Levers and Gears

Sunnybrook Farm Museum Field Trip

sbfcoordinator@shaw.ca
(403) 340-3511 or (403) 986-3410
www.sunnybrookmusuem.ca

Program Description: Grade 3

The Levers and Gears Program at Sunnybrook Farm Museum introduces participants to simple machines through hands-on activities. They explore levers, pulleys, rollers, and gears, learning how these mechanisms made farm tasks easier for pioneers. Participants experiment at various stations, tackling questions like, “How much effort does it take to move a weight with a lever or pulley?” and “Do gear ratios really matter?” By applying their knowledge to historic farm equipment such as hand tools, combines, and tractors, they connect science and history in a fun and educational experience.

Program Length

2 Hours

Specific Curriculum Connections:

Energy:

- Students investigate and explain how forces affect the movement of objects
  - KUSPs:
    - A force is a push or pull on an object resulting from an interaction with another object
    - An object that is not moving will stay still until a force makes it move, and an object that is moving will keep moving until a force stops it. (Newton’s First Law)
    - Contact forces include forces that are:
      - applied by a person or an object on another object (applied)
      - caused by objects, surfaces, or substances sliding against each other (friction)
      - applied by pulling on a string or rope connected to an object (tension)
    - Ways to apply a contact force to an object include
      - stretching
      - pulling
      - squeezing
      - pushing
    - The direction of forces applied to objects can be described as:
      - upward
      - downward
      - from the left
      - from the right
      - from both sides
      - from all directions
    - The effort needed to move objects is reduced by simple machines, such as
      - Levers
      - Wheel and Axle
      - Inclined Planes
      - Rollers
      - Pulley
      - Screw
      - Wedge
    - Simple machines can change the strength and direction of forces.
    - Explore how simple machines reduce the effort needed to move objects.
    - Safely work with tools, materials, and equipment.

Hands on!

Educational!

Engaging!

Scan To Book

Glossary of Terms

Complex or Compound Machine	Mechanical Advantage
• a machine made up of two or more simple machines	• The ratio of the force produced by a machine to the force applied to it, used in assessing the performance of a machine
Force	**Newton's First Law**
• A force is a push or pull on an object resulting from an interaction with another object	• An object that is not moving will stay still until a force makes it move, and an object that is moving will keep moving until a force stops it
Gear System	**Pulley System**
• At least two wheels that work together to transfer motion. There must be more than one cogwheel (sprocket). The first gear in a gear system is called the drive gear; the other gears are called driven gears	• A simple machine that changes the direction of a force, often to lift a load
Law of Conservation of Energy	**Rollers**
• The law of conservation of energy states that energy can neither be created nor destroyed - only converted from one form of energy to another. • Work in = work out	• a cylinder that rotates around a central axis and is used in various machines and devices to move, flatten, or spread something.
Lever	**Simple Machine**
• A stiff rod that rotates on a pivot point. • If downward motion is applied at one end then upward motion occurs at the other end.	• Any of several devices with few or no moving parts that are used to modify motion and force in order to perform work