Building Blocks of Science®

A New Generation

Program Overview

A complete K–5 program for the New York State P-12 Science Learning Standards

Put phenomena in students' hands in 30 minutes a day

CAROLINA®
www.carolina.com

Building Blocks of Science® Is Designed to Meet the New York State Science Standards and Incorporate the 5 Innovations—*in 30 Minutes a Day!*

- **Three-dimensional learning** construction—every lesson, every unit
- Lessons that apply **science concepts** to **engineering design**
- Hands-on investigations in which students build explanations for real-world **phenomena and design solutions—every day**
- **Coherent learning progression** that develops lesson by lesson, unit by unit—no "random acts of science"
- **Literacy and mathematics connections** that bridge science content and lead to deep understanding

What teachers have to say about Building Blocks of Science

"The final design project definitely stretched their skills and allowed me to delve into the engineering design process of design, build, test, analyze, redesign."

"The entire 4th grade was all super engaged during all of the lessons, as was I! Students who struggle in other subjects are able to feel successful with these lessons which are easy to differentiate."

"My students LOVED the dissection portion. They very excitedly told their parents about it. I even had an older brother stop by and ask if he could attend my class when I do the next one."

18 NEW Inquiry-Based Units + 5 Innovations = 1 30-Minutes-a-Day Solution

	Physical Science	Life Science	Earth & Space Science
Kindergarten	Push, Pull, Go	Living Things and Their Needs	Weather and Sky
1st Grade	Light and Sound Waves	Exploring Organisms	Sky Watchers
2nd Grade	Matter	Ecosystem Diversity	Earth Materials
3rd Grade	Forces and Interactions	Life in Ecosystems	Weather and Climate Patterns
4th Grade	Energy Works!	Plant and Animal Structures	Changing Earth
5th Grade	Structure and Properties of Matter	Matter and Energy in Ecosystems	Earth and Space Systems

Three-Dimensional Learning

Building Blocks of Science weaves together Disciplinary Core Ideas, Science and Engineering Practices, and Crosscutting Concepts in each lesson, immersing students in 3-dimensional learning rich with phenomena and engineering design.

Lesson 6: Structure and Function

Lesson Essentials	Next Generation Science Standards	Language Art
Objectives: • Design an accurate model of the human eye. • Construct an explanation to explain how the human eye works. • Describe the brain's role in sight. • Cooperatively work in a group to design and create a project. **Time Requirements:** **Teacher Preparation** **Part A:** 15 minutes **Lesson** **Part A:** 3–4 class sessions **Essential Question:** • How can animals see objects around them and what is the brain's role in vision? **Vocabulary** All vocabulary from previous lessons.	**Performance Expectations** • **4-LS1-1:** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. • **4-LS1-2:** Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. • **4-PS4-2:** Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. **Disciplinary Core Ideas** • **LS1.A:** Structure and Function • **LS1.D:** Information Processing • **PS4.B:** Electromagnetic Radiation **Science and Engineering Practices** • Engaging in Argument from Evidence • Developing and Using Models **Crosscutting Concepts** • Systems and System Models • Cause and Effect	**Language Arts** • **L.4.1:** Convent • **L.4.3:** Knowled • **SL.4.1:** Compr • **SL.4.4:** Presen Ideas • **W.4.2:** Text Typ **Math** • **4.G.A.1:** Draw and classify sha lines and angles

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Performance Expectations
• **4-LS1-1:** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
• **4-LS1-2:** Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
• **4-PS4-2:** Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.

Disciplinary Core Ideas
• **LS1.A:** Structure and Function
• **LS1.D:** Information Processing
• **PS4.B:** Electromagnetic Radiation

Science and Engineering Practices
• Engaging in Argument from Evidence
• Developing and Using Models

Crosscutting Concepts
• Systems and System Models
• Cause and Effect

What Three-Dimensional Learning Looks Like in Building Blocks of Science

Lessons that ignite learning through phenomena.

Introducing phenomena using guiding questions and movement education.

From the unit Plant and Animal Structures:

Hold up the squid card from the Plant and Animal Structures Photo Card Set for the class to view. Ask,

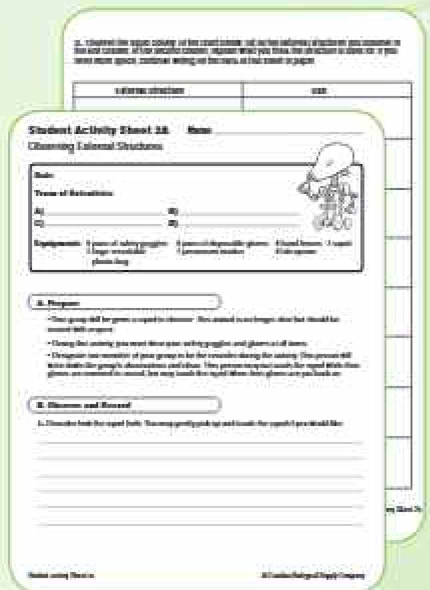
- Does anyone know what type of animal this is? *(A squid)*
- Where do you think this animal lives? *(Ocean)*
- What do you notice about the squid's body? *(Answers will vary.)*

To better understand a squid's body plan, have students stand up and put their hands up towards the ceiling. Explain that both their arms and legs will represent the tentacles of a squid. Ask,

- Think about what you already know about a squid. Should your tentacles (arms and legs) be at opposite ends of your body if you are a squid? *(No)*

Direct students to bend at the waist and move their arms and hands down by their feet. Now all their "tentacles" are facing the correct direction. Ask,

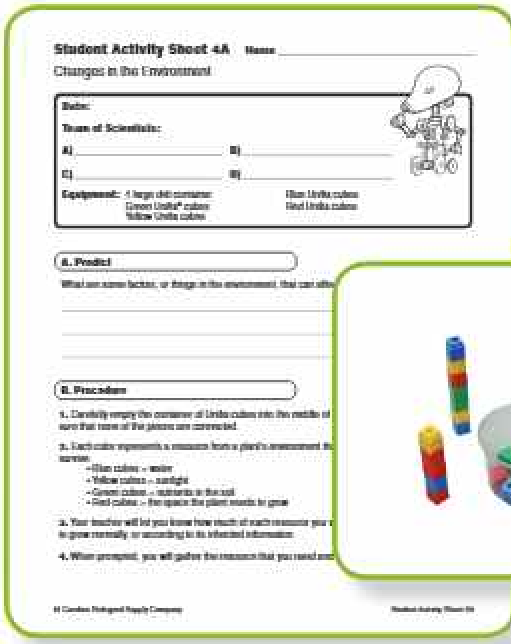
- Where is your head right now? *(Close to the "tentacles")*



Lessons that explore phenomena through experiential learning.

- Students build and explore systems and plan and carry out investigations that mimic and generate data about science phenomena.
- Students gather data that serves as evidence to provide explanations for phenomena.
- Students use data collection to generate additional questions or problems.
- Students analyze and interpret data to aid in revealing patterns and relationships, to create explanations, or to inform design solutions.

