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| **TEAM Lesson Plan Template** | |
| Teacher: Dr. Amanda Niedzialomski | |
| Subject/Grade: Mathematics (measurement) K-3 | |
| Lesson Title: Measurable Attributes | |
| **STANDARDS** | **Identify what you intend to teach.** State, Common Core, ACT College Readiness Standards and/or State Competencies; Enduring Understandings and Essential Questions. |
| SMP3. Construct viable arguments and critique the reasoning of others  SMP7. Look for and make use of structure  [Parts of this activity are appropriate for each of the following standards. Emphasize those parts and omit other parts as necessary to adapt the activity for a particular group of students.]  K.MD.A.1 Describe the measurable attributes of an object, such as length (long/short), height (tall/short), or weight (heavy/light).  K.MD.A.2 Directly compare two objects with a measurable attribute in common, to describe which object has more of/less of the attribute. For example, directly compare the heights of two children and describe one child as taller/shorter.  1.MD.A.2 Measure the length of an object using non-standard units (paper clips, cubes, etc.) and express this length as a whole number of units.  1.G.A.1 Distinguish between attributes that define a shape (e.g., number of sides and vertices) versus attributes that do not define the shape (e.g., color, orientation, overall size); build and draw two-dimensional shapes to possess defining attributes.  2.MD.A.1 Measure the length of an object in whole number units by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. | |
| **OBJECTIVE(s)/Sub-Objectives** | **Connect prior learning to new learning.** Clear, Specific, Observable, Demanding, High Quality, Measurable, Aligned to Standard(s), and Integrated with other subjects, build on prior student knowledge  Student-Friendly (I Can Statement) |
| I know that the length of an object is the same whether the object is in one place or another place.  I know that length is measurable. I know that color is not measurable (yet). [Color is measurable, but not with the tools available in primary school]. | |
| **MATERIALS AND RESOURCES** | **Content-related:** Clearly supports lesson objective(s); rigorous & relevant; Incorporates multimedia & resources beyond the textbook. |
| **Materials**  Measurable attributes notes (attached).  Several objects to discuss. These might include: stuffed animal, toy that makes sounds, colorful toys or blocks, a muffin, pencil, book, stapler, and/or furniture (desk, cabinet, chair).  Metal ruler; magnetic shapes; Mathlink® cubes or other blocks  Meter sticks, measuring tapes, balance or scale (for weight)  **Routine for distributing materials:** For the initial whole-group discussion, the teacher holds objects or gestures toward them; students just look. For small group discussion, keep objects and rulers in buckets or bins. Place buckets on tables when it is time for small groups of students to discuss the objects. | |
| **ACCOMMODATIONS/ADAPTATIONS** | **Learning styles and interests.** Anticipate learning difficulties, regularly incorporate student interests & cultural heritage; differentiate instructional methods. |
| **Modifications/Plans for Diverse Learners**  **Differentiation**  **\_\_x\_\_ Content** For some students, it may be better to limit the types of objects under discussion. Rather than showing a stuffed animal, muffin, pencil, and stapler, the teacher might show three yellow pencils with three different lengths. This will emphasize the attribute “length” since it will be the only distinguishing attribute.    **\_\_x\_\_ Process**  Some students may benefit from holding/touching the objects under discussion. This will naturally happen in the small group discussions. If a student needs to touch an object, allow this during the whole group discussion, too.  For some students, it may be possible to extend the discussion from “what can we measure?” to “why do we measure?” See the *Optional Further Discussion Topics*in the Measurable Attributes notes.  **Accommodations** | |

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| **MOTIVATING STUDENTS/ANTICIPATORY SET** | **“Hook”: Engage students’ attention and focus on learning.** Personally meaningful and relevant. |
| Ask students to describe objects to an alien who has no idea what the objects are (but who does, conveniently, understand the children’s native language).  Or  Show students pictures of people measuring such as  <https://www.123rf.com/photo_5470448_construction-worker-measuring-half-constructed-wall-with-tape-measure.html>  <https://www.123rf.com/photo_44835149_construction-worker-using-measure-tape-to-mark-on-plank-against-workshop.html>  <https://www.123rf.com/photo_124436545_focused-saleswoman-working-in-fabric-store-measuring-and-cutting-off-piece-of-cloth-to-order.html>  <https://food52.com/blog/5444-how-to-measure-flour> | |
