



**Lesson Plan:** How hot?

**Level:** Stage 2

**Syllabus link:** MA2-18SP “selects appropriate methods to collect data, and constructs, compares, interprets and evaluates data displays, including tables, picture graphs and column graphs”

### LESSON OUTLINE

Students will use hand-held digital thermometers to collect data on the temperature of different materials around the school and compare these to the air temperature as measured by the SWAQ station. They will record their measurements in a table format. Once back in the classroom, students will use their results to construct a column graph.

### Resources/Materials:

- Worksheet (included)
- PowerPoint presentation (available on SWAQ website)
- Hand-held digital thermometers
- Access to SWAQ website
- Clipboard
- Ruler
- Grid or lined paper



### Description of activity:

In this lesson, students will work in groups to practice collecting and recording data. They will be using hand-held digital infra-red thermometers to measure the temperature of various materials commonly found around schools.

#### *Part 1: Collecting the Data*

At the beginning of the lesson, use the PowerPoint presentation to familiarise students with the different types of materials they will be looking for. Explain that they will be going outside the classroom and will have to find these materials around the school and measure their temperature using the digital thermometers (you may want to restrict them to a certain area to make supervision easier).

To prepare for recording the data, the students have been given a blank table as part of their worksheet. Their first task will be to finish constructing the table by adding appropriate headings to the columns. Each student should fill out their own individual table. Depending on how much practice they have previously had constructing tables, you may choose to get them to come up with this themselves, or to copy the headings from the example table provided.

They should also record the air temperature on their worksheets. This can be obtained from the SWAQ website. To save time, rather than each student needing to access the website on their own devices, the teacher can access the website whilst using the classroom projector. Make sure you check the temperature

for your specific school, or if there is no SWAQ station at your school, then use the measurement from the nearest school.

Students will work in small groups (3-4 students) in order to collect the data. Before taking your students outside, give them time to practice using the hand-held digital thermometers in the classroom. They can measure each other's temperatures by pointing the thermometer at the other person's forehead. Check that each group is able to successfully do this before taking them outside. You may also like to have the students predict which materials will be the hottest/coldest to get them thinking about the materials and involved in the experiment.

Once outside, students will need to identify the materials, measure their temperatures using the digital thermometers, and record their results in the table. For supervision purposes, you may want to impose certain boundaries on where they can go. Set a time for when you want your students to be back in the classroom.

Conduct a short discussion when you return to the classroom in which students can share their results with the class and compare which materials they found to be the hottest/coldest. Also make note of how the temperature of the materials compared to the air temperature.

### *Part 2: Constructing a Column Graph*

In the second part of the lesson, the students will use their results (including the air temperature measurement) to construct a column graph. Before constructing their own graphs, show them the following video outlining the process for drawing a simple column graph (<https://www.youtube.com/watch?v=K7sH-7SKfqs>).

To construct their column graphs, the students should use grid paper (although lined paper will also suffice). Begin by creating the scale for each axis and drawing the first column for the air temperature as a class (extra tips for this can be found below in the section titled, 'Things to note'). Make sure that all students have written a title for their graphs, as well as a title for each axis. After this, students should complete the remainder of the columns for their graphs individually.

### **Things to note:**

Ideally when creating a column graph, you want to use as much of the space as you have available. To do this, you need to carefully plan the scales for the axes that you will use. The first thing to check is the maximum value you need to be able to fit on the vertical scale of your graph (in this case, what was the hottest temperature that was measured?). You also want to create a scale using whole numbers so that it is easy to use. Start by counting using one square per number. If there is still more than double the space, increase to two squares per number. If there is not enough space, decrease to half a square per number and so on.

Note that in the youtube video, whilst the graph does have an overall title, it is missing a title for the horizontal and vertical axes. Make sure that you get your students to include axes titles for their graphs.

### **Additional Resources:**

- ▶ A video demonstrating the use of infra-red thermometers on playground equipment (note that temperatures are measured in Fahrenheit).  
<https://www.youtube.com/watch?v=DVLo6QDLkJA>
- ▶ A video outlining the process for drawing a simple column graph.  
<https://www.youtube.com/watch?v=K7sH-7SKfqs>

### **Key Questions to Ask**

Which material was the hottest?

Which material was the coldest?

Why do we draw graphs to represent data?

How does a column graph help us to quickly identify the hottest material?

What do you need to remember to add to your graph when it is finished? (titles!)



## How hot is it? – Collecting Data Worksheet

### Instructions:

1. Check today's air temperature by looking up your school (or nearest school) on the SWAQ website ([www.swaq.org.au](http://www.swaq.org.au)). Write it below.
2. Finish setting up your results table by writing headings above the columns.
3. Go outside and look for the materials listed in the cloud. You might not find them all, just look for as many as you can.
4. When you find a material, use the digital thermometer to measure its temperature.
5. Record your results in the table.

Today's air temperature: \_\_\_\_\_ °C.



