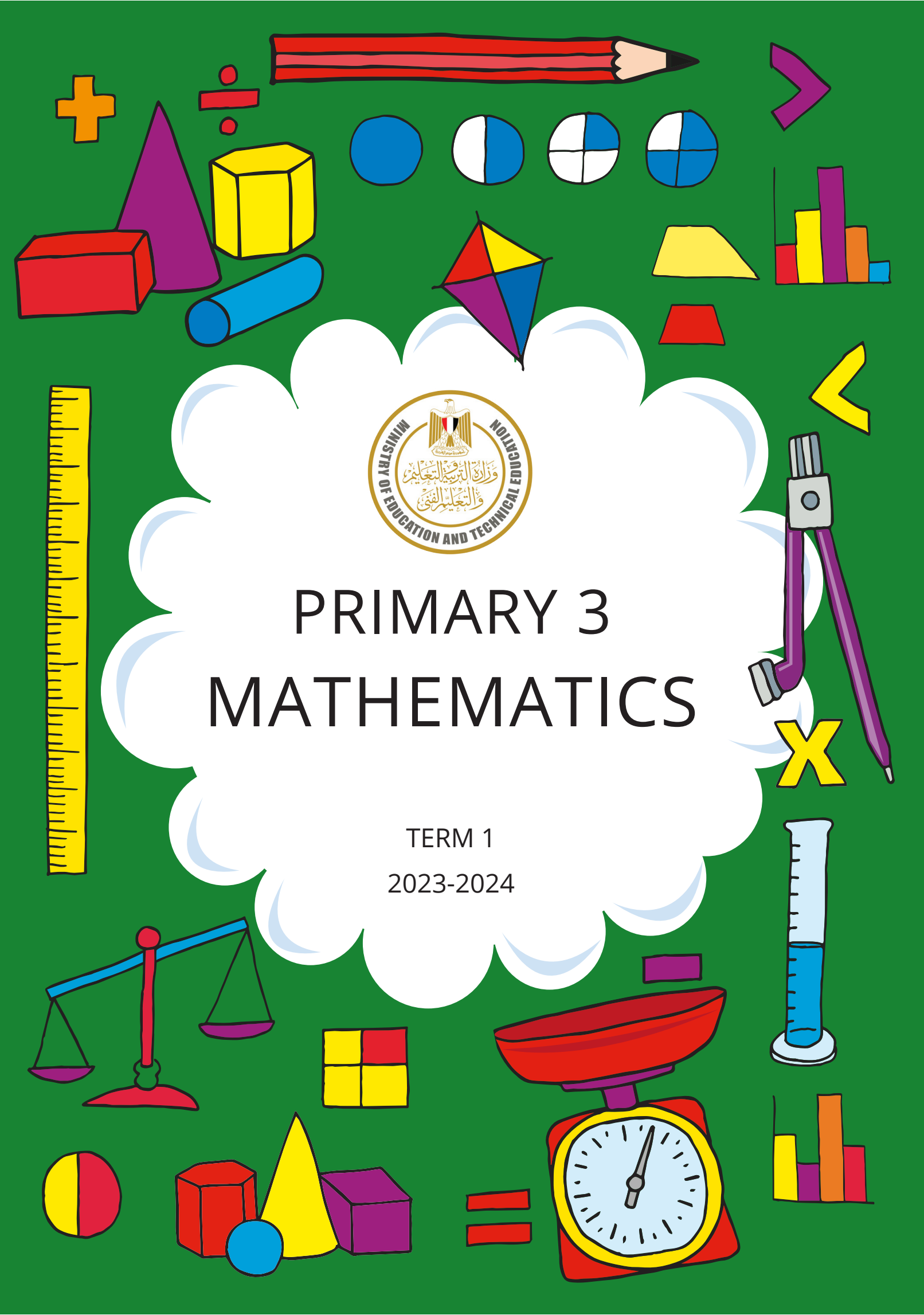

PRIMARY 3
MATHEMATICS

TERM 1

2023-2024

FOREWORD

This is a pivotal time in the history of the Ministry of Education and Technical Education (MOETE) in Egypt. We are embarking on the transformation of Egypt's K-12 education system starting in September 2018 with KG1, KG2 and Primary 1 continuing to be rolled out year after year until 2030. We are transforming the way in which students learn to prepare Egypt's youth to succeed in a future world that we cannot entirely imagine.

MOETE is very proud to present this new series of textbooks, Discover, with the accompanying digital learning materials that captures its vision of the transformation journey. This is the result of much consultation, much thought and a lot of work. We have drawn on the best expertise and experience from national and international organizations and education professionals to support us in translating our vision into an innovative national curriculum framework and exciting and inspiring print and digital learning materials.

The MOETE extends its deep appreciation to its own " Central Administration for Curriculum Development " (CACD) and " Discovery Education".

This transformation of Egypt's education system would not have been possible without the significant support of Egypt's current president, His Excellency President Abdel Fattah el-Sisi. Overhauling the education system is part of the president's vision of 'rebuilding the Egyptian citizen' and it is closely coordinated with the ministries of higher education & scientific research, Culture, and Youth & Sports. Education 2.0 is only a part in a bigger national effort to propel Egypt to the ranks of developed countries and to ensure a great future to all of its citizens.

WORDS FROM THE MINISTER OF EDUCATION & TECHNICAL EDUCATION

It is my great pleasure to celebrate this extraordinary moment in the history of Egypt where we launch a new education system designed to prepare a new Egyptian citizen proud of his Egyptian, Arab and African roots - a new citizen who is innovative, a critical thinker, able to understand and accept differences, competent in knowledge and life skills, able to learn for life and able to compete globally.

Egypt chose to invest in its new generations through building a transformative and modern education system consistent with international quality benchmarks. The new education system is designed to help our children and grandchildren enjoy a better future and to propel Egypt to the ranks of advanced countries in the near future.

The fulfillment of the Egyptian dream of transformation is indeed a joint responsibility among all of us; governmental institutions, parents, civil society, private sector and media. Here, I would like to acknowledge the critical role of our beloved teachers who are the role models for our children and who are the cornerstone of the intended transformation.

I ask everyone of us to join hands towards this noble goal of transforming Egypt through education in order to restore Egyptian excellence, leadership and great civilization.

My warmest regards to our children who will begin this journey and my deepest respect and gratitude to our great teachers.

Dr. Reda Hegazy
Minister of Education & Technical Education

NAME: _____

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CHAPTER 1

LESSON 1: PATTERNS

CONNECT

Pattern Problem 1

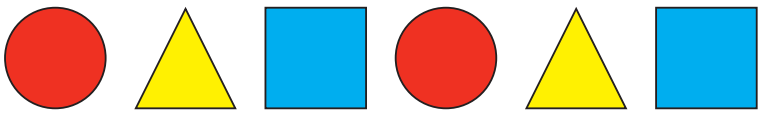
Pattern Problem 2

30, 40, 50, 60, 70, _____ , _____ , _____ , _____ , _____

Pattern Problem 3

52, 54, 56, 58, _____ , _____ , _____ , _____ , _____

Pattern Problem 4

_____ 

APPLY

Directions: Look at each dot image. Build each image using counters. What is the pattern? Figure out the next two images in the pattern. Build them and then draw them in the boxes.

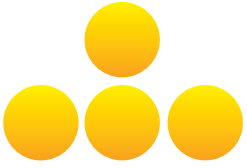


Image One

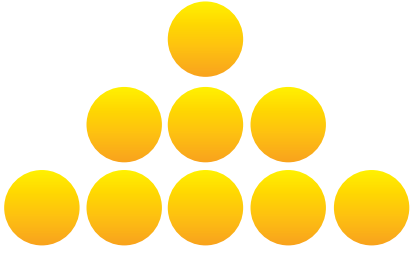


Image Two

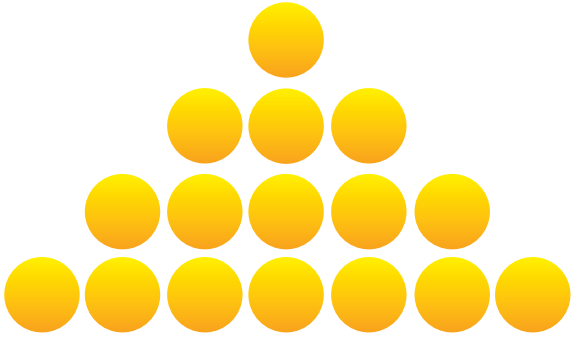


Image Three

Image FOUR

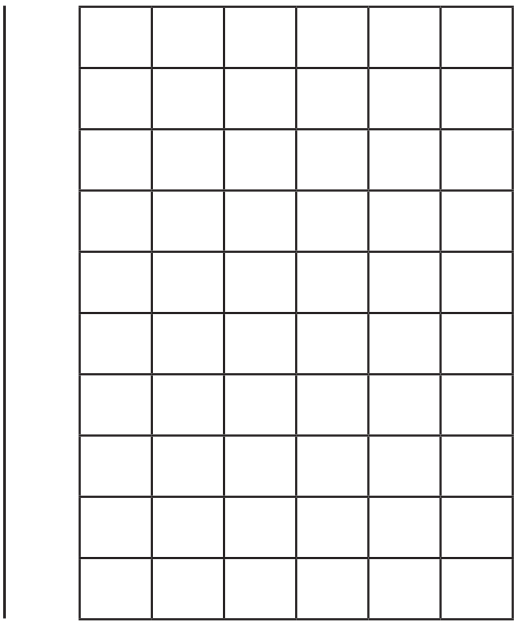
Image FIVE

CHALLENGE: Record the number of counters in each image. How could you predict how many counters would be in the 10th image?

LESSON 2: MORE OF BAR GRAPHS

APPLY

Directions: Make a bar graph using the sibling data. Be sure to include a title, labels for each axis, and colored bars.



CHALLENGE: If we invited all of the siblings to visit, how many people would come?

REFLECT

Directions: Reflect on your learning. Write two questions that could be answered by looking at the data in your Sibling Bar Graph.

1. _____

_____

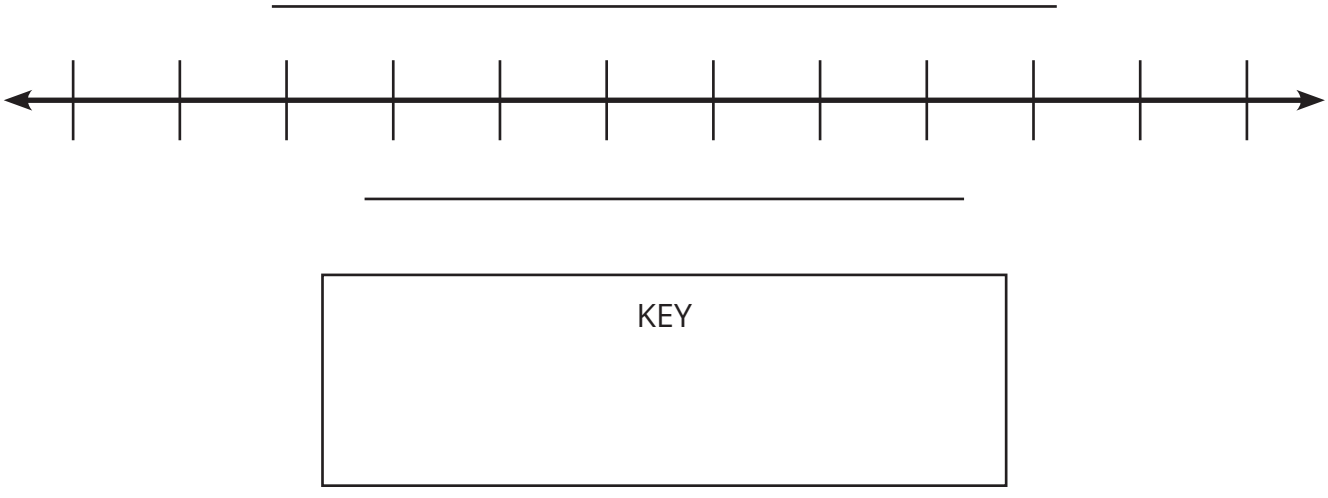
2. _____

_____

LESSON 3: LINE PLOT

APPLY

Directions: Create a line plot using the beans in bag data. Be sure to give your line plot a title and a key.



CHALLENGE: If we dumped all the bags that had the most beans onto the table, how many beans would we have on the table?

REFLECT

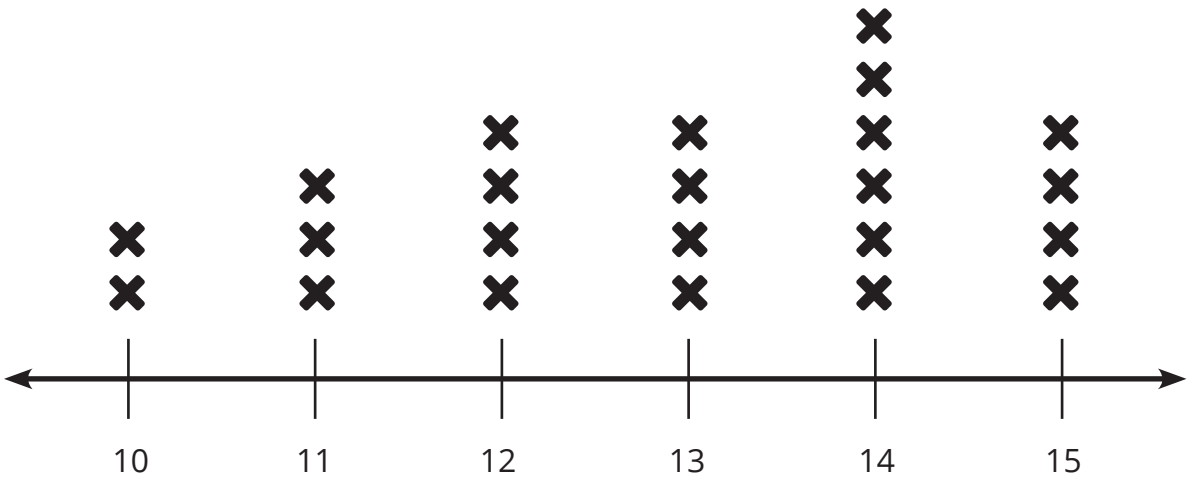
Directions: Reflect on your learning. In the box below, write about bar graphs, pictographs, and line plots.

- **How are these types of graphs the same?**
- **How are these types of graphs different?**
- **Which do you prefer? Why?**

LESSON 4: MEASURING LENGTHS IN CENTIMETER

CONNECT

Length of a Primary 3 Student's Hand from Wrist to Middle Finger



Length of hand in centimeters

X = 1 student

1- How many students whose hand's length is 10 cm long?

_____

2-How many students whose hand's length is 14 cm long?

_____

3- What is the difference between the longest and the shortest hand length?

_____

APPLY

Directions: Measure the pieces of string and record their lengths in centimeters.

String Number	Length in cm
1	
2	
3	
4	
5	

Order the lengths (in centimeters) from shortest to longest:

_____ _____ _____ _____ _____

REFLECT

Directions: Reflect on your learning. In the box below, answer the following question.

- **Where do you use measurement in the world outside of math class?**

LESSON 5: MEASURING LENGTHS IN METER

APPLY

Directions: Look at the images below. Decide if the objects they depict should be measured in centimeters or meters and then write the word in the table.

IMAGES	METERS OR CENTIMETERS?

CHALLENGE: Name at least three other objects that could be measured in centimeters and at least three other objects that could be measured in meters.