Three-Dimensional Learning



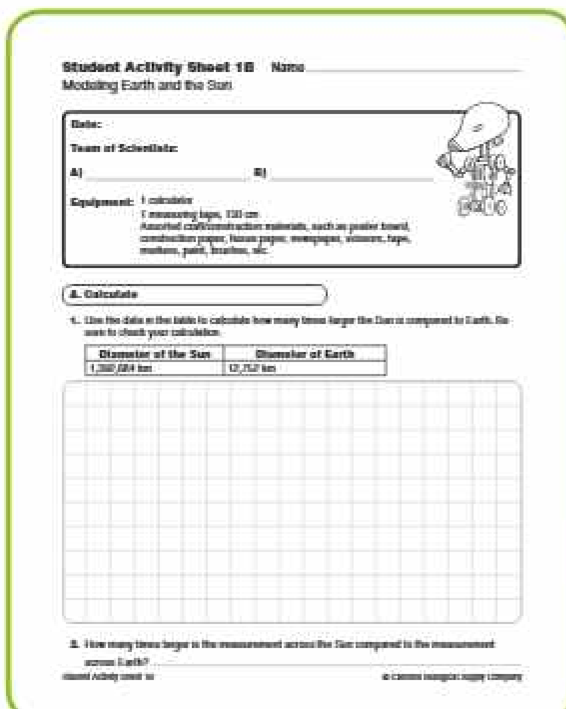
Lessons that use models to

- Represent systems
- Develop questions and explanations
- Generate data
- Communicate ideas

Lessons that integrate literacy and math to support three-dimensional learning

Literacy integration develops deep understanding, creating connections between science and the real world.

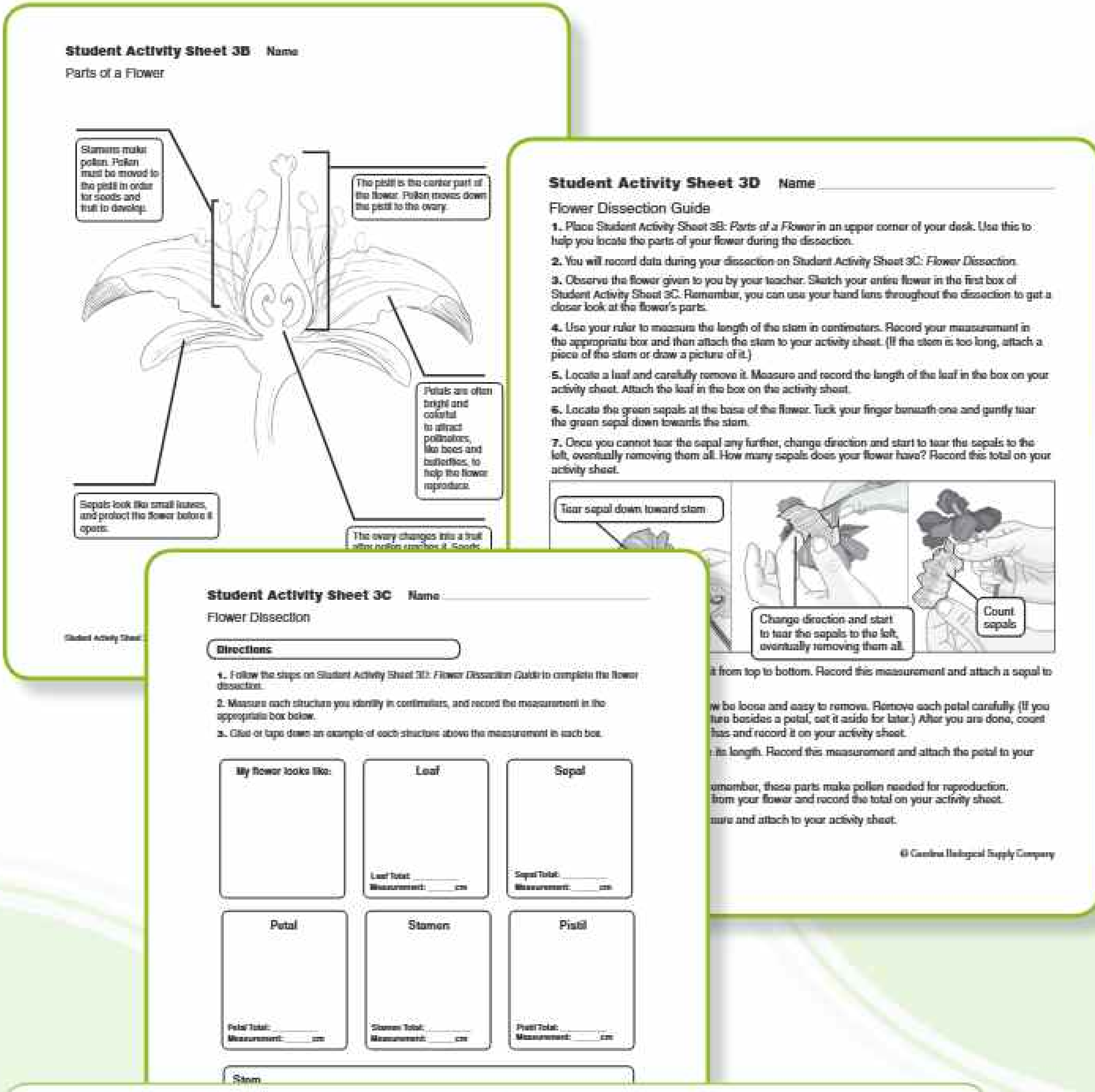
Discussion questions check students' understanding of a reading passage and incorporate their understanding of Practices and Crosscutting Concepts. Reading selections connect science and the real world.



Math integration allows students to learn to quantitatively describe and measure objects, events, and processes.

Lessons that convert learning experiences into understanding of phenomena.

Each investigation ends by asking students to think about and apply concepts they have explored to explain phenomena.


Student Activity Sheet 3B Name

Parts of a Flower

Student Activity Sheet 3D Name

Flower Dissection Guide

1. Place Student Activity Sheet 3B: *Parts of a Flower* in an upper corner of your desk. Use this to help you locate the parts of your flower during the dissection.
2. You will record data during your dissection on Student Activity Sheet 3C: *Flower Dissection*.
3. Observe the flower given to you by your teacher. Sketch your entire flower in the first box of Student Activity Sheet 3C. Remember, you can use your hand lens throughout the dissection to get a closer look at the flower's parts.
4. Use your ruler to measure the length of the stem in centimeters. Record your measurement in the appropriate box and then attach the stem to your activity sheet. (If the stem is too long, attach a piece of the stem or draw a picture of it.)
5. Locate a leaf and carefully remove it. Measure and record the length of the leaf in the box on your activity sheet. Attach the leaf in the box on the activity sheet.
6. Locate the green sepals at the base of the flower. Tuck your finger beneath one and gently tear the green sepal down towards the stem.
7. Once you cannot tear the sepal any further, change direction and start to tear the sepals to the left, eventually removing them all. How many sepals does your flower have? Record this total on your activity sheet.

...t from top to bottom. Record this measurement and attach a sepal to

...w be loose and easy to remove. Remove each petal carefully. (If you ...ture besides a petal, set it aside for later.) After you are done, count ...has and record it on your activity sheet.

...its length. Record this measurement and attach the petal to your

...emember, these parts make pollen needed for reproduction. ...from your flower and record the total on your activity sheet.

...sure and attach to your activity sheet.

