



Lesson: Instrument Experimentation

5th Grade

STANDARDS: California

2. Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials. As a basis for understanding this concept:
 - a. Students know how blood circulates through the heart chambers, lungs, and body and how carbon dioxide (CO₂) and oxygen (O₂) are exchanged in the lungs and tissues.
 - b. Students know plant and animal cells break down sugar to obtain energy, a process resulting in carbon dioxide (CO₂) and water (respiration).

5.0 Connecting and Applying What Is Learned in the Visual Arts to Other Art Forms and Subject Areas and to Careers

- 5.1 Students apply what they learn in the visual arts across subject areas. They develop competencies and creative skills in [problem solving](#), communication, and management of time and resources that contribute to lifelong learning and career skills. They also learn about careers in and related to the visual arts.
- 5.2 Identify and [design icons, logos](#), and other graphic devices as symbols for ideas and information.

Science: Experimenting with Sound

Motivation: Ask students what they know about pianos. Is it a string instrument or a percussion instrument? Does anyone play the piano? What does the inside of a piano look like? Have students draw how they think sound is produced in a piano.

Group Activity: Watch *The Piano* in *At the Piano with Alan Gampel*. Tell students to pay attention to how piano keys work. When the clip is over, ask them what they observed. Ask them what affects the sound a piano produces. Remind them that Gampel talked about the type of wood the piano is made of and the dampers. Point out that strings on the piano are of different lengths and produce different sounds. Ask them to hypothesize how changing different elements of the mechanism of a piano might change the sound.

Independent Activity: Have students get into groups based on what hypotheses they would like to test out making stringed instruments. It may be useful to create options before class. Some easy variables to manipulate include length of string, type of material string is made of, the type of material backboard is made of, and shape of material. Have students create each design instruments testing ONE of these variables. Remind them



that they have to agree on which variables they are controlling and which ones they are testing. Allow students to experiment as to how they will make their instruments. They can do it in class or at home. To integrate math standards, use measurement tools to design shapes, and have students draw their three-dimensional shapes as two-dimensional objects in their lab notebooks. Have students bring instruments to class and make observations about the sounds. What makes sounds higher or lower? What makes sounds quieter or louder? What other words can you use to describe how sounds change? Have students present their findings to the class. Ask students to compose songs using groups of instruments and present these songs with the findings. Encourage students to write songs demonstrating the different sound qualities their instruments are capable of producing.