



## Making a Magnet with Electricity

core, coil, turn of wire

Electricity and Magnetism Unit

Katie was invited to stay at her aunt and uncle's cabin over the weekend. She went to their house, picked up the key, and then drove the two and a half hours through the winding roads of the canyon, deep into the woods. She arrived at the cabin and was so excited that she skipped to the door. While skipping, the key fell out of her pocket and landed in a deep, narrow hole. Katie dropped to her knees and looked down the hole. She could see the key gleaming down there. The ground was cold and hard and would be difficult to dig through, and she didn't want to disturb any of the animals living in there. She also didn't want to drive the two and a half hours back to her aunt and uncle's to pick up a spare key. What she needed was a magnet. Katie did not have a magnet.

Katie sat and thought. She knew there was a way to make a magnet so she did not have to go and buy one from the store. She needed something that could turn into a magnet and knew that iron nails work really well. A **core** is the middle of an electromagnet that makes the magnet stronger. She remembers her teacher telling her to think of the core like the body inside a mummy. Katie will have to spin wire around the nail, like a mummy gets wrapped with cloth. It just had to be made of metal, instead of a dead person. She walks around the cabin and found a rusty nail sticking out of one of the slats. She pulled out the nail. There was one thing down.

Now she just needed something to circle around the metal nail that electricity can move through. She returned to her car and rooted through her things. She found some old, cheap headphones. She decided she would rather listen to the sounds of the forest than music and ripped the wire out of the headphones.

To **coil** is to bend something into circles over and over again. She coiled the wire around the nail, making circles around the nail until it was completely covered with wire.

She wrapped the wire as many times as she could. She knew that with every circle the wire made around the nail, she could make a stronger magnet. Each **turn of the wire** is one circle around the nail with the wire and the more turns there are, the stronger the magnet. She wrapped the nail with as many turns of wire as she could, to make the magnet super strong. She just needed one more thing: electricity. She found a battery rolling around in her backseat. She hoped it still had enough power. She touched the two metal ends of the wire to different ends of the battery and held them there. Sure enough, the wire grew warm, which meant it had electricity from the battery moving through it!

Katie brought her magnet back to the hole and, with her fingers, hung it into the hole. The electricity moved through the coil of wire wrapped around the nail. The nail at the core of the magnet helped to make magnetic stronger. She made many turns of wire around the nail wire to make the magnet even stronger. Both ends of the wire were touching a battery, so electricity could move through the wire. This made it magnetic! Too bad Katie was very clumsy and dropped the magnet down the hole with the key. But! By looking into the hole she could see that the key did, in fact, stick to the nail. She had made a real magnet! It almost made her feel better about having to drive two and a half hours to her aunt and uncle's and two and a half hours back with the spare key. Almost.

### **References:**

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