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| **Synopsis of high-quality task:**  This is a 3-Act Task that is contained within one YouTube video and will be used to launch the fourth-grade unit on metric measurement. The teacher will play the Three-Act Task YouTube video <https://www.youtube.com/watch?v=KLBiS7KzMDE>  and have students complete the Three-Act Task recording sheet (see attached).  Act 1: Students watch the first portion of the video and generate questions about what they see. Teacher prompts them with a question they must work to solve.  Act 2: Students determine the information they will need to solve the problem and begin work on that solution.  Act 3: Teacher asks for volunteers to share strategies and solutions. Teacher reveals the answer and the class as a whole discusses the various ways students could have arrived at the answer.  **Anticipated student time spent on task:** 45 minutes  **Student task structure(s):** Individual, partner, or group work |
| [**Math Content Standards and Practices:**](http://www.doe.mass.edu/frameworks/math/2017-06.pdf)  **4.MD.A.1** - Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.  **4.MD.A.2** - Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.  **SMP1** - Make sense of problems and persevere in solving them.  **SMP2** - Reason abstractly and quantitatively.  **SMP6** - Attend to precision. |
| **Prior Knowledge:**  **3.OA.C.7** – Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 ⋅5 = 40, one knows 40 ⎟5 = 8) or properties of operations. By the end of grade 3, know from memory all products of two single-digit numbers and related division facts.  **3.MD.A.2** - Measure and estimate liquid volumes and masses of objects using standard metric units of grams (g), kilograms (kg), and liters (l).17Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same metric units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. |
| **Connections to the real-world:**  Students will need to be able to convert measurement amounts in order to make comparisons in many real-world scenarios, including determining which among a choice of multiple products is the best value, i.e. unit pricing. |
| **Mastery Goals:**  Learning Objective:  Students will be able to convert larger units of metric measure to smaller in order to make comparisons.  Language Objective:  Students will be able to explain to others why their process is reasonable. |
| **Teacher instructions**  **Instructional Tips/Strategies/Suggestions:**  Act 1: Begin playing the video. Students will see a pan balance loaded on one side with a large die. Smaller dice will begin being added to the other side. When the questions “What do you notice? What do you wonder?” appear on the screen, pause the video and allow time for students to offer responses. Students will likely ask, “How many little dice will it take to equal the big die?” At this point, resume the video, then pause again at the prompt to allow students to make some estimates. Resume the video.  Act 2: Pause the video after the prompt “What information do you need to solve the problem?” appears. Allow for student volunteers to offer responses. Resume the video. Allow students time to retrieve the information from the video and attempt solving the problem.  Act 3: Teacher asks for volunteers to share strategies and solutions. Teacher reveals the answer and the class as a whole discusses the various ways students could have arrived at the answer  Possible Sequels:   * How many smaller dice would you need if the large die had a mass of 2kg 200g? * What if the smaller dice each had a mass of 50g? How many would you need then? * Make a two-column chart that shows the relationship between the number of large dice and their mass. How many large dice would you need to have a mass that was only kilograms with no extra grams (i.e. Xkg instead of Xkg, Xg)? How many grams would there be in those dice altogether? |
| **Instructional Materials/Resources/Tools:**  Include:   * Computer with access to youtube * Link for the video <https://www.youtube.com/watch?v=KLBiS7KzMDE> * Projector * Three-Act Task recording sheet (See attached) |
| **Accessibility and Supports:**  **Potential sentence starters:**  “\_\_\_\_\_\_\_\_\_ small dice balance one big dice”  **Key academic vocabulary:** Grams, kilograms, balance |

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| **Sample Student Work:**  Student work  Student work. Showing work. |