Engaging Mathematics:

TEKS-Based Activities

Grade 8

region 4®
Educated Solutions

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Application Problems Using Proportional Relationships, Activity 2

Activity Objective
The student will use a problem-solving board to solve an application problem involving a proportional relationship.

Materials
- **Gardening**

Facilitation Questions
- **What is the question asking you to do?**
  Answers may vary. Possible answer: Find the area of the backyard garden.
- **What do you know?**
  Answers may vary. Possible answer: I know the cost and square footage of the similar front yard garden. I also know the cost of the backyard garden.
- **What strategy could you use to find the area of the backyard garden?**
  Answers may vary. Possible answer: Since the cost per square foot is the same, I could set up a proportion and solve the proportion to find the square footage of the backyard garden.

Answer
The area of the backyard will be 112 square feet.

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Student Name: _____ Date: _____

Gardening

Ms. Vega is planning to make a garden in her backyard similar to the garden in her front yard. The garden in the front yard has an area of 84 square feet and cost $273 for supplies and plants. To make a similar garden in the backyard will cost $364. If Ms. Vega keeps the cost per square foot the same, what will be the area of the backyard garden? Justify your answer.

SEE: What is the question asking me to do? What do I know? What do I need to know?	**PLAN:** What strategy can I use to solve the problem? Why? Estimate the answer.
DO: (Solve) Answer:	**REFLECT:** Did I answer the question asked? Is my answer reasonable? Why or why not?

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Communicating About Mathematics
Explain the difference between feet and square feet.

_____
_____
_____
_____
_____

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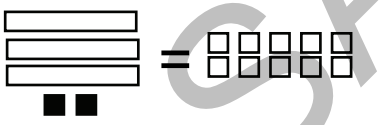
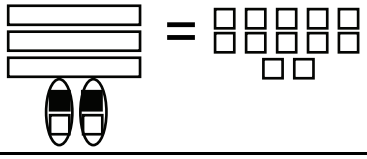
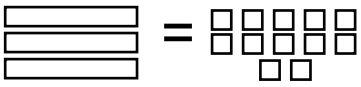
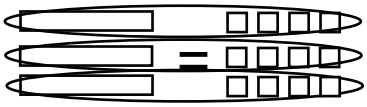
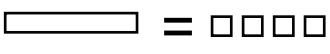
Modeling Equations, Activity 2

Activity Objective
The student will use picture models to solve a multistep equation and record the actions with symbols.

Materials
- **Equation Models**
- **Equation Models Cards**—one set per student
- Scissors
- Tape or glue

Facilitation Questions
- **Based on the key, how could you represent $3x ? -2 ? 10$?**
  I could use three white bars to represent $3x$*, two black squares to represent* -2*, and ten white squares to represent 10.*
- **How could you translate the value of the model to numbers and variables?**
  Answers may vary. Possible answer: I could use the variable x *to represent each* x*-bar in the picture. I could count the number of negative tiles and represent their value with a negative integer. I could count the number of positive tiles and represent their value with a positive integer.*

Answers

Picture Model	Symbolic Representation
	$3x - 2 = 10$
	$3x - 2 + 2 = 10 + 2$
	$3x = 12$
	$\frac{3x}{3} = \frac{12}{3}$
	$x = 4$

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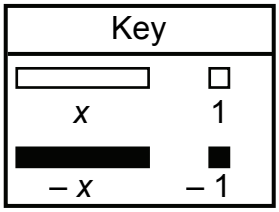
Student Name: _____ Date: _____

Equation Models

Cut apart the **Equation Models Cards**. Arrange the cards so that they represent a correct sequence of steps that could be used to solve the equation $3x - 2 = 10$. Attach the cards in the appropriate place in the table below and write the corresponding symbolic representation for each picture model.



Picture Model	Symbolic Representation
	$3x - 2 = 10$

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Communicating About Mathematics

Define a neutral pair.

