

Archaeology and Erosion Student Sheets

Part 1. Building Tikal Temple 1

The Tikal Temple 1 Map is was created by archaeologists using a laser scanner. Laser scanner uses laser beams to measure an object very precisely. These measurements can help archaeologists learn more about the pyramids and how the Maya constructed the pyramids. You will be using this map to construct your own scale model of a temple. Your sugar cube model will be used in Part 2 to conduct an experiment on erosion and its effect on monuments.

Tikal Temple 1 is one of the tallest pyramids at the site of Tikal. It is also known as the Temple of the Giant Jaguar or Temple of Ah Cacao. Temple I is a typical Mayan stepped pyramid and was built in approximately 730 AD. The pyramid is dedicated to Jasaw Chan K'awill, a king who ruled from 852-784 AD. His tomb is located in the temple, although archaeologists are still trying to determine if the pyramid was built specifically for his burial or if the pyramid was decided upon as his tomb after his death.

In contrast to Egyptian pyramids, Maya `step pyramids` served numerous functions other than tombs, and were constructed not from large, solid stone blocks but from smaller, cut stone blocks on top of a rubble-fill core. Also, new temples would often be built on top of older ones, encasing the older architecture within.

Temple 1 has 9 steps. Nine was an important number for the Maya and was mentioned often in Mayan mythology and on inscriptions. At the very top of the pyramid is a temple with an elaborate roofcomb. Temples were very important to the Maya and housed many religious ceremonies. The roofcomb is a heavily decorated part of the roof with many stone sculptures. The stone sculptures would have acted like a billboard, telling all visitors about the Mayan gods and kings.

1. Using the Tikal Temple 1 Map, you will be constructing a 1:3 scale model of the temple in sugar cubes.

1 sugar cube will represent 3 meters on the Tikal Temple 1 Map.

2. With your group, calculate the height and width of each tier of the pyramid in a 1:3 scale. Round your calculations to the nearest whole number.

3. After you have finished your calculations, discuss the results with a neighboring group.

Do you notice any patterns in length of the pyramid tiers? What does this tell us about the Maya?

4. Design the sugar cube construction of the top half of the pyramid. For your reconstruction, you will build the top 4 tiers of the pyramid and the temple at the very top of the pyramid. Draw your design separate sheet of binder paper. Calculate how many sugar cubes you will need. (Hint: to calculate the amount of sugar cubes you will need, find the area of each the pyramid tiers and add them together.)

5. Wrap a piece of cardboard with tin foil and begin constructing the pyramid on top of the cardboard. You will use glue and sugar cubes to construct the pyramid and follow the plan you drew above. When you are finished, carefully move the pyramid to a safe place and let dry. Be sure to write the names of your group on a piece of paper and tape it to the cardboard base of your pyramid.

Part II - Erosion at Archaeology Sites

The temples at Tikal are made of stone. Stone can be damaged by erosions. Erosion is wearing away of stone or earth by wind, water, sunlight and other geological processes.

Question: How does sun, water, and wind affect archaeological sites?

Hypothesis:

Materials:

Sugar Cube pyramid
Spray water bottle
Blow drier
Heat lamp
Ruler
Digital Camera (optional)

Procedure:

1. Each group will be assigned to test one aspect of erosion: water, wind, and sunlight.

Water Group

Day 1

1. Record any observations on the sugar cube pyramid. If possible, take a picture of the pyramid using a digital camera. When taking a picture, create a label with your group name, date, class period and "Day 1 -0 sprays of water"
2. Fill a spray bottle with water and set the spray bottle to mist. Spray the pyramid evenly with water. Spray the pyramid with a total of 20 sprays.
3. Record any observations in your notebook or on the worksheet. If using a digital camera, take a picture of the pyramid and label it with your group name, date, class period and "Day 1 -20 sprays of water"
4. Carefully move the pyramid to a safe location where it can remain undisturbed until the next class session.

Day 2

1. Repeat Steps 2-4 of Day 1

Day 3.

1. Repeat steps 2-4 of Day 1.

Wind Group

Day 1

1. Record any observations of the sugar cube pyramid, If possible If possible, take a picture of the pyramid using a digital camera. When taking a picture, create a label with your group name, date, class period and "Day 1 -no wind applied"
2. Using a blow drier, blow dry the pyramid evenly for 10 minutes. If using a blow drier with multiple settings, select the "cool" setting.

3. Record any observations in your notebook or on the worksheet. If using a digital camera, take a picture of the pyramid and label it with your group name, date, class period and "Day 1 -10 minutes of wind"
4. Carefully move the pyramid to a safe location where it can remain undisturbed until the next class session.

Day 2

1. Repeat Steps 2-4 of Day 1

Day 3.

1. Repeat steps 2-4 of Day 1.

Sunlight Group

Day 1

1. Record any observations of the sugar cube pyramid, If possible If possible, take a picture of the pyramid using a digital camera. When taking a picture, create a label with your group name, date, class period and "Day 1 -no sunlight applied"
2. Using a lamp, shine the light on the pyramid for 10 minutes.
3. Record any observations in your notebook or on the worksheet. If using a digital camera, take a picture of the pyramid and label it with your group name, date, class period and "Day 1 -10 minutes of sunlight"
4. Carefully move the pyramid to a safe location where it can remain undisturbed until the next class session.

Day 2

1. Repeat Steps 2-4 of Day 1

Day 3.

1. Repeat steps 2-4 of Day 1.

Observations/Results:

Conclusion:

