Georgia Standards of Excellence Curriculum Frameworks

Mathematics

GSE Kindergarten

Unit 4: Measuring and Analyzing Data

Georgia Department of Education

Richard Woods, Georgia's School Superintendent

"Educating Georgia's Future"

Unit 4: Measuring and Analyzing Data

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IF YOU HAVE NOT READ THE KINDERGARTEN CURRICULUM OVERVIEW IN ITS ENTIRETY PRIOR TO USE OF THIS UNIT, PLEASE **STOP** AND CLICK HERE: https://www.georgiastandards.org/Georgia-Standards/Frameworks/K-Math-Grade-Level-Overview.pdf Return to the use of this unit once you've completed reading the Curriculum Overview. Thank you.

OVERVIEW

As Marilyn Burns states, "Measurement is important in the mathematics curriculum because of its practicality and pervasiveness in so many aspects of everyday life. As students measure in different contexts, they develop understanding of important ideas about measurement as well as mathematical concepts from other strands of the curriculum, especially number and geometry (Burns, 2012)." Measurement is an important part of mathematics. In this unit, students will:

- Describe attributes of objects that are MEASUREABLE (length, weight, size, color, shape, etc.)
- Describe MULTIPLE measurable attributes of a single object
- Measure using direct comparison of TWO objects that have an attribute in common
- Describe the DIFFERENCE between the objects using the common attribute
- Classify object into GIVEN categories
- COUNT the number of objects in the categories
- Sort the CATEGORIES by the number of objects in each set

The Critical Areas are designed to bring focus to the standards at each grade by describing the big ideas that educators can use to build their curriculum and to guide instruction.

(1)Representing, relating, and operating on whole numbers, initially with sets of objects. Students use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set; counting out a given number of objects; comparing sets or numerals; and modeling simple joining and separating situations with sets of objects, or eventually with equations such as 5 + 2 = 7 and 7 – 2 = 5. *(Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required.)* Students choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of less sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.

The foundational skills and understandings of measurement should be gleaned from the activities in this unit. Effective questioning from the teacher will ensure these skills and understandings are realized. Underlying skills that are not commonly spoken about within measurement should also be focused upon to ensure a strong foundation in measurement. These skills are:

- When comparing two objects, they must be lined up end-to-end before an accurate measurement can be acquired.
- When measuring an object with units (such as connecting cubes), the units must be lined up end-to-end before an accurate measurement can be acquired.

These skills begin to lay the foundational understanding of the ruler units being laid end-to-end or side-by-side to measure an object. It also begins to form the idea that the ruler and the object must be laid end-to-end or at the starting point of for an accurate measurement.

Math Solutions. (2012). Retrieved January 8, 2012, from http://www.mathsolutions.com/index.cfm?page=wp8&crid=328#c2

For more detailed information about unpacking the content standards, unpacking a task, math routines and rituals, maintenance activities and more, please refer to the Grade Level Overview.

STANDARDS FOR MATHEMATICAL PRACTICE

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. The statements provided offer a few examples of connections between the Standards for Mathematical Practice and the Content Standards of this unit. The list is not exhaustive and will hopefully prompt further reflection and discussion.

Students are expected to:

1. **Make sense of problems and persevere in solving them.** Students will begin to explain to themselves and others how they identified like and unlike attributes while comparing two objects.
2. **Reason abstractly and quantitatively.** Students begin to use diagrams or charts while expressing quantitative ideas for describing lengths, weights and sizes of similar objects.
3. **Construct viable arguments and critique the reasoning of others.** Students will clearly express, explain, organize and consolidate their math thinking using both verbal and written representations to identify attributes, classify objects, and describe differences.
4. **Model with mathematics.** Students will begin to compare similar objects in multiple ways such as using words, pictures, and numbers to describe length, weight or size.
5. **Use appropriate tools strategically.** Students will explore the use of tools (e.g., cubes for measuring, balance scale for weighing) to describe differences in attributes such as length, weight, or size.
6. **Attend to precision.** Students will express their ideas for classifying objects by using descriptive vocabulary words accurately and clearly.
7. **Look for and make use of structure.** Students will look for patterns and structures in measurements while building onto cube units to compare and show difference in lengths.
8. **Look for and express regularity in repeated reasoning.** Students begin to notice repetitive actions in comparing attributes (long and longer, heavy and heavier) such as how adding cube units extends the length or adding more cubes increases weight.

(For descriptors of standard cluster please see the Grade Level Overview)

*****Mathematical Practices 1 and 6 should be evident in EVERY lesson*****

STANDARDS FOR MATHEMATICAL CONTENT

Describe and compare measurable attributes.

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. ***For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"***

MGSEK.MD.2 Directly compare two objects with a measurable 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.*

Classify objects and count the number of objects in each category.

MGSEK.MD.3 Classify objects into given categories; count the numbers in each category and sort the categories by count. (*Limit category counts to less than or equal to 10)*

Measurement Trajectory

This unit will begin Kindergarten student's first study of measurement. Although the trajectory does not match completely with the Kindergarten standards, please consider using the trajectory to guide students who have mastered the current standards. The trajectory was created to show the progression student learning. Once students master the Kindergarten standards, students can be introduced to the next progression found in the following measurement trajectory

Measurement Trajectory –*Putting It All Together*

Each concept builds on the previous idea and students should explore and construct concepts in such a sequence

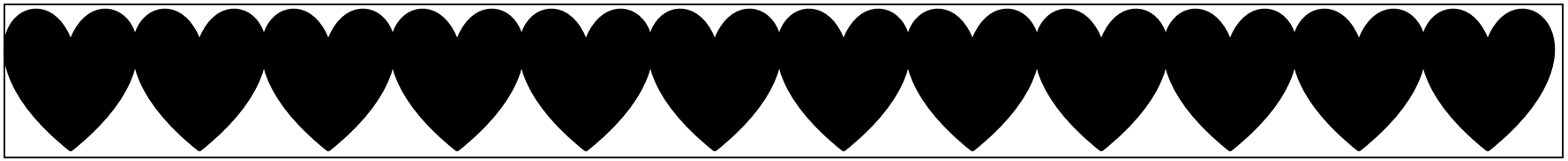
Important Understanding of Measurement: *Students progress through the underlying concepts of the measurement trajectory with the use of non-standard units and standard units of measurement interchangeably (inch cubes, inch tiles, feet, hands, paperclips, etc.). The emphasis in the early stages of the trajectory is related to quantitative and spatial reasoning and comparison; not on procedural use of measurement tools.*

Progression	Length Quantity Recognizer	Length Direct Comparer	Indirect Length Comparer	End-to-end Length Measurer	Length Unit Relater and Iterator	Length Measurer	Conceptual Ruler Measurer
Description	Become aware of the physical attributes of objects in order to clearly identify what is to be measured. At the earliest level, children can identify length as an attribute. For example, they might say, "I'm tall, see?"	Compare the attributes of two or more objects to establish, for example, which is longer, heavier or holds more. When comparing three or more objects they can be ordered. For example, they can stand two sticks up next to each other on a table and say, "This one's longer."	Can use a third object to compare the length of two objects. Students can use a piece of string to measure the width of the door and then hold the piece of string against a table to see if it will fit through the door.	Expects that length is quantifiable as a composition of shorter lengths. Compares an end-to-end train of countable objects to the linear extent of an object. For example, steps or hands can be used to measure length, and cups measure volume. Anything used to measure in this way can be described as a unit.	Is able to iterate a unit along an object to find length***	Can compose and partition length units. Can think of the length of a bent path as the sum of its parts. Mentally iterates a unit and sub units (internalized ruler).	Operates mentally with units and composite units. Can mentally project a known length along an object to measure or partition an unknown length.
Look *Fors*	Length as an attribute • Detects differences in length • May view length as a non-comparative property possessed by objects based on shape • May not know the need to align objects when comparing them based on their length	Need to physically align objects to compare • Guided ruler use (help with alignment and how to read measure) may help children abstract length and understand measurement	Represents the length of objects by another • Assigns a number to length	Lays units end-to-end along object to measure its length • Measurement as the covering of distance (no gaps or overlaps in the placement of units) • May not understand the need for equal units	Relates the size and the number of units • Operates on length as represented by a number (additivity of length) • May understand the need for equal units and universal units • Iterates a single unit to measure	Flexible understanding of the relationship between the whole, units, and units of units • Connected mental representations of length	Equal facility in iterating and partitioning a given length, both physically and mentally

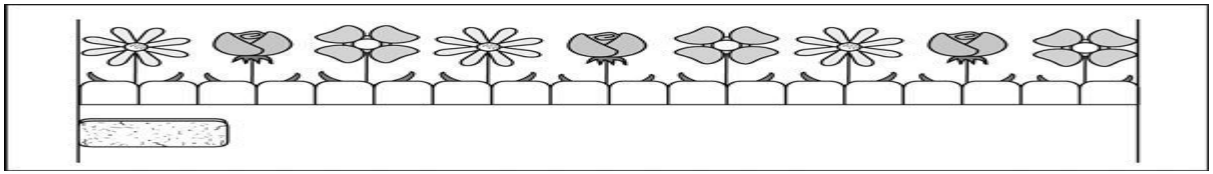
****Unit iteration is the repetition of a single unit. If you are measuring the length of a desk with straws, it is easy enough to lay out straws across the desk and then count them. But if only one straw is available, then you must iterate (repeat) the unit (straw). You first have to visualize the total length in terms of the single unit and then reposition the unit repeatedly.*

Measurement Trajectory (Stages-at-a-Glance)

End-to-end Length Measurer: have students line up hearts and measure how long an object is



Length Unit Relater and Iterator: about how many bricks long is the flower garden?



Length Measurer: how many paper clips would be needed to go around the rectangle?

BIG IDEAS

- Attributes can be compared
- Comparing attributes produces a number called a measure
- Selecting appropriate units to measure attributes
- Comparing length, weight, capacity, and height of objects is important
- Objects can be classified into categories
- The number of objects in a category is called a set
- A set can be counted
- Categories can be sorted according to the number of objects in the sets
- Information can be organized and recorded

ESSENTIAL QUESTIONS

- How can I compare 2 objects by their size?
- Does how I measure matter?
- How can I organize my information?
- What does it mean to measure something?
- Does how I measure matter?
- What ways can I measure an object?
- How can I compare two objects by their size?
- What attributes of an object can be measured?
- How can I compare 2 objects by their weight?
- What categories can I create to identify the different attributes of objects?
- Is there more than one way to sort objects?

CONCEPTS /SKILLS TO MAINTAIN

Although many students may have attended pre-school prior to entering kindergarten, this is the first year of school for some students. For that reason, no concepts/skills to maintain will be listed at this time. It is expected that teachers will differentiate to accommodate those students that enter kindergarten with prior knowledge.

STRATEGIES FOR TEACHING AND LEARNING

Adapted from the Ohio DOE Mathematics Model Curriculum

It is critical for students to be able to identify and describe measureable attributes of objects. An object has different attributes that can be measured, like the height and weight of a can of food. When students compare shapes directly, the attribute becomes the focus. For example, when comparing the volume of two different boxes, ask students to discuss and justify their answers to these questions: Which box will hold the most? Which box will hold least? Will they hold the same amount? Students can decide to fill one box with dried beans then pour the beans into the other box to determine the answers to these questions.

Have students work in pairs to compare their arm spans. As they stand back-to-back with

outstretched arms, compare the lengths of their spans, and then determine who has the shortest arm span. Ask students to explain their reasoning. Then ask students to suggest other measurable attributes of their bodies that they could directly compare, such as their height or the length of their feet.

Connect to other subject areas. For example, suppose that the students have been collecting rocks for classroom observation and they wanted to know if they have collected typical or unusual rocks. Ask students to discuss the measurable attributes of rocks. Lead them to first comparing the weights of the rocks. Have the class chose a rock that seems to be a "typical" rock. Provide the categories: *Lighter Than Our Typical Rock* and *Heavier Than Our Typical Rock.* Students can take turns holding a different rock from the collection and directly comparing its weight to the weight of the typical rock and placing it in the appropriate category. Some rocks will be left over because they have about the same weight as the typical rock. As a class, they count the number of rocks in each category and use these counts to order the categories and discuss whether they collected "typical" rocks.
Provide categories for students to use to sort a collection of objects. Each category can relate to only one attribute, like *Red* and *Not Red* or *Hexagon* and *Not Hexagon,* and contain up to 10 objects. Students count how many objects are in each category and then order the categories by the number of objects they contain.

