

## Activity Title: Creating the Urban Heat Islands Profile

### Objective

- Ranking different types of surfaces based on data from an investigation.
- Creating a line chart based on data.
- Analyzing and explaining trends seen on a chart.

### Materials/Resources

For the class

- Interactive whiteboard

For each student:

- Worksheet 2
- Red and blue card

### Instructions for Teachers/Students

Give each student a worksheet 2, for this lesson the students will mainly work alone and contribute to discussions in class.

Start the lesson by showing the whole class an introduction dialogue provided in worksheet 2 (introduction activity) of two kids discussing the reason why some surfaces have higher temperatures than others. Try to emphasize the terms artificial and natural, taught during the previous lesson. The aim here is that the students realize that John's opinion is wrong, and that Elenis is the correct one. During their explanation the students should justify their answers based on the findings from their experimentation from the previous lesson.

After the introduction activity, the students rank the 5 surfaces examined during the investigation of the previous lesson. For this activity, the students need to use the bar charts they created in worksheet 1. The table in Activity 1 in work sheet 2 asks the students to describe each surface (name, in/out of sunlight), the type of surface (artificial/natural), the color and the ranking (1<sup>st</sup> the one with the highest temperature and 5<sup>th</sup> the one with the lowest temperature). When all the students are done, engage them in a class discussion to compare each one's rankings and ask them to justify their answers (*Why did you rank this surface as 1st /2nd /3rd /4th /5th? What pattern do you notice when comparing the surface temperatures of natural and artificial materials? Did the surfaces with the lowest / highest temperatures have the same/different color?*). This activity will help the students notice a pattern more easily and guide their thoughts for the ongoing activities (surfaces with darker colors have higher temperatures than surfaces with lighter colors).

Further on, the students will develop the Urban Heat Islands profile by creating a line plot based



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on the data table provided in [activity 2 in worksheet 2](#). The students should use the data table to plot the temperature values above their corresponding city district on the profile image. Then, they must connect the values they plotted on the image with lines to create a line plot/chart. If the students are not familiar with the creation of a line chart you may need to first explain in detail how to develop it and what its purpose is. You may need to use [an example](#) of a line plot to help students realize what the result must look like but also show the whole class how to plot the first temperature above the corresponding city district on the profile image. When all the students are done, ask them to help you create the line chart on the board for further discussion (*What does this line plot/chart represent? Who can explain what we have just created? Is there anything that interests you, something you didn't expect to see? Why?*).

Based on the line plot the students created they analyze and explain its trends. For this purpose, [activity 3 in work sheet 2](#) provides some indicative questions for them to answer. Give time to the students to answer the questions and then engage them in a small class discussion. The aim of this activity is for the students to start thinking more deeply about the possible reasons behind the Urban Heat Island Effect (construction, human activities, population density).

At the end of the lesson, play a false and true game with the students. Give each student a red and a blue piece of paper and ask them to raise one for every statement presented, based on what they think is most suitable (blue-true, red-false).

Statements:

Artificial surfaces tend to present higher temperatures. (True)

Lighter colors tend to result in lower temperatures. (True)

Downtown areas of a city present higher temperatures because they have more artificial surfaces. (True)

The population density in one area of the city might be one cause of having different temperatures in that area. (True)

Dark colors tend to result in lower temperatures. (False)

## Conclusion

### Activity 1:

Darker color surfaces tend to present higher temperatures than lighter ones.

### Activity 2 and 3:

The type of surface (artificial/natural), the color, construction, human activities and population density can all contribute to the Urban Heat Island Effect.

Areas of the city which contain more artificial materials (Downtown, Urban Residential, Commercial, Suburban Residential) result in high temperatures.

## Reflection Questions for Teachers/Students

- What would you change/do differently?
- What kind of challenges did you face and how did you manage them?

