

Lesson Title: The Notion of Motion

Unit: Motion & Newton

Grade Level: 7-8

Estimated time requirement: Three 50 minute classes

Summary (25-50 words): Students work together to collect data related to distance and time. They use the data to calculate speeds for each task.

Objectives:

- Students contrast distance and displacement
- Students define speed, velocity, and acceleration
- Students calculate speed, velocity, and acceleration

Content Standards: Texas Middle School Science Grade 8

<http://www.tea.state.tx.us/rules/tac/chapter112/ch112b.html>

- 8.1A the student is expected to demonstrate safe practice during field and laboratory investigation.
- The student uses scientific inquiry methods during field and laboratory investigations
- 8.2A the student is expected to plan and implement investigative procedures including asking question, formulating testable hypothesis, and selecting and using equipment and technology.
- The student uses critical thinking and scientific problem solving to make informed decisions.
- The student knows how to use a variety of tools and methods to conduct science inquiry
- 8.4A The student is expected to collect, record, and analyze information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, hot plates, dissecting equipment, test tubes, safety goggles, spring scales, balances, microscopes, telescopes, thermometers, calculators, field equipment, computers, computer probes, water test kits, and timing devices
- 8.4B The student is expected to extrapolate from collected information to make predictions
- 8.7 The student knows that there is a relationship between force and motion.
- 8.7A The student is expected to demonstrate how unbalance forces cause changes in the speed or direction of an objects motion

Texas Technology Applications Grade 6-8

<http://www.tea.state.tx.us/rules/tac/chapter126/ch126b.html>

- 1: The student demonstrates knowledge and appropriate use of hardware components, software programs, and their connections. The student is expected to:
- 1A: demonstrate knowledge and appropriate use of operating systems, software applications, and communication and networking components
- 1C: demonstrate the ability to select and use software for a defined task according to quality, appropriateness, effectiveness, and efficiency
- 1F: perform basic software application functions including, but not limited to, opening an application program and creating, modifying, printing, and saving documents
- 2: The student uses data input skills appropriate to the task. The student is expected to:
- 4: The student uses a variety of strategies to acquire information from electronic resources, with appropriate supervision.
- 7B: The student is expected to: create and edit spreadsheet documents using all data types, formulas and functions, and chart information

- 8E: The student is expected to: integrate acquired technology applications skills, strategies, and use of the word processor, database, spreadsheet, telecommunications, draw, paint, and utility programs into the foundation and enrichment curricula
- 11A: The student is expected to: publish information in a variety of ways including, but not limited to, printed copy, monitor display, Internet documents, and video

Assessment:

- Successful completion of Speed & Acceleration worksheet
- Final products of Speed Challenge such as worksheet completion, spreadsheet, and graphing

Materials:

- Notion of Motion PowerPoint presentation
- Student Notes Download
- Speed & Acceleration Worksheet
- Speed Challenge Activity & Worksheet
- Meter Sticks, Masking Tape, Timers, Markers
- TI 84 Calculator
- Computer with Excel
- LCD projector

Resources:

- www.sciencespot.net
- Glencoe Texas Science: Grade 8 Textbook

Prior Knowledge/Skills: Prior use of TI 84 Calculator, Basic knowledge of graphing, Prior use of Excel, Prior use of video camera

Procedures:

- View the “Notion of Motion” PowerPoint presentation and discuss each concept with the students
- Students fill out the students notes that accompany the presentation; display the notes on the LCD projector through your computer
- Independent practice on Speed and Acceleration worksheet
- Place students in groups of 5-6 to complete Speed Challenge Activity
- After completion of Speed Challenge, students display their work using the LCD projector

Modifications:

- Prior to activity, teachers may wish to group weaker students with strong students. Students with difficulty writing may use the computer to fill in their notes

Technology Infusion:

- TI 84 Calculator, Excel Spreadsheet, LCD projector

Cultural Connections:

- Hold a class discussion to see if there is evidence in our challenge that one race is faster or slower than another.

Family Connection:

- Try out the Speed Challenge with various members of your family. See who has the fastest and slowest speed.

