

**Adventures in Science  
Level 3 Student  
Sample Lesson**

## Chemical Change Activity 1

### Rust Anyone?

Rust on metals is a chemical change. Have you ever seen a rusty nail? Why does the nail rust?

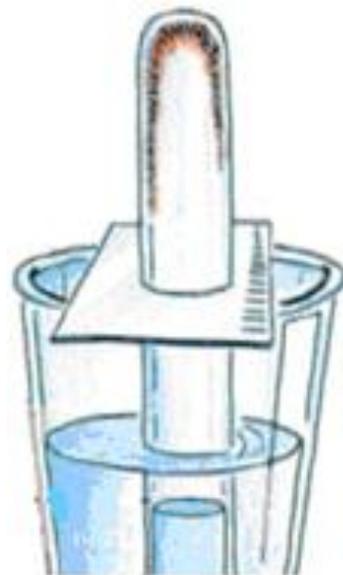


Most nails are made from iron. Iron **reacts** with the oxygen gas in the air to produce a chemical change. Can we prove oxygen gas is in the air around us? Can we demonstrate a chemical change using the oxygen gas in the air? **Investigate!**

### Student Instructions:

1. Fill the beaker with 150ml of water.
2. Cut a hole out of the center of the cardboard for the test tube, being careful not to get it too large.
3. Wet the wall of a test tube with a small amount of water. Sprinkle a small amount of the iron filings in the tube.

4. Turn the test tube upside down and push through the cardboard so the tube will stay in place without sliding into the beaker.
5. Immerse the tube in the beaker. Record the water level in the test tube by marking a spot on the beaker.
6. Leave the test tube for three hours.
7. Now observe the water level in the test tube. Is it the same? No! The water level has risen. Why?



Oxygen is a gas and **reacts** to the iron filings. This chemical reaction formed iron oxide or rust.

The oxygen gas in the test tube **was used up** as it reacted to the iron filings. This allowed space in the test tube so more water entered the tube raising the water level.

## Chemical Change Activity 2

### Is It Getting Warm In Here?

Heat can cause chemical change. But can two materials be mixed together to make heat? Would making heat be a chemical change? **Investigate! Experiment before going further.**

<b>Student Materials:</b>
---------------------------

- **STIR ROD**

1. What was the original temperature on the thermometer? \_\_\_\_\_
2. After the yeast was added, what was the temperature? \_\_\_\_\_

As the mixtures in the beakers begin to bubble, what does the reaction indicate, a physical or chemical change? A chemical change because the mixture is fizzing! Bubbles are one of the indicators of a chemical change.

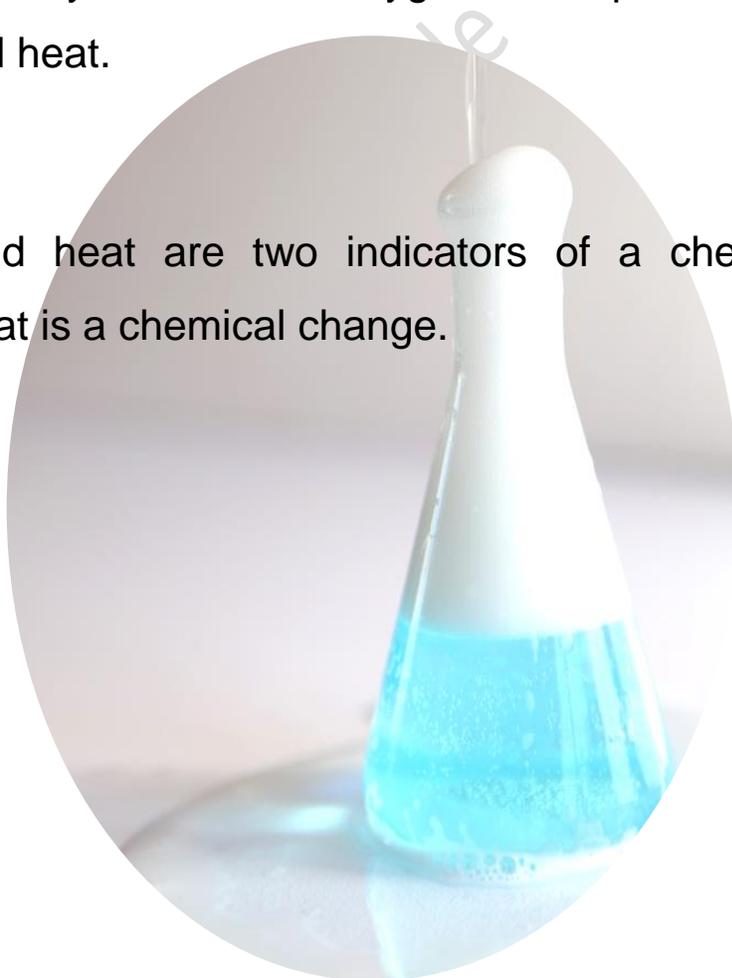


Watch the thermometer. What is happening? The temperature is rising. Feel the outside of the beaker. It is warm. Why?

