Natural Science

MAGNETISM

Senior Phase Grade 9 CAPS Syllabus

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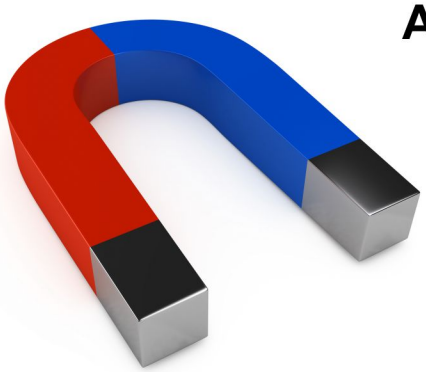
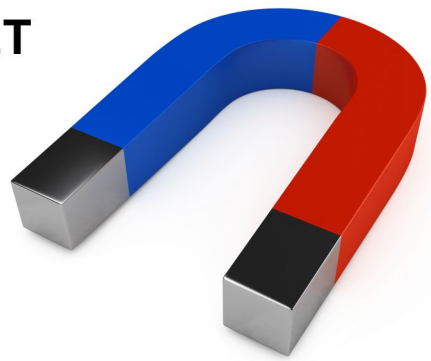
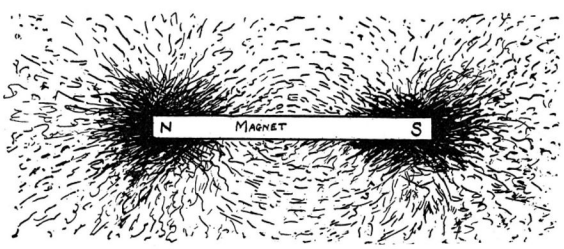


A COMPLETE LESSON SET on MAGNETISM.

INCLUDES:
Teacher's Lessons;
Practical Activity Sheets;
Core Notes;
Revision Exercise;
Assessment;
Practical Evaluation Sheet.





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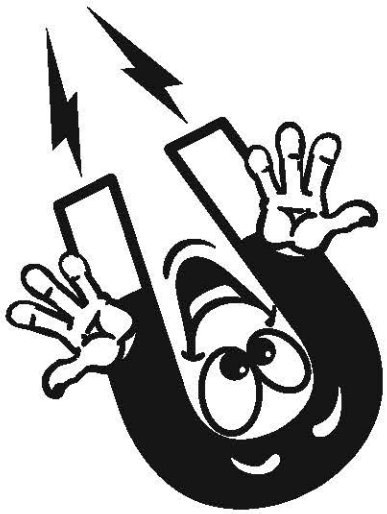
GR 9 CAPS SYLLABUS



Magnetism

Each group ... the following:

1. Tw...
2. ...
3. ...
4. ... research.
5. A ...ilver, gold, steel, etc.
6. Insu...
7. Batte... ...o large cells to save money.
9. Large ir...
9. Paper clip...
10. A compass.

Introduction:
The day before the le... ...nd ready for use.
The teacher should hav... in the class.
Include posters of: magn... ... materials and non magnetic materials; history ...yday life.

As you introduce this section a... ...ters with magnets:
- fridge doors, speakers, telepho...

Hand out the six activity pages. The ... ...heir books.
Read through them with the class - to ... ...he learners to pace themselves.

Discuss the evaluation form with them.

Development
The first hour/ lesson:
After discussion and note reading introduction:
1. Discuss the final project with them. (Page 6)
2. Discuss the homework assignment: Design a game on ...

Game Ideas:
1. Save the diver: Paper clip in water - magnet on the outside o... ...jar to drag the diver up.

2. Sheep dog :
Lots of pap ttle paper sheep.
Place th lastic tray : have 2 sheep pens.
Ob heep as possible and pull the sheep into your pen.
ch to drag the paper clip sheep. They must hold

4. M

5. Cat a

6. Fishing a

I bought a whol tronics shop.

These games give th with magnets and learn about them.

I took two lessons to mar they played each others games.
They learnt about attraction forces.
They learnt that magnetic field ardboard, etc.

Read through the history of magne
Give them the opportunity of finding
(In class and at home.) Page 1

The second hour/lesson:
1. Explain the practical magnetic moment no 1. s as they work.

2. Discuss the results and give the learners a chan understanding of magnetic fields are correct.

Highlight the imp[illegible]nt points on activity page 2.

3. Explai[illegible]grams.
Prac[illegible]nd 4.
[illegible]ing this part of the lesson while you supervise the
[illegible]eed more than one hour.
[illegible]y.

T[illegible]
On[illegible] learners to continue with activity pages
4, 5 a[illegible]
These [illegible] evaluate practical science skills.
See Evalu[illegible]

You can allow [illegible]ors to make their own permanent
magnet. (Magne[illegible]

The fifth and if n[illegible]
Complete electro-ma[illegible]
Discuss and mark some [illegible]
Homework: Games due N[illegible]

Conclusion:
The sixth/ seventh/ eighth les[illegible] ability of the
learners)
Play and mark the games using the [illegible]he activity
sheet.