Ask questions to initiate discussion about the attributes of shapes. Then have students sort a collection of two-dimensional and three-dimensional shapes by their attributes. Provide categories like *Circles* and *Not Circles* or *Flat* and *Not Flat*. Have students count the objects in each category and order the categories by the number of objects they contain.
Have students infer the classification of objects by guessing the rule for a sort. First, the teacher uses one attribute to sort objects into two loops or regions without labels. Then the students determine how the objects were sorted, suggest labels for the two categories and explain their reasoning.

SELECTED TERMS AND SYMBOLS

The following terms and symbols are often misunderstood. These concepts are not an inclusive list and should not be taught in isolation. However, due to evidence of frequent difficulty and misunderstanding associated with these concepts, instructors should pay particular attention to them and how their students are able to explain and apply them.

The terms below are for **teacher reference only** and are not to be memorized by students. Teachers should first present these concepts to students with models and real-life examples. Students should understand the concepts involved and be able to recognize and/or use them with words, models, pictures, or numbers.

- **capacity**
- **category**
- **classify**
- **heavier**
- **height**
- **length**

- **lighter**
- **longer**
- **shorter**
- **taller**
- **weight**
- **organize**

Mathematics Glossary

COMMON MISCONCEPTIONS

- Comparing unlike attributes (comparing the weight of this object to the length of that one)
- The length of objects changes according to how they are placed next to each other when measuring (not lining up the endpoints)
- Placing units for measurement with gaps (not placing units side-by-side)

TASKS

The following tasks represent the level of depth, rigor, and complexity expected of all kindergarten students. These tasks or a task of similar depth and rigor should be used to demonstrate evidence of learning. It is important that all standards of a task be addressed throughout the learning process so that students understand what is expected of them. While some tasks are identified as a performance task, they also may be used for teaching and learning (constructing task).

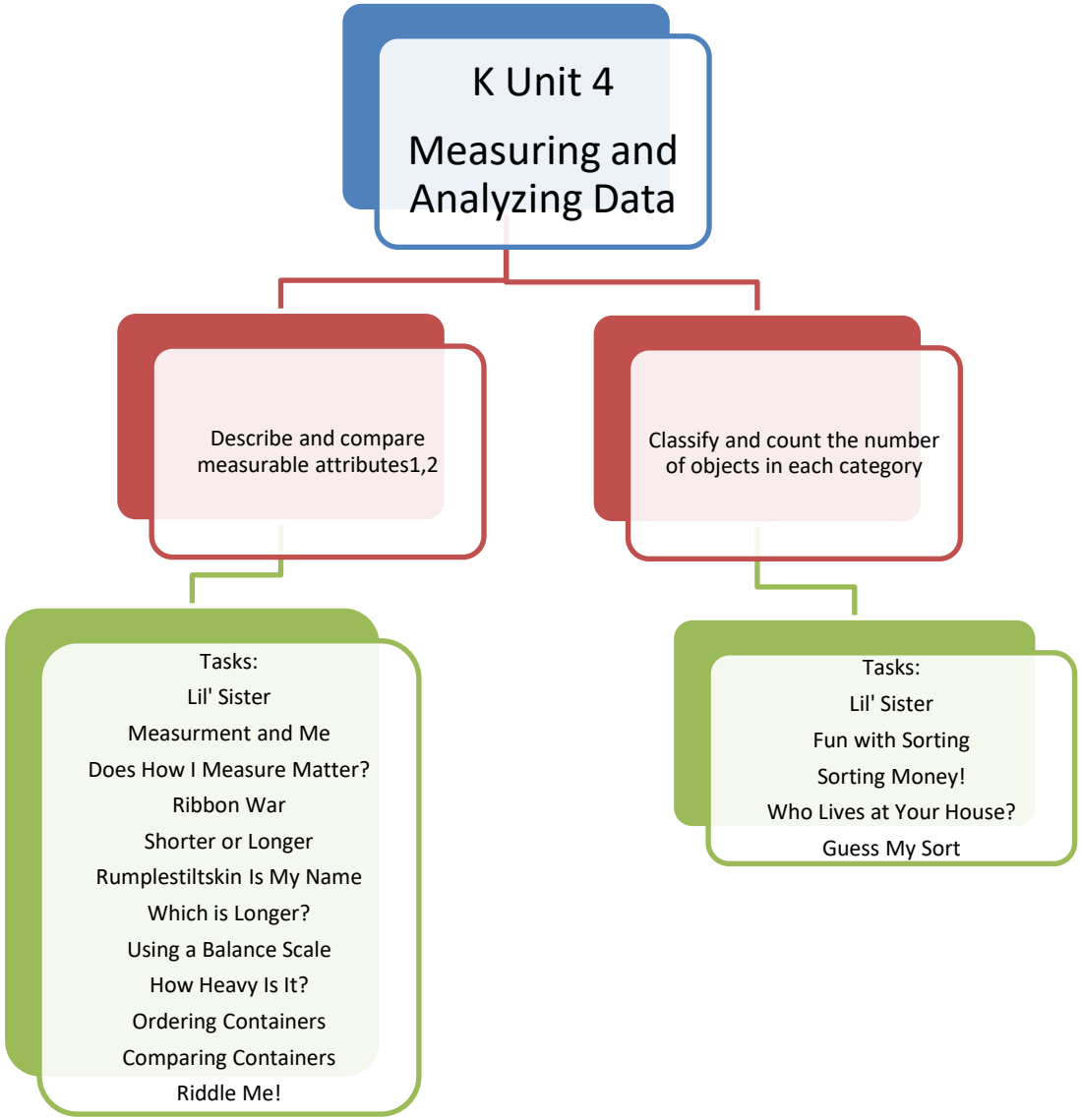
TASK DESCRIPTIONS

Scaffolding Task	Tasks that build up to the learning task.
Constructing Task	Constructing understanding through deep/rich contextualized problem-solving tasks.
Practice Task	Tasks that provide students opportunities to practice skills and concepts.
Culminating Task	Designed to require students to use several concepts learned during the unit to answer a new or unique situation. Allows students to give evidence of their own understanding toward the mastery of the standard and requires them to extend their chain of mathematical reasoning.
Formative Assessment Lesson (FAL)	Lessons that support teachers in formative assessment which both reveal and develop students' understanding of key mathematical ideas and applications. These lessons enable teachers and students to monitor in more detail their progress towards the targets of the standards.
3-Act Task	A Three-Act Task is a whole-group mathematics task consisting of 3 distinct parts: an engaging and perplexing Act One, an information and solution seeking Act Two, and a solution discussion and solution revealing Act Three. More information along with guidelines for 3-Act Tasks may be found in the ***Guide to Three-Act Tasks*** on georgiastandards.org.

Task Name	Standards	Task Type/ Grouping Strategy	Content Addressed	Brief Description
Lil' Sister	**MGSEK.MD.1-3**	3-Act Task *Whole Group*	Comparing height of 2 objects, classifying objects into categories	Students work to compare and classify the heights of two children.
Measurement and Me!	**MGSEK.MD.1**	Constructing Task *Partners*	Introduction to Measurement	Students identify the different attributes of an object and then compare their object with their partner's.
Does How I Measure Matter?	**MGSEK.MD.1-2**	Constructing Task *Partners*	Comparing length of 2 objects	Students compare and describe the lengths of two different objects.
Ribbon War	**MGSEK.MD.1-2**	Practice Task *Large Group, Partners*	Comparing length of 2 objects	Students compare and describe the lengths of two ribbons.
Shorter or Longer?	**MGSEK.MD.1-2**	Constructing Task Small Group or Partners	Comparing height of 2 objects	Students practice measuring and comparing the height two objects.
Rumplestiltskin Is My Name	**MGSEK.MD.1-2**	Practice Task *Partners*	Comparing length of 2 names	Students compare the lengths of each student's name. The students use only 2 names at a time to compare.
Which is Longer?	**MGSEK.MD.1-2**	Constructing Task Partners or Individuals	Comparing length of 2 sets of objects	Students compare the lengths of two different sets of objects.
Using a Balance Scale	**MGSEK.MD.1-2**	Constructing Task Partners	Comparing weight of 2 objects	Students practice using the balance scale to compare the weight of 2 objects.
Measurement	**MGSEK.MD.1-2**	FAL	Comparing length, height, capacity and weight of 2 objects	During the formative assessment students will identify, compare and measure different objects by length, height weight and capacity

How Heavy Is It?	**MGSEK.MD.1-2**	Practice Task *Small Groups*	Comparing weight of 2 objects	Students choose two objects to compare in weight
Ordering Containers	**MGSEK.MD.1-2**	Constructing Task *Small Group*	Comparing capacity of 2 objects	Students compare the capacity of two different containers describing which holds more and less.
Comparing Containers	**MGSEK.MD.1-2**	Practice Task Partners	Comparing capacity of 2 objects	Students compare the capacity of two different containers using a variety of objects to fill the containers and describe which holds more and less.
Riddle Me!	**MGSEK.MD.1-2**	Practice Task Partners or Individuals	Comparing length, weight, height and capacity of 2 objects	Students use their knowledge of measuring and comparing objects to answer riddle questions.
Fun with Sorting	**MGSEK.MD.3**	Practice Task Small Group	Classifying objects into categories	Students practice sorting objects into categories by different attributes.
Sorting Money!	**MGSEK.MD.3**	Practice Task Partners	Classifying objects into categories	Students practice sorting money by different attributes.
Who Lives at Your House?	**MGSEK.MD.3**	Practice Task Partners	Classifying objects into categories	Students practice sorting by using the types of people that live at their house.
Guess My Sort	**MGSEK.MD.1-3**	Culminating Task Partners	Classifying objects into categories	Students will use the knowledge gained from previous tasks to guide their partner in identifying their object.

Each task is suggested but not required. Teachers should choose the most appropriate tasks based on the needs of their students.
For more information on these tasks in this unit please refer to the unit webinar found at
https://www.georgiastandards.org/Archives/Pages/default.aspx



INTERVENTION TABLE

The Intervention Table below provides links to interventions specific to this unit. The interventions support students and teachers in filling foundational gaps revealed as students work through the unit. All listed interventions are from New Zealand's Numeracy Project.

Cluster of Standards	Name of Intervention	Snapshot of summary or Student I can statement. . .	Materials Master
Describe and compare measurable attributes. MGSEK.MD.1 MGSEK.MD.2	Worms and More	Compare lengths from the same starting point	
	The Gingerbread Man	Compare the length of two objects Order objects by length	Copymaster 1 Copymaster 2 Copymaster 3
	Time Capsule	Compare the length of two objects Order objects by length	
	Teddy Bears and Friends	Compare a group of objects by length Measure length with non-standard units Use measuring language to compare length, width, and height	
	Taller, Wider, Longer	Compare a group of objects by length Measure length with non-standard units Use measuring language to compare length, width, and height	Copymaster 1 Copymaster 2 Copymaster 3 Copymaster 4
Classify objects and count the number of objects in each category. MGSEK.MD.3	I Like Trucks	Sort objects and made a display of the data collected	

3-ACT TASK: Lil' Sister

Back To Task Table

Adapted from: www.gfletchy.com
Approximately 1-2 days

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them. Students will begin to explain to themselves and others how they identified like and unlike attributes while comparing two objects.

2. Reason abstractly and quantitatively. Students begin to use diagrams or charts while expressing quantitative ideas for describing lengths, weights and sizes of similar objects.

3. Construct viable arguments and critique the reasoning of others. Students will clearly express, explain, organize and consolidate their math thinking using both verbal and written representations to identify attributes, classify objects, and describe differences.

4. Model with mathematics. Students will begin to compare similar objects in multiple ways such as using words, pictures, and numbers to describe length, weight or size.

5. Use appropriate tools strategically. Students will explore the use of tools (e.g., cubes for measuring, balance scale for weighing) to describe differences in attributes such as length, weight, or size.

6. Attend to precision. Students will express their ideas for classifying objects by using descriptive vocabulary words accurately and clearly.

7. Look for and make use of structure. Students will look for patterns and structures in measurements while building onto cube units to compare and show difference in lengths.

8. Look for and express regularity in repeated reasoning. Students begin to notice repetitive actions in comparing attributes (long and longer, heavy and heavier) such as how adding cube units extends the length or adding more cubes increases weight.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. *For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"*

MGSEK.MD.2 Directly compare two objects with a measurable 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.*

MGSEK.MD.3 Classify objects into given categories; count the numbers in each category and sort the categories by count. (*Limit category counts to less than or equal to 10)*

BACKGROUND KNOWLEDGE

This task follows the 3-Act Math Task format originally developed by Dan Meyer. More information on this type of task may be found at http://blog.mrmeyer.com/category/3acts/.
A Three-Act Task is a whole-group mathematics task consisting of 3 distinct parts: an engaging and perplexing Act One, an information and solution seeking Act Two, and a solution discussion and solution revealing Act Three.

