

# INTRODUCTION

Children are naturally inquisitive and learn best through hands-on experiences. If the study of science is simply a process of curiosity, then it makes sense that children would be attracted to science concepts and activities. Each learning theme in this book highlights how science can be part of young children's everyday experiences. The lessons present important science concepts in a simple format that is easy for children to understand, yet challenges them to use higher-level thought processes. Even though children may not think about specific science skills while exploring, observing, classifying, and communicating about how things act in certain situations, they are still using those skills to understand the world around them.

Here are some ways to get the most out of this resource book while helping young learners acquire necessary science skills:

- **Encourage children to ask questions.** You can use the questions that appear at the beginning of activity suggestions to engage your budding scientists. And when the activity is finished, find out what other related questions the children may have that can be tested with simple experiments.
- **Remember that science is a method for acquiring knowledge.** While this book includes many suggestions for "free exploration" along with demonstration ideas and structured group activities, do not hesitate to let the children tackle any project you feel they can complete safely. (Resign yourself to allowing the children to make a mess—science can be messy. However, messes can be managed easily by providing paper towels and newspaper for spills when working with water, and by directing children to return equipment to storage tubs when finished.) Allowing children the freedom to explore will strengthen understanding of science concepts.
- **Talk with the children as they work.** Find out what they already know about the topic as well as any misconceptions they may have. As the children investigate, encourage them to explain their observations and think of new questions they would like to answer. By taking an active role and asking guiding questions, you will help children acquire science process skills and learn how to be better communicators. Use related vocabulary words for each theme often. It may seem strange for children to understand such "big" words, but before you know it, they will be using those words independently.
- **Record what is being observed.** Second only to actual hands-on exploration, one of the key parts of science investigation is recording information. My Science Plan on page 7 can be used as a guide when recording what the children are learning. Use it as a tool to teach language and writing, and, of course, make it interactive and visual. Record the main points on chart paper and then fill in the information when everyone gathers to discuss their observations. Attach pertinent pieces of equipment, pictures drawn by the children, and samples of data (items in zippered plastic bags) whenever possible. You may even consider enlarging the outline to poster size for each theme and creating a "big book" as a reminder of what science topics the children have studied.
- **Extend the lessons.** Use letters to families to encourage additional science investigations at home. Several themes in this book include letters that you can photocopy and send home to encourage parents to become involved in what is happening in your classroom.
- **Read aloud science books and other related literature to the children whenever possible.** This will stimulate language acquisition and reinforce what the children have observed during "science play." A few literature selections have been provided for each theme. Check with your school librarian for other recommendations.

Above all, enjoy the activities and experiments in this book. And do not forget to be a little curious yourself—you just never know what you will discover. After all, that is what "doing science" is all about: meaningful learning that is a lot of fun, too!

# ACTIVE SCIENCE

When making science explorations, children need to learn and apply these four important steps:

## STEP 1: QUESTION

What do you want to know? It is important for children to clarify what they want to learn in the form of a question. This is the first step, and a very important one, in thinking like a scientist. Questions such as "What will happen when I drop a ball?" "Why is it dark at night?" or "What happens to seeds that grow?" can be answered with simple tests. To demonstrate, try this experiment:

*Pose the question, "What happens when you poke a water-filled balloon with a pin?"*

## STEP 2: PREDICT

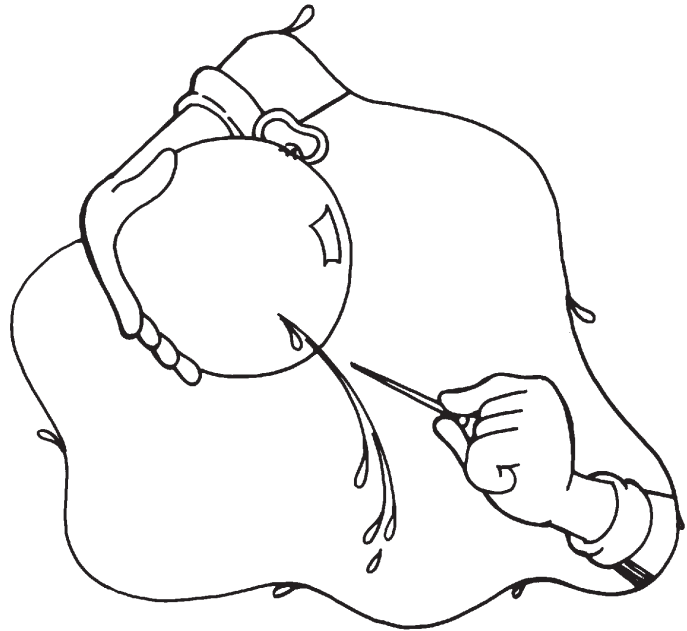
This step of the process is also called making a "hypothesis." When you predict an outcome, you are simply tapping into what you already know in order to make an inference about something you are not sure about. For example, when conducting the balloon experiment, the children are probably very aware that pins can pop balloons. (You may want to demonstrate this outcome on one balloon to see if that is right.) Therefore, they could easily predict the results to this experiment. However, there are always variables that can affect the outcome.

*The children predict what will happen if a water-filled balloon is poked with a pin.*

## STEP 3: TEST

After you have considered what you want to learn and have made a prediction (or guess, if a preschooler) about the outcome, the next step is to test or try out your ideas. Even when you are pretty sure about the results, it is important to test things, just like a good scientist does. Comparing, contrasting, sorting, observing, and classifying are also part of this process.

*Poke a water-filled balloon with a pin.*



## STEP 4: REFLECT

New or confirmed information is gained in this step of the process. By conducting the test, you found out that your prediction was either accurate or incorrect, and you may have to repeat steps 1, 2, and 3 because new questions emerged after conducting the experiment.

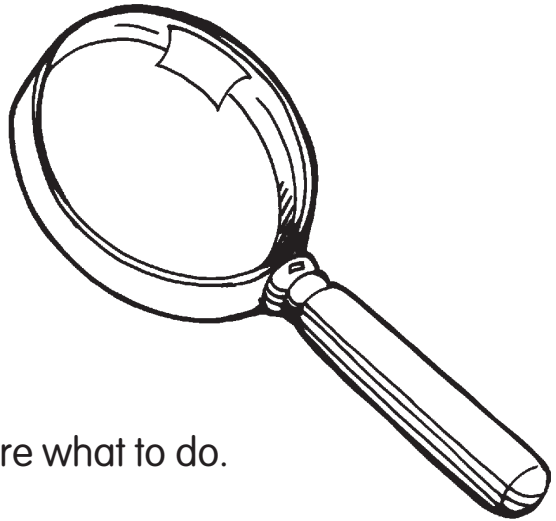
*A water-filled balloon leaks water when poked with a pin.*

By completing My Science Plan on page 7 for an activity, children can become familiar with the process of asking a question, predicting an outcome, testing their ideas, and reflecting on what they have learned.

## Science Safety

Here are some safety tips to follow when doing science activities:

- Always follow your teacher's directions.
- Never smell or taste a project *unless your teacher says it is okay.*
- Always clean up when you are finished.
- Ask a grown-up for help if you are not sure what to do.



Name \_\_\_\_\_

Date \_\_\_\_\_



### My Science Plan

What if . . . ?	I am predicting that . . .
I will test my ideas by . . .	I discovered . . .