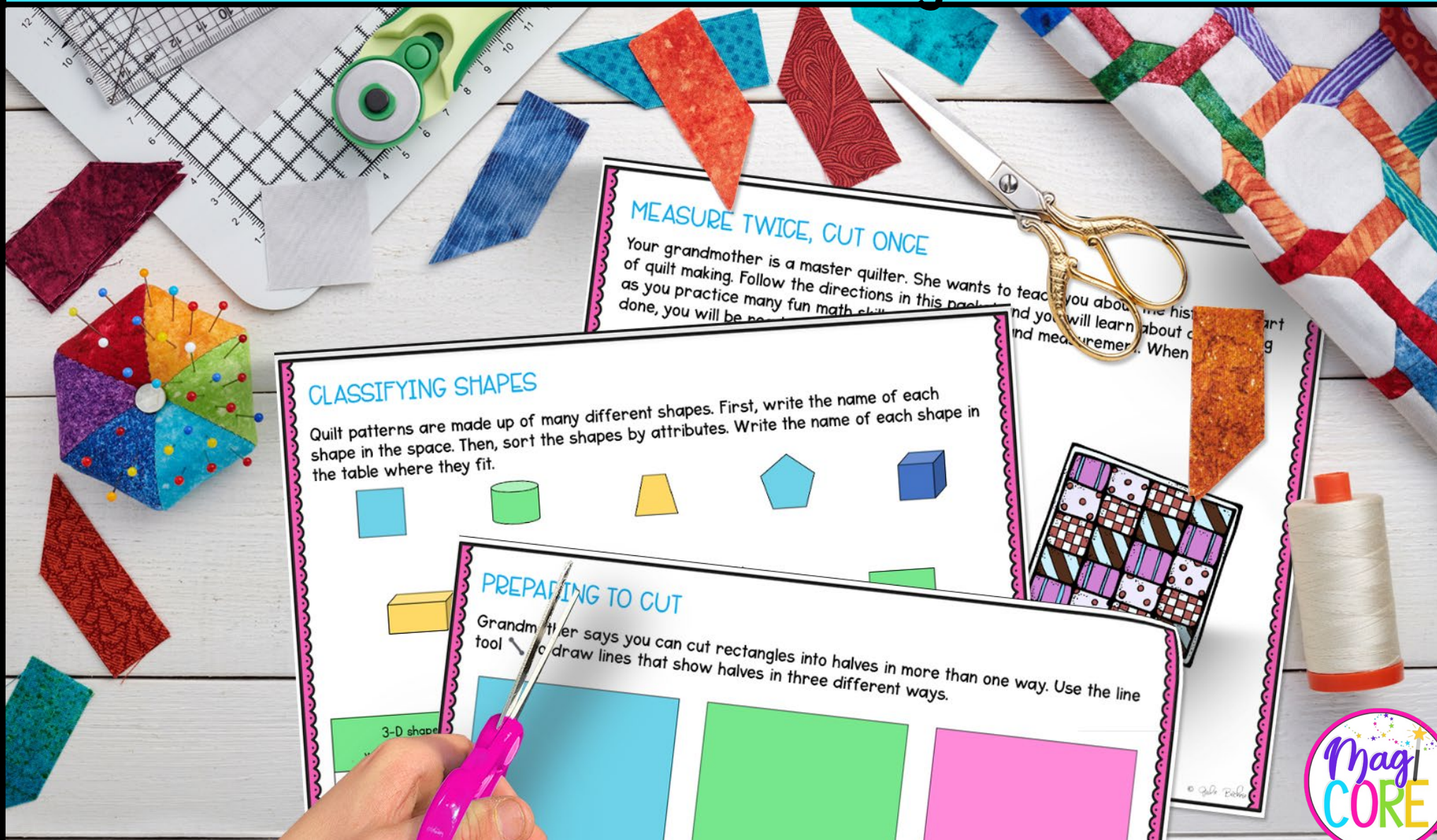


# Measure Twice, Cut Once

## Quilting Project Based Learning

1<sup>st</sup> Grade Print & Google Slides



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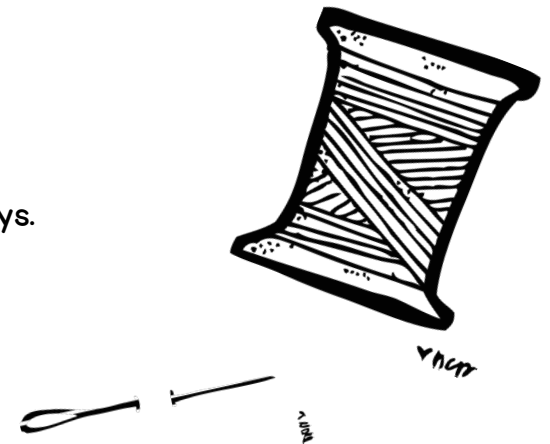
# FOR THE TEACHER

MEASURE TWICE, CUT ONCE, is a project-based learning task that involves using Measurement and Geometry to solve problems related to quilt making. It addresses the following 1st grade CCSS standards.

- 1.OA.A.1 Use + and - within 20 to solve word problems
- 1.OA.A.2 Solve, word problems that call for + of 3 whole numbers whose sum is less than or equal to 20.
- 1.OA.C.6 Use + and - within 20, demonstrating fluency with 10. Use strategies for addition and subtraction.
- 1.MD.A.1 Order three objects by length, compare lengths or two objects indirectly by using a third object.
- 1.MD.A.2 Express length of object as whole number of length units by laying multiple copies of shorter object end to end.
- 1.MD.C.4 Organize, represent, and interpret data with up to 3 categories; ask and answer questions about the data points, how many?, and how many more or less? are in one category than in another.
- 1.GA.1 Distinguish between defining attributes vs non-defining attributes;
