The Unpoppable Balloon

Can you poke a sharp skewer all the way through a balloon without popping it? Balloons are made of long chains of repeating molecules called polymers. The polymers in balloons are able to reform around objects, as long as they aren't too stressed. In this experiment, we recommend pushing the skewer through the bottom tip of your balloon, near the knot. If you attempt to push the skewer through the middle of the balloon, you may find that the polymers are too stressed and unable to reform around the hole—therefore popping the balloon!

Materials needed:

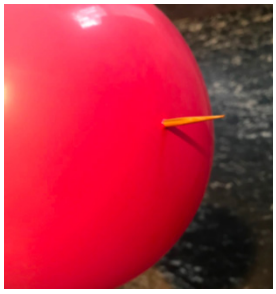
- Balloon
- Wooden skewer
- Vegetable oil

Step-by-step instructions:

1. Fill one large balloon about halfway full with air and tie a knot at the end.
2. Coat the wooden skewer with vegetable oil.
3. Gently twist the skewer through the bottom of the balloon, near the knot.
4. Push the skewer out through the opposite side (the top end) of the balloon.







Additional explorations:

- Grab a second balloon and draw equally sized dots all over it with a permanent marker. Inflate the balloon and observe the dots. The areas where the dots are largest indicate where the polymers are most stressed.
- Add a piece of clear tape to the middle of an inflated balloon. Push the skewer through this spot. Does the balloon pop?

Discussion questions:

- Why do you need to push the skewer through the balloon near the knot and the tip? Why not the middle?
- What happens when you remove the skewer?
- If your balloon popped, what do you think happened?

Additional resources:

- TED-Ed video about polymers
  https://www.youtube.com/watch?v=UwRVj9rz2QQ