Content-Area Literacy Development for Emergent, Early, and Fluent Readers

Reading Essentials®: Discovering & Exploring Science

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Everything starts with standards

In American education today, everything starts with standards. Science educators rely, in part, on The National Science Education Standards (National Academy of Sciences, 1996) to identify skills and content that both teachers and students must master.

National Science Education Standards for Teachers
1. Planning inquiry-based science programs
2. Guiding and facilitating student learning
3. Assessing teaching and student learning
4. Developing environments that enable students to learn science
5. Creating communities of science learners
6. Planning and developing a school science program

National Science Education Standards for Students
1. Science as inquiry
2. Physical science
3. Life science
4. Earth and space science
5. Science and technology

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The *Reading Essentials: Discovering & Exploring Science* program from Perfection Learning is based on the National Science Education Standards for teachers and students. There are 108 student books divided into the five content strands that align with the national standards (chart 2). A sixth strand is math in science. Within each strand, there are six titles on each of the following levels: emergent, early, and fluent.

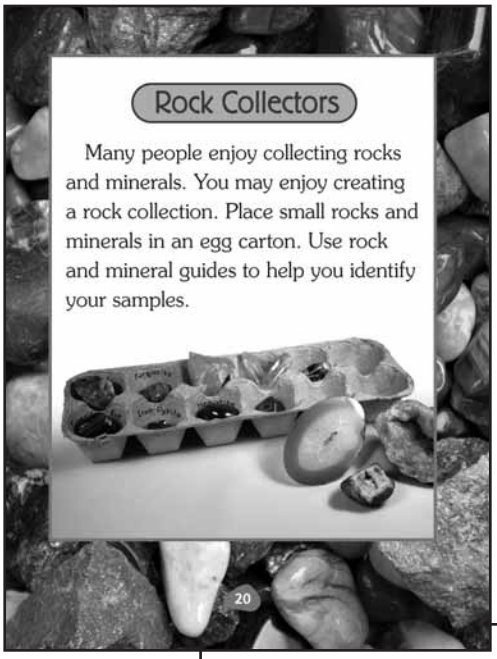
The Teaching Resource for each strand guides the teacher through the six National Science Education instructional standards (chart 1) and has detailed materials for integrating science content with literacy development for emergent, early, and fluent readers.

The *Reading Essentials: Discovering & Exploring Science* Teaching Resources provide excellent suggestions for implementing an inquiry-based approach under the headings "Think Like a Scientist." For instance, *How Much Does it Weigh?* includes suggestions for teachers, such as making lists of average weights of animals, people, and objects in the book and comparing and discussing differences in average weights. These "Think Like a Scientist" sections consistently provide useful suggestions that captivate children's thinking.

Planning inquiry-based science programs

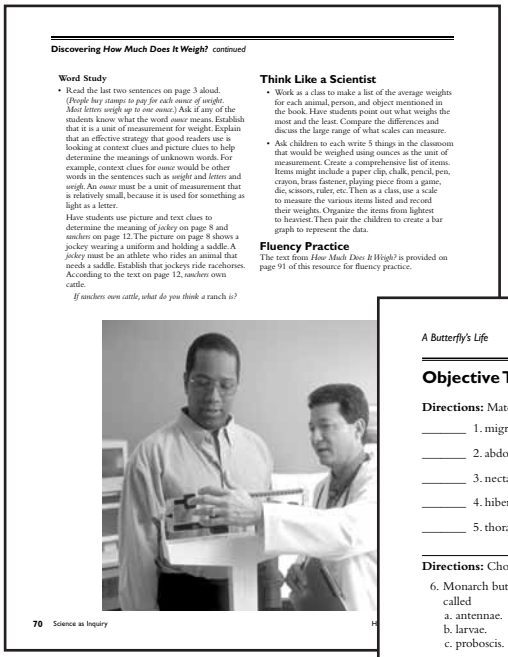
Young children's scientific knowledge and concepts are best developed through the process of inquiry, including; at a basic level, observing, comparing, classifying, measuring, communicating; at an intermediate level, inferring and predicting; and at an advanced level, investigating (hypothesizing and controlling variables) (Charlesworth & Lind, 1999).

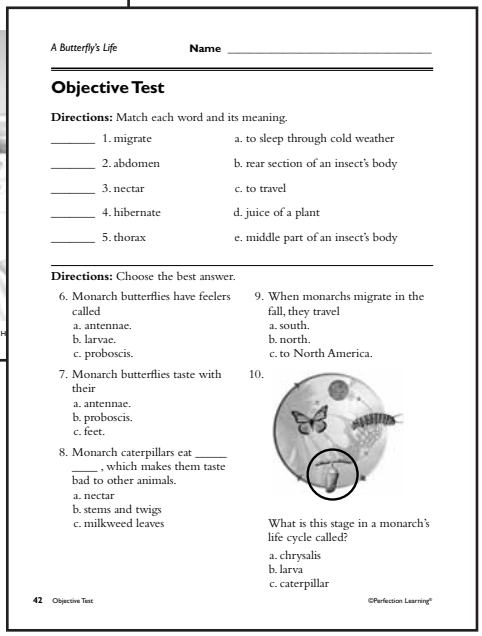
Inquiry-based learning provides a developmentally appropriate way for young children to develop scientific thinking. Children naturally operate from an inquiry-based approach when they ask questions about the world around them. The inquiry approach to learning science helps introduce scientific thinking to young children through books that match their developmental ability to think about science.