- 1.GA.2. Compose 2-D shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or 3-D shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape and compose new shapes from the composite shape.
- 1.GA.3 Partition circles and rectangles into 2 and 4 equal shares, describe the shares using words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

## Directions:

1. Assign students to work alone or in small groups.
2. Preview the activity with your students.
3. Allow students class time to complete the activity. This can span over several days.
4. Students have an opportunity to complete optional extra challenge activities.
5. Students will complete the self-evaluation reflection and evaluation rubric.
6. Allow students an opportunity to share their completed projects.
7. Put students' finished quilt pieces together to create a class quilt.

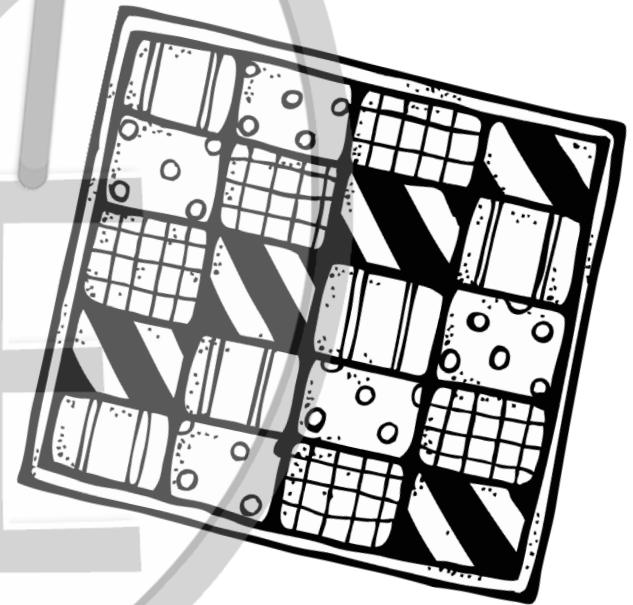


# MEASURE TWICE, CUT ONCE

Your grandmother is a master quilter. She wants to teach you about the history and art of quilt making. Follow the directions in this packet and you will learn about quilt making as you practice many fun math skills, like geometry and measurement. When you are done, you will be ready to make your own quilt.

