

LESSON 10:

SECRET COLOR MESSAGES

SUPPLIES

MAIN BIN

- Cups (half filled with water) (10)
- Paper towels
- Tablecloth (2)
- White Crayons (20)
- Watercolor paints (10)

FOLDER

- White Card Stock (20)

OBJECTIVES

- Explain how wax resists water-based paint and why the crayon marks stay visible.
- Use a scientific process (hypothesis, test, observe) to explore invisible ink.

INTRODUCTION



3-5 min

Have you ever made a secret message before? How did you do it? What do you think a secret message is? Why do people make secret messages? What colors do you like to use when you draw or write? How do you think crayons and watercolors are different? What can you do with them?

HOOK



3-5 min

Ask students:

- Have you ever wanted to send a secret message that only you and someone else could read?
- What do you think would happen if we drew with something you can't see—and then used paint to try to find it?



TIP

Students can share one cup of water and one watercolor paint between 2-3 of them for easier clean up and less mess!



COLOR FACTOR

The white crayon is made of wax, which is hydrophobic—it repels water. When you color on white paper with a white crayon, you can't see it because it blends in. But when you paint over it with watercolors (which are water-based), the paint doesn't stick to the wax, so the crayon marks "pop out" and become visible.

This process demonstrates resistance, absorption, and material properties—basic but powerful scientific concepts that are visually exciting and hands-on.



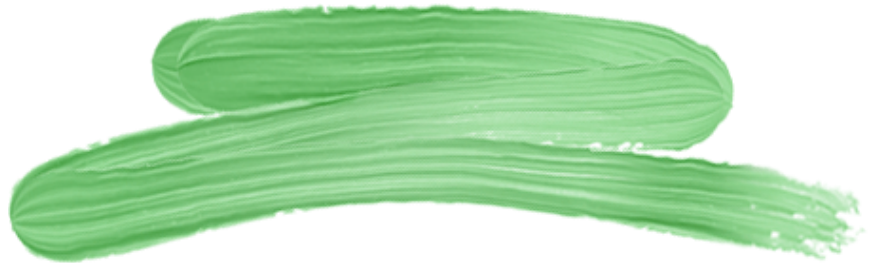
DISCUSSION



3-5 min

Using their ideas from the hook, have students predict:

- I think if I paint over my paper after drawing with the white crayon, then...
- What do you know about crayons and paint—are they made of the same stuff?

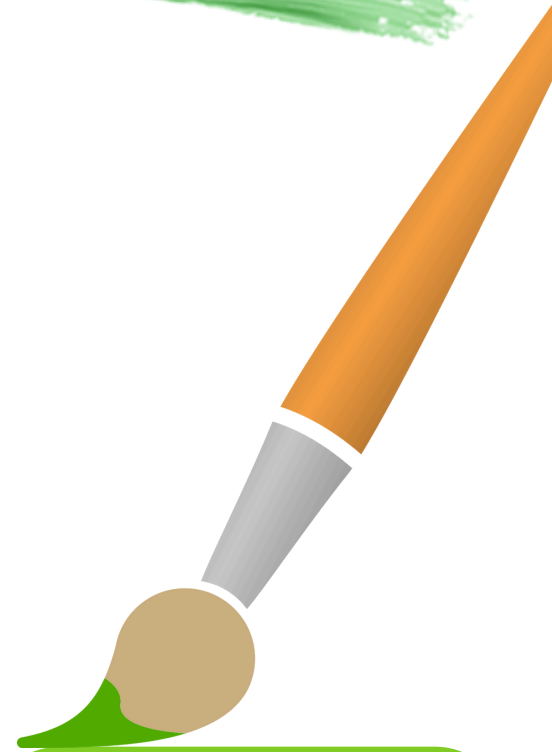


EXPERIMENT



20-25 min

1. Give each student a white crayon and one sheet of white paper. Let them write a message or draw something (encourage big, bold shapes). **NOTE: make sure to use tablecloths to protect tables.**
2. After they're done drawing, give them watercolor paint, a brush, and a water cup. Instruct them to gently brush over their paper and watch the secret message appear.
3. Ask Students:
 - "What did you notice?"
 - "Why do you think the crayon marks show up now?"
 - "What happened when the paint hit the wax?"
4. Let them try again on a second sheet, either to improve or try something new.



MOVEMENT BREAK

Dance Party

Put on some lively, child friendly music and let the kids have a spontaneous dance party. Encourage them to dance freely around the room, using movements inspired by scientific actions like mixing chemicals, peering into microscopes, launching rockets, or acting out animal movements.

TIP

If students' crayon drawings aren't showing up while painting, check how they're using their brushes. They might not be using enough water! Remind them to wet their brush well before dipping into the paint. The more watery the paint, the better their crayon designs will show through—like magic!

OBSERVE & EXPLAIN 5 min

Scientists always watch closely during experiments. Let's use our science eyes and describe what we see, notice, and wonder

- What parts stayed white or bright?
- How did the message appear—slowly, all at once, or in pieces?
- Did the paint go over the crayon or slide off it?

EXTENSION

If there is extra time and materials, the class can repeat the experiment with more or less of the following variables:

- Create a secret code alphabet and have students write messages to decode.
- Make a greeting card or invitation with a hidden message inside.
- Turn it into a mini comic or illustrated story where the hidden image reveals part of the plot.

White crayons are made from wax, which is a type of solid that water cannot mix with. This is because wax is hydrophobic, meaning it repels water. When you draw with a white crayon on white paper, it's hard to see because both are the same color. That's why the message looks "invisible" at first.

In this experiment, we used watercolor paint to reveal the hidden message. Watercolor paint is made with water, and when you brush it over the paper, the paint soaks into the paper—except where the wax crayon is. The wax blocks the paint, so those areas stay white, while the rest of the paper gets covered in color.

This is a science concept called resistance. The wax resists the watercolor because they are made of different materials that don't mix. That's why the message or drawing shows up—it never disappeared, it was just hiding in plain sight!

Even though it looked like magic, it was actually science. You used your knowledge of materials—wax and water—to create a secret message, just like a scientist or spy!

CLEAN UP & DISMISSAL

Students must then clean their workspace. Make sure to leave the classroom the way you found it.

- Collect all brushes and cups of water and place them in the sink for cleaning.
- Have students bring up their finished artwork and lay it flat to dry.
- Give each student a paper towel to wipe down their workstations.

