

# Stars and Constellations

An AskERIC Lesson Plan

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**School/University/Affiliation:** University of Pittsburgh at Johnstown

**Date:** September 8, 2003

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**Grade Level:** 2, 3

**Subject(s):**

- Science/Astronomy
- Science/Space Sciences

**Duration:** 50 minutes

**Description:** This lesson introduces students to stars and constellations. Students will create their own constellations using glow in the dark stickers and black poster board.

**Goals:** Pennsylvania Academic Standards for Science and Technology :

*3.4. Physical Science, Chemistry and Physics*

D. Describe the composition and structure of the universe and the earth's place in it.

**Objectives:**

1. Students will be able to define *star* and *constellation* .
2. Students will be able to describe how constellations are named.
3. Students will be able to identify that star patterns are a part of a constellation.
4. Students will be able to identify specific constellations.

**Materials:**

- I Didn't Know That the Sun is a Star by Kate Petty (1997) Connecticut: Copper Beech Books
- black poster board
- glow in the dark stars
- Scotch tape
- white chalk
- poster board examples (teacher-created)
- vocabulary on poster board strips (teacher-created)

## **Vocabulary:**

1. *star* - A hot rotating ball of gas that creates its own light.
2. *constellation* - A group of stars that forms a pattern in the night sky.
3. *star pattern* - A group of stars that forms a pattern within a constellation.
4. *Ursa Major* - Great Bear; the Big Dipper is a star pattern in it.
5. *Orion* - The Hunter; seen in December.
6. *Taurus* - Bull; 1 billion years old.

## **Procedure:**

Introduce stars and constellations through a book: I Didn't Know That the Sun is a Star .  
[ **Author's Note:** The book includes a different fact on each page. Information is given about the sun, moon, the nine planets, and black holes.]

Ask students what they already know about constellations and stars. Introduce the following vocabulary words: star, constellation, star pattern, Ursa Major, Orion, and Taurus. Describe how constellations are named; different cultures have identified and named star patterns. The Northern Hemisphere' s constellations are named from Greek and Roman mythology. The Southern Hemisphere' s constellations are named from instruments, objects, and animals that explorers encountered. The constellations were named between 1400-1700 A.D.

Describe specific constellations. There are currently 88 constellations! Some common constellations are: Ursa Major, Orion, and Taurus. Ursa Major includes the star pattern Big Dipper; Ursa Major is the shape of a bear. Orion, known as the hunter, is named for a Greek god. Orion is known for the belt in the center of the constellation, seen in December. Taurus is the Greek sign for the bull. It is one billion years old and is a visible constellation. Have students review vocabulary. Ask students to come to the board and match the word to the definition.

### *Activity:*

Students will be put into groups of four. Each group will receive one piece of black poster board, a bag of glow in the dark stars, one piece of white chalk, and tape. Each group will be asked to construct their own constellation in any shape they choose. The groups will use tape to apply the stars to the paper, name their constellation, and describe what they created with their shape. When students are finished, each group will present their constellation to the class and describe why they chose the shape.

**Assessment:** Conduct a review of the lesson' s content. Ask students a variety of questions to reinforce the new information. [Is the Big Dipper a constellation? What is a constellation? How old is the constellation Taurus? What is a star? ] (Teachers may want to construct a review worksheet.)

## **Useful Internet Resources:**

\* [American Association for Armature Astronomers](http://www.corvus.com/con-page/winter/ori-01.htm)  
<http://www.corvus.com/con-page/winter/ori-01.htm>

\* [Orion Constellation](#)

[http://www.seds.org/Maps/Stars\\_en/Fig/orion.html](http://www.seds.org/Maps/Stars_en/Fig/orion.html)

\* [Taurus Constellation](#)

<http://www.crystalinks.com/taurus.html>

\* [Ursa Major](#)

[http://www.astro.wisc.edu/~dolan/constellations/constellations/Ursa\\_Major.html](http://www.astro.wisc.edu/~dolan/constellations/constellations/Ursa_Major.html)

\* [Pennsylvania Academic Standards for Science and Technology](#)

<http://www.pde.state.pa.us/k12/lib/k12/scitech.pdf>

## **Brown Bag Science**

An AskERIC Lesson Plan

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**Author:** Judy Adair, Spring Creek Elementary, Broken Arrow, OK

**Date:** May 1994

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**Grade Level(s):** 1, 2, 3, 4, 5

**Subject(s):**

- Science/Physics

**OVERVIEW:**

This is a hands-on science investigation on electricity. Students learn through the discovery method how electricity works. The student' s natural curiosity and sense of exploration will enable them to explore and learn on their own with little input from the teacher.

**PURPOSE:**

The purpose of this investigation is to introduce students to the concept of electricity and dispel any fears they may have that they don' t understand the concept. This is excellent for girls, who often feel that they don' t or shouldn' t understand electricity as well as boys.

