



## TOPIC: Physics and Car Crashes

**GRADES:** 9 - 12

### OBJECTIVES

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- Understand Newton's laws of motion
- Understand additional physics terms and concepts including: Acceleration, Energy, Friction, Inertia, Joule, Kinetic Energy, Matter, Mass, Momentum, Potential Energy, Speed, Velocity, Weight, Work
- Identify the symbols used to represent the physics terms
- Evaluate the relationships between the physics concepts and the laws of motion
- Recognize how understanding physics helps in car design and transportation technology and infrastructure
- Create a presentation applying knowledge of physics and how they have been used in automotive and transportation technology

### PROCEDURE

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- Assign videos and reading for students to watch:
  - [Understanding Car Crashes: It's Basic Physics](#) created by the Insurance Institute for Highway Safety
  - [Newton's 3 Laws, with a bicycle - Joshua Manley](#) a Ted-ed produced video
- After students complete viewing the videos and reading the information, they should be instructed to review and complete the handouts and presentation.
  - More reading or research could be assigned by the instructor for additional resources for the project.
- Students could perform their presentation over Zoom, record themselves presenting, or simply send it in to be reviewed by their instructor.

### SUPPLEMENTAL MATERIALS

- Laws of Motion Presentation Assignment
- Physics Terms Sheet
- Physics Terms Quiz

#### Answers to Quiz:

1. C	2. D	3. A	4. A.	5. B
1. H	2. I	3. B	4. G	5. E
6. M	7. L	8. O	9. N	10. F
11. J	12. D	13. K	14. C	15. A

## OPTIONAL ACTIVITIES

- [Little Newton in the Energy of Motion Online Game](#) : This resource is an engaging platform game that helps the player review the laws of motion and other physics principles while playing.

## SUMMARY

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By the end of this lesson students should be able to have a working knowledge of some basic physics terms, identify the ways automotive and transportation technology has been improved because of knowledge of the laws of motion, and identify common symbols used to describe physics terminology and equations.