**Year 8 Physics Revision: Magnetism**

The first section of this topic is about magnetism and magnetic fields. We explain how magnetism results from the arrangement of groups of atoms in magnetic materials. We describe how an electromagnet can be formed, and how it can be used. Amongst the most important uses of electromagnetism are electric motors and generators.

The second section of the topic looks at electric power generation, comparing the advantages and disadvantages of the most important methods.

**Magnetism and magnetic fields (pages 102 - 105 & 108 - 109)**

Some \_\_\_\_\_\_\_\_\_\_, such as iron, nickel and cobalt are \_\_\_\_\_\_\_\_\_\_ materials. When they are placed close to a magnet they are \_\_\_\_\_\_\_\_\_\_ to it. When two magnets are placed close together they will either \_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_ each other.

The space around a magnet in which it has an effect is called its magnetic \_\_\_\_\_\_\_\_\_\_. The effect of a magnet surrounds a magnet in all directions, but it becomes \_\_\_\_\_\_\_\_\_\_ as you move further away. The places where the effect of the magnet is strongest are called the \_\_\_\_\_\_\_\_\_\_.

The \_\_\_\_\_\_\_\_\_\_ of a magnetic field can be found by covering the magnet with a piece of paper and sprinkling with \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_.

The \_\_\_\_\_\_\_\_\_\_ of a magnetic field can be found using a \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_, which will always point away from the \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_ pole.

Magnets which keep their magnetism for a long period are called \_\_\_\_\_\_\_\_\_ magnets. They are often made from \_\_\_\_\_\_\_ magnetic materials like steel, which is hard to magnetise but it keeps its magnetism for longer.

\_\_\_\_\_\_\_\_\_ is a soft magnetic material. It is easier to magnetise as its domains are more easily aligned but also loses its magnetism more easily.

In the spaces below, list 3 ways of making a permanent magnet:

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Now list 3 ways in which magnetism can be removed:

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Carefully read the section on ‘Explaining magnetism’ (pages 108 – 109 in your textbook) and make sure that you can answer questions 3 – 5, to explain about magnetic domains.

**The Earth’s magnetic field (pages 106 – 107)**

The Earth’s magnetic field is important to life on Earth because it protects us from \_\_\_\_\_\_\_\_\_\_ rays and \_\_\_\_\_\_\_\_\_\_ wind.

The Earth behaves like a giant permanent magnet. We can show that the geographic North pole behaves as a magnetic south pole because:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Electromagnetism, motors and generators (pages 110 -116)**

Passing an electric current through a wire creates a magnetic field around it. The field can be made stronger by:

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Electromagnets have many important uses because, unlike permanent magnets, their effects can be switched on and off when necessary. Read pages 112 and 113 to make sure that you understand the workings of lifting magnets, electric bells, relays and circuit breakers.

The motor effect and the generator effect are described on pages 114 – 115. Read this section and fill in the following:

The motor effect can be increased by:

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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The generator effect can be increased by:

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Important methods of electrical power generation (pages 118 – 125)**

Most of the electrical energy we use is generated in power stations which burn fossil fuels. However using this method has many disadvantages:

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Nuclear power is used to generate about 5% of the world’s electricity supply. Complete the table below:

|  |  |
| --- | --- |
| **Advantages of nuclear power** | **Disadvantages of nuclear power** |
| Small amounts of nuclear fuel, such as \_\_\_\_\_\_\_\_\_\_ generate large amounts of energy |  |
|  | \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ can cause cancer and death |
|  | The technology required is expensive |
|  | \_\_\_\_\_\_\_\_\_\_ is an expensive and dangerous process |

To make our fossil fuels last longer and to reduce pollution we need to find other ways to produce the energy that we need. Renewable energy resources are energy resources which will not run out. Renewable resources which are widely used are:

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_