Dedicated to Delivery

Nasco SciQuest®

• Observe • Question • Think • Measure • Predict

Sound Multi-Group Kit

by Carl Pfeiffer

TABLE OF CONTENTS

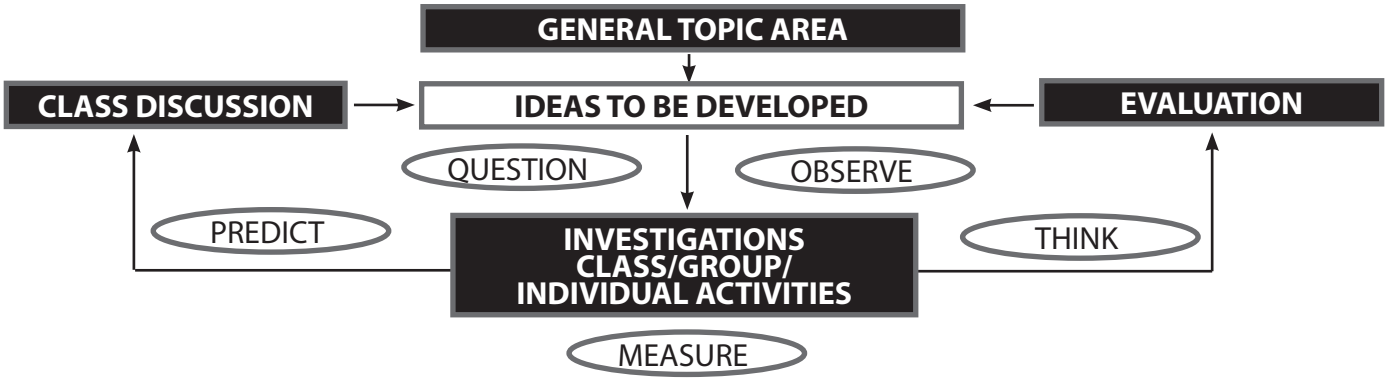
PAGE

Your SciQuest® Multi-Group Kit has been especially designed to enable you to incorporate a wide range of unique and interesting "hands-on" investigative activities into your existing science program.

The SciQuest® topic areas are designed to make it easy for you to match the specific topics and ideas to be developed, through the investigations the kit provides, to the topics and ideas associated with the scope and sequence which make up your current science program.

When used in conjunction with your "in-place" curriculum, your SciQuest® Kit and Teacher's Guide will help you to add a meaningful and exciting dimension to the teaching/learning opportunities you provide for your students.

MODEL FOR IMPLEMENTATION



Each specific activity level topic is described in terms of a set of "Ideas to Be Developed." The teaching strategy intended is that these "Ideas to Be Developed" become the focal point of the investigations, activities, class discussions, and the evaluation.

Your Teacher's Guide includes blackline masters for producing copies of the Data and Evaluation Sheets for your students. For some activities and investigations, you may want to produce copies of the Teacher's Guide for your students as well.

As you become more familiar with your SciQuest® Kit, you will probably find that there are certain activities which you will want to have your students do on an individual basis or in small groups. The additional equipment and/or materials that are required to do this can be ordered from Nasco as separate items. It is in situations where you have your students working individually or in small groups that you will most likely want to produce copies of your Teacher's Guide for your students to use.

Remember, science is a "quest" to develop an understanding about the world around us. It is a "quest" which provides unique opportunities to develop learning skills in observation, questioning, measuring, predicting, and thinking. Best of all, it is fun for you and your students!

We hope that you and your students enjoy using these materials.

Sincerely yours,

Carl Pfeiffer

Carl Pfeiffer

Prior to conducting the **Investigations** described in your **Teacher's Guide,** it would be convenient to divide a set of materials described below. Each group should have the following:

- Meterstick
- Marbles, set of 12 (1" dia.)
- Stopwatch (digital)
- Tuning Fork
- Slinky®
- "Action" Board, 3-ft.
- Insert, Cardboard Tube
- Resonating Tube, 18"
- Resonating Tube, 9"
- Rubber Stopper (solid), size 8
- * Piece of Paper, 8½" x 11"
- * Scissors

*** Not included in kit**

Note: Masking tape is needed for several different activities, but only one roll is included in the kit.

Measuring Wavelength with Open & Closed Resonators

The diameter of the cardboard tube insert, used to adjust the length of the PVC pipe, should be such that it slides into the pipe with slight resistance. If the fit is too loose, wrap a bit of masking tape around one end of the cardboard insert so as to achieve a slight friction fit.

Each SciQuest® kit is custom designed and developed to allow you to easily incorporate Educational Standards. The Sound Multi-Group Kit **SB17861** satisfies the following:

1. Waves: Light and Sound

Students who demonstrate understanding can:

1-PS4-1. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations • Plan and conduct investigations collaboratively to produce evidence to answer a question. (1-PS4-1), (1-PS4-3) ***Connections to Nature of Science*** **Scientific Investigations Use a Variety of Methods** • Scientific investigations begin with a question. (1-PS4-1)	**PS4.A: Wave Properties** • Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1)	**Cause and Effect** • Simple tests can be designed to gather evidence to support or refute student ideas about causes. (1-PS4-1), (1-PS4-2), (1-PS4-3) ***Connections to Engineering, Technology, and Applications of Science*** **Influence of Engineering, Technology, and Science on Society and the Natural World** • People depend on various technologies in their lives; human life would be very different without technology. (1-PS4-4)

Common Core State Standards Connections:

ELA/Literacy

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-PS4-1), (1-PS-2), (1-PS4-3)

SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. *(1-PS-1)*, *(1-PS-2)*, *(1-PS4-3)*

4. Waves

Students who demonstrate understanding can:

4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models • Develop a model using an analogy, example, or abstract representation to describe a scientific principle. (4-PS4-1) ***Connections to Nature of Science*** **Scientific Knowledge is Based on Empirical Evidence** • Science findings are based on recognizing patterns. (4-PS1-1)	**PS4.A: Wave Properties** • Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). (4-PS4-1)	**Patterns** • Similarities and differences in patterns can be used to sort, classify, and analyze simple rates of change for natural phenomena. (4-PS4-1)

Common Core State Standards Connections:

ELA/Literacy

SL.4.5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes. *(4-PS4-1)*

Mathematics

MP.4 Model with mathematics. *(4-PS4-1)*

MS. Waves and Electromagnetic Radiation

Students who demonstrate understanding can:

MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.

MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Using Mathematics and Computational Thinking • Use mathematical representations to describe and/or support scientific conclusions and design solutions. (MS-PS4-1) ***Connections to Nature of Science*** **Scientific Knowledge is Based on Empirical Evidence** • Science knowledge is based upon logical and conceptual connections between evidence and explanations. (MS-PS4-1)	**PS4.A: Wave Properties** • A simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude. (MS-PS4-1) • A sound wave needs a medium through which it is transmitted. (MS-PS4-2)	**Patterns** • Graphs and charts can be used to identify patterns in data. (MS-PS4-1)

Common Core State Standards Connections:

ELA/Literacy

SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. *(MS-PS4-1), (MS-PS4-2)*

Mathematics

MP.2 Reason abstractly and quantitatively. (MS-PS4-1)
MP.4 Model with mathematics. (MS-PS4-1)
6.RP.A.1 Understand the concept of ratio and use ratio language to describe a ratio relationship between two quantities. (MS-PS4-1)
6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems. (MS-PS4-1)
7.RP.A.2 Recognize and represent proportional relationships between quantities. (MS-PS4-1)