

Models of Matter
A 20 session unit
Seeds of Science/Roots of Reading Program
Grades 4–5

Seeds of Science/Roots of Reading units provide rich and varied opportunities for students to inquire about important topics in science as they **investigate** through firsthand inquiry, **read** content-rich science books, **talk** with others about their investigations, and **write** to record and reflect on their learning. Students learn important strategies to comprehend science texts and gather information to support their inquiry by reading. As they read and investigate, they develop flexible knowledge of new vocabulary and learn to communicate using the language of science, a significant academic discourse.

The *Models of Matter* integrated science-literacy unit immerses students in learning about **particulate nature of matter, using properties to separate mixtures, phase change**, and other key physical science concepts. The unit has two investigations—each with 10 sessions, in which students engage in the inquiry processes of making inferences, visualizing and using mental models, evaluating models, and making explanations from evidence. Four student books engage students in reading and talking about these physical science concepts. About half of the sessions in the unit have a literacy focus. As students read the books, they work to master the reading comprehension skills of making inferences, accessing and applying prior knowledge and making explanations from evidence, they write scientific explanations, and they learn to use a variety of nonfiction text features and visual representations such as diagrams. Throughout the unit, students are provided with opportunities for oral discourse focusing on the nature and practices of science.

The *Models of Matter* Kit includes:

- ✓ 18 copies each of 4 books, for a total of 72 student books
- ✓ Student Investigation Notebooks for each student
- ✓ Materials and equipment for leading the unit with 32 students
- ✓ The *Models of Matter* Teacher's Guide

The *Models of Matter* Teacher's Guide includes:

- ✓ Detailed lesson plans for enacting two inquiry-based science investigations comprised of 10 sessions each
- ✓ Science and literacy assessments and scoring rubrics
- ✓ Instructional scaffolds and accommodations for English Language Learners
- ✓ Background information pertaining to the science content introduced in the unit

Learning Goals in the *Models of Matter* unit

Science Learning Goals	Literacy Learning Goals
<p>Science Knowledge</p> <ul style="list-style-type: none"> • Particulate nature of matter • Using properties to separate mixtures • Phase change <p>Science Inquiry</p> <ul style="list-style-type: none"> • Making inferences • Visualizing and using mental models • Making explanations from evidence • Evaluating models <p>Nature and Practices of Science</p> <ul style="list-style-type: none"> • Understanding that science knowledge is based on evidence • Distinguishing observations from inferences • Recognizing that the scientific community seeks to improve explanations • Understanding how scientists engage in the practices of science 	<p>Reading</p> <ul style="list-style-type: none"> • Making inferences • Using and creating diagrams • Using nonfiction text features <p>Writing</p> <ul style="list-style-type: none"> • Writing scientific explanations • Using scientific language and vocabulary <p>Listening/Speaking</p> <ul style="list-style-type: none"> • Participating in scientific discourse • Making explanations from evidence • Using scientific language and vocabulary

Models of Matter Science Books

Made of Matter

Break It Down: How Scientists Separate Mixtures

Phase Change at Extremes

Science You Can't See