More information along with guidelines for 3-Act Tasks may be found in the ***Guide to Three-Act Tasks*** on georgiastandards.org.

As stated in the unit overview the foundational skills and understandings of measurement should be gleaned from the activities in this unit. Effective questioning from the teacher will ensure these skills and understandings are realized. Underlying skills that are not commonly spoken about within measurement should also be focused upon to ensure a strong foundation in measurement. These skills are:

- When comparing two objects, they must be lined up end-to-end before an accurate measurement can be acquired.
- When measuring an object with units (such as connecting cubes), the units must be lined up end-to-end before an accurate measurement can be acquired.

These skills begin to lay the foundational understanding of the ruler units being laid end-to-end or side-by-side to measure an object. It also begins to form the idea that the ruler and the object must be laid at the starting point of for an accurate measurement.

COMMON MISCONCEPTIONS

Some common misconceptions students have with measurement are technical when comparing lengths. Students may compare unlike attributes when comparing the weight of this object to the length of another. Students may also measure incorrectly because the length of objects changes according to how they are placed next to each other. Students may also place units for measurement with gaps and not placing the units side-by-side.

ESSENTIAL QUESTIONS

In order to maintain a student-inquiry-based approach to this task, it may be beneficial to wait until Act 2 to share the EQ's with your students. By doing this, students will be allowed the opportunity to be very creative with their thinking in Act 1. By sharing the EQ's in Act 2, you will be able to narrow the focus of inquiry so that the outcome results in student learning directly related to the content standards aligned with this task.

- How can I compare 2 objects by their size?

- Does how I measure matter?
- How can I organize my information?

MATERIALS

- Act 1 picture http://gfletchy3act.wordpress.com/lil-sister/
- Act 2 information http://gfletchy3act.wordpress.com/lil-sister/
- Act 3 picture http://gfletchy3act.wordpress.com/lil-sister/
- Act 4 http://gfletchy3act.wordpress.com/lil-sister /
- Math Journals

GROUPING

Individual/Partner Task

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

In this task, students will view the picture and tell what they noticed. Next, they will be asked to discuss what they wonder about or are curious about. These questions will be recorded on a class chart or on the board. Students will then use mathematics to answer their own questions. Students will be given information to solve the problem based on need. When they realize they don't have the information they need, and ask for it, it will be given to them. (SMPs1-8)

Task Directions

Act 1 – Whole Group - Pose the conflict and introduce students to the scenario by showing Act I picture. **(Dan Meyer** http://blog.mrmeyer.com/2011/the-three-acts-of-a-mathematical-story/) **"Introduce the central conflict of your story/task clearly, visually, viscerally, using as few words as possible."**

- Show Act 1 picture to students. http://gfletchy3act.wordpress.com/lil-sister/
- Ask students what they noticed in the picture, what they wonder about, and what questions they have about what they saw in the picture. Consider doing a think-pair-share so that students have an opportunity to talk with each other before sharing questions with the whole group. Students may need to see the picture several times.
- Share and record students' questions. The teacher may need to guide students so that the questions generated are math-related.
- Ask students to estimate answers to their questions (think-pair-share). For the question "How much taller is the big sister compared to the little sister" students write down an estimate in

their journals, then write down two more estimates – one that is too low and one that is too high. Allow students to identify their estimates on a number line. This is an excellent time to informally assess a student's understanding of quantity sizes, in addition to practicing writing numbers. Next, students discuss the questions and determine the information they need.

Anticipated questions students may ask and wish to answer:

- How tall is the big sister?
- How tall is the little sister?
- How much taller is the big sister?
- How much shorter is the little sister?

Act 2 – **Student Exploration** - Provide additional information as students work toward solutions to their questions. **(Dan Meyer** http://blog.mrmeyer.com/2011/the-three-acts-of-a-mathematical-story/)

"The protagonist/student overcomes obstacles, looks for resources, and develops new tools."

- During Act 2, students determine the main question(s) from Act 1 and decide on the facts, tools, and other information needed to answer the question(s). When students decide what they need to solve the problem, they should ask for those things. It is pivotal to the problem solving process that students decide what is needed without being given the information up front. Some groups might need scaffolds to guide them. The teacher should question groups who seem to be moving in the wrong direction or might not know where to begin. The information provided in the picture below should be given to the students during the second act. http://gfletchy3act.wordpress.com/lil-sister/

Questioning is an effective strategy that can be used, with questions such as:

- What is the problem you are trying to solve?
- What do you think affects the situation?
- Can you explain what you've done so far?
- What strategies are you using?
- What assumptions are you making?
- What tools or models may help you?

- Why is that true?
- Does that make sense?

Act 3 – Whole Group – Share solutions and strategies.

- Students to present their solutions and strategies and compare them.
- Reveal the solution in Act 3 picture. http://gfletchy3act.wordpress.com/lil-sister/
- Lead discussion to compare these, asking questions such as:
  - How reasonable was your estimate?
  - Which strategy was most efficient?
  - Can you think of another method that might have worked?
  - What might you do differently next time?

Act 4 - Individual/Small Group- The Sequel

- Allow students to change the unit of measure.
- Allow students compare the heights of the sisters using different types of manipulatives ie. Pattern blocks, paper clips, or pencils.

FORMATIVE ASSESSMENT QUESTIONS

- What models did you create?
- What organizational strategies did you use?
- What does your model (do your models) represent?

DIFFERENTIATION

Extension

Allow students to compare the height of themselves to the big sister to identify who is taller and by how much.

Intervention

Allow students to use manipulatives to recreate the height of each of the sisters and physically compare the two towers.

Back To Intervention Table

CONSTRUCTING TASK: Measurement and Me!

Back To Task Table

Approximately 1 day

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
6. Attend to precision.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. *For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"*

BACKGROUND KNOWLEDGE

Students need to understand that they are comparing specific attributes of the objects. In order to do this, they must first identify the attribute to be measured. Objects often have multiple attributes that are measurable, but we compare only one at a time.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- What does it mean to measure something?
- Does how I measure matter?

MATERIALS

- Measuring Penny by Loreen Leedy or Me and the Measure of Things by Joan Sweeney or any other similar book about measurement.
- Chart paper
- Bags with 2 items of various length, weight, height and capacity in each bag (examples could include: a box of crayons and a marker, another bag could have a shoe string and a child's belt, a different bag could have an empty bottle and a plastic cup)

GROUPING

Whole group and/or partner task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students together on meeting area and pose question, "What do you know about measurement?" Record the student responses on chart paper. Use this brainstorming time to activate

student's prior knowledge, as well as to serve as a pre-assessment. After student responses have been recorded, the teacher may choose to share a book such as Measuring Penny by Loreen Leedy or Me and the Measure of Things by Joan Sweeney or any other similar book about measurement. When choosing a book, please be mindful that comparison of objects is the focus in kindergarten. Essential questions should be introduced in this part of the task. Brainstorm and record the different attributes that can be measured. You may choose to paraphrase the book, and use only the relevant sections.

Next, have partners come to the front and select a pre-made teacher bag. These bags will contain only two items. The partners should discuss what attributes can be measured when comparing the two objects; the teacher should circulate around the room and ask questions about the items to guide student thinking. For example, "Which item is heavier? Which item is longer? Which item is shorter? How did you know?" Partners should record their observations about the attributes of the two objects.

After all bags have been discussed, the teacher should guide students in a discussion to share the discovery of measurable attributes to close the introduction to measurement. (SMP 1,3,6)

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?

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?

DIFFERENTIATION

Extension

- (This extension is to be used with Measuring Penny)

Students can draw their own dog using chart paper. Students can then measure different parts (tail, leg, body) of their dog using various items (snap cubes, paper clips, and different sizes of dog biscuits). Students will create a chart to show the lengths of their dog parts:

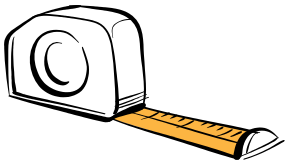
	Paper clips	**Snap cubes**	**Biscuits**
Tail	**10**	**20**	**4**
Leg	**8**	**12**	**5**
Nose to tail	**16**	**32**	**10**

Students will compare the lengths of their dogs (tails, leg, nose to tail) with another student's dog.

Intervention

- Items to be measured should be very different in length or weight so that students can easily see the differences.
- Allow for more time and smaller groupings.

Back To Intervention Table



CONSTRUCTING TASK: Does How I Measure Matter?

Back To Task Table

Approximately 1 day

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. ***For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"***

MGSEK.MD.2 Directly compare two objects with a measurable 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*.

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.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- Does how I measure matter?
- How can I compare 2 objects by their size?

MATERIALS

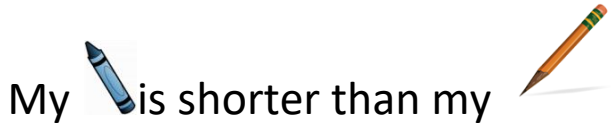
- Chart paper
- Bags with 5 items of various length, weight, height and capacity in each bag (one per group) (examples could include: a box of crayons, a marker, a pencil, a glue stick, paperclip, etc.)

GROUPING

Whole group and/or small group task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Part I
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
(SMP 1,3,5,6,7)

Part II
Tell students they are going to explore comparing objects and writing true measurement description. 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. (SMP 1,3,5,6,7)

TEACHER REFLECTION QUESTIONS

- Are students able to compare objects by their size and can they 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 measurement description 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 find 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.
- Students can categorize the items they have in the bags: these are longer than _____; these are shorter than _____.

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 measurement description to scaffold their learning.

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TECHNOLOGY

Sid the Science Kid-Fab Lab https://pbskids.org/sid/games/crystals-rule
Students measure rocks using nonstandard units of measure.

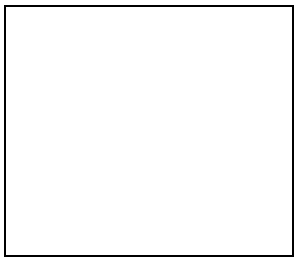
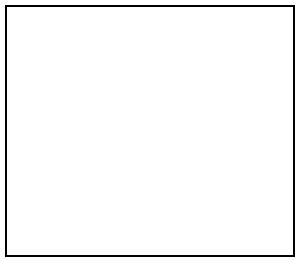
Teaching Resources:

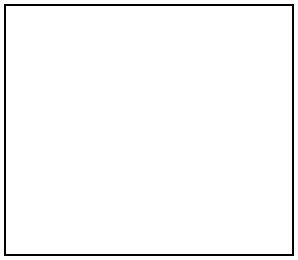
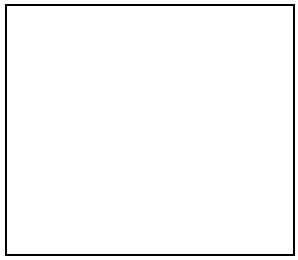
NCTM: Navigation Series – Navigating through Measurement in Pre-kindergarten – Grade 2 String Lengths: p. 18 -20

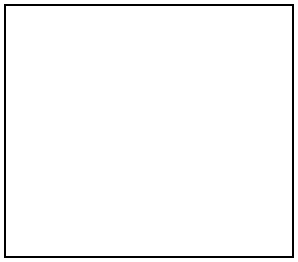
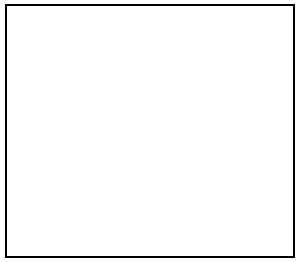
Illuminations: Ladybug Lengths https://www.nctm.org/Classroom-Resources/Illuminations/Lessons/Ladybug-Lengths/
Lesson Plans for teachers using ladybugs to measure objects.

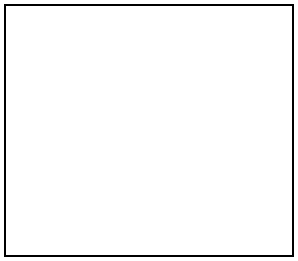
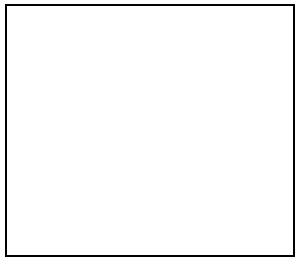
Name_____

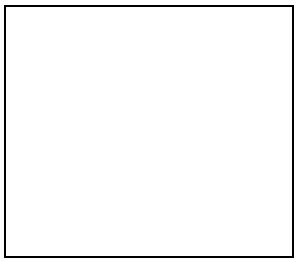
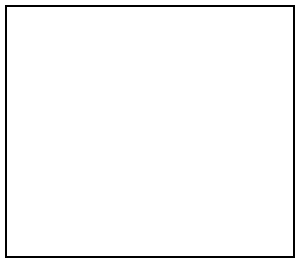
Does How I Measure Matter?

