Teacher's Guide for:

Shapes in the Sky

Objectives:

- To recognize simple shapes with in a complex picture.
- To locate groups of stars in the sky that makes shapes.
- To find some of the familiar constellations in the current sky.
- To be able to locate the North Star in the sky.

This show conforms to the following Illinois state science standards: 12.F.1a, 12.F.2b, 12.F.2c. Next Generation Science Standards: 1.ESS1.1, 5.ESS1.2

Brief Show Summary:

Young students will first find shapes within a drawing and then in a random set of dots. This will be done on the dome and in class before you visit. We will set the Sun and peer at the stars in the current night sky, first finding familiar shapes, like squares and triangles, and then locating some familiar constellations of the season. The Big Dipper and the North Star are common to each season. Then we watch a short show called "Space Shapes." If desired, we can also hear a few legends of the stars in our current season.

Pre-visit Discussion & Activities:

1. Practice seeing constellations without the lines by punching out holes in an opaque sheet of construction paper and putting them on a overhead transparency projector. What different things does your class see? Start out simple with triangles and squares. "How many dots does it take to make a triangle?"
2. Try to find patterns in the clouds overhead. Do these figures really exist?
3. Duplicate a star chart from the planetarium web page (see below) and distribute to the class. What do you see? Possibly even use it outside beneath the "real" sky. The circle is the horizon and the center of the circle is the point overhead. Whatever direction you are facing, put that direction on the chart at the bottom, closest to the ground.
4. Discuss the idea of something being "round." A baseball is round but so is a pizza. What does it mean to be "round?"

Post-visit Discussion & Activities:

1. Make up your own constellations from existing star patterns. From there students can create their own myths and stories.
2. Find Polaris in the night sky and measure its altitude. This may be accomplished by either using your fist (a fist held at arm's length is about ten degrees) or build a quadrant by attaching a straw to a protractor and adding a hanging weight. From Central Illinois, the North Star should be about 40 degrees above the northern horizon.
3. The constellations are figments of our imagination; the stars in them usually don't have any close connection to their neighbors. Build a 3D constellation by first researching the

distances of the stars in the group and then creating a scale. Burnham's Celestial Handbook is an excellent source. Here are the distances to the Big Dipper Stars:

#	Name		Distance (light years)
1	Dubhe	(DUBB-be)	105
2	Merak	(ME-rack)	80
3	Pheeda	(FECK-duh)	90
4	Megrez	(ME-grez)	65
5	Alioth	(ALLEY-oth)	70
6	Mizar	(MY-zar)	88
7	Alcor	(AL-kor)	89
8	Alkaid	(al-KADE)	210

Try one inch = one light year in your classroom.
4. Research star legends and myths of different cultures and report to the class. The local library should have some resources to accomplish this.

Vocabulary

Constellation   Big Dipper   Ursa Major
Polaris

Internet Resources:

- Staerkel Star charts (to duplicate): https://www.parkland.edu/Audience/Community-Business/Parkland-Presents/Planetarium/Educational-Resources/Star-Charts
- Shape matching game: http://www.kidsastronomy.com/fun/shape_match.htm
- StarChild: https://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html