Predict, Observe, Explain Demonstrations

Where is the Centre?

Demonstration: Where is the Centre?

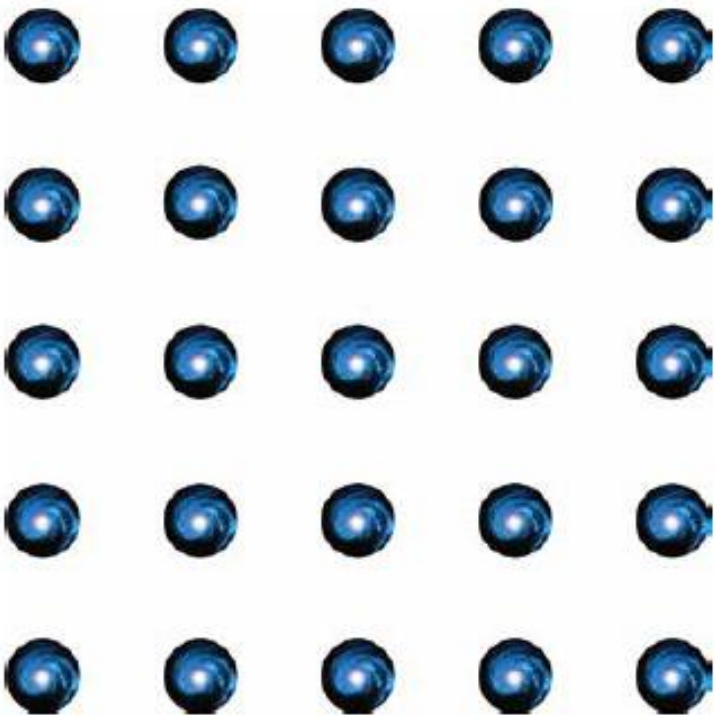
This POE demonstration illustrates the fact that the universe does not have a centre. Students consider how the distances between galaxies change as the universe expands and whether or not this implies that the universe has a centre.

Edwin Hubble observed redshifting in several galaxies and concluded that the universe must be expanding. One common misconception about the expanding universe is that we must be at the centre since everything is moving away from us.

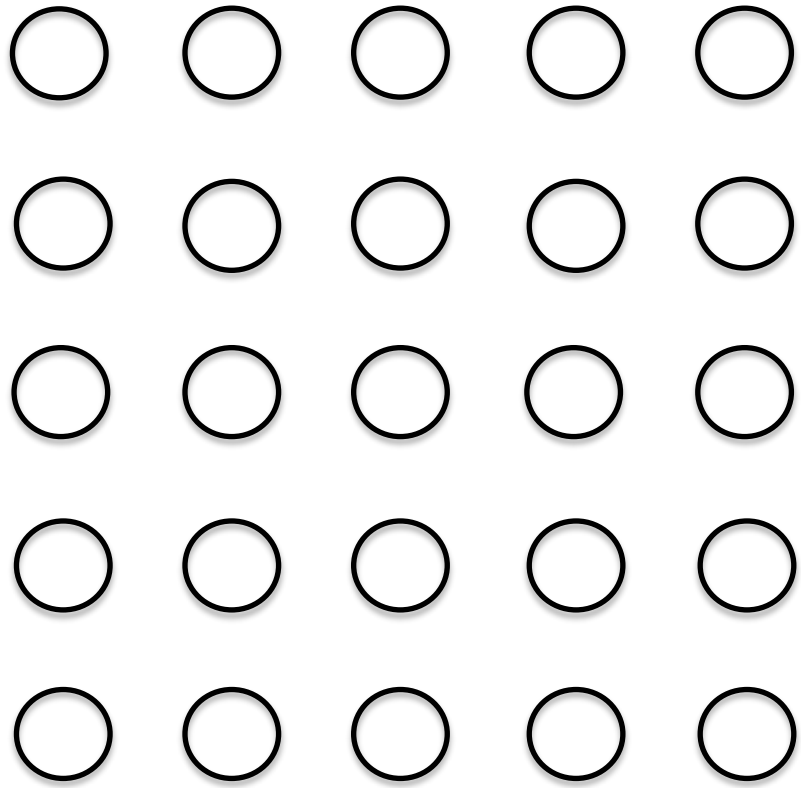
In this activity, we model the past universe as a grid of dots (galaxies). As the universe expands, the dots get further apart, so we model the present-day universe as a grid of circles except the circles are spread out more. Notice that the circles are the same size as the dots. The galaxies themselves do not get bigger - it is the space between the galaxies that is expanding, not the galaxies.

Instructions

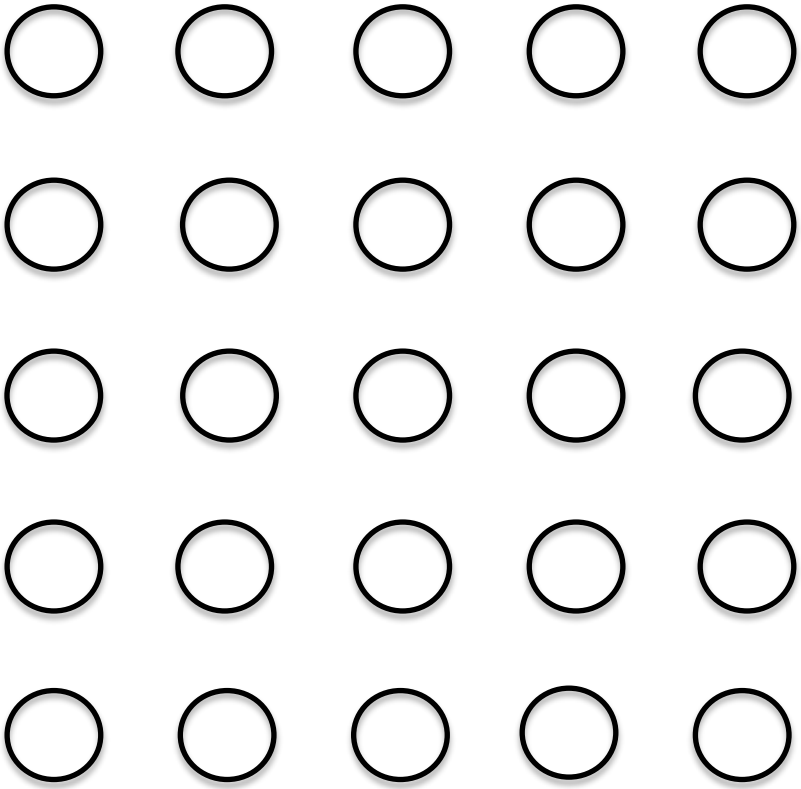
1. Photocopy the past and present-day universe images onto separate transparencies. These images are on the Teacher Support CD-ROM.
2. Choose a galaxy to view from the past universe Image.
3. **Predict and Explain:** What will the pattern of circles and galaxies be when you place the present-day universe directly over the past universe so the circle and dot line up.
4. **Observe and Explain:** What do you notice?
5. **Extend and Explain:** What happens if you choose a different reference point? What does this imply about whether our location in the universe is special or not?



PAST UNIVERSE



PRESENT-DAY UNIVERSE



PRESENT-DAY UNIVERSE