1. A  is longer than a  .

2. A  is shorter than a  .

3. A  is the same length as a  .

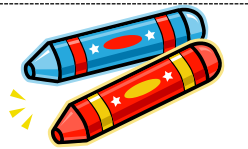
4. A  is shorter than a  .

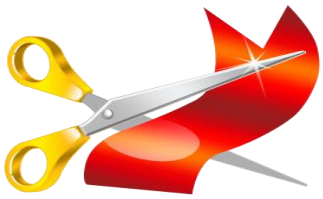
5. A  is longer than a  .

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

 pencil	scissors 	 paperclip	 crayon	 crayon  marker
 glue stick	 pencil	 scissors	 paperclip	



PRACTICE TASK: Ribbon War

Back To Task Table

Approximately 2 days

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. ***For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"***

MGSEK.MD.2 Directly compare two objects with a measurable 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*.

BACKGROUND KNOWLEDGE

Some students may believe that the lining up of end points (placing the ends of objects next to each other) for comparison is not important. These students will also think that a 3-inch block is longer than an 5 inch block when they are lined up like:

3 inch block

5 inch block

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- How can I compare 2 objects by their size?
- How can I organize my information?

MATERIALS

- The Best Bug Parade by Stuart J. Murphy or a similar book about measurement.
- One bag of ribbons or string cut in various lengths. (one bag per pair of students)

GROUPING

Whole group and/or partner task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

The teacher should collect one bag of ribbons or string, cut in various lengths, per pair of students. The lengths should range from about an inch to 24 inches.

Have students go to the meeting area and begin by reading a book on size comparisons such as The Best Bug Parade by Stuart Murphy or a similar book. After reading the book, the teacher will model the Ribbon War described below by showing the students how you and a partner play this game. Demonstrate with a volunteer student taking turns and how to lay the ribbons, side by side, to determine the length. The teacher should observe partners as they make their comparisons. Listen for the use of correct vocabulary (length, taller, shorter, longer, more, less, first, second). As the students make their ribbon comparisons, be sure students are using end-points when they compare the lengths of the ribbons.
Students need to be grouped with partners for this task. The teacher should provide each pair of students with a bag of ribbons.

Ribbon War Game

- Reach in the bag and take a piece of ribbon. Lay the ribbon out in a straight line, making sure that it is flat or holding it down to make it flat.
- Your partner will pull a piece of ribbon out of the bag and lay their ribbon beside your piece. Compare your two ribbons. The partner with the longer ribbon will keep both pieces of ribbon. Observe to make sure students lay the ribbons next to one another (use common end points.)
- If the pieces are the same length, partners pull another piece and add it to the piece that they have already. Compare the two new lengths. The partner with the longer length will keep all the pieces of ribbon.
- Continue playing the game and taking turns until the bag is empty. Count up the total number of ribbons each player has. The winner is the person who has more ribbons.
- Each player then lays out all his/her ribbons in a straight line and compares the total length. Who has the longer total length? Discuss this with your partner.
- The next time you play this game the rules change. Put all ribbons back into the bag and play the game again, but see who has the shorter ribbon. The partner with the shorter ribbon takes both. Again, the partner who has more ribbons is the winner. Make sure to ask students, "What was different about the results this time compared to last time?"

After allowing an appropriate amount of time to play the game, bring students together. Have each set of partners pull two ribbons from their bag and have them identify which is longer and which is shorter and explain their reasoning.

Next, facilitate a class discussion involving a scenario where a student has one ribbon and his partner has 3 ribbons and the one ribbon is longer than the three ribbons. Teacher may need to have an example ready to show, such as 3 ribbons are longer than 5 ribbons. (SMP 1,3,5,6,7)

TEACHER REFLECTION QUESTIONS

- Are students able to compare objects by their size and can they explain why this would be important?
- Are students able to use mathematical language to describe the measurement of attributes of items?
- Are students able to explain why end points are important?

FORMATIVE ASSESSMENT QUESTIONS

- If I hold the objects like this (without the endpoints lined up), does your measurement description change?
- Did the person who has the most ribbons also have the longer length? Could a person have fewer pieces of ribbon but have a longer line? Why or why not?
- How do you know which ribbon is shorter? Longer?
- Why do we need to line the ribbons up end-to-end to compare the lengths?
- I wonder why end points are important. Can you tell me?

DIFFERENTIATION

Extension

- Using the same baggies from ribbon war, students are to use some sort of measuring stick to find the length of their ribbon before comparing the lengths of the ribbons. Examples of measuring sticks are: paper or cardboard strips with a picture of paper clips end to end or paper clips glued end to end; a strip of paper or cardboard with 1-inch hearts or inch worms pictured or glued end to end.

Intervention

- Provide students with a piece of ribbon and ask them to locate items in the classroom that are longer than the piece of ribbon, as well as shorter than the piece of ribbon. Assign one task at a time and provide immediate feedback before sending student to the next task of finding an item. Focus on the discussion of the "why" the item is longer or shorter than the ribbon.

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TEACHING RESOURCES:

Van de Walle (2006) Teaching Student-Centered Mathematics Grades K-3, Crooked Paths: p. 229

CONSTRUCTING TASK: Shorter Or Longer?

Back To Task Table

Approximately 2-3 day *(Adapted from "Is it Shorter" found at K-5_MathTeachingResources.com)*

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. ***For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"***

MGSEK.MD.2 Directly compare two objects with a measurable 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.*

BACKGROUND KNOWLEDGE

An important part of measuring is identifying the unit of measurement. Always have the child state that the objects in the room are being compared to the "tower of 10 cubes". This is the "unit of measurement" for this task. Do not accept statements such as, "Mine is longer" or "This is shorter than that". Desirable responses could be "My tower of ten is longer than…." My tower of ten is shorter than…"

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- How can I compare 2 objects by their size?
- How can I organize my information?

MATERIALS

- Containers with 10 connecting cubes (per student)
- Containers with various amounts of connecting cubes such as 5 red cubes or 7 blue cubes for each pair of students.
- A box of objects taller, shorter and the same height of a tower 10 blocks and tower of 5 blocks.

GROUPING

Whole group, small group and/or Individual

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

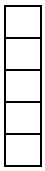
Part I-Shorter or Longer
At the meeting area, the teacher and student should demonstrate holding the two different size towers end-to-end, to determine which one is longer. The teacher should observe partners as they make their comparisons. Listen for students to include the use of correct vocabulary (length, taller, shorter, longer, more, less, first, second). Encourage the students to use numbers to describe how various amounts of cubes make up and allow them to construct a tower. to compare with their elbow partner. As the students make their comparisons, be sure students are using end-points when they compare the lengths of the towers.

Using the tower of 10, model the Shorter or Longer recording sheet described below by showing the students how you complete the task. Model your thinking as you make the comparisons and what attribute you are measuring. Stress the importance of identifying what unit (a tower of 10 cubes) is being used to make the comparison.

Have each student get a set of 10 of cubes. The students should join the connecting cubes in their container to make a tower. Find some objects in the classroom that are shorter than your tower of ten cubes and some objects that are longer than your tower of 10 cubes. Use pictures or words to show your work. The teacher should circulate around the room and observe individuals as they make their comparisons and ask the engaging questions. Listen for the use of correct vocabulary (length, taller, shorter, longer, more, less). As the students make their comparisons, be sure students are using end-points when they compare lengths. Partners should record what objects in the classroom are shorter or longer than their tower and how they know this to be true.

After allowing an appropriate amount of time to complete the task, bring students together. Have students share and discuss their work. Have them identify objects that are shorter or longer and explain their reasoning. Use a different unit (longer or shorter tower of cubes) to show why the identification of the unit is important and how it can make a difference. (SMP 1,3,5,6,7)

Part II – Benchmark of 5
Gather students together at meeting area and show them a tower of 5 and a tower of 10. Explain that we can compare objects length using a tower of 5 or a tower of 10 cubes. Hold up an object that is the same height as a 5 tower or a 10 tower and ask, “Is this object taller than, shorter than, or the same as my tower? Whisper your answer to your elbow partner. Then share with the class. “Why do you think that?” Model writing a true measurement description about your comparison. For example,

My  is the same height as my 

Tower of 5 box

Tell students they are going to explore comparing objects and writing true measurement description. Explain that, as a group, they are to compare five objects of varying sizes to their tower of 5. Give each group a pre-made bag of items such as books, pencils, crayons, glue sticks, paperclips, etc. making sure that each bag has at least one item that is the same as a tower of 5.

Have each child in the group select an object and do the comparison. Listen to how they are using the vocabulary taller, shorter and same height. They should record their observation in their math journal and write a true measurement description. Continue this lesson, allowing them to explore different objects and comparing them to their tower of five. Students can draw pictures to show their answer and record their thinking.

To close, gather students together on meeting area and have them share and discuss their mathematical thinking along with their true measurement description. (SMP 1,3,5,6,7)

Part II – Benchmark of 10

Tell the students "Now we are using a benchmark of 10." Do you think our comparisons will change? Why or why not?"

Have the students build their own tower of ten cubes and count the cubes orally so you can observe them counting the cubes. Next, show the students the box of objects from Benchmark of 5. Ask them to select one object from the box and discuss how the tower of blocks is shorter, longer, and or same height as the object you selected. Listen to how they are using the vocabulary taller, shorter and the same height. Continue this task, allowing them to explore different objects and comparing them to their tower of ten and recording their mathematical thinking in their journals.

To provide closure for the task, gather students together in meeting area and have them share and discuss their mathematical thinking along with their measurement description. (SMP 1,3,5,6,7)

TEACHER REFLECTION QUESTIONS

- Are students able to compare objects by their size and can they explain why this would be important?

- Are students able to use mathematical language to describe the measurement of attributes of items?
- Can students explain how their comparisons are correct?
- Can students decided or offer ideas for how to organize information?
- Are students able to explain how record results? Do they understand why this is important?

FORMATIVE ASSESSMENT QUESTIONS

- What unit did you use to make the comparison?
- Is this task similar to other tasks we have done? How?
- Does holding the objects end-to-end affect the answer? Is this important?
- Which object is shorter or longer? How do you know?
- How can you organize your information so that someone else can understand it?
- How do you know your comparisons are correct?

DIFFERENTIATION

Extension

- Give the student a different object (marker, pencil, or crayon) and have them find some objects in magazines that are shorter or longer than their object. Have student cut the pictures out of the magazines and group them in 2 different groups – Longer than my _____; Shorter than my _____. This is an abstract activity for students to think the true size of the item in the magazine pictures. It also allows students to go beyond the classroom to the world around them.

Intervention

- Give the student a recording sheet, such as "Shorter or Longer", with specified objects around the classroom that should be compared to their tower of cubes. Prior to the activity, it helps to give the students a real picture of what they are to find in the classroom to create a scavenger hunt. Have focused conversations with the student about how to compare two objects and why one is taller or shorter than the other.

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TECHNOLOGY

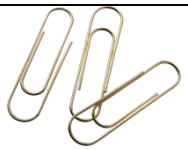
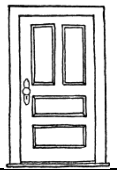
Sid the Science Kid-Fab Lab: https://pbskids.org/sid/games/crystals-rule
Students measure rocks using nonstandard units of measure.

Teaching Resources

Van de Walle (2006) Teaching Student-Centered Mathematics Grades K-3, Longer, Shorter, Same: p. 228

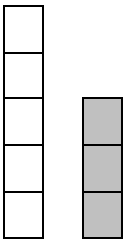
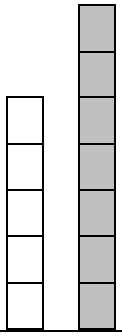
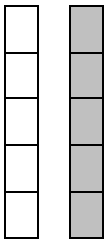
Name_____

Shorter or Longer?

