

# Pencil Experiment

How do they change?!

**Step 1:** Make an observation about the pencils.

**Step 2:** Make a hypothesis about what could be causing this change.

- *Ex. Variables: Pressure, Oils, Heat, and Light*

**Step 3:** Design some experiments!

- *Think about different ways you test each variable.*
- *Think about only testing ONE variable at a time!*



**Step 4:** Test the hypothesis!

**Step 5:** Think about your observations.

- *What happened? Did only certain variables cause changes? What kind of changes occurred?*



## Pencil Experiment

Everyone grab a pencil. Is anything happening? What observations can you make? Is the same thing happening to everyone's pencil?

What could be causing this phenomenon? Let's make a list of hypotheses.

- Pressure
- Oils on your hand
- Heat
- Light

Now that we have these hypotheses, what are we going to do next? Test them!

Should you have one pencil to test with or multiple pencils? Why? Do all the colors react the same way? How should we check this? How many pencils of each color should you Test?

How can we test Pressure? How many variables are you controlling? If you squeeze the pencil with your hand, are you *only* testing Pressure?

Now, how can we test if the Oils on your hands are affecting the pencil? We could use gloves, because they would stop our hands from touching the pencil directly. But should we put the gloves on and hold the pencils? Does that method only Test oils on your hand?

Is it the light that is making the pencils change color? How can you tell?

How can we test Heat? What materials do we have that can change Temperature at a flick of the switch? Water can be turned on to Hot or Cold and we can put it in cups. What happens when you put the Pencil in Hot water? What about Cold water?

Now that we know heat changes the color of the pencil, can we test at what temperature causes the change? What else do we need? Now that we have the thermometer, should we put the pencils directly into the hot or cold water cups? Or should we grab another cup and slowly add hot and cold water?

**Background info:** The pencils change color based on heat. The goal today is to have the participants show this through testing and thinking. We only have certain materials so you will have to use your imagination as well as encourage them to do the same.

**Pressure:** This can easily be tested if you push pencils together or if partners push them together, but make sure they don't slide or rub them together. Because what else is that testing?

**Hand oils:** Initially kids will put the gloves on and grab the pencil. But why is this incorrect? What other variables are involved? What else do your hands give off?

**Light:** If it is light or lack of light causing the pencils the change, they should be different colors in light and dark environment. But wait, this is true. When you clasp your hand around the pencil, it is light under your fingers and dark where you didn't grab it. What else can we do to Test Light/Dark.

**Heat: Water is easy to get and manipulate as far as temperature goes. Don't tell the participants to use water right away. Ask them or hint to them that water is the best resource. Really try to let them figure it out. Why is water the best resource for this experiment?**