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# ONTARIO SCIENCE CENTRE



Exhibit Inquiry

# Tinkering with Technology

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## Exhibit Inquiry

# Tinkering With Technology

Have students look for the following exhibits related to structures and mechanisms during their visit to the Ontario Science Centre:

Where to go:

KidSpark Entrance (Level C)  
*Keep the Ball Rolling*



## Art and Simple Machines Meet

What it's about:

Have the class individually (or in groups) study the workings of the George Rhoads sculpture at the rear of the Science Arcade.

The Rhoads sculpture uses forces, motion and the laws of physics in a pleasing and entertaining way.

What to say and do:

- Identify the simple machines used in the workings of this exhibit (*Inclined planes, levers, pulleys, gears*).
- The sculpture has six ball entrance points. From different points, have the students count the number of levers, pulleys and inclined planes that are used from the time the ball is lifted from the base collection point, until it returns.

Where to go:

Sport (Level D)



## Speedy Inclined Plane

What it's about:

Many sports use the inclined plane to increase the excitement and challenge of the activity. The bigger the hill, the faster and longer the thrill. In the Sports exhibit, students can explore how inclined planes are adapted for human activities.

What to say and do:

- List as many sports as you can that use an inclined plane. (*Bob sled, all skiing, downhill bike racing, all sports that use jumps*)

## Exhibit Inquiry

# Tinkering With Technology

## Inclined Planes

Where to go:

KidSpark (Level C)



What it's about:

Examples of inclined planes can be found all over KidSpark. Students can explore and expand their understanding of the inclined plane by looking for modified examples in this exhibition area.

What to say and do:

- What are some examples of inclined planes in this area? (*Ramp, Ball Fall Wall*)
- Explain to the students that inclined planes can be modified or changed depending on what work needs to be done. For example, stairs have steps instead of a flat plane and a screw has the plane wrapped around the centre in a spiral shape. What are some examples of modified inclined planes in KidSpark? (*Examples of modified inclined planes include: Stairs in the Two-Storey House, the water column in the Water Table.*)
- How are these inclined planes modified? In each case, why wouldn't a traditional inclined plane work?

## Simple Machines at Work

Where to go:

Entrance (Level B)



What it's about:

The elevator and escalator located at the front entrance by the Shoppers Drug Mart<sup>®</sup> Omnimax<sup>®</sup> Theatre have clear sides allowing students to see all the simple machines at work.

What to say:

- Identify all the simple machines you can see in the elevator and escalator.
- Watch the elevator and escalator to see how they work. Where is the load for each?

## Resources

# Tinkering With Technology

### Vocabulary

<b>Effort</b>	Input force applied to a simple machine that produces an output force on the load.
<b>Force</b>	Push or a pull by one body on another; these forces can change the speed or direction of an object.
<b>Fulcrum</b>	The pivot about which a lever turns.
<b>Gear</b>	A toothed wheel that engages another toothed mechanism in order to change the speed or direction of transmitted motion.
<b>Inclined plane</b>	A ramp that reduces the force necessary to lift a weight.
<b>Lever</b>	Rigid bar that pivots about a point (fulcrum) and is used to move or lift a load at one end by applying force to the other end.
<b>Load</b>	Force and weight on structure.
<b>Pulley</b>	A simple machine consisting of a wheel with a groove in which a rope can run.
<b>Screw</b>	Inclined plane threaded spirally around a cylinder.
<b>Simple machine</b>	Device that only requires the application of a single force to work.
<b>Wedge</b>	Any shape that is triangular in cross section and is usable as an inclined plane that can be pushed between two things.

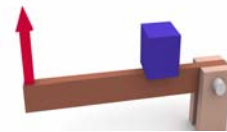
### Classes of Levers

#### First Class



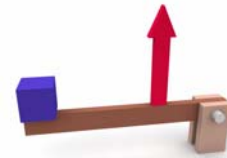
e.g., seesaw, scissors, crowbar, pliers, tin snips, hair clip, cloth pin, balance scale

#### Second Class



e.g., wheelbarrow, nutcracker, bellows, wheelbarrow, bottle opener, hole puncher, light switch, brakes, gearshift, bicycle pedal

#### Third Class



e.g., fire truck ladder, tweezers, ice cube tongs, shovel, baseball bat, tennis racket, hockey stick, golf club, stapler, fishing rod, forearm, jaw, hammer

### Internet Links

<http://www.mikids.com/Smachines.htm>

### Books

Harrison, Patricia and Ryan, Chris. *Technology in Action*. London: Folens Publishing, 1991.

Macauley, David. *The Way Things Work*. Boston: Houghton-Mifflin, 1988.

**PLEASE NOTE:** Programs and exhibits are subject to change without notice.