

Discovering Patterns & Dimension

in the Sonoran Desert *post-activity*



When you visited Taliesin West, you experienced Frank Lloyd Wright's desert laboratory, a place where he and his apprentices experimented with many different materials of the desert, to build in harmony with the climate and many of the natural challenges of the desert. Wright and his apprentices were inspired by the majestic saguaro cactus and its ability to survive in the harsh desert environment for many centuries.

PART 1

Assign the students into engineering design groups. Have the students use the design process along with biomimicry, to help solve one of the challenges of the desert—low average rainfall. Design and then sketch a prototype of a new product that can collect and store water for long periods of time, located in isolated desert areas, keeping in mind the observations of the saguaro cactus.

PART 2

Have each group keep in mind the following criteria to follow when designing and sketching:

- Mimic the materials, color, and shape of the saguaro cactus
- How can you modify and improve the design of the structure?
- Considering the desert environment, how long would your structure survive?
- What would you name your new design?
- What scientific concepts have you learned about the saguaro cactus during your research?

PART 3 (optional)

If you'd like to extend this activity, have each group sketch their designs as an abstraction, using geometric shapes as a guide.

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AZ STANDARDS

Kindergarten: K.L1U1.6; K.L1U1.7; ET-S1-C4-01; ET-S2-C1-01;

First Grade: ET1-S1-C1-01; ET1-S1-C3-01; ET1-S2-C1-01;

Second Grade: ET2-S1-C1-01; ET2-S1-C3-01,02; ET2-S2-C1-01;

Third Grade: 3.L1U1.5; ET3-S1-C1-01; ET3-S1-C4-01,02;

Fourth Grade: 4.L4U1.1; ET4-S1-C1-01; ET4-S1-C2-01,02;

Fifth Grade: ET5-S1-C1-01; ET5-S1-C4-01,02; ET5-S3-CO2-01;

Sixth Grade: ET6-S1-CO1-01; ET6-S1-CO3-01,02; ET6-S2-CO-01;

Seventh Grade: ET7-S1-CO1-01; ET7-S1-CO3-02; ET7-S1-CO3-02;

Eighth Grade: ET8-S1-CO1-01; ET8-S1-CO3-02; ET8-S1-CO3-02

High School: ETHS-S1-CO1-01; ETHS-S1-CO3-01,02; ETHS-S1-CO4-01,02; ETHS-S2C2-PO1; ETHS-S4C2-PO2

NGSS STANDARDS

Kindergarten: K-LS1-1; K-2-ETS1-1; K-2-ETS1-2

First Grade: 1-LS1-1; 1-LS3-1

Second Grade: 2-PS1-1; 2-PS1-2

Third Grade: 3-LS4-2; 3-LS4-3; 3-5-ETS1-1; 3-5-ETS1-2

Fourth Grade: 4-LS1-1

Sixth-Eighth Grade: MS-LS2-5; MS-ESS3-3; MS-ETS1-4