

**Teacher/School:** Debra K. Tilton/Everglades Elementary School

**Unit Title:** The Way We See Stars

**Grade Level:** 3

**Subject/Topics:**

Science/ Star Patterns, Apparent Movement of Stars, Observing Stars (Incorporated in this lesson is use of the Vocabulary LINCing Routine and the Concept Mastery Routine from MSP training.)

**Learning Objectives:**

The students will describe what constellations are. In addition, the students will identify prominent constellations in the night sky of the northern hemisphere and explain how they could be used as a "sky map." (If the students remembered one thing about this study, it should be that constellations are groups of stars that form faraway patterns.)

**Sunshine State Standards addressed:**

SC.E.1.2.3, SC.E.1.2.1, SC.E.2.2.1, SC.E2.2.1, SC.H.1.2.5, MA.C.2.2.2, MA.E.1.2.1, MA.E.3.2.2

**Materials/Supplies:**

**For the Space Bubble:**

10x24' black painter's tarp

large roll of duct tape

large plastic garbage bag

strong box or round fan

scissors

toothpicks

**For Constellation Card Center:**

a sharpened pencil

7 3x3 black poster board squares

7 blank index cards

a yellow highlighter

**For Lesson:**

Concept Diagram Poster

LINCS Tables, student copies

**Prerequisite Skills:**

A general knowledge about Earth and its place in the solar system.

**Instructional Procedures:**

1) Assemble the Space Bubble as directed on the following pages.

2) Set up Constellation Card Center as follows:

a) Plot the points of a constellation (see suggested pattern cards on following pages) on a black square. Insert the pencil through each point to make a hole.

b) Place the black square over an index card. Plot each constellation point onto the card using the holes in the black square as a guide.

c) Connect the points on the index card. Highlight each point and write the name of the constellation at the bottom of the card. Repeat for all 7 constellations.

d) Display cards at a center.

**Guide the Learning:** Motivate with these Fantastic Facts: \*The distance across stars ranges from 450 times smaller than the sun to 1,000 times larger than the sun. (Do you think Earth would be different if the sun were larger or smaller? Explain your answer.) \*It takes light from the sun about eight minutes to reach the Earth. (Why do you think it takes light from the sun so long to reach Earth?)

## **Introduce the following vocabulary words:**

**Star:** a hot ball of glowing gases, like our sun

**Constellation:** a group of stars that form a pattern

**Telescope:** an instrument that makes things that are far away look clearer and bigger.

The stars in the night sky look small because they are so very far away. They may look like they are all the same distance away, but they are not. Some are pretty close to our solar system, but others are millions of light years away. Ancient people looked for patterns in the sky. Different people from all over the world saw the same stars and made up their own stories to explain the patterns in their own way. A constellation is a group of stars, all different distances from the sun that seem to form a picture or pattern.

There are 88 recognizable constellations. The constellations visible in the northern hemisphere are different than those of the southern hemisphere. Ursa Major and Orion are two constellations we can see in our sky. Also, the Milky Way appears as a cloudy streak across the night sky: Two constellations in the southern sky are the Southern Cross and the Great Dog. (Use "constellation" in a whole class Concept Diagram. See example following.) \*ESE and ESOL strategies: reduced text, visuals and props, graphic organizers. \*Gifted strategies: challenge to list less common constellations, challenge to find a constellation on a star map and identify it in the night sky.

Stars seem to move across the night sky, but they really don't. Stars appear to move because the Earth rotates. The stars rise above the horizon in the east, and as the Earth keeps turning to the east, the stars seem to move across the sky. They drop below the horizon in the west. You can see different constellations at different seasons of the year because the Earth revolves around the sun. Polaris, the North Star, seems to stand still above the axis of the Earth. If you can use the Big Dipper as a pointer to Polaris, you will always know which way is north, at least on a clear night!

The names of some 1,000 of the brightest stars come from different languages. Some, like Sirius (scorching), are related to the characteristics of the stars themselves. Other names, like the constellation Cassiopeia, are based on myths or legends. Still others are based on the animals the groups of stars resemble, like the Great Bear, or the Scorpion.

People through the ages have studied the stars. In the 1600's, Galileo used a hand-held telescope to magnify the stars. A telescope is an instrument that makes faraway objects look clearer and bigger. Today, we have complex and sophisticated telescopes that collect light from incredibly distant stars. Modern scientists use telescopes to detect radio waves, heat, and radiation given off by stars so we can learn more about them. (Use "telescope" in a LINC'S Table. Students can come up with their own LINCing story and reminding word. See following example.) \* ESE and ESOL strategies: graphic organizers, reduced text, visuals and props. \*Gifted strategies: challenge to create a more detailed picture and definite relationship.

