Mass, Friction, and Motion: Student Activity Sheet

Name: $\qquad$ Date: $\qquad$

## Part 1: Effect of Mass on Speed

The wooden ball and the marble are the same sizes, but the marble is heavier. The marble weighs 5 grams and the wooden ball weighs 1.5 grams.

Record the speed of the marble from Part 1: Measuring Speed in the Measuring Speed Activity.
$\qquad$ meter per second

How do you think the speed (time it takes to travel 1 meter) of the wooden ball will compare to the speed of the marble? $\qquad$

Set up Ramp A $(40 \mathrm{~mm})$ and time the wooden ball rolling over the runway three times. Record your results for all three times below.

| Wooden Ball | Trial 1 | Trial 2 | Trial 3 | Average |
| :---: | :---: | :---: | :---: | :---: |
| Time |  |  |  |  |

Compare your results to your prediction. $\qquad$

How did changing the mass of the ball affect the speed? $\qquad$

## Part 2: Friction Forces

## Foam

For this investigation use the marble and the Ramp A set-up (40mm). Set up Ramp A with the foam. What do you predict will happen to the speed of the marble? $\qquad$

Time the marble rolling over the runway three times. Record your results for all three times below.

| Foam | Trial 1 | Trial 2 | Trial 3 | Average |
| :---: | :---: | :---: | :---: | :---: |
| Time |  |  |  |  |

How did the speed change when the marble ran across the foam sheet? $\qquad$

What do you think could cause the difference? $\qquad$

## Salt

Set up Ramp A ( 40 mm ) with a piece of paper at the end with a small sprinkle of salt. What do you predict will happen to the speed of the marble? $\qquad$

Time the marble rolling over the runway three times. Record your results for all three times below.

| Salt - sprinkle | Trial 1 | Trial 2 | Trial 3 | Average |
| :---: | :---: | :---: | :---: | :---: |
| Time |  |  |  |  |

How did the speed change when the marble ran across the sheet with salt? $\qquad$
$\qquad$

Set up Ramp A ( 40 mm ) with a piece of paper at the end with a lot of salt. What do you predict will happen to the speed of the marble? $\qquad$
$\qquad$

Time the marble rolling over the runway three times. Record your results for all three times below.

| Salt - a lot | Trial 1 | Trial 2 | Trial 3 | Average |
| :---: | :---: | :---: | :---: | :---: |
| Time |  |  |  |  |

How did the results compare to your prediction? $\qquad$
$\qquad$

Using the term friction, explain how salt affected the speed of the marble. $\qquad$
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