

Energy

Full Magnet or Half?

NCF and/or NCERT Learning Outcomes:

- Understand what happens when a magnet is broken into smaller pieces.

Why Should You Learn This?

- To explore whether a broken magnet still behaves like a magnet, we will conduct a simple activity.
- To explore some properties of magnets, you will use this activity.

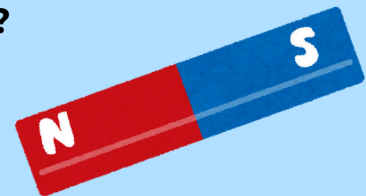
Can you tell what N and S represent on a magnet?

Correct!

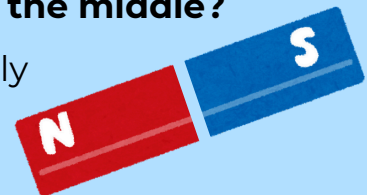
N and S are the two poles of a magnet.

N stands for the North Pole

S stands for the South Pole.

**But think. What will happen if we break a magnet in the middle?**

- Will we get two half magnets? One piece having only the North Pole and the other only the South Pole?
- Or will each piece behave like a complete magnet?



Make your hypothesis and write in your notebook.

Let's try an experiment to understand this.

- You will need



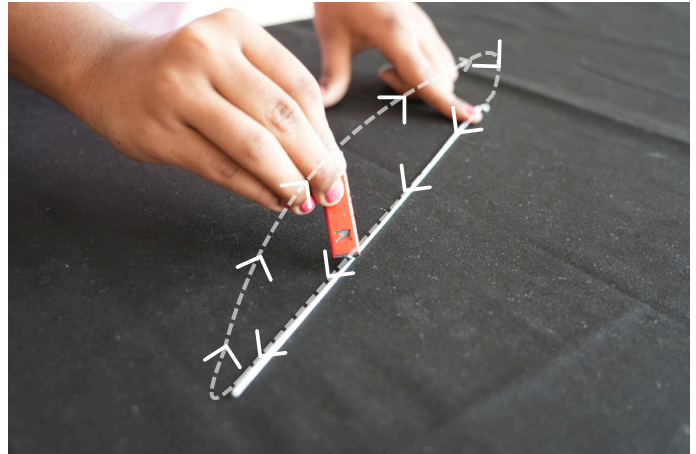
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Experiment

1 Magnetise the Spoke

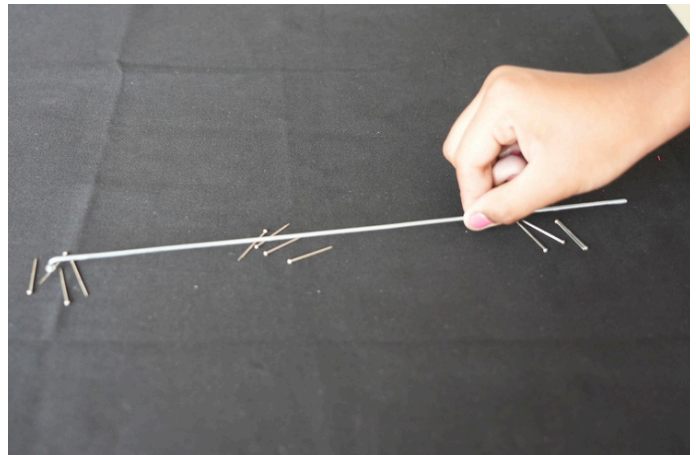
Rub the magnet along the spoke 30–40 times in the same direction with the same pole.

(For detailed instructions, refer to the resource: Make Your Own Magnet)

