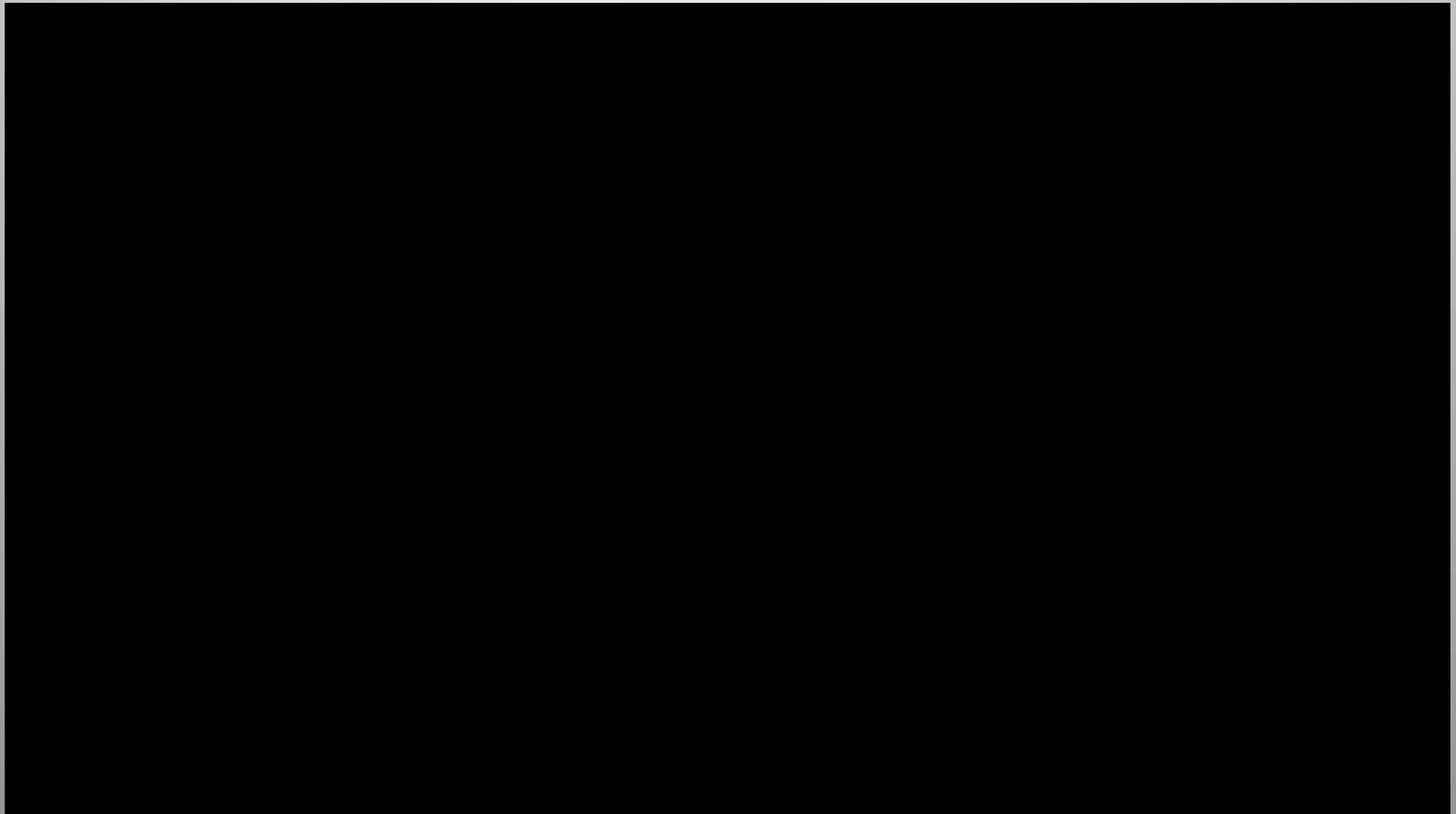




**TENNESSEE DEPARTMENT OF
TRANSPORTATION**

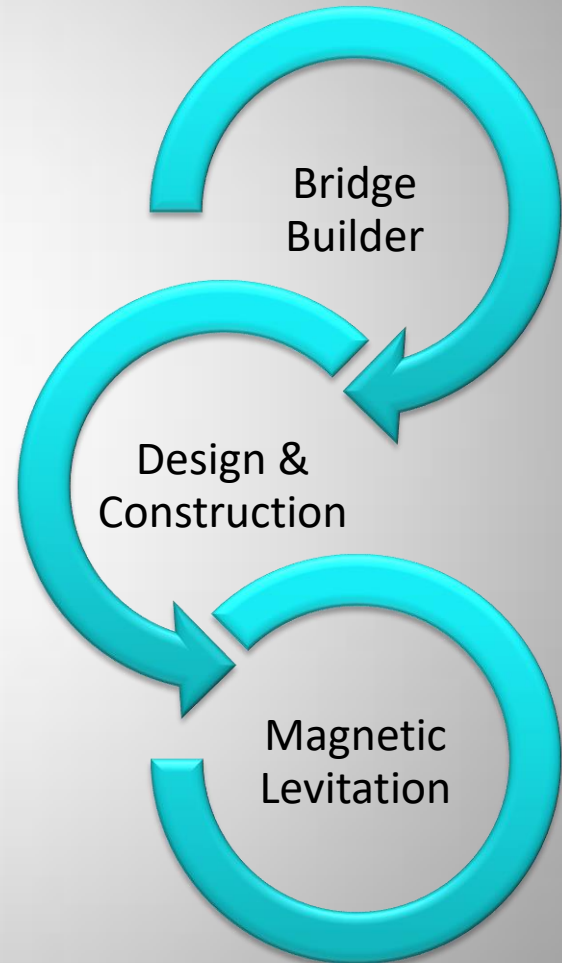
Paige Harris, P.E.

What is the TDOT TRAC Program?



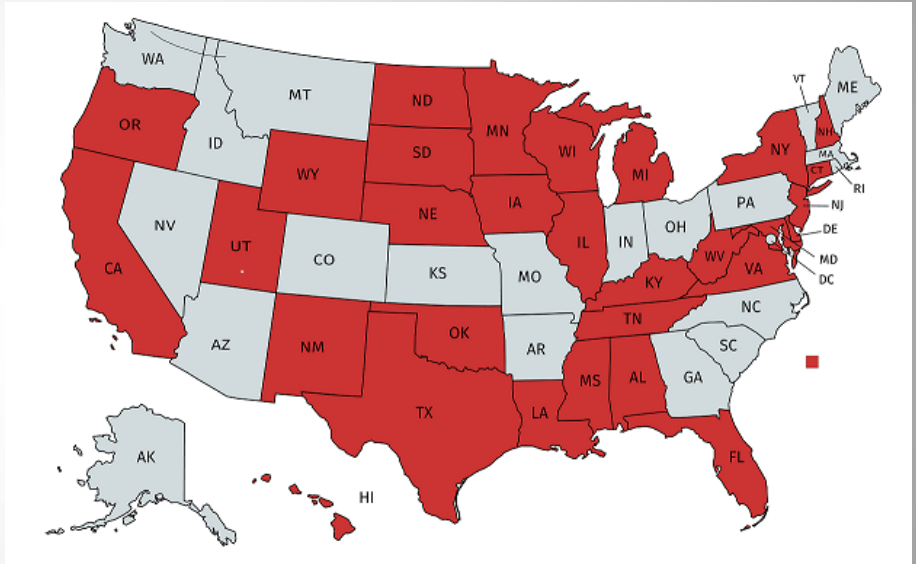
Transportation and Civil Engineering

- A program of the American Association of State Highway and Transportation Officials (AASHTO)
- Consists of 3, **STEM** educational modules
- The program and modules are **FREE** and include:
 - Hands-on materials for math, science, and social science classes
 - Interactive software
 - Replacement supplies, when needed
 - Teacher training
- Also includes engineer visits for career presentations and/or volunteers to assist in teaching TRAC activities



History of AASHTO TRAC

- Established in 1993 as a traveling road show to advertise careers in civil engineering to high school students
- Now a comprehensive program taught in a “laboratory-style” setting
- Implemented ONLY through local DOTs
 - 30 states currently participate