Could be measured in cm	Could be measured in m

REFLECT

Directions. Reflect on your learning. Then write or draw your answers to the following questions in the box below:

- **When might it be okay to estimate a length?**
- **When would you need an exact measurement?**

LESSON 6: MEASURING LENGHTHS IN MILLIMETER

APPLY

Directions: Measure the pieces of string and record their lengths in millimeters.

String Number	Length in mm
1	
2	
3	
4	
5	

CHAPTER 2

LESSON 1 : THOUSANDS

APPLY

Directions: Flip over a card and write the digit in a place value box. You may use the Discard box once. Once you write a digit in place, you may not move it. After you have filled all five boxes, compare your numbers with your friends.

Goal: Make the greatest number in your group.

Practice Round:

Thousands		Hundreds	Tens	Ones		Discard
	,					

Round 1:

Thousands		Hundreds	Tens	Ones		Discard
	,					

Round 2:

Thousands		Hundreds	Tens	Ones		Discard
	,					

Round 3:

Thousands		Hundreds	Tens	Ones		Discard
	,					

Round 4:

Thousands		Hundreds	Tens	Ones		Discard
	,					

REFLECT

Directions: Reflect on your learning. Think about a strategy you used to create the greatest number in the Place Value Game. Explain your strategy in the box below.

LESSON 2: MORE OF THOUSANDS

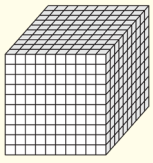
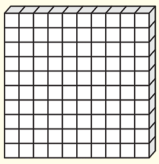
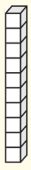
APPLY

Directions: Follow the directions in each step below.

Step 1: Choose a number in the thousands and write it below.

_____ , _____ _____ _____

Step 2: Draw a model of the number in the place value mat below.

Thousands	Hundreds	Tens	Ones
			

Step 3: Write your number in expanded form. Remember to use the addition and equal signs:

_____

Step 4: Compare your number to three other students' numbers using the greater than (>) or less than (<) sign.

YOUR NUMBER	> OR <	OTHER STUDENT'S NUMBER

CHALLENGE: Fill in the blanks with either > or < .

1. 8,903 _____ 9,038
2. 7,878 _____ 7,787
3. 1,342 _____ 1,302
4. 2,345 _____ 2,344
5. 6,534 _____ 6,544

Order the numbers above from least to greatest.

_____ ; _____ ; _____ ; _____ ; _____ ; _____ ;

_____ ; _____ ; _____ ; _____

LESSON 3: TEN THOUSANDS - HUNDRED THOUSANDS

APPLY

Directions: Flip over a card and write the digit in a place value box. You may use the Discard box once. Once you write a digit in place, you may not move it. After you have filled all six boxes, compare your numbers with your friends.

Goal: Make the smallest number in your group.

Round 1:

Hundred Thousands	Ten Thousands	Thousands		Hundreds	Tens	Ones		Discard
			,					

Round 2:

Hundred Thousands	Ten Thousands	Thousands		Hundreds	Tens	Ones		Discard
			,					

Round 3:

Hundred Thousands	Ten Thousands	Thousands		Hundreds	Tens	Ones		Discard
			,					

Round 4:

Hundred Thousands	Ten Thousands	Thousands		Hundreds	Tens	Ones		Discard
			,					

REFLECT

Directions: Reflect on your learning. What strategies do you use to compare really big numbers? Write about them below.

LESSON4: NUMBERS IN DIFFERENT FORMS

APPLY

Directions: Write each number in expanded form. Then practice reading each number in standard and expanded form (whisper).

62,319 = _____

762,319 = _____

15,780 = _____

812,004 = _____

Write your own really big numbers in standard form and then write them in expanded form.

_____ = _____

_____ = _____

Now order all the numbers you have above. Decide whether you want to order them from least to greatest or greatest to least.

_____ ; _____ ; _____ ; _____ ; _____ ; _____

LESSON 5: ARRAYS

APPLY

Directions: Look at each star array and record the number of ROWS and the number of stars in each ROW. Then find the total number of stars.

1.

Number of rows: _____

Number of stars in each row: _____

Total number of stars: _____

2.

Number of rows: _____

Number of stars in each row: _____

Total number of stars: _____

3.

Number of rows: _____

Number of stars in each row: _____

Total number of stars: _____

4.

Number of rows: _____

Number of stars in each row: _____

Total number of stars: _____

APPLY, continued

Directions: Look at each star array and record the number of COLUMNS and the number of stars in each COLUMN. Then find the total number of stars.

5.

Number of column: _____

Number of stars in each column: _____

Total number of stars: _____

6.

Number of column: _____

Number of stars in each column: _____

Total number of stars: _____

7.

Number of column: _____

Number of stars in each column: _____

Total number of stars: _____

8.

Number of column: _____

Number of stars in each column: _____

Total number of stars: _____

REFLECT

Directions: Look at the star array below. Some of the stars have been ripped off. How many stars were in the original array? Explain your thinking using pictures, numbers, or words in the box below the star array.

LESSON 6: MULTIPLICATION

APPLY

Directions: In each box, play a round of Circles and Dots. Roll the die one time to identify the number of circles you will draw. Roll it again to identify how many dots you will draw in each circle. Once you have drawn your models, record a repeated addition equation and a multiplication equation. Then compare your product with your partner's using < , >, or =. See the example below.

Example:

Repeated Addition (+) 3 + 3 + 3 = 9

Multiplication (×) 3 × 3 = 9

Comparison 9 (My product) < 15 (Partner's product)

Round One:

Repeated Addition (+)

Multiplication (×)

Comparison _____ (My product) ◯ _____ (Partner's product)

Round Two:

Repeated Addition (+)

Multiplication (×)

Comparison _____ (My product) ◯ _____ (Partner's product)

Round Three:

Repeated Addition (+)

Multiplication (×)

Comparison

_____ ◯ _____

(My product) (Partner's product)

Round Four:

Repeated Addition (+)

Multiplication (×)

Comparison

_____ ◯ _____

(My product) (Partner's product)

Round Five:

Repeated Addition (+)

Multiplication (×)

Comparison

_____ ◯ _____

(My product) (Partner's product)

CHALLENGE: Draw a Circles and Dots board for the following equations and then find the product:

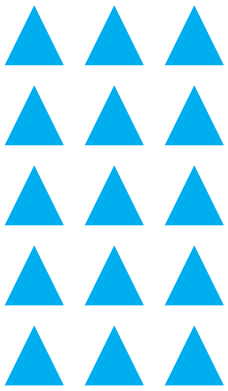
5 × 7 =

6 × 9 =

Lesson 7: Commutative Property in Multiplication

APPLY: Part 1

Directions: Solve the problems below to determine whether or not there is a Commutative Property of Multiplication.



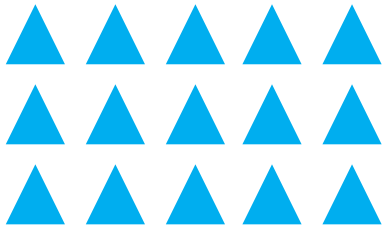
Number of rows: _____

Number of columns: _____

Total number of triangles: _____

_____ × _____ = _____

rows columns product



Number of rows: _____

Number of columns: _____

Total number of triangles: _____

_____ × _____ = _____

rows columns product

Number of rows: _____

Number of columns: _____

Total number of hearts: _____

_____ × _____ = _____

rows columns product

Number of rows: _____

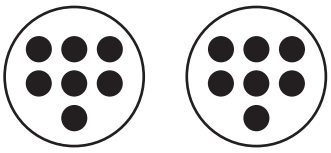
Number of columns: _____

Total number of hearts: _____

_____ × _____ = _____

rows columns product

APPLY, Part 1 continued



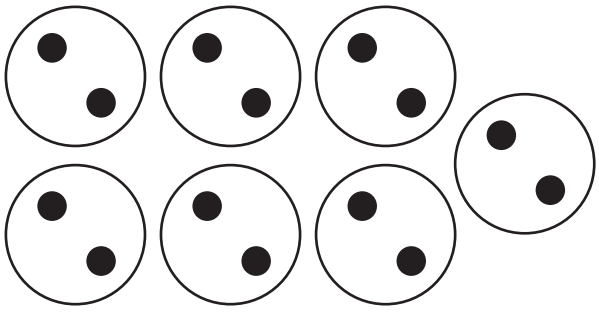
Number of circles: _____

Number of dots: _____

Total number of dots: _____

_____ × _____ = _____

circles dots product



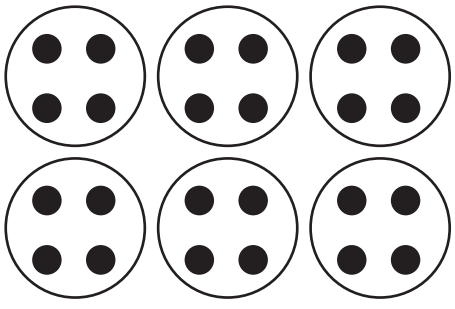
Number of circles: _____

Number of dots: _____

Total number of dots: _____

_____ × _____ = _____

circles dots product



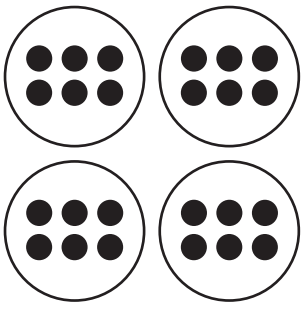
Number of circles: _____

Number of dots: _____

Total number of dots: _____

_____ × _____ = _____

circles dots product



Number of circles: _____

Number of dots: _____

Total number of dots: _____

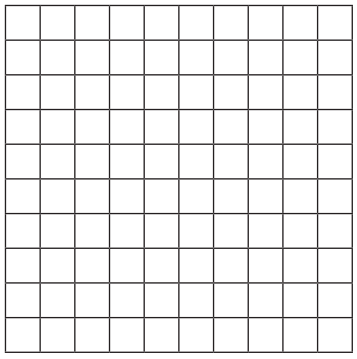
_____ × _____ = _____

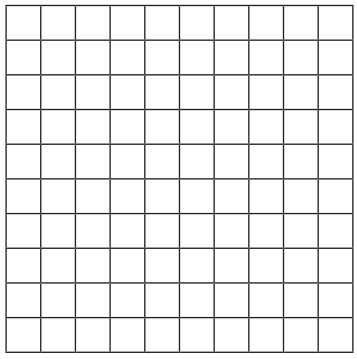
circles dots product

APPLY, Part 2

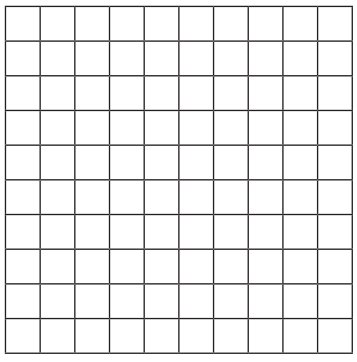
Directions: On the grids below, draw arrays that prove the Commutative Property of Multiplication. Label your grids with the **factors** (the two numbers you are multiplying) and **products** (the answers).

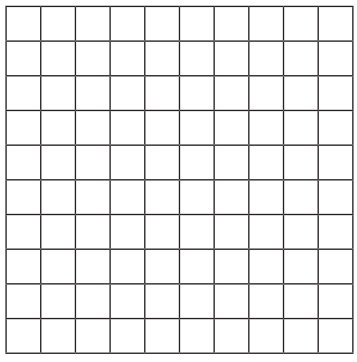
1.



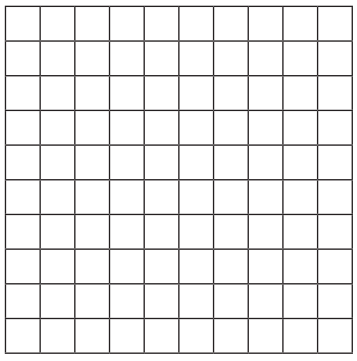


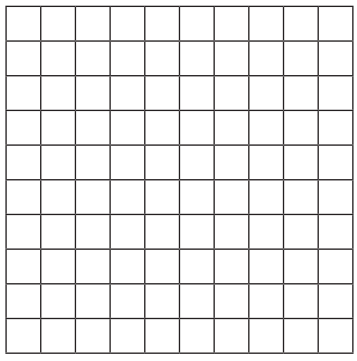
2.





3.





REFLECT

Directions: Reflect on your learning. In the box below, explain **multiplication** and the **Commutative Property of Multiplication**. You can use words, pictures, or numbers to help you.

CHAPTER 3

LESSON 1 : WORD PROBLEMS ON MULTIPLICATION

APPLY

Example problem: Farha went to the store to buy rolls for a big family dinner. At the store, she bought 4 bags of rolls. Each bag contained 5 rolls. How many rolls did Farha buy?

Work Space:

Multiplication equation: _____

PRACTICE:

- **Read each problem carefully.**
- **Show your thinking with pictures, numbers, or words.**
- **Record a multiplication equation that represents this problem.**

1. On Samira's walk home she saw 6 cars. If each car has 4 wheels, how many wheels did she see in all?

Work Space:

Multiplication equation: _____

2. Manal brought 6 bags of cookies to school. Each bag had 3 cookies in it. How many cookies were there all together?

Work Space:

Multiplication equation: _____

3. Malek runs 3 miles each day. How many miles does he run in 7 days?

Work Space:

Multiplication equation: _____

4. A bag of oranges holds 4 oranges. How many oranges are in 8 bags?

Work Space:

Multiplication equation: _____

5. It takes a rocket 7 seconds to travel one kilometer. How many seconds will it take to travel 4 kilometers?

Work Space:

Multiplication equation: _____

6. Each pack of pencils contains 8 pencils. How many pencils are in 3 packs?

Work Space:

Multiplication equation: _____

CHALLENGE:

1. Put the products from problems 1 to 6 above in order from least to greatest.

_____ , _____ , _____ , _____ , _____ , _____

2. Maisa was trying to figure out how to solve the multiplication problem 12 × 13 but was stuck. Can you show her how to work through this problem and what the product might be?

LESSON 2: APPLICATIONS ON MULTIPLICATION

APPLY

Directions: Read each story problem on your own. With a partner, match each story problem to its multiplication equation.

Part 1

Mariam had 4 sweaters. Each sweater had 3 buttons on it. How many total buttons are there on all the sweaters?	6 × 6 = 36
Rana packed 6 boxes full of cans. Each box had 6 cans. How many total cans did Rana pack?	3 × 7 = 21
Amir hiked for 3 days over the summer. Each day he hiked 7 miles. How many miles did he hike in all?	4 × 3 = 12

Part 2

Record your equation here: _____

Write a story problem that matches the equation above.

_____

_____

When you finish, find a partner with the same card. Work together to find the product.

Product: _____

How did you solve this problem? Show your work below:

REFLECT

Directions: Reflect on your learning. Write a response to the questions in the box below.

- **Think about multiplication story problems. Is it easier to solve them or write one?**
- **What do you think is easy about solving multiplication story problems?**
- **What do you still find challenging about solving multiplication story problems?**

LESSON 3: MULTIPLES OF 2 & 3

APPLY

Directions: Use the 120 Chart below to complete the following:

- **Color the multiples of 2 _____ (color stated by teacher).**
- **Color the multiples of 3 _____ (color stated by teacher).**
- **Respond to the prompts at the bottom of the page.**

111	112	113	114	115	116	117	118	119	120
101	102	103	104	105	106	107	108	109	110
91	92	93	94	95	96	97	98	99	100
81	82	83	84	85	86	87	88	89	90
71	72	73	74	75	76	77	78	79	80
61	62	63	64	65	66	67	68	69	70
51	52	53	54	55	56	57	58	59	60
41	42	43	44	45	46	47	48	49	50
31	32	33	34	35	36	37	38	39	40
21	22	23	24	25	26	27	28	29	30
11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10

List the first 10 multiples of 2.

