

## JAF02 Unit 7 Electricity and Magnetism

### Task 1 Vocabulary

Match the words with their definitions.

*circuit*   *circuit breaker*   *coil*   *conductor*   *current*   *fuse*   *insulator*   *voltage*

1. An object in electrical equipment that contains a thin piece of wire that breaks and makes the equipment stop working when there is too much electricity flowing through it.
2. The complete path that an electric current flows around.
3. A substance that reduces the amount of heat, cold, sound, or electricity that can pass through something.
4. The amount of potential difference in an electric current, measured in volts.
5. A piece of equipment that is designed to stop an electric current automatically if it becomes dangerous.
6. A substance that heat or electricity can pass through.
7. A long piece of wire that that forms several circles, each on top of the other.
8. A flow of electricity.

### Task 2 Reading

#### Is it true that the Earth's magnetic field is about to flip?

Like football teams at half time, geophysicists think that the Earth's magnetic poles could soon switch ends with the magnetic north pole becoming south, and the magnetic south pole becoming north. Fortunately, when they say 'soon' geophysicists are thinking in geological timescales and they actually mean sometime in the next few thousand years.

It's thought that the Earth's magnetic field is generated by the molten iron core at the centre of the planet. The molten iron has currents of its own, just like an ocean, and these moving currents create the magnetic field. But the currents are not consistent and the Earth's magnetic field moves around, with the magnetic north pole currently drifting by about 10 miles a year.

But this movement of the field is small compared to a complete flip so what is there to suggest that one is imminent? Geophysicists have been studying the lava that has seeped up from the core and through a ridge on the floor of the Atlantic Ocean. As lava cools and solidifies, it preserves the direction of the Earth's magnetic field so looking at the rock that has formed over time gives us an idea of what has happened to the magnetic poles in the past. These studies show that the poles switch ends every half million years or so – and that we're due for another switch in the next few thousand years. There's also evidence to suggest that before the Earth's magnetic poles switch, the magnetic field slowly fades out before reappearing with the poles reversed. And our magnetic field has depleted by 5% over the last century.

So do we need to worry? Well, birds, sea turtles and bees may get confused as they seem to use the magnetic field to navigate. More drastically, since the Earth's magnetic field protects us from potentially harmful radiation from the Sun, as it fades we could well be faced with a disaster on a global scale. Fortunately, there's no evidence in the fossil record of a magnetic field switch causing a species to die out.

(<http://www.physics.org/facts/frog-magnetic-field.asp>)

**Find words with similar meaning in the above text:**

- a movement in which the body turns over
- heated to a very high temperature so that it becomes a liquid
- moving along smoothly and slowly
- likely to happen very soon (especially about sth. unpleasant)
- has flown slowly and in small quantities through sth.
- disappear gradually
- to reduce sth. by a large amount so that there is not enough left

**Formulate a comprehension question for each paragraph of the text.**

**Task 3 Speaking**

**Consider your ecological footprint in terms of electricity. Below is a list of energy saving features and energy saving habits. Please check all that apply.**

**Energy saving features**

Compact fluorescent bulbs  
Energy efficient appliances  
Extra insulation  
Insulating blinds  
Solar panels  
Storm doors and windows  
Water saving fixtures

**Energy saving habits**

Turn off lights when leaving rooms  
Turn off computers and monitors when not in use  
Dry clothes outside whenever possible  
Keep thermostat relatively low in winter  
Unplug small appliances when not in use

[\(http://myfootprint.org/en/your\\_carbon\\_footprint/\)](http://myfootprint.org/en/your_carbon_footprint/)

**Task 4 Video – 60 symbols**

**Watch the video about current and magnet and then talk about the presented phenomena.**

[http://www.sixtysymbols.com/videos/current\\_magnets.htm](http://www.sixtysymbols.com/videos/current_magnets.htm)

## Task 5 Grammar

### Modals expressing degrees of possibility

1. To express varying degrees of possibility, several different modal verbs are used.

**Unlikely**    cannot    may/might/could    should    must    **Highly likely**

2. To express impossibility, or near impossibility, use *cannot/can't*.  
E.g. The data are wrong, so the results can't be correct.
3. To express low possibility, use *may/may not*, *might/might not*, or *could/could not*.  
E.g. Although the researchers have had problems with the experiment, results may (might/could) be available by the end of the year.

**Note the difference:** There *may be* a storm. *Maybe* it will rain.

4. To express moderate possibility, use *should/should not*.  
E.g. They are coping with the problems, so results should be available by the end of next month.
5. To express a high degree of possibility or probability, use *must*.  
E.g. The researchers fixed all the problems a while ago so the results must be available now.
6. To express degrees of possibility about past time, use *can't*, *couldn't*, *may*, *might*, *could*, *should*, or *must*, all followed by *have + past participle*.  
E.g. They couldn't have published the results yet.  
He must have published his research by now.

### Exercise

Rewrite the following sentences using modal verbs.

1. It is quite likely that the device is available in this country.
2. There is a low possibility that the device arrived yesterday.
3. It's surely not possible that the device arrived last week.
4. There is a high probability that the device is on the way.
5. It is certain that they have already sent the device.
6. We are likely to see the benefits from the program soon.
7. Our colleagues have probably used the same device in their research.
8. It is highly probable that the device is electrical!