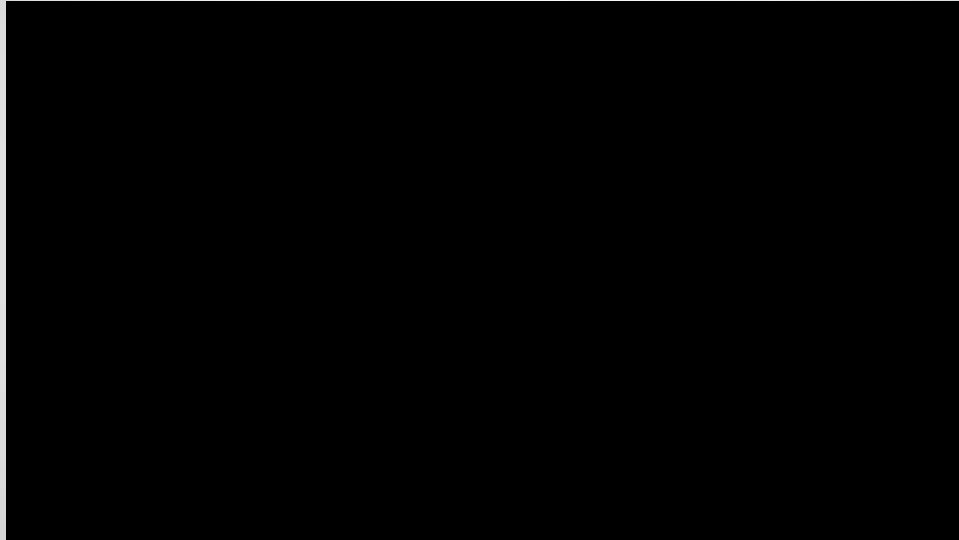


TRAC Mission

*To introduce students in grades 6-12 to the working world of transportation, especially **civil engineering**, and inspire them to consider careers in those fields.*

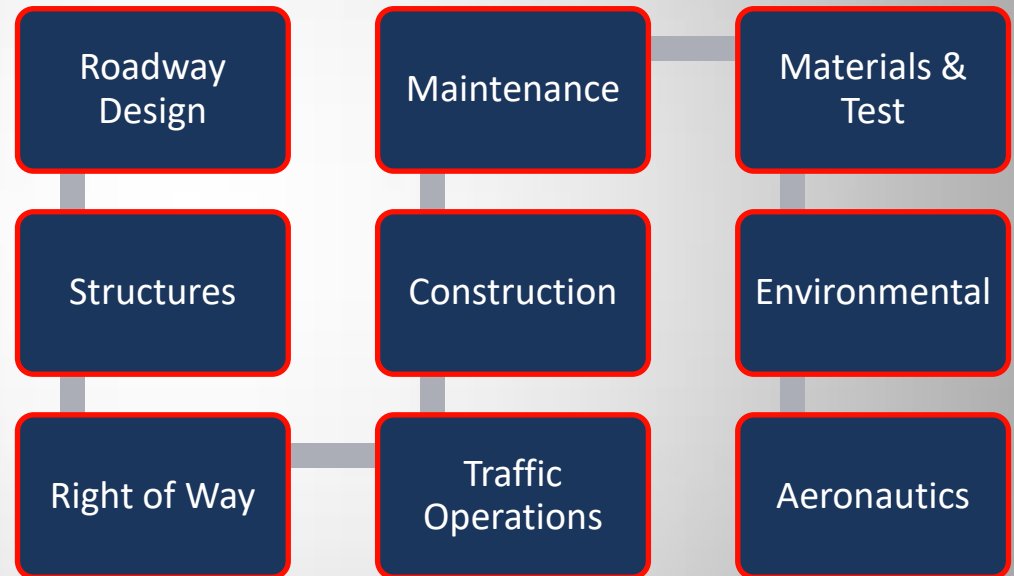


What Do Civil Engineers Do?



Why is this Program Important to TDOT?

- We employ civil engineers!
 - Interns
 - Co-op
 - Entry-level
 - Managers
 - Directors
 - ...



