Session 8: Solar System

A Schoolyard Solar System

This lesson was created as a culminating activity for a Grade 3 unit on the Solar System and may take more than one class session to complete.

Materials:

- Large, blank pieces of newsprint paper
- Rulers
- Meter wheel or spool of string
- Size and distance measurements for scale solar system
- Different size spheres to represent scale models of the Sun and planets
- 10 Cones or other objects to mark the Sun and planet positions

Preparation:

Refer to a solar system table or planetary fact sheet that contains information on the diameters of the Sun and the planets, and the planets' distances from the Sun. Find an outside area available for your use during this activity. Measure the longest distance across this area. This will represent the linear distance from the Sun to Pluto in your scale model. Keeping this in mind, select spheres to represent the Sun and planets, and calculate the appropriate relative distances for the planets from the Sun. If you are using string, mark it at the correct position for each planet.

Procedure:

1. Give each pair of students one sheet of newsprint paper. Have them draw the solar system to scale, to the best of their ability. Tell them to use the ruler to help them make their drawing reflect their thinking as accurately as possible. Have the students label their drawing with as much detail as possible.

2. Combine two sets of partners to make groups of four. Instruct each pair to present their drawing to the other group members. Have them compare their drawings and notice similarities and differences between them.

3. Convene the whole group and tell the students that they will build a solar system model in the schoolyard. Talk about how the models they drew will help them think about the larger scale model. Ask the students to give examples. Explain to the students that once outside they will be asked to consider the size of the schoolyard and, knowing where the Sun is, mark off the positions where they think the planets would lie.

4. In the schoolyard, lead the students to the Sun's position. Ask volunteers to walk to the positions where they think that the planets would be if the planets were all aligned. Be sure to allow ample time for this step to encourage thoughtful planning.

Talk about how the planets are not lined up in a row (all nine planets will "never" line up, or more accurately, the Solar System won't exist long enough for this to occur), and that this arrangement is for measuring convenience only. When volunteers are in position ask the remaining students to evaluate the accuracy of the placement of the "planet" students. Have the students discuss their ideas and make suggestions and adjustments.

5. Once the students are satisfied with the planet placement, place cones or other markers to indicate the position of each planet. Reconvene the students. Place a cone at the position of the Sun and reveal the sphere you selected for the Sun. Stop for all student questions and comments. Have the student who represented Mercury return to her/his position. Then, pace out the distance to Mercury from your calculations. With the students, observe how accurate the student position is in relation to your calculated position. Reveal the sphere you selected for Mercury and place it at the correct distance. Stop for all student questions and comments. Proceed in a similar manner for each planet. When the entire solar system is mapped out, have each student walk the distance from the Sun to Pluto (talk about why Pluto and Neptune exchange places sometimes) and carefully observe the distances between and sizes of each "planet." When done, collect the materials and take the children back inside.

6. Once inside, lead a discussion to help the students process their experiences. Ask them to share their observations and discoveries. Tell the students that they will be drawing new solar system pictures. Talk about how their outside model can help them to amend their partner drawings. Ask students to return to their partners and review their original drawing. Distribute a second sheet of newsprint paper and ask students to make a new drawing of the solar system.

7. When drawings are complete, have each set of partners write a few sentences about how their new drawing is different from their old drawing, and what they learned about the solar system from this activity.