Rosary School / Marj El Hamam

Name : _____ Grade 7: A, B, C, D, E

Subject : Physics (Study sheet 2)

Gravity and gravitational fields

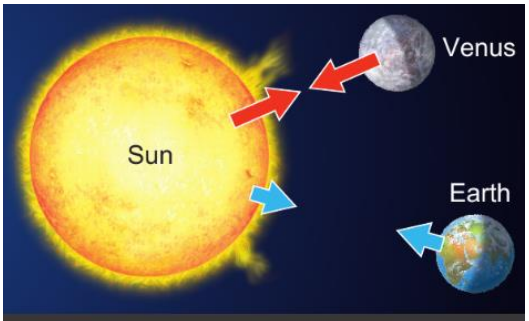
- The **mass** of something is the amount of substance or 'matter' it contains. It is measured in kilograms (kg).

- **Weight** is the force of gravity pulling on a mass. It is a force, so it is measured in newtons (N).

- **Gravity** is the force of attraction between **<u>two masses</u>**. The force of gravity is stronger if:

    - the objects have large masses

    - the objects are close together (the force of gravity gets weaker when the two objects attracting each other get further apart)



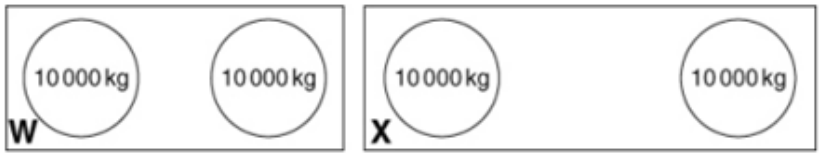
D | The masses of Venus and Earth are similar. The force of gravity between Venus and the Sun is about 1.6 times stronger than between the Earth and the Sun, because Venus is closer to the Sun.

- On Earth, gravity pulls **on every kilogram of mass** with a force of about 10 N.
- Gravity is not as strong on the Moon because the Moon has a much smaller mass than the Earth. If you went to the Moon ***your mass would not change,*** but your weight ***would be less*** than on Earth because the Moon's gravity is weaker.
- The Sun's gravity keeps all the planets in our Solar System moving in elliptical orbits around it. If there was no gravity from the Sun, the planets would all fly off into space.
- The Earth's gravity keeps the Moon in orbit around the Earth.
- A satellite is anything that orbits around a planet. The Moon is the only **natural satellite** of the Earth.
- **Artificial satellites** are put into orbit around the Earth or other planets. They can be used for taking pictures or transmitting TV programs.

***Question:**

These diagrams show different objects in space. Which pair of objects has the biggest force gravity between them? Explain your answer.

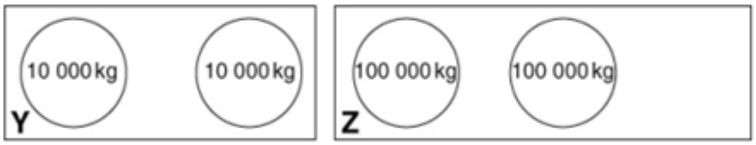
a



The objects in _____ (W/X) have the biggest force of gravity between them because ____

_____

b



The objects in _____ (Y/Z) have the biggest force of gravity between them because ____

_____

- You can calculate the weight of an object using this formula:
  weight (N) = mass (kg) × gravitational field strength (N/kg)

Example:

Calculate the weight of a 5 kg mass on the Earth.

Weight = mass x *g*
= 5 kg x 10 N/kg
= 50 N

***Question:**

a. Calculate the weight of a 2 kg mass on the Earth.

b. The gravitational field strength on the Moon is 1.6 N/kg. Calculate the weight of the 2 kg mass on the Moon.

Course book questions: 3,5,6 pages 190, 191
Workbook page: page 142

Teacher: Zeina Abu Manneh