

Electromagnetism Grade 4 Quiz

Teacher's Answer Key

1. Why didn't the coil of wire on an electromagnet work when it wasn't hooked up to a battery? What does the battery do to the coil of wire? *(The wire is just wire until you have electricity passing through it. The electricity causes a small magnetic field around the wire. When you bundle and coil the wire up, you multiply this effect to create an electromagnet.)*
2. Why is it called an 'electromagnet' and not just a 'magnet'? *(An electromagnet is a magnet that can be turned off and on using electricity.)*
3. What's inside a DC motor? *(An electromagnet and a magnet.)*
4. How can we use electromagnets to make things move? Give an example. *(When you energize a coil of wire, you turn it into an electromagnet. If you bring two magnets together, their magnetic fields interact and they repel each other, causing motion. The DC Motor is one example. When the rotor is energized, it aligns itself with the magnet. As it tries to align itself, it overshoots and so that the un-sanded portion breaks the connection and the electromagnet turns back into just a coil of wire. The coil continues to float around in a circle until it hits the sanded parts again, which re-energizes the coil, turning it back into an electromagnet, which is now attracted to the magnet on the battery, which pulls it around again...and round it goes!)*
5. Give an example of how electricity causes magnetism. *(When you run an electrical current through a coil of wire, you can detect the magnetic field using a compass.)*
6. Give an example of how magnetism causes electricity. *(The Motors and Generators experiment is a great example of this. When you spin the motor shaft, you move an electromagnet quickly past a permanent magnet, which produces a jolt of electricity at the motor's tabs. You can detect this current when the LED lights up or by a digital multimeter.)*

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