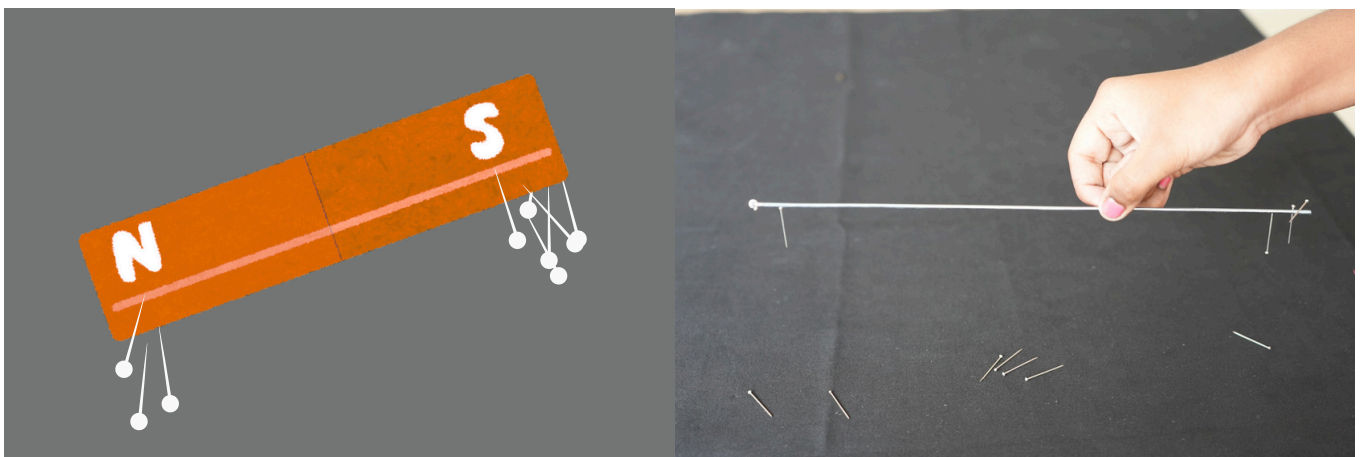


Now bring the spoke near the allpins.

- Do the pins stick all over the cycle spoke? Observe and record your results.
- Do the pins stick to a bar magnet in the same way? Try it and observe.



Yes! Both bar magnet and magnetised spoke similar behaviour. This means that the spoke has become a magnet.

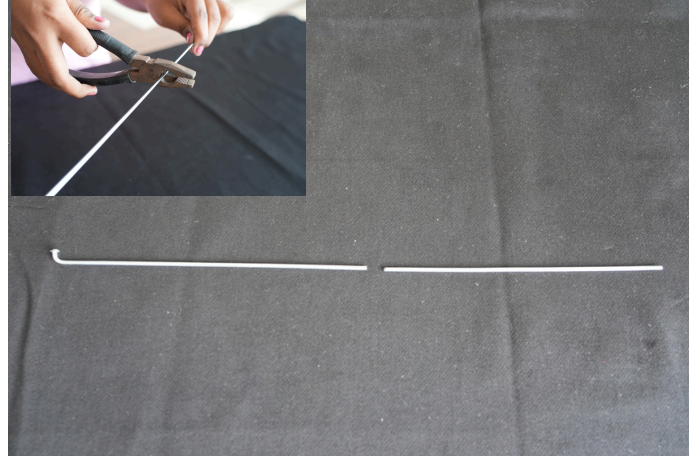


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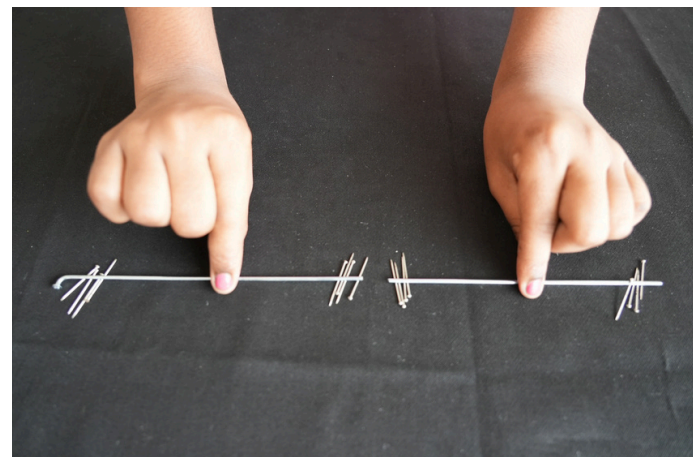
Cut the spoke into 2 pieces

Using pliers, cut the spoke in half.

