

## Grade 1 Design Challenge Quick Guide: Design a Solar Still – Cycle 1

**Lesson Objective(s):** The students will be able to explain a simple way to desalinate water using solar energy.

**Materials:**

*Suggested for teams of 2-3 students unless indicated otherwise*

- Large sheets of construction paper, at least 12 inches by 18 inches (one per pair of students)
- Large tag board and a hole punch
- Brads or other type of fasteners
- Blank handout titled, “WAYS WE USE WATER AT SCHOOL”
- Blank handout titled, “WAYS I USE WATER AT HOME”
- Teacher-created parent letter
- “Water is Very Special,” poem by Beth Corum
- “The Water Cycle Song,” song
- 21<sup>st</sup> Century Skill rubric for grading the project
- Websites
  - <http://www.turtlediary.com/grade-1-games/math-games/graph-and-tally.html>
  - [http://www.teachersdomain.org/asset/ess05\\_vid\\_solarstill1/](http://www.teachersdomain.org/asset/ess05_vid_solarstill1/)
  - <http://tinyurl.com/12f775v>
  - <http://serc.carleton.edu/eslabs/weather/2a.html>

*Design 1*

- Large bowls (one per group and one for teacher)
- Short glass shorter than size of bowl (one per group and teacher)
- Tape or large rubber bands
- Plastic wrap
- Rock or other weight (one per group)
- Pitcher of water
- Salt
- Long spoon for stirring

*Design 2*

- Panty hose
- Wire coat hanger
- Coffee can or other container
- Sand or rocks to weight the container
- Spray Bottle with water

**TEKS:**

*Science*

**PS** SCI 1.4A Collect, record, and compare information using tools, including computers, hand lenses, primary balances, cups, bowls, magnets, collecting nets, notebooks, and safety goggles; timing devices, including clocks and timers; non-standard measuring items such as paper clips and clothespins; weather instruments such as classroom demonstration thermometers and wind socks; and materials to support observations of habitats of organisms such as aquariums and terrariums.

SCI 1.5B Predict and identify changes in materials caused by heating and cooling such as ice melting, water freezing, and water evaporating.

\*SCI 1.6A Identify and discuss how different forms of energy such as light, heat, and sound are important to everyday life.

*Math*

**PS** MATH 1.1A Apply mathematics to problems arising in everyday life, society, and the workplace.

**PS** MATH 1.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.

ELPS	CCRS Science	CCRS Math	CCRS Cross-Disciplinary
C2F, C5B	1E2A, 9F1A	6A1C, 6B2B	1E2C, 2D3A

**Engineering Design Loop:** *For more details, refer to the overview page.*

**Identify the Need:** Students will be challenged to design a simple way to use evaporation to desalinate water.

**Research the Problem:** Students will conduct research on evaporation using a KWL chart, poetry, a video, and movement.

**Develop Possible Solutions:** Students will view two teacher-created designs, use, and ask questions about each.

**Select the Most Promising Solution:** The class will decide between the two teacher-created desalination designs.

**Construct a Prototype:** Students will create in a small group the design decided upon by the class in this stage.

**Test & Evaluate:** The students will answer questions about their design, its function, and the materials used.

**Communicate their Design:** Together, students will create a class big book on their solar still design process.

**Redesign:** Students will brainstorm design changes that could help them “scale up” their design to create larger quantities of desalinated water.