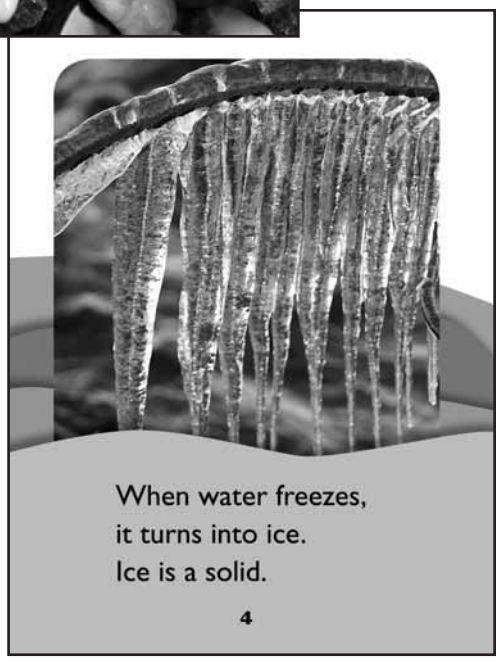
Sample page from *Rocks and Minerals*

Sample page from the *Early A Teaching Resource*





Sample page from the *Fluent A Teaching Resource*



Sample page from *Water*

Guiding and facilitating student learning

Guided reading is one component of an approach that includes self-selected reading, shared reading, writing, and working with words, and it helps children in kindergarten, first and second grade become strong readers.
—Fountas & Pinnell, 1996

Guided reading is recommended for use in primary classrooms as part of a balanced literacy program. Children learn through different social groupings, including working on their own and working with peers, but the teacher has the most opportunity to monitor and guide student learning in small teacher-led groups.

Student books in the *Reading Essentials: Discovering & Exploring Science* series can be used by classroom teachers in their guided reading lessons. The teacher can meet with small groups while other students are applying information from the books in learning centers throughout the classroom. Depending on the level of these reading groups, the teacher may choose to use the "Jump Start" suggestions in the Teaching Resources for ELL and struggling readers. At every level, teachers can rely on the "Before Reading" introductory ideas as well as the "During Reading" and "After Reading" comprehension and word study ideas that are provided for each title.

Assessing teaching and student learning

It is important to evaluate children's reading competence in many ways, not only by their phonics skills but also by their interest in books and their ability to understand information that is read to them.
—National Reading Panel, 2000

Students' learning should always be assessed in multiple ways. To determine children's developmental level in literacy, assessment is used both as a measure of how far the student has come, as well as an indication of where the student needs to go. This helps teachers and parents evaluate the child's progress as well the success (or need for improvement) of the school curriculum.

There are a variety of opportunities to address assessment in *Reading Essentials: Discovering & Exploring Science.* In the early and fluent Teaching Resources, fluency is assessed with text from the book in a counted-word format for timed reading. In the fluent Teaching Resources, objective tests provide summative assessment of vocabulary and content.

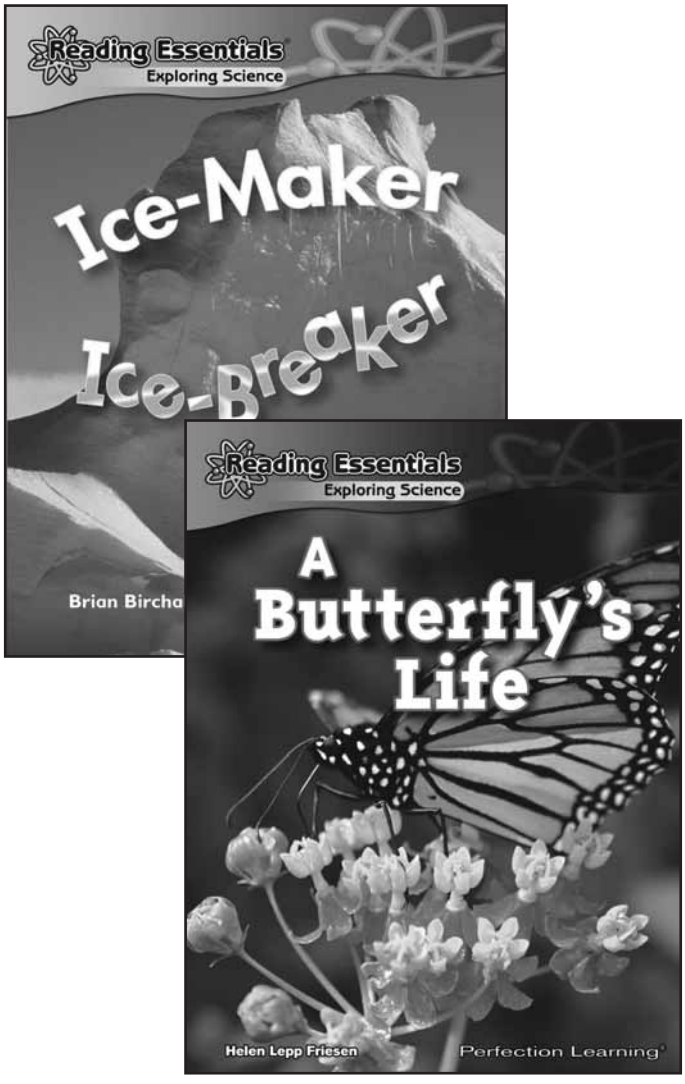
Children's answers to comprehension questions, their independent use of the books and interest in them, their ability to decode the text, and their fluency in reading can all become part of the on-going assessment of children's content knowledge in science as well as their reading abilities.

