

Your Age on Different Planets

Reference: The numbers in the table were found on the web page:
http://en.wikipedia.org/wiki/Orbital_period

Grade Level: 8th grade

Time allotted to unit: 30-40 minutes

Lesson Plan

Learn about orbital time of other planets in our Solar System and beyond.

Goals and Objectives

- Introduce students to the mathematics behind impacts
- Introduce students to information on orbital time of different planets
- Students will learn about the relationships between planetary orbits around the Sun and our measure of time on Earth
- Students will be able to calculate their age on different planets

Materials for each group (x3 groups)

- Pencils
- Light bulb
- Your Age handout (see attached)
- Calculators

NJCCCS: 5.3.8.A.1, 5.3.8.D.1, 5.3.8.D.3, 5.7.8.A.1, 5.8.9.B.1 in Science
4.1.8.B.1, 4.5.8.A.1, 4.5.8.A.2, 4.5.8.C.3, 4.5.8.C.4, 4.5.8.E.1, 4.5.8.F.4 in
Mathematics

Activities and Procedures:

1. Set up for the activity and pass out worksheets to students. Generate short class discussion about the planetary orbits around the Sun and about the time measure on Earth.
2. Let students stand in the circle around the source of light, the Sun. In this system the lamp is the sun and their head is the earth. Their nose is their hometown on the surface of the earth.

3. Ask students to stand so that it is noon in their hometown. Now make them turn counterclockwise in one spa until there is noon again in their hometown. Tell them that one-day just passed.
4. Now make them move once around the Sun. Ask them how much time this represents. They are one year older right now.
5. Break students up into groups of 3 – 4 students and go with them over the Your Age on Different Planets worksheet.
6. Give students some time to complete Your Age on Different Planets worksheet.
7. Record calculated results on the Smart Board and discuss the results with the students.

Accommodations:

For SLD explain each activity step by step. Arrange heterogeneous group assignments. For ELL give some vocabulary the day before so they can prepare with another student or look up in dictionary, or specifically translate some words for them.

Assessment:

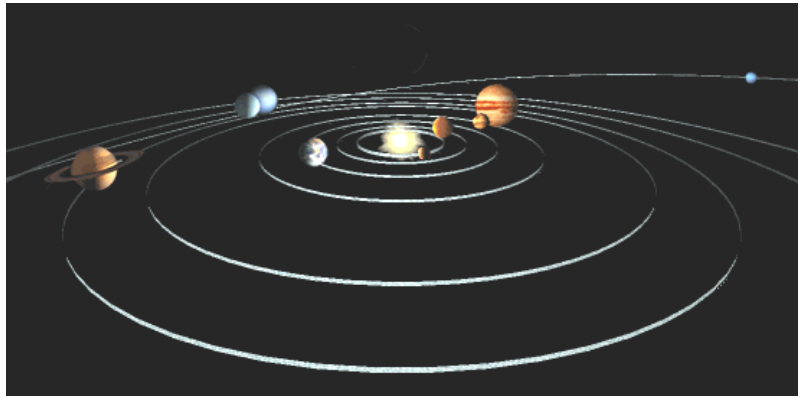
Walk around the room; classroom discussion; collect worksheets.

Home Work:

Given below.

Name: _____

Date: _____



Your Age on Different Planets

The way we measure time on Earth is strictly related with the orbital motions around the Sun and Earth's own axis. Would you have the same age if you were living on different planet? In this activity we will calculate your age on different planets of our Solar System and beyond.

Answer the following:

1. One rotation of Earth around its own axis represents _____
2. To complete one full orbit around the Sun it takes for Earth _____
3. Is orbital period of each planet of our Solar System the same as the one for Earth?
4. How old are you?
5. Would you have the same age if you were living on different planet?
6. How would you convert your age from years to days (there is 365 days in a year)?
7. How old would you be on Jupiter if it takes about 12 Earth years for Jupiter to orbit the Sun?

8. Calculate your age on different planets of our Solar System based on the information given in the chart below. Record your answers.