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Student Activity Sheet 3C Name

Flower Dissection

Directions

1. Follow the steps on Student Activity Sheet 3D: *Flower Dissection Guide* to complete the flower dissection.
2. Measure each structure you identify in centimeters, and record the measurement in the appropriate box below.
3. Glue or tape down an example of each structure above the measurement in each box.

My flower looks like:	Leaf	Sepal
	Leaf Total: ______ Measurement: ______ cm	Sepal Total: ______ Measurement: ______ cm

Petal	Stamen	Pistil
Petal Total: ______ Measurement: ______ cm	Stamen Total: ______ Measurement: ______ cm	Pistil Total: ______ Measurement: ______ cm

Stem

Science Notebook Opportunity

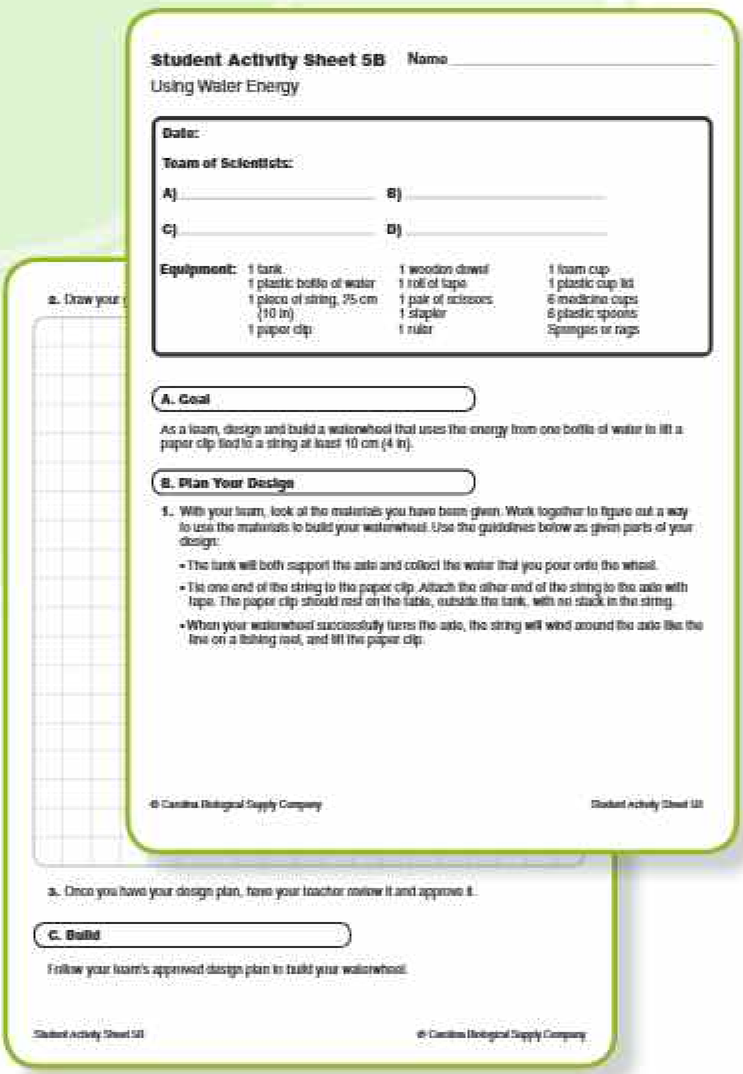
Notebook Prompt:
Based on all the information you learned, explain why parts on the outside of the plant are just as important as the parts on the inside. Use evidence from classroom activities in your explanation.

Building Blocks of Science Applies Science Concepts to Engineering Design

Students engage directly in structural, mechanical, environmental, or biological engineering design challenges throughout each unit using the science content knowledge obtained during the unit lessons.

Energy Works! Designing a Waterwheel

How do wind turbines generate electricity to run a city? How does hydroelectric convert kinetic energy into electrical energy? Students explore this phenomenon while discovering the advantages and disadvantages of wind and water as alternative energy sources. Students construct a model wind turbine and a model waterwheel. They discuss how wind energy or water energy can be transferred to their apparatus, and then how that energy is transformed into mechanical energy. Applying this knowledge, students are challenged to construct their own waterwheel and to use hydropower to move an object.



Student Activity Sheet 5B Name

Using Water Energy

Date:

Team of Scientists:

A) **B)**

C) **D)**

Equipment: 1 tank, 1 plastic bottle of water, 1 piece of string, 25 cm (10 in), 1 paper clip, 1 wooden dowel, 1 roll of tape, 1 pair of scissors, 1 stapler, 1 ruler, 1 foam cup, 1 plastic cup lid, 6 medicine cups, 6 plastic spoons, Sponges or rags

A. Goal

As a team, design and build a waterwheel that uses the energy from one bottle of water to lift a paper clip tied to a string at least 10 cm (4 in).

B. Plan Your Design

1. With your team, look at the materials you have been given. Work together to figure out a way to use the materials to build your waterwheel. Use the guidelines below as given parts of your design:
   - The tank will both support the axle and collect the water that you pour onto the wheel.
   - Tie one end of the string to the paper clip. Attach the other end of the string to the axle with tape. The paper clip should rest on the table, outside the tank, with no slack in the string.
   - When your waterwheel successfully turns the axle, the string will wind around the axle like the line on a fishing reel, and lift the paper clip.

© Carolina Biological Supply Company Student Activity Sheet 5B

2. Draw your ...

3. Once you have your design plan, have your teacher review it and approve it.

C. Build

Follow your team's approved design plan to build your waterwheel.

Student Activity Sheet 5B © Carolina Biological Supply Company

Becoming Aware of Real-World Phenomena through Engineering Design

Phenomena is all around us—even in the transformation of kinetic to mechanical energy. Challenge students to explore and explain this phenomenon by using the knowledge they've gained throughout the unit to design their own waterwheel.

In this investigation, student groups:

- Learn about alternatives to fossil fuels: solar energy, geothermal energy, wind energy, water energy, and biomass energy.
- Construct a model wind turbine and a model waterwheel to demonstrate wind and water energy.
- Design their own model waterwheel to demonstrate water energy.
- Suggest innovations in design.
- Record questions for further exploration.

Building Blocks of Science Incorporates Engineering Design Challenges in Every Unit!

Examples of Engaging Engineering Challenges in Building Blocks of Science:

***Push, Pull, Go,* Grade K:** Students apply what they've learned about force and different kinds of motion—rolling, swinging, tumbling, and spinning—to design their own invention that is set into motion with a push or a pull.

***Exploring Organisms,* Grade 1:** Student use their knowledge of the structures plants and animals use for survival to design a solution to a real problem faced by human parents: keeping their children safe. Student groups come up with their own safety situation and work together to design the solution.

***Earth Materials,* Grade 2:** Students use their knowledge of erosion and the materials that make up Earth to develop a plan to build a model island and describe what impact erosion will have on at least one landform in their model.