Hydrogen peroxide is water with extra oxygen. The yeast contains an **enzyme** called **catalase** that released the oxygen in the peroxide.

An enzyme is a protein molecule. It is the reaction between the catalase in the yeast and the oxygen in the peroxide that created bubbles and heat.

Bubbles and heat are two indicators of a chemical change. Creating heat is a chemical change.



## **Adventures in Science Level 3 Student Sample Lesson**

### **Chemical Change Activity 1 Rust Anyone? Student Workbook Page 110**

Rust on metals is a chemical change. Have you ever seen a rusty nail? Why does the nail rust?



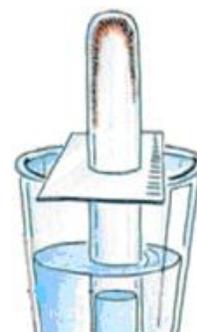
Most nails are made from iron. Iron **reacts** with the oxygen gas in the air to produce a chemical change. Can we prove oxygen gas is in the air around us? Can we demonstrate a chemical change using the oxygen gas in the air? **Investigate!**

#### **Teacher Materials:**

- **BEAKER GLASS 250ml**
- **TEST TUBE GLASS 150**
- **IRON FILINGS**
- **CARDBOARD**

#### **Student Instructions:**

1. Fill the beaker with 150ml of water.
2. Cut a hole out of the center of the cardboard for the test tube being careful not to get too large.
3. Wet the wall of a test tube with a small amount of water. Sprinkle a small amount of the iron filings in the tube.
4. Turn the test tube upside down and push through the cardboard so the tube will stay in place without sliding into the beaker.
5. Immerse the tube in the beaker. Record the water level in the test tube by marking a spot on the beaker.
6. Leave the test tube for three hours.
7. Now observe the water level in the test tube. Is it the same? No! The water level has risen. Why?



Oxygen is a gas and **reacts** to the iron filings. This chemical reaction formed iron oxide or rust.

The oxygen gas in the test tube **was used up** as it reacted to the iron filings. This allowed space in the test tube so more water entered the tube raising the water level.

## Chemical Change Activity 2

### Is It Getting Warm In Here?

#### Student Workbook Page 112

Heat can cause chemical change. But can two materials be mixed together to make heat? Would making heat be a chemical change? **Investigate! Experiment before going further.**

#### Teacher Materials:

- **BEAKER GLASS 250ml**
- **THERMOMETER PARTIAL IMMERSION**
- **60ml HYDROGEN PEROXIDE**
- **3G OR 1 TEASPOON OF YEAST**

#### Student Materials:

- **STIR ROD**

**TEACHER NOTE: PEROXIDE CAN BURN SKIN. BE CAREFUL TO KEEP AWAY FROM STUDENTS.**

1. **Pour the peroxide into the beaker, insert the thermometer, and allow temperature to stabilize. Log temperature allowing thermometer to remain in beaker.**
2. **Pour in the yeast and stir. Have students guess if this will be a physical change or chemical change.**

1. What was the original temperature on the thermometer? \_\_\_\_\_
2. After the yeast was added, what was the temperature? \_\_\_\_\_

As the mixtures in the beakers begin to bubble, what does the reaction indicate, a physical or chemical change? A chemical change because the mixture is fizzing! Bubbles are one of the indicators of a chemical change.



Watch the thermometer. What is happening? The temperature is rising. Feel the outside of the beaker. It is warm. Why?

Hydrogen peroxide is water with extra oxygen. The yeast contains an **enzyme** called **catalase** that released the oxygen in the peroxide.

An enzyme is a protein molecule. It is the reaction between the catalase in the yeast and the oxygen in the peroxide that created bubbles and heat.

Bubbles and heat are two indicators of a chemical change. Creating heat is a chemical change.

