Environmental Science Institute
THE UNIVERSITY OF TEXAS AT AUSTIN

1 University Station C9000
Austin, TX 78712
(512) 471-5847
www.esi.utexas.edu

Starlight, Starbright, Pictures of the Night

Lesson plan for grades K-2
Length of lesson: 40-50 minutes
Adapted by: William Oakley, Environmental Science Institute, Feb 7, 2012
Authored by: Curriculum Associates, Inc. Earth Science Activities (KSAM)

SOURCES AND RESOURCES:

- Star Pictures
  http://www2.semo.edu/mast/mlc/star%20pictures.pdf
- History of the Big Dipper
  http://www.allbestarticles.com/arts-and-entertainment/humanities/history-of-big-dipper.html
- History of Draco
  http://www.mallorcaweb.net/masm/Dra1.htm
- History of Cepheus
  http://www.mallorcaweb.net/masm/Cep1.htm
- Constellation Quiz
  http://www.uni.edu/morgans/ajjar/Constellations/quiz/index.html

POTENTIAL CONCEPTS TEKS ADDRESSED THROUGH THIS LESSON:

§112.11. Astronomy Grade K: 1A,2ABDE ,4AB,8C
§112.12. Astronomy Grade 1: 1A,2ABDE, 4AB,8C
§112.13. Astronomy Grade 2: 1A,2ABDE ,4AB

PERFORMANCE OBJECTIVES:

Students will be able to:

- Define what a constellation is, and what they are made of
- Describe the importance of constellations in the past and present day (science and society)
- Determine a mysterious picture using other pictures as reference

MATERIALS:

- Pencils (One per Student)
- Named Constellation Worksheets (Attached, one per student)
- Mystery Constellation Worksheets (Attached, two per student)

CONCEPTS:

A star is a giant ball of hot gas that exists in the universe that gives out light. Constellations are a group of stars that look like a mythological being, animal or item. Not all constellations look the same however, as some are

1 University Station C9000
Austin, TX 78712
(512) 471-5847
www.esi.utexas.edu

much harder to see then others. It should be noted that the Big Dipper is not actually an "official" constellation by astronomers, and is really a part of Ursa Major. Because constellations are based off of notions of various cultures, constellations have different names and play different roles in various societies. This will be explored during this activity.

PREPARATION:
Students will need to have their pencils ready before the Engage section. No worksheets should be handed out until the appropriate time to prevent students from being distracted or trying to work too far ahead of everyone else unless you are comfortable with that. Worksheets should be ready to distribute when needed.

ENGAGE:
Gather the students around in a circle (or however the teacher feels is appropriate to remove all distractions from the students in a "story/discussion time format"). This brief activity should get the students excited about the prospect of stars and eventually leading to telling them about groups of stars, as detailed below. (It should be noted that these questions are general guidelines to get the students to thinking about the topic)

- What is a star and what is it made of?
  (This question introduces stars as a central topic of discussion)
- What do you think makes the star shine?
  (This question probes the class to think about specific qualities of stars)
- Have you ever looked up at the stars and invented pictures or patterns with them?
  (This question sets the stage for introducing Constellations)
- Based on what you see in the night sky, what kind of stars can you use to invent pictures or patterns?
  (This question is designed to get students to make distinctions between bright and dimmer stars within a group of them)

Note to teachers: After this the students should return to their seats and be ready to start the activity.

EXPLORE: (Note: the activity is designed to be done in step by step format, but it is possible to review all instructions first and then let the students work at their own pace. This is left up to the discretion of the teacher)

1. The teacher will pass out one copy of the Mystery Constellation to each student. Students are to connect the stars into whatever they think the pattern of stars looks like. Note that there is no correct answer here, as the purpose of this stage is to engage the imagination of the students. The box diagram that comes with the sheet is merely an example and students are encouraged to come up with something more than just a box.
2. Students should then name their stars with a short explanation (one or two sentences) about why they named their constellation that name.

1 University Station C9000
Austin, TX 78712
(512) 471-5847
www.esi.utexas.edu

3. The teacher will then distribute the Cepheus, Big Dipper and Draco constellations to each student. Students are to use the little diagram in the upper left corner as a guide to try to find these real life constellations. The students are encouraged to help each other out and the teacher should encourage the students to answer their own questions.

EXPLAIN:

Assign one student from a group (more at the teacher's discretion) students from each group to present their constellation on the DocCam. Give each group of students 5 minutes to prepare. If there are more than 3 groups, you can either combine groups for presentations or randomly choose students to pick it. (This is at the discretion of the teacher). While the students are presenting their works, ask them these questions:

- What do you think your constellation looks like?
- Does this looks like anything else, and if so, does it name anything?
- Does anyone else see a different pattern on this constellation?

