Animated match

When winter arrives, sometimes your hair starts to go in all directions when you put on some clothes... The responsible is « static electricity », and today we are going to move a match without touching it to observe this phenomenon elsewhere than on your head!

What material do you need ?

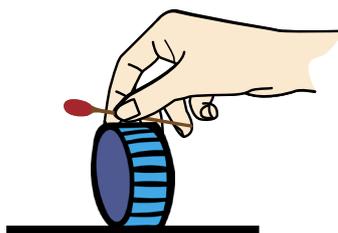| A match | A water bottle cap | 1 clear glass | A balloon | A woolen pullover |

Ready ? Let's experiment !

1 On a flat surface, place the cap on the edge.
Now place the match perpendicularly on it.
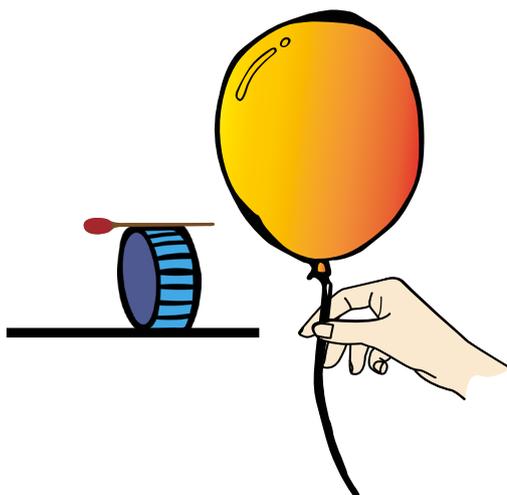It takes a little skill.

2 Blow up your balloon and tie a knot.
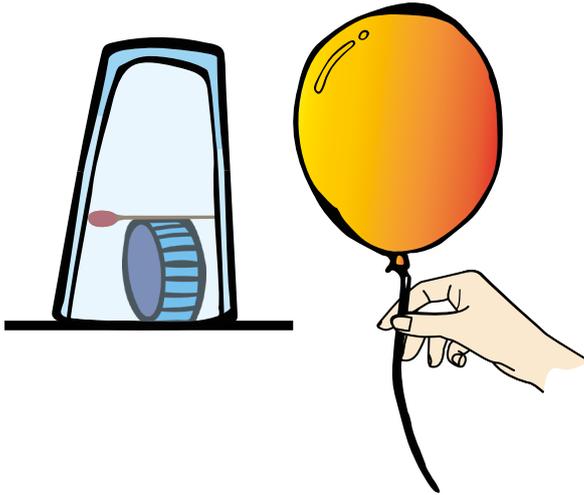Now rub it vigorously onto your woolen pullover for a few minutes.

3 Bring the balloon you've just rubbed near the match. What do you observe ? Does it move ? Does it fall ? Does it spin ?

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Now flip a clear glass over the match and the cap, and repeat the experiment. Does the match still move ?
What if you don't rub the balloon ?

Why does it work ?

The phenomenon which makes the mach move is called static electricity. By rubbing your balloon on the pullover, you create electric charges on it.

The ballon is an insulator (which does not carry electricity) so the electric charges do not move. They are said to be «static». Unlike the electric current which flows through the cables. But even if they don't move, they still have an effect on their environment.

Attraction and repulsion forces...

To understand this phenomenon, you have to know that materials are made up of elements called atoms. Atoms are made up of positive charges in their center (the nucleus) and negative charges revolving around. One of the great physics' principles is that negative charges repel each other and positive and negative charges attract. The balloon carries negative static charges on the surface. The match, very light, feels the presence of these charges. The positive charges of the match are attracted by the negative charges of the balloon. That's why the match moves.

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