

## Universe—Lesson Two

### Light Year Distances to Stars

**Standard IV: Students will understand the scale size, distance between objects, movements, 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.**

**Objective 1: Compare size and distance of objects within the systems in the universe.**

**Indicator a: Use the speed of light as a measuring standard to describe the relative distances to objects in the universe.**

Materials:

1. "Distances of the 15 Brightest Stars" Chart
2. A strip of bulletin board paper 2 inches wide and 2 yards long for each group of 3, 4 or 5.
3. "Distance of 15 Brightest Stars" chart
4. U.S. classroom wall map
5. Package of self-adhesive stars—one sheet per group
6. Calculator per group to find the distance in miles

Directions:

1. Review what was learned in the last activity about light years and how important it is in measuring distances in the universe.
2. Remind them that measuring star distances in miles/kilometers are numbers that are just too big to understand. Therefore, we use light-years.
3. Pass out the "Distance of the 15 Brightest Stars" chart. Read to them some of the actual miles of the brightest stars under the chart. Relate to them that these numbers are incomprehensible for our brains to compute.
4. Tell them that even though all the stars look the same distance away when we look at the night sky, all the stars are different distances from our own sun.
5. Have them look at the light-year distances of some of the prominent stars in our sky that are in known constellations on the chart.

6. Tell them that we are going to do an exercise where one light year equals 1 mile. Look on the wall map in the room of the United States to see how many inches equals one mile.
7. Teach them how to calculate how many inches would make up one of the star distances.
8. Put the students into groups of 3 or 4 on the floor. Give them the strip of paper that is a couple of meters long, a sheet of self-adhesive stars, and a calculator.
9. Have them draw the earth at one end of the strip of paper.
10. By using an inch ruler or yard stick, have them measure the distance of each of the star in inches relative to the scale of one light year equals 1 mile. When they find where each star should be, have them put a star on the strip of paper and write the name of the star next to it.
11. When they are done, have them look at the wall map of the United States map where they have measured the same distances on the map with the names of the stars just to see how they are distanced.
12. Have a discussion about the importance of light years.