Last lesson:
Stick in and read through the core study n[illegible]

Hand in books for marking.

The seventh lesson:
Return books
Mark allocation:
(Homework /4 Diagrams each worh 5 marks = /30 [illegible]rk = /4
Table /12 Practical Moment 6 = / 0 [illegible]e moment 7 = /0
Longer questions /11 Game = /19

Total for written work and homework (game) = /80
Evaluation of Prac[illegible]l work = /20

Record th
Hom

H **form:**
Eac form.
There ive point scale.

During ex to evaluate.
Looking at stery of each learner.
Tick the rele

Once you have ei each skill, calculate
the mark out of 40.

You have an objective n idea of areas of
improvement or talent.

You can draw up different ev e skills you are
aiming to develop in your lesso

Assessment:
Evaluation form : Practical / Class wo ___/20
Written homework :
Total mark out of____/80 = _____

Get a mark out of 100 divide by 2. To get a n

Test : _____/30 = _____/50 (Divide the mark

(Practical work = Written) + test = _____%
_____/50 + ___/50 = _____%

PRACTICAL MAGNETIC MOMENTS EVALUATION FORM

Name of learner:___ _____ Date:_____
Class:_____

KEY: 1- …el of understanding of ability; Remedial help needed.
…ot of improvement.
…ial to develop a sound understanding.
…l to develop a sound understanding
…tial to develop a sound understanding of
…vel of science skills.

Practi…

1. Follow…
   Continue…

2. Working sa…
   Lids on; clean…
   no food/ eating…

3. Group co-operation:
   Waiting for a turn; he…
   others; asking peers fo…

4. Individual behaviour:
   Attitude; independent ability.

5. Scientific insight:
   Use of science terms and language.

6. Scientific application:
   Relating experiments to everyday experiences.

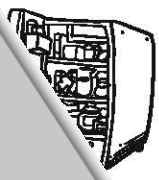
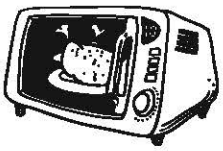
7. Quality of written work:
   The detail and quality of written observations.

8. Other:
   Diagrams; packing up; time management.

1	2	3	4	5

Mark :_____/40 =_____% Comment:_____

MAGNETIC MOMENTS


Fl

As ea wn about the magnetic properties of lodestone.
Lodest e.

As early as e to guide ships through fog.

A Greek philo describe this phenomenon in about 550BC.
Many lodestone ed Magnesia.

No-one knows who direction compass. Legend has it that
the Chinese passed th t onto the Europeans.

Sailors were probably us y long before 1269, when the
earliest description of a co Peter Peregrinus.

A MAGNETIC PERSONALI

Peter Peregrinus' discoveries re

1. **The ends of the magnet be**
2. **The magnetic field surroundi**
3. **Magnets point to north. (But the until 1600.)**

AN ESSENTIAL RESEARCH HO RKS)
Find out at least 3 facts regarding Willia es:

_____

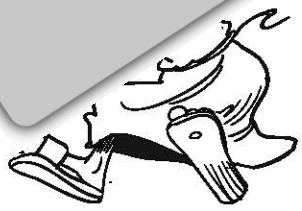
_____

_____

Bibliography / Source of information:

_____

Let's relive Peregrinus' moment of discovery.....



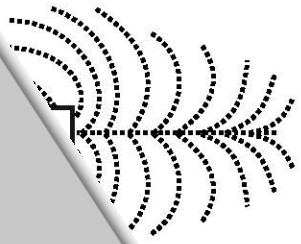
HANDLE WITH CARE!
Magnets are damaged by heat, dropping and hammering!

Peregrinus' Pr[illegible]cal Magnetic Moment No. 1

1. Sprinkle ab[illegible]poon of iron filings over a piece of pape[illegible]ings out evenly.
2. Pla[illegible]e desk.
3. [illegible]0 cm, lower the piece of paper with [illegible]magnet.

[illegible]et strongest?

6. [illegible]ed frame in your science book by drawing t[illegible]ron filing pattern. Label the necessary po[illegible]tic field.
Inclu[illegible] bar magnet.



Important points [illegible]

(Make sure these poin[illegible]

1. The lines of force mov[illegible] available South pole.
2. The magnetic lines of forc[illegible]rm of contact.

Attractive Practical Momen[illegible]

In a science context (Attractive [illegible]

1. Place two bar magnets next to eac[illegible]e N-pole of one magnet lying about 2-3 cm fr[illegible]
2. Sprinkle and spread the iron filings on [illegible] (As in the case of practical moment No.
3. Lower the piece of paper of filings over y[illegible]
4. Tap the paper gently.
5. Record your observations in a 15 lined frame[illegible] Heading: Forces of attraction between differen[illegible] Labels: N-pole; S-pole; Magnetic field; Lines of [illegible] between unlike poles.