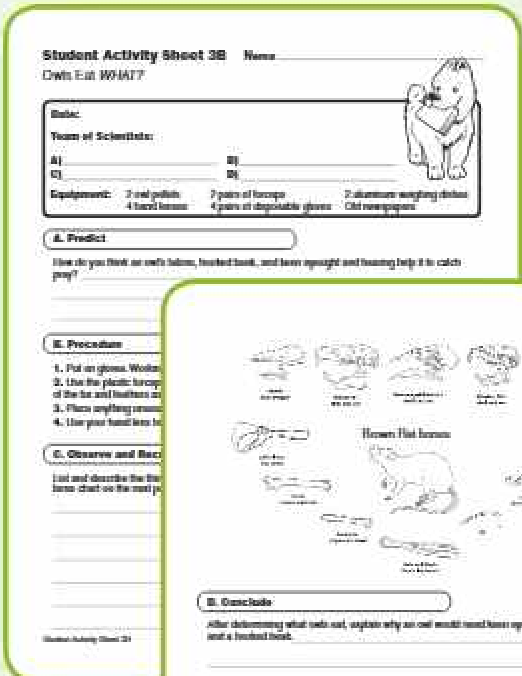
***Forces and Interactions,* Grade 3:** Applying what they have learned about forces, including gravity and magnetism, and how various forces interact, students are challenged to use magnetism to design a model that can sort scrap metal from general trash, keep a door shut, or keep two moving objects from touching, or they can devise a magic trick in which a paper clip secured with a piece of string floats in the air.

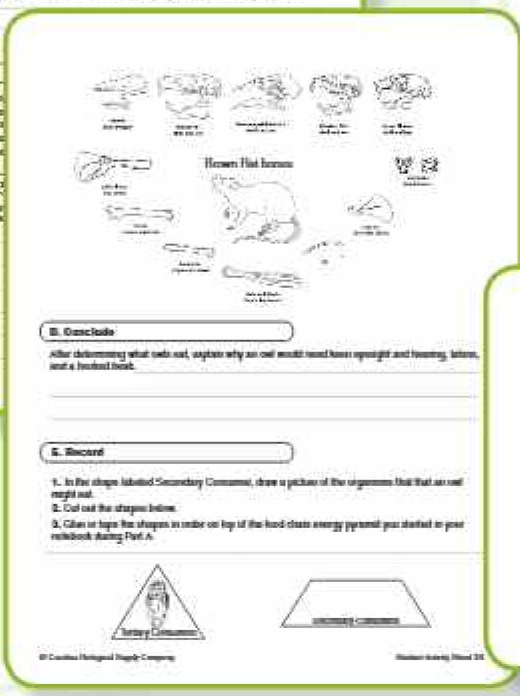
***Plant and Animal Structures,* Grade 4:** Students apply what they have learned about the external and internal structures of the eye to design and build a three-dimensional eye model. Students are presented with a wide range of materials to use for the construction, but must select based on constraints and criteria of the design challenge.

***Structure and Properties of Matter,* Grade 5:** Using the knowledge they have gained about the structures and properties of matter, students plan, build, test, and evaluate a water filtration system.

Building Blocks of Science Connects Real-World and Experiential Phenomena to the Elementary Classroom—in Just 30 Minutes a Day

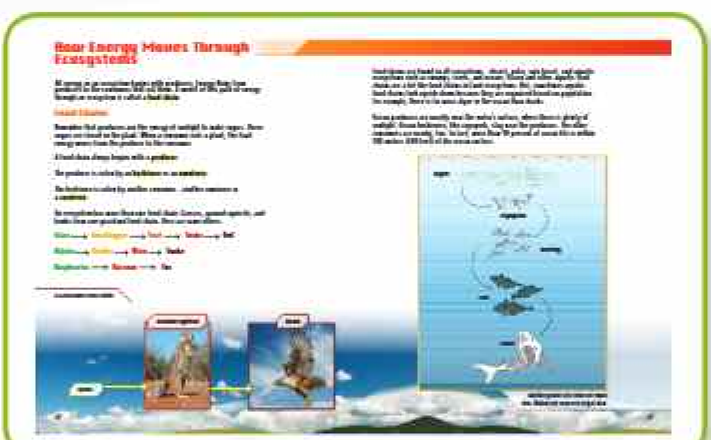
Phenomena is a big part of science standards. The connection of phenomena to science provides concrete experiences that ignite students' interest in learning more.





Your State Science Standards are clear: merely reading about a principle and some examples does not meet the Standards. Phenomena must be modeled, experienced, and explained by students.

Phenomena-rich investigations and meaningful engineering design challenges put the experience in students' hands.



Hands-On Phenomena Ignites Interest in Non-Fiction Reading

Non-fiction literacy supports phenomena by providing real-world, contextually relevant connections to science content, which sparks student interest.

Building Blocks of Science Engages Students with Phenomena that Integrates Life, Earth, and Physical Science, Literacy, and Math

Examples of Engaging Phenomena in Building Blocks of Science:

***Living Things and Their Needs,* Grade K:** Kindergarteners explore the needs of living things as they plant pumpkin seeds and watch plant growth and care for bessbugs. Students make firsthand observations of how living things can change their environment to meet their needs.

***Sky Watchers,* Grade 1:** By looking up and studying what they see, students build on their understanding of day and night, seasons, shadows, and the Moon's patterns. To explore an area of science often filled with misconceptions, students use their bodies to actively model the Sun-Earth-Moon system. In the final activity, groups create models to teach a lesson on what they know about the Sun, the Moon, or how both affect Earth.

***Matter,* Grade 2:** Why does popcorn pop? By observing and exploring solids, liquids, and gases and the physical and chemical changes they go through, students work toward an understanding of the structures and properties of matter that make up the world around them. This knowledge helps them to explain things they see around them every day—even why popcorn pops!

***Weather and Climate Patterns,* Grade 3:** Through the interweaving of science, math, and literacy, students gain the understanding of why there are different climates in different regions of the world. They gain understanding of the variety of natural hazards that result by natural processes on Earth.

***Life in Ecosystems,* Grade 4:** Students explore ecosystems and how plants and animals adapt to their environments. Students learn about healthy ecosystems by studying butterfly larvae and Wisconsin Fast Plants® in the classroom, and look at heredity and traits as well as adaptations. Students use fossils to reveal how organisms change over time as the environment changes.

***Earth and Space Systems,* Grade 5:** By modeling the scale and size of the Sun-Earth-Moon system, students begin to understand Earth's place in the solar system. Through interactive demonstrations, students learn about the effects of gravity on the Sun-Earth-Moon system.

Building Blocks of Science—Assessing to Check Understanding

Building Blocks of Science provides assessment every step of the way.

Building Blocks of Science units provide assessment opportunities that correspond to specific lesson objectives, general science process skills, communication skills, and the student's ability to apply the concepts and ideas presented in the unit to new situations.

The Building Blocks of Science assessment system includes:

- Pre-assessment
- Multiple forms of formative assessment, specified for each lesson in the Lesson Overview Chart
- Performance-task post-assessment
- Written summative assessment

An assessment system that informs your instruction:

What do they already know?

Each Building Blocks of Science unit begins with a **pre-assessment** lesson designed to:

- Reveal misconceptions and preconceptions
- Assist in lesson planning
- Serve as a gauge of students' prior knowledge of key Disciplinary Core Ideas, Crosscutting Concepts, and Science and Engineering Practices.

What did they learn today?

