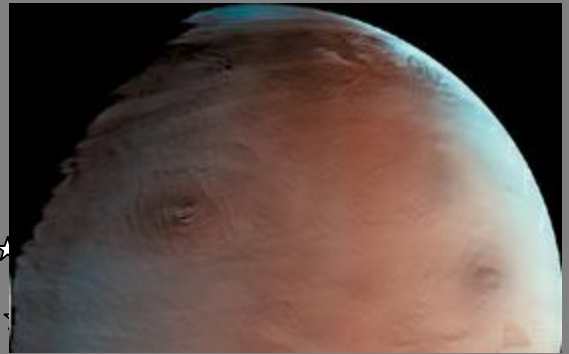


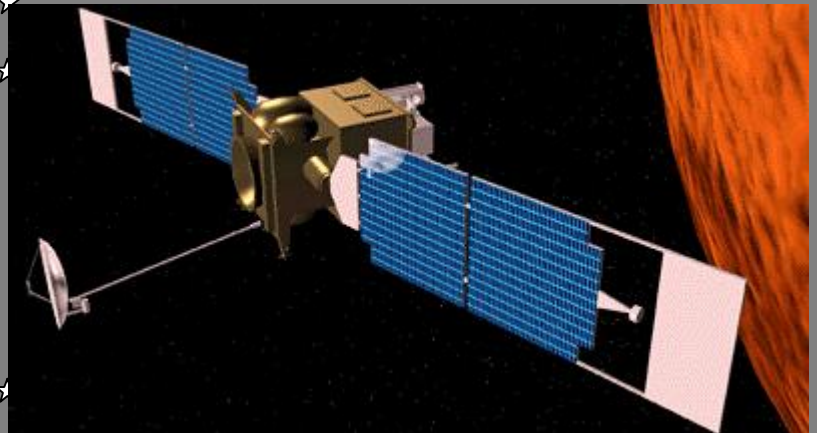
Mars and Beyond!



Mars taken by Mars Orbital Camera



Family Portrait of Jupiter's Great Red Spot and the Galilean Satellites



Mars Global Surveyor

By Nancy Wilkinson

Mars and Beyond
Lesson 7
The Planets and Your Age

Objective:

- 1) Students will use a table to describe and represent patterns.
- 2) Students will solve proportions

Materials Needed:

- 1) Table on the page 42. (You might want to make an overhead of this table.)
- 2) Worksheet Lesson 7 (pages 43-44).

Opening Activity:

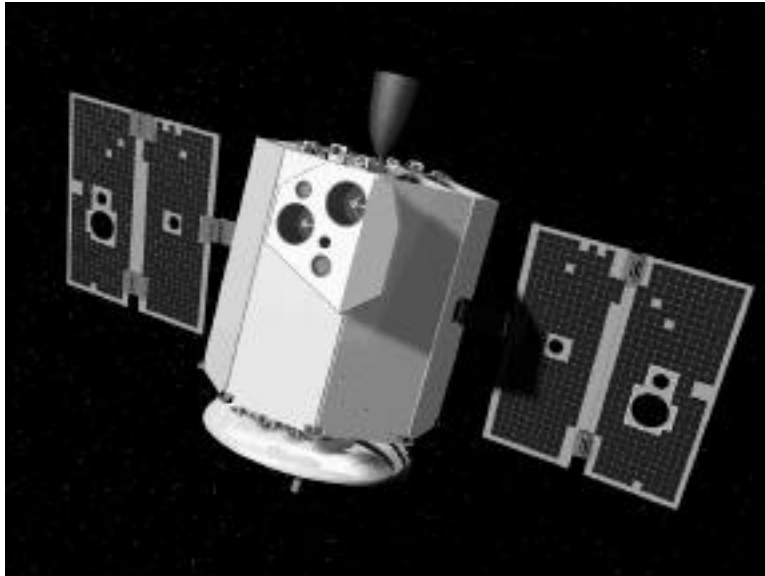
- 1) Place the table on page 42 on the overhead
- 2) Have the students place the planets in order from shortest rotation to longest rotation.

Activity:

Have the students complete Worksheet Lesson 7. It is self-explanatory. Students may work on it by themselves or it may be done as a class.










Closure:

Students may share their ages with the class. Who is the eldest on which planet? Who is the youngest on which planet?



