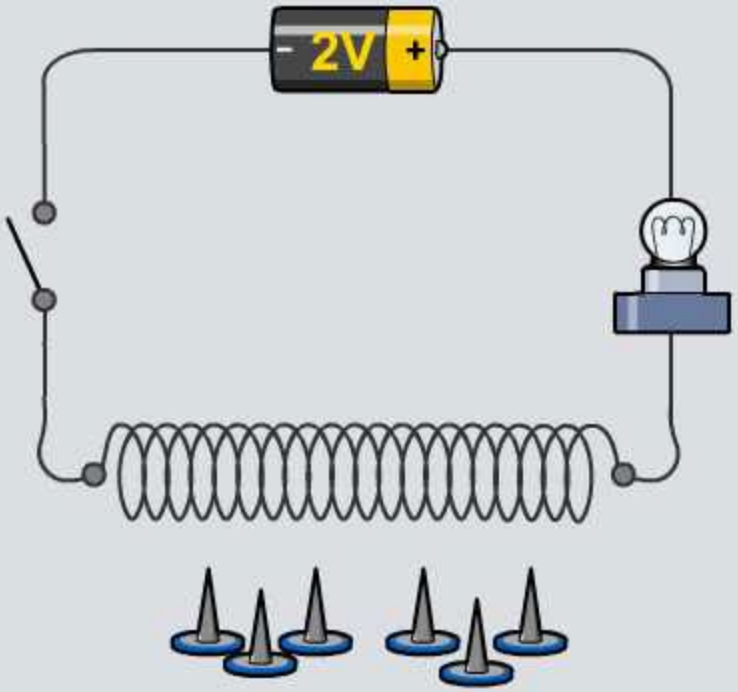
Electromagnets



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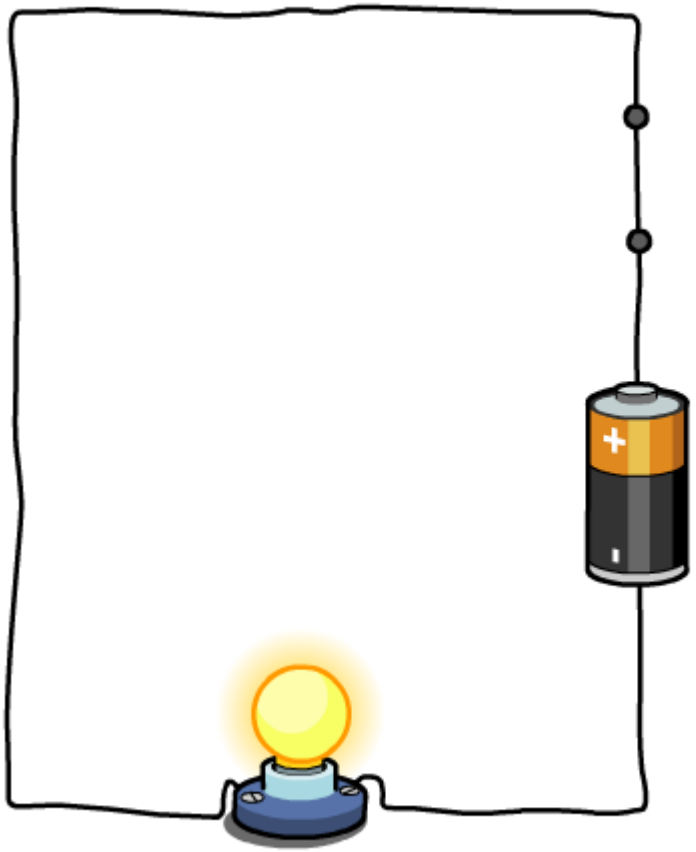
Investigating current and magnetism

In 1819, Hans Christian Ørsted noticed that when he connected a battery to a circuit, a nearby compass was deflected from magnetic north.

Click "**play**" to find out more about this effect.