1. My tower of 10 is	shorter than longer than	
2. My tower of 10 is	shorter than longer than	
3. My tower of 10 is	shorter than longer than	
4. My tower of 10 is	shorter than longer than	
5. My tower of 10 is	shorter than longer than	
6. My tower of 10 is	shorter than longer than	
7. My tower of 10 is	shorter than longer than	
8. My tower of 10 is	shorter than longer than	

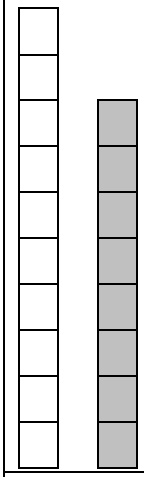
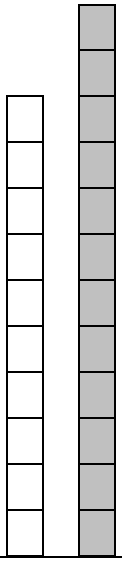
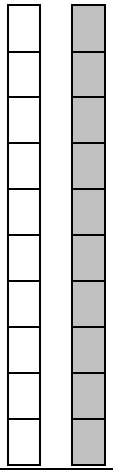
Name_____

Tower of Five

Shorter	Taller	Same
		
Draw a picture of an object that is **shorter** than 5 cubes.	Draw a picture of an object that is **taller** than 5 cubes.	Draw a picture of an object that is the **same** as 5 cubes.

Name_____

Tower of Ten

Shorter	Taller	Same
		
Draw a picture of an object that is **shorter** than 10 cubes.	Draw a picture of an object that is **taller** than 10 cubes.	Draw a picture of an object that is the **same** as 10 cubes.

PRACTICE TASK: Rumplestiltskin Is My Name

Approximately 2 days

Back To Task Table

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. ***For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"***

MGSEK.MD.2 Directly compare two objects with a measurable 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.*

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.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- What ways can I measure an object?
- How can I organize my information?

MATERIALS

- Index cards
- Unifix cubes
- Chrysanthemum by Kevin Henkes or a similar book
- Chart paper
- 1 inch squares cut for each letter of each students' name

GROUPING

Small group task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Part I
At the meeting area, have students brainstorm a list of the longest words they know. After brainstorming long words, choose 2-3 words to write on the board. Lead a discussion on the length of the words. Have volunteers help create a "word rod" to represent the length of each word. For example, use Unifix cubes and have one block represent each letter in the word. Tell students "We've talked about some really long words. I have a story about a little girl who has a really long name. Listen for the different names as I read the story." Read Chrysanthemum by Kevin Henkes, or a similar book. Select one student to pick two of the names in the story. Write these two names on individual index cards. Talk about which is longer and shorter and how you know. Then, model how to represent the name length with cubes. Compare the two names to determine which name is shorter and which name is longer. Repeat this process with several more pairs of names from the story…**but compare ONLY 2 names at a time**.

Explain to the students that they will write their name on an index card and then count out the number of Unifix cubes to build a matching "name rod." Explain that they will be deciding whose names are shorter, longer, or the same length as their own name.

Put students into groups of 4 to 6 for this task. Students will compare "name rods" within their small group to determine whose name was longer, shorter and/or the same name as their own name. **Again, compare ONLY 2 names at a time.**

Bring the class back together to discuss various comparisons. The teacher will lead students in discussion about name towers comparing only two students at a time. (SMP 1,3,4,5,6)

Part II
At the meeting area, discuss how students will write 1 letter of their name in each square. Demonstrate this by writing your name in the squares. Students will do this at their tables or letters could be done prior to this activity and placed in baggies for students to hold. Return to the large group and have each student bring their name up to a chart paper that will be displayed for the class (the teacher can use a glue stick to quickly glue the letters down, or this could be done prior to the meeting). Before the names are displayed, the class can predict if it will be longer or shorter than the previous students name strip. Once the class list of names has been correctly lined up and glued in place, teacher reflection questions can be discussed.

Statements can be made and displayed with the graph of names such as:
_____ name is the longest.
_____ name is the shortest.
_____ and _____ have the same number of letters.

_____ is 2 letters longer than _____.

Students can reflect on how their name compares to the rest of the class. This is to be a whole group activity because names can be longer than 10 letters. (SMP 1,3,4,5,6)

TEACHER REFLECTION QUESTIONS

- Can students tell why it is important to be able to compare the length of 2 objects?
- Are students able to compare objects by their size and can they 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 and 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 attribute did you measure?
- 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

- Write additional words on index cards. If there are labels in the room identifying objects, students may want to copy those words. Example: door, bookshelf, calendar, clock, cubbies, etc. Have students make towers with the same number of cubes as letters in the word to go with the words. Have students use chart paper to write the longer words, shorter words, or words that are the same as their name.
- Have students find the longest and shortest names of months or days of the week and report it to the class.
- Using different colored cubes for each student, have them create cube trains for their names and find a partner to connect to. Have the partners work together to find 2 other partners whose train is longer or shorter and make comparison statements.

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.

- If necessary, provide these students with Unifix cubes that have letter stickers on them that spell their name or allow students to write the letters on the Unifix cubes using a dry erase marker or wax pencil. They will use this to make the connection between their name and the blank Unifix cubes. Look for possible misconceptions and note correct usage of vocabulary terms.
- Letters can be written on 1-inch plastic squares for students to find their name or other shorter words that have been written previously on index cards.

Back To Intervention Table

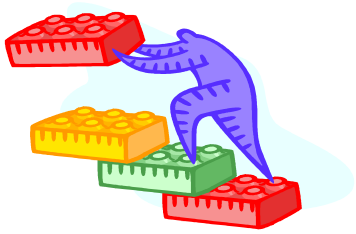
TECHNOLOGY

Sid the Science Kid-Fab Lab: https://pbskids.org/sid/games/crystals-rule
Students measure rocks using nonstandard units of measure.

CONSTRUCTING TASK: Which Is Longer?

Back To Task Table

Approximately 1 day. *This lesson is adapted from "Which Is Longer" found at K-5_MathTeachingResources.com*



STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. ***For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"***

MGSEK.MD.2 Directly compare two objects with a measurable 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*.

BACKGROUND KNOWLEDGE

Kindergarten students need to learn that when measuring multiple objects as one unit, the objects must be lined up end to end in order to get an accurate measurement. If gaps are left between objects, it changes the measurement or comparison. 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 end-to-end is important for an accurate measurement.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- Does how I measure matter?
- How can I compare 2 sets of objects?

MATERIALS

- Connecting cubes
- Paper clips

- Counters
- Pattern blocks
- Other items for measurement

GROUPING

Individual

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students together at meeting area and show two sets of items such as 8 crayons and 8 pencils. Ask, "If I lay these sets of objects end-to-end, 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 set is longer. Select two students to demonstrate how you can measure to determine which is longer. Have a student line up the items end-to-end and remind them of the importance of common endpoints for each line. Ask students, "Why is it important to line items up end-to-end when comparing length of a set?" Model on a chart how to write a measurement description about the two objects. For example:

My 8  are shorter than my 8 
crayons pencils

Tell students they are going to explore comparing sets of objects and writing true measurement description. Give each group pre-made bags of items such as 20 connecting cubes and 20 paper clips, 7 crayons and 7 counters, 12 square pattern blocks and 12 trapezoid pattern blocks and 10 craft sticks and 10 dominoes.

Once they have their bags of objects, they are to lay the objects end-to-end on their table (creating 2 lines with each line containing like objects). They should compare the two sets of objects and write a true measurement description to describe the comparison of common attributes. Then switch bags with a peer in their small group to make a new comparison. Again, please note students are only comparing 2 items at a time. Emphasize the importance of aligning endpoints on both lines of 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. This gives an opportunity to communicate their discoveries in mathematical language. Discuss with the whole group why it DOES matter how you measure. (SMP 1,3,4,5,6)

TEACHER REFLECTION QUESTIONS

- Are students able to compare sets of objects and explain why this would be important?

- Can students explain why we need to line objects up end-to-end in order to accurately measure sets?
- 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

- Why is this set longer/shorter when we have the same number of items as this set?
- What attributes did you measure?
- Which object is (longer, taller, etc.)? How do you know?
- If I hold the objects like this (without the endpoints lined up), does your math statement change?

DIFFERENTIATION

Extension

- Prepare baggies of sets of items of different quantities. For example: 10 connecting cubes and 20 paper clips, 7 crayons and 15 counters, 5 craft sticks and 15 dominoes, etc. that can be used for comparison of length of sets. Have the students order the items end-to-end and compare the lengths. Students can cut a piece of ribbon to match the length of the items to use and compare to another student's findings. Students can draw pictures in their Math Journals to show how they compared the items.

Intervention

- Have pre-made cards of items such as 5 connecting cubes and 5 paper clips, 7 crayons and 7 counters, and 3 craft sticks and 3 dominoes glued down. Have the child make comparisons of the length of each line. Have ribbons pre-cut to match the length each of the listed items above and allow the students to match the ribbons to the items.

Back To Intervention Table

TECHNOLOGY

Sid the Science Kid-Fab Lab: https://pbskids.org/sid/games/crystals-rule
Students measure rocks using nonstandard units of measure.

CONSTRUCTING TASK: Using A Balance Scale

Back To Task Table

Approximately 1 day - *This lesson is adapted from "Using a Balance Scale" found at K-5_MathTeachingResources.com*

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. ***For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"***

MGSEK.MD.2 Directly compare two objects with a measurable 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*.

BACKGROUND KNOWLEDGE

Kindergarten students most likely will have no prior knowledge of using a balance scale. You may want to discuss with them that when something heavy is placed in our hand, our hand drops down from the weight. Then discuss that on a balance scale, the heavier an object is, the lower that side of the scale drops. Objects have multiple measurable attributes. Remind the students that it is important to identify the attribute being measured. Remember:

- 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.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- How can I compare two objects by their size?
- What attributes of an object can be measured?

MATERIALS

- Balance scales

- Items of various weights (examples could include: a box of crayons, a marker, a pencil, a glue stick, paperclip, etc.)

GROUPING

Whole group and/or small group task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students together at meeting area and explain that today we are learning how a balance scale works and comparing objects to see which one is heavier or lighter. Demonstrate how the balance scale is even when each side has the same amount of weight. When you place a heavier object on one of the sides the heavier of the two objects will sinks down lower than the other side. Demonstrate this with several different objects. Discuss with the students that we do not always need a balance scale to help us tell if an object is heavier or lighter than another object, but when the objects are close to the same weight it helps us know that our answer is correct.

My  is heavier than my 
crayon pencil

My  weighs less than my 
scissors shoe

Tell students they are going to explore comparing objects and writing true measurement description. Explain that, as a group, they are to compare five objects of varying weights. 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. They decide if it is necessary to use the balance scale to prove their statement.

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 heavier than a paperclip but lighter than a book. Students can have these discussions when writing their math sentences. Again, please note students are only comparing 2 items at a time. When students complete their comparisons, let them discuss their findings.

Allow students time to share their comparisons. Record these findings on the *Using a Balance Scale* recording sheet. This gives an opportunity to communicate their discoveries in mathematical language. (SMP 1,3,4,5,6)

TEACHER REFLECTION QUESTIONS

- Are students able to determine which item is heavier/lighter than another?
- Are students able to compare objects by their size and can they explain why this would be important?
- Are students able to use mathematical language to describe the measurable attributes of items?
- Can students decide or offer ideas for how to organize and record information?
- Are students able to explain how to record results? Do they understand why this is important to do?

FORMATIVE ASSESSMENT QUESTIONS

- Why do we need a balance scale?
- What attributes did you measure?
- Are there any other ways to compare these objects?
- Why did you decide to measure it this way?
- Which object is heavier? How do you know?

DIFFERENTIATION

Extension

- Prepare a basket of small items students can choose from to weigh in the balance scale. Allow students time to discover one to one comparisons of items.
- Next, allow time for students to find how many blocks would be the same as 1 item (marker, board eraser…). Students can write simple statements such as 6 blocks are equal to 1 eraser; 3 blocks is the same as 1 pencil. Students will attend to precision while making the balance scale even on each side.

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.
- Put together baggies that have only two items in them and items are significantly different in weight.
- Allow additional time with balance scales. To begin, have them concentrate on items that weigh the same so they can practice getting things balanced.

Back To Intervention Table

Using a Balancing Scale

Name:_____

My…	Weighs less than 	My…
My…	Weighs more than 	My…
My…	Weighs less than 	My…
My…	Weighs more than 	My…
My…	Weighs less than 	My…

FAL: Measurement

Back To Task Table

Please use the following website to access the FAL

http://www.jennyray.net/uploads/1/2/9/7/12975776/kmeasurement1.pdf

PRACTICE TASK: How Heavy Is It?

Back To Task Table

Approximately 1 day

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
5. Use appropriate tools strategically.
6. Attend to precision.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. ***For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"***

MGSEK.MD.2 Directly compare two objects with a measurable 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*.

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.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- How can I compare 2 objects by their weight?
- How can I organize my information?

MATERIALS

- Mighty Maddie by Stuart Murphy or a similar book on measurement.
- Balance scales for each small group
- Common objects to weigh on the balance scales- such as a CD, marker, glue stick, paper clip, pencil, pack of Post-It Notes, marble, golf ball, tennis ball, etc.