## HERE ARE YOUR TASKS:

- Read through the entire packet before beginning.
- Read the informational slide about quilt making.
- Follow directions to create a pattern for your quilt.
- Measure, cut and compare lengths of fabric.
- Classify and sort shapes by attribute.
- Complete and extend patterns.
- Identify and draw lines of symmetry.
- Prepare and design your pattern.
- Solve quilting word problems.
- Create a line plot and a bar graph based on data.
- (Optional) Complete the challenge pages.
- Complete the self-reflection and evaluation rubric.



# WHAT IS QUILT MAKING?

Do you have a special quilt or blanket? Most people have that one cozy blanket that they want to sleep with every night. Maybe your quilt was made by someone special who loves you.

Quilting is from ancient times. The craft came to America with the early settlers. They made quilts for only one reason. Quilts kept people warm. They were used on beds. Quilts covered windows and doors. They helped keep the cold out of their homes.

Quilts were sewn by hand. In 1846, the sewing machine was invented. Soon, more colorful fabrics became available. People started creating different patterns for their quilts. They used them to decorate.

Quilt making has a special place in the story of America. It has helped people be more resourceful. Quilting uses math skills. People can be artistic. Today, many people, young and old, enjoy quilting as a hobby.



# GETTING STARTED

Your grandmother helped you pick four different fabrics for your quilt. Each piece of fabric is 12 inches wide, but the lengths are different. The table shows the length in inches of each fabric.



|                  | Green Solid Fabric | Blue Solid Fabric | Blue Print Fabric | Green Print Fabric |
|------------------|--------------------|-------------------|-------------------|--------------------|
| Length in inches | 6 inches           | 12 inches         | 9 inches          | 10 inches          |

Measure and cut one piece of green and one piece of blue construction paper that are the same sizes as Grandmother's solid color fabrics. Then complete the sentences.

1. The green fabric is \_\_\_\_\_ inches wide by \_\_\_\_\_ inches long.

It is the shape of a \_\_\_\_\_.

2. The blue fabric is \_\_\_\_\_ inches wide by \_\_\_\_\_ inches long.

It is the shape of a \_\_\_\_\_.

# PREPARING TO CUT

Grandmother asks you to cut these squares in half in two different ways. Use a ruler to draw lines that show how you could cut the squares.

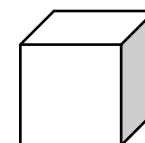
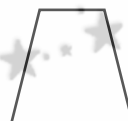
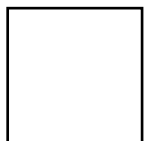


Grandmother always says it is better to “Measure Twice and Cut Once”.  
What do you think that means?

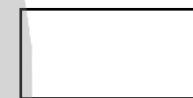
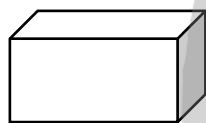


# CLASSIFYING SHAPES

Quilt patterns are made up of many different shapes. First, write the name of each shape on the line. Then, sort the shapes by attributes. Write the name of each shape in the table where they fit.



\_\_\_\_\_



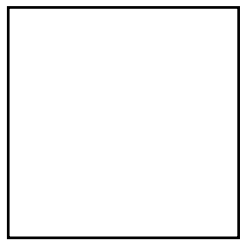
\_\_\_\_\_

| 3-D shape<br>with 6 flat faces | 2-D shape<br>with unequal angles | 3-D shape<br>with no vertices | 2-D shape<br>with all side sides equal |
|--------------------------------|----------------------------------|-------------------------------|----------------------------------------|
|                                |                                  |                               |                                        |
|                                |                                  |                               |                                        |
|                                |                                  |                               |                                        |
|                                |                                  |                               |                                        |

# FINDING LINES OF SYMMETRY

Quilters use lines of symmetry to help them create patterns for their quilts. A line of symmetry is a line that cuts a shape in half. Follow the directions as you explore lines of symmetry.

