

Brownie Space Science Adventurer Badge**The Earth as a Peppercorn p.1**

Outdoor activity option based on *The Thousand-Yard Model: Or, The Earth as a Peppercorn* by: Guy Ottewell (published by Universal Workshop)

Make sure you and your girls have access to approximately half a mile of space.

Time Allotment

45 minutes

Prepare ahead

Find a space of about ½ mile that you and your girls can hike (in a straight line if possible), and walk it before your meeting to ensure the path/space's safety for you and your troop.

Label notecards with the names of the planets and attach the objects to them via tape, or a plastic bag. This is optional, but since some objects are extremely small, it will be hard for the girls to see some of them if they are not in a bag. Do whatever works best for you and your troop.

Materials

- The Solar System
- Notecards
- Pen, pencil, or marker
- Plastic bags (optional)
- Tape (optional)
- Sun – Any ball 8 inches in diameter (dodge ball, bowling ball, etc.)
- Mercury – a pinhead
- Venus – a peppercorn
- Earth – a peppercorn
- Mars – a pinhead
- Jupiter – a chestnut or pecan (diameter 0.9 inches)
- Saturn – a hazelnut or acorn (diameter 0.7 inches)
- Uranus – a peanut or coffee bean (diameter 0.3 inches)
- Neptune – a peanut or coffee bean
- Pluto – a pinhead (or smaller)

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Steps**SAY:**

- *Our Solar System is made up of our star and all the objects that travel around it. Our Solar System's star is the Sun, and all of the objects in our Solar System orbit (move around) it. Did you know that our Solar System was formed about 4.6 billion years ago, and is located in the Milky Way Galaxy?*
- *Earth's closest neighbor, Venus, is over 25 MILLION miles away, and it takes a spacecraft about 3 months to get there! How far away are your neighbors? Can you walk to their homes? What would it be like if it took you 3 months to get to your neighbor's house? How often would you see them?*
- *Today, we're going to explore the 'neighborhood' of our Solar System by creating a scale model. What is a scale model? Can you think of something that is a scale model of a person? Or your pet?*

Girls might say: A doll, or a stuffed animal.

- *Our Solar System is so big that we are going to have to go outside to make our scale model!*
- *But first, let's take a look at these objects that will represent the planets and Sun that make up our Solar System.*

Place the objects on the table and help the girls put them in order: Sun, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. **SAY:**

- *Some of these objects are awfully small, aren't they? This is because we are making a scale model. This peppercorn represents the Earth. How big do you think the Earth is?*

After they've had a chance to guess, **SAY:**

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- *Earth is 8,000 miles wide! This ball represents the Sun, which is 800,000 miles wide! In the scale model we're making today, 1 inch = 100,000 miles.*
- *If 1 inch = 100,000 miles, how much does 12 inches, 1 foot equal?*

Give them a chance to think about it, then **SAY:**

- *1 foot = 1,200,000 miles, and 3 feet, which is also called a yard, is 3,600,000 miles.*
- *Do you know how far it is from the Sun to the Earth?*

After they've guessed, **SAY:**

- *The distance is 93 million miles! That's a long way! Today, that's going to be about 26 paces. We want our paces to be about 3 feet, or 1 yard. Is there room to take 26 paces in this room? Let's try!*

After attempting to take 26 paces in this room, **SAY:**

- *Now, that's only to Earth! What about all the way to Pluto? Looks like we need to get outside!*
- *Everyone take an object from the table that represents the planets.*

Note: If there aren't enough, ask the girls to share. If there are too many, ask the girls to take more than one.

SAY:

- *Now let's get going!*

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Take the girls outside and head out on the path you have reviewed previous to your meeting. **SAY:**

- *All right, who has the Sun? Let's put it down here and start our scale model of the Solar System.*
- *10 paces this way!*

Once you've arrived, **SAY:**

- *Mercury, where are you? Mercury goes right here.*

Once you have placed Mercury, the paces are as follows:

9 more paces – Venus

7 more paces – Earth

14 more paces – Mars

95 more paces – Jupiter

112 more paces – Saturn

249 more paces – Uranus

281 more paces – Neptune

242 more paces – Pluto

Once you've finished placing Pluto, **SAY:**

- *Can you believe how far we just walked? Can any of you see the Sun? Imagine how cold it must be on Pluto without the Sun close enough to warm it.*
- *What was one thing that surprised you about this activity?*

After all the girls have answered, **SAY:**

- *All right, now we need to retrace our steps, pick up our planets, and make sure we leave no trace.*
- *As we go back, let's see if we can remember the names of the planets.*
- *For some of these longer stretches, let's think of a fun Girl Scout song to sing. Do any of you have a favorite?*