_____

_____

_____

_____

_____

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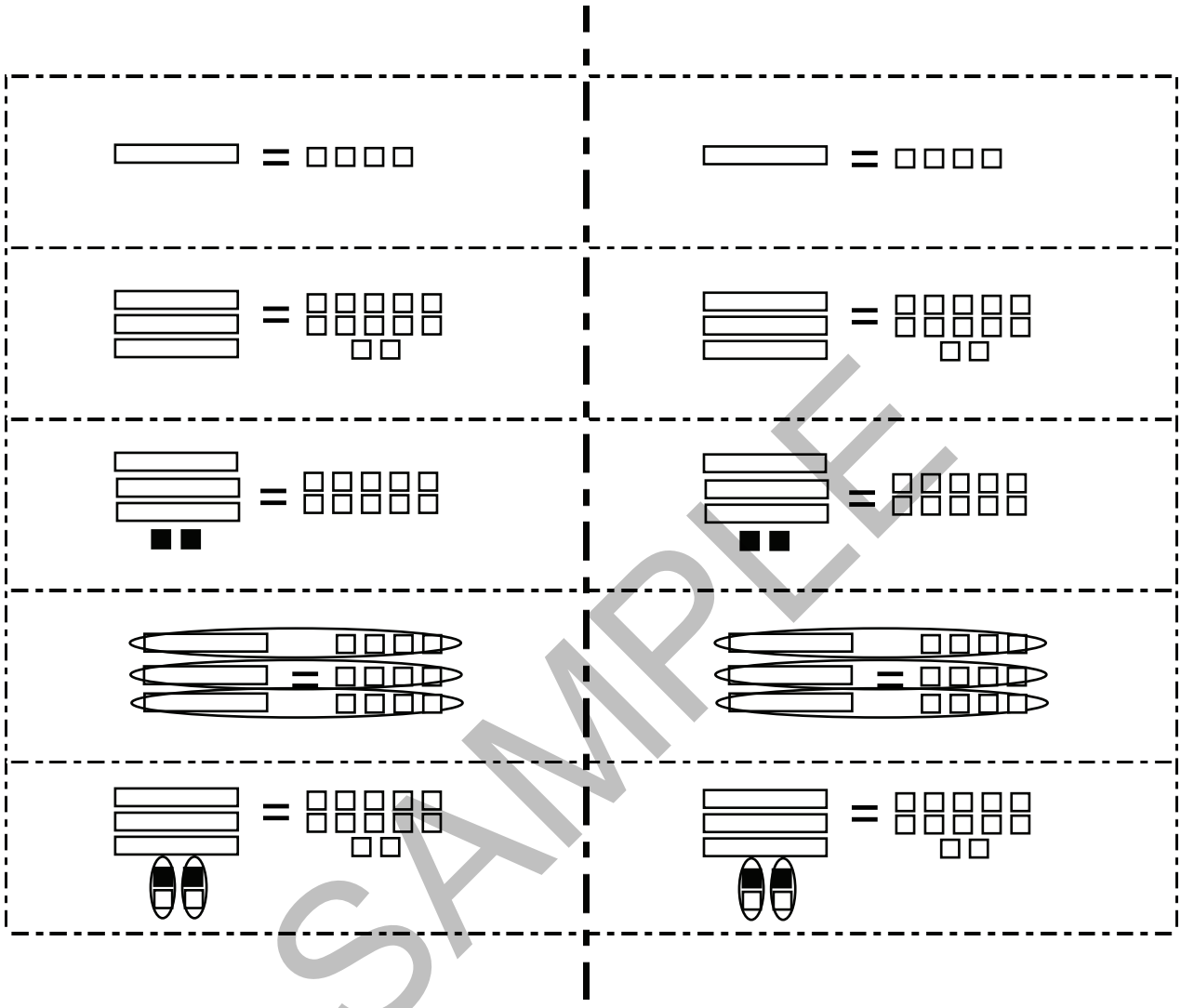
Equation Models Cards

Cut along the bold dotted lines. Two sets of cards are provided.



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Proportional Changes on Perimeter, Activity 1

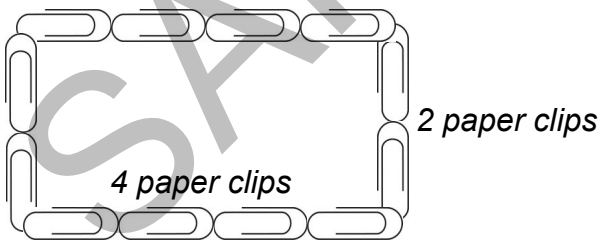
Activity Objective
The student will apply a scale factor to change a shape proportionally.

