



SCIENCE FESTIVAL FAMILY EXPERIMENT GUIDE: BALLOON SKEWERS

**Instructions:**

Both: Put on safety glasses.

Adult: Blow up a balloon and tie it off. Don't over-fill it if you let a little air out of the balloon, it will be easier to skewer.

Student: Dip the tip of the wooden skewer into Vaseline (or oil).

Adult (or student): Use a gentle twisting motion to insert the skewer into the thick end of the balloon, opposite the knot. Continue pushing on the skewer until it emerges from the other side, directly next to (but not in) the knot. The balloon should not burst.

Student: Place your hand over the holes to feel any air leaking out.

Optional: Follow the same steps with a cold or warm balloon.

Questions for after:**K-2nd Grade:**

- What happened when you pierced the balloon with the skewer?
- Why do you think that happened?

3rd-5th Grade:

- Why do you think the balloon did not pop?
- Do you think it would work if you pierced the balloon in another location?
- Does it matter if the balloon is hot or cold?

How It Works:

Balloons are made from thin sheets of rubber or latex. If you could see this at a microscopic level, you would see many long strands or chains of molecules. These are called **polymers**, and the elasticity of these polymer chains causes them to stretch. When the balloon is blown up, the middle area of the balloon stretches more than the ends. A sharp, lubricated point can be pushed through the material at either end because the oil/Vaseline helps the polymers stick together so the rubber or latex can stretch around it. If you pushed the skewer through the side of the balloon it will pop the balloon because in those areas, the material is already stretched.

Vocabulary:

Elasticity: The ability of a material to stretch and then go back to its normal shape.

Polymer: A molecule made from joining together many small molecules or units. 'Poly' means many and 'mer' means units

Real-World Application:

Knowing the elasticity of different materials helps scientists and engineers decide what materials to use when building things, so that they can resist pressure without breaking. Knowing about polymers is useful in many STEM jobs from understanding DNA to designing smartphones.

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