

TRAFFIC TECHNOLOGY *Giving Science the Green Light*



This module meets the following National Standards of Learning

National Science Education Standards

Grades 5–8

Science as Inquiry

- Use appropriate tools and techniques to gather, analyze, and interpret data.
- Use technology and mathematics to improve investigations and communications.
- Think critically and logically to make the relationships between evidence and explanations.
- Formulate and revise scientific explanations and models using logic and evidence.

Standards for Technology Literacy

Standard 8: Students will develop an understanding of the attributes of design

Standard 9: Students will develop an understanding of engineering design.

Standard 10: Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

Grades 9–12

Physical Science Content Standard B Motion and Forces

- Its position, direction of motion and speed can describe the motion of an object. That motion can be measured.
- If more than one force acts on an object along a straight line, then the forces will reinforce or cancel one another, depending on their direction

and magnitude. Unbalanced forces will cause changes in the speed or direction of an object's motion.

Science as Inquiry

- Design and conduct scientific investigations.
- Use technology and mathematics to improve investigations and communications.
- Formulate and revise scientific explanations and models using logic and evidence.
- Recognize and analyze alternative explanations and models.
- Motion and forces: Objects change their motion only when a net force is applied. Laws of motion are used to calculate precisely the effects of forces on the motion of objects.

TRAC PAC 2

This module contains five activities to provide students an understanding of technology applications in Traffic Engineering, as well as understand the factors behind reaction time and stopping distance.

Activities

Activity 1: Calculating Reaction Time

In Activity 1, the concept of reaction time is taught to students through the application of linear motion.

Activity 2: Braking Distance and Friction

Activity 2 studies the concept of braking distance by exploring the relationship between kinetic energy of a moving car and work done to bring the car to a stop.

Activity 3: Setting Yellow Light Time

In Activity 3, the concept of linear motion is applied to the duration of the yellow light time on a traffic signal by tying together reaction time and braking distance.

Activity 4: Programming Logic for Traffic Systems

Activity 4 introduces students to software programming, as it applies to traffic technology.

Activity 5: Shortest Path

Activity 5 explores how modern map applications determine the quickest route between two locations. Students will use Microsoft Excel to calculate the quickest route on a maze based on the distance between different path options.

TRAC™ (TRANsportation and Civil engineering) is a hands-on education outreach program designed for use in science, math, technology, and social science classes. By engaging students in solving real-world problems, sending volunteer mentors in the classroom, and supplying teachers with the needed materials. TRAC connects K-12 students to the working world of transportation professionals and civil engineers, and inspires them to consider careers in these fields. TRAC PAC 2 is designed for students in middle school and high school. Rides K–8 introduces elementary school students to basic transportation concepts.

Visit www.tracrises.transportation.org to learn more about the TRAC program.



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