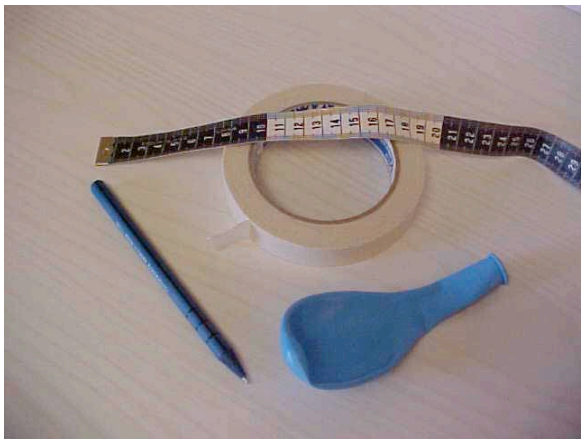
Expanding Balloon Experiment

In *The Expanding Universe* (http://www.seed.slb.com/en/scictr/watch/cosmos/index.htm) Charles Jenkins tells us that galaxies are moving away from each other. The universe appears to be growing larger.

We can use a balloon to help us understand what is going on in the cosmos. In this activity, the balloon represents the universe. Bits of tape on the surface of the balloon represent some of the galaxies located throughout the universe.

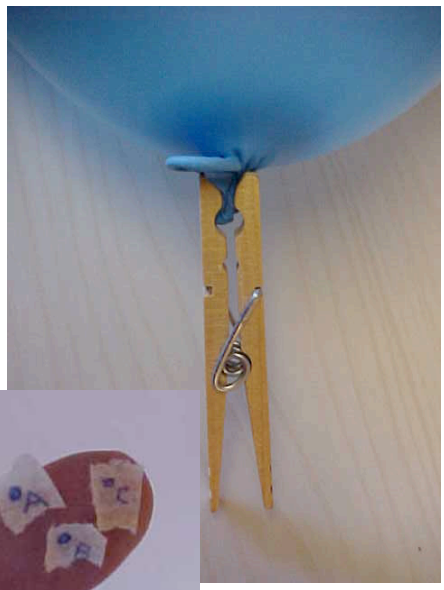


Tools & Materials

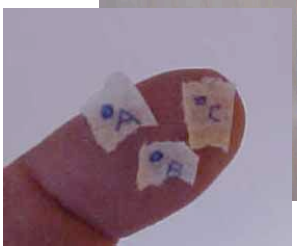
- A round balloon
- Masking tape
- A tape measure
- A pen or pencil
- A clothespin (optional)

The Experiment

Here's what to do:



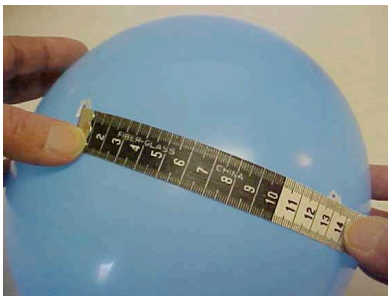
1. Blow up the balloon part way. The partially-inflated balloon represents the universe. Imagine that there are many galaxies both inside the balloon universe and on its surface. Have someone hold the mouth of the balloon closed so that it doesn't deflate, or use a clothespin to clamp the rolled-up mouth closed.



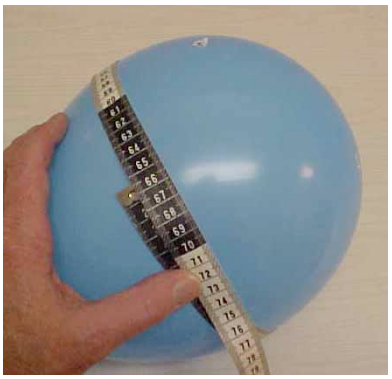
2. Tear off three small bits of masking tape, each about the size of your little fingernail. Draw a round dot in the middle of each bit of tape to represent a galaxy. Label each galaxy as A, B, or C.

3. Place the three bits of tape on the balloon so that the distances between them are all different. These represent three of the many galaxies in the universe.

4. Use your tape measure to find the distance from each masking tape galaxy to each of the others. Also measure the circumference of the balloon at its widest part. This gives you an indication of the size of your balloon universe at this time. Record these measurements for Round 1. (See chart below.)



5. Blow the balloon up a bit more, to represent the expanding of the universe. Measure and record the balloon circumference and the distances between the masking tape galaxies for your next round.



Repeat Step 5 a few more times until the balloon is about as big as it can get without popping. (Try to avoid a Big Bang!)

Use a chart like the one on the next page to record your results.

Changes in Distances between Galaxies as the Universe Expands

	Universe Size	Distance between Two Galaxies		
Balloon	**Circumference**	**From A to B**	**From B to C**	**From C to A**
Round 1				
Round 2				
Round 3				
Round 4				

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Observe how the distances between the galaxies changed as the balloon universe expanded. Do you see any pattern or trend? Compare your observations with our results (http://www.seed.slb.com/en/scictr/lab/balloon/res.htm).