Inflatable Planetarium

The use of a planetarium can greatly excite young students about the universe around them. In addition to being cool, universe science is a standard for several grade levels. This kit will allow the instructor to teach standards in a clever and engaging way.

This document will contain several different activities from which the teacher can choose and/or modify or they can use the equipment for their own activity.

Activities and Worksheets Available:

1. **Constellation Information Introduction Sheet**
    - No activity but is a sheet with introductory information on constellations
2. **Constellation Project**
    - This activity is a take home research project about a constellation that culminates in a planetarium experience with public speaking.
3. **Design Your Own Constellation**
    - This activity is part of the project or is a stand-alone in which the student designs a constellation and writes a mythology story about the drawn constellation. It is one worksheet
4. **Flashlight lab with two portions**
    - This activity allows students to make their constellations whether the researched one, the made up one, or both and project them onto the planetarium sky.

Planetarium Use Instructions

Inflating the Planetarium:

1. Plan at least 15 minutes each for set up and take down
2. Ideally there will be at least two adults to assist in the setup, takedown, and management of the planetarium over the course of the lab. It is essentially a gigantic plastic pillow that is inflated with a fan on one end and a slit door
3. This lab requires a large, dimly lit, indoor space. Outside is not a good place because it tends to be very bright and more importantly the roughness of the ground could puncture the planetarium. This space needs to be at least 35x30ft. It will be able to fit a whole elementary class inside
4. Carefully unfold and lay the dome flat in the space with the fan tube on the *bottom* side and the standing fan facing the interior of the dome
5. Turn the fan on hi and allow the dome to inflate. It might be helpful to have someone hold up the corner of the bag above the fan and the door slit on the other side closed for the duration of the inflation period.
6. Keep the fan on high until ready to deflate

Using the Planetarium:

1. There are to be no shoes inside the planetarium or clothing with hard metal or plastic protrusion
2. Once the planetarium is inflated and rules explained the students can begin to enter slowly and carefully.
3. The students should enter and sit down quietly and wait for instructions
4. Begin the lab you have chosen to do

Packing Up the Planetarium:

1. When finished turn off the fan and hold the door open so as to let as much air out as possible
2. Be careful when folding and rolling the planetarium to not rip or tear it. It is fragile.
3. Make sure everything is put away in the box neatly and return to the CSO promptly

Constellations

Constellations are patterns in the sky. Think of them like a gigantic connect the dots. Almost all civilizations throughout history have looked up in the sky and traced patterns of the bright stars in the sky. Usually there was a story with each picture pattern helping to pass on history and stories to younger generations. Each culture has their own stories and patterns. Today astronomers (scientists who study outer space) officially recognize 88 constellations, most of which are based off of Greek Mythology.

Most of you have probably heard of the *Big Dipper*. The *Big Dipper* is part of a constellation called *Ursa Major* or the *Big Bear*. Throughout the years, this constellation has been known by many names such as: the plough, a drinking gourd, a coffin, and the seven kings. These star patterns are not only helpful for passing down history but for finding your way around the night sky. Constellations give astronomers a point of reference for areas of the sky they have been studying. They can say that the asteroid they saw was in the constellation of *Leo* or the black hole they are studying is located in *Hercules*. This does not mean they relate to the exact stars that make up the pattern in the constellations but it does mean that the asteroid or black hole is in the area around it.

Astronomers use a tool called a star chart to find and identify constellations in the sky. The star chart tells astronomers what constellations should be in certain areas of the sky at specific times of the year and night. If astronomers want to look at a star or planet in more detail than they can see with their eyes, they use a tool called a telescope.

Project Constellation

Teacher Guide

This project will allow the student to pick a constellation, learn about its mythology and its place in the sky as well as do some creative writing.

This project has four worksheets:

- Design your Own Constellation
- Constellation Flashlight Lab
- Constellation Fact Sheet
- Flashlight Assembly Instructions

It is possible to do only some of the worksheets depending on the time allowed. This lab can be done as a project spread out over days ending in a planetarium day with the flashlight portion of the activity or it can be adapted to a one-class lesson with just the flashlights. Students can complete the worksheets and/or have them put all of the information into a project visual with a poster or tri-fold board. The *fact sheet* research component can be done at a different time or never if the teacher so chooses.

Students should be given a list of the major constellations and allowed to choose one to research. It is preferable that they pick one that they can see at their latitude and hemisphere, but the season doesn't matter.

The invented constellation needs fit into the mythology of the chosen constellation. For example if *Pegasus* was chosen as your constellation they could design the Gadfly that bit him in the mythology story. For younger students the teacher may choose to give the students full creative license instead of focusing on the mythology.

