



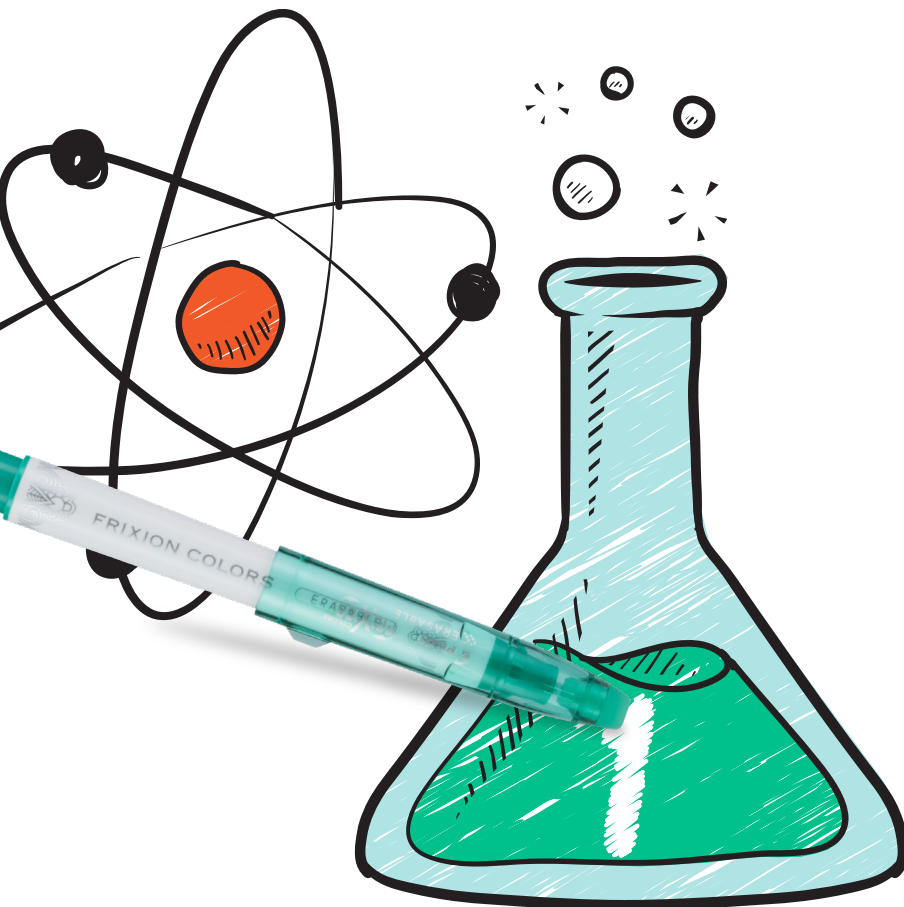
Bringing science to life with the incredible, ERASABLE FriXion pens, markers and highlighters.

Grades K-2

# SEE THE CHANGE PART 1: BREAKING BONDS



Students will learn about breaking bonds by making FriXion ink disappear on different surfaces.



## LEARNING OBJECTIVES

After this activity, students should be able to:

- Explain why and how the thermo-sensitive ink in FriXion pens can erase
- Identify the difference between a thermo-sensitive FriXion pen and a 'regular', non-erasable pen

Developed by





## MATERIALS

- FriXion Colors or FriXion Fineline markers
- Scotch tape
- Non-erasable pen, such as G2
- Paper
- Hair dryer or other heat source

## INTRODUCTION

Did you know that FriXion erasable pens are not just any ordinary, everyday type of pen? In fact, they are almost magic! Well, maybe not magic, but they are super scientific pens. FriXion pens work unlike any other writing instruments.

By design, FriXion erasable pens, markers and highlighters incorporate science, technology, and engineering. The unique, heat-sensitive ink uses covalent bonds to help the ink to:

- **Write smoothly** in many different colors
- **Be ‘erased’ completely** and become invisible when it’s rubbed with the eraser or gets hotter than 140°F (65°C)
- **Reappear** when the ink gets colder than 14°F (-20°C)

When you rub the heat-sensitive ink with the hard rubber eraser, heat created by friction causes the compounds in the ink to activate and make the ink clear.

Today we will try some experiments of our own.

## PROCEDURE

### Before the Activity

- Make sure you have enough FriXion pens for students to complete the activity
- Gather the rest of the materials

### With the Students

1. With the class, talk through the Introduction section.
2. Begin by demonstrating how a FriXion pen works. Write something on a piece of paper, then erase it.
3. Next, write something with a ‘regular’ non-erasable pen. Show how the pen does not have an eraser, and how a pencil eraser would not erase it either. Another example would be to say, “What if I misspelled my name or a word? How would I correct it, etc.? I could easily fix it with a FriXion pen, etc.”
4. Now explain to students that not only can FriXion pens be used for erasing, but they can also be used for creating copies. For example, if they write their name on a piece of paper using a FriXion pen and then place a piece of Scotch tape on top, they can then use their finger to rub vigorously over the tape to create a copy or transfer of their name.



5. Begin by writing out a word, then place the Scotch tape over the word. Rub vigorously.
6. Gently remove the tape and place it on a clean spot on the paper, then rub again.
7. Ask what the students notice when the tape is removed?
8. You can repeat the process with a 'regular' pen and compare.
9. Try again and erase the copied version of the FriXion. What happens? Try using various heat sources, like the hair dryer. What happens?
10. Discuss observations with the class. Ask students to guess how erasing is achieved (Answer: expose ink to hot temperatures above 140°F)

## DISCUSSION QUESTIONS

- What attributes of FriXion ink make it erasable?
- What does this tell us about FriXion ink versus non-erasable ink?
- How could this be helpful?