

COMMON CORE COLLABORATIVE



MEASUREMENT & DATA **CARDS**

Grades 3–5

MEANINGFUL TASKS

Grade 3 PAGES 2–3

Grade 4 PAGES 4–5

Grade 5 PAGES 6–7

by Kit Norris



TEACHER'S PAGE

GRADE LEVEL	3
TASK	What Happens If . . . ?
COMMON CORE STATE STANDARDS ADDRESSED	3.MD.7, 3.MD.8
STANDARDS FOR MATHEMATICAL PRACTICE	1. Make sense of problems and persevere in solving them. 6. Attend to precision. 8. Look for and express regularity in repeated reasoning.

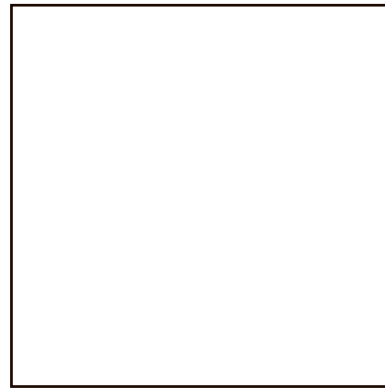
LAUNCH Students have formed their groups using the Collaborative Cards and have identified their roles in the group. Say:

In what ways are area and perimeter similar?

In what ways are area and perimeter different?

Have students think independently first and then discuss their ideas with their team. Look for students to suggest similarities such as “both are measurements and both use side lengths of polygons.” Look for students to suggest differences such as “area is measured in square units and perimeter is measured in linear units.”

TASK Show students the two squares below.



Part 1: Ask: *What happens to the perimeter of a square when we double the length of a side?*

Part 2: Ask: *What happens to the area of a square when we double the length of a side?*

The task requires team members to work together according to their group roles.

CLOSURE Ask students to look for patterns in their table. What do they notice? What are they wondering about? Have students share their thoughts as a team and then discuss their thinking with the class.

EXTENSION Predict what would happen to the perimeter and area if the side of the square were tripled!

WHAT HAPPENS IF ... ?



NAME _____

Team members work together according to their group roles:

Facilitator: Ask the team: "What is the task asking? How can we find out?" Make sure that all team members actively contribute to the team's success.

Recorder: Take notes on what the team discovers. Work with the Resource Manager to build a table of values.

Team Captain: Check the accuracy of the team's work. Makes sure that all information is included in the table.

Resource Manager: Work with the Recorder to build a table of values. If everyone on the team has the same question, you can ask the teacher on behalf of the team.

Side length of a square	Perimeter	Area
1 inch	4 inches	1 square inch
2 inches		
3 inches		
4 inches		

Side length of NEW square	Perimeter	Area
2 inches	8 inches	4 square inches
4 inches		
6 inches		
8 inches		



TEACHER'S PAGE

GRADE LEVEL 4
TASK Salaries of Rock Stars
4.MD.1

COMMON CORE STATE STANDARDS ADDRESSED
STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
5. Use appropriate tools strategically.

LAUNCH Tell your students that they will be making an estimate of how much money a very successful rock band earns in a year.

Before starting the task, review unit conversions involving seconds, minutes, hours, days, and years.

TASK Pose the following problem to students:

It was recently reported that the band *One Direction* earns \$2.50 per second. How much money will the band earn in one year?

The task requires team members to work together according to their group roles. Observe how the groups organize their work. Do they begin with the amount of money per second? Do they include all of the necessary measurement units?

Without instructing the teams, notice which groups determine that a calculator is a helpful tool for this task.

CLOSURE Ask the teams to share their approach to this question. Ask: *How did you organize your work?*

Record the rates in a table:

Then discuss the amount earned per year. Check to make sure that your students read this large value correctly: \$78,840,000.