**OBJECTIVES:** As a result of this activity, the students will:

1. Be able to draw and explain how an electrical circuit works.
2. Be able to define and use vocabulary associated with electricity. Vocabulary: circuits, electrons, force, conductors, switch, insulation
3. Be able to construct a simple circuit and a parallel circuit.
4. Be able to make an electrical motor work and add a switch to turn it on and off.

**RESOURCES/MATERIALS:** All items can be bought very inexpensively at Radio Shack or from Edmond Scientific Elementary Catalogue.

## ACTIVITIES AND PROCEDURES:

1. The teacher will prepare ahead of time a kit for each two or three students. If students work in larger groups, some will not get hands on experience. Each kit will include a brown lunch sack, one C cell battery, two insulated copper wires, one battery holder and two brass battery clips, one small flashlight bulb and socket. All these items must be separate and in random order in the bag. The bag must be closed, sometimes I close it with one of the copper wires like a twisty.
2. Give each pair of students a bag and allow 10 minutes for exploration. During this time the teacher must remain quiet unless asked a question. The students will be very busy trying to find out what to do with the contents of the bag. Do not give any clues as to use of contents. This is exploration time.
3. Before the 10 minutes are up some students will have undoubtedly have made a simple circuit with the contents of the bag. At this time you can stop for discussion. Have the students explain what they did so others can follow. You can now talk about the concept of electricity, the flow of electrons through a conductor , discuss what things are conductors, etc. Discuss where the electricity comes from and where it goes, how does it make the light bulb light. Discuss how the battery stores electricity. How do we know that electrons are flowing?
4. After all students have been successful with the simple circuit, each pair must draw what they have done in their science log or on a piece of paper. Older kids will label all the parts of the circuit, etc.
5. At this time, I give each pair of students a second battery and let them experiment. Does the second battery change anything? Does the light get brighter or dimmer? Does the way the batteries are connected make any difference in the way the light works. Try different ways of connecting the batteries. Some students will make a parallel circuit. At this time stop and have the students tell what they did. Discuss the concept of parallel circuits. Each pair of students draw what they have done.
6. A follow up activity if you have time is to have switches available. For those students that finish quickly, they get a switch. See if they can connect it into the circuit to make the light come on and off. Discuss how electricity flows. Why does the electricity not cross over the switch when it is open? Does electricity jump? Again, each pair must draw what they have done. This completes the thinking process and makes the learning more personal.
7. Electrical motors can also be added. Students enjoy making small fans out of the motors. Each pair of students can exchange their light bulb and socket for a small electric motor and try to connect it into the circuit. Torn or cut paper makes great fan blades. Let the students experiment to find the best size and shape to make the fan go very fast.
8. The role of the teacher in this activity is to be a facilitator. Please refrain from your urge to teach. In this activity, students discover the concept of electricity. The less you show and tell the better.

### **TYING IT ALL TOGETHER:**

1. Check each pair of students diagrams and leave small personal messages so they will know that you have looked at what they have done.
2. Encourage all students to share what they have learned with other students and parents.
3. I have done this activity with students in grades 1-5 and all have learned and had great fun doing so. For the younger students their drawings will be less sophisticated and you do not need to dwell on vocabulary. With older students, they will need to label and use the vocabulary correctly. Most students are so eager to get hands on experience in science and with this activity, all students can experience success.

# A New Way to Tell Time

An AskERIC Lesson Plan

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**Submitted by:** Karen Veches

**Endorsed by:** Dr. Don Descy, Mankato State University

**Date:** October 23, 1996

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**Grade Level(s):** 2

**Subject(s):**

- Interdisciplinary

**Description:** The students will learn to look at a clock as though it had two time lines.

**Goal:** The students will have a better concept of time.

**Objectives:**

1. The students will place themselves in the shape of a clock and verbally tell the class what time it is when other students use their arms as hands of a clock.
2. The students will draw clocks representing the time that they get up, eat lunch, leave school and go to bed.

**Background information:** This is a good lesson to use as an introduction to telling time or as a review for older students. It helps to give students a hands on activity. They can visualize and be part of a clock. The lesson may be better suited for smaller classes.

**Materials:**

- chalkboard
- pencils
- paper

**Procedures:**

Tell the students that there are two number lines on the clock. Ask them what they might be (hours & minutes). The large numbers represent the hour and the little dashes represent the minutes. The hands on the clock point to either the minutes or the hours.

The small hand represents the minutes and the big hand represents the hours. Make sure they understand that the hour hand represents the hour that was last past even though the hand does not point directly at the hour. This may be a good time to talk about the fact that there are 5 minutes between each hour so you can multiply the number that the minute hand has just passed by 5 and add up the remaining dashes to figure out the minutes.