_____ , _____ , _____ , _____ , _____ , _____ , _____ , _____ , _____ , _____

List the first 10 multiples of 3.

_____ , _____ , _____ , _____ , _____ , _____ , _____ , _____ , _____ , _____

List all of the multiples you found that 2 and 3 share:

REFLECT

Directions: Reflect on your learning. Predict a number greater than 120 that would be a multiple of both 2 and 3. Explain why you think your prediction is correct.

LESSON 4: MULTIPLES OF 5 & 10

APPLY

Directions: Use the 120 Chart to complete the following:

• Color the multiples of 10 _____ (color stated by teacher).

111	112	113	114	115	116	117	118	119	120
101	102	103	104	105	106	107	108	109	110
91	92	93	94	95	96	97	98	99	100
81	82	83	84	85	86	87	88	89	90
71	72	73	74	75	76	77	78	79	80
61	62	63	64	65	66	67	68	69	70
51	52	53	54	55	56	57	58	59	60
41	42	43	44	45	46	47	48	49	50
31	32	33	34	35	36	37	38	39	40
21	22	23	24	25	26	27	28	29	30
11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10

Write the equations for the multiples of ten. The first two have been done for you.

10 × 1 = 10

10 × 2 = 20

10 × 3 = _____

10 × 4 = _____

10 × _____ = _____

10 × _____ = _____

10 × _____ = _____

10 × _____ = _____

10 × _____ = _____

10 × _____ = _____

APPLY, continued

Directions: Use the 120 Chart on the previous page to complete the following:

- **Color the multiples of 5 _____ (color stated by teacher).**
- **Write the equations for the multiples of five. The first two have been done for you.**

5	×	1	=	5	5	×	____	=	____
5	×	2	=	10	5	×	____	=	____
5	×	3	=	____	5	×	____	=	____
5	×	4	=	____	5	×	____	=	____
5	×	____	=	____	5	×	____	=	____
5	×	____	=	____	5	×	____	=	____

LESSON 5: FACTORS OF A NUMBER USING ARRAYS

REFLECT

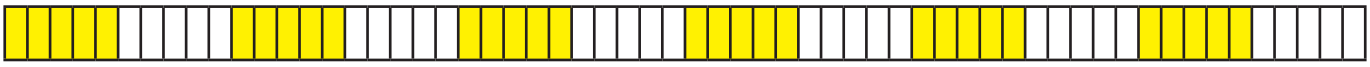
1- If we have 6 seats, what is the number of different arrays can be created?

2- Use the arrays to find al the pairs of factors for the numbers: 6 , 12 and 24

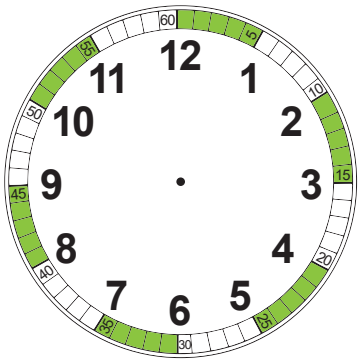
LESSON 6: TIME

APPLY

Picture 1:



Picture 2:

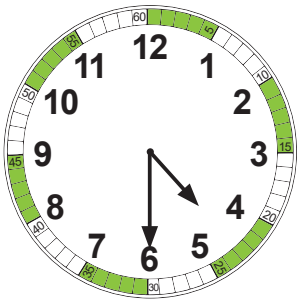


Group Practice:

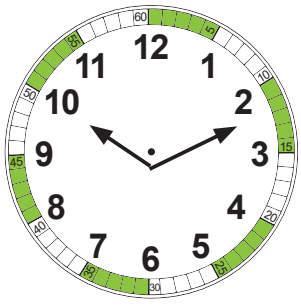
Clock One		Clock Two	
Hour	Minutes	Hour	Minutes
_____ :	_____	_____ :	_____

PARTNER PRACTICE:

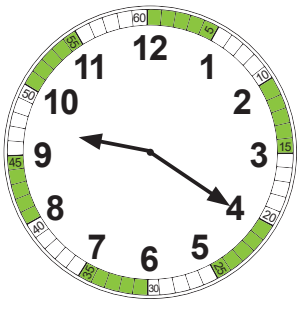
Directions: Look at each of the clocks below. Determine the time on the analog clock and write the digital time below. Remember that each hour number represents a group of 5 minutes.



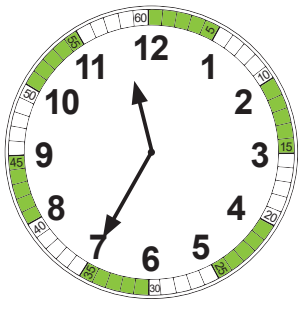
_____ : _____



_____ : _____



_____ : _____



_____ : _____

LESSON 7:

APPLY

Directions: Play "Who Has the Later Time?" with your Shoulder Partner.

- **Pick a card to tell you how many groups of 5 minutes have passed.**
- **Record the minutes on the digital clock. The hour is already decided for you.**
- **Draw the minute hand on the analog clock.**

Round One:	Round Two:	Round Three:	Round Four:	Round Five:
1 : _____	2 : _____	7 : _____	4 : _____	10 : _____

CHALLENGE: Time Story Problems

1. Your mom puts muffins in the oven at 7:00. When you take them out, the clock looks like this:

How many minutes did it take to bake the muffins?

2. You leave school at 3:00 and when you get home the clock looks like this:

How many minutes did it take you to walk home?

3. If it takes you 45 minutes to walk home from school and you leave at 3:00, what time will it be when you get home? Draw the time on the clock.

REFLECT

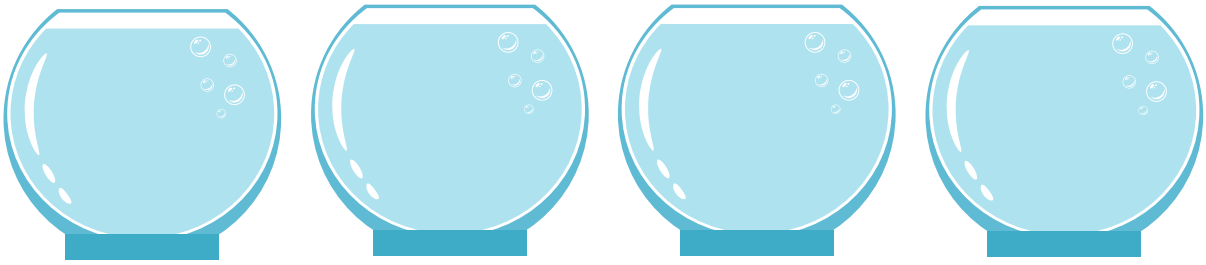
Directions: Reflect on what you have learned about telling time. Look at the analog clock below and the time that is recorded on the digital clock. Decide if the digital time is correct for the clock shown. If it is, explain why. If it is not, explain why and provide the correct time. Write your response in the box below.

LESSON 8: DIVISION

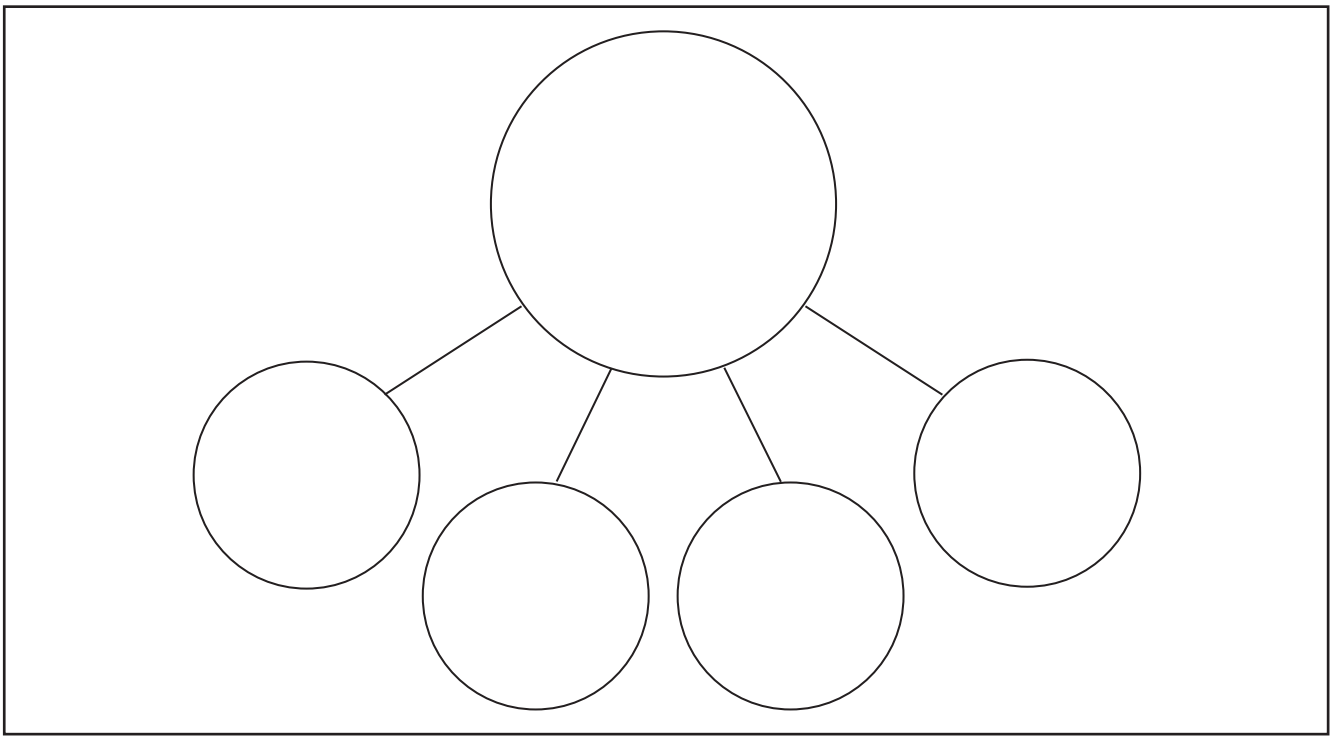
APPLY

Directions: Solve the sharing problems below.

1. There are 16 fish that need to be placed in 4 bowls. Each bowl must hold the same number of fish. How many fish should be put into each bowl? Draw a picture in the bowls below to solve the problem.



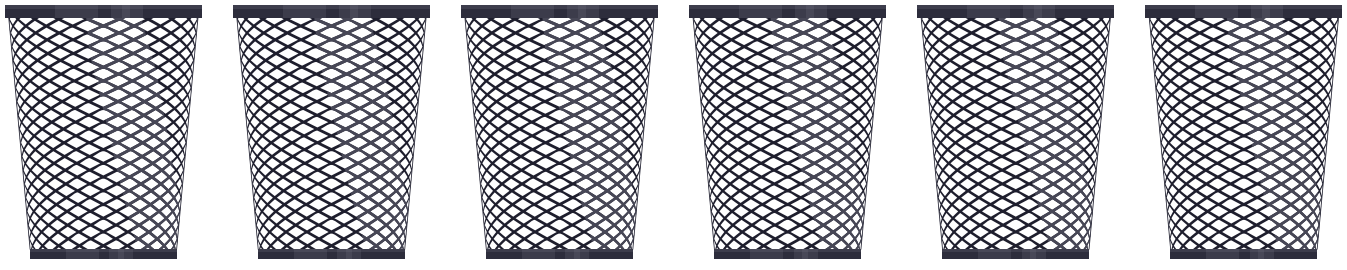
Draw a part-part-whole model in the box below to show your answer.



2. Sameh is preparing gift baskets. He has 20 oranges that need to be divided equally between 5 baskets. Draw a picture in the baskets below to solve the problem.

Draw a part-part-whole model in the box below to show your answer.

3. The teacher has 36 crayons to share equally between 6 students. She must place the crayons in the cups below. Draw a picture in the cups below to solve the problem.



Draw a part-part-whole model in the box below to show your answer.

REFLECT

Directions: Reflect on your learning. In the box below, write a sharing story problem using the numbers 15 and 3. Then solve the problem and show your work with both a picture and a part-part-whole model.

LESSON 9: APPLICATIONS ON DIVISION

APPLY

Example 1:

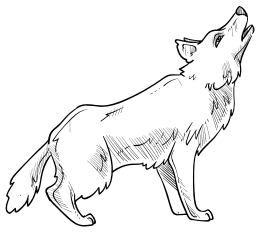
Directions: Draw a mathematical picture to solve.

Each cat needs 2 fish for lunch. How many cats can we feed with 12 fish?

Directions: Solve the following grouping problems to figure out how many animals can eat. You can use counters to help you. Please draw and show all of your work.

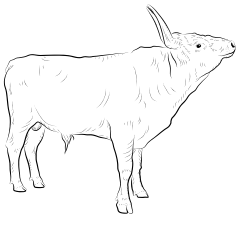
1. Each ibis will eat 3 worms. You have 18 worms. How many ibis can be fed?

2. Each jackal must eat 6 insects. There are 24 insects. How many jackals can be fed?



3. Each crocodile wants to eat 5 fish. There are 25 fish. How many crocodiles can be fed?

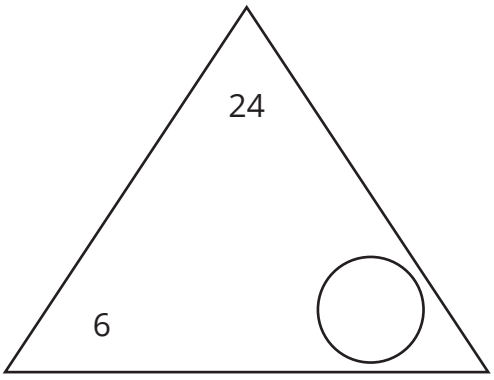
4. Each bull eats 2 bales of hay each day. There are 100 bales. How many bulls can be fed each day?



LESSON 10: THE RELATION BETWEEN MULTIPLICATION AND DIVISION

APPLY

Directions: Find the missing factor in the triangles below. Then write the four equations that go with the fact family. Use the counters to help you.