Developing environments that enable students to learn science

School-aged children "learn about [scientific] concepts through writing, manipulation, asking questions, reading, performing operations, and observing."
—Wellhousen & Crowther, 2004, p. 199

Children learn scientific concepts, as they can learn most things, through playful experiences with their world, including nature and books. In particular, young school-age children can engage in inquiry by, for instance, using books as a resource with which to compare the results of their own experiments. Books therefore become part of an environment of playful inquiry, which also includes things from nature, measuring equipment, and graphing materials. Materials to support the learning of science may also include curiosity tables, mini-museums, animals, and displays of collections. Books support and compliment these materials and can be placed in a classroom library or on display in a special section on science.

The *Reading Essentials: Discovering & Exploring Science* student books cater to children's desire for and interest in playful inquiry. The books compliment the use of other exploratory materials as part of the classroom environment. They can be used as a reference library one day and an inspiration for experimentation the next day.



Creating communities of science learners

Within the classroom community, "children write reports, demonstrate principles, prepare presentations, discuss results, evaluate, and readjust."
—Wellhousen & Crowther, 2004, p. 200

The culture of inquiry must be nurtured, modeled, and supported in the classroom so that children can learn to think, write, and speak scientifically. When teachers model the appropriate use of technical vocabulary, for instance, they are helping students to learn to speak scientifically.

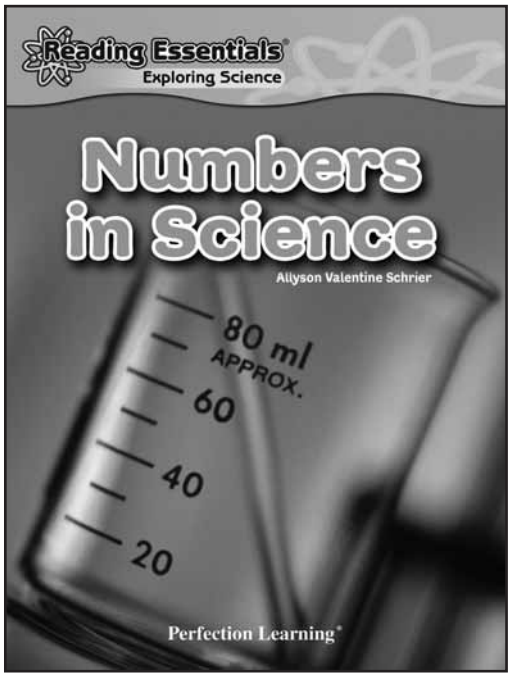
Appropriate technical terminology is presented at developmentally appropriate levels in the series. This starts at the emergent level with books such as *Water* that includes the words boil, frost, gas, ice, liquid, solid, and steam; proceeds to the early titles in books such as *Shapes,* that includes the words edges, faces, rectangular prism, and solid, and finally culminates at the fluent level with books such as *Rocks and Minerals* that includes the words igneous, sedimentary, and metamorphic. The Teaching Resources provide teachers with definitions for the more technical words.

Planning and developing a school science program

Certain attitudes are considered scientific, and children can develop these attitudes with assistance. Scientific attitudes include: curiosity, skepticism, positive approach to failure, and positive self image.
—Charlesworth & Lind, 1999

A school-wide science program includes scientific attitudes throughout the curriculum, as well as an integration of science into other disciplines, particularly math. Each school district must come to their own decisions about how to best plan and develop an integrated, inquiry-based science program. Some use named approaches such as thematic planning, the inquiry approach, constructivist curriculum, or the project approach (Prairie, 2005), while others develop their own more home-grown approaches. Either way, children's development as young scientists must be supported through the use of books in the classroom.

The *Reading Essentials: Discovering & Exploring Science* library can be used in the classroom for more than one purpose and in any of the curricular approaches listed above. In addition, the series specifically integrates math and science, with certain titles categorized as "Math in Science." Teachers can easily and quickly pull these books out to use for lessons that integrate math concepts.



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