*** Don't forget to fill in the little arrows on your lines of fo[illegible]ection of force.*

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AN INDEPENDANT HOMEWORK INVESTIGATION: (4 MARKS)

Describe the follo terms:

1. Ferrous m

2 Au

o. 3

In oulsion) means:

1. P her in a horizontal line, having the N-pole of c he S-pole of another magnet :
2. Sprin iece of paper. (As in
3. Lower th your arrangement of bar magnets.
4. Tap the pa
5. Record you led in your science book.
   Heading: For oles.
   Labels: N-pole, ; Repulsive force between like pol

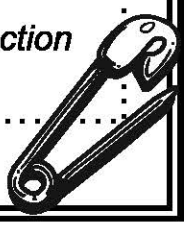
*** Don't forget to fill in t showing the direction of force.*

Repulsive Practical Moment

Repulsive forces are (pulling / pus

1. Place two bar magnets next to each l-pole of one magnet lying about 2-3 cm from
2. Sprinkle and spread the iron filings on a (As in the case of practical moment No. 1)
3. Lower the piece of paper of filings over you
4. Tap the paper gently.
5. Record your observations in a 15 lined frame,
   Heading: Forces of repulsion between the South
   Labels: N-pole; S-pole; Magnetic field; Lines of for between like poles.

*** Don't forget to fill in the little arrows on your lines of forc e direction of force.*

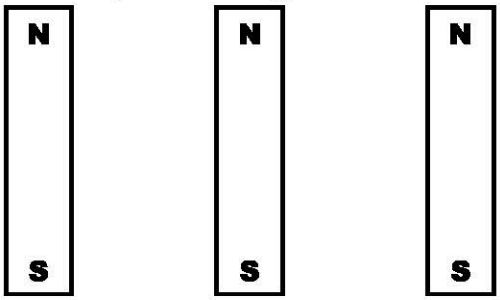


AN INDEPENDENT HOMEWORK INVESTIGATION: (4 MARKS)

Draw 2 frames (2[illegible]es down) Investigate or deduce from previous investigations [illegible]netic lines of force between the following magnet arranger[illegible]

nt A

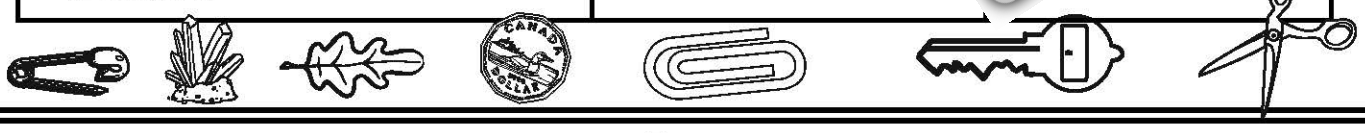
Magnet arrangement B



Practical M[illegible]

1. Hold a magn[illegible]ts - listed on the table below.
2. List the results [illegible]ere attracted to / pulled towards the mag[illegible]re not pulled towards the magnet (non-mag[illegible]

TYPE OF SUBSTANCE	NON-MAGNETIC
1. Rubber tubing	
2. Cork	
3. Wood	
4. Iron (of a nail)	
5. Stainless steel (bowl)	
6. Copper (Ornament)	
7. Gold	
8. Cotton	
9. Lead	
10. Nickel (Old cent coin)	
11. Cement	
12. Silver	



1. What do we mean when we say that a material is magnetic?

_____

2. Are all
Ex

_____

_____

_____

Pra **Making a permanent magnet.**

1. Use
show
you re
eriment. Stroke it in one direction only as
epeat this many times. The more times

2. Test the n
Does it hav
Does the nor
north pole of a
g it. Is it magnetic?_____
_____
other magnet and repel the

Practical Magnetic M **omagnet.**

You need: Insulated copper
Iron nail (Soft iron
Battery.
(If you use a steel nail, you will

YOUR GROUP ASSIGNMEN GEST
MAGNET YOU CAN.

1. Before you start, decide on how you will 's
magnet.

You should use paper clips and a compass fo
Describe your test:

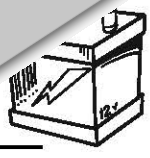
_____

_____

_____

_____

How did you make your electromagnet?



_____

_____

_____

3. How did you test the strength of each group's magnet?

4. Whose m strongest?
5. How magnets the strongest?

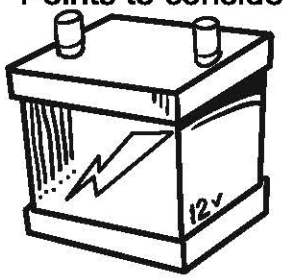
S

An

Answ ok.
You wi them.

1. What s an electro magnet? (1)
2. Does it n und the core / nail? Why? (2)
3. Do more c er? (1)
4. Which part
5. What sort of n 3)
8. Name a few ho net / permanent magnet to work. (3)
7. Design and make part the driving force of the game. (19)

Points to consider : The na and interesting.
Age gro
Include cl me.
The game s
Packaging a ble.
Your name and l parts of your game.



Mark allocation for game : Name of Game:

1. Presentation :_____/6
2. Originality : _____/3
3. Feasibility : _____/5
4. Ins
5. Extra .

Comment : _____

Date_____ Core note Page 1

Magic...