| **INSTRUCTIONAL PROCEDURES** | **Step-by-Step Procedures-Lesson Sequence: Basic to Complex.** Lesson includes visuals, modeling, logical sequencing and segmenting (beginning, middle, ending); essential information; concise communication; grouping strategies; differentiated instructional strategies to provide intervention & extension; seamless routines; varied instructional strategies; key concepts & ideas highlighted regularly. |
| ***Introductio*n**  With the whole group’s attention, show students an object. Ask the students to describe the object. Mention various senses. What can they see, feel, smell, hear, or taste? Ask what the objects have in common. How are they different? As students mention measurable attributes, emphasize those.  Mention objects that small groups have on their tables. Ask them to discuss the objects within their small groups. Observe their discussions.  **Middle**  Regain the whole group’s attention. Introduce the idea of measurement. Focus on an object that students described as “tall,” “heavy,” “big,” or “long.” (the following section assumes that the object is a “big” “toy.” Change the words based on what the students observed). Ask “How big is the toy?” Is the toy bigger than an eraser? Is the toy bigger than a door? Is the toy bigger than the school? The idea of “big” involves a comparison.  Are their different ways of being big? (tall, heavy, wide, . . . )  Can we find something smaller than our big toy? Can we find something larger?  What kind of objects are best to compare to? The toy is about as big as my shoe, but is it as big as the teacher’s shoe? If we tell someone who has not seen the object that the toy is as long as a shoe, is that enough information?  Can we find a group of things that are as big as the toy? (e.g. the toy is eight Mathlink® cubes tall).  Comparing the size of one object to the size of another is called **measuring**.  There are some tools we use to measure. Show students a ruler, a meter stick, and a measuring tape. Show students how a ruler is good for measuring something small, like a toy. Show students how a meter stick is good for measuring something longer, like a table. Show students how a tape is good for measuring around something, like our heads.  Point out that orientation does not change an object’s length. The toy is \_\_\_ inches tall whether it is standing up, laying down, facing us, or facing away.  Point out that an object’s length is constant, even if the object moves to another position. Show a magnetic shape on a ruler with one edge on the zero mark. Announce its length. Move the magnetic shape to another position on the ruler. Did the shape’s length change? (no) Is the shape resting against different numbers on the ruler? (yes).  Have students measure objects with rulers in their small groups.  **End/Closure**:    Regain the whole group’s attention. Remind students that measuring involves comparing one object to another. Remind students that we need a consistent object for comparison, and we typically use inches or centimeters for length.  Have students return the objects/rulers to the buckets or bins.  **Motivating Students**  \_x\_ Relate to Real World Measurement is a real-world activity  \_x\_ Verbal Reinforcement The teacher will monitor students’ work throughout the activity to provide reinforcement.  **Presenting Instructional Content**  \_x\_ Hands on Students are holding objects to compare the objects sizes  \_x\_ Modeling Show students how hold one object against another to compare lengths. Show students how to use ruler.    ***Instructional strategies:***  **Modeling and Guided Practice *–*** The teacher will demonstrate comparison and measurement. The teacher will monitor students’ work and ask questions to prompt them if they are stuck.  **Check for Understanding (CFU) –**  ***What am I doing for students that progress at different rates?***  Encourage students to help each other. If students finish early, have them measure more objects, or measure the same object with a different tool. For example, move on from measuring a toy to measuring a table or door. Alternatively, measure the toy with a ruler, then with a meter stick, then with a tape measure.  ***What do I do if they get it?***  Move on from “how to measure” to discussing “why we measure.”  ***What do I do if they don’t get it?***  Limit the number of objects under consideration. Limit the type of measurements under consideration to length only. | |
| **QUESTIONING/THINKING/PROBLEM SOLVING (embedded throughout)** | **Balanced mix of question types.** Utilizes Blooms Taxonomy/Webb’s Depth of Knowledge; high frequency; purposeful & coherent; require active responses; balance based on volunteers/non-volunteers, ability, & gender; lead to further inquiry & self-directed learning.  **Implement four types of thinking (Analytical, Practical, Creative, & Research-based) & Teach/Reinforce problem-solving types**. Provide opportunities for students to generate ideas & alternatives; analyze, evaluate & explain information from multiple perspectives& viewpoints. |
| **Questioning** These questions will occur throughout the activity as prompts based on groups’ or individual students’ progress.  **Knowledge:**  What is \_\_\_\_ called? Ask while holding up or gesturing toward a pencil, toy, muffin, etc.  What is \_\_\_\_ called? Ask while holding up a ruler, meter stick or measuring tape after having named these for the group.  **Comprehension:**  Where do we see measurement happening in our lives?  Which is longer, the \_\_\_\_ or the \_\_\_\_ ? Which is heavier? Which is  How can we describe this object to someone who has never seen it before?  What can we see about the\_\_\_ ? (color, length, . . . )  Does the \_\_\_\_ make a sound? (yes, no , loud, quiet)  What does \_\_\_\_\_ feel like? (rough, smooth, soft, hard, heavy, light, warm, cold . . . )  Does the \_\_\_\_ have a taste? ( yes, no, sweet, salty, . . . )  Does the length of the \_\_\_ change if we lay it down (stand it up)?  Does the length of the \_\_\_ change if we move it from one side of the table to the other?  **Application:**  How can we describe this object to someone who has never seen it before?  How is the pencil like the paper clip? How are they different?  Why do we measure things?  **Analysis:**  **Synthesis:**  **Evaluation:**  **Thinking**    \_x\_ **Practical** – Some people measure things every day; most people measure things at some point in their lives.  \_x\_ **Creative**– Students can describe objects in a variety of ways.  \_x\_ **Analytical** – Comparing lengths is a comparison. Describing objects involves comparison and contrasting to other objects.  \_x\_ **Research-based** – Students choose whether to use a ruler, meter stick, or measuring tape  **Problem Solving**  **\_x\_\_** **Observing and Experimenting**. Students think about using various senses to describe objects.  **\_x\_\_ Predicting Outcomes** Students predict whether length will change when an object is in a different location. | |

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| **GROUPING** | **Maximize student understanding & learning** Varied group composition (race, gender, ability, & age); clearly understood roles, responsibilities & group work expectations; accountability for group & individual work; student opportunities for goal setting, reflection & evaluation of learning. |
| * Whole group discussion; heterogeneous groups of 4 to 5 students engage in guided practice * Product. Students will describe which object in a pair is bigger than the other | |
| **ASSESSMENT** | **Formative and/or summative assessment.** A variety of assessments, including rubrics, measure achievement of objectives and informs instruction. |
| **\_\_x\_ Teacher Made Test** In a future assessment the teacher can ask students which of two objects is longer or show two identical objects in different locations an ask if one is larger than the other.  **\_\_x\_ Observation** The teacher will directly observe if the students are sorting their objects correctly by size. | |
| **CLOSURE** | **Reflection/Wrap Up.** Summarizing, reminding, reflecting, restarting, connecting. |
| Display two objects on different ends of a table or on different sides of the classroom. Ask students to point to the taller (or longer, or wider) one. Notice whether they point to the correct one.  Or  Display two identical objects at different places on two rulers. Ask students to raise their left hands if the object on their left is larger, their right hands if the object on their right is larger, or not to raise a hand if the objects are the same size.  *Or*  *Display an object approximately 10cm long. Ask students to hold up the number of fingers matching the number of Mathlink® cubes it would take to match the length of the object. The students holding up 4, 5, or 6 fingers probably understand. Students holding up more or fewer fingers probably do not.*  ***Reflection: You must reflect on every lesson you teach.*** | |

**NOTES:**

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