

STEMducate

AIM
KITS

PARALLAX EFFECT

October 2025



October 2025: PARALLAX EFFECT

This month's AIM Kit is all about investigating the parallax effect and an essential question: how can we find the distances to stars? The question of measuring star distances has occupied astronomers at least since the time of the ancient Greek astronomer Hipparchus. He realized that if the Earth were to move around the Sun, then the stars should show the effects of parallax. Parallax occurs whenever our viewpoint to nearby and distant objects changes, leading to an apparent angular change which is different for nearby objects, relative to more distant ones. The effect diminishes with distance so that even for the nearest stars, the parallax is so small that extremely precise measurements are needed just to detect the effect.

In this AIM Kit, you will use the parallax technique to measure the length of your arm and you will become familiar with the necessary geometry.



MATERIALS NEEDED:

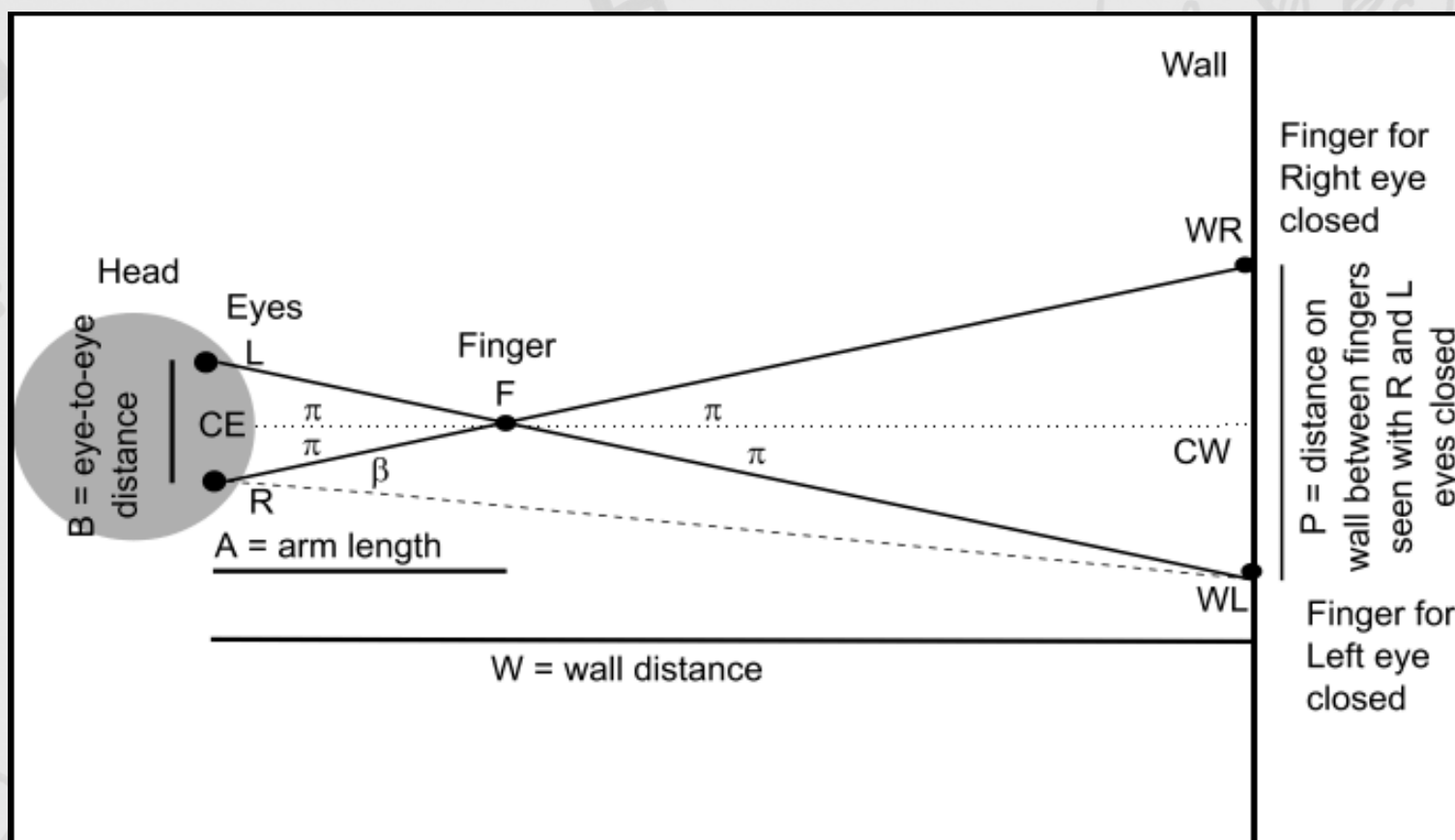
1. One sheet of paper
2. Writing utensil
3. Tape
4. Ruler
5. Scratch Paper
6. Calculator



PROCEDURE:

1. Use your writing utensil to draw stars on the one sheet of paper. Tape it onto the wall and stand 3 feet back (measure this with ruler).
2. Hold your finger out an arm's length in front of you, parallel to the floor. Your finger should be backdropped by the paper.
3. Close your right eye and make note of the spot your fingertip points to on the paper with a mark.
4. Return to 3 feet away and close your left eye and make note of the spot your fingertip points to on the paper with a mark. This should be different from Step 3.
5. Measure the distance between the points on your paper
6. The average distance (B) between the human eyes is 2 inches. Perform the necessary trigonometric calculations to determine the length of your arm. See the next page for the starter triangulation diagram.

TRIANGULATION:



If completed correctly, your final answer should be around 25+ inches



WHY IT WORKS:

In astronomy, parallax is the apparent shift in position of a nearby celestial object relative to distant background objects which is caused by a change in the observer's point of view. The concept hinges on the geometry of a triangle formed between the Earth at two different points in its orbit at one end and a star at the other. The parallax angle is half the angle formed at the star between those two lines of sight. The closer the star is to the observer, the larger the angle would be. By finding all the values in the triangles, trigonometry can find the length of your arm.

This is a small-scale simulation of the methods astronomers use every day to find distances relative to our location in the universe.



Contact Us



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About STEMducate

STEMducate is a non-profit organization dedicated to creating and promoting STEM to students from a young age to increase their curiosity and imagination. Our goal is to expose students to STEM opportunities and careers, enabling them to dream big and make their dreams a reality. We provide positive and powerful opportunities and experiences in STEM fields for people of all ages. These initiatives will hopefully entice students toward becoming the next innovators, educators, researchers, and leaders. We aim to reduce the number of unfilled jobs due to the lack of specialized skills that are needed to perform job tasks.

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