

MASS VS. WEIGHT PRACTICE PROBLEMS

Calculate the following problems in your science notebook. Show all your math, including equations and conversions. No naked numbers!

1. What is the force on a 1 kg ball that is falling freely due to the pull of gravity? (Hint: force is measured in Newtons) (neglect air resistance)
2. A man has a mass of 66 kg on Earth. What is his weight in both Newtons and pounds?
3. A person weighs 540 N on Earth.
 - a. What is the person's mass?
 - b. What would be the person weight on the moon where the acceleration due to gravity is 1.67 m/s^2 ? Calculate weight in Newtons and pounds.
4. An astronaut has a mass of 50 kg.
 - a. How much does she weigh (N) before liftoff?
 - b. When her space vehicle is 6400 km above the Earth's surface, she will weigh one quarter of what she weighed on the Earth.
 - (1) What does she weigh (N) at that point in space?
 - (2) What is the acceleration due to gravity on her mass at that point in space?
5. Felicia the ballet dancer has a mass of 45.0 kg.
 - a. What is Felicia's weight in newtons at Earth's surface?
 - b. Given that 1 kilogram of mass corresponds to 2.2 pounds at Earth's surface, what is Felicia's weight in pounds on Earth?
 - c. What would be Felicia's mass on the surface of Jupiter?
 - d. What would be Felicia's weight on Jupiter's surface, where the acceleration due to gravity is 25.0 m/s^2 ?