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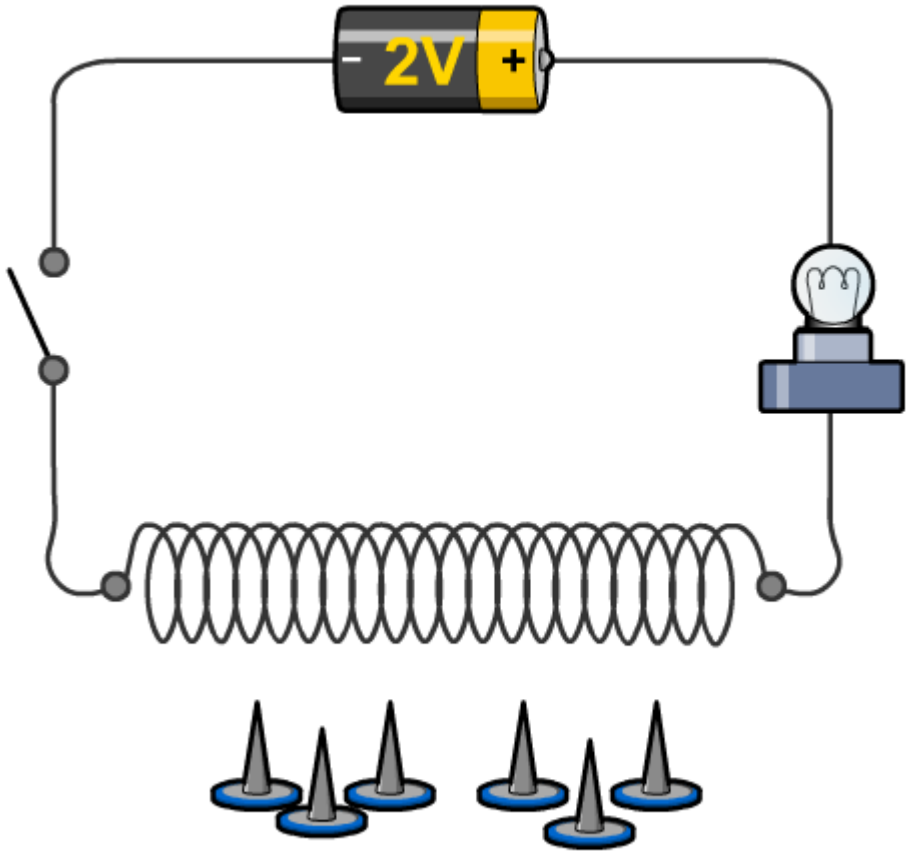
Making an electromagnet

How are electromagnets made?

The magnetic field produced by a single current-carrying wire is relatively weak. How can it be increased?

Click "**play**" to find out.



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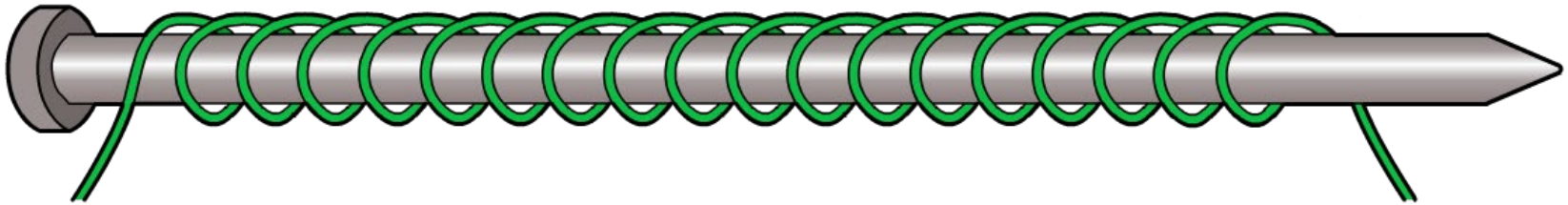
Investigating electromagnets

The strength of an electromagnet depends on whether it has a core of iron.



Two experiments can be carried out to investigate the other factors that can affect the strength of an electromagnet:

- Investigate how the **number of coils** affects the number of thumb tacks attracted to an electromagnet – keep the current the same in this experiment.
- Investigate how the **size of the current** affects the number of thumb tacks attracted to an electromagnet – keep the number of coils the same in this experiment.

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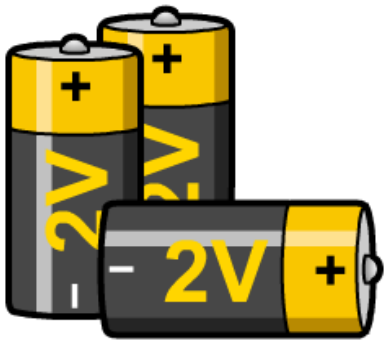
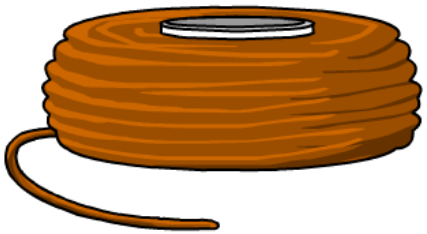
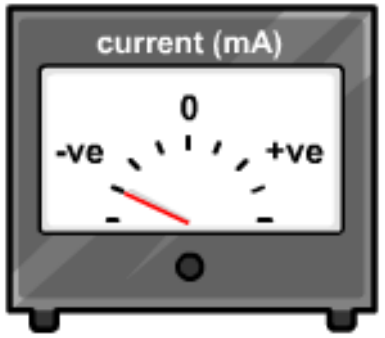
Investigating electromagnets

