PHET – Forces in One Direction Demonstration and Worksheet

1. Open the simulation called Forces 1D
2. Learn where the controls are to change objects, add/remove friction
3. Learn where the controls are to change the friction coefficient
4. Create the following set up:
    a. Crate
    b. Original position – 0
    c. Graph Acceleration (and Force)
    d. No Friction
    e. Applied Forces

Force Applied (kgm/s^2)	Measured Acceleration (m/s^2)	Ratio of Force to Acceleration

Is the ratio of the force to the acceleration constant? If so, what does this tell you about the relationship between Force and Acceleration?

Start the crate moving, then see what you have to do to stop it. What do you have to do to arrest the motion of the crate?

Add Friction, check the controls, and set the value to 0.2 for static and kinetic friction, change to a sleepy dog of mass **25kg**.

Force Applied (kgm/s^2)	Frictional Force (kgm/s^2)	Measured Acceleration (m/s^2)	Ratio of **Net** Force to Acceleration

Is the ratio of the force to the acceleration constant? If so, what does this tell you about the relationship between Force and Acceleration? Why does it, or does it not change with friction?

Repeat the above experiment (with values of your own choosing, but keep the mass of the object constant), and change the frictional coefficients. Record the values in the table indicated.

Force Applied (kgm/s^2)	Friction coeff.	Frictional Force (kgm/s^2)	Measured Acceleration (m/s^2)	Ratio of **Net** Force to Acceleration

Is the ratio of the force to the acceleration constant? If so, what does this tell you about the relationship between Force and Acceleration? Why does it, or does it not change with friction?