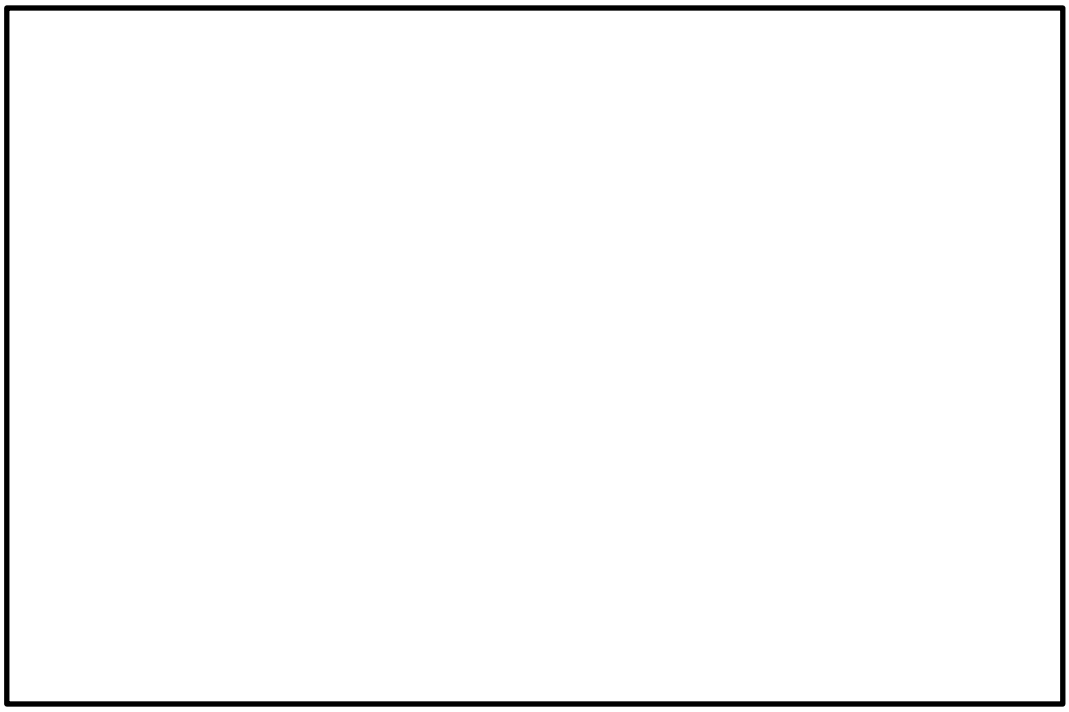
Design Your Own Constellation Lab

Student worksheet

Name:_____

Use the space below to make a star pattern. Draw the Stars, connections and background picture. Then write a short story to describe the meaning behind this new star pattern.

My Star pattern:



My Story :

_____

_____

_____

_____

_____

_____

_____

Constellation Flashlight Lab

Student worksheet

Name:_____

In this activity you will get to enter into a planetarium. A planetarium is a dark room with a rounded roof that is used to model the night sky. There is often a projector in the middle of the planetarium that projects the stars onto the ceiling like the sky. This planetarium is made of plastic and very fragile and expensive so it is to be treated with care.

For this lab you will be assigned a constellation and you will show it to the class on the ceiling of the planetarium. Start by drawing your constellation here:

Constellation Name : _____

Constellation Fact Sheet

Please list some facts about your constellation. You could have found these in a book, online, or another approved resource. You will be presenting these facts to the class. Some of the facts are required information and the remaining info is any other interesting information you found out.

Hemisphere: _____

Season Visible: _____

Largest Star's name: _____

Is it in the zodiac? : _____

Fact 1:

_____

_____

_____

_____

Fact 2:

_____

_____

_____

_____

Fact 3:

_____

_____

_____

_____

Flashlight Assembly Instruction

Step 1: Get a black cupcake liner. You might need two so the flashlight doesn't shine through

Step 2: Draw your constellation on a smaller scale with just the dots and lines on the *inside* of the cupcake liner. A white crayon or silver sharpie can be used, but a pencil should be sufficient

Step 3: Using a very sharp pencil *gently* poke small holes where the stars should be. These holes do not need to be large; the size of a mechanical pencil lead is wide enough.

Step 4: Place your liner over the flashlight with the flashlight shining into the dots as if the flashlight handle is the frosting on the cupcake. The flat lens where the light comes out should go against the bottom of the wrapper.

Step 5: Secure the liner to the flashlight with a rubber band when it is your turn to shine the constellation on the planetarium.