How could you use the apparatus below to investigate the effects of changing the current and the number of coils on the strength of an electromagnet?







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Investigating electromagnets – results

Here are some example results.

number of coils	number of thumb tacks attracted
0	0
20	8
40	18
60	31
80	46

current (A)	number of thumb tacks attracted
0	0
1	12
2	23
3	38
4	49

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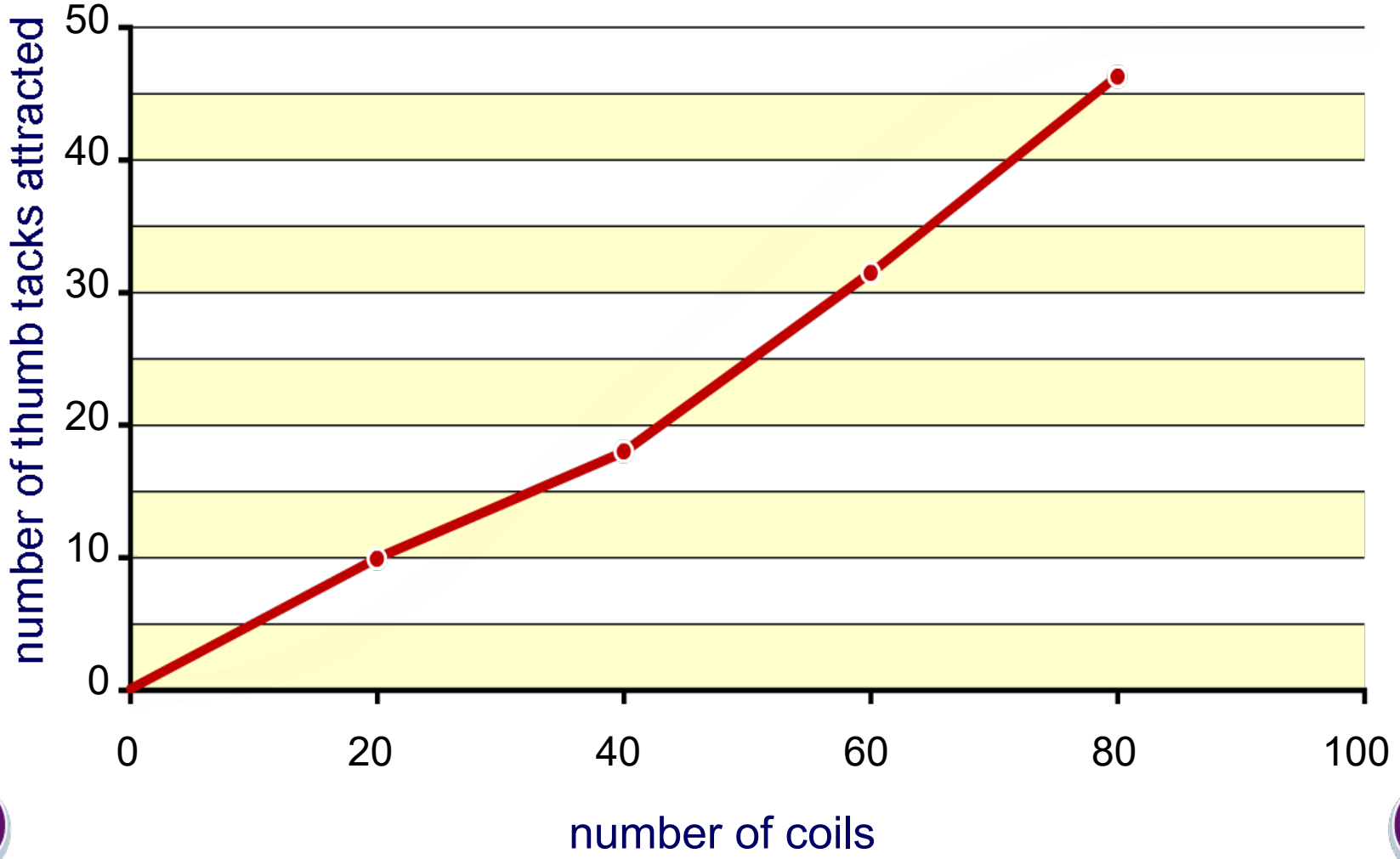
Investigating electromagnets – analysis

How did the number of coils affect the number of tacks attracted to the electromagnet?



