How hot is the Hot Spring water?

Learning Objective: Students will collect temperature data at 5 locations in Hot Springs National Park and compare the water temperature at each location to determine the hottest spring or collection pool.

Recommended grade level – third or fourth

Arkansas Student Learning Expectations

Third grade

- NS.1.3.1 Communicate observations orally, in writing, and in graphic organizers: T-charts, pictographs, Venn diagrams, **bar graphs**, frequency tables
- NS.1.3.3 Conduct scientific investigations individually and in teams: lab activities, **field studies**
- NS.1.3.5 Estimate and measure length, mass, **temperature**, and elapsed time using International System of Units (SI)
- NS.1.3.6 Collect and analyze measurable empirical evidence as a team and/or as individuals

Fourth grade

- NS.1.4.1 Communicate observations orally, in writing, and in graphic organizers: T-charts, pictographs, Venn diagrams, **bar graphs**, frequency tables, line graphs
- NS.1.4.3 Conduct scientific investigations individually and in teams: lab activities, **field studies**
- NS.1.4.6 Estimate and measure length, mass, **temperature**, capacity/volume, and elapsed time using International System of Units (SI)
- NS.1.4.7 Collect and interpret measurable empirical evidence in teams and as individuals

Materials per group:

-Celsius thermometer
-clipboard, pencil, and worksheet
-Calculator

Procedure:

1. Divide students into manageable groups of 4 or 5 students per group. One student should be designated as the recorder. This student will be in charge of recording all data collected by the group during the data collection phase at the park.
2. In moving through the park, students should be instructed to stay on walkways. At each spring or collection pool, students will place the end of the thermometer into the water and wait approximately 30 seconds to one minute. Students should be directed to use care so that they do not touch the glass part of the thermometer and affect the temperature reading. The thermometer should be quickly removed from the water and the temperature should be read and recorded in degrees Celsius. The group should repeat this process 3 times at each location.
3. Upon return to school following the data collection process, all students should record on their worksheets the data collected by their group. Using calculators, each group should calculate the average temperature they recorded for each location.
4. Students will then complete a bar graph showing the average temperature their group recorded for each location. (The teacher might want to average the data collected by each group and organize a class bar graph showing data from all groups.)
5. Students will then use the information from their bar graph to communicate the results from their group as to which location has the hottest water.
6. Students should infer why they think a particular location has the hottest water.

Name_____

How hot is the Hot Springs' water?

Your group will be collecting data from 5 different locations in Hot Springs National Park. When we return to school, you will use your data to communicate your findings.

Materials per group:

Celsius thermometer
Clipboard, worksheet, and pencil for team recorder
Calculator (when class returns to school)

Procedure:

We will travel to 5 different locations in the park. At each location you will use your thermometer to measure the temperature of the water. Each time you measure the temperature, the group recorder will write it down. You will take 3 temperature recordings at each location.

Data Collection:

Lamar Spring

	Temperature °C (Celsius)
	1.
	2.
	3.
Total of 3 temperatures collected	
Average water temperature (total ÷ 3)	

Noble Spring

	Temperature °C (Celsius)
	1.
	2.
	3.
Total of 3 temperatures collected	
Average water temperature (total ÷ 3)	

Collection Pool

	Temperature °C (Celsius)
	1.
	2.
	3.
Total of 3 temperatures collected	
Average water temperature (total ÷ 3)	

Maurice Historic Spring—Tunnel Spring

	Temperature °C (Celsius)
	1.
	2.
	3.
Total of 3 temperatures collected	
Average water temperature (total ÷ 3)	

Cascade Pool at Arlington Lawn

	Temperature °C (Celsius)
	1.
	2.
	3.
Total of 3 temperatures collected	
Average water temperature (total ÷3)	

Now you will complete a bar graph showing the results of the data collections.

70 °C					
60 °C					
50 °C					
40 °C					
30 °C					
20 °C					
10°C					
	Lamar Spring	**Noble Spring**	**Collection Pool**	**Maurice Historic Spring – Tunnel Spring**	**Cascade Pool at Arlington Lawn**

Use the data to answer the questions below.

1. Put the springs/collection pools in order from hottest water to coolest.

   _____

   _____

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2. Infer: Why do you think some locations have water that is hotter than other locations?

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