

HOT & COLD

TEACHER GUIDE



PLANNING

Here's a suggested schedule for this kit! The activities should be completed in order, but you can choose when the lessons take place over time. Required times are estimated.

ACTIVITY INFORMATION	SECTION(S)	TIME REQUIRED	DAY/ LESSON
ACTIVITY 1: MAKE A DIY THERMOMETER Make your own thermometer and test how temperature works. Total time: 45 min	· Diy Thermometer	30 Minutes	Day 1
	· Testing Time	15 Minutes	Day 2
ACTIVITY 2: HOW DOES A THERMOMETER WORK? Test your thermometer to understand temperature. Total time: 1 h 15 min	· Temperature	30 Minutes	Day 3
	· Larger And Smaller	15 Minutes	Day 4
	· Rise And Fall	30 Minutes	Day 5
ACTIVITY 3: REVERSIBLE AND IRREVERSIBLE TEMPERATURE CHANGES Understand how reversible and irreversible changes occur. Total time: 1 h 45 min	· Change	15 Minutes	Day 6
	· Reversible And Irreversible Changes (Thorough Step 9)	30 Minutes	Day 7
	· Reversible And Irreversible Changes (Through Step 11)	15 Minutes	Day 8
	· Reversible And Irreversible Changes (Through Step 12)	15 Minutes	Day 9
	· Reversible And Irreversible Changes (Through To The End)	30 Minutes	Day 10
ACTIVITY 4: DESIGN A TEMPERATURE EXPERIMENT Take learning into your own hands by building on a question you already have. Total time: 1 h 30 min	· Design An Experiment (Questioning & Experimental Question)	30 Minutes	Day 11
	· Design An Experiment (Prediction & Experimental Plan)	30 Minutes	Day 12
	· Design An Experiment (Test It Out!)	30 Minutes	Day 13
ACTIVITY 5: SHOW WHAT YOU KNOW! Assess your learning with fun activities. Total time: 30 min	· Crossword	15 Minutes	Day 14
	· Lake Temperatures	15 Minutes	Day 15
ACTIVITY 6: LEARN MORE! Use any or all of these fun extensions to take your student's learning further! Total time: 30+ min	· Anders Celsius	30 Minutes	Day 16
	· Crayon Changes	45 Minutes	Day 17
	· Leaf Test	90 Minutes	Day 18
	· Temperature Changes	30 Minutes	Day 19

6+ hours

1

activity

MAKE A DIY THERMOMETER

We observe temperature each day with how warm or cold you feel. Temperature is so much more than that!

In this activity, your students will make a DIY thermometer. They will need an adult's help for part of it, so make sure you are nearby.

DIY THERMOMETER



WARNING! FLAMMABILITY WARNING: Isopropyl alcohol is flammable, may cause skin/eye irritation, and may cause poisoning if swallowed. KEEP AWAY FROM FIRE. Wash hands well after use. DO NOT EAT.

PREPARATION AND SUPERVISION

- Support your student as they do the first two steps, which are removing the outer and inner caps of the bottle and filling it with 10 mL of water.
- Help the student with Steps 3-5. It can be helpful to do these steps over the sink in case of a spill. If a spill does occur, simply use a paper towel to soak up the spilled liquid.
- During Step 3, encourage your student to count the number of drops of food coloring you add as you do it. This can engage younger students in learning number sequencing.
- Students might need help in making sure the straw is securely in place, that it's not moving up or down, and that there are no air pockets between the clay and the bottle. If there is space, the alcohol can leak out during the experiments.
- The clay should never touch the alcohol in the thermometer. It's there to hold the straw in place and stop air from entering the bottle.
- If the clay does get wet, dry it with a paper towel and try again.
- Make sure to fill the bottle only about halfway with alcohol to prevent the clay from getting wet. Then, you can add more alcohol with the pipet when the seal is in place.
- Another thing that helps make a strong clay seal is this: where the bottom of the clay meets the bottle, smear it down so that it's flush with the bottle and there's no gap between the clay and the outside of the bottle.
- Step 11 should be done by you because it requires precision while handling the alcohol. The alcohol will not go up to the top of the bottle inside the bottle. The student can do Step 12, but make sure the seal is tight so that the alcohol cannot evaporate out of the top of the straw.
- Once the clay is secure, students can move the clay closer to the bottle so it doesn't cover the straw as much. This will allow them to see more liquid in the straw.

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



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