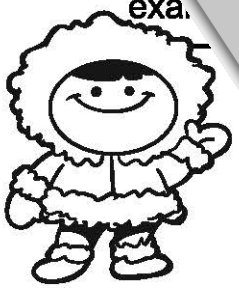
...AND NON-MAGNETIC MATERIALS

...ome objects towards it. These objects are made of ... Magnetic materials are attracted to a magnet.

...s a material that is strongly magnetic. Iron, nickel ...magnetic.

...e materials and other substances, e.g. ...arbon.

...a magnet are called non-magnetic ...ne metals like lead and gold are



The ...nds.
Thes... ...gnet.
The N... ...re equally strong.

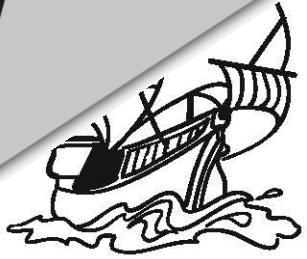
3. THE COMPASS:

A compass is used to find dir...
compass is a small, thin magn...
When it rests, it always points to ...
of the compass points towards a p...
North.

4. FORCES BETWEEN MAGNETIC POLES:

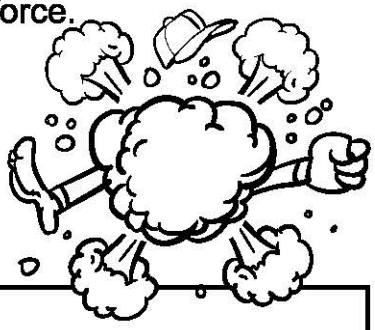
a. Magnets pull some materials towards them. That is to say ... magnets attract some materials. Iron, nickel, steel and coba... are four metals that are attracted to magnets.

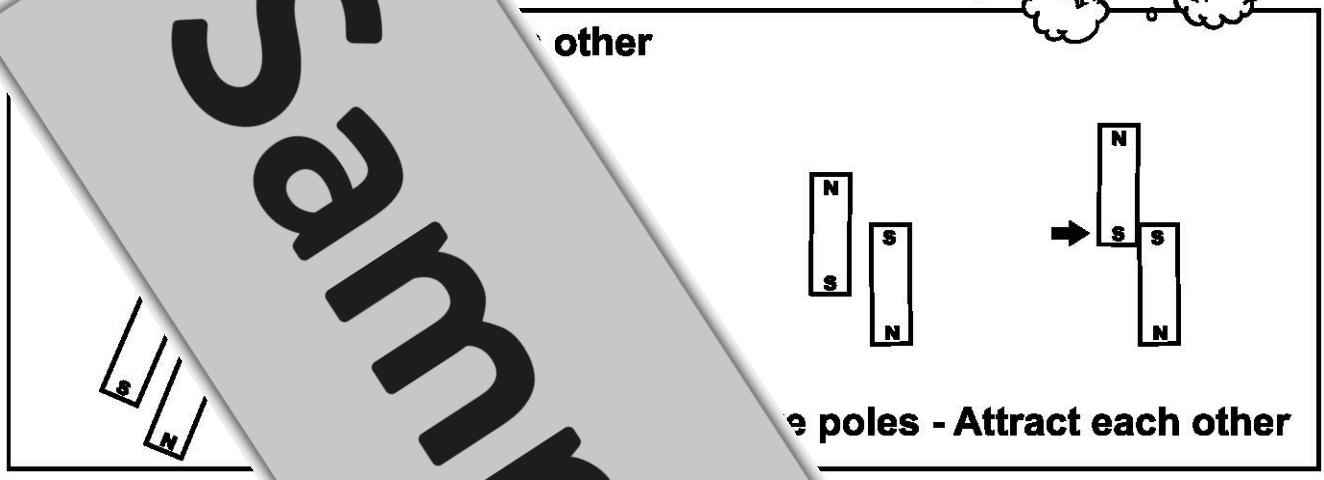
Non-magnetic materials (eg. wood) are not attracted to a magnet.



b. When two magnets repel each other, it is called a repulsive force.
Two North poles will repel each other. So too, will two South poles repel each other.
We say that like poles repel each other.

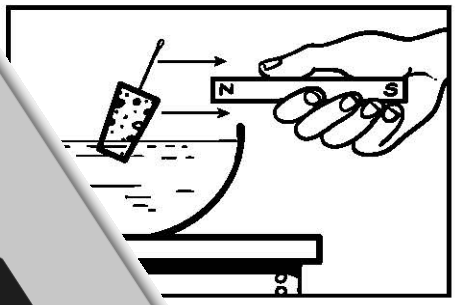
A North pole and a South pole will attract each other.





c. Magnets can attract

If you hold a pin a sho
you can feel the pulling
though the magnet does
moves.
The magnetic force surround
the pin to move towards the a



d. Magnets can attract magnetic ma
materials: The paper clip is attracte
paper. Magnetic fields can also have
water.

