Name Period Date

**Newton’s 2nd Law Notes**

What is acceleration?

What is mass?

What is net force?

**The Second Law of Motion**

Suppose you are baby-sitting two children who love wagon rides. Their favorite part is when you quickly. When you get tired and sit in the wagon, one of the children pulls you. He soon finds he cannot accelerate the wagon nearly as fast as you can.

How is the wagon’s acceleration related to the force pulling it?

How is the acceleration related to the wagon’s mass?

**Determining Acceleration**

According to Newton’s , acceleration depends on the object’s and on the acting on the object.

This can be written as an equation:

Acceleration =

OR

Force =

What unit of measure is used for acceleration?

For , we will be using the SI unit of .

This means that is measured in kilograms times meters per second per second.

Instead of having to write all of that out, we use for the SI unit of force.

You can think of as the force required to give a an acceleration of .

**Calculating Force**

A speedboat pulls a 55 kg water skier. The force causes the skier to accelerate at 2.0 m/s2. Calculate the net force that causes this acceleration.

**Changes in Force and Mass**

How can you the acceleration of the wagon? Look again at the equation.

Acceleration =

One way to increase acceleration is by .

If the mass is constant, and change in the way.

So to increase the of the wagon, you can increase the used to pull it.

Another way to acceleration is to change the . According to the equation, acceleration and mass change in ways.

If the force is , an increase in causes a in acceleration.

The opposite is also true: A in mass causes an increase in .