The teacher should then explain the origin of the particular constellation to the class. These origins are found in the resources section. The teacher should explain in particular the story of the Big Dipper and how it has been used as a navigation beacon by many societies to find Polaris.

ELABORATE:

This activity requires a computer with internet access and java hooked up to a projector/Doc cam. Access the Constellation Quiz website located in the resources section. This website has various star maps of constellations throughout the year. Instead of using the quiz as it was intended, this online interactive quiz can be used in another way, as described below.

Pick one of the listed seasons, and turn off the "lines". Have students volunteer to come up and "connect the dots" with what they think is a constellation. You can then turn the lines on to show the students what the official constellations look like. Alternatively, you can leave the lines on and have the students name each of them on screen.

Either of these methods allows the students to expand upon what they learned about constellations and apply them in a real life situation. A final method to expand upon what they know is to actually partake in the quiz, letting the class guess where the constellation is.

Environmental Science Institute
THE UNIVERSITY OF TEXAS AT AUSTIN

1 University Station C9000
Austin, TX 78712
(512) 471-5847
www.esi.utexas.edu

EVALUATE:

The teacher can give a short post-assessment questionnaire:

Name:_____

Date:_____

1) What are constellations made of?

2) Name all three constellations that were talked about in class

3) Name some of the different names for the Big Dipper used by various societies

Environmental
Science Institute
THE UNIVERSITY OF TEXAS AT AUSTIN

1 University Station C9000
Austin, TX 78712
(512) 471-5847
www.esi.utexas.edu

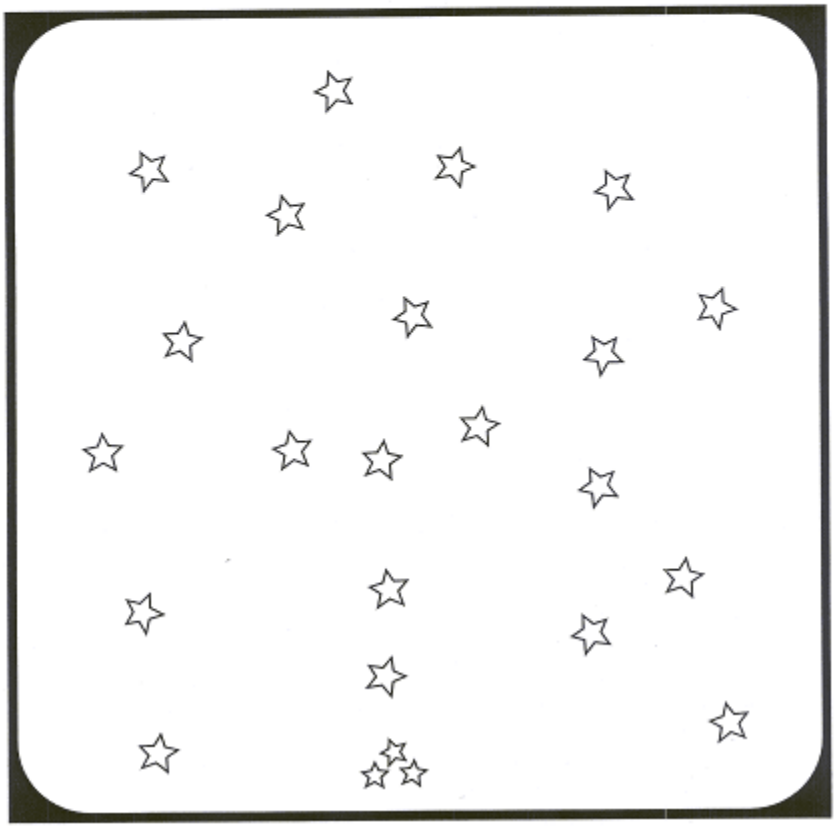
MYSTERY CONSTELLATION

Name_____

Figure name or description: _____

_____

Example



Environmental Science Institute
THE UNIVERSITY OF TEXAS AT AUSTIN

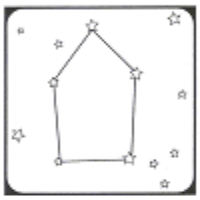
1 University Station C9000
Austin, TX 78712
(512) 471-5847
www.esi.utexas.edu

