



## FORCES & SIMPLE MACHINES



### Dear Educator:

Thank you for choosing to bring your students to the Science Gallery. When you arrive, check in at the box office on the Planetarium level. For payment, you will be required to know the exact number of students and adults in your group.

Store outerwear, lunches, backpacks, etc, in the cloakroom in the lower level. No backpacks in the gallery. The Manitoba Museum is not responsible for loss or theft; valuables should be left at home or school.

For further information, please visit our website [www.manitobamuseum.ca](http://www.manitobamuseum.ca) or call 988-0626.

### Visiting the Science Gallery

After your program, you will be exploring the Science Gallery. Our exhibits are best enjoyed with the assistance of an adult – teachers are asked to divide the class into smaller groups assigned to adult supervisors.

Please note, washrooms and water fountain are located near the *Numbers Game* exhibit. There is no need to leave the gallery during your visit.

### Science Gallery Rules

1. No running, please.
2. Out of respect for other classes and visitors, please use indoor voices.
3. Food and drink are not allowed in the gallery. No gum, please.
4. Before entering the Matrix –the room of mirrors– everyone must remove their shoes and put on the slippers provided. Please put your shoes back on your feet when you leave the Matrix.
5. Please read or listen to instructions before trying out the exhibits.

Class control remains the teacher's responsibility.

Please turn off cell phones or set the ring to silent during programs.

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**Grade:** 5  
**Cluster:** Forces & Simple Machines  
**Duration:** 30 minutes

### Program Outline:

This program reviews basic forces and demonstrates how forces contribute to a variety of experiments. A single-fixed pulley and block and tackle pulley allow students to witness and experience the mechanical advantage of a simple machine.

### Vocabulary

Here is a list of words we use during this program:

Applied force, balanced and unbalanced forces, fulcrum, pivot point, load, friction, pulley, lever, wheel and axle, inclined plane, wedge, gear, screw and gravity.

### Pre-visit Suggestions:

1. Identify types of simple machines and how we use them in everyday life.
2. Discuss the idea of balanced forces versus unbalanced.

### Science Gallery

When your class is exploring the Science Gallery, have them take advantage of the following exhibits:

1. Engineered for Speed –at the racetrack students can build and race cars, using the wheel and axle and a series of pulleys.
2. Levers –located near the Numbers Game, our interactive levers exhibit allows students to try out different fulcrum points and discover which gives you the best mechanical advantage.

### Follow-up Activity:

Have two same-height students stand back to back with their heels aligned. Ask them to touch their toes at the same time. What happens? In order to stay balanced, with our centre of gravity (belly buttons) above our feet, we need to adjust our bottoms. Two people attempting to bend over at the same time creates unbalanced forces and someone will fall over.