

## Rough Riders

Materials – wood block, spring scale, sandpaper, 200 g mass, 250 g mass, ~5cm masking tape

**Do this...** Use masking tape to attach the sandpaper to the table. Place the block on the sandpaper with side "A" facing up. Place the 250 g mass on the wood block. Use the spring scale to gently pull the block across your table, just hard enough to get the block sliding. Be careful not to drag the scale on the sandpaper. You are looking for two forces: (1) the maximum amount of force reached before the block slides and (2) the amount of force to keep the block sliding at a constant velocity. Record both of these forces in Newtons.

Repeat with side "B" of the block facing up.

*Have your teacher approve at this point*

**Answer these...** When was more force required: to start the block sliding or to keep it sliding at a constant velocity?

What was the net force on the block while you were pulling it with a constant velocity?

**Now do this...** Repeat the **Do this...** with both masses on the block.

*Have your teacher approve at this point*

**Finally, answer these...** Based on your observations, which variable makes a more dramatic change in the amount of friction... surface area or weight?

How and why would the forces you observed change if you did not use the sandpaper?

Define friction.