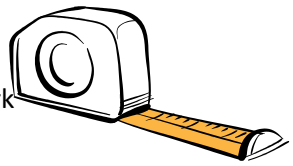


CONSTRUCTING TASK: DOES HOW I MEASURE MATTER?

Approximately 1 day

STANDARDS FOR MATHEMATICAL CONTENT

MCC.K.MD.1 Describe measureable attributes of objects, such as length or weight. Describe several measureable attributes of a single object.

MCC.K.MD.2 Directly compare two objects with a measureable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. *For example, directly compare the heights of two children and describe one child as taller/shorter*.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

It is important to keep several big ideas in mind when circulating throughout the room having math conversations with your students:

- It is important that the students clearly identify the attribute being measured.
- It is important that the students realize that BOTH objects must share the attribute before a comparison can be made.
- The lining up of the endpoints for an accurate measurement is important.

ESSENTIAL QUESTIONS

- How can we measure something?
- Does it matter how we measure?
- What qualities of an object can be measured?
- How can I compare 2 objects by their size?
- What does it mean to measure something?
- How can I measure something?
- What ways can I measure this object?
- How can I record my information?

MATERIALS

- Chart paper

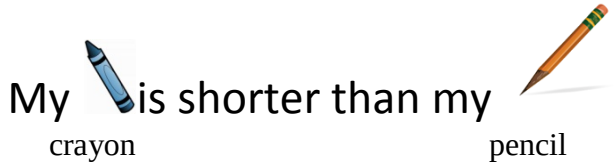
- Bags with 5 items of various length, weight, height and capacity in each bag (examples could include: a box of crayons, a marker, a pencil, a glue stick, paperclip, etc.)

GROUPING

Whole group and small group task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students together at meeting area and show two items such as a crayon and a pencil. Ask, "Which do you think is longer?" Whisper your answer to your elbow partner. Then share with the class. "Why do you think that? How can we prove that?" Discuss how you decide which is longer. Select two students to demonstrate how you can measure to determine which is longer. Have one student line up the ends of the items and another student place the items side by side but not line up the ends of the items. Ask students, "Why are common endpoints important when comparing length?" Model on chart paper how to write a math statement about the two objects. For example:



crayon pencil

Tell students they are going to explore comparing objects and writing true math statements. Explain that, as a group, they are to compare five objects of varying sizes. Give each group a pre-made bag of items such as books, pencils, crayons, glue sticks, paperclips, etc.

Once they have their bag of objects, they are to lay the objects they have chosen on their table. Students choose 2 items at a time to compare. They should compare the two objects and write a true math statement to describe the comparison of common attributes.

All students in the group do not have to choose the same two objects to compare. Different comparisons between partners will encourage more productive discussions. For example, a pair of scissors may be longer than a paper clip but shorter than a book. Students can have these discussions when deciding where to place the objects on their recording sheet. Again, please note, students are only comparing 2 items at a time.

When students complete their comparisons, let them discuss their findings. Emphasize the importance of aligning endpoints on both objects to compare length. Observe as students compare to make sure they are lining the endpoints up correctly.

Allow students time to share their comparisons. Record these findings on a class chart for later reference. This gives an opportunity to communicate their discoveries in mathematical language. Discuss with the whole group why it DOES matter how you measure.

Teacher reflection questions:

- Are students able to compare objects by their size and explain why this would be important?
- Are students able to use mathematical language to describe the measurement of attributes of items?
- Can students decide or offer ideas for how to organize/record information?
- Are students able to explain how to record results? Do they understand why this is important to do?
- Can students explain why we need to have common endpoints when comparing the height or length of two objects?

FORMATIVE ASSESSMENT QUESTIONS

- What attributes did you measure?
- Are there any more ways to compare these objects?
- Why did you decide to measure it this way?
- Which object is heavier (longer, taller, holds more, etc.)? How do you know?
- If I hold the objects like this (without the endpoints lined up), does your math statement change?

DIFFERENTIATION

Extension

- Students can be encouraged to find objects throughout the room that can be measured with identified attributes, or choose another bag to discuss and record observations.
- Encourage students to different comparisons for the same object. For example, the stool is shorter than the door but it is taller than the desk.
- Encourage students to compare different attributes of the same two objects.

