

## Activity **2**

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# Winter Driving

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Activity developed at Cégep de Trois-Rivières  
By **ANNE BLOUIN**

## Activity **2**

### Controversies in Human Biology

Date Last Tested

**2005**

Author's Name

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Scientific Discipline

**Physics**

Average Age of Students

**17-18 years old**

Course Title and Number

**Mechanics (203-NYA-05)**

Duration of Activity

**30 minutes**

#### NOTE

In this document, the masculine is used without discrimination and solely to make the text easier to read.

Appendices are available in PDF and Word format on the CD provided with this document.

In addition, an instructional analysis of the activity is available in the pedagogical treasures section (*Trésors pédagogiques*) on the Saut Quantique Web site at:

<http://www.apsq.org/sautquantique>.

Use of this text is authorized for instructional purposes, provided that author's name and college are mentioned.

Adherence to these recommendations will encourage authors to share their experience.



## Winter Driving

### Description of Activity

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#### OVERVIEW

Based on a problem situation dealing with driving a car in winter, students divide into teams of 2 or 3 people to apply Newton's laws (force and motion) to winter driving.

#### RELEVANCE AND ORIGINALITY OF ACTIVITY

This activity serves the dual purpose of reviewing Newton's laws, and relating them to preventive driving tips that students learned during their driver's education course.

### Objectives and Relation to the Program

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#### PEDAGOGICAL OBJECTIVES OR TARGETED COMPETENCIES

Relate the laws of motion to daily life situations.

#### LINK BETWEEN THE ACTIVITY AND THE PROGRAM

##### *General Program Goals Targeted*

This activity targets the following general goals of the *Science* program:

- To make connections between science, technology and social progress;
- To apply what they have learned to new situations.

##### *Link with Course*

Intuitive introduction to Newton's laws (laws of motion).

### Number of Students and Educational Support

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#### APPROXIMATE NUMBER OF STUDENTS IN CLASS

25-30 students

#### NUMBER OF STUDENTS PER TEAM

2-3 people

#### EDUCATIONAL SUPPORT

The teacher supervises and guides the students in their reflection.

### Conducting the Activity

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#### CONDUCTING THE ACTIVITY AND TIME REQUIRED TO COMPLETE EACH STEP

##### *Before*

The teacher explains Newton's first two laws in previous sessions.

He briefly presents the problem situation (Appendix S.1).

##### *During*

Based on the problem situation (Appendix S.1), students take thirty minutes to analyze the following driving situations in light of Newton's first two laws:

- Driving on the highway;
- Exiting the highway in a very sharp curve;
- Driving in the city with frequent stop-and-go traffic.

Students establish the safety rules for each of the previous situations, justifying their reasoning on the basis of physics arguments. They then submit a report of their reflection.

### *After*

During the next class, after reviewing team reports, the teacher goes over Newton's laws and corrects erroneous conceptions, if any.

## Evaluation and Required Material

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### SUGGESTED EVALUATIONS

This activity is graded based on a formative evaluation. Students submit a report to be read and corrected by the teacher.

### APPENDICES

#### *Students*

Appendix S.1: Winter Driving

#### *Note:*

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## Other Ideas to Explore

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A similar problem situation could deal with amusement park rides for circular motion and energy conservation.

### MEDIA DIRECTORY

Google search on Newton's laws and icy roads:

Keywords: "Newton's laws" icy roads. [Online].

URL Address:

<http://www.google.ca/search?hl=fr&q=%22Newton%27s+laws%22+icy+roads&btnG=Rechercher&meta>

*The Physics of SUV Rollover Accidents.* [Online].

URL Address:

<http://www.biology.ualberta.ca/facilities/safety/uploads/doc/The%20PhysicsRolloverAccidents.htm>



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