Comparing Densities of Objects in Various Fluids

Engage

Materials: 500 mL beaker or small fish tank filled with water, 1 can Diet Coca Cola, 1 can regular Coca Cola

What To Do:

1. Predict what will happen when your teacher places the can of regular Coca Cola in the water.
2. Observe what happens after placing the can in the water.
3. What did you observe?

4. Was your prediction correct.
5. Predict what will happen when your teacher places the can of Diet Coca Cola in the container..
6. What did you observe?

7. Was your prediction correct? .
8. Draw what you observed in the space below. Be sure to label the water and the cans of Coca Cola.

Explore

Part 1

Directions:

1. Watch the video "Eggs and Water Experiment" from https://www.youtube.com/watch?v=cipDtvN6ClQ

2. Answer the following questions.

Questions:

1. What happened to the egg in the plain water?

2. What happened to the egg in the salty water?

3. Did the egg change in any way?

4. How did the water change?

Part 2 Teacher Demo

Materials: 500 mL graduated cylinder, or tall glass, lamp oil, 91% Isopropyl Alcohol, Vegetable Oil, water, food coloring, Dawn Dish Soap, light corn syrup, honey, screw, grape tomato, plastic bottle cap, ping pong ball

Your teacher will show you a tall glass or graduated cylinder with several fluids in it.

OR

Watch the video "7 Layer Density Column" from https://www.youtube.com/watch?v=KgZ7JtmOgHI

What To Do:

1. Draw the Density column and label each layer is the space below.
2. Watch your teacher or the video as they drop objects into the column.
3. Draw where the objects stop in the column.

Questions:

1. Which liquid was on the bottom?

2. Which liquid was on the top?

3. What happened to the screw?

4. What happened to the plastic bottle cap

5. Is the plastic bottle cap larger or smaller than the screw?

6. Is the plastic bottle cap lighter or heavier than the screw?

7. Which of the following statements are true?

   a. The screw is smaller than the plastic bottle cap but it has more "stuff" inside.

   b. The screw is smaller than the plastic bottle cap, so it has less "stuff" inside.

8. What happened to the ping pong ball?

9. Is the ping pong ball larger or smaller than the grape tomato?

10. Is the ping pong ball lighter or heavier than the grape tomato?

11. Which of the following statements are true?

    a. The grape tomato is smaller than the ping pong ball, but it has more "stuff" inside.

    b. The grape tomato is smaller than the ping pong ball, so it has less "stuff" inside.

Explain

Density

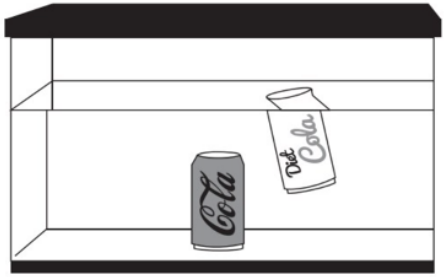
How much _____ is packed into a certain _____.

Density of substances

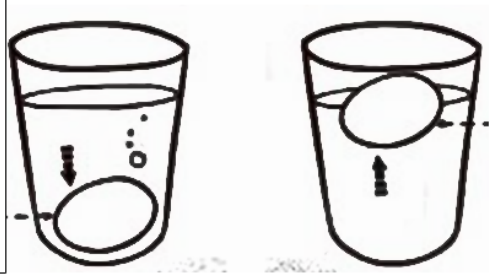
Relative to various fluids

Diet Cola has less _____ in it, so it _____ in water.

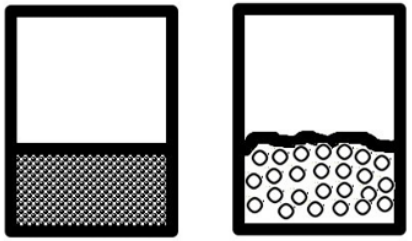
Regular Cola as more _____ in it, so it _____ in water.

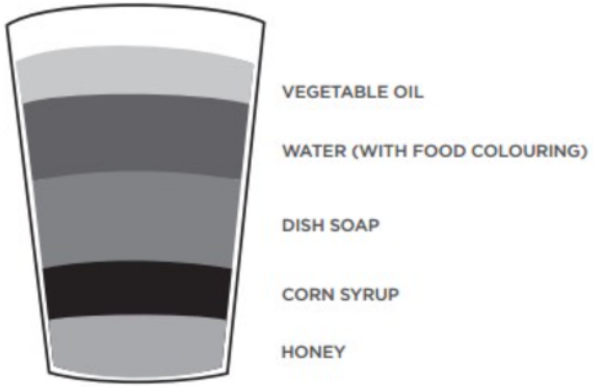


Eggs _____ in fresh water and _____ in saltwater because saltwater has more _____ in it and so it is _____ dense than fresh water.



Which of the substances below has the most density? Which has the least? **Label the space above with most and least.**





A Ping pong ball is _____ dense than all the liquids, so it _____ on the top. A screw is _____ dense than all the liquids, so it _____ to the bottom.

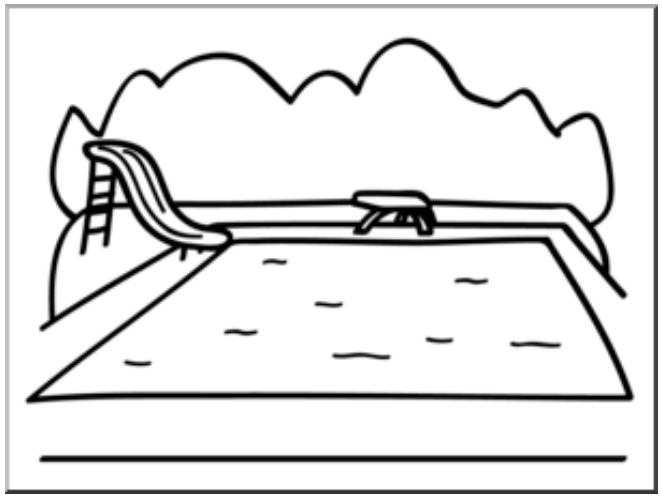
Elaborate

Liquids, such as water, and gases, such as air, are called fluids because they can be made to flow or move. Balloons that float are typically filled with Helium gas, which is less dense than the gas in the air we breathe.

Directions:
1. Color and label the fluid in the picture that is the densest BLUE.
2. Color and label the fluid in the picture that is the least dense YELLOW.

3. What would happen if you took an empty plastic soda bottle into the pool with you? Draw it below.

4. What would happen if you took a full plastic soda bottle into the pool with you? Draw it below.



5. Explain why you drew the bottles where you did.

Evaluate

Name _____ period _____

EXIT TICKET

Comparing Densities of Objects in Fluids

1. Why did the Diet Coke float in the water and the regular Coke sin?

   a. The Diet Coke had more stuff in it.

   b. The Diet Coke had less stuff in it.

   c. The water was thicker around the Diet Coke.

2. Why did the egg sink in freshwater sink?

   a. The freshwater had less stuff in it, so it couldn't hold the egg up.

   b. The freshwater had more stuff in it, so it pushed the egg down to the bottom.

   c. The water was thicker around the egg.

3. Why did the plastic bottle cap float on top of the vegetable oil?

   a. The bottle cap had more stuff in it than the vegetable oil.

   b. The vegetable oil was thicker than the honey.

   c. The bottle cap had less stuff in it that the vegetable oil.

Conclusion: (sinks, fluid, floats, flow, densities)

The air we breathe is considered a _____ because it can move or _____. Fluids have different _____ and that is why a helium balloon_____ in the air and a full bottle of soda _____ to the bottom of the pool.