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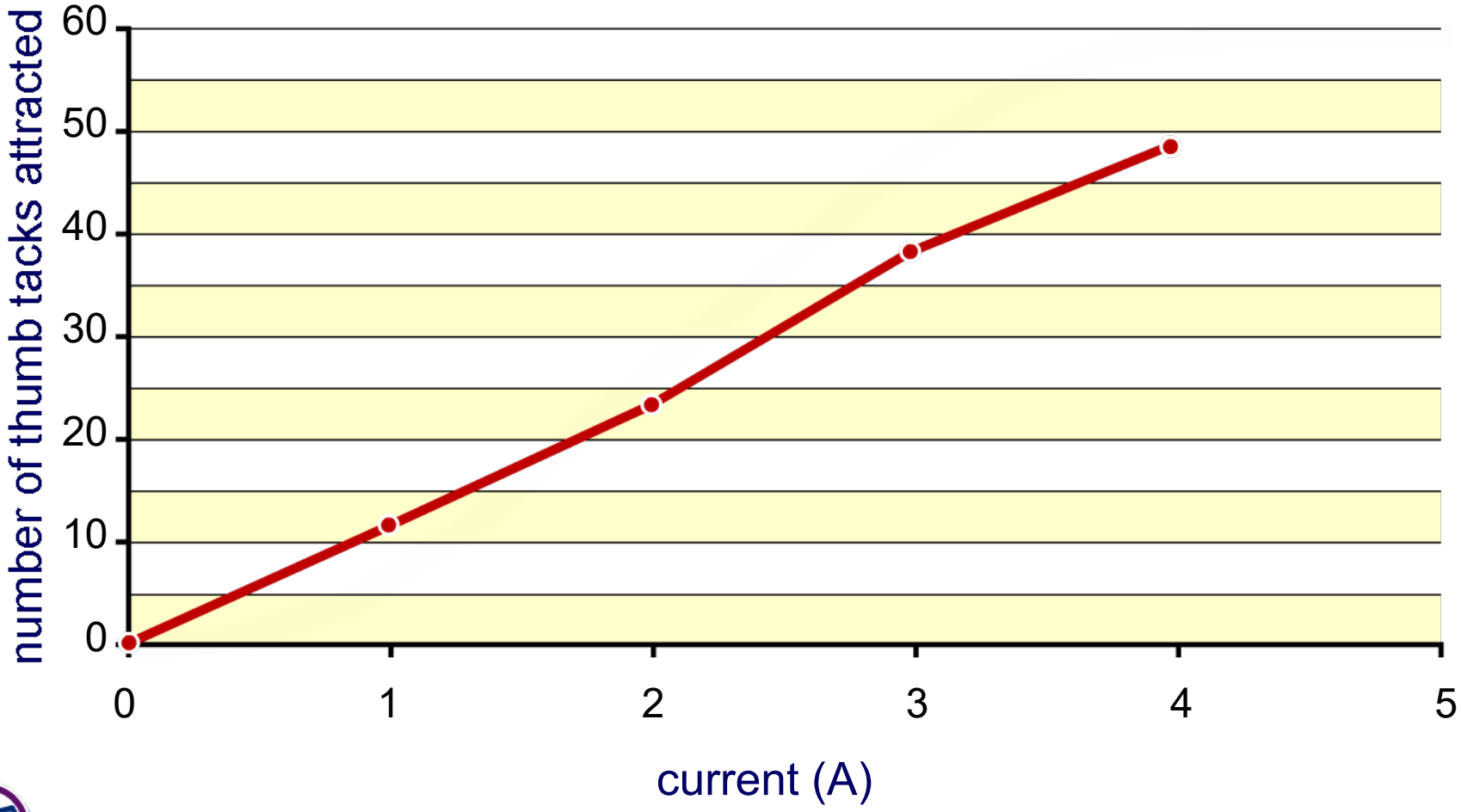
Investigating electromagnets – analysis

How did the size of the current affect the number of tacks attracted to the electromagnet?



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