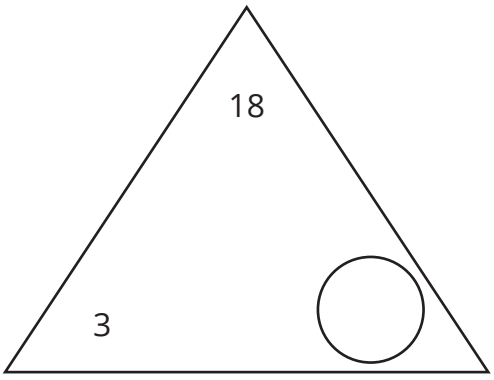


____ × ____ = ____

____ × ____ = ____

____ ÷ ____ = ____

____ ÷ ____ = ____

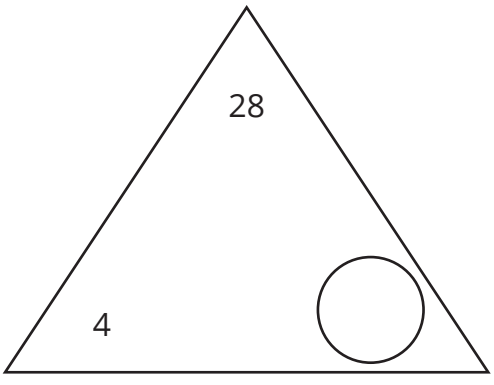


____ × ____ = ____

____ × ____ = ____

____ ÷ ____ = ____

____ ÷ ____ = ____

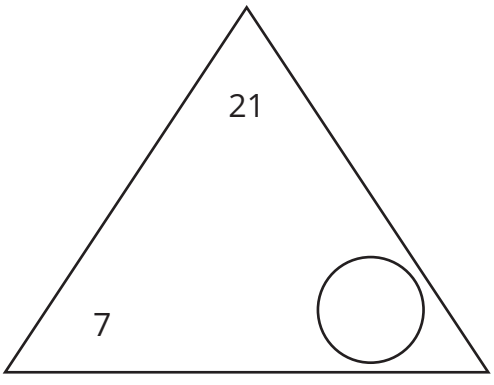


____ × ____ = ____

____ × ____ = ____

____ ÷ ____ = ____

____ ÷ ____ = ____



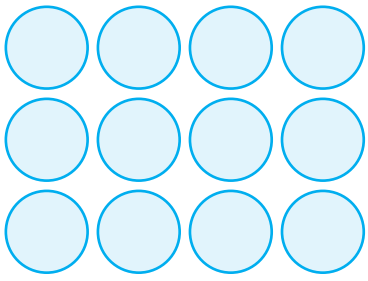
____ × ____ = ____

____ × ____ = ____

____ ÷ ____ = ____

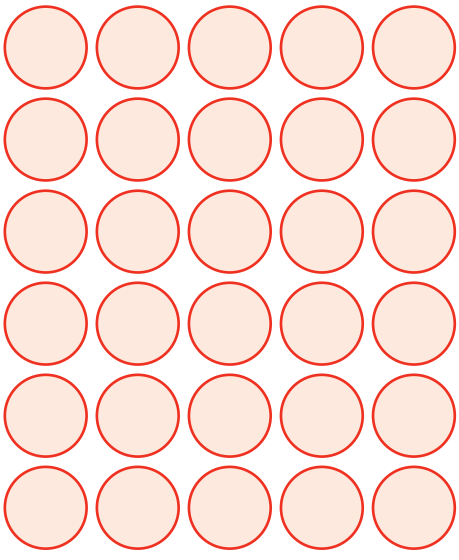
____ ÷ ____ = ____

CHALLENGE: Describe each of these arrays using one multiplication equation and one division equation.



____ × ____ = ____

____ ÷ ____ = ____



____ × ____ = ____

____ ÷ ____ = ____

Draw and write your own array with two connected multiplication and division problems.

CHAPTER 4

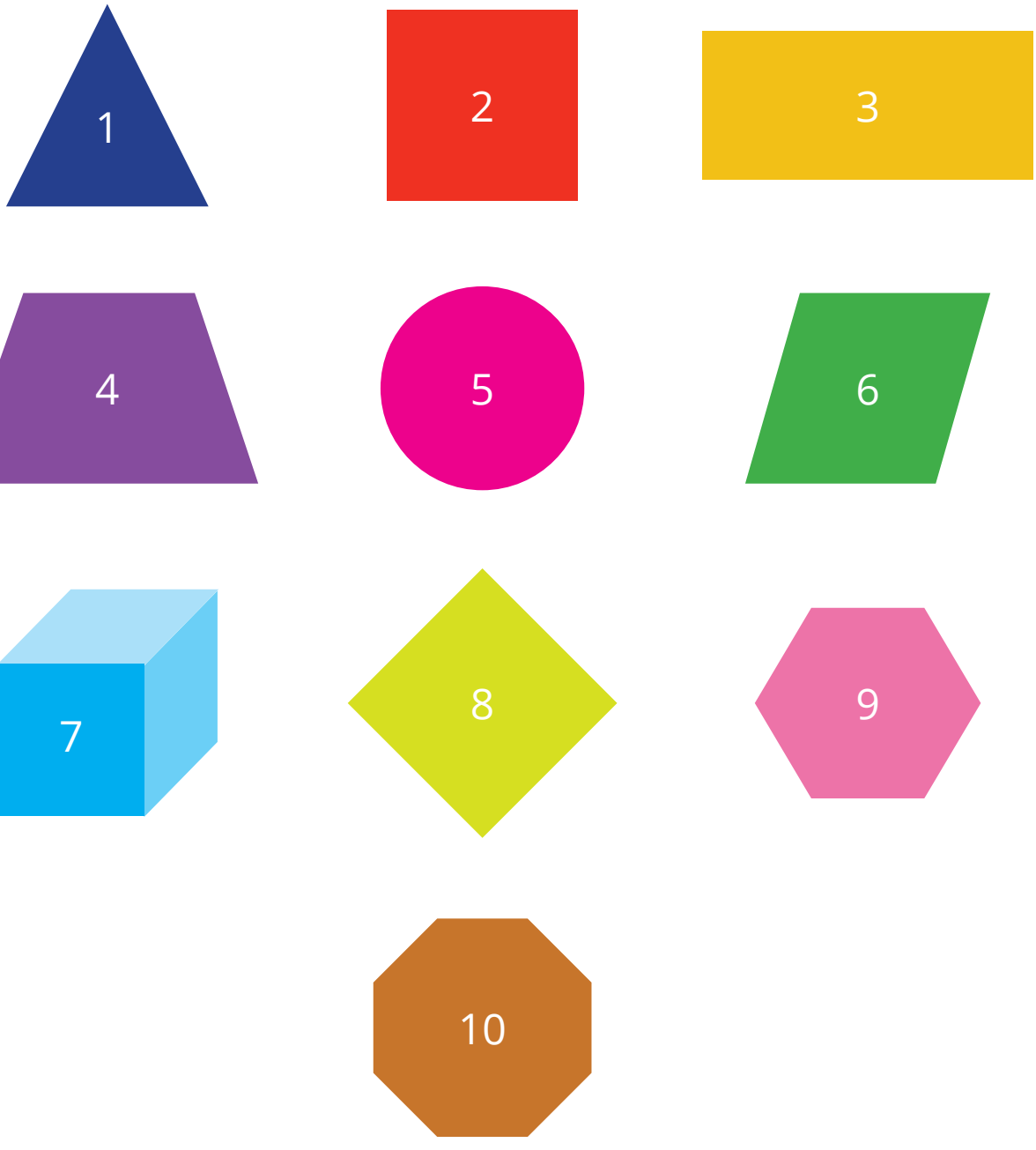
LESSON 1 : POLYGONS

APPLY

Directions: Do the following.

First, name each shape with your partner.

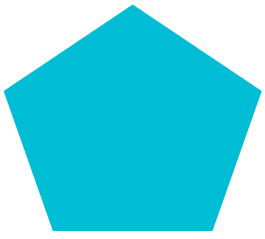
- **Then sort the shapes below into categories.**
- **Label each category.**
- **Write the number of the shape that belongs in the category or draw it.**

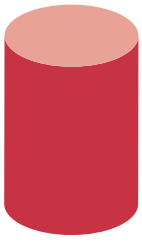


Category Title: **Four Vertices** **Square** **Rectangle**	Category Title:
Category Title:	Category Title:
Category Title:	Category Title:

CHALLENGE:

Write a list of attributes for one of the shapes below. Not all of these are polygons.





Could any of these shapes fit into one of your categories from above? Explain.

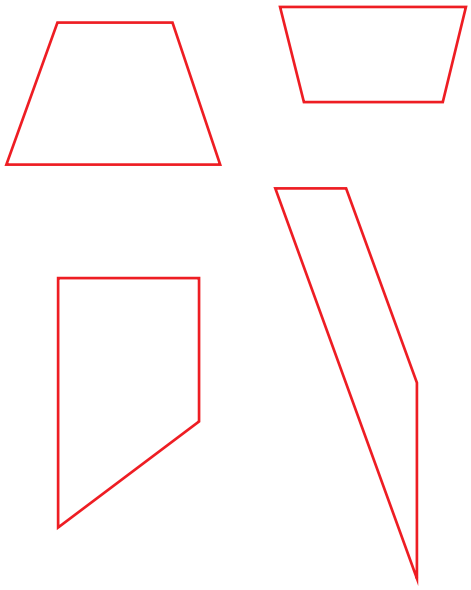
REFLECT

Directions: Reflect on your learning. In your own words, explain what a polygon is. Draw two examples. Then, in your own words, explain what a parallelogram is. Draw two examples.

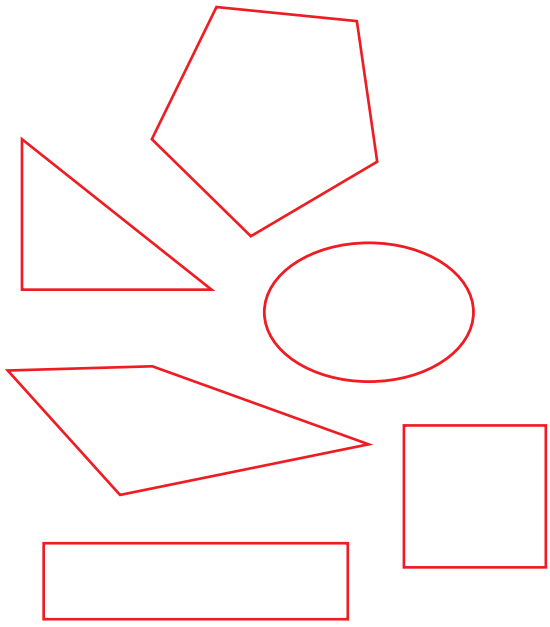
LESSON 2: PROPERTIES OF QUADRILATERALS

CONNECT

These are trapeziums.



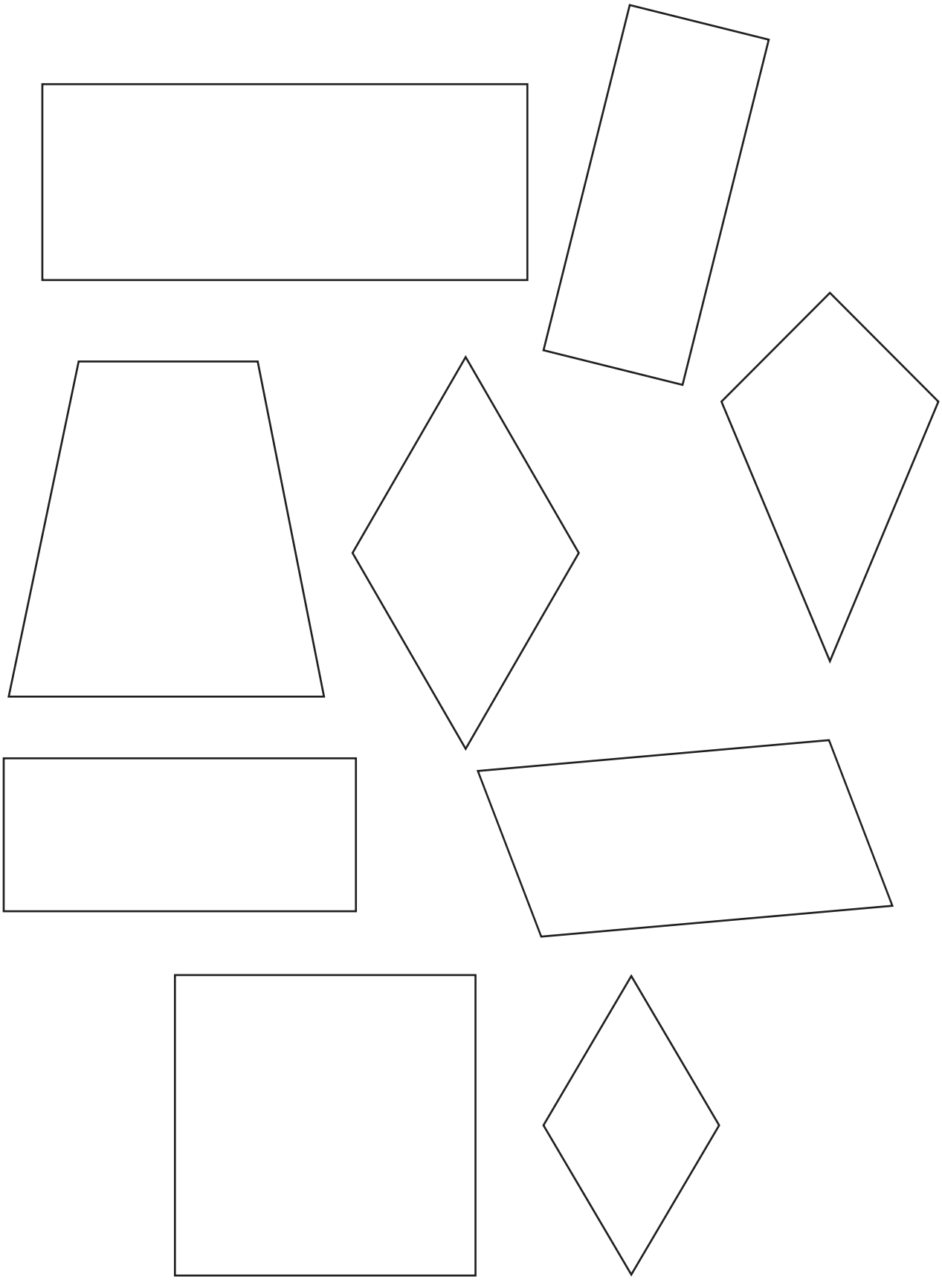
These are not trapeziums.



Directions: Write a definition of a trapezium in your own words. Compare your definition with a partner's.

APPLY

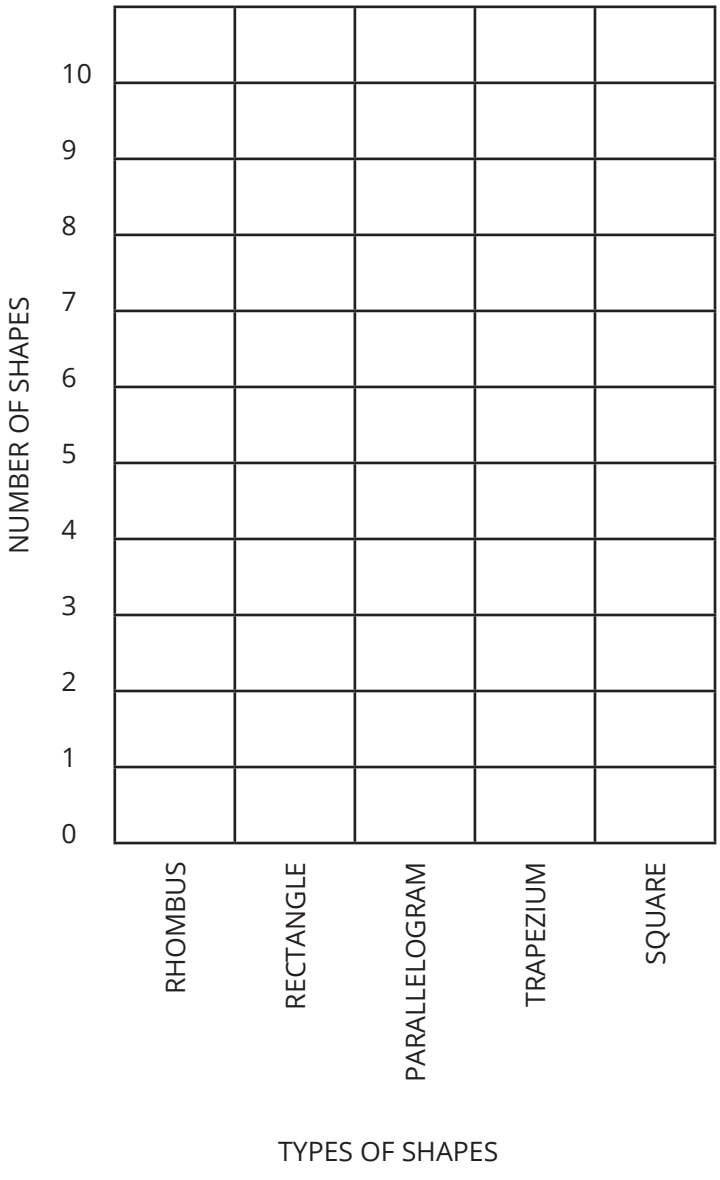
Directions: Tear out this page and cut out quadrilaterals to use for your quadrilateral image.