Building Blocks of Science's **formative assessment** informs instruction through:

- Student Activity Sheets
- Performance Observation Sheets (K–2)
- Science Notebook Opportunities and Prompts

Assessment Strategies

Pre-Unit Assessments:
- "Animal Structures" and "Plant Structures" class charts: Students brainstorm internal and external structures of plants and animals. (TG pg. 4)
- Sorting structures into categories based on function allows assessment of individual knowledge. (Student Activity Sheet 1A: *Sorting It All Out*)
- Brainstorm the structures of a polar bear and predict their functions. (TG pg. 5)

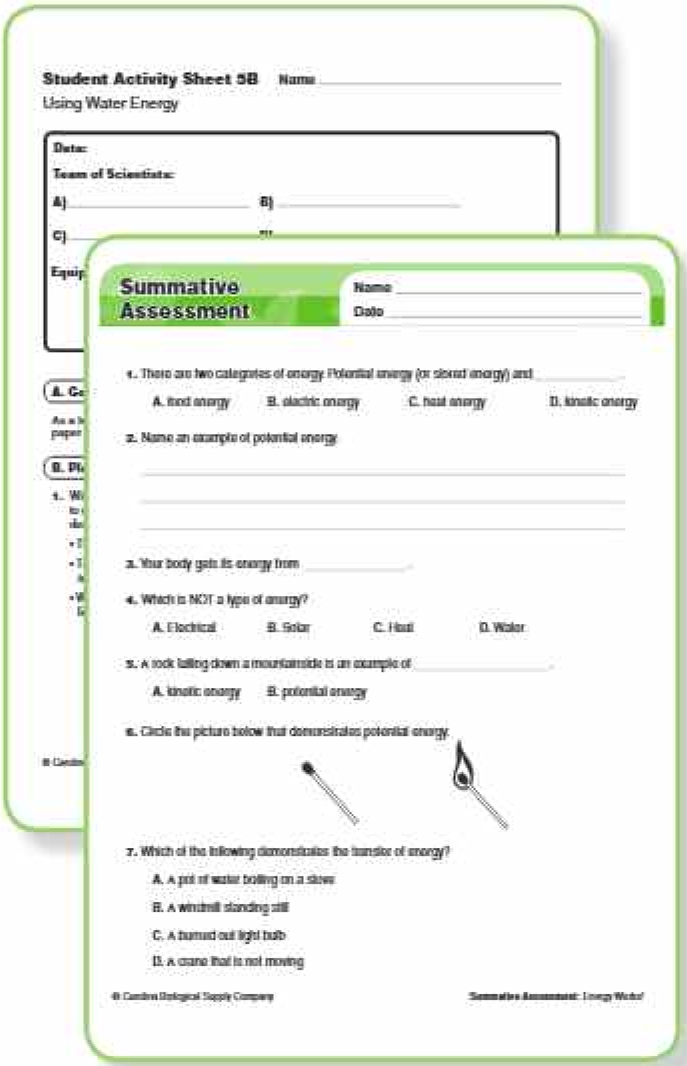
Student Activity Sheets:
- Student Activity Sheet 1A: *Sorting It All Out*
- Student Activity Sheet 1B: *Polar Bear*
- Student Activity Sheet 1C: *Growing Radish Plants*

Science Notebook Opportunity:
- Students predict what will happen to the seeds they plant in a resealable bag and what the plant will look like if it grows. (TG pg. 6)

Formative Assessments:
1. Notebook prompt: Pick one of the following organisms. Identify and explain the structures that help the organism survive in its environment. Use evidence to support your claim.
   - Penguin
   - Giraffe
   - Hawk
   - Rabbit
2. Use Student Activity Sheet 1A: *Sorting It All Out* to assess student understanding of internal and external structures.
3. Use the information about polar bear structures that students recorded in their science notebooks in Part B to further assess their understanding of internal and external structures.
4. Use the notebook prompt from Part B to assess student understanding of making a prediction and prior knowledge of plant growth.
5. Evaluate student understanding through lass discussions.

General Rubric:
- Refer to the General Rubric included in Appendix D to assess individual progress.

Science Notebooks



Student Activity Sheet 5B Name ____________

Using Water Energy

Data:

Team of Scientists:

A) ____________ B) ____________

C) ____________

Summative Assessment Name ____________ Date ____________

1. There are two categories of energy. Potential energy (or stored energy) and ____________.
   A. food energy B. electric energy C. heat energy D. kinetic energy
2. Name an example of potential energy.
3. Your body gets its energy from ____________.
4. Which is NOT a type of energy?
   A. Electrical B. Solar C. Heat D. Water
5. A rock falling down a mountainside is an example of ____________.
   A. kinetic energy B. potential energy
6. Circle the picture below that demonstrates potential energy.
7. Which of the following demonstrates the transfer of energy?
   A. A pot of water boiling on a stove
   B. A windmill standing still
   C. A burned out light bulb
   D. A crane that is not moving

© Carolina Biological Supply Company — Summative Assessment: Energy Works!

What did they learn over the course of the unit?

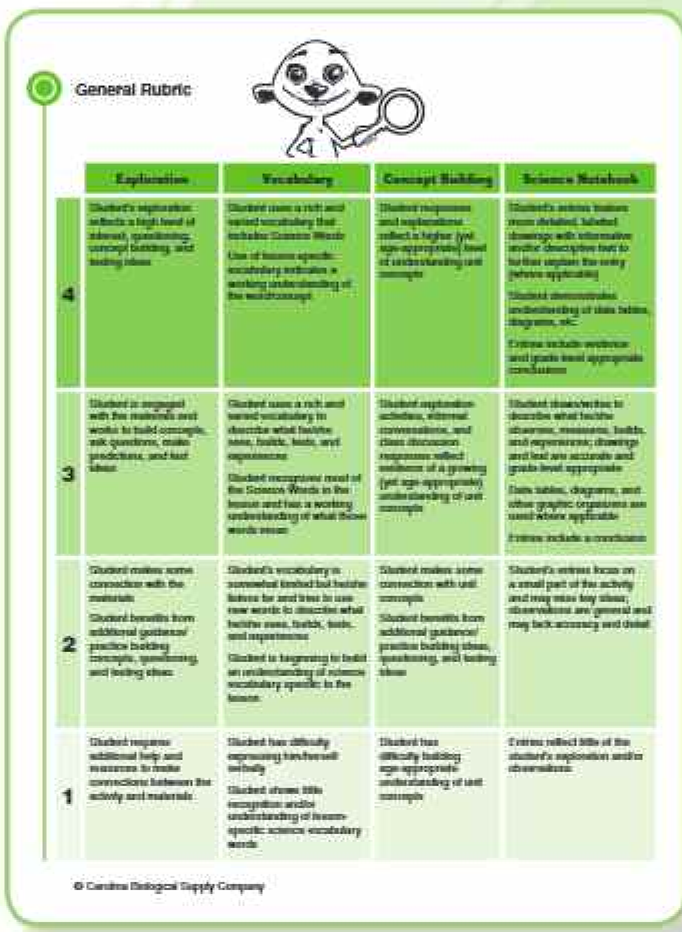
Each unit concludes with a post-**assessment investigation** and a **written summative assessment**. This combination ensures that the full range of unit concepts and practices are assessed through:

- A performance-task investigation
- A written assessment consisting of multiple-choice and constructed-response questions

How have they progressed?