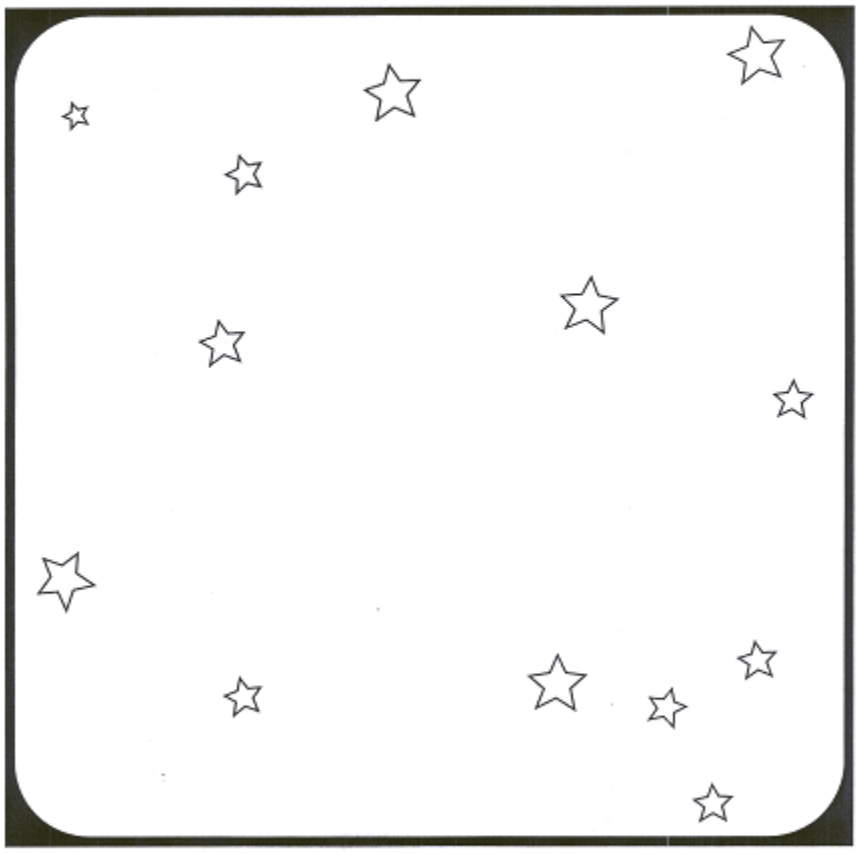
ACTIVITY 41

STAR PICTURES

CEPHEUS

Name _____





Environmental Science Institute
THE UNIVERSITY OF TEXAS AT AUSTIN

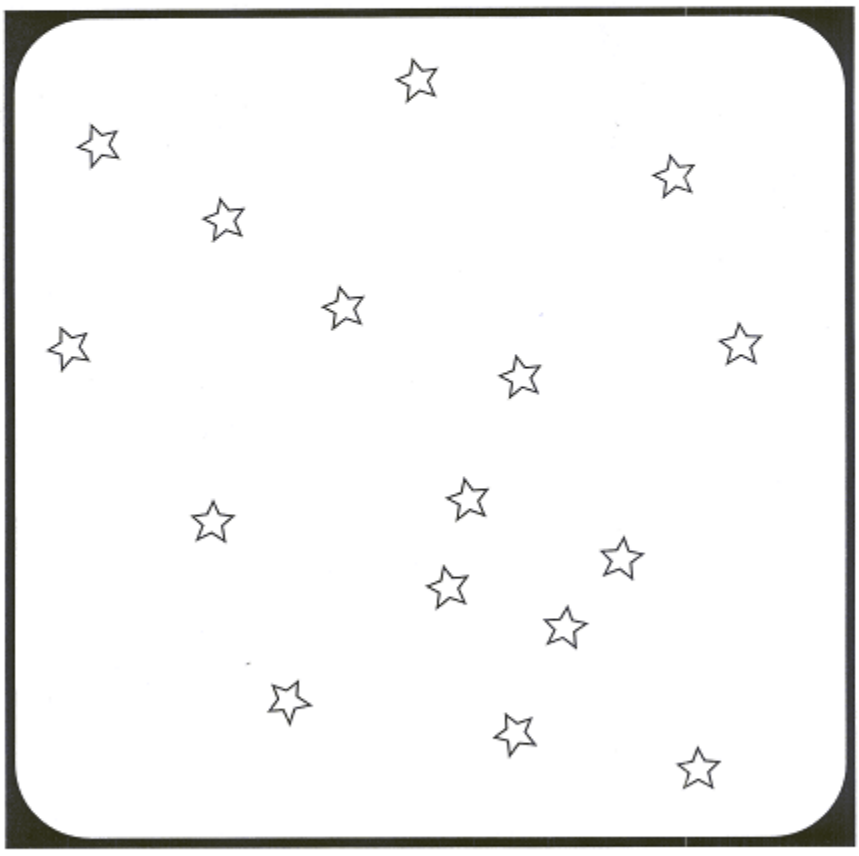
1 University Station C9000
Austin, TX 78712
(512) 471-5847
www.esi.utexas.edu

ACTIVITY 41

STAR PICTURES

BIG DIPPER

Name_____



Environmental Science Institute
THE UNIVERSITY OF TEXAS AT AUSTIN

1 University Station C9000
Austin, TX 78712
(512) 471-5847
www.esi.utexas.edu

ACTIVITY 41

STAR PICTURES

DRACO

Name _____