APPLY, continued

Directions: Once your picture is complete, fill out the bar graph below.

QUADRILATERAL GRAPH



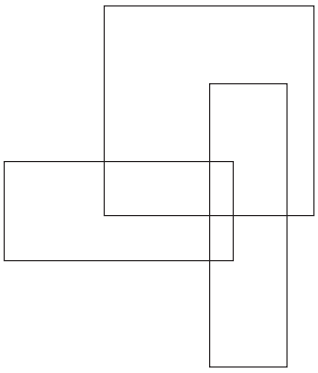
REFLECT

Directions: Reflect on your learning. Write two statements about the data in your bar graph. Then write one question that could be answered using your graph.

LESSON 3: AREA

CONNECT

Directions: Look at the puzzle below. How many rectangles can you find? You may color or number them (or use another method) to help you keep track.

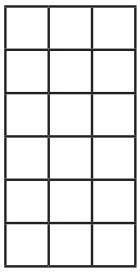


APPLY

Directions: Determine the area of each rectangle. Explain the strategy you used in the work space provided next to each shape and record the answer.

Work Space

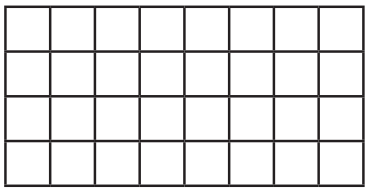
Rectangle 1:



Rectangle 1:

Total area = _____ square units

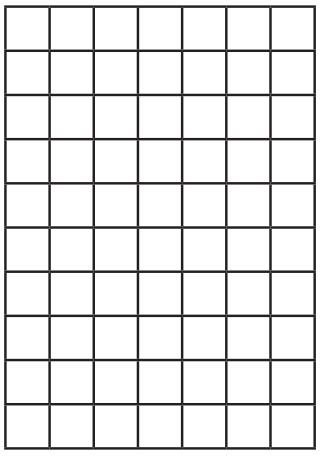
Rectangle 2:



Rectangle 2:

Total area = _____ square units

Rectangle 3:

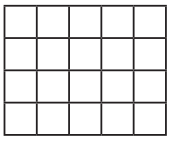


Rectangle 3:

Total area = _____ square units

Work Space

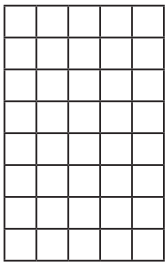
Rectangle 4:



Total area = _____ square units

Rectangle 4:

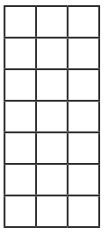
Rectangle 5:



Total area = _____ square units

Rectangle 5:

Rectangle 6:



Total area = _____ square units

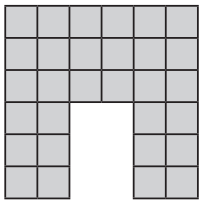
Rectangle 6:

CHALLENGE:

These gardens are not rectangular. Can you find the area anyway? Show your thinking.

Work Space

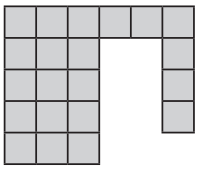
Problem 1:



Total area = _____ square units

Problem 1:

Rectangle 2:



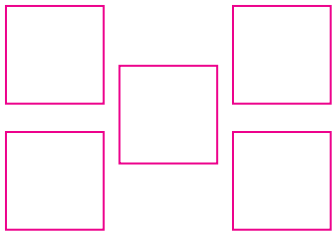
Total area = _____ square units

Rectangle 2:

LESSON 4: RECTANGLES WITH EQUAL AREA

CONNECT

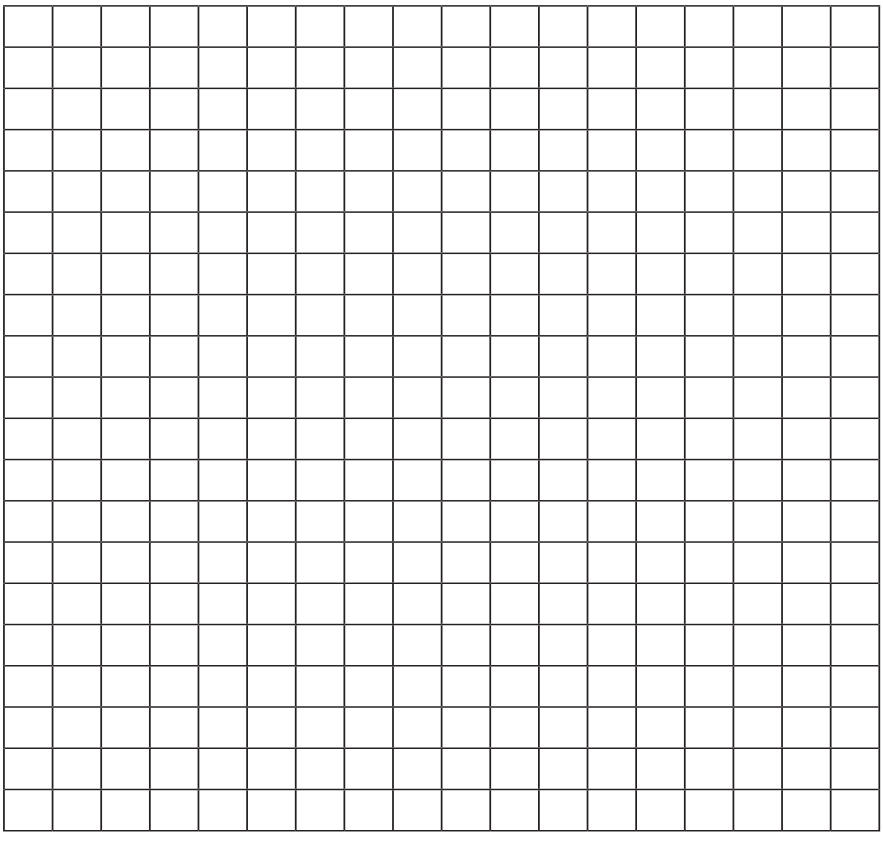
Directions: Solve the following problem: Mohammad makes a drawing with 5 squares. Mona makes the same drawing but uses triangles. It takes 2 triangles to make a square. How many triangles does Mona draw?



Show your work in the box below.

APPLY

Directions: On the grid below, draw and label as many rectangles as you can with an area of 18 square units. Then write equations that match your rectangles.



List your arrays as equations below:

CHALLENGE: Use the Commutative Property to answer the following.

What is another way you could write:

$3 \times 7 = 21$ _____

$6 \times 2 = 12$ _____

$4 \times 10 = 40$ _____

REFLECT

Directions: Reflect on what you have learned about area, arrays, and multiplication.

Omar planted two flower plots. One was 3 × 4 and one was 2 × 6. Do they have the same area? How do you know? Show your thinking in numbers and pictures in the box below.

LESSON 5: AREA USING MODELS

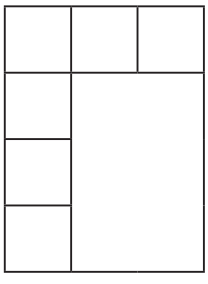
CONNECT

Directions: Play Mystery Multiplication. Select two number cards, create an array using the two numbers as your factors, write the equation, and then find the product.

APPLY

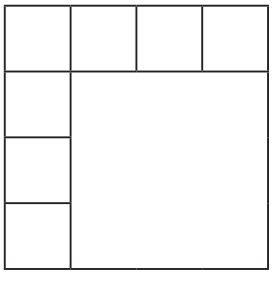
Directions: Determine the total area of each shape.

Rectangle 1:



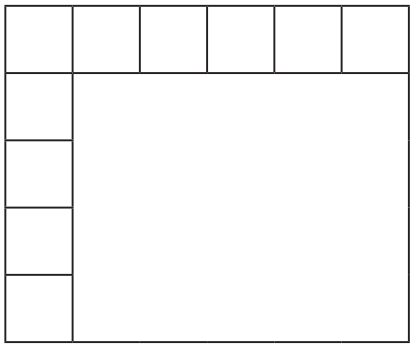
Total area = _____ square units

Rectangle 2:



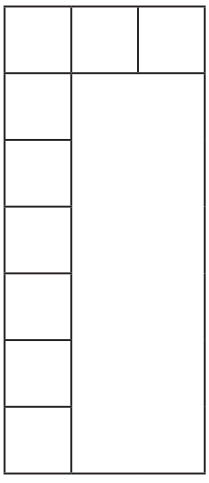
Total area = _____ square units

Rectangle 3:



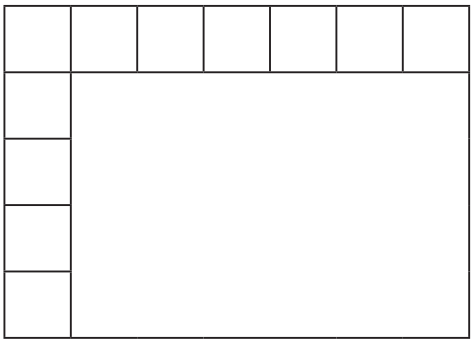
Total area = _____ square units

Rectangle 4:



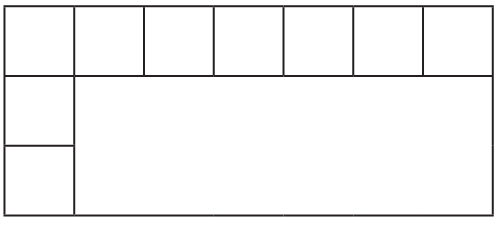
Total area = _____ square units

Rectangle 5:



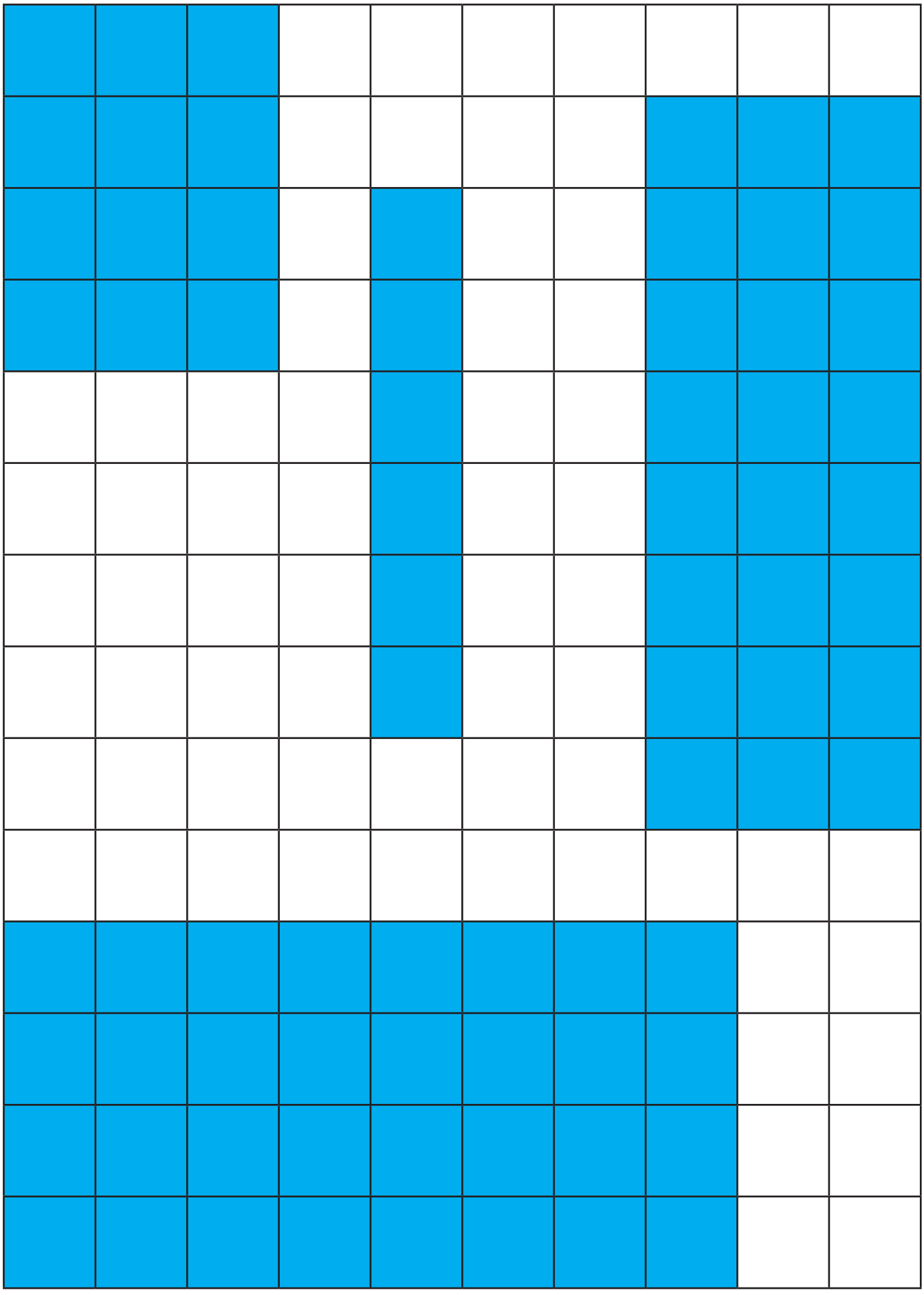
Total area = _____ square units

Rectangle 6:



Total area = _____ square units

CHALLENGE: Determine the total area of the following shapes.



REFLECT

Directions: Reflect on what you have learned about area. Then answer the following questions using words and pictures.

How would you explain area to a younger friend? Write your answer below.

How do you determine the area of a rectangle? Write your answer below.

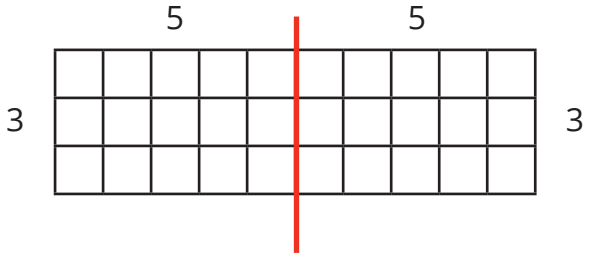
When might you need to find the area of a rectangle in real life? Write your answer below.

LESSON 6: AREA BY SPLITTING ARRAYS

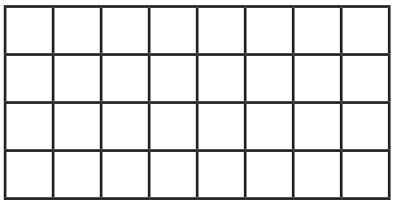
APPLY

Directions: Split the arrays below into at least 2 smaller arrays. Label the factors for each part. An example is shown below.

