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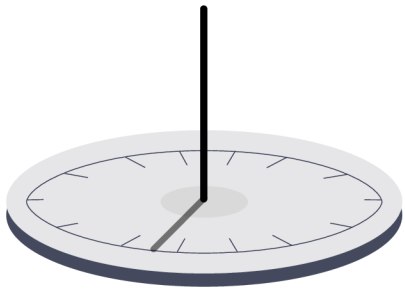
Sundial Study

Materials:

- Paper plate
- Straw or pencil
- Marker
- Small stones or chalk
- Tape, glue, or putty



Instructions:

1. Place the paper plate outside on a sunny day and insert a straw or pencil in the center, securing it upright. You can secure it with tape, glue, or putty.
2. Mark which direction is north on your plate.
3. Every hour, mark the shadow's position on the plate with a stone or chalk.
4. Compare your sundial "clock" time to a real clock.
5. As fall progresses, track how the length of daylight changes.

Why it works:

Light is made of particles called photons that travel in a wave. Shadows occur when this light wave is blocked by an object, creating a dark silhouette of that object on nearby surfaces as light continues to travel all around the object. On your homemade sundial, the pencil or straw will block the light from the sun and cast a shadow on your plate. As the Sun moves across the sky, the angle of the sun, and therefore the position of the shadow, will change. The position of the shadow shows what time it is. Sundials are not affected by changing the clocks. When clocks are put forward during the summer, reading a sundial stays the same—the position of the sun in the sky has not changed.

Fun Fact:

The ancient Egyptians made the earliest known sundial in about 3500 bce. This sundial was simply a stick or a pillar that cast a shadow on the ground.

Name: _____ Date: _____

Experiment: Sundial Study

Question:

Hypothesis:

Observations:

Conclusions:

The Scientific Method

A series of steps used to help solve a question

Question:

Make an interesting observation and ask a question about it. Is there something you want to know more about?
E*xample: Why don't all balloons float?*

Research/ Background Information:

Use your 5 senses to make observations about the topic. Read books and collect facts about the topic.
Example: Research different gases. Do they all have the same density?

Hypothesis:

A hypothesis is an educated guess. It can be tested. A hypothesis will start with the words, "If I (do something), then (this will happen)."
Example: If I fill the balloon with helium, it will float.

Procedure:

Design a set of steps to test your hypothesis. Consider variables like what will stay the same and what will change.
*Example: The balloon will stay the same (**controlled variable**), but it will be filled with different gases **(independent variable**), and it will either sink or float **(dependent variable**).*

Experiment:

Conduct your experiment and record your data. Write down the materials you use, the amount, the temperature, the time, and anything else important to your testing.
Example: A latex balloon was filled with 500mL of helium at 70'F. It floated 8 ft (the height of the ceiling). A latex balloon was filled with 500mL of carbon dioxide at 70'F. It stayed on the ground.

Observations/ Results:

Analyze your data to determine what effect your independent variable had on your dependent variable. Was your hypothesis right? Wrong? Why?
Example: When the balloon was filled with helium (independent variable) it would float (dependent variable) but when it was filled with carbon dioxide (independent variable) it did not float.

Conclusion:

Write a paper or give an oral presentation stating your conclusion. You can create a poster to display your findings.

Name: _____ Date: _____

Experiment: Sundial Study

Question/ Purpose:

Background information:

Hypothesis:

Experiment:

Materials:

Procedure:

Observations/ Results:

Conclusion: