



JPL

★
★ *“\$40 Planetarium &
Story Writing Activity”* ★
★ A Classroom Activity for Teachers ★

★ **TEACHER GUIDE** ★

Note: This Guide is used with permission of the Educational Affairs Office of NASA’s Jet Propulsion Laboratory. For more information, contact Art Hammon (ahammon@jp.nasa.gov).

Rationale

The writing that students do in connection with an activity in science class is often helpful in the improvement of language skills. A recent study by Leslie Garrison and Olga Maia Amaral of San Diego State University, Imperial Valley Campus, showed marked improvement on school district and state writing proficiency exams among students involved in inquiry/activity based science with significant writing components.

Background

You can see about 3,000 stars overhead with your own eyes on a clear night in a dark place. People have always seen patterns of stars and imagined that they looked like earthly objects. Some of these patterns are familiar to you, such as the Big Dipper.

The International Astronomical Union has identified 88 regions of the sky for naming stars and within each, designated a pattern called a constellation. Other patterns such as the Big Dipper are not official and are called asterisms. Most constellation names are rather Eurocentric, having as a source Greco-Roman mythology and designations by early European explorers to the Southern Hemisphere.

But almost all cultures of the world have their own star patterns and stories. Books such as *Echoes of the Ancient Skies* by Dr. E.C. Krupp (Harper and Row, Publishers, New York, 1983, ISBN #0-06-015101-3) and *Earth is My Mother, Sky is My Father* by Trudy Griffin-Pierce (University of New Mexico Press, Albuquerque, 1992), present the night sky as well as daytime astronomy from a multicultural point of view.

Anyone can find his or her own pattern and give it a name and story!

What

1. A planetarium constructed from black plastic, duct tape, trash bag and fan;
2. Paper templates encouraging:
 - The design of a star pattern from a personal pattern of stars,

- An artistic rendering of the image, and
- The writing of a story to accompany the constellation.

These personal constellations are added to the top of the planetarium by punching with a ball point pen through the top of the plastic dome and letting light shine into the planetarium as an analog for star patterns. The student worksheets with their personal constellation and story can be placed on the wall as a kind of art gallery of student work.

Materials

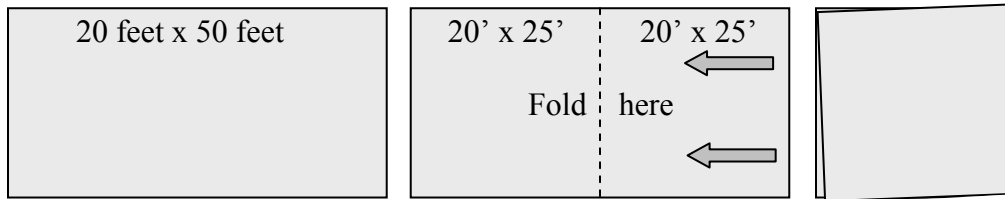
- 4 mil black plastic sheeting (thinner material lets too much light through). Size will vary depending on size of space and group (20ft x 25ft for a class, 20ft x 50ft for a large group).
- 1 large roll of duct tape.
- 1 large black plastic trash bag (to fit over fan).
- 1 window or floor level fan with extension cord.
- Washable markers (medium point, school safe).
- Ballpoint pens.
- Paper template worksheets of constellation and story (at least one per student; provide more for students that wish to start over). See samples.
- Step stool so small children can reach high on the dome.

Construction of the Planetarium:

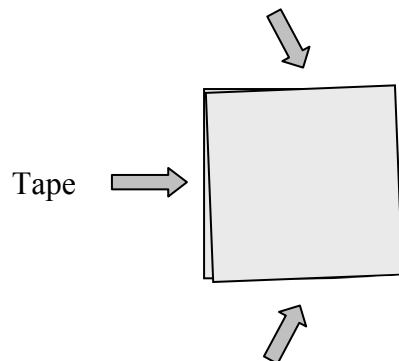
Let students help do this.

Building the Planetarium Dome

1. Open the roll of black plastic, unroll the plastic and unfold until the full size is lying on the ground. This will take a big space, perhaps a clean space outside. *The ground needs to be smooth and level underneath the planetarium.*
2. Have students take the corners and fold the plastic in half the long way.



3. Tape the open sides with duct tape being sure to roll the edges together a little so that there will be no “light gaps”



Building the Dome Inflation System

4. Using scissors, opposite from the end that will have the entrance/exit, cut a hole that is the size of the open end of the trash bag.
5. Cut the bottom out of the trash bag, insert it in the hole in the planetarium and duct tape it to the plastic of the planetarium.
6. In the same way, insert the unplugged fan in the other end of the trash bag and duct tape them together so that the air from the fan blows through the trash bag tube into the planetarium.
7. Now plug in the fan and the planetarium will inflate.

Building the Entrance/Exit

8. Access to the planetarium may be accomplished by a simple slit made by the teacher with scissors or the creation of more elaborate cardboard doors with duct tape hinges. An entrance and exit opening separated by a few feet is advised. In an emergency, the teacher can always easily open up a side with scissors for exit.
9. Carpet on the bottom of the planetarium will prevent slipping on the plastic or an oval can be cut out of the bottom of the planetarium for standing.

Job Descriptions When Running the Planetarium (3 persons total at all times)

- One supervisor inside the planetarium to monitor behavior and the total number of people inside, help with hole punching, and use flashlight to guide walking and viewing. In case of electrical failure, this person will guide participants out of the planetarium. The dome will remain inflated for several minutes allowing for orderly exit through the normal doors but the plastic can easily be cut with scissors for emergency exiting. Large cuts will deflate the dome more rapidly.
- One exterior manager to help people in and out of the planetarium from the outside.
- One materials manager to supervise fan, electricity and general condition of the planetarium (generally from the outside).

The Writing Connection

After the students have written their stories and designed their constellations, they may add their design to the roof of the planetarium by punching through the plastic from the inside with a ballpoint pen. After all star patterns have been placed on the planetarium roof, a time for sharing of stories is appropriate. A flashlight may be needed to help students read their stories from their worksheets. When each story has been concluded, some recognition is appropriate (mild applause) and discussion if desired.

When all stories have been read, a discussion about themes of the stories is interesting. Experience has shown that human nature tends to cluster stories around three themes:

- Stories about persons who are friends, famous, familiar, or infamous;
- Historical events in students' lives or community;
- Moral or societal lessons that need to be shared and remembered (ex. Kind behavior toward others is often rewarded with returned kindness).

Safety Notes

- Although the interior volume is large and it does not get very dark inside, teachers should be aware of signs of claustrophobia or unease among students.
- At no time should an open flame be allowed anywhere in or near the outside of the dome.

“Stories in the Sky”

Education Office- Jet Propulsion Laboratory
ahammon@jpl.nasa.gov

You can see about 3,000 stars overhead with your own eyes on a clear night in a dark place. People have always seen patterns of stars and imagined that they looked like earthly objects. Some of these patterns are familiar to you, such as the Big Dipper.

But anyone can find his or her own pattern and give it a name and story!

Use the space below to make a pattern of stars, connect them with lines, even make a drawing with colored markers that shows what you imagine the star pattern looks like.

Then write a short story to describe your meaning for this new star pattern. When you have finished, someone will help you enter our “planetarium” and you can put your star pattern in the top of our planetarium so the light can shine through, making it look like a night sky full of stars.

My Pattern of Stars

The name of my pattern of stars _____

My Story:
