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| **TEAM Lesson Plan Template** | |
| Teacher: Dr. Amanda Niedzialomski | |
| Subject/Grade: Mathematics (measurement) 3rd grade | |
| Lesson Title: Compare masses | |
| **STANDARDS** | **Identify what you intend to teach.** State, Common Core, ACT College Readiness Standards and/or State Competencies; Enduring Understandings and Essential Questions. |
| SMP5. Use appropriate tools strategically.  3.MD.A.2 Measure the mass of objects and liquid volume using standard units of grams (g), kilograms (kg), milliliters (ml), and liters (l). Estimate the mass of objects and liquid volume using benchmarks. For example, a large paper clip is about one gram, so a box of about 100 large clips is about 100 grams. | |
| **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 can find the weight of something using a balance.  I can find the volume of a liquid.  I can measure 100ml of water.  I know that a liter of water weighs 1 kilogram.  No attempt is made in this lesson to distinguish between mass and weight. Students are technically finding mass with the balance, but they can call it weight. | |
| **MATERIALS AND RESOURCES** | **Content-related:** Clearly supports lesson objective(s); rigorous & relevant; Incorporates multimedia & resources beyond the textbook. |
| **Materials**  Several things to measure: glass of water, handful of paperclips, box of paperclips. (It will be helpful if the amount of water is very close to a number of milliliters marked on the measuring cup to be used: either 1 liter, or 500 milliliters or 100 milliliters, for example.  Things to measure with: balance/mass set, measuring cup.  Water source (pitcher or faucet), paper towels & a bucket (if using water).  A spoon or dropper to add and remove small amounts of liquid.  **Routine for distributing materials:** The teacher will keep materials at the front of the room. Students will come to the front of the room as individuals or in pairs for each activity. | |
| **ACCOMMODATIONS/ADAPTATIONS** | **Learning styles and interests.** Anticipate learning difficulties, regularly incorporate student interests & cultural heritage; differentiate instructional methods. |
| **Modifications/Plans for Diverse Learners**  **Differentiation**  **----- Content ----- Process**  **-----Product ----- Tiered Assignments ----- Flexible Grouping**  **----- Learning Centers \_\_\_\_ Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Accommodations**  **\_\_\_ Preferential Seating \_\_\_ Extended Time \_\_\_ Small Group \_\_\_ Peer Tutoring**  **\_\_\_ Modified Assignments \_\_\_ Other**  **Early Finishers:** | |

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| **MOTIVATING STUDENTS/ANTICIPATORY SET** | **“Hook”: Engage students’ attention and focus on learning.** Personally meaningful and relevant. |
| Discuss people’s heights and weights in centimeters and kilograms. Some sources include:  Athletes  <https://www.topendsports.com/sport/soccer/anthropometry-worldcup2018.htm>  U.S. Children:  <https://www.cdc.gov/growthcharts/data/set1clinical/cj41l021.pdf>  Ask “How much does a third grader weigh in kilograms?” An exact answer is not the point. We want students to understand that third graders weigh somewhere around 35kg, not 1kg or 100kg. An answer anywhere between 20 kg and 50 kg should be considered reasonable. | |
| **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**  Show students a glass of water. Explain that the water occupies space, or takes up room, and that the amount of space is called the water’s volume.  Show students a box of paperclips. Explain that the paperclips have weight.  Explain that the class is going to measure volume and weight.  **Middle**  Have a pair of students come to the front of the room. Ensure that all students can see. Have the students pour the glass of water into a measuring cup and read the amount of water. Record the amount of water on a chalkboard or whiteboard.  Have another pair of students come to the front of the room. Ensure that all students can see. Show students that the balance is balanced (centered). Have the pair of students count out five paper clips into one of the buckets in the balance. Show them the mass set and ask them to experiment to find a mass (or masses) with the same weight as the paper clips. (5 grams ought to work, but let them figure it out).  Ask the whole group “If five paperclips weigh five grams, about how much does one paper clip weigh?” Record the mass of one paper clip on the board.  Have another pair of students come to the front of the room. Have the students place a box of paper clips in one of the balance’s buckets. Show them the mass set and ask them to experiment to find a mass (or masses) with the same weight as the box of paper clips. After the whole class gets to see the centered balance, record the weight of the box of paper clips on the board.  Have another pair of students come to the front of the room. Ensure that all students can see. Ask the pair of students to measure pour 100ml of water into the measuring cup. They are allowed to pour some in, pour some out, pour some more in, and so on. They might need a spoon to remove or add just a bit at a time. Make sure that the entire class sees the 100ml of water.  Pour 1 liter of water into the measuring cup. Have another pair of students come to the front of the room. Give one of the students the measuring cup with 1 Liter of water. Give the other student the 1Kg mass from the mass set. Have them walk around the room allowing each student to hold the measuring cup and the 1Kg mass. As this is happening, ask students, is one of these definitely heavier than the other, or are they about the same. (the goal is for the answer to be “about the same.”).  Students may perceive the 1Kg mass to be heavier because it is more dense. In that case, try placing the mass in a different measuring cup, and have students close their eyes before holding either the water or the 1kg mass. The students will be holding the handle of a measuring cup in both cases.  **End/Closure**:  Regain the whole group’s attention.  Ask students what they have done or seen. Answers should include finding masses and volumes . Ask students how much a paper clip weighs. (about 1g).  Ask students why a liter of water weighs 1 Kg. They are not expected to know the answer, but it is worth having them think about it. Explain that the liter was defined first, and then the kilogram was defined as the mass of one liter of water.  **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 and using measurement tools and materials to measure  \_x\_ Modeling This lesson assumes previous lessons where students have learned to measure with a measuring cup and balance. If necessary, remind students how by showing them.  ***Instructional strategies:***  **Modeling and Guided Practice *–*** 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?***  This is a whole group activity.  ***What do I do if they get it?***  Move on to another lesson.  ***What do I do if they don’t get it?***  Have more pairs of students come to the front of the room and repeat the measurements. | |
| **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:**  Which of these do we use to measure volume?  Which of these do we use to measure weight?  **Comprehension:**  About how much to you drink with a meal? (anywhere from 200ml to a liter)  About how much water do you use to take a bath? (about 100 liters)  About how heavy is a textbook? (1 to 3 kilograms)  About how heavy is a third grader? (20 to 50 kilograms)  **Application:**  **Analysis:**  **Synthesis:**  **Evaluation:**  **Thinking**    \_x\_ **Practical** – Some people measure things every day; most people measure things at some point in their lives.  \_x\_ **Analytical** – Students are comparing masses and getting a quantitative result  \_x\_ **Research-based** – Students experiment to find the amount of weight to match the paper clips.  **Problem Solving**  **\_x\_\_** **Observing and Experimenting**. Students experiment to find the amount of weight to match the paper clips.  **\_x\_\_ Categorization** Students classify quantities as volume or weight to decide which tool is appropriate for measuring. | |

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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 activity, with pairs of students measuring at a time. | |
| **ASSESSMENT** | **Formative and/or summative assessment.** A variety of assessments, including rubrics, measure achievement of objectives and informs instruction. |
| **\_\_x\_ Observation** The teacher will directly observe if the students are selecting appropriate tools and measuring correctly. | |
| **CLOSURE** | **Reflection/Wrap Up.** Summarizing, reminding, reflecting, restarting, connecting. |
| ***Reflection: You must reflect on every lesson you teach.*** | |

**NOTES:**

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