**Building an Electromagnet Worksheet**

# 1. Draw the battery, wire coil and magnetic field. Label the positive and negative ends of the battery, and the poles of the coil’s magnetic field.

# 2. Describe what happens if you hold a nail or paper clip near the coil.

# 3. Reverse the connection of the coil. Draw the battery, coil and magnetic field. Label the positive and negative ends of the battery, and the poles of the coil’s magnetic field.

# 4. Describe what happens if you hold a nail or paper clip near the coil.

# 5. How did you test the strength of your electromagnet?

# 6. Can your electromagnet pick up paper clips when the current is disconnected?

**Electromagnet Engineering**

# 7. What did you modify in building your electromagnet (number of coils or size of battery)?

# 8. Fill in the table below with how many paper clips your electromagnet was able to pick up.

|  |  |
| --- | --- |
| **Electromagnet** | **How Many Paperclips Did It Pick Up?** |
| **With 10-12 coils** |  |
| **With fewer coils**  How many coils? \_\_\_\_\_\_\_\_\_ |  |
| **With more coils**  How many coils? \_\_\_\_\_\_\_\_\_ |  |
| **With a different battery #1**  What size battery? \_\_\_\_\_\_\_\_\_ |  |
| **With a different battery #2**  What size battery? \_\_\_\_\_\_\_\_\_ |  |
|  |  |

# 9. Write a sentence about how changing the number of coils or battery size affects how many paper clips the electromagnet could pick up.

# 10. What are some ways that engineers might be able to use electromagnets?