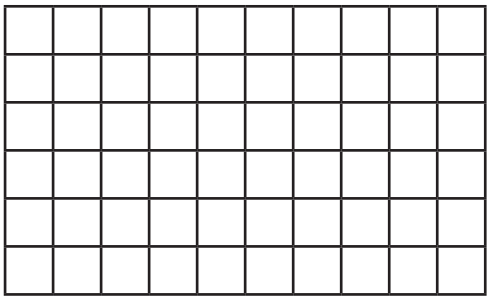
Example



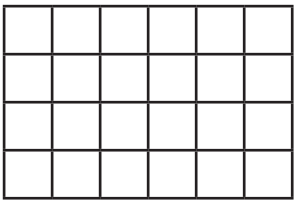
Problem 1



Problem 2



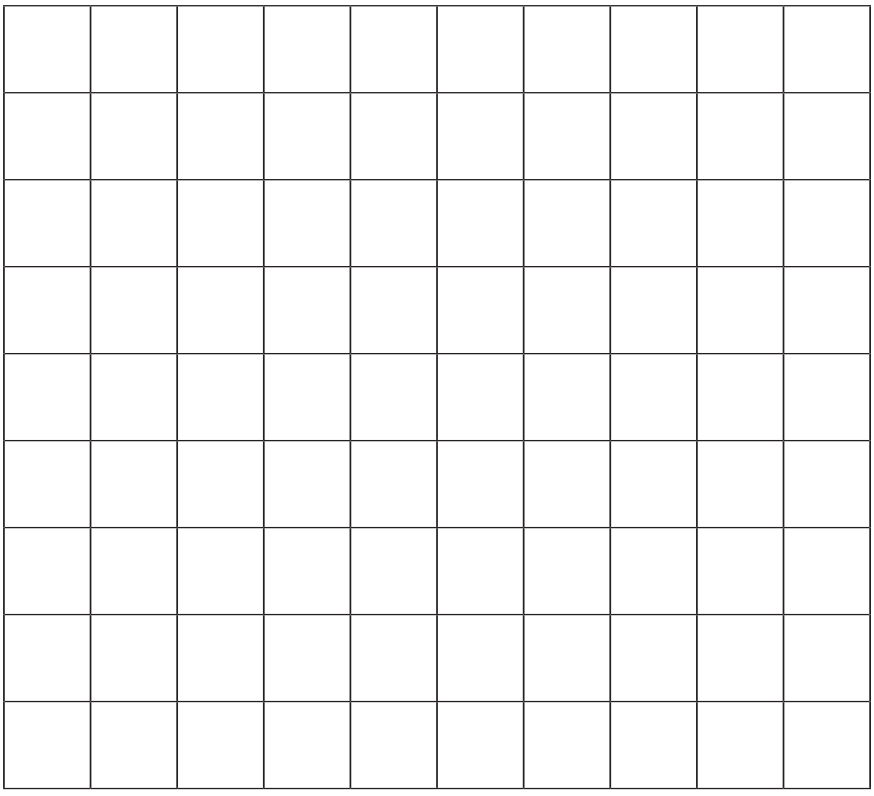
Problem 3



LESSON 7: DISTRIBUTIVE PROPERTY ON MULTIPLICATION

CONNECT

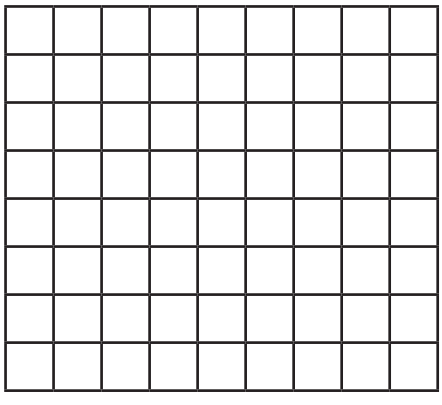
Directions: Play Mystery Multiplication. Select two number cards, create an array using the two numbers as your factors, write the equation, and then find the product.

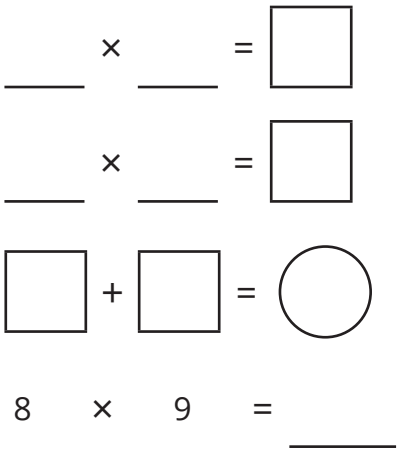


APPLY

Directions: Break apart the arrays and, using the distributive property, write an equation to show your work.

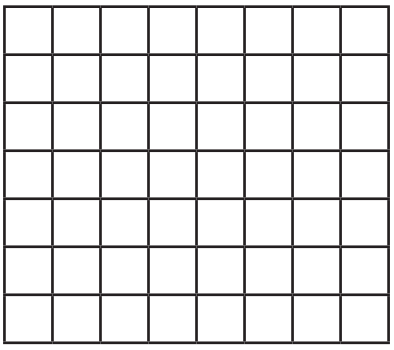
1.





8 × 9 = ____

2.



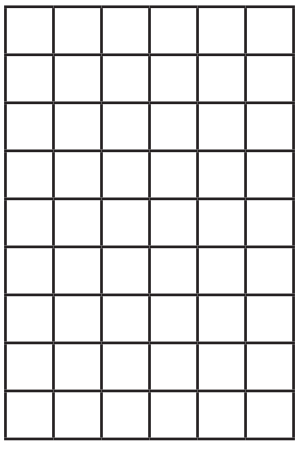
___ × ___ = □

___ × ___ = □

□ + □ = ○

7 × 8 = ___

3.



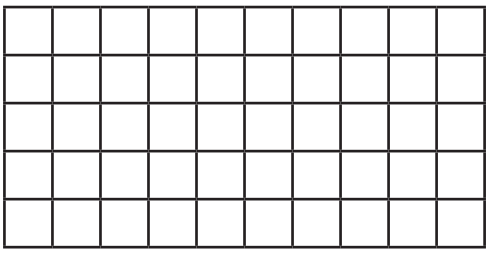
___ × ___ = □

___ × ___ = □

□ + □ = ○

9 × 6 = ___

4.



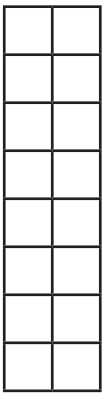
___ × ___ = □

___ × ___ = □

□ + □ = ○

5 × 10 = ___

5.



___ × ___ = □

___ × ___ = □

□ + □ = ○

8 × 2 = ___

REFLECT

Directions: Reflect on your learning in this lesson. Answer the questions in the boxes below.

What is the Distributive Property of Multiplication? Explain it in your own words. Use drawings and numbers to explain your thinking.

CHAPTER 5

LESSON 1 : PERIMETER OF POLYGONS

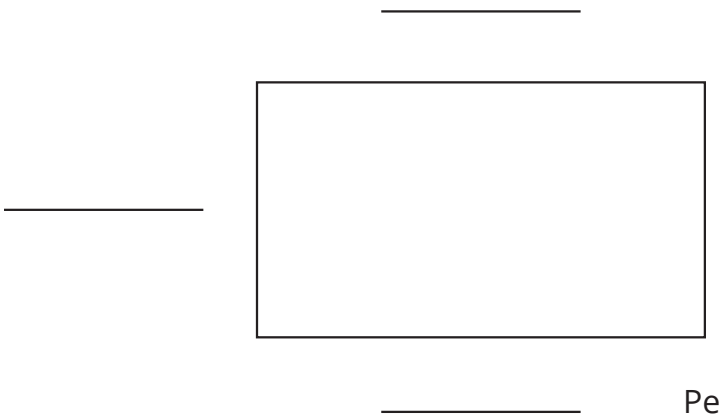
APPLY

Part 1 Directions: For each shape below, do the following:

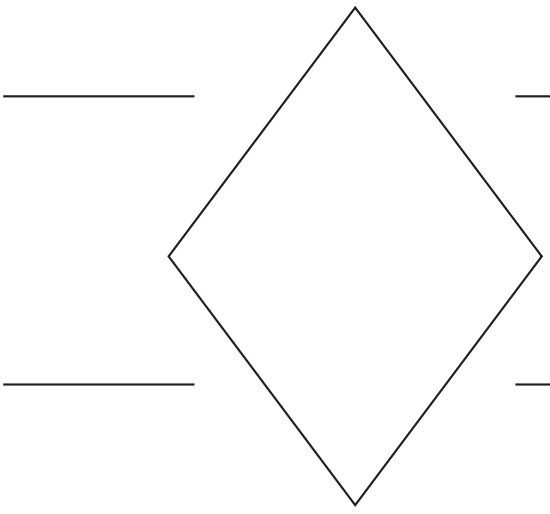
- Measure and record each of the side lengths of the quadrilaterals with your ruler.
- Label the units.

Part 2 Directions: Choose two shapes and do the following:

- Measure and cut a piece of string matching the total perimeter of the shape.
- Lay the string around the shape to check your measurement. It should match perfectly.

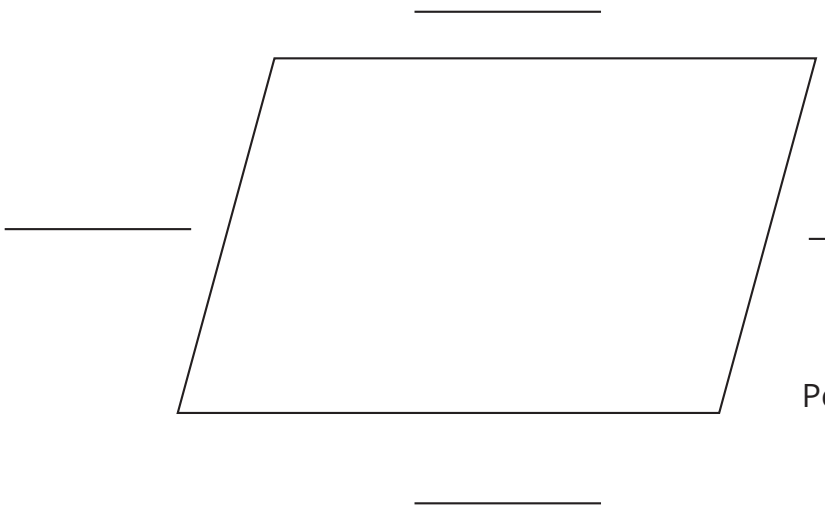


Perimeter: _____



Perimeter: _____

Perimeter: _____



Perimeter: _____

REFLECT

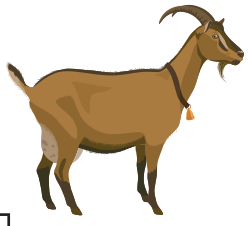
Directions: Reflect on your learning about perimeter. Think about how you found the perimeter of the shapes today. Why is perimeter a linear measurement? Write your thoughts in the box below.

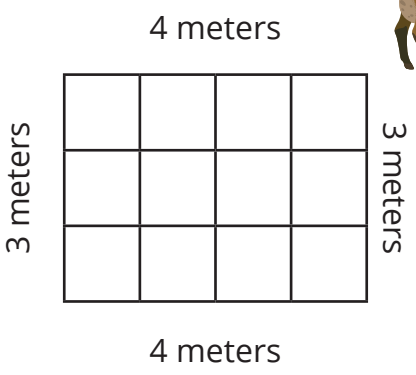
LESSON 2: PERIMETER AND AREA

APPLY

Directions: Work with your Shoulder Partner to solve the perimeter and area problems below. Your teacher will give you additional directions.

Goat Pen



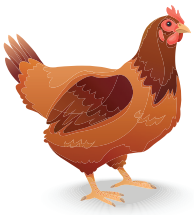


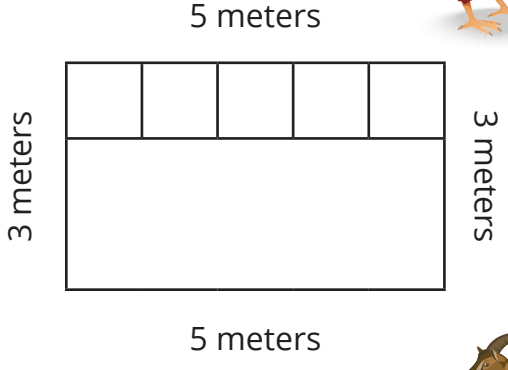
Perimeter = _____ meters

Area = _____ square meters

Work Space

Chicken Pen



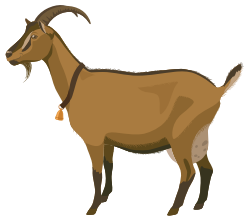


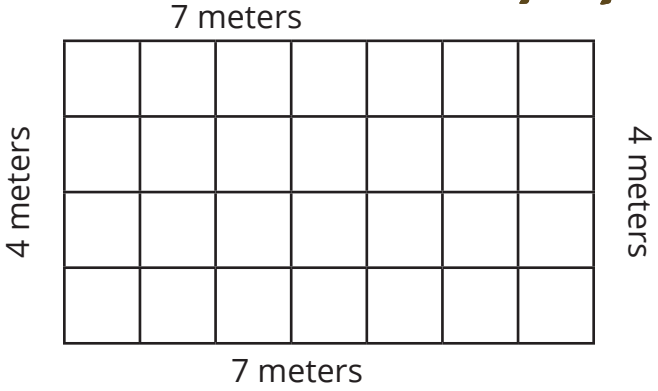
Perimeter = _____ meters

Area = _____ square meters

Work Space

A New Goat Pen





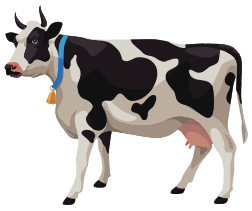
Work Space

Perimeter = _____ meters

Area = _____ square meters

APPLY, continued

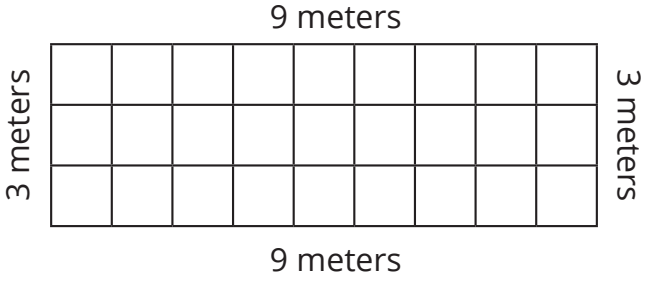
Cattle Pen



Perimeter = _____ meters

Area = _____ square meters

Work Space

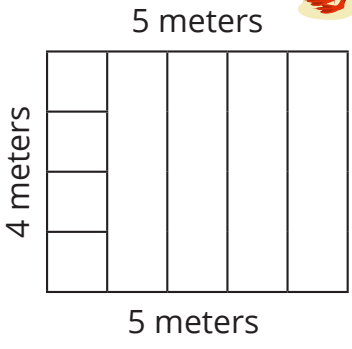


Duck Pen

Perimeter = _____ meters

Area = _____ square meters

Work Space

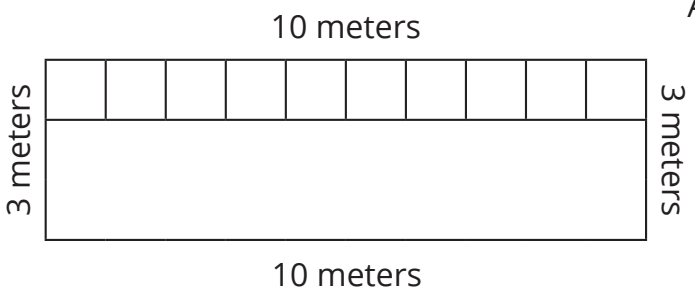


Sheep Pen

Perimeter = _____ meters

Area = _____ square meters

Work Space



CHALLENGE:

1. How much fencing would you need to make ALL of these pens?

2. How many square meters of space would the animals have if you combined ALL of the pens?

REFLECT

Directions: How would you explain the difference between perimeter and area to a Primary 2 student? Write your explanation in the box below. Use numbers, pictures, and words to explain the difference.

