INTRODUCTION

Welcome to these DVDs of science demonstrations for the elementary school! They have been produced to assist educators with learning how to do simple science demonstrations and student activities in the elementary school science curriculum. The step-by-step instructions, use of everyday materials, and brief explanations of the scientific principles illustrated by each activity will enable educators with limited background in science to introduce a variety of activities into their science teaching.

This series is not geared to any particular curriculum; rather, the demonstrations are based on many of the common topics covered in the physical sciences curriculum in the elementary school and can be used at different grade levels, with grade-appropriate explanations. The explanations accompanying each activity will provide the viewer with a basic understanding of the scientific principles involved.

Science demonstrations are part of a long heritage of teaching science. Demonstrations using simple, readily available apparatus enrich the teaching of science and help the student to understand science better. These DVDs will provide the educator with many ideas and explanations (both visual and oral) for including more science demonstrations and student activities in the teaching of science. From personal experience, students learn much more from actual demonstrations done by their teacher than from watching demonstrations on video. Thus these DVDs are not meant for use in the classroom but rather for showing educators how to do the activities themselves. Aside from some basic science equipment (described in the Introduction (1.5)), most of the materials required for these demonstrations can be obtained locally.

One of the goals of science teaching is to teach students to observe and to think critically about what they see and to be able to explain why matter behaves the way it does in a given situation. Thus, when doing a demonstration, be sure to explain what is being done, but do not tell students what is going to happen. Many demonstrations will have an unexpected result; these are often referred to as 'discrepant events' and can lead to some very engaging and interesting discussions. Other demonstrations simply help to illustrate or reinforce a scientific principle or application that will help students remember and understand the concept better. Some demonstrations can be done just for the fun of it! These can also generate an interest in the science behind the demonstration. In whatever way a demonstration is used, be sure to try it first, before presenting it in class. Familiarity with the demonstration allows changes to be made, and increases confidence.

As you become more comfortable doing science demonstrations with your class, be sure to adapt them to suit your teaching style. Try new ones to enrich your teaching. Share the ones that worked well for you with fellow teachers. Above all, show your students that you too are learning with them and that you love your teaching. Be prepared to try "what if we do this?" type of experiments to show that we can learn by *doing* science.

How to use this resource

This series of approximately 300 demonstrations includes about 14 hours of video on 4 DVDs. Each DVD is labelled with the topics covered on that DVD; using the Menu page on the DVD, you can access each demonstration directly, or view all the demonstrations for a given topic in sequence. The printed Table of Contents lists the 18 different topics covered; under each topic are the titles of the demonstrations for that topic. The Introduction has a section describing basic lab equipment needed along with common chemicals (and their local sources) used in many of the activities; it also includes a section on working with glass tubing (cutting, polishing, bending, drawing out) for those brave enough to shape their own

glass tubing. Instructions are also given with the actual demonstrations for making special apparatus using semi-rigid plastic tubing instead of glass. Many of the demonstrations can be used with several topics (e.g. density of a liquid or boiling point of water could be used as examples of Properties of Matter). A number of student activities can also be used to incorporate math skills (such as use of formulas, calculations, graphing) that the students are learning, especially at the senior elementary level. This is a great way to integrate math and science!

The written material (also available on DVD 4 as PDF files) includes a more detailed description of each demonstration in chart form, including its purpose, list of special materials needed, discussion questions, whether the activity would be suitable for a student activity and other suggestions. References to other demonstrations that could be used for a given topic are also given. Be sure to read the section on "Safety Guidelines" (p. 11); you may even want to post these in your classroom as a reminder to always do science safely!

Index (or how to search for a given word)

The PDF file (PM-2) which contains a brief description of each demonstration may be used to search for specific words or phrases and can help to find a demonstration using a specific piece of apparatus or a certain term (e.g. balloon, sublimation, boiling point). Here's how:

1. Load the PDF file PM-2 (Summary of all the Demonstrations) located on DVD 4 into your computer using Acrobat Reader.
2. To change pages that are in Landscape mode (sideways) to the horizontal position, go to **View** in the menu bar and click on **Clockwise** near the bottom of the selection.
3. To search for a specific word, go to **Edit** in the menu bar and click on **Find**. Type in a word that you are looking for and press **Find**. Acrobat Reader will identify where the given word is found in the document and gives the option to search for the next occurrence of that word.

Canadian Suppliers of Science Equipment for Elementary Schools:

General Lab Suppliers:

Prolab Scientific
255 Albert St., Suite 600
Ottawa, ON K1P 5B3
www.prolabscientific.com

Boreal Laboratories Ltd.
399 Vansickle Rd.
St. Catharines, ON L2S 3T4
www.boreal.com

Indigo Instruments Laboratory Equipment
169 Lexington Court, Unit 1
Waterloo, ON N2J 4R9
www.indigo.com

Specialty Suppliers:

S17 Science Supplies and Services
57 Glen Cameron Rd., Unit 6
Thornhill, ON L3T 1P3
www.s17science.com

Efston Science Inc.
3350 Dufferin St.
Toronto, ON M6A 3A4
www.escience.ca

Some of the larger laboratory suppliers (e.g. Fisher Scientific™, Sargent-Welch™, Wards™) also carry supplies for elementary schools, but the range of equipment available from these companies is much greater than what is needed at the elementary level.