Date : _____

SPU3UI Unit 2 : DYNAMICS

Newton's Three Laws

Newton's First Law : Inertia

Things like to _____.
If you throw a _____ in space, it will just keep _____…. at the _____

Scientific Wording:

If the _____ acting on an _____ is _____, the object will _____ its state of _____ or _____.

_____ means that unless an _____ on an object, it won't _____ _____

Newton's Second Law : Acceleration

If an _____ is applied to _____, it will _____ in the _____ of the _____.

The _____ is _____ to the _____ of the _____ and _____ to the _____ of the _____.

Newton's second law as a formula:

F =_____ force = _____

Units force – _____
mass – _____
acceleration – _____

Newton's Third Law : Equal and Opposite Forces

For every _____ force, there is a _____ force equal in _____ but opposite in _____.

The forces of _____ on each other are always equal in _____ but _____ in direction.

Example of Newton's Second Law – stopping suddenly in a car.

Example 1 (no air bag, no seatbelt) – What is the force applied to a person with mass of 70kg if they are in a car accident and stop suddenly from a velocity of 50km/hr in .009 seconds?

Example 2 (with air bag and seat belt) – What would be the force if the person was wearing a seatbelt and the impact was padded by an air bag and the stop took 8 times longer?

Example 3 (force of gravity) – What is the force of gravity on the surface of the earth on a person with mass of 70kg (recall – the acceleration due to gravity is 9.8 m/s^2).

Example of Newton's Third Law – acceleration of the earth (can this happen?)

Assuming the acceleration due to gravity is 9.8 m/s^2. calculate the force of gravity on a 70 kg person as they jump down from a chair.

What is the force that the person exerts back on the earth?

If the earth weighs 5.97×10^{24}kg, what is the acceleration of the earth?

Practice / Review
Read – Sections 2.2, 2.4, 2.5,
Do questions 1,2,4,6 page 73