Intervention

- Allow students to work through the stages at a speed that is appropriate for their performance level. Some students may need additional experiences acting out problems, using manipulatives, or drawing pictures.
- Give students cards with pictures of different objects. Have the student choose two cards and tell whether one item is longer, shorter, or the same as the other item. The other students can use a "thumbs up" signal if they agree and a "thumbs down" if they don't agree. If the student does not agree, they have to be able to explain their reasoning.
- Put together baggies that have two items in them. Have students compare the items in these bags by making Unifix cube trains for each object and then comparing the length of the trains.
- Draw a line or provide a box with a low lip to help the student line up the endpoints.
- Provide the student with copies of "Does How I Measure Matter? recording sheet and copies of cut outs. The student can use these pictures and math statements to scaffold their learning.

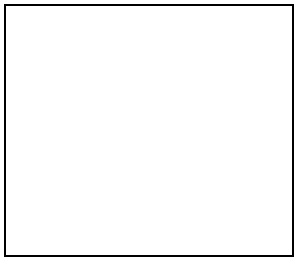
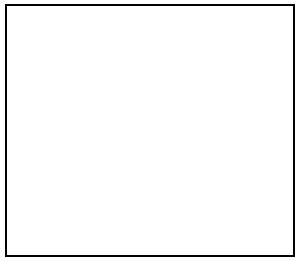
ADDITIONAL RESOURCES:

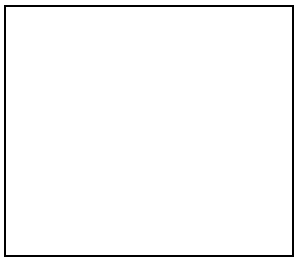
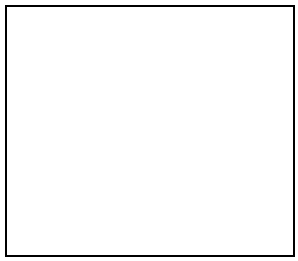
NCTM: Navigation Series – Navigating through Measurement in Pre-kindergarten – Grade 2 String Lengths: p. 18 -20

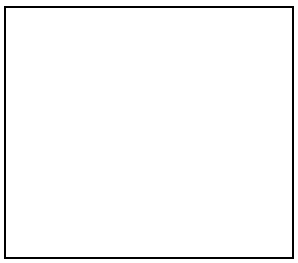
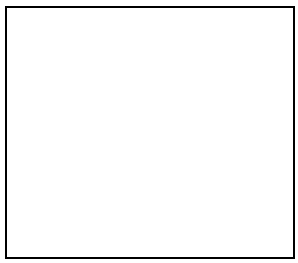
Illuminations: Ladybug Lengths (http://illunimations.nctm.org/LessonDetail.aspx?id+L123

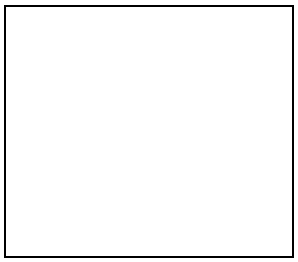
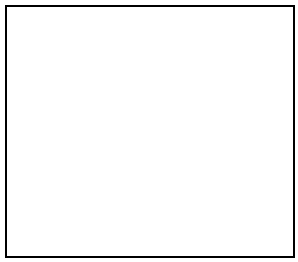
Name_____

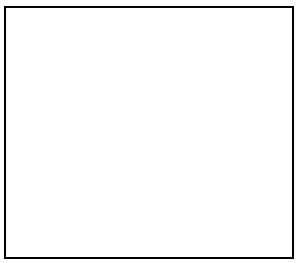
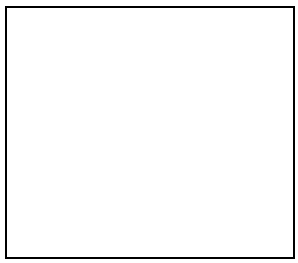
Does How I Measure Matter?

1. A  is longer than a  .

2. A  is shorter than a  .

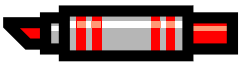
3. A  is the same length as a  .

4. A  is shorter than a  .

5. A  is longer than a  .

Does How I Measure Matter?

Directions: Cut out the pictures below and place them in the boxes to make correct comparisons.

 Crayon	 marker	 glue stick	 pencil	 scissors
 paperclip	 crayon	 marker	 glue stick	 pencil
 scissors	 paperclip	 crayon	 marker	 glue stick
		 paperclip	 crayon	 crayon

pencil 	scissors 			 marker
 glue stick	 pencil	 scissors	 paperclip	