Clementine – 1/25/1994 - Lunar Orbiter/Attempted Asteroid Flyby

Mars and Beyond Lesson 7 The Planets – A Chart of Information

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Diameter in KM	4,880	12,104	12,756	6,787	142,800	120,600	50,800	48,600	3,000
Number of Moons	0	0	1	2 – Phobos and Demos	16	18	15	8	1
Period of Rotation	59 Days	243 Days retrograde	23 hours 56 min.	24 hours 37 min.	9 hours 55 min.	10 hours 40 min.	17.2 hours retrograde	16 hours 7 min.	6 days 9 hours 18 min. retrograde
Density	5.4	5.3	5.5	3.9	1.3	0.7	1.2	1.7	3-.8
Surface Gravity	0.39	0.91	1	0.38	2.6	1.07	0.9	1.15	0.05
Average Distance from Earth (Mill of KM)	85	40	0	56	628	1,276	2,736	4,310	4,345
Average Distance from Sun (Mill of KM)	58	108	150	228	778	1,427	2,870	4,497	5,900
Relative Distance	0.39	0.72	1	1.52	5.19	9.51	19.13	29.98	39.33
Symbol									
Relative Diameter	0.38	0.95	1	0.53	11.19	9.45	3.98	3.81	0.24
Period of Revolution	88 days	224.7 days	365.3 days	687 days	11.86 years	29.46 years	84 years	165 years	248 years
Atmosphere (main components)	virtually none	carbon dioxide	nitrogen oxygen	carbon dioxide	hydrogen, helium	hydrogen, helium	helium, hydrogen, methane	hydrogen, helium, methane	methane + ?
Rings	0	0	0	0	3	1,000+	11	4	0
Inclination of Orbit of Ecliptic	7°	3.4°	0°	1.9°	1.3°	2.5°	0.8°	1.8°	17.1°
Eccentricity of Orbit	0.206	0.007	0.017	0.093	0.048	0.056	0.046	0.009	0.248

Mars and Beyond
Worksheet Lesson 7
The Planets and Your Age

Name _____ Period _____

Directions: Answer each question using complete sentences.

- 1) Pluto takes 6 days, 9 hours and 18 minutes to rotate completely around. It rotates retrograde. What do you think that means?
- 2) How old are you in days? To figure this:
 - a) Multiply how many years old you are by 365.
 - b) Add 1 day for each leap year (Feb 29) that you were alive. The leap years since 1964 were: 1964, 1968, 1972, 1976, 1980, 1984, 1988, 1992, 1996
 - c) Add how many days it has been since your last birthday.
- 3) Fill out the chart on page 44 to figure out how old in days you would be if you lived on each planet. For example, let's say you are 5,000 days old. Mercury takes 59 days to rotate. To figure your age on Mercury, you would divide 5,000 by 59. Remember, you want to divide days by days. Therefore, you will want to change some of the planet's information into a fraction. There are 1440 minutes in a day. You will want to change the planet information into minutes and then place it over a fraction with a denominator of 1440. For example, Saturn's Day is 10 hours and 40 minutes. Ten hours and 40 minutes equals 640 minutes.

Your fraction would be $\frac{640}{1440}$. To figure your age in days, if you lived on Saturn, you would write the equation:

$$5,000 \div \frac{640}{1440} = X \text{ days old.}$$

Remember to divide a fraction, we would find the reciprocal of $\frac{640}{1440}$ and multiply. Our new equation would be:

$$\frac{5000}{1} \cdot \frac{1440}{640} = X \text{ days old.}$$

To multiply fractions, we multiply the numerators and the denominators:

$$\frac{5000 \cdot 1440}{1 \cdot 640} = \frac{7200000}{640}$$

Finally, we change this fraction into a decimal. To do this, we divide the numerator by the denominator.

$$7,200,000 \div 640 \approx 11,250 \text{ days old.}$$

Fill out the chart below to show how many days old you would be on each planet.

Planet	Period of Rotation	Days Old
Mercury	59 Days	
Venus	243 Days retrograde	
Earth	23 hours, 56 minutes	
Mars	24 hours, 37 min	
Jupiter	9 hours, 55 min	
Saturn	10 hours, 40 min	
Uranus	17.2 hours, retrograde	
Neptune	16 hours, 7 min	
Pluto	6 days, 9 hours, 18 min, retrograde	

- 4) The Period of Revolution is how long it takes the planet to go around the sun. Divide your age in years by the fraction of a year or number of years the planet takes to go around the sun. Remember to divide years by years. For example, let's say you are 15 years old. Mercury takes 88 days to revolve around the sun. Follow the same directions as explained in problem 3. To figure your age in years, your work would look like this:

$$15 \div \frac{88}{365} = X \text{ years old}$$

$$\frac{15}{1} \cdot \frac{365}{88} = \frac{5475}{88}$$

$$5475 \div 88 \approx 62.215 \text{ years old}$$

Fill out the chart below to show how many years old you would be on each planet.

Planet	Period of Revolution	Years Old
Mercury	88 Days	
Venus	223.7 days	
Earth	365.3 days	
Mars	687 days	
Jupiter	11.86 years	
Saturn	29.46 years	
Uranus	84 years	
Neptune	165 years	
Pluto	248 years	

Mars and Beyond
Worksheet Lesson 7 - Answers
The Planets and Your Age

- 1) Pluto takes 6 days, 9 hours and 18 minutes to rotate completely around. It rotates retrograde. What do you think that means?

Retrograde means to turn the opposite of what Earth turns. Earth turns clockwise. Retrograde would be counter-clockwise.

- 2) How old are you in days? To figure this:

Answers will vary

- 3) Fill out the chart below to show how many days old you would be on each planet.

Answers will vary on the chart. The chart below shows the answers for a student who is exactly 12 years old (4,383 days old).

- 4) Fill out the chart below to show how many years old you would be on each planet.

Answers will vary on the chart. The chart below shows the answers for a student who is exactly 12 years old.

Planet	Period of Revolution	Years Old
Mercury	88 Days	49.77
Venus	223.7 days	19.58
Earth	365.3 days	12.00
Mars	687 days	6.38
Jupiter	11.86 years	1.01
Saturn	29.46 years	0.41
Uranus	84 years	0.14
Neptune	165 years	0.07
Pluto	248 years	0.05