Objective: Students will be able to:

- Reflect on the information gained from their learning experience with the Baseball Hall of Fame.
- Review Newton's Three Laws of Motion and their application in the game of baseball.
- Create a project of their choice based on Newton's Laws and baseball.

Time Required: 2 - 4 class periods

Materials Needed:
- Poster board
- Markers, colored pencils, glue sticks, and other art supplies
- Other materials as needed depending on the type of projects chosen by students.

Vocabulary:

Acceleration - The velocity an object has per unit of time that it is traveling

Balanced Forces - Two or more forces act on a single object, completely canceling each other out.

Force - A push or pull exerted by one object on another

Inertia - The tendency of an object to oppose a change in motion

Mass - The quantity of matter in an object

Motion - A change in position measured by distance and time

Net Force - The combined effect of all the forces acting on an object

Unbalanced Force - When several forces are acting on a single object and the forces do not completely offset one another

Velocity - An object's speed in a given direction
Applicable Common Core State Standards:

CCSS.ELA-Literacy.WHST.6-8.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

CCSS.ELA-Literacy.WHST.6-8.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CCSS.ELA-Literacy.WHST.6-8.5 With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

CCSS.ELA-Literacy.WHST.6-8.6 Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

CCSS.ELA-Literacy.WHST.6-8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

CCSS.ELA-Literacy.WHST.6-8.9 Draw evidence from informational texts to support analysis reflection, and research.

Additional Relevant National Learning Standards: (Based on Mid-continent Research for Education and Learning)


Science. Standard 11. Level III [Grade: 6-8]. Understands the nature of scientific knowledge

Science. Standard 12. Level III [Grade: 6-8]. Understands the nature of scientific inquiry
1. During this unit, students have learned about Newton's Laws of Motion and the application of each law in the game of baseball. As a class, review each of Newton's Laws.

**First Law - Law of Inertia**

Newton's first law of motion says that an object in motion will stay in motion and an object at rest will stay at rest unless acted on by an unbalanced force.

- An object will not change its motion unless a force acts on it.
- An object that is not moving remains at rest until something pushes or pulls it.
- An object that is moving remains moving until something pushes or pulls it.
- All objects resist having their motion changed. This is called inertia.
- The more mass an object has, the greater its inertia. This means that the more mass an object has, the harder it is to move, stop, or change the speed or direction of the object.

**Second Law - Law of Motion**

The second law of motion states that the force of an object is equal to its mass times its acceleration.

- If you exert the same force on two objects of different mass, you will get different accelerations (changes in motion).
- It takes more force to move an object with a large mass than an object with a small mass.
- Objects accelerate more quickly when a greater force is used.

**Third Law - Law of Action/Reaction**

Newton's third law of motion states that for every action there is an equal and opposite reaction.

- Forces act in pairs.
- When one object exerts a force on a second object, the second object exerts an equal force in the opposite direction on the first object.
- The force exerted by the first object is the action force.
- The force exerted by the second object is the reaction force.
1. Divide students into pairs. Explain that each pair of students will create a final project based on Newton’s Laws of Motion in baseball. The options for the final project are as follows:

   - Create a poster illustrating each of Newton's Laws of Motion in baseball.
   - Create a picture book (minimum 6 pages) illustrating each of Newton's Laws in baseball.
   - Create a website explaining each of Newton's Laws of Motion and showing the application of each law in baseball.
   - Create a video in which you explain and demonstrate each of Newton's Laws of Motion and their application in baseball.
   - Create and perform a song or rap with the lyrics to describe the laws of motion in baseball.
   - Write a 3-5 page research paper about Newton’s Laws of Motion in baseball.
   - Another project discussed and approved by the teacher.

2. Students are free to choose which project they would like to complete. Provide all students with a due date for their projects. You may choose to assign a due date for a rough draft as well.

3. As students work, monitor their progress and provide guidance if needed.

Conclusion:

To conclude this lesson and check for understanding, have each group share their final projects with the class. Display finished projects inside your classroom if they are three-dimensional.

Optional:

The Education Department at the Baseball Hall of Fame loves student work! If you would like to send some of your students' projects to be considered for display in our Learning Center, please contact us via e-mail at education@baseballhalloffame.org.