SUGGESTED ACTIVITIES

(*The Solar System*)

From *Harcourt Science* Teacher's Ed.

Activity	Page Number	Concept
Planet Time	See following	Compare/Contrast Orbits, Length of Year
Solar System	See following	Distance of Planets
Building a Solar System	See following	Distance of Planets to Earth

Planet Time

From Harcourt TE

Problem:
Is the length of one year the same for all planets?

Prior Knowledge:
What is an orbit? What is the order of planets from closest to farthest from the sun?

Materials:
Large sheet of paper, markers, string, scissors, field watch

Directions/Procedure:

1. Take the class outside and place a large sheet of paper on the ground
2. In the center of the paper, draw a circle representing the sun
3. Cut the different lengths of string to form nine circles around the "sun" representing the other planet's orbit
4. Have nine students stand on the circles-each holding a sheet of paper with the planet's name printed on it-Mercury, Venus, Earth, Mars, Jupiter, Uranus, Neptune, and Pluto (Pluto is optional, great subject for debate)
5. Starting at the same time, have each student walk heel to toe around the orbit of his or her planet. Time how long each "planet" takes to revolve around the sun. This amount of time reflects the "year" for that planet. Record your observations in the data table.

Data/Observations:

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Time (minutes)									

The smaller the circle, the faster the planet will take to orbit around the sun.
The larger the circle, the longer the planet will take to orbit the sun.

Analysis:

The closer planets have less distance to travel compared to the planets farther away from the sun. If you straighten out the string of each orbit and measure you will see that Mercury has the shortest string (distance to travel/orbit around the sun, and Pluto has the longest string.

Conclusion:
The length of one year is not the same for all planets due to their distance from the sun.

Solar System
From Harcourt TE

Problem:
Can you create a living model of the solar system?

Prior Knowledge:
What is a solar system? What is a planet?

Materials:
Outdoor area, 10 students, yardstick

Directions/Procedure:
1. Take the class outside
2. Have one student representing the Sun stand in the middle of the area
3. Using the table below as your guide, have the other students representing the nine planets mark off their distance from the Sun

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Distance in feet	1	2	3	4	15	24	51	78	102

4. Have the planets start to "orbit" the Sun in a counter clockwise direction at the same time and same speed (walking heel to toe)
5. Repeat Step 4 but have the planets closer to the Sun move the fastest. The farther away from the sun, the slower the speed of each planet

Data/Observations:
The farther away from the Sun a planet is, the longer it takes to make one revolution around the sun.

Analysis:

The planets closest to the Sun orbit the fastest due to the stronger gravitational pull (the closer the object, the stronger the gravitational pull on that object). The planets farthest from the sun move slower because they are farther away from the Sun and do not have a strong gravitational force on them, and take longer to orbit because there is more distance to cover on their orbits (See Planet Time Experiment).

Conclusion:
A living model of the solar system can be made if one knows the distance of each planet from the sun.

Building A Solar System

From Harcourt TE

Problem:

How far away are each of the planets from Earth?

Prior Knowledge:

What is a planet? How many planets are in *our* solar system?

Materials:
Self-stick circles, meter stick

Directions/Procedure:

1. Using 9 self-stick circles, write the first letter of each planet on a circle
2. Using a wall corner as your starting point, measure in 6 cm.
3. Place the "Mercury" circle in this spot
4. Using the table in "Data/Observations" as your guide, place the remaining circles on the wall
5. Measure the distance from "Earth" to the other planets. Record your results

Data/Observations:

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Distance from Sun (cm)	6	11	15	23	78	143	287	450	590
Distance from Earth (cm)									

Analysis:

Compare your results.
Which two planets are the closest? Farthest away?

Conclusion:

Venus and Mars are the closest. Neptune and Pluto are the farthest away.