5. MAGNETIC FIELDS:

Magnetic forces can not be seen, yet they can be
We can see the effects of these lines of force - use

There is an area around a magnet, which can attract a

a. Magnetic field lines:
The magnetic field is shown by magnetic field lines.
These are lines that start at the North pole and end at the South pole.
They never touch, nor cross each other.

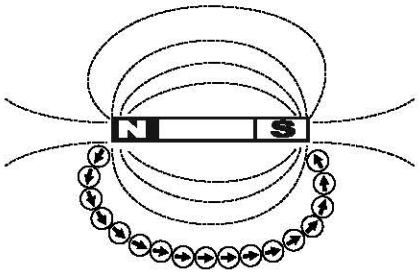
These magnetic lines of force are closest together where the magnetic field is the strongest.
Magnetic field lines ...so called lines of force.

The magnet... the whole magnet. When a magnet enters this field, it is attracte...

...ject, the stronger the pulling force.

a. ...al

b. Like n...

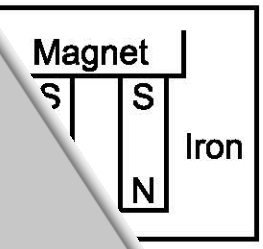


Magnetic field of a bar magnet

These above diagra... ...d when two magnets are put close together.
Unlike poles attract eac... ...each other.
The field from one magne... ...agnet.
X is called the neutral point

6. MAKING MAGNETS:

When pieces of iron and steel are ... they become magnetic fields themse... to the end of the magnet by a force o... poles.



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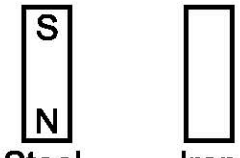


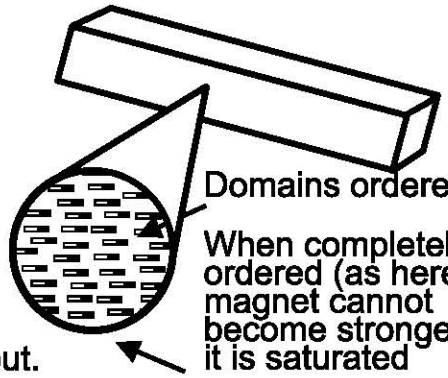
When two pieces are ...
the steel keeps some ... ...t.
The steel has become a ...
only a temporary magnet.
The iron lost all its magneti...
the magnet.

To make a permanent magnet:

A piece of streel can be made into a permanent magnet by st... ...g it with one end of a bar magnet.

Un-magnetised magnetic substances

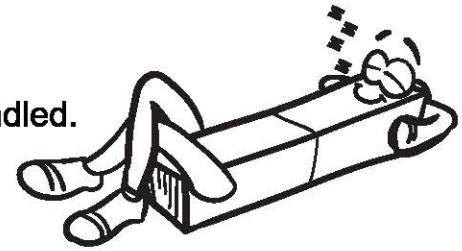
Magnetised substances



ach other out.

Perm substances - steel.
Tempo bstances - iron.

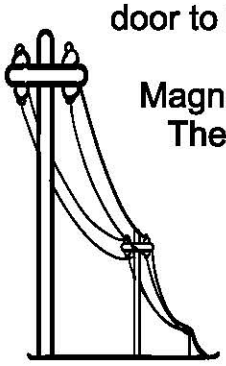
7. CARE



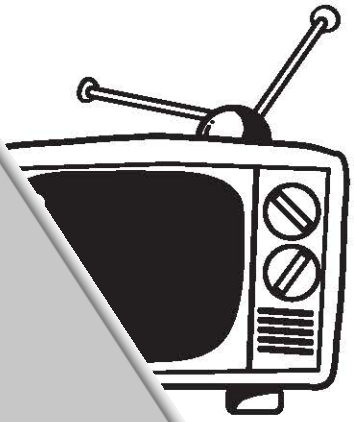
Magnets can l ly handled.
They must neve

8. USES OF MAG

There are magnets i
and electric motors.
door to keep it close



Magnets help to make
There is a magnet in

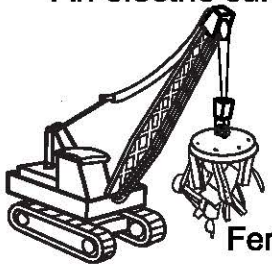


9. INTERESTING....

Mankind has known about
for centuries. There is evide
first natural magnets were found in Asia Min agnets
consist of an oxide or iron called Magnetite. W sed
state, it is given the name "Lodestone" (leading

The properties of magnetite were first investigated
Gilbert, whose famous treatise "De Magnete" appea

An electric current flowing through a wire produces a
The shape of the field depends on t
of the wire and the current flowing. This
called Electromagnetism and is used i
powerful magnets.



