Name: _____

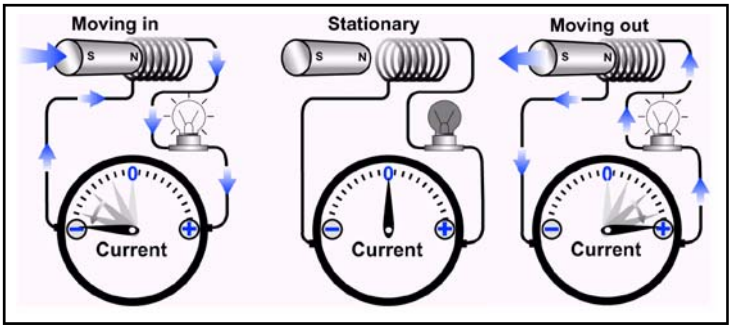
Period: _____

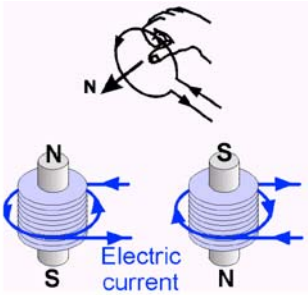
Magnetic Induction/ Chapter 5 and 10 Review

Magnetic Induction

You "induce vomiting" when someone drinks poison – you force them to vomit.

Magnetic induction is the forcing of electric current by moving a magnet through wire loops.

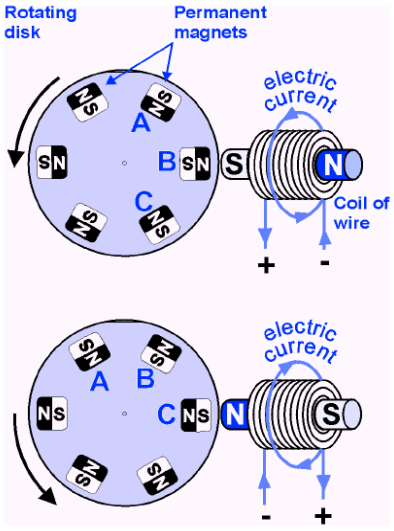




Right-hand rule:
To find the north pole of an electromagnet, simply wrap your right hand fingers in the direction of the electric current (from + to -). Your thumb will point in the direction of the electromagnet's *north pole.*

Generators versus Motors

A motor and a generator are the same device in reverse. One can be used as the other.



Motor or Generator? Depends on if electricity is going in or out.

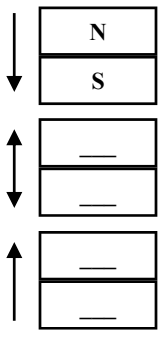
Motor—makes work from electricity (stored work). Electricity makes electromagnets which push against permanent magnets to cause the motor to move.
Electricity In - Work Out.

Generator—generates electricity from work (a force and distance). Moving magnets make electricity from magnetic induction. Generators usually move in circles.
Work In - Electricity Out.

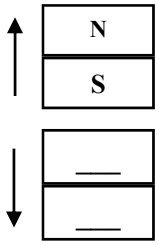
What kind of Energy?
Thermal; Nuclear; Radiant; Mechanical; Chemical; Electrical

___ An acorn in a tree.
___ Energy from a wall power plug.
___ Something hot.
___ Fusion in the sun.
___ The light of the sun.
___ In a piece of wood.

1. Chemical	A. Energy of molecular bonds.
2. Radiant	B. Energy of moving electrons.
3. Thermal	C. Energy of the atom being split or fused.
4. Nuclear	D. Light energy—electromagnetic radiation.
5. Mechanical	E. Heat energy. Also caused by friction.
6. Electrical	F. Energy (kinetic or potential) stored in object and can do work.



If the three magnets are ***attracting*** each other, label N and S on the second magnet.



If the two magnets are ***repelling*** each other, label N and S on the second magnet.

Write in the following formulas (with units)

Work	Power	Potential Energy

Kinetic Energy	An object falling or thrown into the air.	Efficiency

A magnet has a 20 cm magnetic field. If a piece of metal is 18 cm from the magnet, will it be attracted or not?

Why?

1. Efficiency	A. Units for efficiency.
2. Percent	B. Ratio of work out to work in (how good a machine or energy transformation is).
3. Transformation	C. Energy can never be lost or gain, just transformed.
4. Law of Conservation of Energy	D. Changing from one form to another.

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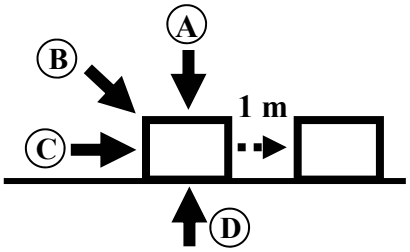
1. Temporary magnet	A. Anything that attracts or repels another magnet or magnetic material.
2. True north	B. Where a compass points to (in Hudson Bay, Canada).
3. Magnet	C. Becomes a magnet near a magnet, then loses its magnetism when moved away.
4. Permanent magnet	D. The North Pole; where maps point to as north.
5. Magnetic north	E. Does not lose its magnetism: lodestone and magnetite are only types.

1. Core	A. The area in which magnets will feel magnetic force. More arrows show a stronger one.
2. Iron	B. The center of an electromagnet.
3. Compass	C. A magnetic navigational device that point toward magnetic north.
4. Electro-magnet	D. Best magnetic substance; more of this in an electromagnetic core makes it stronger.
5. Magnetic field	E. A magnet made from electricity.

1. Energy	A. Uses energy and can create energy.
2. Power	B. The units for energy and work.
3. Work	C. The rate of doing work; how fast you do work.
4. Joules	D. Has the ability to create forces; stored work.

1. Magnetic Induction	A. Making an object "float" with magnets to reduce friction.
2. Maglev	B. Uses work to spin magnets and make energy.
3. Generator	C. Forcing energy into wires by moving magnets.
4. Motor	D. Uses energy to cause electromagnets to turn and do work.



Which of the four forces are doing work on the object?

Which are not?

A 10 kg cart is accelerated 4 m/s^2 in 3 meters. How much work did the force do?

A 8 kg cart is rolling 5 m/s. Calculate kinetic energy.

A 40 watt bulb is run for 3 seconds. How much energy is used?

A 30 N rock is moved 4 meters. How much work is done?

How far up can a 200 N elevator be lifted with 600 J of energy?

If done in 3 seconds, how much power was used?

A rock is thrown 1.8 meters into the air. Find how fast it was thrown?

A 2 kg rock on a 6 meter ledge has how much potential energy?

You push 5 N for 20 meters to lift a 10 N object 6 meters. Find the efficiency of the pulley.

How much kinetic energy can it have if it falls?

A 5 N book is held on a table for 10 seconds, but it stays on the table. How much work is done?

How many support ropes does it have?

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