Each unit includes rubrics intended to provide a progression of process skills and building of understanding of science content. These guidelines assess students':

- Exploration of science
- Science-specific vocabulary
- Understanding of science concepts
- Recording observations, and
- Understanding the meaning of the data collected



General Rubric

	Exploration	Vocabulary	Concept Building	Science Notebook
4	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]	[illegible]

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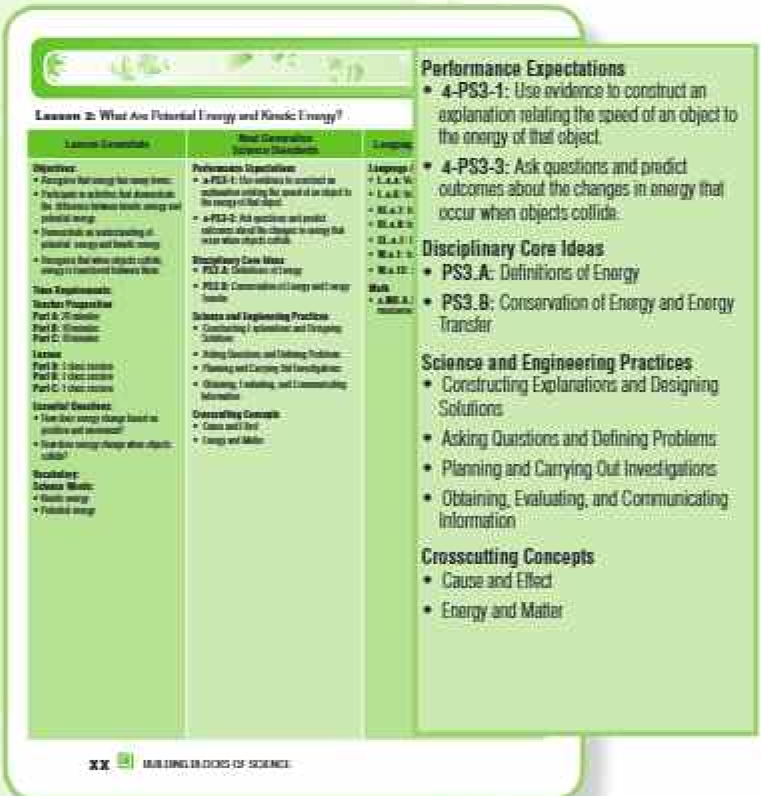
Support for Teachers During the Transition to the New York Science Standards

Three-dimensional learning calls for building to Performance Expectations over time with Science and Engineering Practices, Crosscutting Concepts, and Disciplinary Core Ideas.



Lesson-by-lesson correlations ensure true three-dimensional learning.

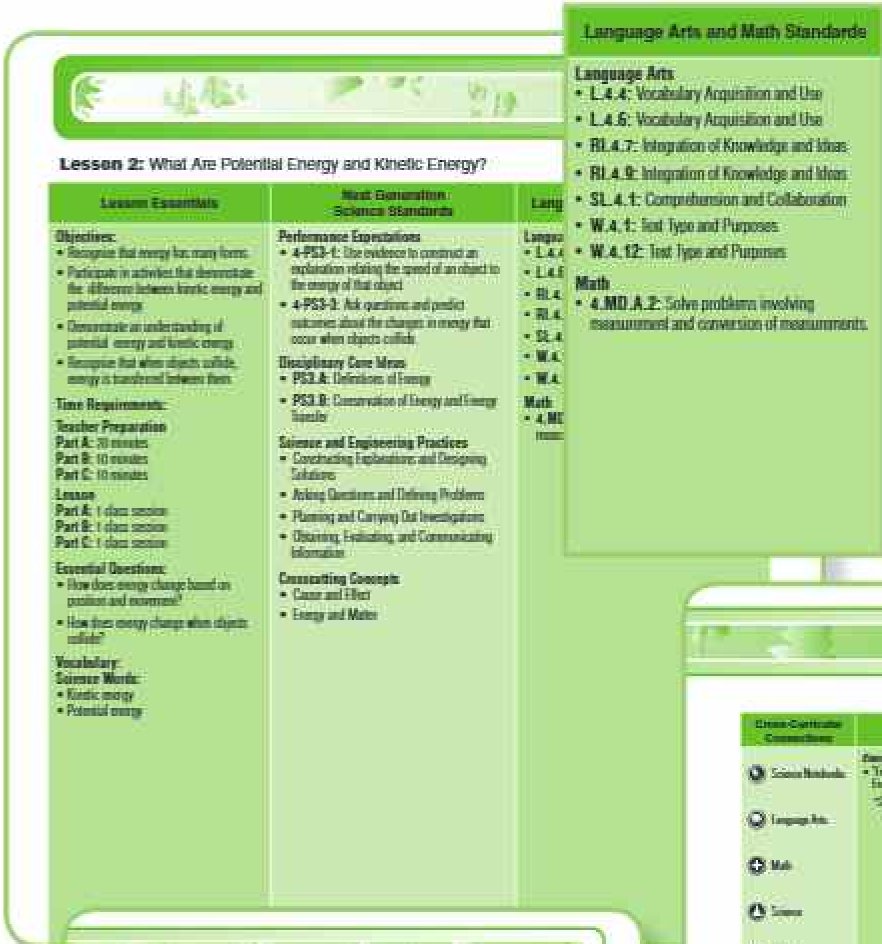
Building Blocks of Science provides educators with support for this new innovation in teaching every step of the way.

Teacher support that helps you and helps you support your students.

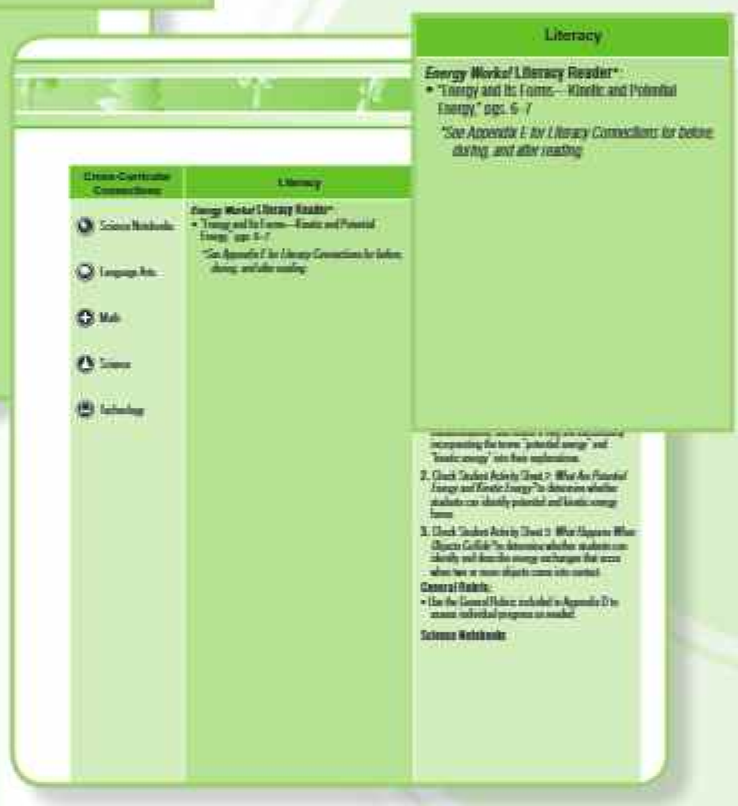
Background Information provides teachers, who may not have recent experience with the content, with foundational knowledge about lesson topics.

