

Science Action: 1st Grade

Thermometers

Thank you for volunteering to help with the Science Action lab in your child's classroom on

Please read the attached instructions BEFORE the lesson, it really does help!!! Plan on arriving 15 minutes before the lab is scheduled to begin. We will meet by the front office so that we can go over any questions and pass out supplies. If you have any questions or cannot make it please contact me.

Thank you,

***PLEASE BRING THESE INSTRUCTIONS WITH
YOU ON THE DAY OF YOUR LAB!!!***

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Thermometers

Teacher preparation: Introduce the concept of temperature as a way to measure hot, cold and warm.

Lab summary: Students will learn how to read a thermometer to measure temperature.

Objectives:

- Students will observe thermometers as tools that measure temperature
- Students will learn to read a thermometer
- Students will relate the numbers on a thermometer to hotter or colder temperatures
- Students will do a temperature experiment to see how people can be fooled by temperature
- Students will use thermometers to measure hot, cold and warm water as well as to measure the air temperature

Materials: (all materials will be supplied by the coordinator)

Alcohol filled glass demonstration tube

Assortment of different types of thermometers

Thermometers (1 per student)

6 oz clear plastic cups (3 per student)

Yeast

Sugar

Plastic spoon

Sticky notes

Cold water 50F (4-6oz per student)

Hot water 110F (4-6oz per student)

Warm water 80F (4-6oz per student)

Thermoses to keep water hot/cold

Worksheets/Activity sheet (1 per student)

Red pencils (1 per student)

One bucket for dumping water (1 per small group)

Paper towels

Introduction: (Large group, done by lead parent)

Welcome to Science Action. (Introduce yourself and have the other parents do the same.)

Today I brought some things I want to show you. Does anyone know what this is? (Hold up a thermometer).

That's right, it's a thermometer. Does anyone know what a thermometer does? Allow the students to answer.

Thermometers tell temperature or we can say that a thermometer is a tool we use to measure heat. Where have you seen thermometers before? I have some examples of different kinds of thermometers to show you. Hold up the various thermometers and let the kids tell you what they are used for.

All of these thermometers may look different but they all have something in common. All these thermometers have either a metal or liquid that expands (gets bigger) when it is heated or contracts (gets smaller) when it is cooled. Older thermometers mostly used a liquid metal called mercury to measure heat. Today mercury is rarely used in home thermometers because mercury is poisonous and can be harmful if the thermometer is broken. Most thermometers we use now have a liquid like alcohol inside them to measure the temperature.

Here is a demonstration tube filled with red alcohol. (Show the tube to the class). **If I hold the part with the liquid in my hand it will start to heat up and the liquid will get bigger. You can see the liquid going up the tube. But when I take my hand away the liquid goes back down the tube because it is cooling down and getting smaller. All bulb thermometers work this way, with liquid that gets bigger when it heats up. Some digital thermometers work this way too--they just use metals that get bigger when they warm up. The thermometers that we are going to use today are the ones where you can see the red liquid go up or down.**

Before we get started I want to make sure everyone knows how to read a thermometer. Here is a pretend thermometer let's see if we can read it together. (Hold up the poster board with model thermometer).

This thermometer has two different sets of numbers on it. The letter F at the top of these numbers stands for Fahrenheit. Mr. Fahrenheit made up this scale to tell temperature a long time ago. The letter C at the top of these numbers stands for Celsius. Mr. Celsius used a different number scale to talk about the same temperature. When it is 32F it is

0C. These are the same temperature, just different numbers. In our country (the U.S.) we use the Fahrenheit numbers. However, most of the rest of the world uses the Celsius numbers.

What else do you notice about the numbers on the Fahrenheit scale? That's right the only numbers written are the 10's. Each line between the 10's represents a number and we count those lines by either one's or two's depending on how many lines are between the numbers. Let's practice together by counting by 10's to 120. (Do this together as you point).

When we read a thermometer we read the number that is at the top of the red line.

What temperature is this? (Set the thermometer at 80 degrees). What kind of weather is this temperature? Hot or cold? Look at the pictures and tell me the kinds of things you might do or wear at 80 degrees.

What temperature is this? (Set the thermometer to 30 degrees) What might you do or wear at this temperature?

Before we break into small groups to practice using a thermometer we are going to start an experiment which demonstrates how important it is for living things to be at the right temperature.

Activity #1: (Large group, yeast experiment)

Have you ever helped anyone make bread or pizza dough? To make breads people often use yeast. (Show the yeast to the students). Yeast is a living organism that eats sugar and makes a gas but yeast will only make a gas at a certain temperature. The gas made by the yeast is what causes bread or dough to rise and become light and airy and tasty to eat. We are going to find out what temperature yeast likes best.