LESSON 3: AREA USING THE DIMENSIONS

APPLY

Directions: Look at the space requirements for the animals below. Then determine which pen each animal could use. Write the area of the pen and the name of the animal for each pen. Some pens might work for multiple animals.

Goat's area > 30 square meters

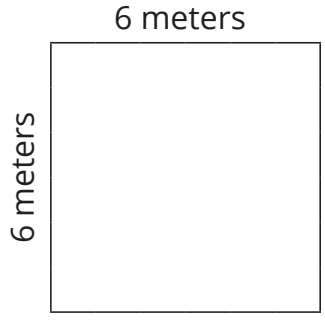
Cattle's area > 39 square meters

Chicken's area < 20 square meters

Sheep's area < 30 square meters but > 24 square meters

Animal Pens

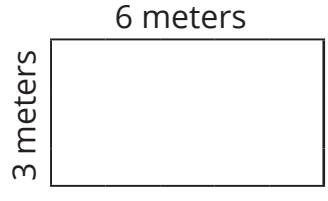
Pen 1



Area = _____ square meters

Animal that can use: _____

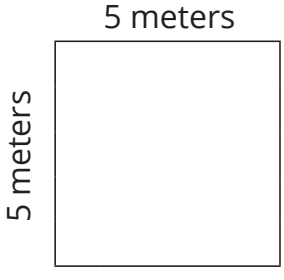
Pen 2



Area = _____ square meters

Animal that can use: _____

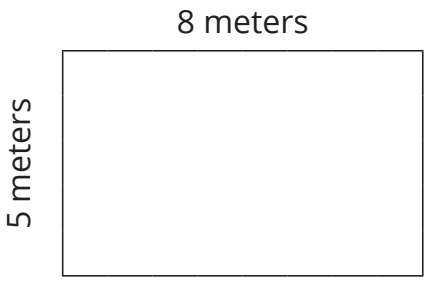
Pen 3



Area = _____ square meters

Animal that can use: _____

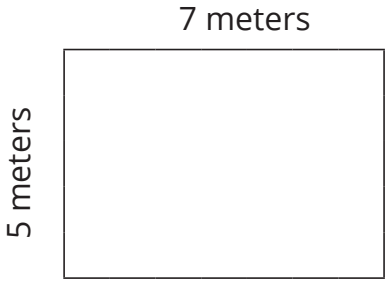
Pen 4



Area = _____ square meters

Animal that can use: _____

Pen 5



Area = _____ square meters

Animal that can use: _____

CHALLENGE:

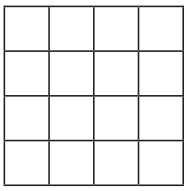
Sketch a different pen for each animal. Be sure to label your pens' dimensions.

LESSON 4: AREA USING DIFFERENT STRATEGIES

CONNECT

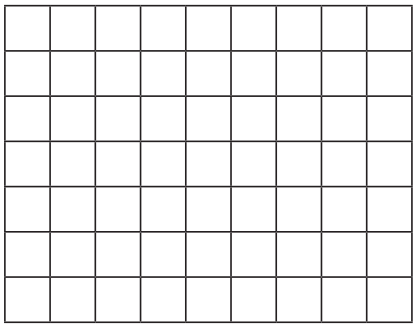
Directions: A friend said that the area of the square shown below is 8 square units. Do you agree or disagree? Explain your thinking in the box below using words, pictures, and/or numbers.

4

4 

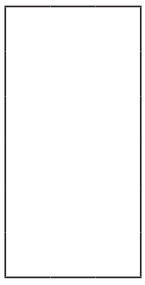
APPLY

Directions: Choose two of the problems below to demonstrate strategies for finding the area of rectangles. For each problem, show TWO ways to find the area. Explain your thinking using words, pictures, and/or numbers. Remember to label all of your answers.

1. 

Show your work here:

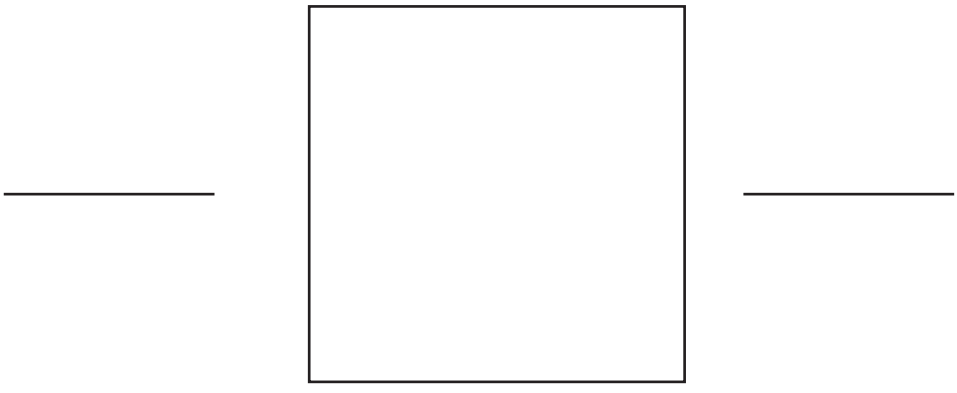
2. 3 units



6 units

Show your work here:

3. Measure this shape with a ruler and label the dimensions in centimeters.



Show your work here:

APPLY, continued

In the boxes below, answer the following questions:

1. Which strategy for finding area works best for you? Why?

2. Which strategy for finding area is the most challenging for you right now? Why?

LESSON 5: DIFFERENT PERIMETERS FOR THE SAME AREA

CONNECT

Directions: Use counters to solve the division problems below. For each problem, draw a picture to show your solution.

1. 36 ÷ 6 =

2. 21 ÷ 3 =

3. 48 ÷ 12 =

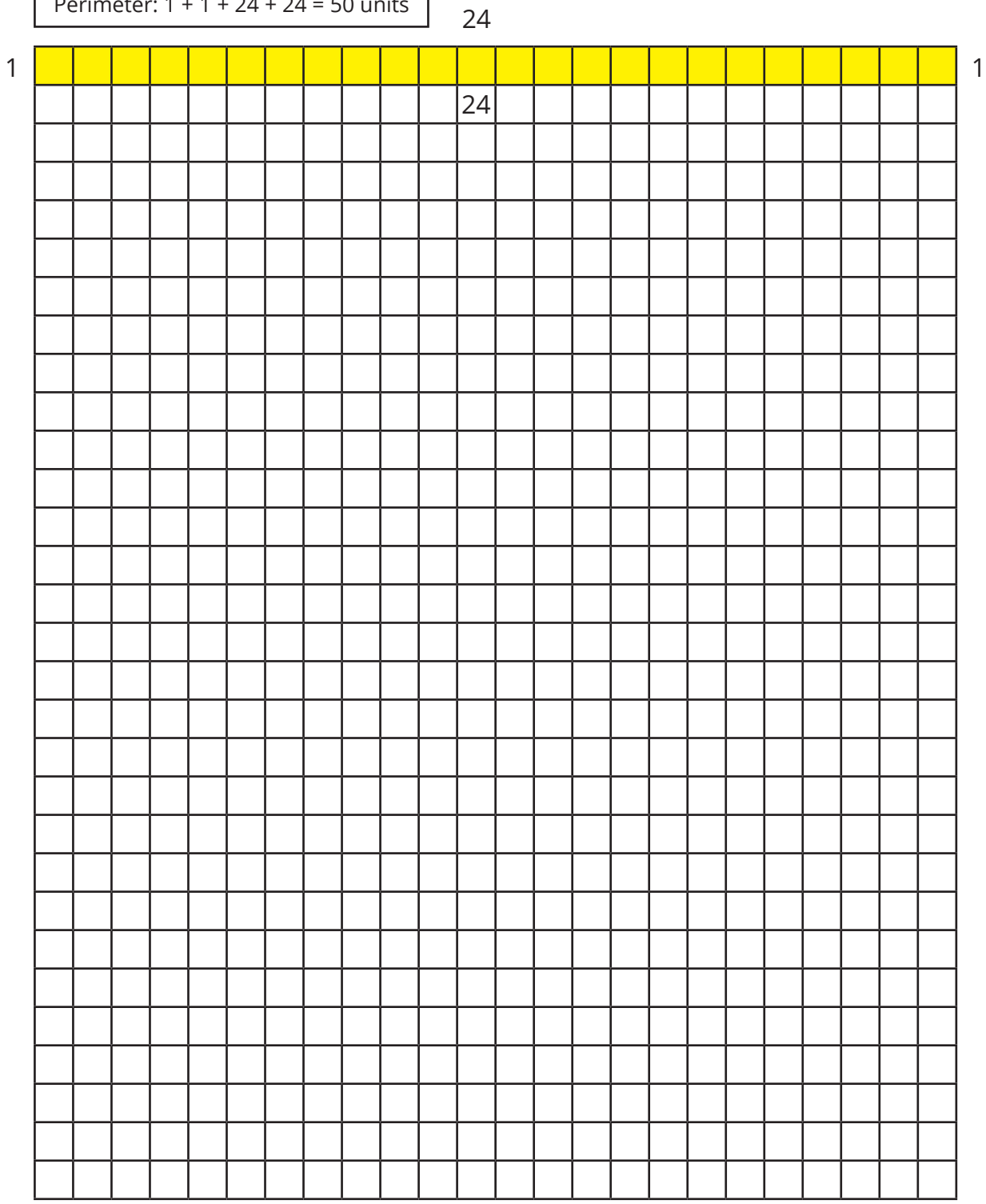
APPLY

Walid invited his friends over to play board games. He has 24 small square tables that he wants to arrange to make a larger rectangular table.

Part 1 Directions: In the grid below, draw as many rectangular tables as you can. Label the width and length and then write an equation to find the area and another equation to find the perimeter. One rectangular table is done for you.

Area: 24 × 1 = 24 square units

Perimeter: 1 + 1 + 24 + 24 = 50 units



Part 2 Directions: In the table below, record the dimensions, perimeter, and area of each of the rectangular tables you built.

Width (linear units)	1								
Length (linear units)	24								
Perimeter (linear units)	50								
Area (square units)	24								

CHALLENGE:

Directions: Which seating arrangement would be the best for playing games with friends? Why do you think so? Write your response in the box below. Use pictures, numbers, or words.

LESSON 6: DIFFERENT AREAS FOR THE SAME PERIMETER

Do two rectangles with the same area always have the same perimeter?

Directions: Complete the following steps.

1. Use your ruler to draw two different rectangles with an area of 6 square cm.
2. Label the side lengths of each rectangle.
3. Calculate the perimeter of each rectangle.
4. Compare the two perimeters and explain your observations using words and/or numbers.

APPLY

Directions: Complete the following steps.

1. In the space below, use your ruler to draw two different rectangles with a perimeter of 20 cm.
2. Label the side lengths of each rectangle.
3. Calculate the area of each rectangle.
4. Compare the two areas and explain your observations using words and/or numbers.

CHALLENGE:

Can you draw a different type of polygon with a perimeter of 20 cm? (You do not have to find the area.) Use your ruler to draw as many as you can below.

REFLECT

Directions: Reflect on your learning about area and perimeter. In the box below, explain the strategy you used to solve today's Apply problem. You may use words, numbers, and/or pictures.

LESSON 7: APPLICATIONS ON PERIMETER AND AREA CONNECT

Directions: Use counters to solve the division problems below. For each problem draw a picture to show your solution.

1. 27 ÷ 3 =

2. 44 ÷ 11 =

3. 36 ÷ 9 =

APPLY

Part 1 Directions: Solve the story problems below. Include a drawing and an equation for each problem. Be sure to label your answers.

1. Shaimaa is sewing a border on a square baby blanket. The length of the blanket is 45 centimeters and the width is 45 centimeters. How long will the border be?

2. Farouk is building a patio out of tiles. He wants the length of the patio to be 7 tiles across and its width to be 6 tiles. How many tiles will he use in all to build the patio?

3. Omnia wants to put a wooden trim around her window. The window is 4 meters tall and 1 meter wide. How much wood does she need for the trim?

4. A farmer is building a fence around his garden. If the garden is 8 meters long and 3 meters wide, how much fencing does he need to buy?

5. A rug is 3 meters long and 2 meters wide. What is the area of the rug?

Part 2 Directions: Write your own story problems. Write one perimeter story problem and one area story problem.

My Perimeter Story Problem

My Area Story Problem

LESSON 8: MULTIPLYING BY MULTIPLES OF 10

Directions: Draw lines to represent the groups of 10 to help you solve the following problems.

3 × 70 =

8 × 40 =

6 × 90 =

10 × 10 =

$8 \times 20 =$

$7 \times 40 =$

$3 \times 50 =$

$4 \times 40 =$

CHALLENGE:

Think about the patterns you observed when solving the Apply problems. How can you use what you know to help you multiply 18 × 10? Explain your thinking in words, pictures, or numbers.

REFLECT

Directions: Answer the question below. Show your work in the box.

Based on what you know about multiples of 10, what would you predict would happen when you multiply a number by a multiple of 100, such as 2 × 300, or 4 × 500?

~~CHAPTER 6~~

LESSON 1 : PATTERNS OF MULTIPLYING BY MULTIPLES OF 10

CONNECT

Directions: There is a large auditorium with 8 rows of seating. Each row has 50 chairs. Omar thinks there are 450 chairs total. Is he correct? Use words, pictures, and/or numbers to explain your thinking.

APPLY

Use the multiplication facts and patterns to find :

Example:

2 x 10 = 20	3 x 10 = _____
2 x 100=200	3 x 100 = _____
2 x 1000 = 2000	3 x 1000 = _____
4 x 6 = _____	5 x 7 = _____
4 x 60 = _____	5 x 70 = _____
4 x 600 = _____	5 x 700 = _____
4 x 6000 = _____	5 x 7000 = _____

Directions: Solve the problems below. Split the multiples of 10 into 10 and the other factor. For example, 40 has the factors 10 and 4.

Example: 8 × 40 (8 × 4) × 10 = 320

3 × 90 (____ × ____) × 10 =	4 × 80 (____ × ____) × 10 =
9 × 20 (____ × ____) × 10 =	6 × 30 (____ × ____) × 10 =
8 × 50 (____ × ____) × 10 =	7 × 30 (____ × ____) × 10 =
6 × 70 (____ × ____) × 10 =	5 × 40 (____ × ____) × 10 =

CHALLENGE: Malek bought a box of cards. In the box there were 6 smaller boxes, and in each of those boxes there were 6 packs of 10 cards. To find the total number of cards he bought, Malek wrote this equation: 6 × 60 = 360. Is he correct? Explain how you know.