TDOT TRAC Overview

- Provide modules free-of-charge to TN teachers:
 - Bridge Builder
 - Design and Construction
 - Magnetic Levitation
- Free teacher training sessions
- Provide replacement materials
 - Request material via fillable form on website →
- TDOT staff to serve as speakers/volunteers, if and when needed

The screenshot shows the 'Request Supplemental Material' page on the TDOT TRAC website. At the top, there are three tabs: 'TRACs Overview', 'Summer Teacher Training', and 'Request Supplemental Material'. The 'Request Supplemental Material' tab is active. Below the tabs, there is a section titled 'Supplemental Materials for Each Module:'. This section lists three modules: 'Magnetic Levitation', 'Design and Construction', and 'Bridge Builder'. Each module has a list of materials it requires: 'Magnetic Levitation' requires 'Styrofoam Blocks' and 'Magnetic Tape'; 'Design and Construction' requires 'Maps', 'Overlays', and 'Road Curves'; 'Bridge Builder' requires 'Balsa Wood', 'Wood Glue', 'Graph Paper', 'Wax Paper', 'Pins', and 'Safety Cutters'. Below this list is a form to request materials. The form has fields for 'Name*' (split into 'First Name' and 'Last Name'), 'At which school do you teach?*', 'Email*', 'Module you need more material for: (Bridge Builder, Maglev, and Design & Construction)*' (a dropdown menu), 'Which items do you need?*', and 'How many of each item?*' (a text area). A 'Submit Form' button is located at the bottom right of the form.

TDOT TRAC Program To-Date

- Since Fall 2016:
 - 3 Modules: Bridge Builder, Design & Construction, and Magnetic Levitation
 - Over 70 Schools & After-School/Outreach Organizations

