Magnetism & Electromagnetism

Name: Class:

e	f	f	e	c	t	e	s	l	a	x
r	o	f	c	u	r	r	e	n	t	r
m	r	m	d	e	n	s	i	t	y	m
i	c	o	a	e	l	i	n	e	s	f
n	e	t	a	g	r	e	p	e	l	i
d	s	o	l	e	n	o	i	d	l	e
u	s	r	m	a	t	e	r	i	a	l
c	o	m	m	u	t	a	t	o	r	d
e	o	r	f	l	u	x	r	i	i	r
d	e	l	e	c	t	r	i	c	c	e
p	a	t	t	r	a	c	t	c	r	o

Find the 18 Key Terms and use them to fill in the blanks in the definitions below

_ _ _ _ _ _ _ _ _ Magnet: type of magnet that produces its own magnetic field.

_ _ _ _ _ _ _ Magnet: a material that becomes a magnet when it is placed in a magnetic field.

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _: a substance that always feels a force of attraction from a magnet.

_ _ _ _ _ _ _ _ _ _ _ _ _ _:the area round a magnet where a magnetic material will feel a force.

_ _ _ _ _ _ _: two opposite poles will do this.

_ _ _ _ _ : two like poles will do this.

_ _ _ _ _: a magnet exerts this on a magnetic material.

_ _ _ _ _ _ _ _: a coil of wire with a current running through it.

_ _: how we draw the area round a magnet to show the strength and direction of the magnetic field.

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _: the name for the strength of the magnetic field

_ _ _ _ _ _ _ _ _ _ _ _: The process of a conductor moving in a magnetic field because it feels a force.

_ _ _ _ _: the unit for Magnetic Flux Density.

_ _ _ _ _ _ _: when this flows through a conductor, a magnetic field is induced round the conductor.

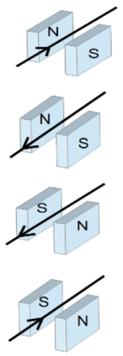
_ _ _ _ _ _ _ _ _ _ _ _ _: a useful machine that uses the motor effect to make it work.

_ _ _ _ _ _ _ _ _ _: the connection on the end of the coil of an electric motor that stops the wired getting tangled.

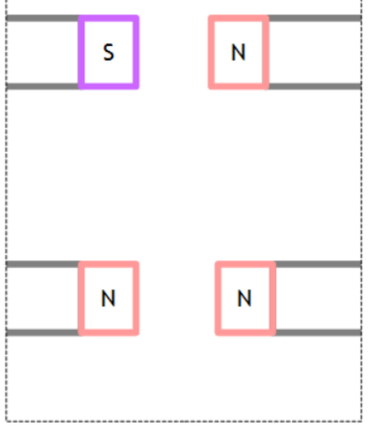
Draw the magnetic field lines round this magnet. Show the direction.

First Finger : magnetic Field
seCond finger: Current
thuMb: Motion

Use Fleming's Left Hand Rule to show which way the wire will move:



Draw the magnetic field lines round these magnets. Show the direction.

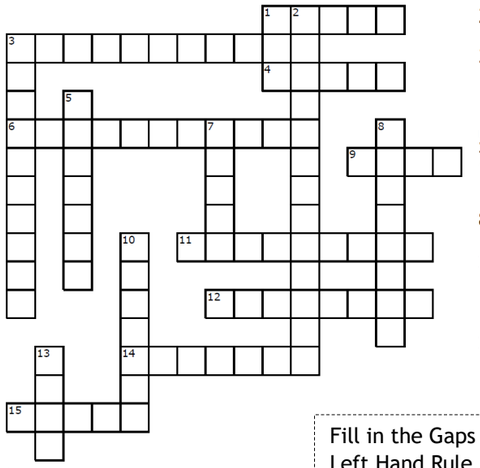


How does an electric motor work?

Key words:

Magnetic	Current	Force
Spin	Direction	Coil
Opposite	Half-Turn	

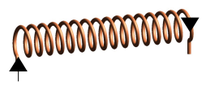
Across
1 Like poles do this.
3 Something which electricity can flow through.
4 The unit for magnetic flux density.
6 The name given to the effect that a magnetic field has on a current carrying conductor.
9 The strongest part of a magnet.
11 These magnets produce their own magnetic field.
12 The type of field that forms round a magnet.
14 When this flows in a wire, a magnetic field forms round the wire.
15 The magnetic _ _ _ _ _ is tha area round a magnet where magnetic materials feel a force.



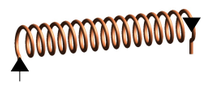
Down
2 A solenoid with an iron core.
3 The arrangement on an electric motor which stops the wire getting twisted and allows the coil to spin.
5 Opposite poles do this.
7 A current carrying conductor feels this when it is in a magnetic field.
8 A coil of wire with current flowing through it.
10 A type of magnet that only becomes a magnet when it is placed in a magnetic field.
13 What a coil of wire does in an electric motor.

UNITS: Fill in the Gaps
F _ _ _ _ (F): Newton, N
M _ _ _ _ _ _ _ flux density (B): Tesla, T
C _ _ _ _ _ _ (I) : Ampere, A
Length (L): m _ _ _ _ , m

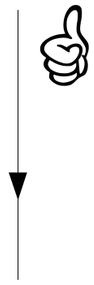
Draw the magnetic field lined for this solenoid



Turn this solenoid into an electromagnet. How does the magnetic field change?



Use the 'Right Hand Grip' to help draw the magnetic field round this wire



How do you use a plotting compass to show the shape of a magnetic field?

How does a compass work?

What does the Earth's magnetic field look like?

Fill in the Gaps for Fleming's Left Hand Rule

Thumb: M _ _ _ _ _

First Finger: F _ _ _ _

Second Finger: C _ _ _ _ _ _

What is the strength of the magnetic field if the 3m wire with 0.2A flowing feels a 40N force?

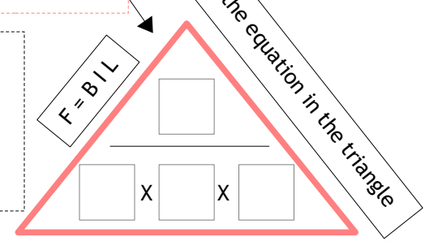
=_____ unit ____

What is the force acting on 2m of wire in a 3T field if 0.2A flows through it?

= _____ unit _____

This equation only shows you the force on a conductor if it is at right angles to the magnetic field.

Write the equation in the triangle



force =
magnetic flux density × current × length

What would you need to add to this coil of wire to turn it into an electric motor: Draw the missing bits on and label them.

Magnet

Commutator

□ Show the direction of the magnetic field
□ Show the direction of the force on each side of the coil

What is the current if a 20m wire feels a force of 60N in a 2T field?

= _____ unit _____