1. How many lines of symmetry do these shapes have? Draw the lines and write the number under the shape.



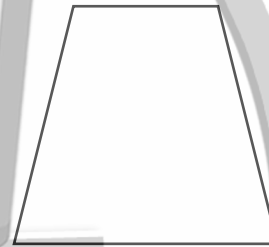
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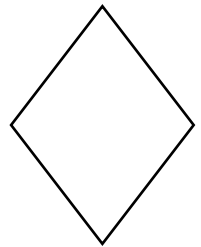
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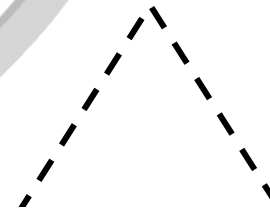
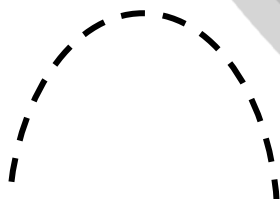


\_\_\_\_\_



\_\_\_\_\_

2. Imagine the shapes have a paper over the bottom half right at the line of symmetry. Draw the part that is under the paper.

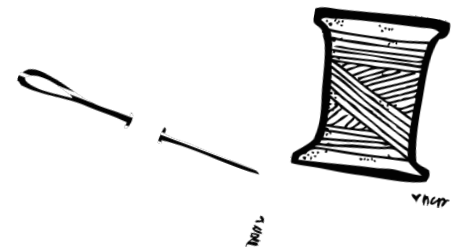


# MEASURING FABRIC

The table shows the number of pieces of each fabric you need to make your quilt. Calculate the total number of inches you need for each fabric.

|                        | Green Solid Fabric | Blue Solid Fabric | Blue Print Fabric | Green Print Fabric |
|------------------------|--------------------|-------------------|-------------------|--------------------|
| Length in inches       | 6 inches           | 12 inches         | 9 inches          | 10 inches          |
| Number of pieces       | 3                  | 1                 | 2                 | 2                  |
| Total number of inches |                    |                   |                   |                    |

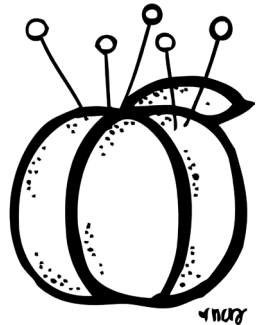
1. Which two fabrics have the same total number of inches?
2. Name the fabric with the largest total of inches. How many inches is it?
3. Grandmother asks you to write the totals in order from shortest to longest.



# HOW MANY SQUARES?

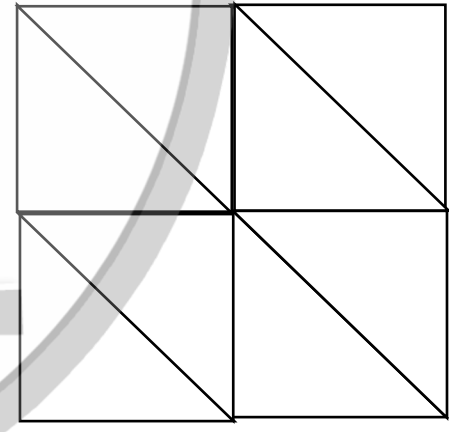
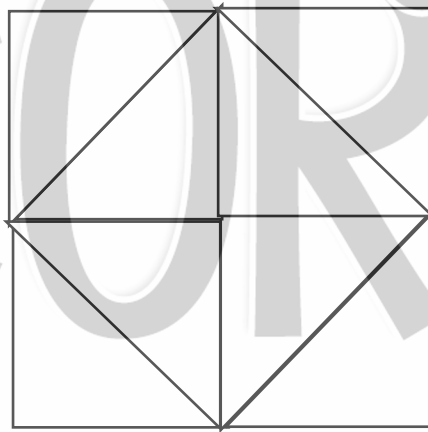
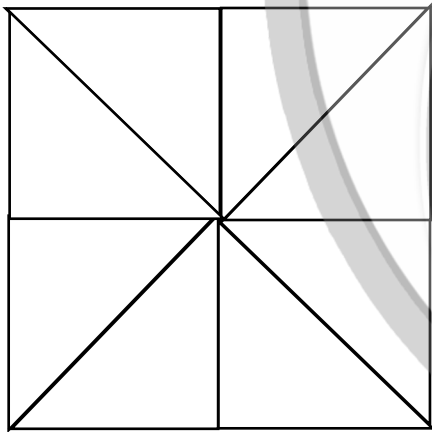
Let's find out how many 6-inch squares you will get from the solid fabric.