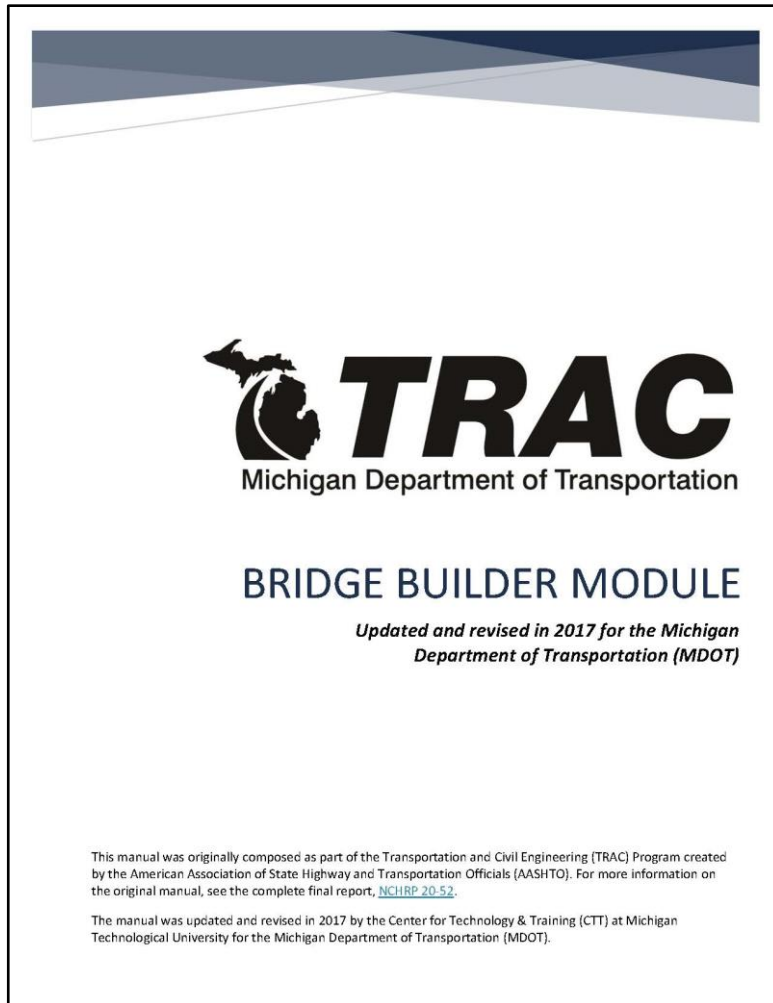


Graphic Current as of 9/20/2017



TRAC Manuals

Manual Layout

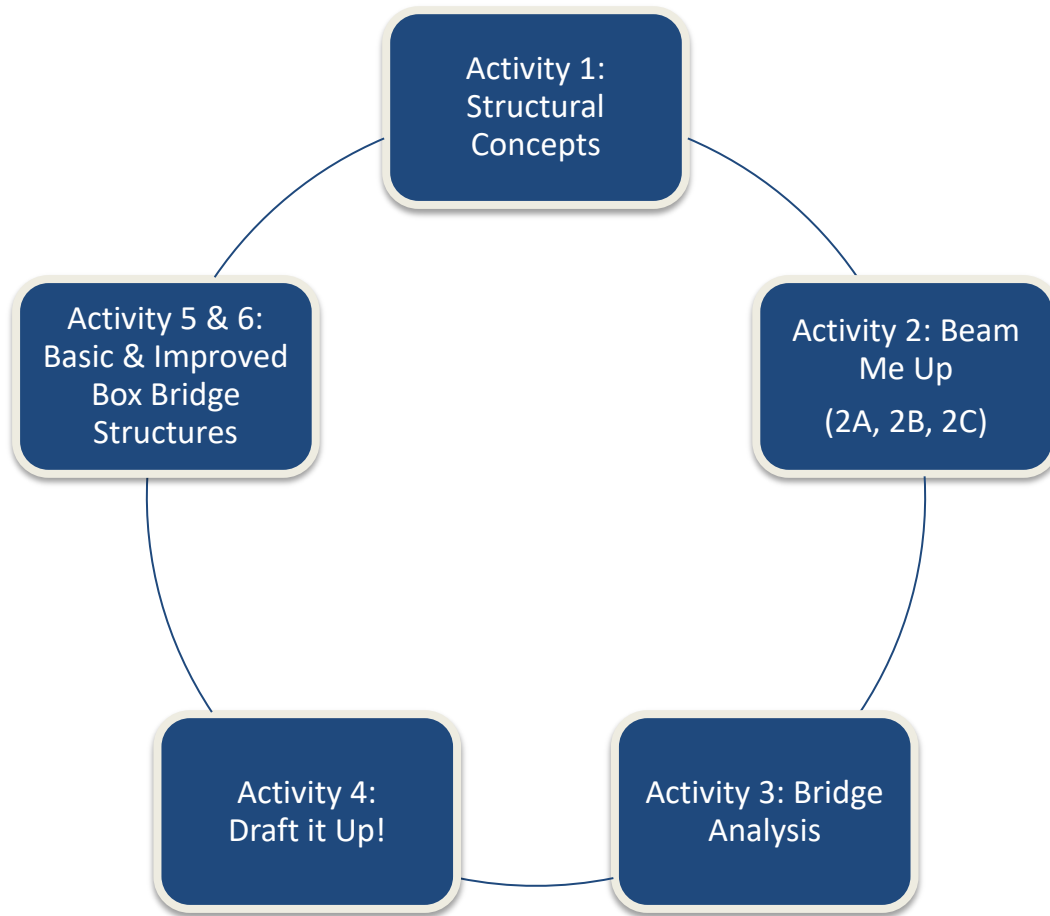


1. Instructor's Reference
 - Contains activity summary and preparation information for the activity
2. Instructor's Answer Key & Discussion Ideas
 - Contains questions given to students, along with answers and points of discussion
3. Research Manual
 - Student use and contains background, setup, and procedure information and instructions for completing the activity
4. Research Notes
 - Student use while working on the activity, and lists the same questions found in the Instructor's Answer Key & Discussion Ideas section



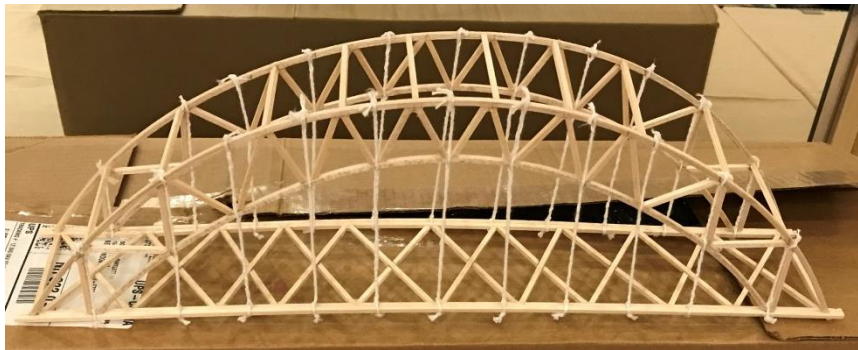
Bridge Builder Module

Bridge Builder Module Overview



- Best geared towards 6 – 12
- Includes 5 – 6 activities that build upon one another
 - Activity 4 is solely computer-based
 - Activities 5 & 6 are the same minus the structure dimensions

