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| **Learning Activity** | | **Duration:** 50 minutes | **Cycle/Year:** Cycle 2  **Topic:** Density |
| **Science: World & Theme** | | Material World: Matter | |
| **Nature of Science (NOS)** | | Science is based on observation and it helps us to explain things and  predict how things will be in certain situations. Scientific knowledge  involves creativity and imagination. | |
| **Big Idea** | | Density is a physical property of matter which is the measure of the  relative “heaviness” of objects with a constant volume. Density may also  refer to how closely “packed” or “crowded” the material/substance  appears to be. Students will be comparing different liquids to understand  the concept of density and recognize different density of each substance  using different models (experiments). | |
| **Learning Intentions or Objectives**  **(SWBAT):** | | **By the end of this lesson, students will be able to:**   * Use models to test or experiment different substances * Compare the density of different liquids (more or less dense) | |
| **Skills developed or practiced:** | | * Predict * Observe * Experiment (Planning and Investigating) * Compare | |
| **Materials for whole class and groups:** | | 1 tall clear jar (for each group)  1 L corn syrup  1 L water  1 L oil (any kind)  Food colouring (3 colours) | |
| **Subject Competency:** | | | |
| ***Competency 1: To propose explanations for or solutions to scientific or technological problems***  This learning activity will help learners to propose explanations for how one fluid sinks under or floats on another fluid by observing and carrying out an experiment. | | | |
| **Cross Curricular Competencies:** | | | |
| * ***To adopt effective work methods*** * ***To cooperate with others***   From this learning activity, learners will input different substances in a clear jar in the order of density levels and they will collaborate with peers to carry out experiments and analyze the data. | | | |
| **Time** | **Lesson** | | |
| 15 minutes  10 minutes  10 minutes  15 minutes | **Engage:**   * Have students sit in a group five. * Show the students a graduated cylinder filled with three different substances. Make sure that each liquid has different colour (ex. Oil – blue, Water – Red, Corn Syrup – Yellow). Once students have observed the cylinder, place it on the side of teacher’s desk/table. Prompt students’ active thinking and engagement by asking, “*How do you think these substances can be divided into different layers?*” * Encourage students to come up with any possible ideas. * Record students’ responses on the left half of the board.   **Explore:**   * Provide each group with 1 tall clear jar, 200 ml of corn syrup, 200 ml of oil, 200 ml of water and 3 food colourings of different colour. * Ask the students what might happen (predict) when mixing 1) oil and water, 2) water and corn syrup and 3) corn syrup and oil. Record their responses on the right half of the board. * Present a demonstration of mixing 1) oil and water, 2) water and corn syrup, and 3) corn syrup and oil in three beakers. * Have students record their observations in a table (*see Appendix 1 Figure 1 for an example*). * Students should observe which substance sinks/floats on the other substance.   **Explain:**   * Explain the term “density” and how each liquid has different density. * Have students analyze from their data which substance was denser or less dense and which was in the middle. * Students should understand that denser materials sink whereas less dense materials float. * They should recognize that corn syrup is the densest, water is the least dense, and oil is in between them. * Show them the graduated cylinder filled with three layered substances and ask them what liquid would be on the bottom, the middle, and the top.   **Extend:**   * Have each group mix different food colouring into each fluid. * Let them pour the liquids in the clear jar in the order of densest to the least dense to have them in a separate layer. * Ask the students how this experiment can be related to the oil spill. * Make sure that they use the term “density.” (denser, less dense etc.) * Instruct students to clean up the materials. | | |