

Name \_\_\_\_\_

## **Grade 5 Science: Simple Machines**

### **Experiment #2: 2 Fast 2 Furious**

#### **What you will be doing:**

- 1) After everyone in your group has finished their hypothesis worksheet you will create an incline with various materials in the classroom to the height of 20 cm.
- 2) Place the 1m long boards on top of your inline to create an incline plain
- 3) Measure from the floor upwards 1m on both sides of the board and then create a straight line (in pencil) with a ruler across the board. This will be your start line.
- 4) Choose 1 car for your group from the bucket and have one person hold the car behind the starting line.
- 5) Another member of the group will use a stopwatch to record how many seconds it take the car to move from the start of the board till it falls off the board and onto the floor.
- 6) Record the speed in m/s (meters / second) in your chart
- 7) Repeat steps 5-6 until everyone has a turn to race a car and time a car. Record data for each and every car drop.
- 8) Place the Blue Easy Liner on the Boards and repeat steps 5-7.
- 9) Answer the remaining questions on the worksheet.

**Hypothesis:** The cars will travel at a (greater or lesser) speed on the smooth finish than on the Blue Easy Liner because

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**Controls:** In order to make sure that we only test the variable of **how different materials will affect the speed the car travels** we need to make sure that we don't mess with the \_\_\_\_\_ of the incline plain, that we don't apply any push or pull forces to the \_\_\_\_\_, and that we use the \_\_\_\_\_ car every time.

**Speed:** (Think about the speed limit signs you pass every day to help you answer this question: They measure speed in kilometres per hour km/h)

A class before ours performed this experiment and discovered that it took their car on average 6 seconds to travel 1 mete: How fast was their car travelling in meters / seconds \_\_\_\_\_m/s

**Data Entry:**

	<b>Solid Wood</b> Speed the car is travelling in meters/second	<b>Blue Easy Liner</b> Speed the car is travelling in meters/second
Run 1		
Run 2		
Run 3		
Run 4		
Run 5		
Average: Total/Runs=		

**Conclusions:** My Hypothesis was \_\_\_\_\_. (Correct or Incorrect) The reason that the cars travelled \_\_\_\_\_ on the solid wood than on the Blue Easy Liner is

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**Actual Reason:** The cars travel with greater speed (velocity) because there is less energy lost to friction with the smooth wood than the Blue Easy Liner.

**Details:**

**Friction:** As the wheels of the little toys cars begin to roll down the board they come in contact with the surface. The smooth surface does not resist motion very much. It does however resist motion a little bit. All of the little lumps and bumps in the board (you could see them if you got out a microscope) resist the motion of the car to some degree: in fact, those lumps and bumps actually slow down the acceleration of the car. They create friction, which is simply a force that acts to resist motion. In a nutshell, as the cars travel down the smooth ramp the tiniest lumps and bumps in the wood actually push against (in the opposite direction the car is moving) the racers and slow down their acceleration. With the Blue Mats there are more lumps and bumps. As a result there is more friction to resist the downward motion of the racers. The greater the friction, the lesser the acceleration, and as a result the lesser the overall speed.