

HOT & COLD



STUDENT WORKBOOK



ACTIVITY

4

DESIGN A TEMPERATURE EXPERIMENT

You have learned a lot about temperature, thermometers, reversible temperature changes, and irreversible temperature changes. However, you might have some more questions. That's great! In this activity, you will design an experiment to test one of the questions you have.

LEARNING GOALS:

- ✓ I can design an investigation to find out how temperature can change in different situations.

13 DESIGN AN EXPERIMENT

WHAT YOU NEED:

- Black construction paper
- Foil
- Thermometer
- White construction paper

EXPERIMENTAL QUESTION

What are some questions you have about temperature and your thermometer?



Question: _____



Question: _____



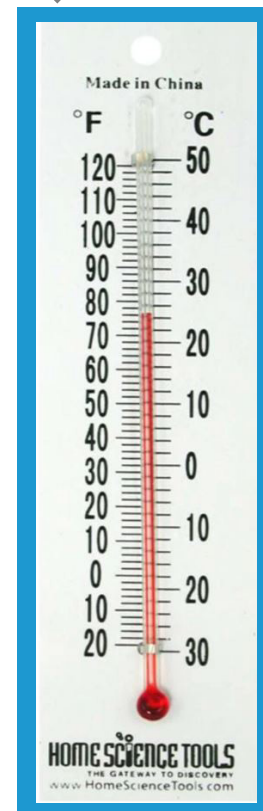
Question: _____

To answer a scientific question, you can do an **experiment**. An experiment is a test to find out if a prediction is true.

In the next step, you will do an experiment to answer one of your own questions. Choose your experimental question carefully. The experiment you do to answer it should only use supplies you have, not take too long of a time, and be safe.

Your question should have a simple answer, not a complicated answer. For example, it would be hard to do a home experiment to answer the questions, “How much of the heat from the Sun gets to the Earth?” or “What are the temperatures of all of the pools in my town?”.

The kit includes a marked student thermometer. You can use that one, your DIY thermometer, or both. The kit also includes black and white construction paper and aluminum foil. You can use these to make changes in the temperature around your thermometer, especially when it's put in sunlight or other bright light. You can ask your teacher for help with choosing a question.



Here are some ideas to get you started:

- Temperature changes during the day
- How the two thermometers are different
- Temperature of different places in and around your home
- Temperature changes happening slowly or quickly
- Different materials changing how much light becomes heat
- Temperature changes caused by sunlight compared to other light

Once you have an experimental question, write it below.

14

PREDICTION

Now, make a **prediction**. A prediction is what you think will happen, or what you think the answer to your question will be when you do your experiment.

Predict what the answer to your question will be and write it below. It's okay if you're not sure, or if you're wrong. That's part of science!

EXPERIMENTAL PLAN

An experiment helps you gather **evidence**, or clues that your prediction is right or wrong. How will you gather evidence in this experiment? What will you have to do with the thermometer and your other materials?

Write your plan below.

- 1.
- 2.
- 3.
- 4.
- 5.

1. If your prediction is true, what evidence will you observe?

2. If your prediction is *not* true, what evidence will you observe?


TEST IT OUT!

Do the experiment you planned. As you do, it might be helpful to record your observations in a table or a graph. Be sure to include labels for what you're measuring and what the values will be measured in (for example, temperature in degrees Fahrenheit).

You can use the space on the next page for recording your observations and evidence. You can use all of it, part of it, or none of it.

<ul style="list-style-type: none">••••	<ul style="list-style-type: none">••••	<ul style="list-style-type: none">••••

SAMPLE

 After you've recorded your results, go back and look at your prediction. Was your prediction correct? How do you know?

GLOSSARY

Contract – get smaller, take up less space.

Degree – a unit of temperature that can be in Celsius or Fahrenheit.

Evidence – facts or observations that show something is true or false.

Expand – get bigger, take up more space.

Experiment – a test to find an answer to a question.

Irreversible – not able to change back to the original condition.

Prediction – what a scientist thinks will happen.

Reversible – able to change back to the original condition.

Temperature – how hot or cold something is.

Thermometer – a tool used to measure temperature.

SAMPLE

WONDER



SCIENCE UNLOCKED®

© Home Science Tools. All rights reserved.
Reproduction for personal or classroom use only.

Contact us at: www.homesciencetools.com/customer-service/

A product of

HOME SCIENCE TOOLS®

Kit	SU-HOTCLD
Instructions	IN-HOTCLDS
Revision Date	6/2023