STUDENT HANDOUT

When scientists are trying to determine how close a star is to us, they use the earth's rotation around the sun to be the right and left eye, just as you did with your thumb in the earlier experiment. Earth orbits the sun at a relatively constant distance of approximately 93 million miles away from the sun. That means that at the beginning of the year (January) Earth will be 93 million miles from the sun, let's say on the right, but 6 months later (June) Earth will be halfway through its full orbit, so will be 93 million miles to the left of the sun. Scientists view a single star from the left and then from the right of the sun, just as you view your thumb from one eye and then the other. Stars with more "jump" are closer!

ACTIVITY

Using a ruler, draw a line down the center of a clean sheet of paper, longways, creating a right and left half. Draw a line perpendicular to your long line near the bottom of your paper, about 1 inch from the bottom.

Draw a small dot right where the two lines meet. This will be the sun. Draw a 2inch ring around the sun. (Small children may trace something circular, older children should use a compass.) Draw the earth on the ring, to the right and the left of the sun. Label one of them Earth in January, and the other Earth in June.

Far away, at the top of the page, draw some small stars near the top of your long line. Somewhere between the distant stars and the sun, draw one star right on the long line.

Using your ruler, create a triangle by drawing lines between the star that is on the long line and Earth in January and the Earth in February. Your lines should go from the closer star, to Earth (on the right), through the Sun and to Earth (on the left). All three should be connected as the vertexes of a triangle.

Using a protractor, measure each angle on the inside of the triangle. What is the angle of the star's vertex of the triangle?

Draw another star, this time put it closer to the sun than the one before but keep it on the long line. Draw lines again connecting this new star in a triangle with the

Earth in January and the Earth in June. Measure the angles again. What is the measure of the star's vertex in this new triangle?

Did the angle change? Why do you think it did? What does this have to do with Parallax? How does this knowledge help scientists determine a star's location?

ANSWER KEY

Students should have drawn something similar to this diagram.

The closer the star is to the sun, the larger the angle is going to be. When the angle is larger, it creates a larger "jump", telling scientists that the star is closer to us than the surrounding stars.