GROUPING

Whole group and/or small group task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students in meeting area and say, "There are several of ways to measure items. We have talked about longer, shorter, or the same length. What are other ways we can measure?" Record student responses on a class chart. "If I wanted to pick something up, what would I want to know about what I was going to lift?" (How heavy it is…how much it weighs.)

Read a book such Mighty Maddie by Stuart Murphy or similar book. Show real examples of scales. Discuss where they see these in the real world such as the grocery store, the doctor's office, and the bathroom. Discuss how scales can be used to find the weight of objects and balance is like a seesaw. Balance Scales can be used to compare two objects to see which one weighs more. Help students develop the concept of weight by holding several objects such as a tennis ball and a golf ball or a marble and a tennis ball (both are spheres) in their hands. Then compare the weights when they are placed in the scale. Be sure to use the terms heavier and lighter. Model on a chart how to write a math statement about the two objects. For example:

My  is heavier than my  .
crayon pencil

Tell students they are going to explore comparing objects and writing true measurement description. 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, CD, marker, glue stick, paper clip, pencil, pack of Post-It Notes, marble, golf ball, tennis ball, etc.

Once they have their bag of objects, they are to lay the objects on their table. Students choose 2 items at a time to compare. They should compare the two objects simply by holding them in their hands. If the objects are too similar to compare accurately in your hands, then they should use the balance scale. Each student should record his/her math thinking by writing 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 marble may be heavier than a paperclip but lighter than a book. Students can have these discussions when writing their math sentences. Again, please note students are only comparing 2 items at a time. When students complete their comparisons, let them discuss their findings.

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 that choosing when to use a math tool is important. (SMP 1,3,5,6)

TEACHER REFLECTION QUESTIONS

- Are students able to compare objects by their weight and explain why this would be important?
- Are students able to determine which item is heavier or lighter than another?
- Are students able to use mathematical language to describe the measurable attributes of items?
- Can students decide or offer ideas for how to organize and record information?
- Are students able to explain how to record results? Do they understand why this is important to do?

FORMATIVE ASSESSMENT QUESTIONS

- What attributes did you measure?
- Are there more ways to compare these objects?
- Why did you decide to measure it this way?
- Which object is heavier or lighter? How do you know?

DIFFERENTIATION

Extension

- Students can use more than one item to compare and record results. Example: 2 erasers are heavier than 2 blocks; 5 blocks are lighter than 3 markers.
- 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.
- Put together baggies that have only two items in them which are significantly different in weight.
- Allow additional time with balance scales. To begin, have them concentrate on items that weigh the same so they can practice getting things balanced.
- Provide the student with copies of a recording sheet to help organize their thinking. See the "How Heavy Is It" example page.

Back To Intervention Table

TEACHING RESOURCES

NCTM: Navigation Series – Navigating through Measurement in Pre-kindergarten - Grade 2 Body Balance: p.14 -15

How Heavy Is It?

Name: _____

Have the student draw representations of the objects being compared and circle the correct measurement term.

	is heavier than is lighter than	
	is heavier than is lighter than	
	is heavier than is lighter than	
	is heavier than is lighter than	
	is heavier than is lighter than	
	is heavier than is lighter than	
	is heavier than is lighter than	

CONSTRUCTING TASK: Ordering Containers

Approximately 1 day Back To Task Table

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
5. Use appropriate tools strategically.
6. Attend to precision.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. ***For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"***

MGSEK.MD.2 Directly compare two objects with a measurable 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*.

BACKGROUND KNOWLEDGE

Introducing capacity (how much something can hold) can be tricky with kindergarten students. You will want to consider the skill of conservation when working with capacity. Some students may need extra guidance with understanding how different shaped objects can hold more or less. You may want to set up a water investigation station to let the students explore different types of containers and how much they hold. You will also want to reinforce the identification of the unit of measurement. 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.
- Keeping a careful count of how much of the substance it takes to fill an object is important.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- Does how I measure matter?
- How can I organize my information?

MATERIALS

- A variety of containers (at least 10 containers per group) Example: small boxes, cups, bowls, bottles, etc.
- Substances to fill containers: beans, sand, water, rice
- Funnel

GROUPING

Whole group and/or small group task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students on meeting area. Show the students two containers; examples could include: a coffee cup and a gallon jug. Pose this question, "Which holds more liquid?" Allow various students to respond. Include "How do you know?" questions. Use a substance to fill the one of the containers and then pour the substance into the other container to determine if it would hold more, less, or the same amount. Model on a chart how to write a math statement about the two objects. For example:

My  holds more than my  .
milk jug coffee cup

Show the students that you have many different sizes of containers for each group. Have students make estimates about which container holds more and which container holds less. Allow children to use a substance (sand, water, rice, beans, etc.) to fill the containers. Discuss which container holds the most, or the least. The students should record their observations about the comparisons.

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 coffee cup may hold less than a pitcher but more than a lid. Students can have these discussions when writing their measurement description. Again, please note students are only comparing 2 items at a time.

When students complete their comparisons, let them discuss their findings. Observe as students compare to make sure they are accurately filling the containers.

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. (SMP 1,3,5,6)

TEACHER REFLECTION QUESTIONS

- Are students able to determine which items hold more or less than others?
- 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 measurable attributes of items?
- Can students decide or offer ideas for how to organize and record information?
- Are students able to explain how to record results? Do they understand why this is important to do?

FORMATIVE ASSESSMENT QUESTIONS

- What attributes did you measure?
- Are there more ways to compare these objects?
- Why did you decide to measure it this way?
- Which object holds more or less? How do you know?
- If I fill one container with beans and the other container with water, can I still compare how much they hold? Why or why not?

DIFFERENTIATION

Extension

- Provide the student with several other containers for students to choose from. Containers that students use in their world allow for real life understanding (milk cartons from lunch, small cereal boxes, pop tart boxes, macaroni noodle boxes). Students can make predictions before comparing amounts. Allow time for students to discuss and record observations.
- Encourage students to compare different attributes of their containers (the macaroni box is taller than the pop tart box).

Intervention

- Have students pour the material into two identical containers so they can compare which holds more or less. This direct comparison will assist them in seeing the comparisons more clearly. Using a larger material such as small counting bears, fruit loops, etc. so that students can count the amount needed to fill the containers might by helpful.
- Provide the student with copies of a recording sheet to help organize their thinking. See the "Ordering Container" example page.

Back To Intervention Table

TEACHING RESOURCES:

Van de Walle (2006) Teaching Student-Centered Mathematics Grades K-3, Capacity Sort: p. 238

Ordering Containers

Name: _____

Have the student draw representations of the objects being compared and circle the correct measurement term.

	holds more than holds less than	
	holds more than holds less than	
	holds more than holds less than	
	holds more than holds less than	
	holds more than holds less than	
	holds more than holds less than	
	holds more than holds less than	

PRACTICE TASK: Comparing Containers

Back To Task Table

Approximately 1 day

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
5. Use appropriate tools strategically.
6. Attend to precision.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. ***For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"***

MGSEK.MD.2 Directly compare two objects with a measurable 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*.

BACKGROUND KNOWLEDGE

In this task, students will be using various size containers. Remember, students only compare two at a time, so when selecting the two containers to be compared be sure it is easy to determine which holds more or less. You will also want to discuss that different qualities of an object (wider, taller, etc) affect how much it can hold. 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.
- Keeping a careful count of how much of the substance it takes to fill an object is important.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- What ways can I measure an object?
- How can I organize my information?

MATERIALS

- A variety of containers (at least 10 containers per group) Example: small boxes, cups, bowls, bottles, etc.
- Items for the children to choose from to fill the containers. For example: plastic eggs, tennis balls, golf balls, wads of paper (make them about the same size)

GROUPING

Whole group and/or small group task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students on meeting area. Show the students two containers; examples could include: a coffee cup and a gallon jug. Pose this question, "Which holds more marbles?" Allow various students to respond. Include "How do you know?" questions. Use marbles to fill one of the containers and then pour them into the other container to determine if it would hold more, less, or the same amount. Model on a chart how to write a math statement about the two objects. For example:

My  holds more marbles than my  .

plastic cup coffee cup

Show the students that you have many different sizes of containers for each group. Have students make estimates about which container holds more and which container holds less. Allow children to use items (marbles, golf balls, paper wads, etc.) to fill the containers. Discuss which container holds the most, or the least. Discuss why it would not be appropriate to measure the plastic cup and coffee cup with tennis balls. Tell the students that part of being correct in math means choosing the right tool. The students should record their true measurement description about the comparisons making sure that they identify the unit of measurement.

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 coffee cup may less than a pitcher, but more than a lid. Students can have these discussions when writing their measurement description. Again, please note students are only comparing 2 containers at a time.

When students complete their comparisons, let them discuss their findings. Observe as students compare to make sure they are accurately filling the containers.

Allow students time to share their comparisons. Make sure that the unit of measurement is identified in measurement description. This gives an opportunity to communicate their discoveries in mathematical language. Discuss with the whole group why it DOES matter how you measure. (SMP 1,3,5,6)

TEACHER REFLECTION QUESTIONS

- Are students able to identify appropriate units for measurement?
- Are students able to determine which items hold more or less than others?
- 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 measurable attributes of items?

FORMATIVE ASSESSMENT QUESTIONS

- What attributes did you measure?
- Are there more ways to compare these objects?
- Why did you decide to measure it this way?
- Which object holds more or less? How do you know?
- If I fill one container with beans and the other container with water, can I still compare how much they hold? Why or why not?

DIFFERENTIATION

Extension

- Provide the students with several different containers to choose from. Provide several different items to use as fillers such as cereal, bears, marbles, miniature linking cubes, or any other smaller items. Allow students time to fill and sort their containers to show which holds the most and which holds the least amounts. Students will attend to precision wile discussing and recording observations.
- Encourage students to measure the same container with the different fillers offered. Students will understand that the longer fillers will take up more space and use less of the filler items. Students will discover that the longer the item, the less amount you will need.
- Encourage students to compare different attributes of the same two objects.

Intervention

- Have students pour identical materials into two different containers so they can compare which container holds more or less. This direct comparison will assist them in seeing the comparisons more clearly.

Back To Intervention Table

TEACHING RESOURCES:

Van de Walle (2006) Teaching Student-Centered Mathematics Grades K-3, Capacity Lineup: p. 239

PRACTICE TASK: Riddle Me!

Back To Task Table

Approximately 1 day

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
3. Construct viable arguments and critique the reasoning of others.
5. Use appropriate tools strategically.
6. Attend to precision.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. ***For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"***

MGSEK.MD.2 Directly compare two objects with a measurable 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*.

BACKGROUND KNOWLEDGE

In this task, students are placed in a problematic situation with multiple possibilities for correct answers. Remember, students only compare two objects at a time, so it is imperative that you model how to compare the first object in the riddle to the possible correct answer and then the second object in the riddle to the possible correct answer. For example, if the riddle says, I am heavier than a penny, but lighter than a desk. You will need to model suggesting a possible correct answer such as a shoe and then comparing the shoe to the penny and then comparing the shoe to the desk. 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.
- Comparing each object in the riddle separately from the possible correct answer.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- Does how I measure matter?
- How can I organize my information?

MATERIALS

- Riddles for the students to solve. (See attachment at the end of the task)
- Balance scale
- Items for the children to choose from to fill containers. For example: plastic eggs, tennis balls, golf balls, wads of paper (make them about the same size) (optional)

GROUPING

Individuals and/or small group task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students on meeting area. Show the students a riddle for the class to solve together, making sure to model how to compare only two objects at a time. Model by think aloud your reasoning for proving that the answer is or is not correct. Explain to the students that they will be given riddles to solve with their partner. They will need to be prepared to share their answers with the class and be prepared to prove that their answer is correct.
Possible class riddles for modeling your thinking:

I am heavier than a  but lighter than a .

penny desk

What am I?

I am longer than a  but shorter than a .

sticky note clip board

What am I?

Divide the students into pairs (you may want to consider different abilities for this task and create pairs accordingly) and give each pair of students a copy of the "Riddle Me" task page. The students need to discuss with their partner what attributes are being compared and find correct answers in the classroom for the riddles. The teacher should circulate throughout the classroom and ensure that proper measuring and mathematical conversations are occurring. You will want to have a balance scale for the measuring of weight, and other manipulatives for the measurement of capacity.

