



Lesson: The Composition of Instruments

STANDARDS: California

1. Elements and their combinations account for all the varied types of matter in the world. As a basis for understanding this concept:
 - a. *Students know* that during chemical reactions the atoms in the reactants rearrange to form products with different properties.
 - b. *Students know* all matter is made of atoms, which may combine to form molecules.
 - c. *Students know* metals have properties in common, such as high electrical and thermal conductivity. Some metals, such as aluminum (Al), iron (Fe), nickel (Ni), copper (Cu), silver (Ag), and gold (Au), are pure elements; others, such as steel and brass, are composed of a combination of elemental metals.
 - d. *Students know* that each element is made of one kind of atom and that the elements are organized in the periodic table by their chemical properties.
 - e. *Students know* living organisms and most materials are composed of just a few elements.

6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
 - a. Classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria.
 - b. Develop a testable question.
 - c. Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.

 - h. Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.

Science: Creating Instruments

Motivation: Ask students to make a list of things that make noise. Tell them this includes instruments, like pianos and violins, and household objects, like pots and pans. After generating the list, ask them to list the materials used to make these instruments. Encourage them to think about materials you have studied in class, particularly metals and organic substances.



Group Activity: Show students *Early Trumpet* and *How a Trumpet is Made* under *The Trumpet* in the e-presentation *Jazz* by Wynton Marsalis. While they watch, ask them to write down all the kinds of instruments Marsalis names. These include the [conch](#), animal horns, Egyptian trumpets, Roman trumpets, and [Baroque](#) trumpets. Go through the list as a class and determine what these instruments are made of. What is an animal horn made of? What is a shell made of? Ask students how they think the material something is made from affects the sound that thing produces. Try to get them to make connections between physical properties of materials and the sounds they make.

Independent Activity: Have students choose instruments they would like to research. Encourage them to choose instruments they play or people they know play. Make sure some students do parts of living organisms, like conch shells and animal shells, as well. Students should write reports about these instruments and, ideally, present these reports to the class. Students should include the following information their research:

- 1) What METALS make up the instruments? What are their properties?
- 2) What NONMETALS make up the instruments? What are their properties?
- 3) What ELEMENTS compose these materials? What are their properties?
- 4) Are these materials elements, compounds, or mixtures?

Have students analyze the information they have found as a class. Encourage them to observe which materials are commonly used and which ones are not. Ask them to hypothesize ways in which a material's properties affect the sounds it is capable of making. Do certain instruments that sound similar have similar physical and chemical properties? What are the instruments' physical properties? As a supplemental assignment, have students investigate whether their hypotheses are true or not.