Set out three cups and put a thermometer in each. Pour 1-2" of hot water, cold water and warm water into each cup. Measure the temperatures and write the numbers on a sticky note and put on each cup.

Who has a prediction as to which temperature the yeast will like best? Now we will add some yeast food or sugar to the cups and wait and see which cup makes the most gas. That will tell us which temperature yeast likes best. (Add a spoonful of sugar to each cup and stir).

Now we are going to do some more experiments in small groups. We will check these cups at the end of our lab.

Activity #2: (Small groups, temperature trick)

Give each student a paper towel, 3 clear cups (one filled with hot water, one with cold water and one with a mixture of hot and cold to make warm water). Make sure the warm water is lukewarm or the trick does not work as well.

We are going to do a temperature trick with these cups of different temperature water.

Put one finger in the hot water and one finger in the cold water. We will leave them here for about a minute and then check and see what the mixed water's temperature is.

We are going to test one finger at a time. Put the finger that is in the cold water into the mixed water. How does it feel, warm or cold? (It should feel warm).

Now take the finger that is in the hot water and put it in the mixed cup. Does the water feel warm or cold? (It should feel cold).

How can the mixed water feel hot and cold at the same time? It is two different temperatures? That's right, the water in the mixed cup is not two different temperatures. The water is just one temperature, somewhere between very warm and very cold.

The water just feels different to each finger because our sense of temperature depends on where our body's been. Have you ever been out playing in the snow and when you come into your house it feels hot? That's because your body was used to being cold and when you come into a warm house it feels really warm. We do our best at telling temperature with our bodies but we can be fooled sometimes. This is why thermometers were invented. Once you have a thermometer you don't need to feel things to see how warm or cold they are.

Activity #3: (Small groups, reading thermometers)

Pass out a thermometer to each child and let them become familiar with it. ***How many lines are between the numbers on your thermometer? That's right there are 4, this means each line counts as 2 degrees. Can you count by 2's? Let's count together.***

What temperature does your thermometer say right now? Help the students read their thermometers by reading the number at the top of the red line. ***Yes, that is the air temperature right now in your classroom.*** Have the students record the air temperature on their worksheet and color in the thermometer bulb with a red pencil.

What do you think will happen if you hold your thumb gently over the thermometer bulb? Let's try it and find out. (The red liquid in the thermometer is getting warmer which causes the liquid to get bigger and expand. The liquid has no place to go but up the tube).

Once the liquid stops rising ask students to read the temperature. ***Did the temperature go up or down? Why?*** (Our body temperature is warmer than the air temperature).

Now we are going to measure the temperature of the water with our thermometers. Let's start with the cold water. Put your thermometer in the cold water and leave it there until the red liquid in the thermometer stops moving. I am going to come around and have each of you read your thermometer to me. Help those who need help then have the students record the temperature of the cold water on the worksheet and color the worksheet thermometer bulb with a red pencil.

Repeat the process for the hot water. Take the temperature and record it on the worksheet.

Now let's try and guess the temperature of the mixed water. Will it be warmer or colder than the cold water? Yes warmer, so the number you guess should be BIGGER than the cold water number. Will the mixed water be warmer or colder than the hot water? Yes colder, so the number you guess should be SMALLER than the number for the hot water.

Have the students record their prediction by drawing a line on the worksheet thermometer for the warm water. Then have the students take the temperature of the warm water and record the real temperature and color in the thermometer bulb.

Once the worksheet has been completed have the students dump out their water and dry any spills while you collect their thermometers, red pencils and cups.

Have the students work on the temperature activity sheet while other groups finish up.

Closure: (Large group, looking back at activity #1)

The lead parent gets the classes attention. ***Remember our yeast experiment? We need to check and see which temperature the yeast liked best.***

Remember, the best temperature for yeast will create a lot of gas which makes fluffy bread. Bring the cups around to the tables and let the students decide which kind of water the yeast liked best (hot water). Have the students draw and label the temperatures of all three cups using the temperatures of the water you wrote down at the beginning of the experiment. Then have the students circle the picture and temperature that yeast liked best.

Before we go can anyone share with us something you learned from today's science lesson? (Allow the students to answer). ***Thank you for letting us come in and do some temperature experiments with you.***

Name_____

Draw a picture of something you like to do on an 80 F day.

Draw a picture of something you like to do on a 30 F day.

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Ask me what I learned!!!

There was a Science Action lab in your child's classroom today on temperature and thermometers. Please ask your child what he/she learned today.

- What tool do we use to measure temperature?
- What scale do people in our county use to tell temperature, Celsius or Fahrenheit?
- How can your body be fooled by temperature?
- When making bread what temperature does yeast like best?