

# LaB-aids<sup>®</sup>

Proven Science Programs

FULL-YEAR  
CURRICULUM  
& UNITS  
CATALOG

20  
20



**SEPUP**<sup>®</sup>  
*Issue-Oriented Science*



THE LAWRENCE  
HALL OF SCIENCE  
UNIVERSITY OF CALIFORNIA, BERKELEY

**EDC** Learning  
transforms  
lives.

# THE RESEARCH-BASED DESIGN PROCESS

## Science Education Research

This provides the research background for our pedagogical approach.



## Initial Program Development

Lesson sequences are tried out in local schools by project staff, to create a version suitable for national testing.

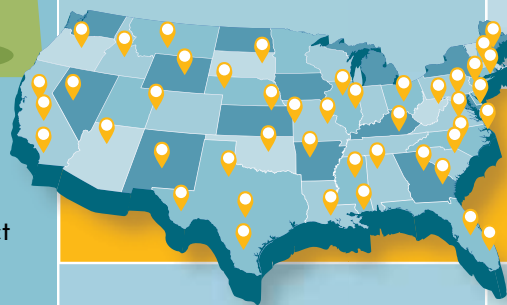
## Field Testing

Initial drafts and equipment prototypes are tested in classrooms across the country.



## Educator Feedback

We address input from teachers, students, and education experts before the program is commercially published.



## Scientist Review

Content reviews by scientists working in the specific field of each unit make sure our materials reflect up-to-date scientific knowledge and research.

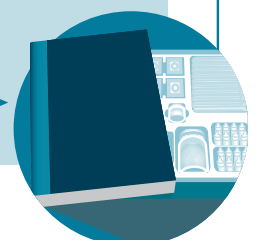


## External Evaluations

In some cases, external evaluators conduct reviews of student learning based on pre and post-assessments of field test versions.



Off to Lab-Aids for final production and distribution.



## Issues and Science: Designed for the NGSS

**Designed for the NGSS to support both students and teachers.** SEPUP, at the Lawrence Hall of Science, rises to meet the high expectations of the NGSS by carefully connecting each element below into its middle school program, *Issues and Science*.

This is not a textbook. This is not a kit. This is a thoughtfully developed program where each component is a critical part of the intentional whole.



## Program Elements

**Student Sensemaking** Instruction is designed to promote student sensemaking by: relating concepts to students' current knowledge and experiences, engaging students in each dimension of the NGSS, allowing students to reflect on new knowledge, and using assessments to build understanding.

● Page 10

**Differentiation** Unlike traditional programs that use add-ons to text-based curriculum, SEPUP's programming is designed for all learners from the start. Additional supports further allow customization for each unique classroom.

● Page 42

**Literacy** Rather than separate literacy tools and strategies, SEPUP embeds them into the science and engineering instruction for seamless support. This integration creates science learning experiences that also promote consistent language development.

● Page 43

**Issue Driven** Each unit's overarching issue provides a common entry point and anchoring storyline for students to ask questions, collect evidence, and construct explanations around relevant phenomena and related problems that connect to the real world.

● Page 8

**NGSS/3-D Learning** In the context of the unit issue, learning objectives are meaningfully connected to the standards. Unit materials show how the three dimensions, PEs, and assessments are interwoven and how each fits into the issue context.

● Page 41

**Concrete Experiences** Instructional design and unique equipment prioritize student ideas and learning through personal, concrete experiences related to the unit's issue, phenomena, three-dimensions, and PEs.

● Page 10

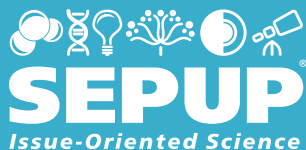
**Complete Program** Our program includes all the materials students need to authentically connect to, investigate, and understand each unit's real-world issue, along with tools for teachers to guide, assess, and personalize their robust NGSS instruction.

● Page 16

**Assessment** Analysis, quick checks, summative, and formative assessments appear within the body of unit lessons to maintain strong connections to the unit issue and investigative phenomena. Assessments help both teachers and students evaluate their progress towards understanding the unit's performance expectations.

● Page 44

## OUR PARTNERS



THE LAWRENCE  
HALL OF SCIENCE

A NATURAL APPROACH TO  
CHEMISTRY



SEPUP designs issue-oriented curricula for secondary science classrooms. The instructional materials present standards-based science content in the context of personal and societal issues. These issues range from personal medical issues, such as whether to be tested for a genetic disease, to societal issues such as the sustainable use of resources.

**SEPUP instructional materials are designed to encourage student sensemaking and promote the use of scientific principles, processes, and evidence in public decision making.** SEPUP programs are extensively tested in local and national centers to ensure they are effective with diverse groups of students in a variety of settings.

The SEPUP approach also enhances the role of teachers as facilitators of student learning and as educational leaders within their communities by having them share in the development, implementation, and assessment of issue-oriented science materials and programs.

***A Natural Approach to Chemistry* gives students the opportunity to do chemistry, not just read about it.** In this program students learn the science to understand how chemistry is relevant to their lives.

The developers saw an opportunity in chemistry curricula, with students using college books that were written at the wrong reading level for them, emphasizing problem-solving without spending enough time on conceptualizing the big picture of chemistry. They felt chemistry instruction needed examples in order to make connections with students, it must be experienced at an appropriate level, and it must be relevant to their lives. In the end the program aims to teach students by posing a question, showing them how to investigate and solve problems without giving them the answers.

*EDC: Earth Science* is an initiative between the Oceans of Data Institute and the Learning and Teaching Division at the Education Development Center, Inc. (EDC). For more than 50 years, EDC has been a leader in efforts to solve a wide range of educational, health, and social problems and is recognized for the high quality of its program and product development, research, technical assistance, and professional and organizational development.

