

MATTER: HANDS-ON ACTIVITIES

- Objectives
- Is the bottle really empty?
- Clean the cent.
- Floating egg.
- Experiment Record Sheet
- Survey Sheet
- Facts sheet: Matter; put it to the test

Hands on Activity
Matter: Put it to the Test!
OBJECTIVES

The purpose of this activity is to prove right the facts sheet **Matter: Put it to the Test**, by carrying out the three experiments. Every experiment should begin with the reading of this fact sheet, and it should end with checking if the experiment proves some of the facts. The survey sheet and record sheet can also be used with either activity.

- **Objectives:** 1. To use different procedures to determine mass and volume of matter. 2. To observe physical and chemical changes by mixing matter. 3. To understand that different types of matter have different densities, and that this affects to whether they sink or float.

1. IS THE BOTTLE REALLY EMPTY?

- **Before you start:** With this activity children will prove that air takes up space. They will try to pour water into an 'empty' bottle which has a funnel sealed to it with plasticine. The water will stay in the funnel because the air cannot leave the bottle.

You will need:

- A small funnel per group
- A small plastic bottle per group
- A big chunk of play dough per group
- A cup of water per group



Procedures:

1. Give each group an empty bottle, the funnel and the plasticine. Ask the children to seal the funnel to the bottle with plenty of plasticine. Walk around and monitor that the funnel is firmly sealed, or the experiment won't work!

2. Write this question on the board:

What will happen when we pour water into the bottle?

- A) The water will flow into the bottle
- B) The water will stay in the funnel
- C) There will be bubbles
- D) The plasticine will dissolve

3. Have the children survey their classmates' predictions. Use the survey sheet to make a bar graph.

4. Give each group the cups with water and have them pour the water in the funnel.

5. Ask them to write their observations on their experiment record sheet.

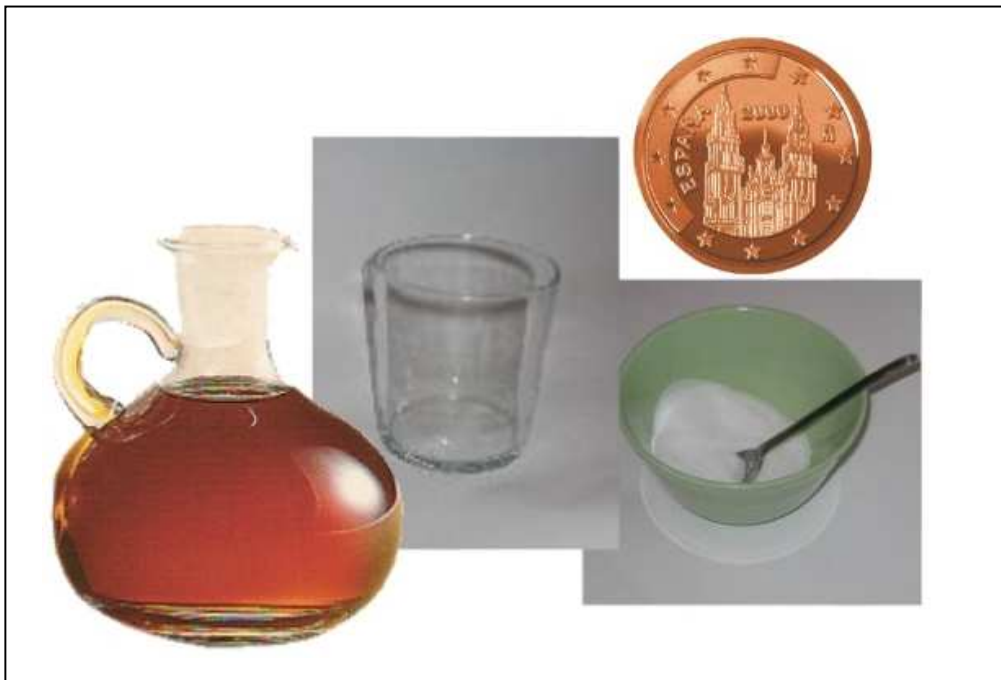
6. Explain that the water didn't go through because the bottle is full of air, and air occupies space inside the bottle. Ask children to write a conclusion (why the water stayed in the funnel) on their record sheet.