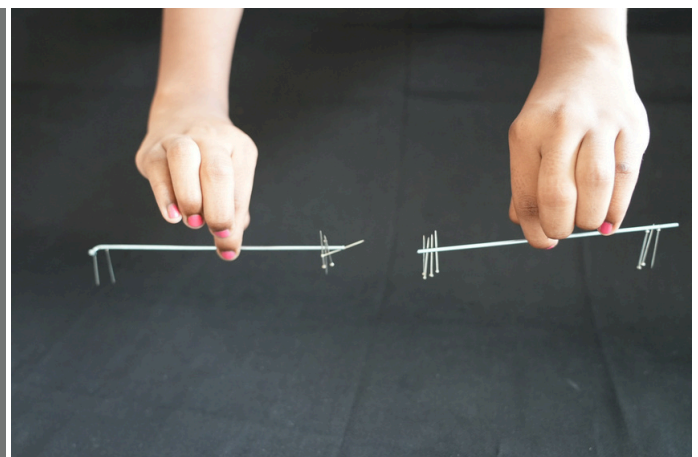
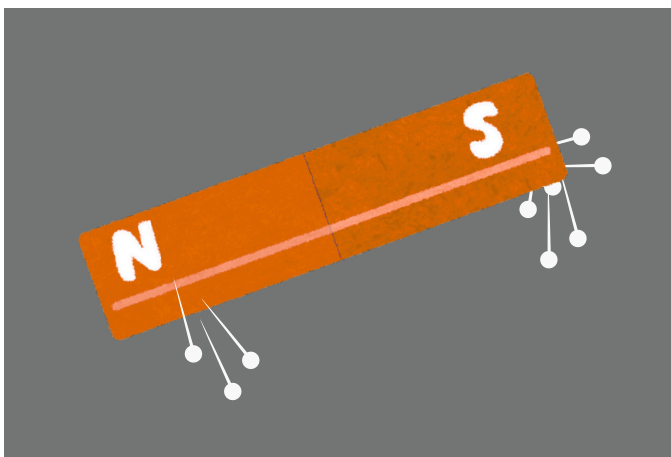


Now bring both pieces of the spoke near the allpins one-by-one.

- Do the pins stick all over the pieces of spoke? Observe and record your results.



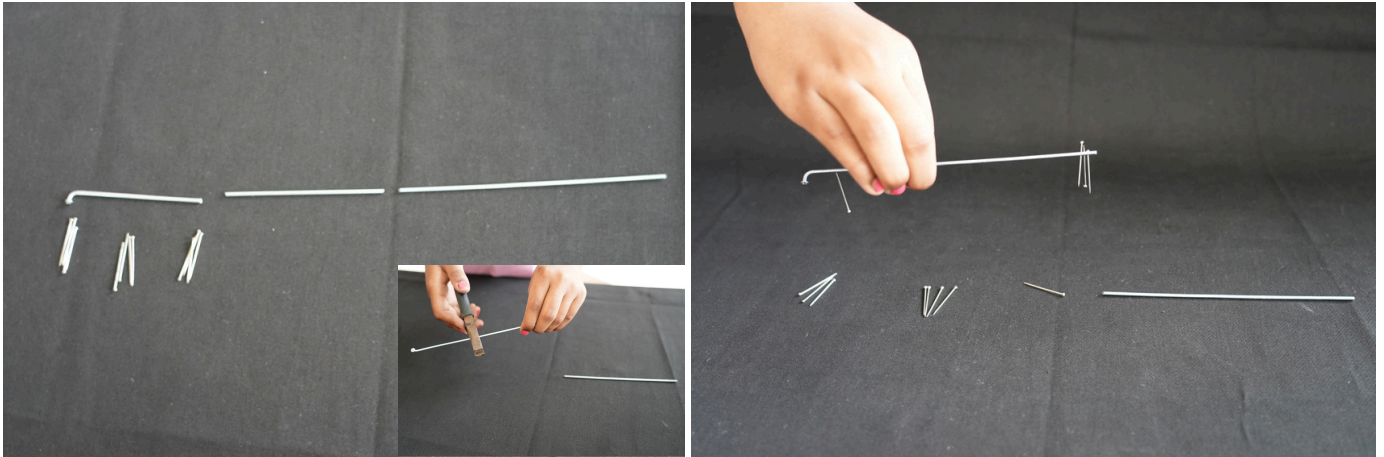
Interesting! Pins stick to both ends of the spoke but not in the middle, just like they did with the full magnet. It means each piece still behaves like a complete magnet.



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Conclusion

This proves that every time you cut a magnet, each piece becomes a new complete magnet. No matter how many times you repeat the process, the result remains the same.



- Now if the spoke pieces are complete magnets, will they attract or repel each other? Bring their ends close to each other and note down your observations.
- Based on your observations and previous knowledge of magnets, can you identify and label the ends of the cut or pieces of spoke?

Reflect and Extend

- Was the hypothesis you made in the beginning correct?



- What if a horseshoe magnet (U-shaped) or a ring magnet break? How will they behave? Think, write your hypothesis, and test if possible
- You can also break the cycle spoke into even smaller pieces and observe what happens?