



Activity 2: Answers
How Much Do You Weigh?

1. Identify a planet that has a similar gravitational attraction as Earth.

Venus or Uranus, because their factors are close to 1.

2. List the planets' gravitational attraction from least to greatest.

Pluto, Moon, Mars and Mercury, Uranus, Venus, Earth, Saturn, Neptune, Jupiter, Sun.

3. Compare the multiplication factors in the chart. Judging from these factors, which planet has the greatest mass?

The multiplication factors are compared to Earth's gravity. The factors less than one are planets where the gravitational attraction is weaker than Earth's, because mass is less. The planet with the greatest mass is Jupiter.

4. Another student claims that the Moon's gravity is $\frac{1}{6}$ of the Earth's gravity. Is this a true statement. Look at the chart and use mathematics to support your answer.

This is a true statement because of the following:

A person weighing 80 pounds would weigh $(0.17)(80) = 13.6$ pounds on the Moon and 13.6 is $\frac{1}{6}$ of 80 because 0.17 is approximately $\frac{1}{6}$.

5. What if your doctor told your aunt that weighing 165 pounds at 5'4" makes her 20 pounds overweight. To what planet could she travel to be at an acceptable weight? Justify your answer.

The student would have to find a gravitational factor that would suffice for a weight at most 145 pounds.

$$\begin{aligned} 165x &= 145 \\ x &= .88 \end{aligned}$$

Therefore, the best answer would be Uranus with a 0.8 factor. Note, that choosing Venus would only yield the aunt weighing 148.5 pounds.