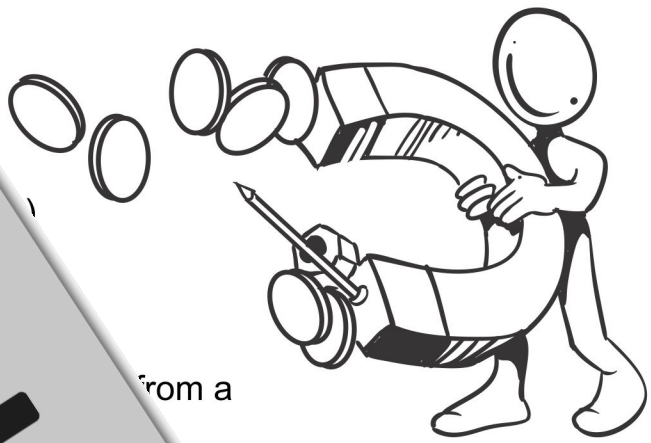
Ferromagnetic soft materials are used in electromagnets. eg. iron.

Date_____

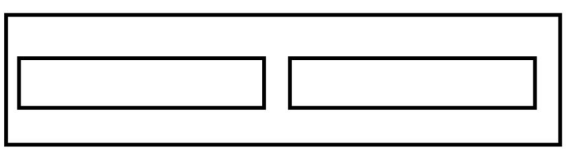
MAGNETISM: REVISION

Use your observation notes to answer the following questions in your science book.

1. What is magneti… erial? (1)
2. Name two… erials. (2)
3. Wha… rial? (1)
4. … rials. (2)
5. … agnet the strongest? (1)
6. N… (1)
7. Wha…
8. What …
   a) a Nu…
   b) a North…
   c) a South …
9. Explain why you … from a distance. (1)
10. What is a magnetic fie…
11. How can you show that … bar magnet? 91)
12. Draw a magnetic field arou…
13. Give 3 ways in which we can… netism. (1 1/2)
14. Give three uses of magnets. (…
15. How can you turn a steel knitting …
16 Draw each of the following magnetic … netic fields for each. (LABELS; 15 LINED FRAM…

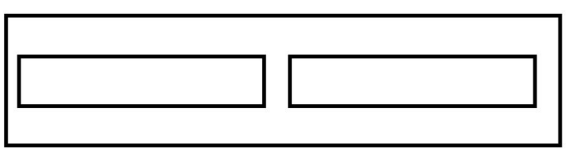


a



(2)

b



(2)

c

(3)

ENRICHMENT:
1. Why is cobalt and nickel magnetic?

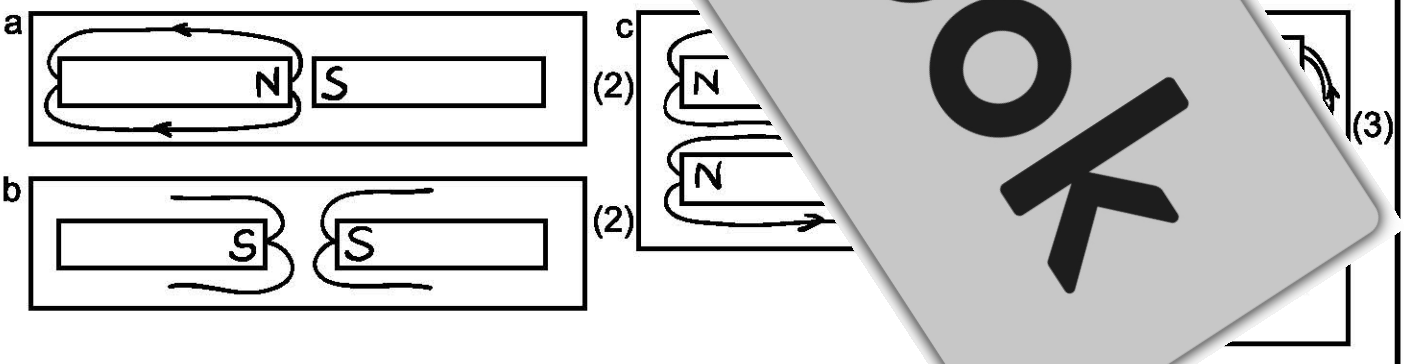
TOTAL: /30

MAGNETISM: REVISION (ANSWERS)

1. Materi… …acted to a magnet.
2. I…

…cted to a magnet.

6.
7. Fe…
8. a) N…
   b) No…
   c) South
9. A pin is a m… …rrounds the magnet and attracts the magnetic …
10. Lines of force m… …h pole.
11. A magnet, paper a…
12. (see core note 3)
13. Hit it, heat it, drop it.
14. (see core note page 4 and…
15. Stroke the needle in one dire… …magnet. Do it as many times as possible.
16



MAGNETISM ASSESSMENT

NUMBER OF PAGES: 5+2
TIME: 1/2 - 1 HR
MARKS: 30

IN

1. Read … attempting to answer them.
2. Answe… answer page.
3. Write yo… wer page.
4. Work nea…
5. Check your…
6. THINK! TRY … Y! GOOD LUCK!




