



STEM in the lab

• Inspiring Idaho's future STEM workforce

STAR WARS TATOOINE DOME HOMES



GRADE LEVELS

This activity is appropriate for grades K-5.



MISSION

Build your own Tatooine Dome Home.



VOCABULARY

STAR WARS: Star Wars is an American epic space opera media franchise created by George Lucas. The saga began with the 1977 film and quickly became a worldwide pop-culture phenomenon.

GEODESIC DOME: Spherical structure that is made from a network of triangles



MATERIALS

- » 11 chewy candies (gumdrops, jelly beans or other semi-firm candy) or marshmallows
- » 25 round toothpicks

ABOUT THIS ACTIVITY

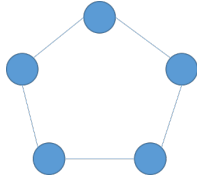
A long, long time ago, in a galaxy far away, a young boy named Luke Skywalker lived on Tatooine. Tatooine, is a beige colored, desert planet that appears in the fictional Star Wars series. It is inhabited by human settlers and a variety of other life forms, including Jawas and the Tusken Raiders. Tatooine is seen throughout the movies because it was the birthplace of Anakin Skywalker and the current residence of Obi-Wan Kenobi and Luke Skywalker.

Tatooine is usually very hot during the day and cold at night. During the day the temperature can get as hot as 130°F! Tatooine is also known for its brutal sandstorms. So how do Luke and the other inhabitants of Tatooine survive in this extreme weather? To combat the elements, the residents of Tatooine build geodesic dome shaped houses. Geodesic domes are interconnected triangles that are extremely energy efficient. Their shape promotes efficient air circulation, which helps to keep temperatures even throughout the house, so the occupants are cool in the day and warm at night. Their triangular shape also makes the houses extremely strong. They can withstand high winds, earthquakes and heavy snow.

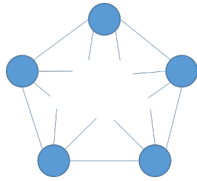
Another reason that Luke Skywalker has a geodesic dome for a home is that geodesic domes require less building materials than traditional homes do, making his home less expensive to build. All of these factors make geodesic homes ideal for people looking to build an environmentally friendly home on a budget. In this activity, you will become an engineer on Tatooine and build a simple geodesic dome using chewy candies and toothpicks.

INSTRUCTIONS

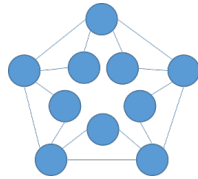
- 1 Attach five toothpicks together using the chewy candy to form a flat pentagon (five-pointed) shape. You should have a candy at each point and a toothpick along each edge.



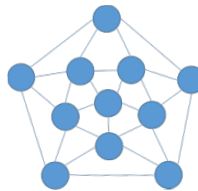
- 2 Poke two more toothpicks into each candy, arranging the new toothpicks so that they are pointing up.



- 3 Take five new candies and attach them to the top of the new toothpicks, putting two toothpicks into each candy, to form triangles. The pentagon should form the base of the triangle, and the new candies should form the top point. You should end up with five triangles this way.



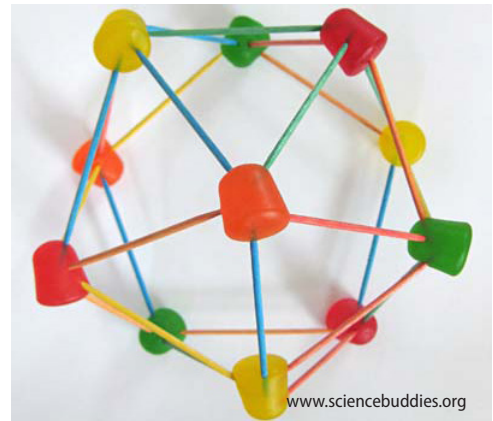
- 4 Attach a toothpick between the top points of the triangles you just made, connecting the triangles together. This uses five toothpicks, and will create another pentagon shape, this time at the top of the dome. Take five more toothpicks and poke one into each of the five candy that make up the top pentagon. Arrange the new toothpicks so that they are pointing up. Then poke all five toothpicks into a gumdrop in the middle, at the top of the dome.



- 5 Gently press down on the top of your geodesic dome. If it does not break, try carefully pressing down on it a little more. How strong is your geodesic dome? Will it be able to survive a Tatooine sandstorm?

THE SCIENCE BEHIND IT

A geodesic dome's design allows it to support a surprisingly large amount of weight compared to the structure's own weight and size. Because of this, you should have seen that the geodesic dome could easily support your hand as it pressed down on the top of the dome, even when you increased the pressure a little. You would need to apply a lot of pressure before the dome would fail. The struts (the toothpicks in the model you made) of a geodesic dome are arranged to make triangles. This rigid network of triangles distributes any forces applied to the top of the dome to the rest of the structure.



EXTENSIONS

- » Try doing this activity again but this time use long, wooden skewers instead of toothpicks. Is one geodesic dome stronger than the other? If so, which one is stronger and why do you think this might be?
- » The geodesic dome you made in this activity uses a relatively simple design. You could try making a more complicated design.
- » Does the triangle shape matter? Try using different shapes to build your structure.
- » What other base shapes can be used? Try a hexagon or an octagon.

RESOURCES

- » **Build a Gumdrop Geodesic Dome**
<https://www.sciencebuddies.org/stem-activities/geodesic-domes-gumdrops>
- » **Star Wars Rebels Wiki**
https://starwarsrebels.fandom.com/wiki/Star_Wars_Rebels_Wiki
- » **The Pros and Cons of Geodesic Dome Homes**
<https://www.2-10.com/blog/the-pros-and-cons-of-geodesic-home-homes/>
- » **The Impact and Importance of the Geodesic Dome**
<https://www.3blmedia.com/News/Impact-and-Importance-Geodesic-Dome#>

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