

Expanding Balloon Universe

Recommended Ages: 4-14

Did you know that the Universe is expanding right now? Right under your feet? 13.8 billion years ago a tiny explosion happened, the **Big Bang**. The *Big Bang*, like an explosion, got bigger and bigger, creating our Universe. But even today, our Universe is still getting bigger.

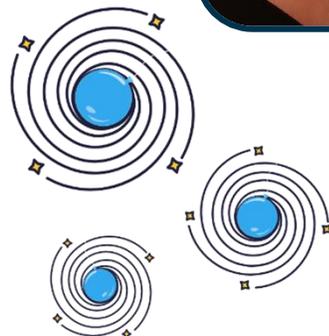
When astronomers, or people who study space, look into the sky, we see that everything is moving away from us, and the further away it is, the faster it is moving away from us. This is called **Hubble's Law**. **Edwin Hubble**, the scientist who created *Hubble's Law*, also tells us that there is no center to our Universe because the space between our galaxies is equally expanding. This is hard to understand in words, but using a balloon as our Universe, we can see it in action.

Materials:

- 1 Balloon
- Markers
- Paper
- Ruler and/or String

Procedure:

1. Blow up the balloon just a little. Don't tie it closed!
2. Draw 5-10 galaxies on the balloon, try to spread them out so they're all about the same distance from each other.
3. Label the galaxies with numbers and pick one of the numbers to be the Milky Way.
4. Measure the distance between the Milky Way and the other galaxies. (It's easiest to measure with a string.) Then write the distances on your paper.
5. Blow up the balloon and count as you do. Write the number down and don't tie the balloon yet!



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6. Measure the new distances for each galaxy and put it on your paper.
7. Now, what if you picked another galaxy to be the Milky Way?
8. Repeat steps 4-6, but blow up the balloon just as long as you did the first time. You can also tie the balloon closed this time.
9. Compare your distances. Your distances should almost be the same as your first Milky Way.

		Difference
1-3.75	5	1.25
2-3.25	5	1.75
3-2.25	3	0.75
4-1.5	2	0.5
5-MW	MW	MW
6-2.75	3.25	0.5
7-1.75	2	0.25
8-2	2.75	0.75
9-3	3.5	0.5
10-3.25	4.5	1.25

What happened when you measured the distance between the balloons? It might look like the Milky Way is the center of the Universe as everything moves away from it, but when you do it a second time, you should see that no matter what other galaxy you pick as your Milky Way, they all look like they're the center.

If you got someone else to blow up your balloon, you'd see that no galaxy is the center, but they all move away from each other at the same time.

DID YOU KNOW?

An **astronomer** is someone who studies everything outside of our planet, Earth. They study the stars, planets, moons, comets and galaxies. If you liked exploring this activity, maybe astronomy is for you!

