

23. Cruising into the 21st

Classroom Activity: Design a car for 2001. By building the car, students will discover whether power, design or both influence fuel consumption. The cars undergo 30-foot speed trials. Students will also write an essay on how the automobile has changed since Henry Ford rolled out the Model T.

Grade(s): 9 and 10 (Technology); 11 and 12 (Physics)

Course(s) and Strand(s): Technological Education

Exploring Technologies, Grade 9 Open

B. Technological Skills

C. Technology, the Environment, and Society

Technological Design, Grade 10 Open

B. Technological Design Skills

C. Technology, the Environment, and Society

Transportation Technology, Grade 10 Open

C. Technology, the Environment, and Society

Course(s) and Strand(s): Science

Physics, Grade 11 University

B. Kinematics

C. Forces

Physics, Grade 12 University

C. Energy and Momentum

Physics, Grade 12 College

B. Motion and its Applications

E. Energy Transformations

See supplementary document Ontario Curriculum Alignment for Engineer-in-Residence Secondary Classroom Activities: Science and Technological Education for relevant overall and specific expectations.

Assessment Categories:

- Knowledge and Understanding
- Thinking and Investigation
- Application

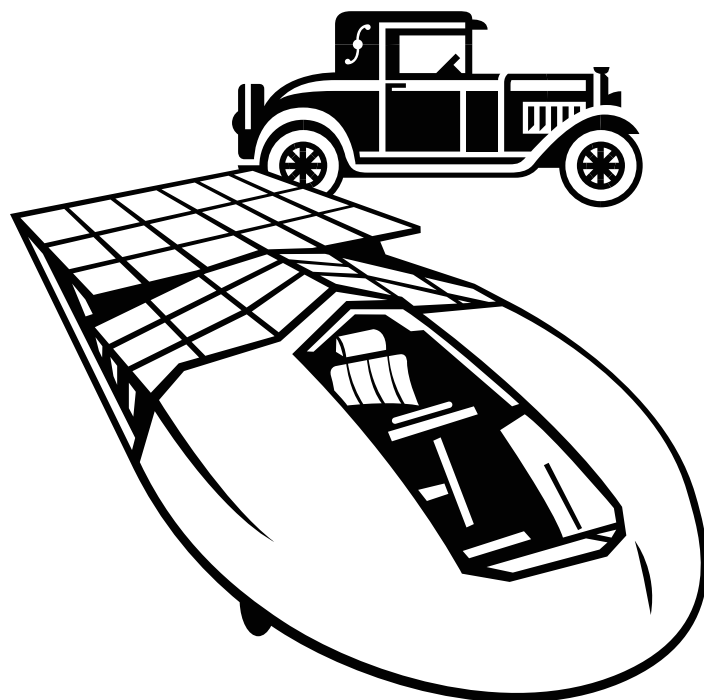
Cross-discipline connections:

Language and History

Type of Activity:

Classroom (individual and small group work)

Preparation: (time varies)



assemble materials

time needed to complete the task: four classes +
time for the essay

Materials/Resources for the teacher:

no additional resources required

Materials/Resources for students:

9 volt batteries

electric motor

wheels

material to build the car: lego, wood, meccano

Activity Description:

Ask the class:

What would the car of the 21st century look like?

With fuel prices escalating the cars need to satisfy society's desire for high speed, yet be fuel-efficient.

Students are asked to design a car with the following characteristics:

23. Cruising into the 21st Century (continued)

- powered by a 9 volt battery
- operated with an electric motor
- possess at least three wheels
- composed of any materials (wood, Lego, meccano etc.)
- maximum dimensions: 20 cm x 12 cm

The cars undergo a 30-foot speed trial and are rated on overall looks. Before the trial, students explain their methodology to the class and the EIR.

Part two of the assignment is an essay describing how the automobile has changed since Henry Ford's Model T. The essay must discuss:

- air resistance
- design/efficiency
- materials (strength vs mass)
- safety
- power sources

Tips:

- With the battery and DC voltage the students learned that reversing the battery (motor) electrical leads reversed the motor.
- If the leads were not reversed, the wheels had to be reversed. One twist of the elastic band drive reversed the wheels.
- Gear drives can teach students about gear ratios.
- Direct drive cars teach the importance of traction.