



# High Touch High Tech®

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## Space Case: Expanding Universe & Stars Twinkle

### Supplies:

- Balloon
- Black Marker
- Small clear cup filled partway with water
- Foil torn into small pieces
- Flashlight
- Square piece of black paper

### Instructions:

1. First, we will examine how the universe expands. Blow up your balloon halfway. Do not tie it!! Just pinch it closed.
2. Use your marker to draw galaxy spirals and stars on the balloon. Make a bunch of small stars all in one spot.
3. Now blow the balloon up more! What did you see? Everything got further apart.
4. Next, we will examine why stars twinkle. You have a cup of water, foil, black paper, and a flashlight.
5. Make sure your foil is broken into small pieces. Sprinkle the foil onto the black paper.
6. Place your cup on top of the foil. The foil pieces are now sandwiched between the black paper and the cup.
7. Shine the flashlight into the cup to see the stars twinkle!

### The Science Behind it:

The Big Bang Theory is the leading explanation about how the universe began. At its simplest, it says the universe as we know it started with a small singularity, then inflated over the next 13.8 billion years to the cosmos that we know today. This expansion is still happening today! Space is getting bigger, carrying whole galaxies farther apart.

Galaxies contain many stars and you can see some of them at night when you look at the sky. Have you ever wondered why the stars twinkle? Stars are just like our sun (hot balls of bright, burning gas!) but further away. The light emitted by the stars travels through space and enters our atmosphere. They twinkle because the light bends and moves as it passes through all the layers of the atmosphere. Planets on the other hand do NOT twinkle because they do not emit light. We can see them because of light from the sun bouncing off their surface. Similar to how the moon is lit.