



Science 6

Science 6 - Quarter 3 - Module 1

Friction

Lesson 1: Describe Friction

Friction

- occurs between the surfaces of two objects in contact, rubbing or sliding against one another
- opposes an object's motion
- causes objects to slow down and eventually stop
- always acts opposite the direction of an object's motion
- also occurs when air particles rub against objects falling down, thrown upward, or flying like airplanes and kites -- called air friction or air resistance

Lesson 2: How Friction Affects Movement of Objects

Friction varies depending on the type of surface an object comes in contact with.

Friction is affected by:

- Surface area of the object that is in contact with the surface (ex. ball vs. box, flat vs. crumpled paper)
 - Bigger surface area → greater friction → easier to stop → travels a shorter distance
 - Smaller surface area → lesser friction → harder to stop → travels a longer distance
- Type of surfaces of the two objects rubbing against each other
 - Rough surface → greater friction → object moves more slowly
 - Smooth surface → lesser friction → object moves faster



Science 6 - Quarter 3 - Module 2

Energy Transformation

Lesson 1: Forms of Energy

Mechanical energy

- the energy of movement
- found in objects that are moving or have the potential to move
- the sum of kinetic energy (the energy of ongoing motion) and potential energy (the energy stored in a system by reason of the position of its parts)
- two types:
 - potential energy
 - kinetic energy
- examples: windmills, falling water, moving cars

Electrical energy

- the energy of moving electrons
- electrons flow through wires to create an electric current
- examples: electric circuit, lightning, transmission lines, appliances that have been turned on

Chemical energy

- the energy that is stored in the bonds between the atoms that make up compounds
- examples: batteries, food, fuel, matchsticks, fireworks

Heat energy *

- energy in transit
- transferred from one body to another

Thermal energy *

- the energy of moving atoms of matter
- due to the movement of molecules
- examples: sun, hot stove

Sound energy

- the energy produced by vibrating objects
- travels in waves through matter from a vibrating object
- examples: radio, television, cell phones, musical instruments

Radiant or light energy

- a form of electromagnetic energy/radiation



- can travel through a medium or through empty space
- examples: sun, lighted bulb, candle, laser, fire, flashlight

* Note: Many sources consider heat and thermal energy to refer to the same thing. Some describe heat as the transfer of thermal energy.

Lesson 2: Energy Transformation

Law of Conservation of Energy states that:

- energy cannot be created or destroyed
- energy may be transformed from one form to another
- the total amount of energy never changes

Examples of energy transformation

- Light energy from the sun is transformed into chemical energy stored in plants.
- The chemical energy of liquefied petroleum gas (LPG) is transformed into light and heat to cook food.
- When a flashlight is turned on, the chemical energy from the battery is transformed into electrical energy through the circuit, and then transformed into light energy and heat.
- With electricity, fossil fuels (chemical energy) are burned (heat energy) to generate steam that powers turbines (mechanical energy) that drive generators to produce electrical energy. Electricity is then distributed to homes where it is further transformed to sound energy (TV, computers), heat (flat iron), mechanical energy (electric fans), etc.

Sources of energy

- Renewable
 - solar
 - wind
 - water
 - tidal
 - geothermal
 - biomass
- Non-renewable
 - fossil fuels (coal, petroleum, natural gas, oil)
 - nuclear energy

Heat is a common byproduct of energy transformations.



Science 6 - Quarter 3 - Module 3

Characteristics and Uses of Simple Machines

Simple machine

- a device with few or no moving parts that is used to perform work
- it can (1) multiply the force and speed and (2) change the direction of the force applied
- helps people do their work faster and more easily

Six basic simple machines:

1. inclined plane
2. wedge
3. wheel and axle
4. pulley
5. screw
6. lever

Inclined plane

- a flat surface raised at an angle
- sloping surface connects a lower level to a higher level
- used to lift or raise a heavy object by moving it up a slope
- examples: ramp, stairs, slide, switchback roads

Wedge

- two inclined planes positioned back to back, giving it a thick edge and a thin edge
- used for cutting or splitting things apart – force is applied to the thick edge and the sloping sides of the wedge apply force to the object, cutting it or splitting it apart
- examples: axe, knife, chisel, the teeth of a saw

Wheel and axle

- a circular frame (the wheel) that revolves on a shaft or rod (the axle)
- used to raise weights and carry/transport loads over a long distance
- examples: car/bike wheels, door knob, steering wheel, Ferris wheel, electric fan

Pulley

- a wheel with a rope, cord, cable, chain, or belt on its rim – pulling on the rope turns the wheel
- used to lift or lower objects (called the load) more easily
- examples: flag pole, ropes on a sailboat, movable clothesline, well, elevator

Screw

- a long inclined plane wrapped around a shaft (central cylinder)



- used to fasten/hold things together
- examples: screw, jar lid, bolt, bottom end of a bulb, bottle cap, faucet

Lever

- a long beam or bar that rests on a support or fixed point called a fulcrum
- used to lift, remove, or pull out objects easily
- three components:
 - fulcrum - supporting point of the lever
 - load - the weight being moved or lifted
 - effort - the force used to cause movement
- three classes of lever based on the position of the effort, load, and fulcrum
 - first class lever
 - the fulcrum is between the load and the effort
 - examples: seesaw, scissors, crowbar, pliers, hammer claws (for pulling out a nail)
 - second class lever
 - the load is between the fulcrum and the effort
 - examples: wheelbarrow, wagon, can/bottle opener, nutcracker
 - third class lever
 - the effort is between the fulcrum and the load
 - examples: tongs, broom, stapler*, fishing rod, tweezers, hockey stick, baseball bat, using your arm to lift something

* Some sources consider a stapler a second class lever (perhaps if you apply your force on the tips of the stapler?) but majority consider it a third class lever.