1. Draw a picture of the squares you can cut from one green and one blue square. Color the squares you draw to show your thinking.
2. Use addition to show the total number of squares you can cut altogether from all of the solid pieces of green and blue fabric. Use the table to help you.
3. Grandmother cut 4 squares from each of the blue and green print fabrics. If you add her squares to your squares, how many squares will you have in all? Draw a model to show your thinking.

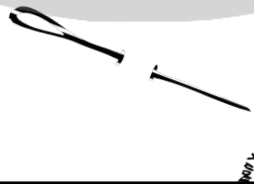


# MAKING TWO PATTERNS

1. Count your triangles. You should have 4 of one color and 4 of the other color. How many triangle do you have in all? Show with a doubles fact.
2. It is time to arrange your triangles to make a pattern. Fit all 8 of your triangles in a pattern that makes a square. Try a few different arrangements until you get the one you like best. Then glue them on a large piece of white paper. Here are some examples from Grandmother.



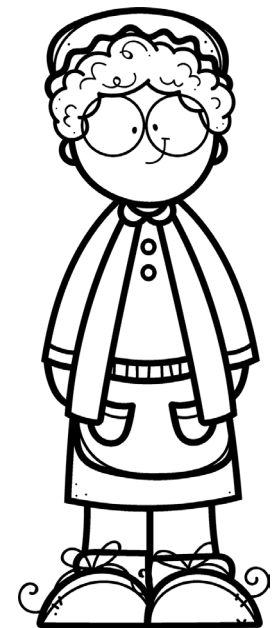
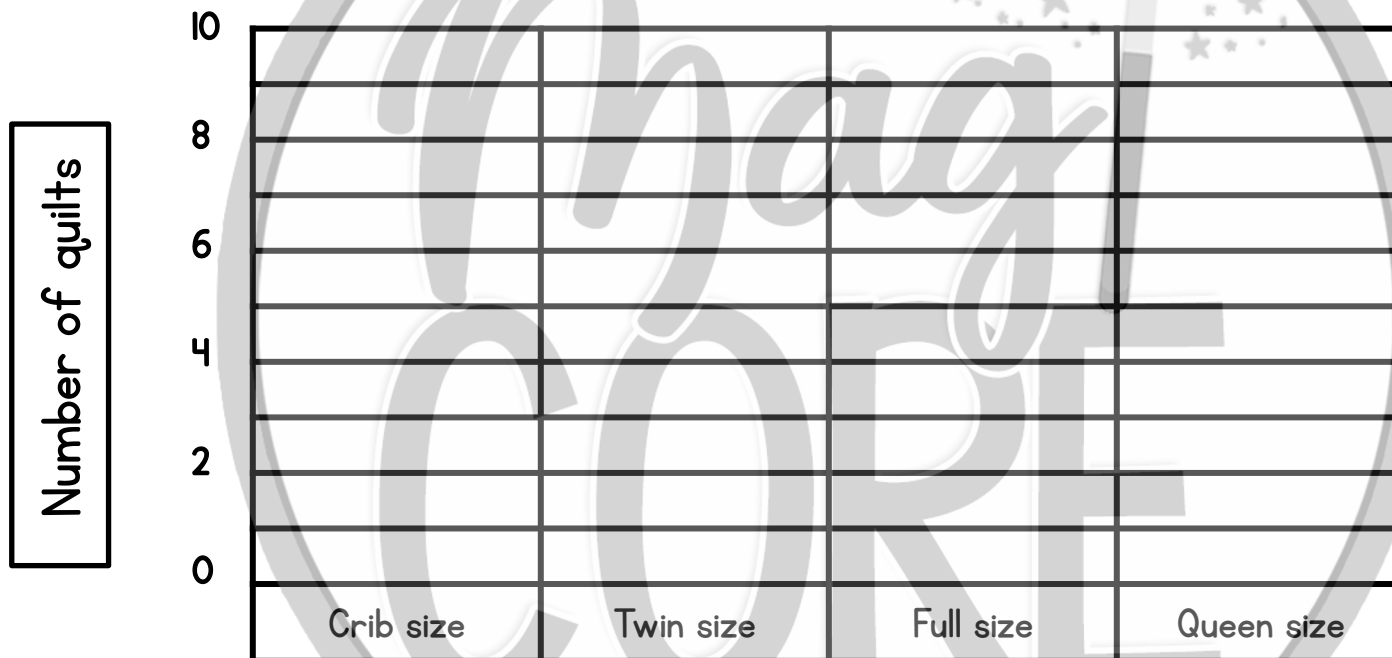
Have fun and be creative.



