

# Star Charting

**Overview:** If you want to get from New York to Los Angeles by car, you'd pull out a map. If you want to find the nearest gas station, you'd pull out a smaller map. What if you wanted to find our nearest neighbor outside our solar system? A star chart is a map of the night sky, divided into smaller parts (grids) so you don't get too overwhelmed. Astronomers use these star charts to locate stars, planets, moons, comets, asteroids, clusters, groups, binary stars, black holes, pulsars, galaxies, planetary nebulae, supernovae, quasars, and more wild things in the intergalactic zoo.

**What to Learn:** How to find two constellations in the sky tonight, and how to get those constellations down on paper with some degree of accuracy.

## Materials

- Dark, cloud-free night
- Two friends
- String
- Rocks
- Pencil

## Experiment

1. Tape your string to the pencil.
2. Loosely wrap the string around your finger several times so that the tip of the pencil is about an inch above the ground.
3. Find a constellation. Point to a star in the constellation.
4. Have a second person place a rock under the pencil tip.
5. When they've placed the rock in position, point to another star.
6. Have a second person place a rock under the pencil tip again.
7. Repeat this process until all the stars have rocks under their positions.
8. You should see a small version of the constellation on your paper.

## Reading

People have been charting stars since long before paper was invented. In fact, we've found star charts on rocks, inside buildings, and even on ivory tusks. Celestial cartography is the science of mapping the stars, galaxies, and astronomical objects on a celestial sphere.

Celestial navigation (astronavigation) made it possible for sailors to cross oceans by sighting the Sun, moon, planets, or one of the 57 pre-selected navigational stars along with the visible horizon.

Watch the video that shows how the stars appear to move differently, depending on which part of the Earth you're viewing from. What's the difference between living on the equator or in Antarctica (explained in video)?

The first thing to star chart is the Big Dipper, or other easy-to-find constellation (alternates: Cassiopeia for northern hemisphere or the Southern Cross for the southern hemisphere). The Big Dipper is always visible in the northern hemisphere all year long, so this makes for a good target.

Use glow-in-the-dark stars instead of rocks, and charge them with a quick flash from a camera (or a flashlight). Keep your hand as still as you can while the second person lines the rock into position. You can also unroll a large sheet of (butcher or craft) paper and use markers to create a more permanent star chart.

**Exercises:**

1. If you have constellations on your class ceiling, chart them on a separate page marking the positions of the rocks with X's.
2. Tonight, find two constellations that you will chart. Bring them with you tomorrow using the technique outlined above in Experiment.

### **Answers to Exercises: Star Charting**

1. If you have constellations on your class ceiling, chart them on a separate page marking the positions of the rocks with X's.
2. Tonight, find two constellations that you will chart. Bring them with you tomorrow using the technique outlined above in Lab Time.