When students complete the riddles, allow them time to share their answers. You may want to combine partner pairs and have them "prove" to one another that their answers are correct. Make sure that the unit of measurement is identified in verbal measurement description. This gives them an opportunity to communicate their discoveries in mathematical language. Discuss with the whole group why it is possible to have more than one correct answer. (SMP 1,3,5,6)

TEACHER REFLECTION QUESTIONS

- Are students able to identify appropriate units for measurement?
- Are students able to correctly measure for different attributes?
- Are students able to use mathematical language to describe the measurable attributes of the items?

FORMATIVE ASSESSMENT QUESTIONS

- What attributes did you measure?
- Are there more ways to compare these objects?
- Why did you decide to measure it this way?
- Are there other possible correct answers?

DIFFERENTIATION

Extension

- Have the students create riddles for their classmates to answer. Allow students to create books or posters with answers hidden for displaying in the room. Students can use cameras to take pictures or draw pictures of the items used.

Intervention

- Narrow the selection of possible correct answers by having the student choose from a set of objects to answer the riddles. The answer selections could be pictures for them to choose from.

Back To Intervention Table

TECHNOLOGY

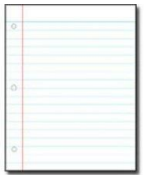
Sid the Science Kid-Fab Lab: https://pbskids.org/sid/games/crystals-rule
Students measure rocks using nonstandard units of measure.

Riddle Me!

Names of Group Members:

_____

Riddle 1:

I am longer than a  but shorter than a  .

paper clip

piece of paper

What am I?

Riddle 2:

I am heavier than a  but lighter than a  .

CD

laptop

What am I?

Riddle Me! Continued

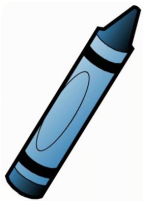
Riddle 3:

I hold more than a  but less than a  .

coffee cup milk jug

What am I?

Riddle 4:

I am longer than a  but shorter than a  .

crayon book

What am I?

Riddle 5:

I am shorter than a  but longer than a  .

window block

What am I?

Riddle Me! Continued

Riddle 6:

I am lighter than a  but heavier than a. 

student book

What am I?

Riddle 7:

I hold less than a bathtub but more than a cup .

What am I?

Riddle 8:

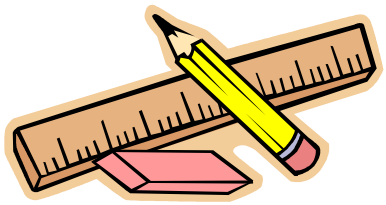
I am shorter than a school bus but longer than a  shoe .

What am I?

PRACTICING TASK: Fun With Sorting!

Back To Task Table

Approximately 2 days



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.
5. Use appropriate tools strategically.
6. Attend to precision.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.3 Classify objects into given categories; count the numbers in each category and sort the categories by count. (*Limit category counts to less than or equal to 10)*

BACKGROUND KNOWLEDGE

Students may struggle with the different attributes that are possible for sorting these objects. You may need to discuss that one child may sort the objects in one way using one set of attributes, while another child sorts it in a different way. This is a great time to discuss the importance of identifying the attribute of the sort on the paper for the viewer. 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 attributes being sorted.
- It is important that the students know that asking the questions, "How are these things alike? How are they different?" guides their sorts. A question should always guide your work with organizing data.
- Counting the number of objects in the categories and then organizing the categories by how many are in the set is the bridge to representing data in graphs and charts.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- What categories can I create to identify the different attributes of objects?
- Is there more than one way to sort objects?

MATERIALS

- Sets of common everyday objects for each group. For example: plastic plate, Styrofoam plate, plastic cup, Styrofoam cup, plastic silverware, etc.
- Fun with Sorting recording sheet

GROUPING

Whole group and/or small group task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students together at the meeting area. Discuss with them how we can sort common everyday items according to their attributes. Show them how the books in the classroom can be sorted by categories of books with a hard cover or books with a soft cover. The same books can be sorted by type (storybooks, informational books, teacher books, etc., limit the set more than 10 books in a set). We can then count the number of books in each set and organize the sets according to count. Then we could easily tell if we had enough storybooks, and if we needed to buy more informational books.

Show the students a set of common everyday objects such as paper plates, plastic cups, plastic silverware, Styrofoam plates, Styrofoam cups, etc. Ask, "What attributes could you use to describe these objects? Whisper your answer to your elbow partner." Then share with the class. Ask, "Are there other attributes that we can identify?" Tell students they are going to explore sorting these objects into categories. Give each group a pre-made bag of 10 objects.

Once they have their bag of objects, they are to lay the objects on the table and talk about how they are alike and different. They should then decide on categories to sort the objects into. Each student should draw a picture to show how the objects were sorted, then label the groups and count how many are in each set. The students should then cut the sets apart and arrange them in order according to count. Students should be able to identify the rule for sorting the objects, or how the objects within the set are alike and different. If there is time, the students should try to sort the objects by different attributes.

Allow students time to share their classified groups. Discuss how many items are in each set. This gives them an opportunity to communicate their discoveries in mathematical language. Discuss with the whole group how the objects within a set are alike and how the sets are different. (SMP 1,2,3,5,6)

TEACHER REFLECTION QUESTIONS

- Are students able to sort objects by attributes?
- Are students able to use mathematical language to describe the sorts?
- Can students decide or offer ideas for how to organize and record information?
- Are students able to explain how to record results? Do they understand why this is important to do?
- Are students able to identify how many objects are in a set?
- Can they order the sets by the number of objects?

FORMATIVE ASSESSMENT QUESTIONS

- What attributes did you use to determine your groups?

- What are all the ways to sort the attribute blocks? How do you know you have found them all?
- Are there more ways to compare these objects or to sort them?
- Why did you decide to classify the objects this way?
- How many objects are in each set? Can you organize the sets to represent how many are in each set?
- How can you organize your information so that someone else can see how you sorted your objects? How will you identify the attributes?

DIFFERENTIATION

Extension

- Students can explore the classroom to find objects that have the same attributes. They can then create a picture of their items or take a photo of the items and label it according to the attributes. The attribute could be items that are red, items that are round, items that are flat.
- Students can explore the classroom to find objects that have 2 attributes such as red and round, or blue and square.
- Students can create a book (individual, group or class) to show their findings.

Intervention

- Give students baskets that have already been sorted into matching attributes. Allow students time to view the items and choose answers from a list of answers such as: Are the items all red? Are the items all round? Are the items all square? Are the items all flat?

Back To Intervention Table

TECHNOLOGY

Flo and Zoe Sort It Out: http://www.scholastic.com/clifford/play/sortitout/sortitout.htm
Students sort object into two categories using a variety of attributes

The Cat in the Hat Sort-a-ma-gogo: https://pbskids.org/catinthehat/games/sorta-ma-gogo
Students listen to different directions to sort the objects by attributes.

Fun with Sorting

After drawing the objects in each group, cut the groups apart and arrange them in order by how many are in each set.

Names of Group Members:

_____

_____

Draw pictures of the objects in Group 1:

Label the Group:

_____

How many objects are in Group 1? _____

Draw pictures of the objects in Group 2:

Label the Group:

_____

How many objects are in Group 2? _____

Draw pictures of the objects in Group 3:

Label the Group:

_____

How many objects are in Group 3? _____

Draw pictures of the objects in Group 4:

Label the Group:

_____

How many objects are in Group 4? _____

PRACTICE TASK: Sorting Money!

Back To Task Table

Approximately 1 day

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.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.3 Classify objects into given categories; count the numbers in each category and sort the categories by count. (*Limit category counts to less than or equal to 10)*

BACKGROUND KNOWLEDGE

Kindergarten students need much practice with sorting and labeling sorts. Once again, you will want to remind them to identify how they sort the coins so that others can understand their work. You will also want to remind them that there are multiple possibilities for the sorts.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- What categories can I create from the identified attributes in these objects?
- How can I organize my information?

MATERIALS

- Coins- pennies, nickels, dimes and quarters
- Sorting Money recording sheet

GROUPING

Whole group and/or small group task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students together at the meeting area. Review how to identify attributes of objects, decide how objects are alike and/ or different, and create categories by classifying the objects according to their likenesses. Tell students they are going to practice sorting coins into categories. Give each group a pre-made bag of 15 coins.

With a partner, the students should talk about how the coins are alike and how they are different. They should then decide on categories to sort the coins into. Each student should draw a picture to show how the coins were sorted. They should then label the groups and count how many are in each set. The students should then cut the sets apart and arrange them in order according to how many are in each set. Be ready to tell your rule for sorting the coins or how the coins within the set are alike and how the sets are different. If there is time, the students should try to sort the coins in a different way.

Allow students time to share their classified groups. Discuss how many items are in each set. This gives them an opportunity to communicate their discoveries in mathematical language. Discuss with the whole group how the objects within a set are alike and how the sets are different. (SMP 1,2,3,4,5,6)

TEACHER REFLECTION QUESTIONS

- Are students able to sort objects by attributes?
- Are students able to use mathematical language to describe the sorts?
- 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?
- Are students able to identify how many objects are in a set?
- Can they order the sets by the number of objects?

FORMATIVE ASSESSMENT QUESTIONS

- What attributes did you use to determine your groups?
- Are there more ways to compare these objects or to sort them?
- Why did you decide to classify the objects this way?
- How many objects are in each set? Can you organize the sets to represent how many are in each set?
- How can you organize your information so that someone else can see how you sorted your objects? How will you identify the attributes?

DIFFERENTIATION

Extension

- Create a Venn Diagram for students to use for sorting. One example would be label on circle ‘Silver’ and one circle ‘Smooth’.
- Allow students time to find new ways to sort their coins. If students are aware of the value of coins, accept answer such as: quarters and nickels both have a ‘5’ in their value and dimes and pennies both have a ‘1’.

Intervention

- Before using coins, students can be given buttons of various colors, sizes and shapes to sort. Accept all answers as long as they can support their reasons for their sorting. After several attempts at sorting the buttons and showing mastery for sorting, students can view coins that have already been sorted and will need to decide how they are alike. Be sure to allow students time to group them on their own if they see a new way to sort.

Back To Intervention Table

TECHNOLOGY

Flo and Zoe Sort It Out: http://www.scholastic.com/clifford/play/sortitout/sortitout.htm
Students sort object into two categories using a variety of attributes

The Cat in the Hat Sort-a-ma-gogo: https://pbskids.org/catinthehat/games/sorta-ma-gogo Students listen to different directions to sort the objects by attributes.

Sorting Money

After drawing the coins in each group, cut the groups apart and arrange them in order by how many are in each set.

Names of Group Members:

_____

_____

Draw pictures of the coins in Group 1:

Label the Group:

_____

How many coins are in Group 1? _____

Draw pictures of the coins in Group 2:

Label the Group:

_____

How many coins are in Group 2? _____

Draw pictures of the coins in Group 3:

Label the Group:

_____

How many coins are in Group 3? _____

Draw pictures of the coins in Group 4:

Label the Group:

_____

How many coins are in Group 4? _____

PRACTICE TASK: Who Lives At Your House?

Back To Task Table

Approximately 2 days. This task was adapted from *Teaching Children Mathematics by NCTM.*

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.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.3 Classify objects into given categories; count the numbers in each category and sort the categories by count. (*Limit category counts to less than or equal to 10)*

BACKGROUND KNOWLEDGE

This performance task is designed for the teacher to collect formative information about students' mastery of classifying objects according to attributes, labeling how many in the set and organizing the categories by how many are in each set. Prior to this task, students should have multiple opportunities to practice this skill. 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 attributes being sorted.
- It is important that the students know that asking the questions, "How are these things alike? How are they different?" guides their sorts. A question should always guide your work when organizing data.
- Counting the number of objects in the categories, and then organizing the categories by how many are in the set, is the bridge to representing data in graphs and charts.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- Is there more than one way to sort a set of items?
- How can I organize my information?

MATERIALS

- Pictures representing each person that lives at the student's house.
- It would make a nice homework or art class project for the student to draw, color and cut out a picture of each person that lives with them. (see attachment at the end of task)

GROUPING

Individual and/or small group task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students together at the meeting area. Review with them how they have been sorting objects by common attributes. Ask, "What are some of the categories that we have created? Whisper your answer to your elbow partner." Then share with the class. Tell students they are going to use the pictures they created for homework to sort them into categories. Encourage students to look at different ways to describe the people living in a house together. For example, there are adults, children, boys, girls, brothers, sisters, grandparents, etc.

Students should use their pictures to create categories and represent the categories in an organized way that someone else can understand. Use numbers to identify how many are in each set and organize the sets by count. Then, choose a partner and share your work. Combine your data (pictures representing the people living in your house) and create different categories. Tell how many people are in each set, and organize the sets by count. Challenge the pairs to join with a third student and repeat the process. Each time they should make sure they represent the data in an organized manner that others can understand.

