

Name/Number: _____

Date: _____

Force, Motion, Energy STUDY GUIDE (KEY)

Standard 4.2a: SWBAT understand that motion is described by an object's speed and direction.

Vocabulary:

- Motion – **a change in an object's position**
- Relative Position – **an object's position related to another object nearby**
- Speed – **a way to describe how fast an object is moving**
- Velocity – **a measurement of an object's speed and direction**
- Acceleration – **a change in the speed or direction of an object's motion**

How can a location or position be described? **An object's location or position can be described by using relative location words like "next to," "bordering," "to the right of," "beside," etc... in relation to other objects that surround it.**

What do you need in order to be able to calculate the speed of an object? **(1) the distance and (2) the time it took to travel that distance.**

What is a common misconception about acceleration? **Many people believe that acceleration is only an increase in speed, but it can be a decrease as well.**

Standard 4.2b: SWBAT understand that forces cause changes in motion.

Vocabulary:

- Force – **Any push/pull that causes an object to move, stop, change speed/direction**
- Newton – **a unit that measures force. It is named after Sir Isaac Newton.**
- The **greater** the force, the **greater** the **change in motion** will be. The **more massive** an object, the **less effect** a given force will have on the object.
- Unless acted on by a **force**, objects in **motion** tend to **stay in motion** and objects at **rest remain at rest**.

What is the difference between a contact force and a non-contact force? **A contact force is a force that must touch an object to have an effect on it. Non-contact forces can effect an object from a distance like the force of gravity on Earth.**

Describe balanced and unbalanced forces. Give examples. **Balanced forces are equal forces and unbalance forces are unequal forces. In tug of war, balanced forces mean the rope won't move and unbalanced forces cause it to go in the direction of the stronger force.**

Standard 4.2c: SWBAT describe how friction and gravity cause changes in motion.

Vocabulary:

- Friction – the resistance to motion created by two objects moving against each other
- Gravity – the force that pulls object toward each other
- Mass – the amount of material in an object
- Weight – a measurement of gravity's effect on an object's mass

What are some things that can cause friction to increase or decrease? Friction can be affected by (1) the type of surface of the two objects in contact and (2) how hard they are pressed together

What two things determine the force of gravity between objects? The force of gravity between objects depends on their mass and the distance from each other.

How are mass and weight different? The mass of an object stays the same unless something is added or taken away. Weight changes depending on the force of gravity.

Standard 4.2d: SWBAT understand that objects have kinetic or potential energy.

Vocabulary:

- Kinetic energy – the energy of motion
- Potential energy – stored energy

What are some things that can cause kinetic energy to increase or decrease? Kinetic energy can be increased or decreased depending on an object's mass and speed.

Examples of Kinetic Energy	Examples of Potential Energy
<ul style="list-style-type: none">• <u>Roller skating down a hill</u>• <u>Dribbling a soccer ball</u>• <u>Running a mile</u>• <u>Anything that is MOVING!</u>	<ul style="list-style-type: none">• <u>A child at the top of a slide</u>• <u>A stretched rubber band</u>• <u>A pitcher winding up to throw a ball</u>• <u>Anything that is READY TO MOVE!</u>

STUDY!! Your Force, Motion, Energy TEST will be on:
