Names of Team Members: _____

Part I

Materials:

- toy car
- small plastic container (no longer than the length of the car)
- metal BBs (or other material to increase the weight of the car)
- spring scale
- string

Advanced Preparation: Fill the plastic container with the material to increase the weight of the car. Attach the filled container to the top of the car with strong tape or, with the help of an adult, a hot glue gun.

1. Use the spring scale and string to determine the weight of the car with the plastic container attached (in N). Record the results in your science notebook.

2. Place the car halfway up the ramp and, using the spring scale and string, keep the car holding still. The car should not be rolling down the ramp or being pulled up. Record the amount of force (in N) in your science notebook.

3. The upward force on the car must be equal to its weight in order for the car to remain still. Compare your results from steps 1 & 2. Why are they different? What other force is acting on the car?

Part II

Suppose you want to put your toy car up on a platform. How would you do that? With a ramp or by lifting it up and putting it on the platform? Which one is more work? Use the materials below and your knowledge of designing a scientific investigation to determine which is more work.

Materials:

- wooden board (approx. 60 cm in length)
- books (enough to achieve a height of 30 cm)
- toy car (from Part I)
- spring scale
- string
- meter stick

Hypothesis:

_____

_____

_____

Independent Variable:

_____

Dependent Variable:

_____

What procedures would you follow to test your hypothesis? Discuss this with your team and be prepared to share your discussion with the class.

Data and Calculations

remember: W = Fd