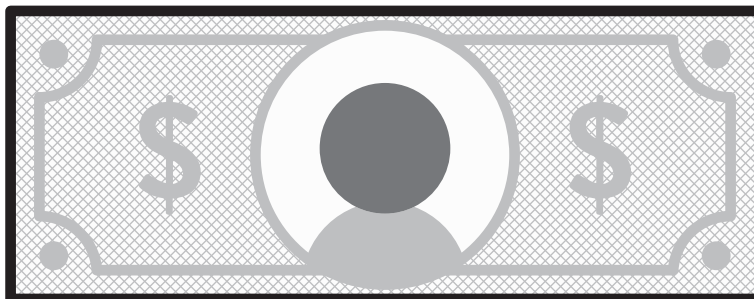
Amount Earned	
per second	\$2.50
per minute	\$150
per hour	\$9000
per day	\$216,000
per year	\$78,840,000

EXTENSION The band has (4, 5, 6) members. How much did each band member earn assuming that they shared their earnings equally?

SALARIES OF ROCK STARS



NAME _____



A very successful rock band earns \$2.50 per second! How much money does the band earn in one year? Work together with your team members to find out.

- Facilitator:** Ask the team questions such as “What is the task asking? How can we find out?” Make sure that all members of the team actively contribute to the team’s success.
- Recorder:** Take notes on what the team discovers. Discuss with team members the best way to show your work.
- Team Captain:** Check the accuracy of the team’s work. Makes sure that all information is included. Ask, “How can we prove that our answers are correct?”
- Resource Manager:** Help the Recorder to figure out how to show the team’s work. Get any necessary supplies. If everyone on the team has the same question, you can ask the teacher on behalf of the team.



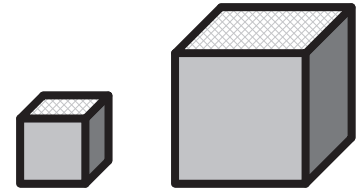
TEACHER'S PAGE

COMMON CORE STATE STANDARDS ADDRESSED	GRADE LEVEL	5
STANDARDS FOR MATHEMATICAL PRACTICE	TASK	Building Boxes
		5.MD.3, 5.MD.4, 5.MD.5
		1. Make sense of problems and persevere in solving them.
		2. Reason abstractly and quantitatively.
		5. Use appropriate tools strategically.

MATERIALS

Per group of 4 students:

- 72 cubes for each group of 4 students
- 4 sheets of 1 in. or 1 cm. graph paper
- Scissors and tape



LAUNCH

After the students have found their groups using the Collaborative Cards, review the meaning of volume.

Ask: *What do we know about volume?*

Look for students to say that volume is the measurement of how much space a three-dimensional figure (for instance, a right rectangular prism) occupies and that the volume of the prism is found by multiplying its three dimensions. Students may figure out that multiplying the area of the base by the height of the object is a similar way to find volume.

Provide each group with 72 cubes. The four group members pair off to determine how many different prisms they can make using 36 cubes. The partners work together to build the prisms and record their work in a chart. The two pairs then compare their work and determine whether or not they have found all of the prisms.

TASK

Provide 4 sheets of graph paper (square-inch or centimeter), scissors, and tape to each team. Each team member will create boxes without a top. The team is to determine the dimensions that will yield the greatest volume.

Prepare a model box out of cardboard. Show students how to cut off a square unit at each corner of the cardboard to allow the sides to fold up to make the box.

Tell the teams that they will be working with whole number units. The team needs to organize their work so that each member of the group is making a different-sized box.

CLOSURE

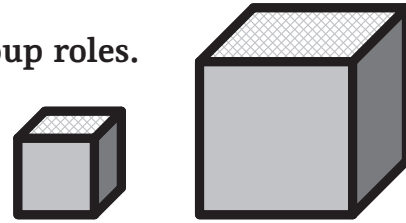
Ask the teams to discuss their responses to the questions within their group. A designated team member can then share the team's conclusions with the class.

BUILDING BOXES



NAME _____

Team members work together according to their group roles.
Each team member makes a different-sized box.



- Facilitator:** Ask the team questions such as “What is the task asking? How can we make the box?”
- Recorder:** Take notes on what the team discusses. Record the dimensions of each box in the table.
- Team Captain:** Check the accuracy of the team’s work. Makes sure that all information is included. Are the appropriate labels used?
- Resource Manager:** Get any necessary supplies. If everyone on the team has the same question, you can ask the teacher on behalf of the team.

	Length	Width	Height	Volume
Box 1	11 units	9 units		
Box 2				
Box 3				
Box 4				

1. Which box has the greatest volume? _____
2. As the height increases, what happens to the length and width of the box?

3. What other patterns do you notice? _____
