

Click It!

Lesson at a glance:

Students will participate in an inquiry activity that will help them understand the concept of inertia. They will also understand why seat belts are important.

Grades:

3-5

Skills:

Investigating, Observing, Predicting, Communicating, Comparing

Materials:

For each pair of students:

- A toy dump truck
- A stuffed animal that will fit into the back of the truck
- A wooden board
- A ruler
- Three books or bricks
- Carpet sample (at least 18" long)
- String or masking tape
- "Click It! Observations" (please print on both sides)



Background Information:

Newton's First Law of Motion states that an object at rest will remain at rest and an object in motion will remain in motion and continue moving at the same speed and in the same direction unless acted upon by an outside force. This natural inclination of an object to resist changes in its state of motion is called inertia.

Activity:

For younger students, you can perform the activity and have them watch rather than dividing the class into teams.

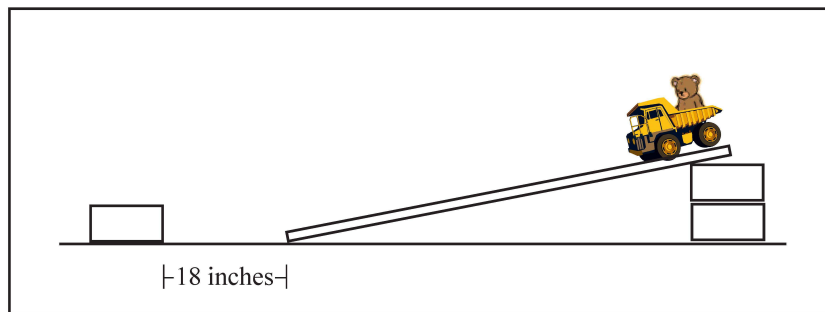
Part 1:

1. Divide the students into groups of two.
2. Give each team of students:
 - A dump truck
 - A stuffed animal
 - A wooden board
 - A ruler
 - Three bricks or books
3. Have each group set up its ramp by placing two of the books or bricks under one end of the wooden board.
4. Have the students place the last brick/book 18 inches from the bottom of the ramp.



AMERICA'S CAR MUSEUM®

5. Have each group place their stuffed animal into the back of the dump truck.
6. Tell the students to place their truck on the top of the ramp. Have them release the truck without pushing it, allowing it to roll down the ramp and crash into the brick/book. Have the students record their observations.
7. Students should run more than one trial, altering ramp height if desired.



Part 2:

1. Give each pair of students a carpet sample
2. Have each group place their carpet sample between the bottom of their ramp and the brick/book that is 18 inches away from the bottom of the ramp. (Note: If the carpet is longer than 18", place the brick/book on top of the carpet 18 inches from the ramp.)
3. Place the truck with the stuffed animal in it on the top of the ramp. Without pushing it, allow the truck to roll down the ramp and crash into the brick/book. Have the students record their observations.
4. Students should run more than one trial, alternating ramp height if desired.

Part 3:

1. Give each student masking tape and string.
2. Have your students design a "seatbelt" for their stuffed animal in the back of their truck.
3. Have the students make sure their book/brick is still 18 inches from the bottom of the ramp.
4. Place the truck on the top of the ramp. Without pushing it, allow the truck to roll down the ramp and crash into the brick/book. Have the students record their observations.
5. Students should run more than one trial, altering ramp height if desired.

Extensions:

1. Have each team of students describe how they might modify their seatbelt to make it more successful.
2. Have your students investigate how different moving bodies stop. Students might explore trains, bikes, skateboards, cars, animals, etc. Ask them to identify what kind of force might be involved.



Assessment:

1. Have each team of students describe how they made their seatbelt and why it is important. Can the students communicate what they observed?

4	The student is able to communicate that both the dump truck and the stuffed animal were in motion. The brick acted on the truck to make it stop, but the stuffed animal had no such force acting on it to stop it. It continued to move forward because an object in motion tends to continue in motion with the same speed and in the same direction unless a force acts on it.
3	The student is able to communicate that the stuffed animal continued to move forward because objects in motion tend to continue moving.
2	The student is able to communicate that the brick made the stuffed animal fly out of the truck.
1	The student is able to communicate that the stuffed animal fell out of the dump truck.



Click It! Observations



Part 1

Prediction: What will happen to the stuffed animal when the truck hits the brick/book?

	Ramp Height	Observations
Trial 1		
Trial 2		
Trial 3		

Conclusion: What happened to the stuffed animal when the truck hit the brick/book?

Why should you wear your seatbelt when riding in a car?



Part 2 – Carpet sample

Prediction: What will happen to the stuffed animal when the truck crosses the carpet sample and then hits the brick/book?

Carpet sample	Ramp Height	Observations
Trial 1		
Trial 2		
Trial 3		

Conclusion: What happened to the stuffed animal when the truck crossed the carpet sample and hit the brick/book?

Describe any differences you observed in conducting this experiment when compared to the truck traveling on the smooth floor.



Part 3 – Seatbelt



Prediction: What will happen to the stuffed animal if it is strapped in when the truck hits the brick/book?

	Ramp Height	Observations
Trial 1		
Trial 2		
Trial 3		

Conclusion: What happened to the strapped in stuffed animal when the truck hit the brick/book?

Did your seatbelt hold the stuffed animal securely? Are there any changes you would make to your design?

