

Orion Constellation Model

<p><u>Standard III:</u></p> <p>Students will understand the scale of size, distance between objects, movement, and apparent motion (due to Earth's rotation) of objects in the universe and how cultures have understood, related to and used these objects in the night sky.</p>
<p><u>Objective 2:</u></p> <p>Describe the appearance and apparent motion of groups of stars in the night sky relative to Earth and how various cultures have understood and used them.</p>
<p><u>Intended Learning Outcomes:</u></p> <ol style="list-style-type: none"> 1. Use science process and thinking skills. 2. Manifest scientific attitudes and interests. 3. Understand science concepts and principles.
<p><u>Content Connections:</u></p> <p>Math IV-2 Units of measurements</p>

*Science
Standard
III*

*Objective
2*

Connections

(From the Elementary CORE Academy 2008 Book)

Background Information

Many students are under the assumption that the stars that make up a constellation are all on the same plane. Going through the process of creating a model of the constellation Orion, students will have a hands-on experience showing them that stars of a constellation are actually not on the same plane.

Research Basis

Klentschy, Michael (2005). Science notebook essentials. *Science & Children*. 43, 24-27.

When literacy skills are linked to science content, students have a personal and practical motivation to master language as a tool that can help them answer their questions about the world around them. Language becomes the primary avenue that students use to arrive at scientific understanding.

Caine, RN., & Caine, G. (1994). Making connections: *Teaching and the Human Brain*. Menlo Park, CA: Addison-Wesley.

Learning from classroom activities with application to real world situations are the lessons students seem to learn from and appreciate the most. Brain research shows the more senses used in instruction, the better learners will be able to remember, retrieve, and connect the information in their memories. "I hear and I forget; I see and I remember; I do and I understand." Students learn best when doing. By incorporating realistic, integrated, or interdisciplinary activities that build on established knowledge and skills and more than one sense, memory pathways become more accessible and cross-referenced for

future use. As teachers discover the most effective strategies for better student achievement, they can adapt their lessons accordingly.

Invitation to Learn

We know that light travels 186,000 miles per second. Let's say that a 1 cm string equals the distance light travels in one second. If it takes about 8 minutes for light from the sun to reach us, how long would the string be? (480 cm) The light from the next nearest star takes $4 \frac{1}{2}$ years to reach us, how long would that string be? (141,912,000 cm)

Materials

- Orion Constellation
- 7 Beads
- 150 cm of Thread
- Black Cardstock
- Ruler
- Scissors
- Pushpin
- Foam Core Board
- Tape



Instructional Procedures

1. Hand out to each student a copy of the *Orion Constellation* on cardstock.
2. Give each student 150 cm of string.
3. Give each student 7 beads.
4. Have the students tie a bead on the end of the string.
5. Place the constellation picture on the foam core board and use the pushpin to make a hole big enough for the thread at the location of the 7 labeled stars.
6. From the bead on the thread measure 15 cm long and cut the thread. Thread the end through the star labeled 522 ly until 1 cm is on the back side of the cardstock. Tape the 1cm piece of string securely on the back.
7. Use the measurements below to cut the remaining threads to the appropriate lengths and attach them to the cardstock using 1 cm of string on the back.

243 ly 18 cm

817 ly 12 cm

1342 ly 7 cm

916 ly 11 cm

815 ly 12 cm

773 ly 13 cm

8. Hold the model above your head to see the relative distance from the earth of each star.

Assessment Suggestions

- Ask the students to write in their journals why the star that is farthest from Earth has the shortest thread and the star that is closest to us has the longest thread?
- Ask the students to write about what they learned about the distances of stars in constellations from doing this activity.

Curriculum Extensions/Adaptations/Integration

- Have students research other constellations and create similar models.
- Partners could help with the construction of the model.

Family Connections

- Have students show their parents the Orion model and explain the different lengths of string to them.
- At home locate Orion in the night sky and identify the correlating stars in the model.

Additional Resources

Media

Beyond The Solar System- Expanding the Universe in the classroom, by Harvard-Smithsonian Center for Astrophysics; ISBN 0-9776402-0-5

Web sites

<http://www.futureschannel.com>

<http://www.spaceplace.nasa.gov>

<http://www.jpl.nasa.gov>

<http://www.clarkplanetarium.org>

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