



# Virtual STEAM

## Science

### Scale Model of the Universe

**Goal:** I can create a model of the solar system using scale factors.

**Science Indicator:** SC.8.11.6.B Develop and use a model to describe the role of gravity in the motions within the galaxy and the solar system.

**Math Indicator:** MA 7.2.3.e Use proportional relationships to solve real-world problems

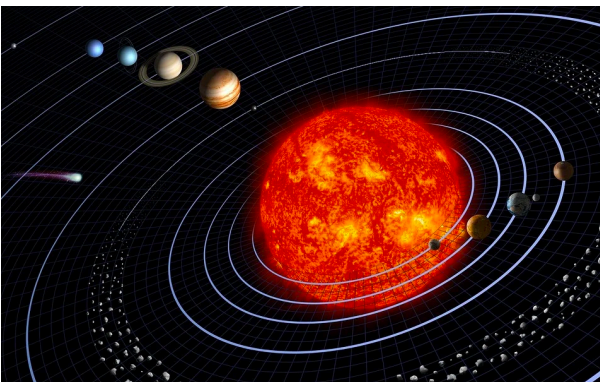
**Music Indicator:** FA 8.4.3.b Analyze and explain how the performer/creator uses composition and performance characteristics (e.g., dynamics, phrasing) to convey expressive intent.

#### Materials:

- [Worksheet](#)
- 10 different colors of Beads
- 1 - 5 meter Piece of String
- 1 - Ruler
- 2 - Address Labels / Tape

#### Instructions:

1. Watch YouTube Video for background knowledge: Solar System Distance and Size - <https://www.youtube.com/watch?v=DMZ5WFRbSTc&feature=youtu.be>
2. Look at the example on the worksheet to how to calculate the distances for the model. (one AU distance = 10 cm.)
3. Fill out the worksheet on your own based on the scale factor.
4. Tie the Sun at the top of the string, and tie the rest of the beads/clay following their calculations.
5. Have fun!





### **Extension:**

- The actual alignment of the planets is not in a straight line like the beads on the string, but really a bunch of circles around the Sun. Do you think the planets rotate at the same speed around the Sun? Why or why not?
- Which planets do you think have the hottest or the coldest average temperatures? Why do you think so?
- Which planets do you think are the most similar to Earth? Which are the least similar? Explain your reasoning.

### **Video/Website Extensions:**

- NASA Solar Bead Activity:  
<https://www.jpl.nasa.gov/edu/teach/activity/solar-system-bead-activity/>
- “Introduction to the Solar System: Crash Course Astronomy #9”  
<https://www.youtube.com/watch?v=TKM0P3XIMNA>

### **Book Extension:**

[“Boy, We Were Wrong About the Solar System!” by Kathleen V. Kudlinski](#)

### **Music Connection:**

[\*The Planets\*, by Gustav Holst](#)

Listen through at least one movement from *The Planets*, by Gustav Holst.

Explain how he uses musical characteristics, such as dynamics, tempo, timbre, and more in order to express his ideas.

### **Ignite Our Future Connection:**

- **Teamwork & Cooperation** - The planets in the solar system all have different roles. They all are a community united under one goal (orbiting around the Sun). Just like people, they work together to make the universe as we know it!