Interactive Lab Newton #2
Name_____ Block____

During this interactive you are going to investigate Newton's 2nd Law of motion.
1. State Newton's 2nd Law of motion without using any equations.

2. You are going to set the force supplied by space ships engines so that they stay in formation. Initially, all four space ships have the same velocity. Their pilots want all the ships to accelerate at 5.15 m/s^2. The red ships have a mass of 1.27×10^4 kg, and the blue ships, a mass of 1.47×10^4 kg. You need to set the amount of force supplied by the ships' engines so that they accelerate at 5.15 m/s^2. The masses of the ships do not change significantly as they burn fuel. Calculate the force needed by each type of ship. **(Show all work including substitution with units)**

Open the shortcut "**IL N#2 Q3**" on one of the lab stations. Open the simulation contained in this section. **Do Not follow the directions in the simulation follow these instructions.**

The simulation uses scientific notation; you need to enter three-digit leading values. Enter the values you calculated in question 2 and press GO to start the simulation. If all the ships accelerate at 5.15 m/s^2, you have succeeded.

3. Did you succeed? **YES** **NO**

If the answer is no recalculate here and try your new values by pressing RESET.

Open the shortcut "**IL N#2 Q4-6**" on one of the lab stations. Open the simulation contained in this section. **Do Not follow the directions in the simulation follow these instructions.**

In this simulation a helicopter is being used as a scale. This simulation also includes three crates; each has a slightly different mass. The helicopter lifts each crate with a force of 10,748 N via the tension in the cable.

4. Drag the helicopter to the left-hand most crate and press GO to lift the crate. Using the information provided in the simulation calculate the inertia of this crate. **(Show all work including substitution with units)**

Press RESET

5. Drag the helicopter to the center crate and press GO to lift the crate. Using the information provided in the simulation calculate the inertia of this crate. **(Show all work including substitution with units)**

Press RESET

6. Drag the helicopter to the right-hand most crate and press GO to lift the crate. Using the information provided in the simulation calculate the inertia of this crate. **(Show all work including substitution with units)**

Press RESET

7. Drag the helicopter to the landing pad and press GO. Using the information provided in the simulation calculate the inertia of the helicopter. **(Show all work including substitution with units)**

8. What did you learn during this interactive?