2. CLEAN THE CENT.

- **Before you start:** With this activity children will observe a chemical change by mixing two substances: vinegar and salt. The new solution (Hydrochloric acid) will clean the dirt on a copper coin, like a 5-cent coin.

You will need:

- A very dirty 5 cents coin per group.
- A plastic cup per group.
- White vinegar.
- Salt.
- A spoon to stir
- Paper towels



Procedures:

1. Write this question on the board:

What will happen to a dirty 5-cent coin when we dip it in a salt and vinegar mixture?

- A) The coin will dissolve
- B) The coin will remain the same
- C) The coin will get clean as new
- D) The coin will become soft

2. Give each group the materials and have them mix the salt and vinegar. Stir well with the spoon. Ask the children to dip half the coin in the solution, and place it on the paper towel. Write observations on record sheet.

3. Ask the children to write their observations on their record sheets. Their conclusion should include the term chemical change.

3. FLOATING EGG.

- **Before you start:** This activity will demonstrate that dissolving a substance in water (salt) will change the density of the mixture, and how this affects floatability. Children will test sinking a boiled egg in two jugs of water, one with fresh water and the other with salt water. The egg in the salt-water solution should float. (As an extension, the children can find out the volume of the egg by measuring how much the water rises and subtracting that amount to the initial mark. They can also find out the mass of the water by weighing the container with water, then the empty container, and then subtracting).

You will need:

- Two measuring jugs with water per group
- Salt
- A boiled egg per group
- A spoon
- Paper towels
- Post-it pad



Procedures:

1. Write this question on the board:

What will happen when we introduce the egg in the two jugs?

- A) The egg will sink in both jugs
- B) The egg will float in both jugs
- C) Egg will sink in jug A but will float in jug B
- D) Egg will float in jug A but will sink in jug B

2. Give children the two jugs and post-it, and ask them to label them A and B. Fill them with the same amount of water.
3. Ask children to add salt to jug B, and stir, until no more salt dissolves.
4. Give each group a boiled egg, and ask them to put it in jug A. Write observations on notebook.
5. Ask them to try the same in jug B. Write down observations.
6. Explain to the class why the egg floated in jug B but it sank in jug A. Children write their conclusions (why) in their notebooks.

(Extention: Can you find out the volume of the egg submerged in fresh water? Can you find out the mass of the water in the container?)

EXPERIMENT RECORD SHEET

Question: (What we want to test)

Procedures: (How we conducted the test)

Conclusion: (why)

Make a survey: ask your classmates what their prediction is. Show your results on a bar graph.

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MATTER

Put it to the Test

- **Matter** is everything around you that **takes up space (volume) and has a mass (weight)**.
- **Matter also has density**. Density is how many particles of matter are contained in a certain space or volume.
- Matter can be found in **three states: solid, liquid, or gas**. Therefore, a pencil is matter, water is matter, and the air is matter too.
- **Solids have a constant shape and volume**. This means that a solid will not change its shape unless you break it, and it takes up the same space, regardless of where you place it. The particles that make a solid are arranged close together in a tight structure, which allows very little flow among them.
- **Liquids have a constant volume, but a variable shape**. This means that a liquid will occupy the same space, but it will change shape, depending on the container where it is found. The particles of a liquid are arranged a bit looser and unorganized, and allow a greater flow among them.
- **Gasses have both a variable shape and volume**. This means that a gas will change to the shape of the container where it is found, and it will change volume too, because it can expand or compress, depending on the space available. The particles that form a gas are arranged in an even more unorganized structure, and flowing even more so than a liquid's.

- **Matter can be mixed.** When we mix different materials, we can obtain a **reversible mixture** or a **non-reversible mixture**. For example, the mixture of salt and water can be reversed; when water evaporates the salt will be left behind. The mix of flour, water, and oil, cannot be reversed. When water evaporates, the mixture will dry, but we cannot separate flour and oil out of it.
- **Matter can undergo physical and chemical changes.** A physical change is for example when matter evaporates and changes from liquid to gas. It is still water. A chemical change is for example, when we mix vinegar and salt. A new substance is then created, with new properties.

