Experiment 1.1: Hull Down

Data:

When my helper moved the boat model along the flat surface, it got larger as it was moved closer to me and smaller as it was moved away.

When my helper moved the boat model along the ramp of books, it got larger as it was moved closer to me and smaller as it was moved away. Also, the entire boat was only visible when it was close to me. As it was moved away, the bottom of the boat was no longer visible, even though the sail was.

Summary:

In this experiment, I made a sad-looking model of a sailboat. I laid a long strip of paper on a flat table and then positioned my head so that one of my eyes was level with the paper. I then closed my other eye, so I was looking straight down the paper. My helper moved the boat model along the paper so that it got close to my eye, and then he moved it along the paper away from my eye.

I then made a "ramp" out of books and laid the long strip of paper on the books so that it formed a smooth ramp going down. I positioned my head so that one eye was level with the top of the ramp and then closed my other eye. My helper moved the boat model along the paper so that it got close to my eye, and then he moved it along the paper away from my eye.

Conclusion:

If a boat moves along a flat surface, its apparent size changes, but you can always see the entire boat. If it moves along a sloped surface, the bottom of the boat will be no longer visible even though the top of the boat will be. That's what sailors have always seen as boats moved away from the shore, which is why they knew the earth was a sphere, even in ancient times.