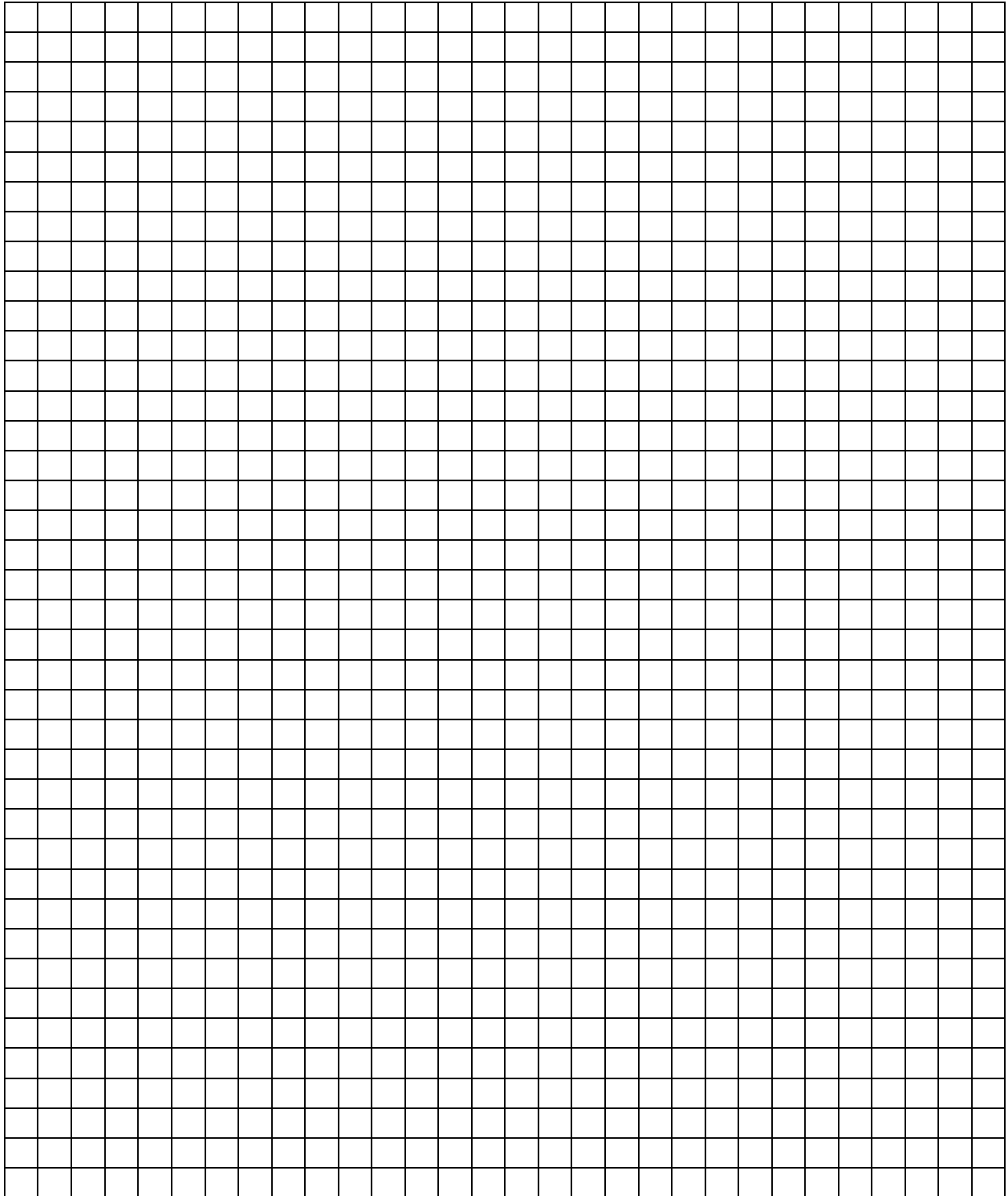
Terrestrial Planets	Orbital Period relative to Earth	Length of year in days (x365)	Your Age
Mercury	0.241		
Venus	0.615		
Earth	1		
Mars	1.881		
Outer Planets			
Jupiter	11.87		
Saturn	29.45		
Uranus	84.07		
Neptune	164.9		

9. On which planet of our Solar System would you like to live and why?

10. There is a planet somewhere in the outer world which orbital period takes only 4 Earth days. How old would you be if you were living on this planet?

11. Would you like to live on this planet?

12. Plot a graph of your age versus orbital period relative to Earth of terrestrial planets. Make sure to label your axis.



13. Connect the points smoothly. Is the straight line the best fit?

14. Is the change linear?

X								
Y								

15. Place your ages from different planets on the number line. For simplicity you may omit Mercury.



16. Why are these points not evenly distributed?

Homework:

Earth and other planets are preparing for Solar System High Jump Olympics 2857. Many people want to participate. However, to be allowed to participate ones have to be in the age range between 13 and 37 Earth years. Check whether all below candidates qualify for Solar System High Jump Olympics 2857. Think of the name for each of them.

Candidate's Name	Home Planet	Age on Home Planet	Age on Earth	Qualify? Yes / No
	Mercury	135 years		
	Venus	18 years		
	Mars	15 years		
	Jupiter	1.5 years		
	Saturn	2 years		
	Uranus	10147 days		
	Neptune	0.6 years		