Name _____ Date _____

HOW MUCH DO I WEIGH?

Imagine that you weigh 100 pounds. What does that really mean? Weight is a numerical representation of the amount of gravitational force being applied to your body here on Earth. If you were to travel to another celestial body in our solar system, you would not have the same weight as you do here on Earth, because the gravitational force is not the same.

For example, the moon has a gravitational force approximately one-sixth that of Earth's. Because of this, you would weigh one-sixth of what you weigh on Earth. If you weigh sixty pounds on Earth, you would weigh ten pounds on the moon, because one-sixth of sixty pounds is ten pounds (1/6 x 60 = 10).

Another way to look at this comparison mathematically is to know that one-sixth equals approximately 0.167. If you multiply 60 pounds by 0.167 it would equal 9.999996, or approximately 10 pounds.

Now it is time to find out how much YOU would weigh on the moon. Insert your weight on the blank line in the formula and multiply it to learn how much you would weigh on the moon.

(your weight here)_____ X 0.167 = _____

Now that you know how much you weigh on the Earth and the moon, let's see what you would weigh on the other eight planets of our solar system.

Directions: Insert your weight in the first line like you did for the moon. Multiply that number by the decimal number given and see how much you would weigh on the other planets.

Mercury

_____ x 0.33 = _____

Venus

_____ x 0.88 = _____

Mars

_____ x 0.30 = _____

Jupiter

_____ x 2.50 = _____

Saturn

_____ x 1.07 = _____

Uranus

_____ x 1.17 = _____

Neptune

_____ x 1.21 = _____

Pluto

_____ x 0.40 = _____

Name _____ Date _____

HOW MUCH DO I WEIGH?

Directions: Answer the following questions using the data you collected on the previous page.

1. Name the planet on which you would have the most similar weight to your weight on Earth. Explain your reason for choosing that planet.

_____
_____
_____
_____

2. Name the planet on which you would have the least similar weight to your weight on Earth. Explain your reason for choosing that planet.

_____
_____
_____
_____

3. Group the planets into two categories of similar gravitational forces.

Group one:	Group two:
_____	_____
_____	_____
_____	_____
_____	_____

4. What was your reason for grouping the planets the way you did? What is the one factor each group had in common?

_____
_____
_____
_____

Name _____ Date _____

HOW HIGH CAN I JUMP?

Directions: Use the following procedures to measure how high you would be able to jump on each of the nine planets. You can do this activity on an outside wall of the school with chalk, or in the classroom on the board, or on paper covering the wall.

Materials list: Indoors - large sheet of paper, masking tape, marker, ruler or measuring tape, string, scissors, 2" to 3" strips of paper to label string

Outdoors - brick outside wall of school, washable sidewalk chalk, ruler or measuring tape, string, scissors, masking tape, 2" to 3" pieces of paper to label string

Step1: Holding the chalk or marker in one hand, reach as high as you can and make a mark on the wall or paper.

Step 2: Without a running head start, jump as high as you can and make another mark above the first one.

Step 3: Take a ruler or measuring tape and measure the difference between the marks. Make sure you are measuring with the metric system, as scientists do. This measurement is how high you can jump on Earth.

Step 4: Write the measurement on the first line of the following table, do the calculations, and see how high you would be able to jump on each planet.

Mercury	Venus
_____ x 3.00 = _____	_____ x 1.20 = _____
Mars	Jupiter
_____ x 3.30 = _____	_____ x 0.40 = _____
Saturn	Uranus
_____ x 0.90 = _____	_____ x 0.80 = _____
Neptune	Pluto
_____ x 0.75 = _____	_____ x 2.50 = _____

Step 5: Using a ruler or measuring tape, measure how high you jumped on Earth. Mark the measurement on a piece of string, and cut it. Tape a label to the string and write *Earth* on it.

Step 6: Repeat Step 5 for the remaining eight planets.

Step 7: Lay the strings on the floor or ground in order from shortest to longest.

Step 8: Compare with a student near you to see if they have the same order of planets.

Name _____ Date _____

Teacher whole group prompts:

1. Lead the students to look for a pattern similar to the groupings they did with weight. They should see that the smaller planets had a larger jumping distance. This is because the gravity is weaker. The larger planets had a stronger gravity, so the students couldn't jump as high.

2. Lead the students to make comparison statements: the smaller planets had weaker gravity so they weighed less and could jump farther. The larger planets had stronger gravity so they weighed more and couldn't jump as far.

3. This is also an opportunity for a science journal entry. Students can write their comparisons in their journal. They could pick a planet they want to live on based on the activity and give reasons why they want to.

Answer key to page 2:

1. The answer should have been Saturn. The difference of gravity is 0.07. Explanations may vary.

2. The answer should have been Jupiter. The difference of gravity is 1.50. Explanations may vary.

3. Group one: Mercury, Venus, Mars, Pluto
   Group two: Jupiter, Saturn, Uranus, Neptune

4. The factor for this grouping is the gravity value greater than or less than Earth's gravity, 1.00. Another possible answer would be the sizes of the planets, if the students have access to pictures.