Materials
- **Paper Clip Perimeters**
- Paper clips—approximately 30 per student

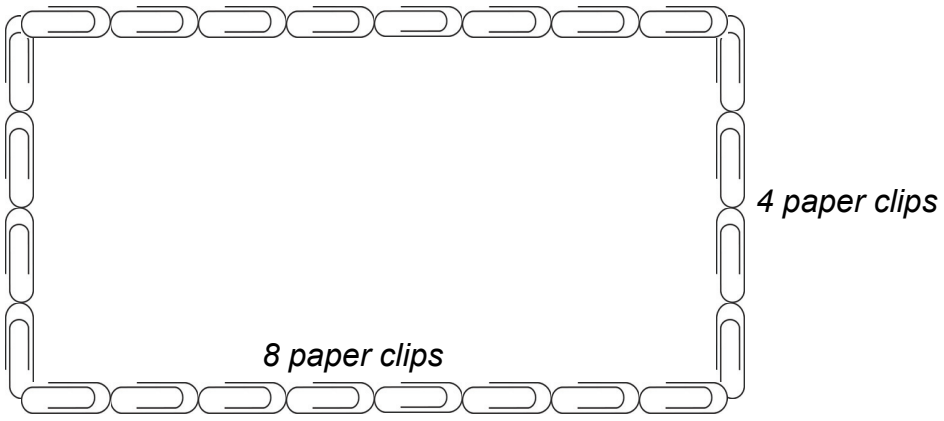
Toothpicks, straws, or popsicle sticks may be used in place of paper clips.

Facilitation Questions
- **How could you create a rectangle using paper clips?**
  Answers may vary. Possible answer: I could join the 12 paper clips together to form a loop and form a rectangle using the loop.
- **What is a dimension?**
  A dimension is the length of a side of a figure.
- **What are the dimensions of your original rectangle?**
  Answers may vary. Possible answers: one by five, two by four, or three by three
- **What does it mean to double?**
  To double is to multiply by two.

Answers
Answers may vary. Possible answer:
Original Rectangle: two paper clips by four paper clips



New Rectangle: four paper clips by eight paper clips



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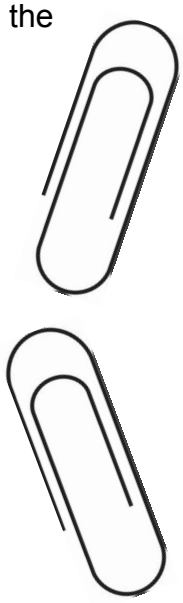
Student Name: _____ Date: _____

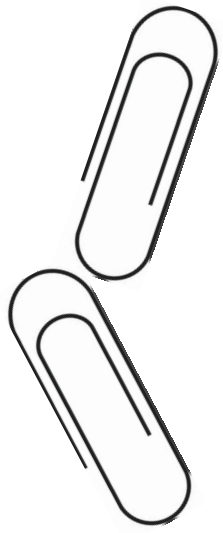
Paper Clip Perimeters

Use 12 paper clips to create a rectangle. Sketch your rectangle below and label the dimensions.



SAMPLE

Double each dimension of your original rectangle and create a new rectangle using paper clips. Sketch the new rectangle below and label the dimensions.



Communicating About Mathematics
Describe the similarities and differences between the original rectangle and the new rectangle.

_____

_____

_____

_____

_____

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Probability, Activity 2 (Technology)

Activity Objective
The student will use a calculator to simulate independent events.

Materials
- **Simulating Probability**
- Graphing calculator with APPS program *Probability Simulation* installed

Facilitation Questions
- **How many times does a result of two appear in your table? What fraction of the data does this represent?**
  Answers may vary.
- **If ___ two's were rolled in ten trials, how could you predict the number of times a two would be rolled out of 100 trials?**
  Answers may vary. Possible answer: I could write a proportion.
- **How many times does a marble marked with a *B* appear in your table? What fraction of the data does this represent?**
  Answers may vary.
- **If ___ marbles marked with a *B* were drawn in ten trials, how could you predict the number of times a marble marked with a *B* would be drawn out of 100 trials?**
  Answers may vary. Possible answer: I could write a proportion.

Answers
1 *Answers will vary.*
2 *Answers will vary.*

SAMPLE

Note: The graphing calculator APPS program *Probability Simulation* can be downloaded from the Texas Instruments website (http://education.ti.com).

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Student Name: _____ Date: _____

Simulating Probability

- Determine who will be Student A and Student B.
- Follow the appropriate steps outlined below.

Student A

1. Press APPS.
2. Select *Prob Sim* and press ENTER twice.
3. Select *Roll Dice,* then ENTER.
4. Simulate one roll of the number cube by pressing WINDOW. Record your result in the table.
5. Repeat 9 times.

Student B

1. Press APPS.
2. Select *Prob Sim* and press ENTER twice.
3. Select *Pick Marbles,* then ENTER.
4. Simulate one draw of a marble by pressing WINDOW. Record your result in the table.
5. Repeat 9 times.

Trial	Roll (number)	Marble (letter)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

1 Using the results from your table, predict the number of times a *2* will be rolled in 100 rolls.

2 Using the results from your table, predict the number of times a *B* will be drawn in 100 draws.

SAMPLE

Communicating About Mathematics
Does the roll of a dice affect the draw of a marble? Why or why not?

_____
_____
_____
_____
_____

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