**Summary:** A star is a hot ball of burning gases. Groups of stars that form patterns or pictures are called constellations. A telescope is an instrument that makes faraway objects like stars and planets seem closer, clearer, and bigger.

## **Assessment:**

1) Students answer 4/5 review questions correctly. (See sample questions following.)

2) As students rotate through Constellation Card Center, they choose a black constellation card, hold it up to the light, and find the matching constellation on an index card. Repeat for the remaining black cards. Students check their work by placing each black card over the matching index card. If the highlighted stars are visible through the holes, it is a correct match. \*ESE and ESOL strategies: alternative assessment, demonstration. \*Gifted strategies: challenge to make constellation cards of their own.

3) As students rotate their turn in the Space Bubble, they write down the names of the constellations, planets, and other bodies of the solar system that you have chosen to incorporate. They should be able to correctly identify at least 80% of the objects.

## **Additional reading for parents, students:**

- Do Stars Have Points, A Scholastic Question and Answer Series, by Melvin and Gilda Berger: Contains intriguing questions and answers about stars and planets.
- A Book about Planets and Stars, by Betty Polisar Reigot: Facts about space, stars, and our solar system.
- Stargazers, by Gail Gibbons: Focuses on stars, constellations, and ways to observe them.
- Follow the Drinking Gourd, by Jeanette Winter: an American folktale about a map to freedom written in the sky.

## **Suggested web sites for constellations:**

<http://www.americataking.com/studyhall/science.html>

<http://www.kidscosmos.org/kids-stuff.html>

[www.mnva.org/program/third/science/html](http://www.mnva.org/program/third/science/html)

## The Bubble

### Materials:

10x24 black painter's tarp  
large roll of duct tape  
large drawstring garbage bag  
strong box or round fan  
scissors  
toothpicks

### Procedure:

- Lay the tarp flat on the floor.
- Fold the tarp in half so that it is now 10x12.
- Align the top and bottom of the tarp and begin taping. It works best if you start from the back and work towards the end without the fold.
- Tape both sides and the front, leaving a space large enough to attach a garbage bag.
- Cut open the bottom of the garbage bag then tape the top of the garbage bag to the top of the tarp and do the same for the bottom.
- Wrap the opening of the garbage bag around the fan and tighten the drawstrings. Remember, you are creating a wind tunnel between the fan and the bubble so try to avoid holes and leaks.
- Cut a slit in the fold. It does not need to be very big, maybe 2 1/2 to 3 feet, to allow you and your students to crawl through. Reinforce the ends of the slit with duct tape.

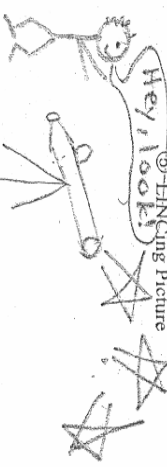
Turn on the fan, hold the entry flaps closed until inflated, and CLIMB IN!

Punch holes in the top and sides with toothpicks in the patterns of the more common constellations, the Milky Way, etc. Paint Styrofoam balls of varying sizes in fluorescent colors and suspend on monofilament tied to toothpicks poked through the tarp to represent planets, stars, or other solar bodies you include in your lessons. Students can carry a small flashlight with them as a "pointer" as they lean back and enjoy their view of "the night sky."

Adapted from Wendy Strickland, Osceola Middle School, Okeechobee. FL

# LINCS Tables

## LINCS Tables

<p>① Term telescope</p>	<p>③ Reminding Word tell</p>	<p>④ LINCSing Story Tell a friend how big the stars look through this thing</p>	<p>⑤ LINCSing Picture </p>	<p>② Definition An instrument that makes faraway objects look bigger, closer, and clearer.</p>
<p>① Term</p>	<p>③ Reminding Word</p>	<p>④ LINCSing Story</p>	<p>⑤ LINCSing Picture</p>	<p>② Definition</p>

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### Check What You Know

1. A hot ball of burning gases is a \_\_\_\_\_
2. What is a constellation?
3. What does a telescope do?
4. Why do stars seem to move across the night sky?
5. Native Americans named one constellation "The Great Bear" because it looked like an animal they recognized. The ancient Chinese thought the same group of stars looked like the chariot of the king. Which group of people was right?

(Answers)

1. stars
2. A constellation is a group of stars that form a picture or pattern
3. A telescope is a tool that makes faraway objects look bigger, closer, and clearer.
4. The stars seem to move across the sky because the Earth rotates. The stars seem to rise in the east and set in the west.
5. No group was right or wrong. People see different patterns in the stars based on what they know or are familiar with.