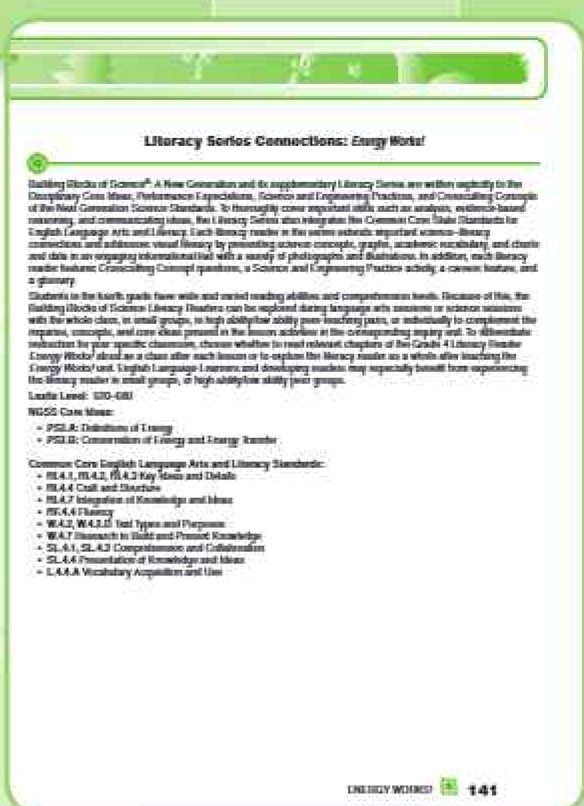
Teacher Tips provide helpful hints on classroom management, suggestions for remediation, and additional places to seek out information that relates to lesson.

English Language Arts, and Math Standards: Easily Identifiable, Lesson by Lesson



Lesson Overview Charts provide an overview of each lesson, including the lesson-specific connections to English Language Arts and Math Standards.

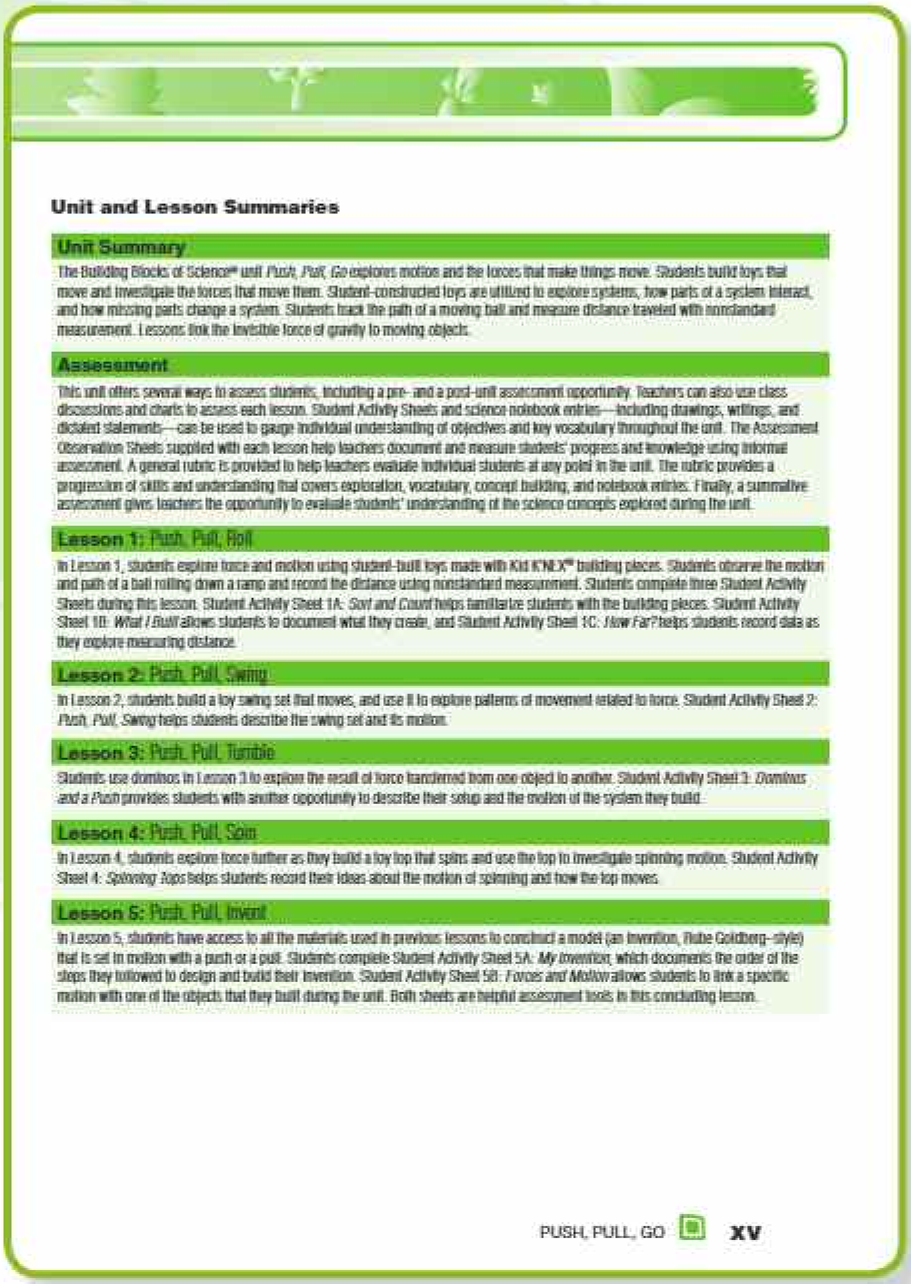




Literacy Series Connections integrate English Language Arts and Literacy standards. Together with the non-fiction reader, the Connections extend important science–literacy connections.

Building Blocks of Science's Coherent Learning Progression—Lesson by Lesson

Building Blocks of Science units were developed by Carolina Biological Supply Company to help teachers and students establish a solid foundation in elementary science. This foundation begins with a coherent learning progression in which students work through a series of lessons that build on one another. Students learn important science content and investigative skills, foster cooperative learning and critical thinking as they work in teams and actively discuss their findings, record data, and assess their understanding.



Unit and Lesson Summaries

Unit Summary

The Building Blocks of Science® unit *Push, Pull, Go* explores motion and the forces that make things move. Students build toys that move and investigate the forces that move them. Student-constructed toys are utilized to explore systems, how parts of a system interact, and how missing parts change a system. Students track the path of a moving ball and measure distance traveled with nonstandard measurement. Lessons link the invisible force of gravity to moving objects.

Assessment

This unit offers several ways to assess students, including a pre- and a post-unit assessment opportunity. Teachers can also use class discussions and charts to assess each lesson. Student Activity Sheets and science notebook entries—including drawings, writings, and dictated statements—can be used to gauge individual understanding of objectives and key vocabulary throughout the unit. The Assessment Observation Sheets supplied with each lesson help teachers document and measure students' progress and knowledge using informal assessment. A general rubric is provided to help teachers evaluate individual students at any point in the unit. The rubric provides a progression of skills and understanding that covers exploration, vocabulary, concept building, and notebook entries. Finally, a summative assessment gives teachers the opportunity to evaluate students' understanding of the science concepts explored during the unit.

