Title: Phenomenon or How to Observe Them

Time: 70-75 min

Description: Introducing the density bead bottle as the phenomenon and having students make observations.

Objective: Students will be able to identify phenomenon and make quality observations.

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| Standard: No Core Standard but Scientific Approach |
| DCI: (Everything in Normal Font in Standard)* Density
 | CCCs: (Underlined in Standard) * Patterns
* Systems and Systems Model
 | Practices: (Bold in Standard)* Phenomena
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**Whole Standard Phenomena:**

At the end of the unit, students will conduct a gold panning experiment and applying how density works in the world around them.

**Starter:**

During the summer, was there any thing that sparked your curiosity or made you find out more about it?

Whole Standard Phenomenon Introduction:

Ask the students the following question - Have you ever come across a smooth pond like the one below? It just seems to ask you to "skip a rock on the surface!" You know that when the rock stops skipping, it will sink beneath the surface. What makes rocks sink while leaves or twigs float in water? There is a Google Slide with image and question put together ([Click here](https://docs.google.com/presentation/d/1k5oMi13t6r2zay0kYxm7HoAhMYPJYSLuBBaOSjHEfn0/edit#slide=id.p9))

Tell the students the following story:

James W. Marshall was walking along the river bank at Sutter’s Mill on January 24, 1848. He was wondering what treasures lay hidden beneath the water surface? He bent over with a pan and begin to sift through the dirt. The treasure he found was gold. Over the next several years, hundreds of thousands of prospectors traveled westward hoping to make their fortunes mining gold.

**Supporting Phenomena:**

Students will be shown a Density Bead Bottle and offered a reward to try to move the bead from the top to the bottom and make it stay. *Teacher will explain how to fill out the CER “Phenomenon, CCCs, and Wonderings about Phenomenon” sections.*

**Anticipated Questions from students**

1. Why are the beads floating?
2. What are the beads made out of?
3. What liquid is it?

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|  | **Student Does:** | **Teacher Does:** |
| **Gather** | Using the CER handout students will make observations as they conduct investigations on the bottles. They can manipulate the bottles however they want except for opening the bottle. (super-glue the cap). FIll out the “Evidence for data and observations” section in the CER. | Students will be divided into 8 groups and assigned a lab station to work at. At station they will have their own bead bottle to work with. Monitor and guide students as necessary (walk around and interact with students)Explain how to fill out the CER “Evidence for data and observations” section. |
| **Reason** | ***Individually*** explain the observations you made during your experimentation with the bottle in your CER. You can consult with you group members.  | Explain how to fill out the Reasoning/Justification section of the CER.Walk around and monitor. |
| **Communicate** | Switch groups per teacher instructions and discuss your observations and reasoning with your new group. Then go back to your initial group and discuss any new information learned.In the CER, complete the “Claim” and “Explanation” sections as a group. | Instruct students to switch groups (teacher discretion). Explain/model how to appropriately share their findings with each other. Walk around and monitor discussions.Explain how to fill out the “Claim” and “Explanation” section in their CER. Students will work as a group to fill out these sections.Here is the definition for Phenomena: **Phenomena** are observable events in nature (or our lives). A fact or situation that is observed to exist or happen. Unknown causes to us.  |

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| **Formative Assessment:** On your CER, answer the question on your own, What is your definition for phenomenon?Exit Ticket: Discuss your answer with your table and write your table’s definition for phenomena on the paper provided by your teacher.(for teacher: Provide a blank piece of paper where each group throughout the the day will write down their own table definition for phenomenon. Keep the same sheet of paper for each table.) | **Materials, resources, handouts, etc:*** CER handout
* 20 oz bottle (such as a Smart Water bottle)
* 1 cups (300 mL) 91% Isopropyl (Rubbing) Alcohol
* 1 cup (240 mL) Distilled Water
* 2.5 Tablespoons (45 g) Salt (Pickling and canning salt works well because it does not have extra additives.)
* 100 Pony Beads or 16.0 grams Craft Stores
* 100 Polypropylene Beads or 16.5 grams (UV sensitive beads work well. Perler Beads also work, but are a different shape than the pony beads.) Amazon
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| Phenomenon: |
| Screen Shot 2017-06-02 at 10.45.02 AM.png |
| CCCs:  |
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| Wonderings about phenomenon: |
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| Evidence from observations: | Reasoning/Justification: |
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| Claim (your claim should answer the question): |
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| Explanation: (Logical Explanation including Claim, Evidence, and Reasoning) |
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| Extension (How would you extend this claim in real life?) |
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| What is your definition for phenomenon? |
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