

# Materials List by Activity

## Scale Model Solar System

### Materials for Part 1:

- Index cards (9 per student or small group of students) or planet cards
- Markers
- Transparent tape
- Metric rulers
- A copy of the **Size table** (with or without all of the columns filled in) and the student instruction sheet for each student or group of students
- A large grapefruit or approximately 14 cm yellow ball for the Sun for each scale model solar system
- Objects for the planets. Suggestions:
  - poppy seeds or other tiny dark seeds (Mercury, Mars, Pluto)
  - small round candy sprinkles (Venus, Earth)
  - peppercorns or unpopped popcorn – may be dyed blue (Uranus, Neptune)
  - Small Marbles (Jupiter, Saturn)
    - Consider also having some objects such as cherries or small balls that are significantly larger than size a typical marble and smaller than the grapefruit/yellow ball, which are too large to represent the planets on this scale.

### Materials for Part 2:

- Labeled cards with objects from Part 1
- Masking tape
- Meter stick(s)
- An open area or straight hallway at least 80 meters (87 yards) long. This is a bit less than the length of a football field.
- A copy of the **Distance table** (with or without all of the columns filled in) and the student instruction sheet for each student or group of students
- **Scale Sun** handout to use for the sun
- Optional: Cones, sticks, or other card holders to hold each of the planet cards as you and your students make your scale model solar system(s).
- Optional: string to attach each of the planet cards together at the proper distances.

## Sizes of Stars

### **Materials:**

- **Star Size** Table (1 per student)
- A metric ruler for every student or small group of students

### **Recommended objects that represent stars and the Earth:**

- A three cm (~1 inch) cherry tomato or small red ball (like from a paddle ball or cat toys)
- An orange
- A large grapefruit or 14 cm diameter yellow ball
- A cantaloupe
- A volleyball
- A very large blue play ball (diameter of about 43 cm or 17 inches)
- A picture of blue or violet small roundish car, such as a VW bug (optional)
- a blue candy sprinkle or Earth's planet card from the Scale Model Solar System Activity
- 1 marble or Jupiter card from the Scale Model Solar System

## Stellar Distances

### **Materials:**

- A copy of the student instruction sheet for each student
- An orange (for Alpha Centauri B)\*
- Two grapefruits (for the Sun and Alpha Centauri A)\*
- a cherry tomato or small (3 cm or about 1") red ball\*
- A meter stick
- A map of your state, region, or province per group of 3-5 students (The maps need not be identical; the students can bring them from home.)
- At least one globe or map of the world, (One for each group of 3-5 students is preferred.)
- A calculator for each student (optional)

*\*Or objects of a similar size and color. Use the same objects as in the Sizes of Stars activity.*

## Star Birth

### **Materials:**

- A student information sheet for each student
- An experiment worksheet sheet for each student

- A color image of the **Orion Nebula** or internet access for each student or group of 2-3 students
- A copy of the **Relative Numbers of Stars Born by Class** table for each student and/or a copy of this table on a transparency
- 61 small colored objects identical in shape, size, and texture such as plastic beads (inexpensive and easily found in craft stores) for each group of two or three students. Preferred colors and quantities are 50 red, 10 yellow, 1 blue.
- An opaque container to hold the colored objects for each group of two or three students (must be significantly bigger than the 61 objects, and should either have a lid or be shaped such that a student's hand can fit tightly over the opening. **A disposable coffee cup with lid works well.**)
- Scratch paper for each student

## Lifetimes of Stars

### **Materials:**

- A copy of the **Stellar Lifetimes Table** for each student
  - A copy of the **Major Events on the History of the Earth** table
  - A copy of the student instruction sheet for each student
  - **Lifetimes of Stars Timeline** copies or Sheets of 8 1/2" x 11" paper \*
  - A ruler \*
  - A pair of scissors \*
  - Pencil\*
  - Markers or colored pencils (recommended)
- \*For each student or small groups of students*

## Death of Stars

### **Materials Required:**

- A copy of the student instruction sheet for each student
- **Size table** from the Scale Model Solar System activity
- **Distance table** from the Scale Model Solar System activity

### **Materials Recommended** (*objects that represent the present-day Sun and the Earth*):

- Large grapefruit or 14 cm yellow ball to represent the present-day Sun
- A cherry tomato or small red ball that is about 3 cm (~1 inch) in diameter to represent a main sequence M class star)
- A blue candy sprinkle or planet card for the Earth from the Scale Model Solar System activity
- A white candy sprinkle glued on black construction paper
- A metric ruler for every student or small group of students

## Planet Hunting

### **Materials for Part 1:**

- A copy of the student handout for part 1 for each student
- A blue candy sprinkle taped to a black card or piece of construction paper
- A white candy sprinkle taped to black card or piece of construction paper.
- A candy sprinkle taped to the end of a toothpick
- A shadeless lamp and 100-Watt clear (unfrosted) light bulb
- One large grapefruit or 14 cm yellow ball (for the Sun)\*
- A map of the United States, map of the world, or globe
- A calculator for each student\*

*\* Optional, but highly recommended. Objects should be the same or similar to those used in the Scale Model Solar System and Sizes of Stars activities.*

### **Materials for Part 2:**

- A copy of the student handout for part 2 for each student
- A copy of **Table 2: A Sampling of Extrasolar Planets** (with or without all of the columns filled in)
- Three small marbles (to represent Jupiter-like planets)
- Three peppercorns or corn kernels (to represent Neptune-like planets)\*
- Two candy sprinkles taped to cards (to represent Earth-like planets)
- One large grapefruit or 14 cm yellow ball (for a Sun-like Star)\*
- One orange (for a K class star)\*
- One cherry tomato or small red ball (for a M class star)\*
- One cantaloupe (for a F class star)\*
- A calculator for each student\*

*\*Objects should be the same or similar to those used in the Scale Model Solar System and Sizes of Stars activities.*

## Gaggle of Galaxies

### **Materials:**

- A student sheet for each student
- One color printout of the **Hubble Ultra Deep Field** for each small group of students
- A balloon for the teacher to use in a demonstration
- A marker (if the balloon is not already marked with a sine wave)

**Several of the activities include Web extensions using images from NASA's Great Observatories. Many of the images have also been included on the Stars and Planets CD that can be downloaded to computers with no or limited Web access.**