Have 12 students arrange themselves as a clock. Have two students in the center of the clock be the hands of the clock. Students can take turns calling out different minutes, hours, or complete times and the 'hands' need to point to the proper numbers. You can rotate the hands and the people calling out numbers. Make sure to remind them that they are representing two number lines.

**Assessment:**

After you are certain they understand the concept of telling time have them go back to their seats. They will then draw clocks representing key times of their day like when they get up, go to lunch, their favorite TV show is on, school is out, and when they go to bed.



## Story Starters

An AskERIC Lesson Plan

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**Author:** Frances Vitali

**School or Affiliation:** Lake Valley School, Crownpoint, NM

**Endorsed by:** These lesson plans are the result of the work of the teachers who have attended the Columbia Education Center's Summer Workshop. CEC is a consortium of teacher from 14 western states dedicated to improving the quality of education in the rural, western, United States, and particularly the quality of math and science Education. CEC uses Big Sky Telegraph as the hub of their telecommunications network that allows the participating teachers to stay in contact with their trainers and peers that they have met at the Workshops.

**Date:** May 1994

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**Grade Level(s):** Kindergarten, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

**Subject(s):**

- Language Arts/Story telling

**Overview:**

Children enjoy telling stories as much as they enjoy listening to them. Sometimes simple props such as masks, puppets and costumes take the attention away from the student so s/he can focus on the content and telling of the story. In using every day objects as props, students become more relaxed to let their story unfold naturally and creatively while others (the audience) enjoy the visual representations as well as the oral delivery.

**Objective(s):**

Students will be able to:

1. Orally tell different kinds of stories using the assistance of props.
2. Be a performing storyteller as well as a receptive member of the audience.

**Resources:**

**Teacher:** box, container, or paper bag

**Students:** odds and ends to contribute for prop box

### **Activities and Procedures:**

1. Explain that not all stories are written down. Ask students for examples of stories they know are not written in books (oral history, family stories, etc.). Optional - Tell the story, "Knots on a Counting Rope" by Bill Martin and John Archambault as an example of a family story.
2. Ask students to think of the many different and unusual ways you can tell a story (mime, poetry, theater, plays, dance, ballet, etc.).
3. Take an empty box and have each student contribute something small to put in the box - pencil, button, penny, string, bobby pin, tissue, etc. (anything they freely are willing to give up for a while or are willing to donate without wanting it back).
4. Suggest that just as an actor/actress on stage has props and scenery, you are going to tell a story using the objects in the box as the props and scenery for **your** story.
5. Tell a short story using some (not all) of the objects from the box as you tell the story to the students.
6. Explain that all students will have a chance to tell a story using the props in the box.

### **Tying It All Together:**

Storytelling is a special activity that may be reserved for special times or for all times keeping in mind respect for the storyteller and the audience. A ritual of lighting a candle during storytelling time can be observed.

### **Variations:**

Students in the audience can illustrate stories being told stories may be told according to specific genre: Mystery, Horror, Comedy, Fiction, Biographical, Autobiographical, Science Fiction, etc.

#### ***Story Improvisation***

- the telling of a story will include a given condition, setting, situation, or theme, etc.

#### ***Story Relay***

- One student begins a story and another student can pick up the story where the previous student left off, followed by another student until the end of the story.

Story telling is an effective means of communication. I heard a storyteller once say, ' When you read a book, the audience connects with the pictures in the book. When you tell a story, the audience connects with you.'

# Space: Your Guide to Location Orientation and Travel

An AskERIC Lesson Plan

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**Submitted by:** Brian F. Geiger, EdD

**School or Affiliation:** University of Alabama at Birmingham, School of Education

**Date:** June 16, 1998

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**Brief Description:** The purpose of this lesson is to teach elementary school students the basic knowledge and skills of location orientation and map reading. There are three objectives for learners:

1. Each student will demonstrate accurate map reading skills
2. Each student will correctly identify the names of one star, two planets, and one constellation
3. Each student will create a mini-model of the solar system using an empty box or food container

**Grade Level(s):** 2, 3, 4

**Subject(s)**

- Social Studies/Geography
- Science/Astronomy

**Background Information and Concepts Covered:**

Using space to teach elementary school children about astronomy, mythology, location orientation, map reading skills, and travel is fun and engaging.

Students can plan mock trips from school to home, to a field trip site or distant city, or even into the solar system. Combining didactic instruction with practical learning activities is an effective way to increase the level of interest and attention of learners.