REFLECT

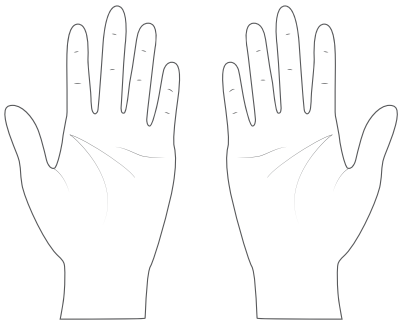
Directions: Reflect on your learning about multiplying by multiples of 10. In the space provided, explain the patterns you observed when multiplying a single digit by multiples of 10. Use words, pictures, and/or numbers to explain your thinking.

LESSON 2: STRATEGIES OF MULTIPLYING BY 9

APPLY

Group 1: Finger Trick Strategy

After you practice the strategy, draw an example below and use words to explain how to do it.



CHALLENGE: Why do you think this strategy works?

Group 2: List of Equations Strategy

Directions: List the equations for multiplying by 9 in order. The first two have been done for you. Then record below the table what you notice about any patterns.

9 × 1 =	9
9 × 2 =	18
9 × 3 =	

Describe the patterns you observe. Be sure to look at the factors and the products.

CHALLENGE: What additional pattern do you observe when you add the Tens digit and Ones digit of each product (for example, 0 + 9 and 1 + 8)?

APPLY, CONTINUED

Group 3: 120 Chart Strategy

Directions: Shade in all the multiples of 9. Next to the chart, record what patterns you notice.

111	112	113	114	115	116	117	118	119	120
101	102	103	104	105	106	107	108	109	110
91	92	93	94	95	96	97	98	99	100
81	82	83	84	85	86	87	88	89	90
71	72	73	74	75	76	77	78	79	80
61	62	63	64	65	66	67	68	69	70
51	52	53	54	55	56	57	58	59	60
41	42	43	44	45	46	47	48	49	50
31	32	33	34	35	36	37	38	39	40
21	22	23	24	25	26	27	28	29	30
11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10

Describe the patterns you observe.

CHALLENGE: Record all the multiplication equations below. See if you can find products beyond those you colored in the 120 Chart.

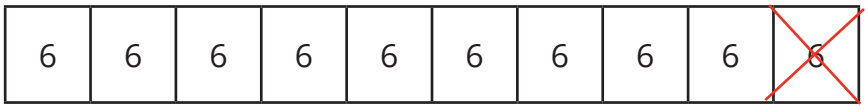
APPLY ,CONTINUED

Group 4: Tens Facts Strategy

Directions: You can use what you know about multiplying by 10 to quickly multiply by 9. Look at the example below. Solve and discuss each problem with your group.

9 × 6

First draw a model of 10 × 6 and then cross out one group of 6. Now there are 9 groups of 6.



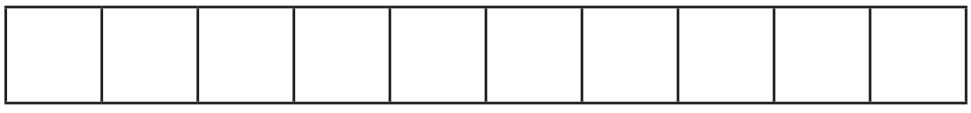
10 × 6 = 60

60 – 6 = _____ so 9 × 6 = _____

9 × 5

10 × 5 = _____ so 9 × 5 = _____

9 × 7



10 × 7 = _____ so 9 × 7 = _____

9 × 3

10 × 3 = _____ So 9 × 3 = _____

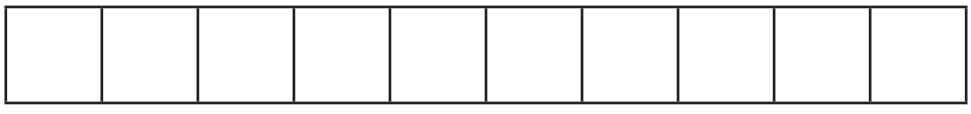
9 × 2

10 × 2 = _____ so 9 × 2 = _____

9 × 8

10 × 8 = _____ so 9 × 8 = _____

9 × 9



10 × 9 = _____ So 9 × 9 = _____

CHALLENGE: A student told me that 9 × 8 = 70. They said they know that 10 × 8 = 80, so 9 × 8 = 70 because they subtracted a 10 from 80. Are they correct? Show your thinking in the box below.

LESSON 3: FACTS ON MULTIPLICATION AND ADDITION

CONNECT

Directions: When your teacher gives the signal, solve as many problems as you can in 2 minutes. Use any strategy you learned in Lesson 52.

9 × 2 = _____	4 × 9 = _____	9 × 1 = _____
9 × 0 = _____	9 × 10 = _____	9 × 2 = _____
3 × 9 = _____	9 × 5 = _____	9 × 0 = _____
9 × 7 = _____	9 × 9 = _____	8 × 9 = _____
1 × 9 = _____	9 × 0 = _____	6 × 9 = _____
9 × 4 = _____	9 × 2 = _____	9 × 10 = _____
9 × 5 = _____	9 × 8 = _____	2 × 9 = _____
9 × 6 = _____	1 × 9 = _____	9 × 3 = _____
9 × 8 = _____	9 × 6 = _____	4 × 9 = _____
10 × 9 = _____	9 × 7 = _____	9 × 0 = _____

Number correctly answered: _____

Number incorrectly answered: _____

Number not answered: _____

Put a check mark next to the strategy you used most today.

☐ Finger Trick Strategy
☐ Tens Facts Strategy
☐ List of Equations Strategy
☐ Other
☐ 120 Chart Strategy

Do you think that strategy worked well for you? Why or why not?

APPLY

7 × 2 = _____	3 × 9 = _____	10 + 1 = _____
6 × 0 = _____	4 × 3 = _____	2 × 3 = _____
3 + 9 = _____	6 + 5 = _____	0 + 10 = _____
1 × 7 = _____	9 + 9 = _____	8 × 0 = _____
1 + 9 = _____	9 × 9 = _____	6 + 5 = _____
2 × 4 = _____	4 × 2 = _____	3 + 10 = _____
9 × 6 = _____	6 + 6 = _____	2 × 6 = _____
3 + 9 = _____	3 + 3 = _____	7 + 3 = _____
10 × 8 = _____	2 × 10 = _____	0 + 4 = _____
3 + 9 = _____	9 + 10 = _____	6 × 0 = _____
4 × 8 = _____	2 × 10 = _____	0 + 4 = _____
1 × 1 = _____	6 + 1 = _____	8 × 8 = _____
3 × 3 = _____	5 × 10 = _____	5 + 5 = _____
6 × 1 = _____	9 × 6 = _____	9 × 0 = _____
10 × 0 = _____	5 × 10 = _____	6 + 2 = _____
2 + 9 = _____	0 + 10 = _____	1 × 2 = _____
5 × 8 = _____	2 × 3 = _____	4 + 4 = _____
8 + 9 = _____	9 + 6 = _____	6 × 7 = _____
0 × 8 = _____	9 × 10 = _____	10 + 4 = _____
2 × 5 = _____	1 + 10 = _____	4 × 2 = _____

Problems completed: _____

Directions: Record the strategies you used today. If you did not have a strategy for one of the boxes, leave it blank.

ADDITION STRATEGIES	MULTIPLICATION STRATEGIES
+ 0	× 0
+ 1	× 1
+ 2	× 2
+ 3	× 3
+ 4	× 4
+ 5	× 5
+ 6	× 6
+ 7	× 7
+ 8	× 8
+ 9	× 9
+ 10	× 10

What other strategies did you use?

LESSON 4: COMPARING AND ORDERING NUMBERS IN DIFFERENT FORMS

APPLY

Directions: Solve the problem below with your partner.

Gamila said that since 9 is the digit with the largest value, the number 999 is larger than 1000. Do you agree or disagree? Why?

Directions: Solve the rest of these problems independently.

Puzzle 1:

This number has 5 Thousands, 7 Hundreds, 6 Tens, and 4 Ones. What number is it?

_____

Puzzle 2:

This number has 12 Hundreds, 15 Tens, and 6 ones. What number is it?

_____

Puzzle 3:

Write the following number in standard form. Pay attention to the place value.

6,000 + 50,000 + 40 + 300 + 2 =

_____

Puzzle 4:

Write the following number in expanded form.

3,509 = _____

Puzzle 5:

Radwa ordered the following numbers from smallest to largest. What did she do incorrectly?

5,021 5,201 5,102 5,210

Reorder the numbers correctly: _____ , _____ , _____ , _____

Puzzle 6:

Sara compared the numbers below. What is her error?

13,470 < 13,407

Puzzle 7:

Order the following numbers from least to greatest: 50; 5; 500; 5,000; 1; 10,000; 500,000.

_____ , _____ , _____ , _____ , _____ , _____ , _____

CHALLENGE:

Write at least one place value puzzle of your own for a number that has at least 4 Ten Thousands.

LESSON 5: ADDITION STRATEGIES

APPLY

Directions: Solve the addition problems below using a strategy that is efficient for you. When finished, choose two problems and double-check your answer using a different addition strategy. Rewrite the two problems in the rows at the bottom and show your work for the new strategy.

PROBLEM	WORK SPACE	SUM
97 + 184		
483 + 201		
823 + 262		
677 + 233		
865 + 337		

DOUBLE-CHECKING USING A NEW STRATEGY		
PROBLEM	**WORK SPACE**	**SUM**

CHALLENGE:

1. Choose one of the problems from above and write a story problem using those numbers.

2. Choose four of the sums and find the sum of those four numbers.

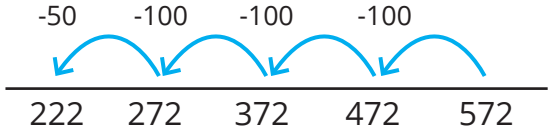
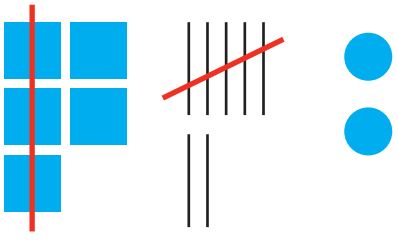
REFLECT

Directions: Reflect on your learning about addition strategies. Why is it important to learn different strategies to solve addition problems? Write your thinking below and use examples to support your answer.

LESSON 6: SUBTRACTION STRATEGIES

APPLY

Directions: Solve each subtraction problem using any strategy you choose. Then write an addition problem to check your answer. The first one is an example.

SUBTRACTION PROBLEM	ADDITION PROBLEM TO CHECK
Example: 572 – 350 = 222 Work: *Number Line*  *Place Value Picture* 	Example: 222 + 350 = 572 200 + 300 = 500 22 + 50 = 72 500 + 72 = 572
1. 780 – 450 = Work:	
2. 925 – 610 = Work:	

SUBTRACTION PROBLEM	ADDITION PROBLEM TO CHECK
3. 2,550 – 1,225 = Work:	
4. 3,000 – 1,500 = Work:	
5. 5,548 – 3,315 = Work:	
6. 1,759 – 1,255 = Work:	

CHALLENGE:

1. Pick one of the problems from above and write a story problem using those numbers.

2. Pick the largest difference from above and subtract the smallest difference.

LESSON 7: APPLICATIONS ON ADDITION AND SUBTRACTION

CONNECT

Mr. Mahmoud raises chickens. In the past two years, his chickens have laid 5,350 eggs. Last year his chickens laid 2,120 eggs. How many eggs did his chickens lay two years ago?

Circle the equation that represents how you might solve. Would you use addition or subtraction?

2,120 + _____ = 5,350 **OR** 5,350 – 2,120 = _____

2,120 + 3,000 = 5,120

5,120 + 200 = 5,320

5,320 + 30 = 5,350

3,230 eggs

5,350 – 2,000= 3,350

3,350 – 100 = 3,250

3,250 – 20 = 3,230

3,230 eggs

APPLY

Directions: Read each story problem and decide on a strategy to solve it. Show your work in the box below each problem. Some of the problems might have more than one step. Read carefully.

Example:

Mr. Mahmoud also raises sheep. One day he took 235 sheep out to graze on a hill. Later, his neighbor brought his sheep to the hillside to graze. Now there are 680 sheep on the hill. How many sheep did the neighbor bring to the hillside?

Practice:

1. The library can hold 2,475 books, but 525 books are out on loan and 137 books are missing. How many books are there in the library right now?

2. Three boxes filled with books were just delivered to the library. If each box is filled with 215 books, how many books were delivered?

3. The librarian takes some of the new books out of the boxes. Now there are only 510 books in the boxes. How many books did the librarian take out of the boxes?

4. Amir's family is saving to buy a new TV. The TV costs 4,590 LE on sale. They have saved 2,410 LE so far. How much more money do they need before they can buy the TV?

5. Omar just moved to the city. He found an apartment to rent for 3,340 LE per month. Electricity and gas will cost him 692 LE per month. How much money will it cost him each month to live?

6. If Omar had 5,000 LE to spend each month, how much money does he have left after he pays for rent, electricity and gas?

REFLECT

Directions: Reflect on your learning about addition and subtraction strategies and adding and subtracting large numbers. Circle the number that best describes your level of confidence solving addition and subtraction problems with large numbers at this point in the year.

1 = Adding and subtracting large numbers is still tricky for me.

5 = I am very confident solving large-number addition and subtraction problems.

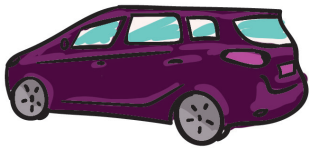
1	2	3	4	5

In the box below, describe why you circled the number you did. Explain how you are feeling about these concepts. Identify what you are doing well and where you think you might still need help.

LESSON 8: CAPACITY

APPLY

Directions: Cut out the pictures below and then sort them according to whether the capacity is best measured in milliliters or liters. When you and your Shoulder Partner are finished, compare your answers. Discuss any areas of disagreement.

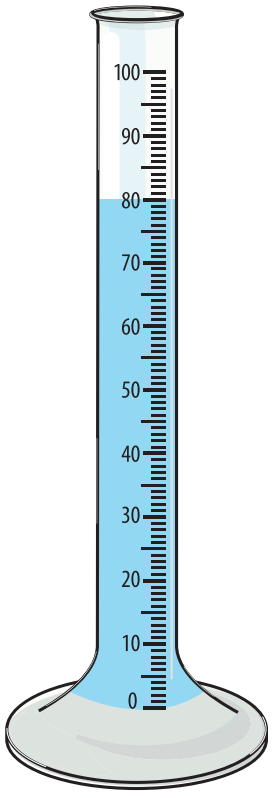
Petrol in a car 	Soda in a can	Spoonful of medicine
Dishwashing soap	Water in a bottle	Shampoo in a bottle
Juice in a juice box	Water in the bathtub	

MILLILITERS	LITERS

LESSON 9: READING THE CAPACITY

CONNECT

Directions: The picture below represents a graduated cylinder. Write your observations in the table below. Share what you notice, what the graduated cylinder reminds you of, and what you wonder.



WHAT I NOTICE	WHAT IT REMINDS ME OF	WHAT I WONDER

APPLY

Directions: Read aloud the capacity on each container. Then write the name of the container (for example, large shampoo bottle), draw a picture of it, and write its volume in the table below. Be sure to record the unit label for each measurement.

CONTAINER	PICTURE	VOLUME

CONTAINER	PICTURE	VOLUME

REFLECT

Directions: Reflect on your learning about volume. Imagine you were going to teach a Primary 2 friend everything you know about volume.

In the box below, write what you know about volume: what it is, how to find it, the units we use, how the units compare to each other, containers that use volume measurements, and so on. Use words, pictures, and/or numbers to share your thinking.

Revised by

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