SECTION A: MU…

INSTRUCTIONS:

1. Use a sharp HB pencil to answ…

2. Cross the letter representing the …

3. Only one answer, per question, is co…

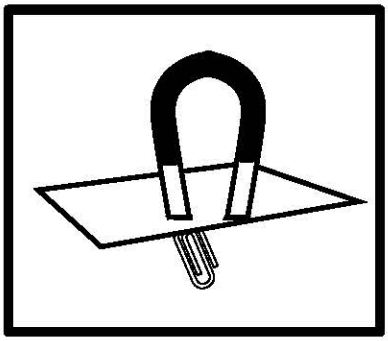
1. The apparatus shown in the diagram on the …

A. Bar magnets incorrectly packed away for st…
like poles must not be forced together.
B. Bar magnets correctly packed away with sleeper…
like poles must be next to each other.
C. Horse-shoe magnets packed away for safekeeping -
Don't drop or heat magnets.
D. A box of magnets - it makes no difference to the safekeeping of the magnets as to how one packs them away.

2. Which pair of metals are not magnetic?

A. Steel and iron.
B. Nickel and silver.
C. Lead and o
D. Copper and cobalt.

3. Th ation showing that:



steel paper clips.
ough paper.
lips.
d iron clips.

4. W

A. The exerts a force over a distance.
B. The l and the horse-shoe magnet.
C. The for poles of two bar magnets.
D. It all dep h other:

5. In which dire ve/point?

A. It depends on
B. Always North to being used.
C. Sometimes north t epulsion and attraction.
D. It all depends on whi

6. Which metal can be made

A. Iron B. Steel Gold

7. Select a suitable heading / titl

A. Cork floats on water.
B. A home made compass.
C. Making a permanent magnet.
D. Magnets act at a distance.

8. Which statement is correct about the care

A. Stroke a magnet vigorously to make it strong
B. Always put like poles together when you pack t
C. Avoid magnets coming into contact with Dad's Ca
D. Avoid heating, hammering and dropping magnets.

9. What is an alloy?

A. A pure, magneti… etal.
B. A mixture of only two materials.
C. Usually a m… two or more metals.
D. A mixture of two non-metals.

10. Y… UE regarding the direction compass?

…t that is attracted to the metallic north.
…al that is attracted to the Earth's North.
…vs points towards true north.
…racted towards magnetic north.

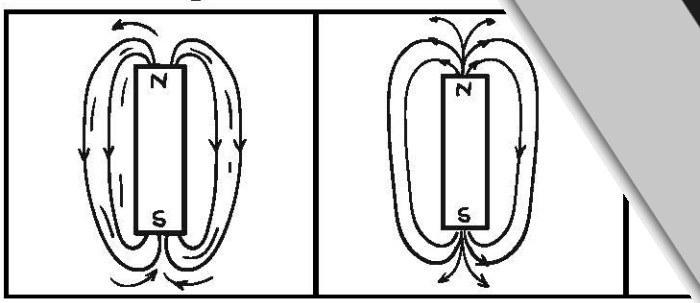
11. T… st:

A. Pas… per coil wound around an iron core.
B. Strok… he more strikes, the stronger the magnet.
C. Stroke an… or a very long time.
D. Hard metal… net to become a permanent magnet.

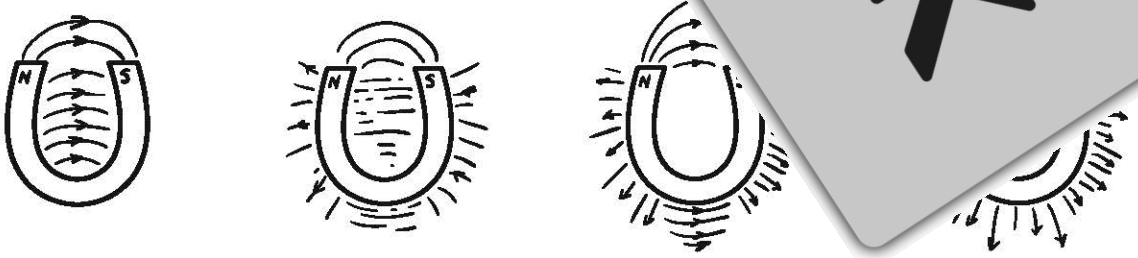
12. Which household… smatched?

A. Telephone - electr…
B. Loudspeakers - perm…
C. Fridge door - temporar…
D. Battery operated doorbe…

13. Which magnetic field has be…



14. Whichdiagram illustrates a magnetic field …



15 Identify t… instruction about drawing science diagrams:
A. All sc… have a 15cm square frame.
B. C… ncil to rule one's frame and to draw one's diagram.
… underneath each other.
… frame above the diagram.

16.
A. Ti… ttracted to the metallic north.
B. The … ttracted to the Earth's North.
C. The st… owards true north.
D. The sma… rds magnetic north.

17. Steel….
A. Is an alloy of …
B. Is softer than i…
C. Is a mixture of ca…
D. Is a pure magnetic …

18. Like poles of any two …
A. Attract each other.
B. Repel each other.
C. Unable to predict as we don't …
D. Pull towards each other if they …

19. Magnets should be coated with vas… ing because:
A. All magnets are made from pure iron.
B. All magnets are made from iron alloys, …
C. All magnets are made from stainless steel, …
D. All magnets get wet during experiments and …

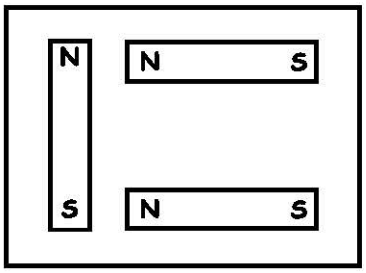
20. Where is magnetic force the strongest?
A. At the north pole.
B. At the south pole.
C. Both poles are equally strong.
D. In the middle of a bar magnet.

