

4½ minutes

**Whole-Class Seatwork:** Class reviews what they did in their previous lesson

The teacher begins class by reviewing what they discussed yesterday. He diagrams on the chalkboard information about atoms, molecules, and chemical bonds. They also review groups of elements in the Periodic Table: metals and non-metals.



1½ minutes

**Whole-Class Seatwork:** Class develops new content information about metals and non-metals

The teacher announces to class, "What we need to do now, and this is what this lesson's about. I want you to be able to find ways of distinguishing between metals and non-metals." He introduces the fact that elements have physical properties and chemical properties. They will be looking at the chemical properties of two metals (magnesium and iron) and two non-metals (phosphorus and sulfur) by burning them and dissolving the products in water.



1½ minutes

**Science Organization:** Students prepare for their practical activities

The teacher instructs student groups to get their tray of materials. They prepare the materials and equipment.



1½ minutes

**Whole-Class Practical Work:** Teacher demonstrates procedures for today's activities

The teacher shows the class the different types of metals they will be using (i.e., magnesium and iron). He instructs them how to burn the pieces, highlighting safety issues. He also demonstrates how much water to pour into their beakers and tells them to use drops of universal indicator.



3½ minutes

**Independent Practical Work:** Students work in groups of three to burn magnesium

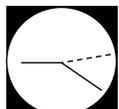
Students start their practical work by putting a few drops of universal indicator in their beakers of water. They then set their burners to the heating flame and burn the magnesium. The product is placed in the beaker and the solution turns blue, indicating it is an alkaline.



1½ minutes

**Whole-Class Seatwork:** Class talks about results from the burned magnesium activity

The teacher talks about the results from burning magnesium. He says that magnesium combined with oxygen in the air to form magnesium oxide. He then tells the class that they will be burning two non-metals (i.e., phosphorus and sulfur) in a fume cupboard. Students gather around in preparation for the demonstration.



8 minutes

**Whole-Class Practical Work:** Teacher burns phosphorus and sulfur

The teacher gathers students around the fume cupboard. He burns phosphorus first, then sulfur. While burning both non-metals the teacher prompts students for their observations. The universal indicator solution turns red in both cases, indicating acidic products. The class concludes that other non-metals will burn in oxygen and dissolve to form an acid.



2½ minutes

**Independent Practical Work:** Students work in groups of three to burn iron

Students continue the lesson by burning iron, which results in a black powder.



7½ minutes

**Whole-Class Seatwork:** Class talks about metal oxides using results from their practical work

The teacher asks the class for their observations of the burned iron in the universal indicator solution. Students report that the color stays green. There is no change in color because the resulting product, iron oxide, does not dissolve in water. The teacher announces that those metal oxides that do not dissolve in water are called bases, and those that do dissolve in water are called alkalis. He summarizes the lesson by writing on the chalkboard, highlighting what happens to metals and non-metals when they are burned with oxygen.



1 minute

**Independent Seatwork:** Students write in their notebooks

The students are specifically instructed to write two things in their science notebooks: (1) what they learned today and (2) the difference between metals and non-metals.