# CHALLENGE 1-GRANDMOTHER'S QUILTS

Grandmother makes quilts for charity. The table shows different sizes of quilts she made this year that she donated to hospitals and homeless shelters. Use the data to create a bar graph that shows how many quilts she made.

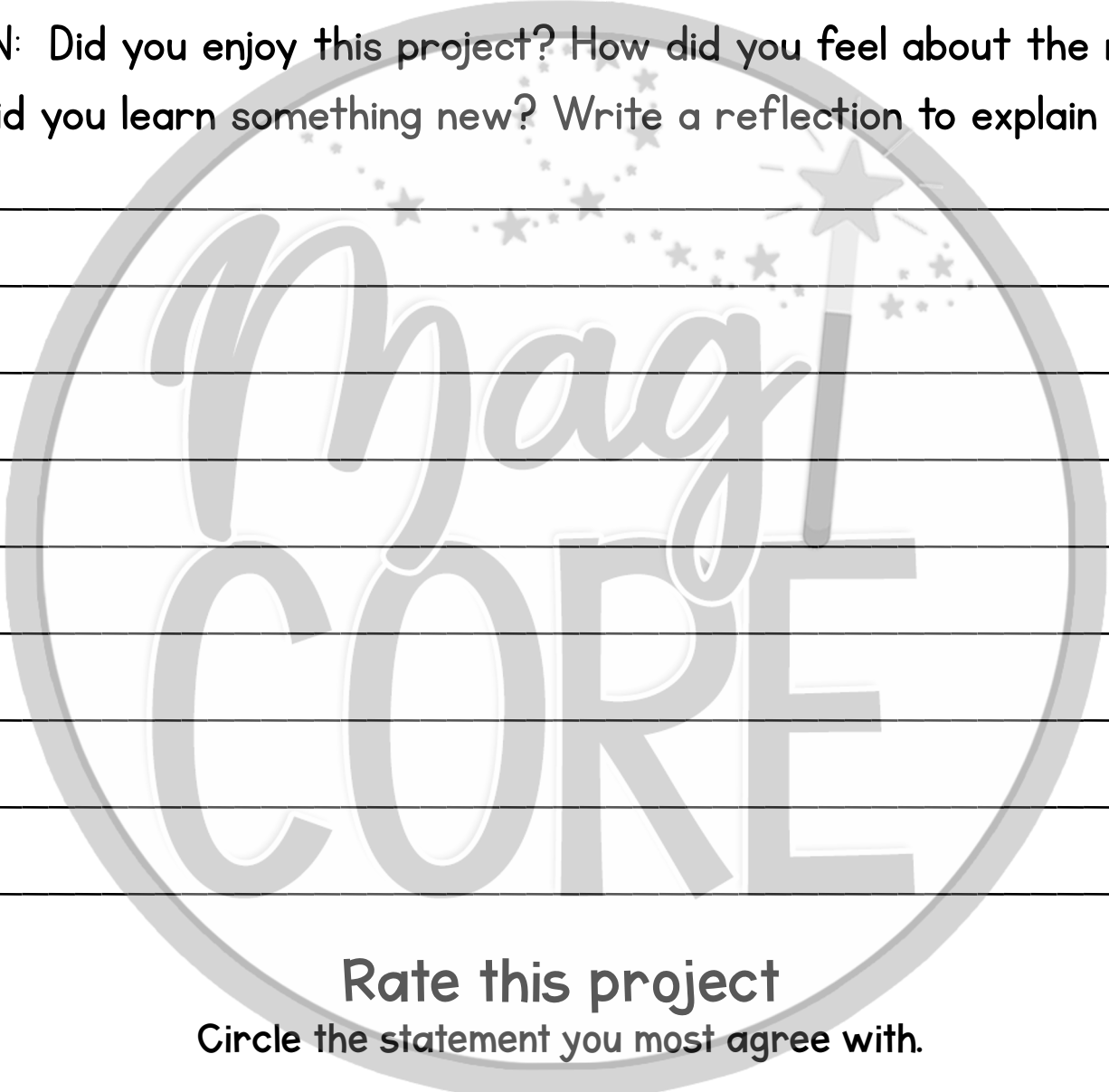
| Quilts Made for Charity |    |
|-------------------------|----|
| Crib size               | 10 |
| Twin size               | 4  |
| Full size               | 5  |
| Queen size              | 6  |



