How Cool Is Your School?

SUBJECT AREA: Science – Earth Science, Environmental Science.

GRADE LEVEL: Third through fifth.

DURATION: 45 minutes to an hour; set up time is minimal.

AUDIENCE SIZE: 30 students; students will be divided into five groups.

OVERVIEW: This innovative program focuses on student centered discovery that allows generation of conclusions about their environment. Students will first raise questions about the natural world while using infrared thermometers to take temperature measurements of various air and surfaces at their school. This will enable students to observe, measure and analyze temperature variations in their school environment, fostering a hands-on understanding of how different materials absorb, retain and release heat. During this time, concepts of how surface materials can influence the temperature of a city or community will be presented. Building on their knowledge, students will be challenged to apply their understanding to create a model sustainable city that considers the thermal properties of building materials, green spaces and other urban infrastructure.

OBJECTIVES:

The student will:

- Explain how different materials absorb and release heat.
- Describe the factors that influence air and surface temperatures in their school environment.
- Apply the scientific method through hands-on inquiry that uses infrared thermometers to measure and analyze temperature variations across different surfaces.
- Recognize how surface materials and human activities can contribute to localized temperature increases in urban areas.
- Identify sustainable design principles in urban areas.

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SUNSHINE STATE STANDARDS:

SC.3.N.1.1 – Raise questions about the natural world, investigate them individually and in teams through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.

SC.3.N.1.2 – Compare the observations made by different groups using the same tools and seek reasons to explain the differences across groups.

SC.3.N.3.2 – Recognize that scientists use models to help understand and explain how things work.

SC.3.E.6.1 – Demonstrate that radiant energy from the sun can heat objects and when the sun is not present, heat may be lost.

SC.3.P.8.1 – Measure and compare temperatures of various samples of solids and liquids.

SC.4.N.1.4 – Attempt reasonable answers to scientific questions and cite evidence in support.

SC.4.N.1.7 – Recognize and explain that scientists base their explanations on evidence.

SC.4.P.11.1 – Recognize that heat flows from a hot object to a cold object and that heat flow may cause materials to change temperature.

SC.4.P.11.2 – Identify common materials that conduct heat well or poorly.