(20)

SECTION B: DIAGRAM

Instructi
1. Dra **am on the provided answer sheet.**
2. P **le your frame, heading and necessary labels.**

lustrate the
agnet



SECTION C: I

Instructions.
1.Write a neat, c **f the following**
questions.
2. Select the topic y
3. DO NOT ANSWER

1. Discuss reasons why modern
magnets - permanent and / or

(O

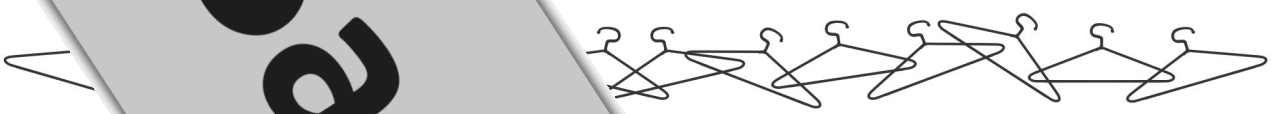
2. How should one care for a magnet? Men
do and points one should do.

(5)

TOTAL + (30) =_____%

MAGNETISM ASSESSMENT - ANSWER SHEET

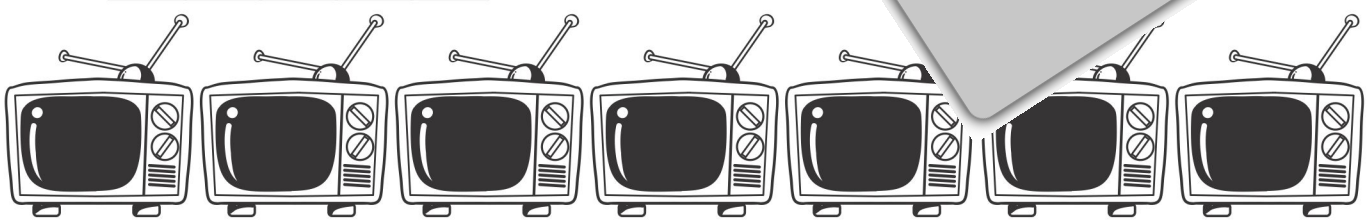
NAME:



SECTION A (20)

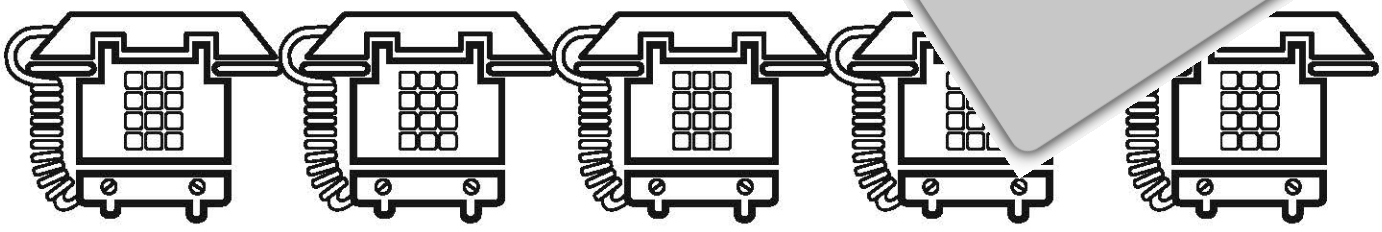
1	2					10	11	12	13	14	15
A	A	A					A	A	A	A	A
B	B	B	B					B	B	B	B
C	C	C	C	C				C	C	C	C
D	D	D	D	D					D	D	D

16	17	18	19	20
A	A	A	A	A
B	B	B	B	B
C	C	C	C	C
D	D	D	D	D



SECTION B: DI[illegible]M (5)

SECTION C: PARAGR[illegible]



MAGNETISM ASSESSMENT - ANSWER SHEET

NAME: _____

DATE: _____

SECTION A : MULTIPLE CHOICE (20)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
~~A~~	A	A	~~A~~	A	A	A	A	A	A	A	A		
B	B	~~B~~	B	~~B~~	~~B~~	B	B	B	B				
C	~~C~~	C	C	C	C	C	C	~~C~~					
D	D	D	D	D	D	~~D~~							

16	17	18
A		
B	B	
~~C~~	~~C~~	C
D	D	D

SECTION B: DIAGRAM (5)

Heading ①

Frame - 15 line
down, ma
to m

S

① ①

force. ①

M (5)

①

vricity

larms

- Speakers, radio, T.V. etc ④

OR

Heading ①

2) Don't heat, hammer, etc. ④

Store with sleepers, opposite ends together.