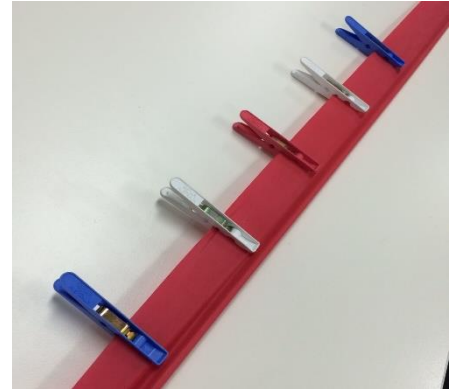


Mini Models of the Expanding Universe

Equipment

- Elastic resistance band
- 5 clothes pegs
- Measuring tape
- Paper and pen
- Balloon
- Marker



Method

1. Have two people hold opposite ends of the resistance band and move away from each other until the elastic is pulled straight but not stretched.
2. Have another person clip the 5 pegs on the elastic, spacing the pegs 5 cm apart.
3. The third person will now stand next to a peg. They will be the stationary observer.
4. Have the people holding the ends of the resistance band move further apart until the distance between the observer's peg and one of the adjacent pegs is 10 cm, as measured with the ruler.
5. Measure the distances from observer's peg to each of the other pegs.
6. Repeat steps 1-5 with the stationary observer standing next to a different peg.

Discussion

- Compare the distances measured. What did you notice?
- If the stretching of the band took 1 second, what can be implied about the speed of movement of each of the pegs from the observer's peg?
- Was there any difference in the results when the observer was standing next to a different peg?

Extra activity

Draw 'galaxies' on a balloon that is barely inflated. Inflate the balloon and see how every galaxy moves away from every other galaxy.

- When looking at the balloon from the perspective of one galaxy, how does every other galaxy behave?
- On the surface of the balloon, is there any centre to this expansion? Does it look like every galaxy originated from one point on the surface, or is the surface expanding everywhere at once?