AASHTO National Bridge Competition



2017 Competition; Portland, Maine

- How to apply?
 - Submit a proposal
 - Information within guidelines packet
- If selected, will attend the 2019 TRAC Bridge Competition Finals
 - Present to a panel of judges via PowerPoint presentation
 - Have bridge tested
 - Bridge performance is 60% of total score
- Awards:
 - First Place Team: \$1,200
 - Second Place Team: \$900
 - Third Place Team: \$600



Design & Construction Module

Design & Construction Module Overview



Activity 1: How Much
Can the Road Handle?

Activity 2: Not In My
Backyard!

Activity 3: How Much
Does It Cost?

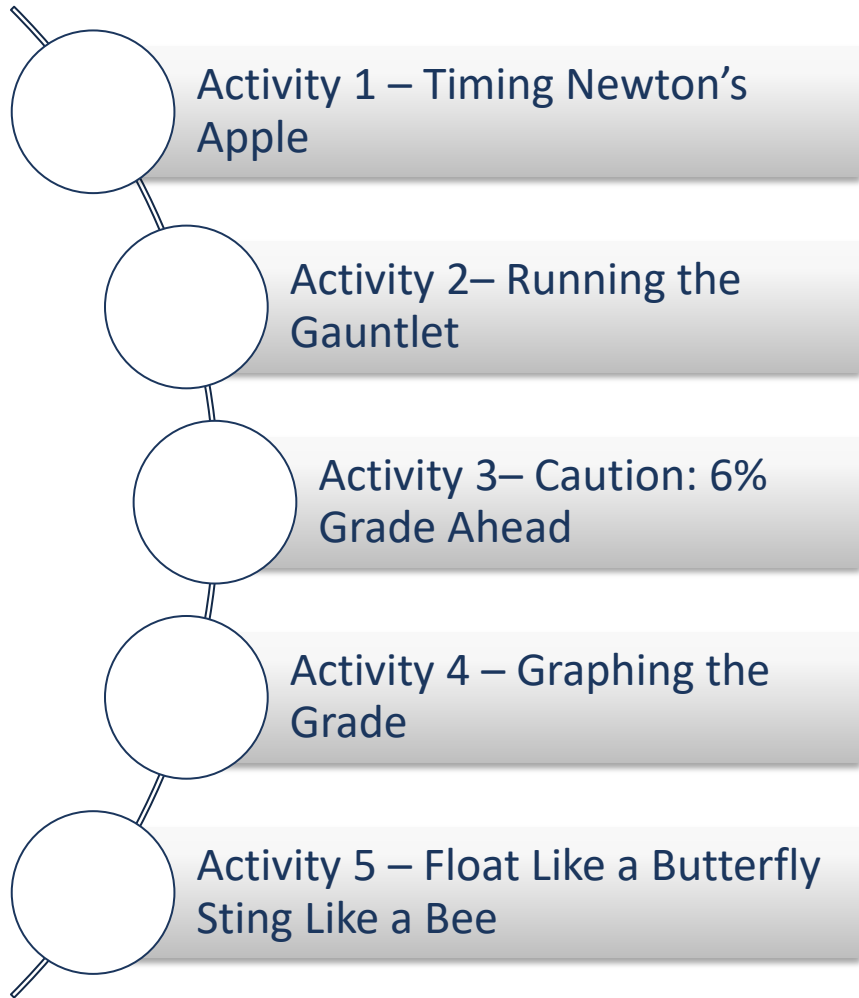
Activity 4: Construction
Estimating

- Mostly independent activities
- All activities are separate
- Activity 3 utilizes Microsoft Excel (not provided)



Magnetic Levitation Module

Magnetic Levitation Module



- 5 activities which provide a comprehensive overview of basic physics concepts as they apply to moving vehicles
- Covers educational topics of basic kinematic concepts by investigating **Newton's First and Second Laws of Motion**

