Electricity and Magnetism
Answer key and audioscript

A - Vocabulary
1. A 2. B 3. B 4. C 5. A 6. C

B - Comprehension
1. B 2. C 3. B 4. A 5. D

C - Listening
What I'm going to talk about today is how electricity is generated for use in our homes and factories.

There are three main ways that we can make electricity, as well as some newly developing technologies that I believe we will come to rely on in the future. They all have one thing in common. That is, they use fuel to turn a turbine, a large wheel. The three most common means of power generation are firstly, by burning fuel to make steam, which turns the turbine. Another way is to use a nuclear reaction to heat the water to make steam. And a third is to use the force of moving water to turn the turbine – hydroelectricity. All have advantages and disadvantages. Burning is cheap and the fuel, usually coal, is easily available. However, burning does cause pollution. Nuclear energy is the cheapest way to make electricity, once the costs of building the nuclear power station are taken away. The waste, however, stays radioactive for a very long time, so we have the problem of storage. Hydroelectricity is the cleanest way to generate power – there is no pollution. But , not everywhere has fast-running rivers, and creating an artificial lake is very expensive and often means moving people away from their homes.

Other, newer ways of generating electricity, for example the use of wind power, do not pollute the atmosphere but they also do not yet produce enough electricity for the needs of a modern city. Of course, improvements in technology are happening all the time. What I'd like to discuss now is …

1. easily available
2. causes pollution
3. the cheapest way
4. radioactive fuel, storage problem
5. the cleanest way
6. no fast-running rivers everywhere, artificial lake very expensive to make
7. clean way, doesn't cause pollution
8. doesn't produce enough electricity

D - Vocabulary

a) 1. B 2. D 3. C 4. A 5. E 6. G 7. F
b) 1. F 2. H 3. B 4. J 5. D 6. A 7. E 8. I 9. C 10. G
c) 1. D 2. E 3. A/B 4. B/A 5. C

E - Comprehension

1. He educated himself
2. He worked as Davy's secretary
3. Davy made him, because he didn't want Faraday to work with electricity.
4. He put the process down in mathematical terms.
5. He was offered honours by the Queen, which he refused to accept. Then, between 1991 and 2001 his face appeared on paper money (a Bank of England £20 note).

F - Listening

Girl: Do you know how your hairdryer works?
Boy: You switch it on and it blows warm air onto your hair. Easy.
Girl: No, I mean, how does it blow the air, and how does it warm it?
Boy: Erm, electricity, I suppose. Go on. Tell me then.
Girl: There's an electric motor inside. When you switch it on, it turns a fan. That's what blows the air.
Boy: But that doesn't get it warm does it?
Girl: No, I was about to explain. There's a heating element in there too. When the current passes through it …
Boy: You mean the electricity?
Girl: That's right, the electric current. It passes through the element and it gets hot. Then, air is blown over the element by the fan and this is how it gets warm. There's a thing called a thermostat in there, too. That stops the element getting too hot. If it does, it switches it off. Simple.
Boy: Very interesting. I think my hair's dry now.

1. electricity
2. motor
3. current
4. blown over
5. thermostat

H - Writing

Model answer

Michael Faraday came from a poor background and this was to have a great effect on his scientific work. As a boy, his education was very limited and there were certainly no great teachers behind him giving him encouragement and support. However, he must have been hungry for an education because he worked during the day as a bookbinder and attended lectures in the evening.

It was after a lecture given by Humphrey Davy that Faraday decided to write to him seeking a place in the scientific community. Davy's reply suggested he give up the idea. Luckily for Faraday, Davy injured his eyes shortly after and decided to employ him as his secretary.

Unfortunately, though, Faraday was not considered a gentleman and was treated like a servant. Although this made him unhappy, he had the opportunity to carry out experiments at the Royal Institution of Great Britain. He managed to make advances in an electrical motor, but probably Davy was not happy with this as he removed Faraday from the work. In fact, he prevented him working with electricity, but on Davy's death in 1829, Faraday resumed experiments. His work laid the foundations of electromagnetism and modern technology.

Until his death, Faraday remained a hard-working modest man who made many important discoveries but refused honours from the Queen. Finally, many years later, he was honoured between 1991 and 2001, when his face appeared on the Bank of England's £ 20 banknote.