Lesson 1: Push, Pull, Roll

In Lesson 1, students explore force and motion using student-built toys made with Kid K'NEX® building pieces. Students observe the motion and path of a ball rolling down a ramp and record the distance using nonstandard measurement. Students complete three Student Activity Sheets during this lesson. Student Activity Sheet 1A: *Sort and Count* helps familiarize students with the building pieces. Student Activity Sheet 1B: *What I Built* allows students to document what they create, and Student Activity Sheet 1C: *How Far?* helps students record data as they explore measuring distance.

Lesson 2: Push, Pull, Swing

In Lesson 2, students build a toy swing set that moves, and use it to explore patterns of movement related to force. Student Activity Sheet 2: *Push, Pull, Swing* helps students describe the swing set and its motion.

Lesson 3: Push, Pull, Tumble

Students use dominos in Lesson 3 to explore the result of force transferred from one object to another. Student Activity Sheet 3: *Dominos and a Push* provides students with another opportunity to describe their setup and the motion of the system they build.

Lesson 4: Push, Pull, Spin

In Lesson 4, students explore force further as they build a toy top that spins and use the top to investigate spinning motion. Student Activity Sheet 4: *Spinning Tops* helps students record their ideas about the motion of spinning and how the top moves.

Lesson 5: Push, Pull, Invent

In Lesson 5, students have access to all the materials used in previous lessons to construct a model (an invention, Rube Goldberg–style) that is set in motion with a push or a pull. Students complete Student Activity Sheet 5A: *My Invention*, which documents the order of the steps they followed to design and build their invention. Student Activity Sheet 5B: *Forces and Motion* allows students to link a specific motion with one of the objects that they built during the unit. Both sheets are helpful assessment tools in this concluding lesson.

PUSH, PULL, GO xv

Within Building Blocks of Science, each lesson:

- Builds on the previous
- Provides rigorous investigation
- Begins with Essential Questions that drive the focus of the lesson

Building Blocks of Science Learning Framework—Age-Appropriate Conceptual Progression Unit by Unit

Building Blocks of Science follows a coherent conceptual learning progression. Lessons within each unit authentically incorporate all three dimensions that support each grade level's Performance Expectations. The conceptual progression of Building Blocks of Science provides multiple opportunities for students to engage in each of the dimensions across science disciplines and across grade levels.

	Physical Science	Life Science	Earth & Space Science
Kindergarten	Push, Pull, Go	Living Things and Their Needs	Weather and Sky
1st Grade	Light and Sound Waves	Exploring Organisms	Sky Watchers
2nd Grade	Matter	Ecosystem Diversity	Earth Materials
3rd Grade	Forces and Interactions	Life in Ecosystems	Weather and Climate Patterns
4th Grade	Energy Works!	Plant and Animal Structures	Changing Earth
5th Grade	Structure and Properties of Matter	Matter and Energy in Ecosystems	Earth and Space Systems

Building Blocks of Science—Building a solid foundation in science for students from Kindergarten through Grade 5

Is It Really an Innovative Science Program?

7-Point NGSS Program Checklist—A Quick-Start Guide

Five Innovations	Questions
Three-Dimensional Construction	• Does the curriculum explicitly reflect and integrate all three dimensions and build to the Performance Expectations? • Are there multiple opportunities for students to master each dimension?
Focus on Engaging Phenomena	• Are students observing, investigating, modeling, and explaining phenomena? • Are they conducting inquiry science investigations and designing solutions? Are they engaging?
Engineering Design and the Nature of Science	• Are engineering standards and science standards taught with equal importance? • Do learning experiences include Disciplinary Core Ideas of engineering design as well as the Science and Engineering Practices and Crosscutting Concepts of both engineering and the nature of science? • Are engineering design and the nature of science integrated throughout the science content and not separate lessons at the unit's end?
Coherent Learning Progression	• Is it clear that there is a coherent learning progression within each unit as well as across grade levels? • Is there a convincing concept storyline or other coherent framework? • Do units build on and extend knowledge and understanding gained in prior grades?
Connections to Math and ELA	• Are connections to the Mathematics and ELA Standards explicit?
Key Support Materials	
Materials	• Do students have the materials to carry out scientific investigations and engineering design projects?
Assessment	• Are there multiple assessments capable of evaluating student progress and the performance expectations, including the science and engineering practices?

So many programs claim to meet the rigor of your standards, but how can you be sure? Use this 7-point program checklist as a guide.

	BBS	Where Is It in Building Blocks of Science?
	✓ Yes	• Unit Overview and Lesson Summaries at the beginning of every unit show how Performance Expectations build over time. • Lesson Overview Charts include a lesson-by-lesson alignment to the Performance Expectations, Disciplinary Core Ideas, Science and Engineering Practices, and Crosscutting Concepts. • Three-dimensional integration ensures students are immersed in instruction that allows them ample opportunities to make connections between science principles and real-world situations, preparing them for 21st-century careers.
	✓ Yes	• Investigations put real-world phenomena into students' hands, building knowledge and understanding and enabling students to explain phenomena. • Integrated engineering design challenges allow students to demonstrate their understanding of phenomena in order to generate solutions to real-world problems. • Non-fiction student literacy supports experiential science phenomena with real-world, contextually relevant connections to science content.
	✓ Yes	• Lesson Overview Charts provide content alignment to Science Standards. • Integrated engineering design challenges allow students to demonstrate their understanding of phenomena in order to generate solutions to real-world problems. • Further investigation builds science content knowledge, allowing students to redesign or further develop design solutions.
	✓ Yes	• Building Blocks of Science learning framework illustrates a coherent conceptual learning progression. This conceptual progression provides multiple opportunities for students to engage in each of the dimensions across science disciplines and across grade levels. • Lessons within each unit authentically incorporate all three dimensions that support each grade level's Performance Expectations. • Conceptual building, lesson to lesson, ensures that interconnected pieces of knowledge and skills required to meet a set of performance expectations are combined, developing a unit with a coherent story line.
	✓ Yes	• Lesson Overview Charts provide content alignment to Language Arts and Math Standards. • Student literacy books written explicitly to support the Disciplinary Core Ideas for Science allow a real-world connection to the science students investigate in the classroom. • Math integration within the lessons allows students to learn to quantitatively describe and measure objects, events, and processes.
	✓ Yes	• Unit purchase includes the Teacher's Guide (print and digital), digital student literacy book access, and all the materials to complete the investigations that are not commonly found in elementary classrooms.

	✓ Yes	• Assessment opportunities that correspond to specific lesson objectives, general science process skills, communication skills, and the student's ability to apply the concepts and ideas presented in the unit to new situations. The Building Blocks of Science units include:
		  • Pre-assessment
		  • Multiple forms of formative assessment specific to each lesson and listed in the Lesson Overview Charts
		  • Performance-task post-assessment
		  • Written summative assessment
		  • Rubrics to assess understanding of science content and performance-based tasks

Building Blocks of Science

K–5 Scope and Sequence

	Physical Science	Life Science	Earth & Space Science
Kindergarten	Push, Pull, Go	Living Things and Their Needs	Weather and Sky
1st Grade	Light and Sound Waves	Exploring Organisms	Sky Watchers
2nd Grade	Matter	Ecosystem Diversity	Earth Materials
3rd Grade	Forces and Interactions	Life in Ecosystems	Weather and Climate Patterns
4th Grade	Energy Works!	Plant and Animal Structures	Changing Earth
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