Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Guided Notes: Newton’s Laws

Newton’s First Law: The law of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* An object at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tends to stay at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and an object in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tends to stay in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ unless acted upon by an ­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force.

What are balanced forces?

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What are unbalanced forces?

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If objects in motion tend to stay in motion, why don’t moving objects keep moving forever?

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* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the measure of the amount of matter in an object
* INERTIA is a property of an object that describes how \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the motion of the object
* more \_\_\_\_\_\_\_\_\_\_\_\_\_\_ means more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is this unbalanced force that acts on an object in motion? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4 Types of friction:

* + \_\_\_\_\_\_\_\_\_\_\_\_\_\_ friction: ice skating
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_ friction: bowling
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_ friction (air or liquid): air or water resistance
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_ friction: initial friction when moving an object

Newton’s Second Law

* *Force equals mass times acceleration.*
* *\_\_\_\_\_ = \_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_*

Force = Mass x Acceleration

* Force is measured in ­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + ACCELERATION of GRAVITY(Earth) = 9.8 m/s2
  + Weight (force) = mass x gravity (Earth)
* Moon’s gravity is 1/6 of the Earth’s

If you weigh 420 Newtons on earth, what will you weigh on the Moon?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If your mass is 41.5Kg on Earth what is your mass on the Moon?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* WEIGHT is a measure of the force of \_\_\_\_\_\_\_\_ on the mass of an object
* measured in \_\_\_\_\_\_\_\_\_\_

Newton’s Third Law

* *For every action there is an* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*and* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*reaction.*
  + A bug with a mass of 5 grams flies into the windshield of a moving 1000kg bus.
    - Which will have the most force?

Newton's Laws

* 1stlaw: Homer is large and has much mass, therefore he has much inertia. Friction and gravity oppose his motion.
* 2nd law: Homer’s mass x 9.8 m/s/s equals his weight, which is a force
* 3rd law: Homer pushes against the ground and it pushes back.

Consider hitting a baseball with a bat. If we call the force applied to the ball by the bat the *action force*, identify the *reaction force*.

(a) the force applied to the bat by the hands

(b) the force applied to the bat by the ball

(c) the force the ball carries with it in flight

(d) the centrifugal force in the swing