Unit Title: Keeping It Cool With Solar

Lesson #7: Reflections of an Engineer

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DESCRIPTION
This lesson is designed for one 30-minute session. Students analyze their data and reflect through video recording about how solar technology and their structures kept the ground (earth’s surface) cooler.

GRADE LEVEL(S)
K-2

SUBJECT AREA(S)
Engineering design, structure

ACTIVITY LENGTH
One 30 minute session

LEARNING GOAL(S)
1. Students will reflect on how their structure and solar technology changed the Sun’s effect on the Earth’s surface

CONTENT BACKGROUND

STUDENT BACKGROUND
- Ask and/or identify questions that can be answered by an investigation.
- Able to build a structure using various objects.
- Recognize and compare numbers 1-100.

EDUCATOR BACKGROUND
LESSON PLAN

- Educators should be able to and environment to support students’ arguing from evidence, practicing with age-appropriate speaking and listening techniques. See https://drive.google.com/open?id=0B-9Irq87W7mnQkVOMI8mRjI5S1E for pedagogy and resources on Fostering Academically Productive Talk in the classroom.

MATERIALS NEEDED

HANDOUTS/PAPER MATERIALS
- Per student:
  - Observation/Temperature Worksheet from Lesson 6 (Lesson 5 - Thermometer)
- Per pair of students:
  - Structure previously built, solar panel, motor, fan blade for motor. Data of earth surface temperatures.

LESSON PROGRESSION

PLANNING AND PREP
This lesson is one 30-45 minute period. Teacher needs to make sure s/he has students’ structures from previous lesson. Teacher needs to make sure students have data sheet for temperatures. Instructional supports such as KLEWS charts or other supports should be ready for the discussion.

LESSON SEQUENCE

1. (5 min) Intro discussion: Review steps of engineering design process for structures: Design, Build, Test, Improve, Test Again.
2. (5 min) Phenomenon: Show students phenomenon of video showing a time lapse of a solar structure being built (https://www.playposit.com/share/180226/811845/solar-shade-structures-solar-parking-canopies-greenfuel-technologies). Ask the question: “Using solar technology, how might we make the ground in our structures even cooler?”.
3. (30 min) Practice speaking and listening. Have students share how their structure worked and did not work. How would they improve it? Use age appropriate speaking and listening techniques and instructional supports.

ASSESSMENT AND EXTENSIONS

FORMATIVE ASSESSMENT
As students reflect, have students explain their reasoning for how the solar motor fan might make the structure cooler.

SUMMATIVE ASSESSMENT
Collect engineer design worksheets from students. Take pictures of student design structure. Have students share how the sun affects the earth’s surface and how solar energy might be used to help cool their structure.

Here is a rubric that the teacher may use:  
https://www.themespark.net/@mlewin/rubric/4JQC3ral

LESSON EXTENSIONS
None.