STATEWIDE STAR PARTY

# Solar System Walk

## FACILITATOR GUIDE

ncscifest.org/starparty

## OBJECTIVE

Experience the relative sizes and distances of objects in our solar system by taking a scaled walk from the Sun to the Kuiper Belt

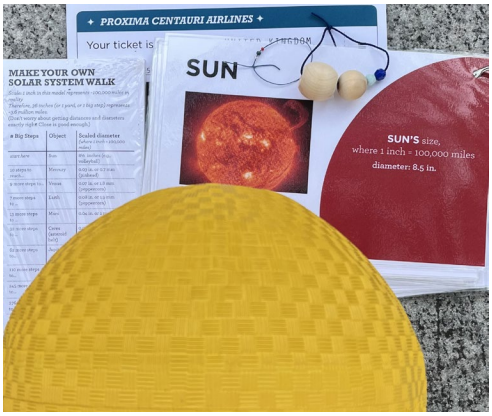
## SUGGESTED AGE RANGE

All ages

## ACTIVITY DURATION

Up to 1 hour

## MATERIALS




- 8.5-inch diameter ball (the Sun)
- Objects with these approximate scaled diameters:
  - 0.07 in. or 1.8 mm (Venus)
  - 0.08 in. or 1.9 mm (Earth)
  - 0.04 in. or 1 mm (Mars)
  - 0.9 in. or 22 mm (Jupiter)
  - 0.7 in. or 18 mm (Saturn)
  - 0.3 in. or 7 mm (Uranus)
  - 0.3 in. or 7 mm (Neptune)

  *Mercury, Ceres, and Pluto are too small to be included.*
- Two-sided interpretive cards
- Plane ticket on Proxima Centauri Airlines

## SETTING AND PREPARATION

- The solar system walk is best done outdoors. Scout out your location in advance. Ideally, you'll find a safe straight path that will take you from the Sun all the way to Pluto and the Kuiper belt (about 1000 yards, or just over 1/2 mile one-way).
- Consider if your group can manage the whole distance (just over 1 mile roundtrip). Is it better to stop earlier and just discuss the remaining objects?
- Although a straight line is ideal, a curving path can also work. You can even have your walk fold back on itself.
- Check which planets are currently visible in the night sky. (Use **Stellarium** or NASA's Night Sky Planner at **https://nightsky.jpl.nasa.gov/planner/**)
- Check the moon phase. Will the Moon be visible that day or night? (See **https://aa.usno.navy.mil/data/RS_OneDay** or **https://www.timeanddate.com/moon/** -- specify your location and date)
- You may wish to check dates of upcoming lunar and solar eclipses. (See **https://www.timeanddate.com/eclipse/**)
- If you plan to do an add-on activity in which your participants arrange themselves where the planets are currently located in their orbits, check the planet configuration on the date of interest (e.g., **https://heavens-above.com/** -- choose "solar system chart" and type in the correct date).

## TIPS AND PROCEDURE

1. You'll take your group on a vacation through our solar system, starting from the Sun and stopping to visit eight planets and two dwarf planets. The walk ends at the Kuiper Belt, where Pluto resides, and does not go all the way to the Oort Cloud, which scientists think is a very distant, gigantic spherical shell of icy, comet-like objects surrounding the Sun, planets, and Kuiper Belt.
2. This walk is based on the "thousand-yard model," with the Sun-to-Pluto distance scaled down to about 1000 yards, or 1000 big steps. On this scale, 1 inch in the model equals about 100,000 miles in reality. For every big step someone takes that covers 1 yard (36 inches), they travel through 3,600,000 (3.6 million) miles in space.

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## FACILITATOR GUIDE, CONTINUED

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### CREDIT

**This activity is adapted from "The Earth as a Peppercorn" by Guy Ottewell:**

**https://noirlab.edu/public/products/educational-programs/eduprog032/**

3. You may wish to assign people to be responsible for a particular object. They might count the steps there or hold up the object for everyone to see.
4. Before you head to the outer solar system, consider having someone run back to pick up the Sun, to lessen the risk of the Sun being kicked or carried off by an inquisitive passerby.
5. Are there children eager to have an active role? You might invite them to guess which stop is next, count the steps there, or look for a pebble or rock of the appropriate size for the next planet. Or ask if they can provide one fact about the planet you've stopped at.
6. Separate your two-sided cards, so that at each stop you can hold up each card individually. This allows you to refer to the information printed on the front while simultaneously showing your group the image and scaled size on the back.

### MORE RESOURCES

Prefer another scale? Visit **https://www.exploratorium.edu/explore/solar-system/activity/build-model** and enter the diameter you want for the Sun. The website will calculate the other sizes and the distances.

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