Draw a model to show your how many quilts Grandmother made for charity this year.

# MEASURE TWICE, CUT ONCE

SELF REFLECTION: Did you enjoy this project? How did you feel about the math problems and activities? Did you learn something new? Write a reflection to explain your thoughts.



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**Rate this project**

Circle the statement you most agree with.

I am ready for something harder.

It was just right.

I found this very challenging.

# RUBRIC

**SELF-EVALUATION RUBRIC:** Circle or highlight the parts of the rubric that express how you rate yourself on this Project Based Learning Activity.

|    |            |     |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <p>I felt very confident about the math in this project.</p>                        | <p>I felt okay with most of the math in this project.</p>                                    | <p>The math in this project was too hard for me to do alone.</p>                       |
| <p>I understood all of the math and did not need help to complete the problems.</p> | <p>I understood most of the math but needed a little help to solve some of the problems.</p> | <p>I understood some of the math but needed help to complete most of the problems.</p> |
| <p>I easily used many strategies to solve the math problems efficiently.</p>        | <p>I needed some help to determine the best strategies for solving the math problems.</p>    | <p>I had trouble understanding the best way to solve many of the math problems.</p>    |
| <p>I feel I am ready for a harder math project.</p>                                 | <p>I feel I would like to spend more time practicing more projects like this.</p>            | <p>I feel I need help to work on similar math problems.</p>                            |

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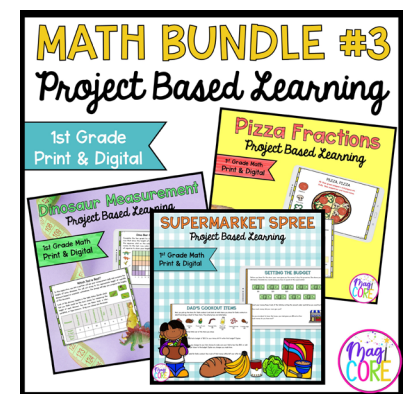
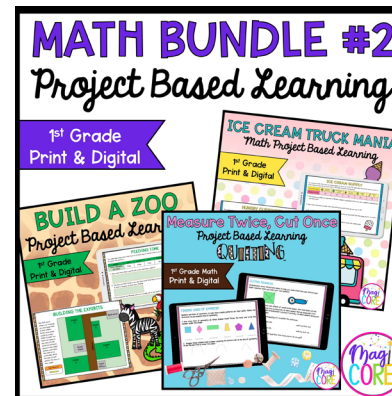
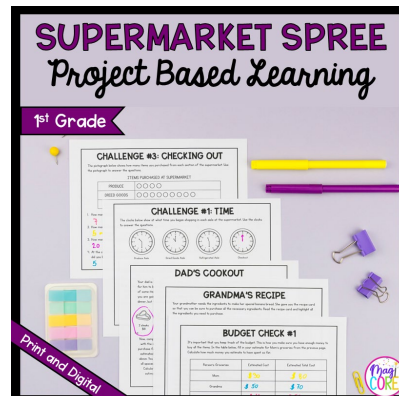
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