## **Materials or Equipment List:**

illustrated atlas and books about the solar system  
state and city highway maps  
shoeboxes or empty food containers  
sheets of construction paper  
buttons  
seeds  
pom-poms  
Styrofoam balls of assorted sizes  
glue  
scissors  
marking pens  
paint  
aluminum foil  
string  
yarn or ribbon  
stapler

## **Procedures:**

1. Use illustrated atlas or wall charts of the continent, nation, and state to locate the U.S.A., Washington, D.C., your state, and city.
2. Ask students to distinguish directional locations important for map reading, i.e., north, south, east, and west.
3. Demonstrate the use of a map index and grid to locate a nearby landmark or city.
4. Assist pairs of students to locate the state capitol, and cities in each of four directional locations.
5. Students will practice locating a distant home city of a relative or friend.
6. Use illustrated books, for instance, *The Magic School Bus Lost in the Solar System* (Cole, 1990), and *The Glow-in-the-Dark Night Sky Book* (Hatchett, 1988), and astronomical photographs to identify the names of prominent stars and planets in our solar system, several constellations, and our galaxy.
7. Ask students to locate the Earth in relation to the other planets in our solar system.
8. Use a chart to illustrate approximate average distances of each planet from the Sun (DeWeese, 1994).
9. Read a story of mythology that describes a constellation, for instance, Great Bear and Little Bear.

10. Describe basic scientific knowledge of the formation of stars.
11. Discuss how stars have been used to assist with navigation for centuries.
12. Assist pairs of students to locate and name at least two stars and their constellations, e.g., Polaris or the North Star and the Little Dipper.
13. Each student will describe the directional location and distance from the classroom to his or her home, a field trip site or distant city, or a location somewhere in our solar system.

### **Application Assignment:**

Display a labeled 3-D model of the solar system constructed inside of an empty box or food container.

As class work or homework, each student will create their own models before the next class.

Offer art supplies such as seeds, pom-poms, Styrofoam balls, and string or yarn for their use.

Models should show each planet's name and position in relation to the Sun and the other planets.

Students should refer to an illustration of the solar system as a reference.

### **Assessment:**

Review again the purpose and objectives for the lesson.

1. Observe pairs of students as they locate the state capitol and different cities will reveal their abilities to correctly read a map using an index and grids to determine a location and distance.
2. Observe students as they locate and name at least two stars and their constellations. Critique students' models of the solar system for accuracy and completeness.

### **Useful Informational Resources:**

1. Boy Scouts of America, 1984. The Big Bear Cub Scout Book. Irving, TX: Author.
2. Cole, J., 1990. The Magic School Bus Lost in the Solar System. New York, NY: Scholastic Press.
3. DeWeese, B., 1994. Outer Space: Putting Distances in Perspective. Monterey, CA: Evan-Moor Corporation.

4. Eyewitness Encyclopedia of Space and the Universe. 1996. New York, NY: DK Multimedia, <http://www.dk.com>
5. Hatchett, C., 1998. The Glow-in-the-Dark Night Sky Book. New York, NY: Random House.
6. NASA Spacelink homepage <http://spacelink.msfc.nasa.gov>
7. Wood, L.H., 1996. Eyes on Adventure. Exploring Space. Chicago, IL: Kidsbooks, Inc.
8. Young Astronaut Council, Washington, D.C., 1-800-800-4182. Brian Geiger

# Story Pyramid

An AskERIC Lesson Plan

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**Author:** Donna Calder

**School or Affiliation:** Bullhead City Intermediate School, Bullhead City, AZ

**Endorsed by:** These lesson plans are the result of the work of the teachers who have attended the Columbia Education Center's Summer Workshop. CEC is a consortium of teacher from 14 western states dedicated to improving the quality of education in the rural, western, United States, and particularly the quality of math and science Education. CEC uses Big Sky Telegraph as the hub of their telecommunications network that allows the participating teachers to stay in contact with their trainers and peers that they have met at the Workshops.

**Date:** May 1994

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## Grade Level(s):

Kindergarten, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

## Subject(s):

- Language Arts/Whole Language

## Overview:

This is a strategy to help students with comprehension. Could be used for character traits and relationships with other characters.

## Purpose:

To make sure the students understand the story

## Objectives:

Students will be able:

1. to read and understand a story line
2. to state the story problem
3. to state the solution to the problem

**Materials:**

overhead, transparency, paper, and pencils

**Activity:**

Prepare the transparency for the class to do as a class activity the first few times. Later the students should be able to do this on their own.

**Story Pyramid**

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_
- 7. \_\_\_\_\_
- 8. \_\_\_\_\_

Have the students fill in the pyramid with the information asked for below.

On line

- 1. write the name of the main character
- 2. two words describing the main character
- 3. three words describing the setting
- 4. four words stating the story problem
- 5. five words describing one event in the story
- 6. six words describing a second event
- 7. seven words describing a third event
- 8. eight words describing the solution to the problem

The more the students work with this activity, the easier it will become. Have the students write a sentence for each line using the number of spaces as the amount of words for each sentence. Then they can write a sentence for each space for each line.

**Tying It All Together:**

Use this pyramid as an outline for a summary of the story.