by testing out various values or blocks until desired outcome is attained.



"I'm going to change the steps to 50 and the wait to 2 and the degrees to 100."

Reads and alters code by visualizing and explaining the impact of changes until desired outcome is achieved.

OR



"I'll change the steps to 50 and the degrees to 120, so they add to 180 and it's a rhombus. I'll delete the wait because it doesn't impact the end image."
OR
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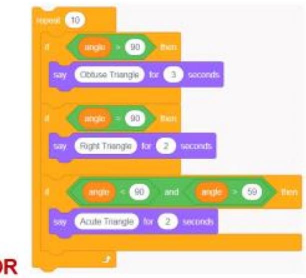
Reads and flexibly alters code and makes sense of conditional statements related to outcomes of code when classifying shapes.

OR



"I'm going to make the condition that if Balloon is touching Basketball, it 'pops,' but if it's touching the edge, it gets bigger." OR "I've created conditions for the 3 types of triangles based on the greatest angle, but now I still need to account for any other values like 0, 160, and 180 or more."

Observations/Documentation

Patterning and Algebra

Activity 13 Assessment
Classifying Triangles

Analyzing and Classifying 2-D Shapes and Using Algebraic Thinking (cont'd)		
Uses basic blocks to write code for a desired outcome. "I tried using these blocks in this order, but it didn't make what I wanted."	Uses more complex blocks (including repeat and conditional statements) to write code for a desired outcome. "I wrote code, but it used so many blocks. I can see that these blocks repeat. So, I used the repeat block instead and deleted these other blocks. I put it inside the 'If, then' because if it has 3 sides, it will draw this triangle."	Uses conditional statement blocks to flexibly write different code related to outcomes and the classification of shapes. "Writing code with conditional statements is like creating a flow chart. All the possibilities must be accounted for. If the condition isn't met, then we need to have other options, with the 'else' block defining the other situations"
Observations/Documentation		