



Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

CRASH SCIENCE IN THE CLASSROOM

## PENNY FOR YOUR THOUGHTS ON INERTIA

### MATERIALS NEEDED

For each group of 3-4 students

- » One 3"x 5" index card
- » One 10-16-ounce plastic cup or beaker
- » 1-10 pennies
- » **OPTIONAL:** additional mix of dimes, nickels, quarters, and half dollars

Per Student

- » One copy of the "Penny for Your Thoughts" Student Activity Sheet



### Key Question

- » How is a magician's tablecloth trick similar to a crash dummy falling off the tailgate of a pickup truck as the truck accelerates?

### Did You Know?

*Whether you are attempting the magician's tablecloth trick or slamming on your car brakes to avoid an accident, the laws of physics apply.*

*Understanding the physical laws of motion can help improve your chances of success in either situation and could even save your life someday!*



### Procedure

1. Cover the cup with the index card and center the penny above the cup on top of the card (See Figure 1).
2. Try to figure out how to get the penny into the cup without lifting the card and only touching the card with one finger.
3. After each group member has succeeded with one penny, try it with a stack of multiple pennies and/or other coins.

### Analysis Questions

1. Describe the successful technique you used.

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2. Why does the penny drop in the cup when the card is "flicked" away?

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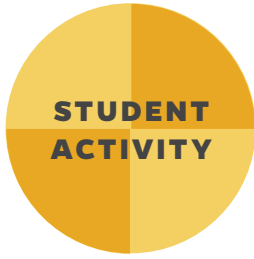
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## PENNY FOR YOUR THOUGHTS ON INERTIA



### Analysis Questions (continued)

3. How did the total mass of the coins used affect your success?  
(HINT: How are “mass” and “inertia” related?)

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4. How does this activity illustrate Galileo’s Principle of Inertia and Newton’s First Law of Motion?

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5. Should magicians select lighter or heavier dishes for their tablecloth trick? Why?

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### Key Question 2

How is the magician's tablecloth trick similar to a crash dummy falling off the tailgate of an accelerating pickup truck?

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