OOBLECK SLIME

PURPOSE:

In this experiment you will be creating and observing a non-newtonian fluid. This type of fluid doesn't obey Newtons law of viscocity which states: "the viscosity of a liquid does not depend on pressure exerted on it". During this experiment you will get to observe the different interactions a non-newtonian fluid exhibits, depending on the pressure placed on it.

Source: https://www.thebestideasforkids.com/how-to-make-oobleck/

MATERIALS:

- 1 Bowl
- 1 1/2 Cups of corn starch
- 1 Cup of water
- Food colouring (optional)

PROCEDURE:

1. Start with the water in the bowl and gradually add the corn starch
2. Stir in the cornstarch with your hands
3. Add food coloring (optional)
4. Have fun!

CONCEPT CHECK:

- What happens when you slowly put your hand in?
- What happens when you quickly poke it?
- Do you know other substances that behave like oobleck?

Key Concepts:

Viscosity: is a measure of a fluid's resistance to flow. It describes the internal friction of a moving fluid. Think of it as how 'thick' a fluid is.

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Source: https://www.scientificamerican.com/article/oobleck-bring-science-home/

YEAST BALLOONS

PURPOSE:

In this experiment you will be observing the process of fermentation through the reaction of yeast and sugar which produces carbon dioxide gas (CO_2)

https://sciencebob.com/blow-up-a-balloon-with-yeast/

MATERIALS:

- 1 small clear plastic pop bottle
- 1 package of active yeast
- 1 balloon
- 1 cup warm water
- 2 tablespoons of sugar

PROCEDURE:

1. Fill half your bottle with warm water
2. Add the yeast and sugar to the bottle
3. Put the cap on and shake the bottle
4. Take the cap off the bottle and stretch the neck of the ballon over the opening of the bottle
5. Sit it somewhere undisturbed and observe it every 20 minutes.

CONCEPT CHECK:

- What do we need sugar for the experiment?
- Why does the balloon inflate?
- What is yeast used for?
- Try this with hot and cold water, what happens to the size of the balloon? Why?
- Try this with baking soda instead of yeast and leave out sugar, what happens?

Key Concepts:

Fermentation: The chemical breakdown of a substance by yeast, bacteria and other microorganisms that produces a gas and heat.

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Source: https://www.howtosmile.org/resource/smile-000-000-001-331

RAINBOW DENSITY

PURPOSE:

In this experiment you will be observing how density works by making a colourful density column.

MATERIALS:

- Sugar
- 5 Glasses or clear plastic cups
- Water
- Food colouring
- Tablespoon

https://www.howtosmile.org/resource/smile-000-000-001-236

PROCEDURE:

1. Line up 5 glasses. Add 1 Tablespoon of sugar to the first glass, 2 Tablespoons of sugar to the second glass, 3 Tablespoons of sugar to the third glass, and 4 Tablespoons of sugar to the fourth glass. The fifth glass remains empty.
2. Add 3 Tablespoons of water to each of the first four glasses. Stir each solution. If the sugar does not dissolve then add one more Tablespoon of water.
3. Add 2-3 drops of red food colouring to the fist glass, repeat with the other three glasses in order using yellow green and then blue.
4. To make the density column, fill the 5th glass about 1/4th full of the blue sugar solution. Carefully layer some green sugar solution above the blue liquid. Do this by putting a spoon over the glass, just above the blue layer, and pouring the green solution slowly over the back of the spoon. If you
5. Add the green solution until the glass is about half full.
6. Repeat with other colours, decreasing how much you pour in each time.

CONCEPT CHECK:

- Which coloured solution do you think is the most dense? Why?
- What happens if you mix the colours together?

Key Concepts:

Density: how much space an object or substance takes up (its volume) in relation to the amount of matter in that object or substance (its mass). Density = mass / volume

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Source: https://www.howtosmile.org/resource/smile-000-000-001-236

INVISIBLE INK

PURPOSE:

In this experiment you will be creating a secret message using lemon juice! Lemon juice is an organic (carbon-based) substance that oxidizes and turns brown when heated. The heat of the light bulb allows the carbon to become oxidized. This will make your secret message visible.

https://www.howtosmile.org/resource/smile-000-000-001-300

MATERIALS:

- Lemon juice
- Water
- 1 small brush or cotton swab
- Paper
- Lamp or other light bulb (one that gets hot!)

PROCEDURE:

1. Squeeze some lemon juice into a bowl and add a few drops of water. Dip your brush into the lemon juice and write a message on the paper.
2. Let it dry fully (around 15 minutes)
3. Heat the paper under the lamp to reveal the secret message!

CONCEPT CHECK:

- What happens when you write your message? can you see it? Why or why not?
- What colour is your message after placed under the lamp?
- What is another example of an oxidation reaction? Why not research this with an adult!

Key Concepts:

Oxidation: A chemical reaction that occurs through the transfer of elections when oxygen is present. This causes visible physical changes and molecular chemical changes.

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Source: http://www.sciencekids.co.nz/experiments/invisibleink.html

EGG OSMOSIS

PURPOSE:

In this 4 day experiment you will be observing the process of **osmosis** through a semi-permeable membrane.

MATERIALS:

- 2 whole raw eggs (in the shell)
- Corn syrup
- 2 jars or cups that can fit an egg
- Water
- Vinegar

https://www.exploratorium.edu/snacks/naked-egg

PROCEDURE:

Day 1-2:

- Put each egg it it's own jar
- Fill the jar with vinegar (you only need enough to cover the egg fully)
- Leave overnight and observe them on day 2. Record your observations.

Day 3:

- Remove each egg from the jars and rise the jars out.
- Place an egg in each jar
- In one jar cover the egg with water and in the other cover the egg with corn syrup.
- Leave over night in a safe spot

Day 4:

- Observe the eggs. Remove liquids and feel each egg. Record Observations.

CONCEPT CHECK:

- What happened to the shell on day 3?
- How do the eggs feel at each step?
- What is the difference between the egg covered in corn syrup Vs. water?

Key Concepts:

Osmosis: The process where a **solvent** (a substance which will dissolve a solute, an example is water) will travel across a semi-permeable membrane to make each side of the membrane the same concentration.

Semi-permeable membrane: A membrane that allows specific substances travel through it.

Solute: the substance dissolved in a given solution (an example would be sugar)

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Source: https://www.howtosmile.org/resource/smile-000-000-001-330