Names \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block \_\_\_\_\_

**Newton’s Laws of Motion**

**\*You have been asked as a cartoonist, to create three separate simple animations that illustrate each of Newton’s Laws of Motion. Use the “Animator” app on the iPad. Choose Create Flipbook. Be sure to read the directions on how to use each function.**

What is Newton’s First Law?

What are some everyday examples that show this law in action? (at least two)

Describe in words what your mini animation will show:

Draw freeze frames in four boxes that explain how your animation shows the concept:

|  |  |
| --- | --- |
|  |  |
|  |  |

What is Newton’s Second Law?

What are some everyday examples that show this law in action? (at least two)

Describe in words what your mini animation will show:

Draw freeze frames in four boxes that explain how your animation shows the concept:

|  |  |
| --- | --- |
|  |  |
|  |  |

What is Newton’s Third Law?

What are some everyday examples that show this law in action? (at least two)

Describe in words what your mini animation will show:

Draw freeze frames in four boxes that explain how your animation shows the concept:

|  |  |
| --- | --- |
|  |  |
|  |  |

**Application questions:**

**I. NEWTON’S FIRST LAW OF MOTION**

1. Newton’s first law of motion is also known as the LAW OF \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Newton’s first law says that
3. an object that IS NOT MOVING, or is at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, will stay at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, **AND**
4. an object that IS MOVING will keep moving with constant \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which means at the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and in the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, **UNLESS**
5. an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force acts on that object.
6. What is inertia?
7. What property of an object determines how much inertia it has?
8. Which of the following has more inertia?
   1. Bowling ball or Tennis ball
   2. Hammer or Feather

**II. NEWTON’S SECOND LAW OF MOTION**

1. Newton’s second law of motion is also known as the LAW OF \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Newton’s second law says that when an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force is applied to a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, it causes it to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. The greater the force that is applied, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the acceleration.
4. The lesser the force that is applied, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the acceleration.
5. If the same force is applied to an object with a large mass, it will have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ acceleration.
6. If the same force is applied to an object with a small mass, it will have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ acceleration.
7. The equation that is used to solve second law problems is **F = ma**.
   1. What do each of the variables mean?

F = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. What unit of measurement must be used with each variable?

F = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**III. NEWTON’S THIRD LAW OF MOTION**

1. Newton’s third law of motion is also known as the LAW OF \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Newton’s third law says that every time there is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force, there is also a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ force that is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in size and acts in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ direction.
3. Newton’s third law states that forces must ALWAYS occur in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. Listed below are ACTION forces. Tell the REACTION force.
   1. Your bottom pushing on your desk seat
   2. A bat hitting a baseball
   3. Your finger pressing on your phone screen while texting