

Flame Out!

A candle flame is actually a chemical reaction in action! Candle wax is one of the chemicals in the reaction. Can you guess what the wax reacts with? Find out in this experiment!

What you'll need

- Goggles
- Tealight candle
- Matches
- Glass jar

Be safe

- Since there is a flame in this experiment, be sure that a teacher, parent, or other adult works with you.
- Wear goggles when doing this experiment as well as when cleaning up.
- Tealight candles are used because they do not tip over as easily as other candles.
- Wash your hands after the activity.



Here's what to do

1. Ask the adult you are working with to light the candle.
2. Watch the candle flame start out small and get bigger. Notice how some of the wax near the wick melts.

As the flame burns, the wax from the candle is reacting with something else to make the flame.

What do you think it might be?

3. Ask the adult you are working with to carefully place a glass jar over the candle and to leave it there.

What to expect

The flame will go out.



What's happening in there?

Why does the flame go out when the jar is covering it?



The substance that reacts with the candle wax is oxygen. It comes from the air. Putting the jar over the candle keeps oxygen from outside the jar from getting in. The reaction can only use the oxygen that is already in the jar. So, when that oxygen is used up, the reaction can't keep going. Running out of oxygen makes the flame go out.

What else could you try?

Another chemical reaction you probably know is the reaction between vinegar and baking soda. This reaction produces a gas called carbon dioxide. This gas can be used to put out a flame. Let's try it!

What you'll need

- Goggles
- Tealight candle
- Glass jar
- Baking soda
- Vinegar
- Plastic cup
- Measuring spoons

Here's what to do

1. Ask the adult you are working with to light the tealight candle.
2. Place about two teaspoons of baking soda in the jar.



3. Next pour about two tablespoons of vinegar in a cup.
4. When you are ready, carefully pour all the vinegar from the cup into the jar with the baking soda.



5. Hold your hand gently over the top to keep most of the carbon dioxide in the jar.



6. Ask the adult you are working with to carefully pour the carbon dioxide gas onto the flame. Be sure no liquid comes out – just the gas.



What to expect

The flame should go out.

What's happening in there?

Why does the flame go out when carbon dioxide is poured on it?

Carbon dioxide molecules are heavier than air. Because of this, they push the oxygen and other molecules in the air out of the way as they sink down over the flame and candle. When oxygen is pushed away from the wick, it can't react with the wax anymore. This makes the flame go out.



Next time you blow out a candle, think about what your breath is actually doing. Why do you think blowing on a candle flame makes it go out?