Allow students time to share their classified groups and discuss how many items are in each set. This gives them an opportunity to communicate their discoveries in mathematical language. Discuss with the whole group how the objects within a set are alike and how the sets are different. (SMP 1-6)

TEACHER REFLECTION QUESTIONS

- Are students able to sort objects by attributes?
- Are students able to use mathematical language to describe the sorts?
- Can students decide or offer ideas for how to organize and record information?
- Are students able to explain how to record results? Do they understand why this is important to do?
- Are students able to identify how many objects are in a set?
- Can they order the sets by the number of objects?

FORMATIVE ASSESSMENT QUESTIONS

- What attributes did you use to determine your groups?
- Are there more ways to compare these objects or to sort them?
- Why did you decide to classify the objects this way?
- How many objects are in each set? Can you organize the sets to represent how many are in each set?
- How can you organize your information so that someone else can see how you sorted your objects? How will you identify the attributes?

DIFFERENTIATION

Extension

- Allow students to work with a partner. Students can compare how to group family members with their partners' family members. Students can create discussion ideas such as there are more brothers than sisters, or that there are more boys than girls, or that there are an equal number of boys and girls.
- Students might begin to discuss attributes such as hair color. Allow them time to create pictures according to their findings.

Intervention

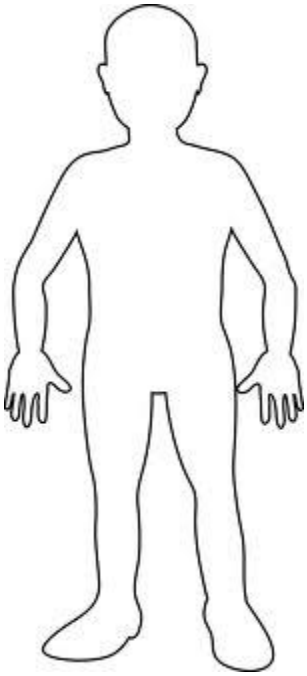
- The teacher should identify how to classify the pictures of the family members for the students to sort. The teacher can label two circles with titles such as parents and kids, or boys and girls, etc. Allow students to explain who the family member is and why they are placing their cut out in a specific circle.

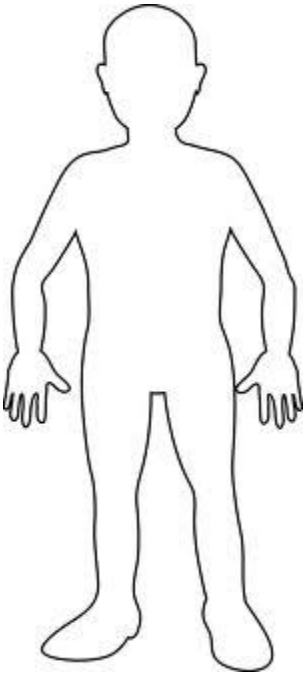
Back To Intervention Table

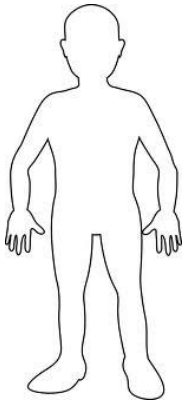
TECHNOLOGY

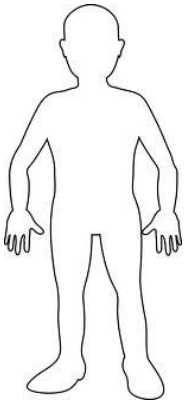
Flo and Zoe Sort It Out: http://www.scholastic.com/clifford/play/sortitout/sortitout.htm
Students sort object into two categories using a variety of attributes

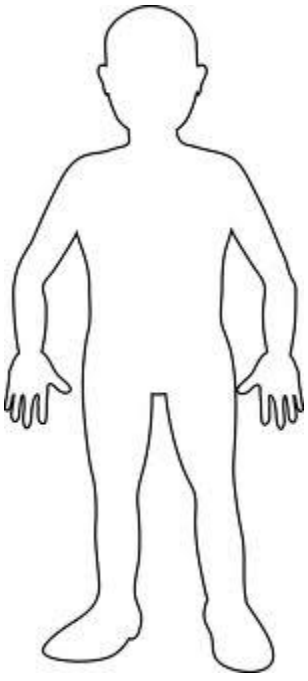
The Cat in the Hat Sort-a-ma-gogo: https://pbskids.org/catinthehat/games/sorta-ma-gogo Students listen to different directions to sort the objects by attributes.











Culminating Task: Guess My Sort

Back To Task Table

Approximately 1 day

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.

STANDARDS FOR MATHEMATICAL CONTENT

MGSEK.MD.1 Describe several measurable attributes of an object, such as length or weight. *For example, a student may describe a shoe as, "This shoe is heavy! It is also really long!"*

MGSEK.MD.2 Directly compare two objects with a measurable 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*.

MGSEK.MD.3 Classify objects into given categories; count the numbers in each category and sort the categories by count. (*Limit category counts to less than or equal to 10)*

BACKGROUND KNOWLEDGE

This task is the culmination of all that is learned in this unit. Students will identify attributes of an object, make comparisons, sort multiple objects into categories according to common attributes, count and label the number of objects in a set and order sets according to the amount identified. These concepts will lay the foundation for gathering data and data analysis that will be further developed in 1st and 2nd grade.

- Students should clearly identify the attributes being sorted or compared.
- There are specific ways to measure certain attributes, such as length (the end points must be lined up).
- Students should know that asking the questions, "How are these things alike? How are they different?" guides their sorts. A question should always guide your work with organizing data.
- Encourage the students to be creative with the different ways that the objects can be sorted.
- Counting the number of objects in the categories and then organizing the categories by how many are in the set is the bridge to representing data in graphs and charts.

For more information about common misconceptions, please refer to the unit overview.

ESSENTIAL QUESTIONS

- What categories can I create from the identified attributes in these objects?
- How can I organize my information?

MATERIALS

- A set of random objects per pair of students (for example: coins, blocks, paper clips, erasers, bottle caps, pencils, rocks, plastic silverware, plastic cups, etc.)

GROUPING

Partners

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Gather students together at the meeting area. Show them an assortment of random items and model how to compare different objects by their attributes. Choose different items from the pile to create sorts (no more than 3 categories). The partner should guess the rule for how the categories are alike. When the partner guesses the rule for the sort, he/she should count the number of objects in each category and order the sets according to the amount in each. Demonstrate how to take turns playing the game and to communicate with the partner about how the items are alike. Encourage the students to be creative with the sorts, always identifying the attribute that the set has in common. Discuss different ways you can create groups and sort the objects into categories according to the attributes they share.

Tell students they are going to play the game with a partner. Taking turns, one student chooses objects from the pile to compare and create categories. The other student tries to guess the rule for the sort (how the objects in each category are alike). When that partner gets the rule correct, he/she counts the number of objects in each set and orders the sets according to the amount. The partner guessing the rule should describe the categories to the teacher, and tell how many objects are in each set. Then the students change roles and play the game again.

Allow students time to share their classified groups with other students and discuss how many items are in each set. This gives them an opportunity to communicate their discoveries in mathematical language. Choose at least one set of data to discuss with the whole group and show the information represented in a graph. (SMP 1-8)

TEACHER REFLECTION QUESTIONS

- Are students able to sort objects by attributes?
- Are students able to use mathematical language to describe the sorts?
- 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?
- Are students able to identify how many objects are in a set?
- Can they order the sets by the number of objects?

FORMATIVE ASSESSMENT QUESTIONS

- What attributes did you use to determine your groups?
- What are all the ways to sort the attribute blocks? How do you know you have found them all?
- Are there more ways to compare these objects or to sort them?
- Why did you decide to classify the objects this way?
- How many objects are in each set? Can you organize the sets to represent how many are in each set?
- How can you organize your information so that someone else can see how you sorted your objects? How will you identify the attributes?

DIFFERENTIATION

Extension

- Allow students several choices for their sorting of items. Place several sorting items in a basket and allow students time to create their groupings. Students can work with a partner to play a different version of the above game. Partner 1 places one item on the table. Partner 2 can select a second item on the table. Partner 1 has to decide what the attribute partner 2 used to select the item. Play continues with the partners taking turns at who goes first.

Intervention

- Limit the number of objects in a pile for the students to choose from for the sort. The items should be similar, such as, all buttons, all seashells, etc. This will limit the type of attributes that the students will need to identify.
- Identify how the objects are alike and or different and label the categories for the sort for the students.

Back To Intervention Table

STUDENT WORK SAMPLES

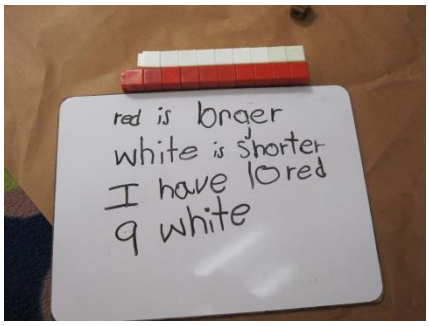
Kindergarten
Unit 5 Measuring and Analyzing Data
Task: Ribbon War

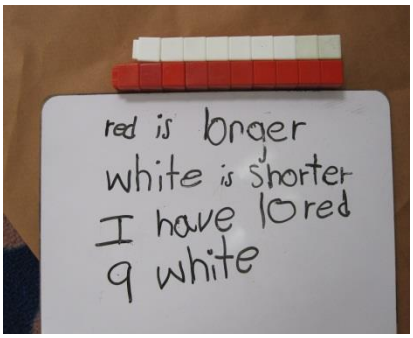
MGSEK.MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

Kindergarten
Unit 5 Measuring and Analyzing Data
Task: Comparing Towers

MGSEK.MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

MGSEK.MD.2 Directly compare two objects with a measurable 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.*



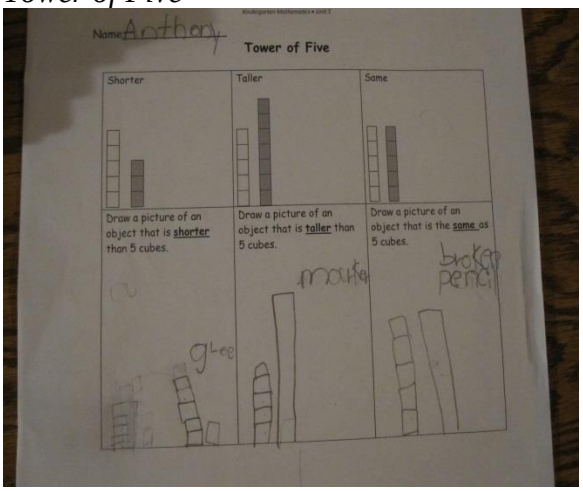


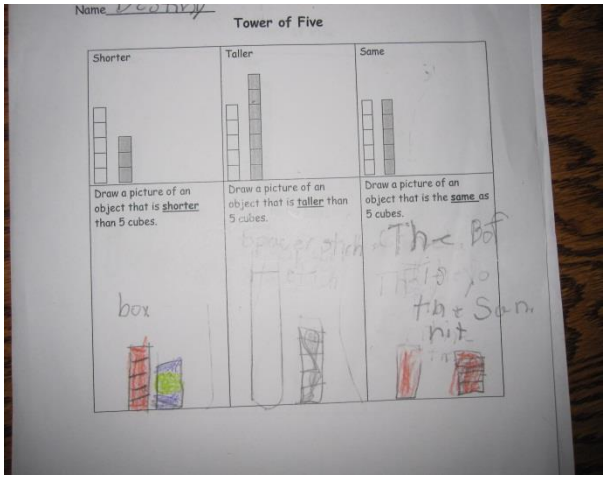
Kindergarten
Unit 5 Measuring and Analyzing Data
Task: Taller Than a Tower of Ten

MGSEK.MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

MGSEK.MD.2 Directly compare two objects with a measurable 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.*

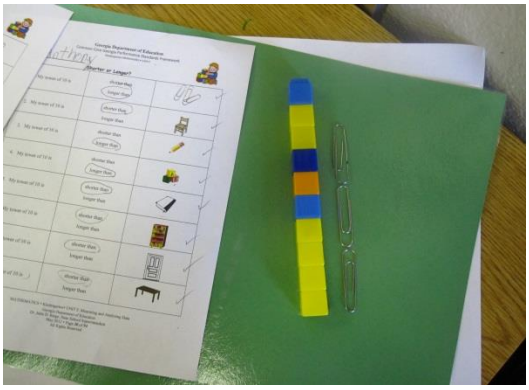
Tower of Five





Tower of Ten

Shorter than a book



Longer than 3 large paperclips