***EDC Earth Science* is designed around the belief that students are capable of rigorous and in-depth explorations in science when given adequate support, structure, and motivation for learning.** Students perform data-intensive investigations set in real-world contexts and engage in a variety of activities that build critical data-using skills.

# TABLE OF CONTENTS

## MIDDLE SCHOOL PROVEN PROGRAMS

About SEPUP	6
Issues and Instructional Materials	8
Customize Your Scope and Sequence	14-15
What Makes it a Program?	16
NGSS Units	18-34
Equitable Access and Literacy	42-43
Assessment System	44-45
Where it all gets put together	67
Professional Development	12, 35

## NGSS CURRICULUM

Issues and Instructional Materials	8
Sensemaking and Concrete Experiences	10-11
Implementing the NGSS	12-13
Customize your scope and sequence	14-15
NGSS Equipment Packages	36-40
NGSS and 3-D Learning	41
Equitable Access and Literacy	42-43
Assessment System	44-45

### NGSS Middle School Units by SEPUP

Earth's Resources	18
Geological Processes	19
Land, Water, and Human Interactions	20
Solar System and Beyond	21
Weather and Climate	22
Biomedical Engineering	23
Body Systems	24
Ecology	25
Evolution	26
From Cells to Organisms	27
Reproduction	28
Chemical Reactions	29
Chemistry of Materials	30
Energy	31
Fields and Interactions	32
Force and Motion	33
Waves	34
NGSS High School Earth Science	94

### ISSUES AND EARTH SCIENCE by SEPUP

Full Course (Second Edition)	48-56
------------------------------	-------

### ISSUES AND LIFE SCIENCE by SEPUP

Full Course (Second Edition)	58-66
------------------------------	-------

### ISSUES AND PHYSICAL SCIENCE by SEPUP

Full Course (Second Edition)	68-75
------------------------------	-------

### PROFESSIONAL DEVELOPMENT 12, 35

## HIGH SCHOOL PROVEN PROGRAMS

What Makes it a Program?	76
SEPUP	78
Oceans of Data Institute	92
A Natural Approach to Chemistry	102

### SCIENCE & GLOBAL ISSUES: BIOLOGY by SEPUP

Full Course	80
Sustainability	82
Ecology: Living on Earth	83
Cell Biology: World Health	84
Genetics: Feeding the World	85
Evolution: Maintaining Biodiversity	86

### SCIENCE AND SUSTAINABILITY by SEPUP

Full Course	88
Part 1: Living on Earth	90
Part 2: Feeding the World	90
Part 3: Using Earth's Resources	91
Part 4: Moving the World	91

### EDC EARTH SCIENCE by EDC

Full Course	94
Hydrosphere: Water in Earth's Systems	96
Atmosphere and Climate	97
Earth's Place in the Universe	98
Plate Tectonics	99
The Rock Cycle	100
Earth Resources	101

### A NATURAL APPROACH TO CHEMISTRY

Full Course	104
Scope and Sequence	106
Lab Master Safety Package	108

## KEY TO ICONS

- AG** – popular with AgSci teachers
- ADD A GROUP** – materials for one additional group of four
- LITERACY** – meets our criteria for supporting literacy
- NONCONSUMABLE** – contains no consumable materials
- REFILLABLE** – refills for consumable items are available (-RC indicates a discounted refill pack)
- SPANISH** – comes with two sets of student sheets, one in English, one in Spanish
- STEM** – meets our stringent STEM criteria

# TESTIMONIALS AND TWEETS



**Rodger Lawson**

@lawson\_rodger

SEPUP's best lab ever. What happens to the waste??



10:08 PM · Nov 2, 2019



**Kathryn Eller**

@KathrynEller3

High School [#scienceteachers](#) enjoy learning how to use \$20,000 worth of lab stations and e-resources provided and trained by [@labaids](#) and funded through a grant awarded to [@ebec\\_ri](#) by [@USnavyresearch](#). Johnston, Cranston and Coventry High Schools and Tourtellotte Memorial HS, CT



8:06 PM · Oct 28, 2019



**Diana Pierscinski**

@MrsPierscinski

Students continue to learn about mutations. They followed the inheritance of a hemoglobin mutation through 2 generations. They learned the positives and negatives to the sickle cell gene (sickle cell anemic vs. carrier) and the effects malaria has on them. [@LarsonMS](#) [@SEPUP\\_UCB](#)



5:54 PM · Oct 8, 2019



**Rebels SOS - Seriously Obsessed with Science**

@crscienceteach

Light Station Wave Reflection Lab. So fun! [@SEPUP\\_UCB](#) [@STEMuClaytion](#) [@AmyWindus](#) [#mycrs](#)



9:21 AM · Oct 10, 2019



**Audrey Braun**

@MissBraunWMS

Creating a clay model of some organs and structures of the body. Following our guiding question of “what do we know about structures, such as organs, in the human body?” @weldre4instruct @Weld4 @LabAids #science #bodysystems #InspIRE4



4:30 PM · Oct 3, 2019



**Toby McDonald Chou**

@sciencewithtoby

The role of CO<sub>2</sub> in photosynthesis is the hardest for Ss to grasp since they can't see it. BTB makes CO<sub>2</sub> visible. Next, Ss will design an investigation to test if light is necessary for this phenomenon to occur. @LabAids @SEPUP\_UCB @NGSSphenomena #NGSS



12:45 PM · Mar 20, 2019



**Tammy Gilbert**

@TGilb10

Hiding in the background, toothpick worm model. SEPUP. @bpbroncos @troyschools



10:31 AM · Apr 15, 2019



**Marie Chick Woodman**

@ChickWoodman

8th Grade Science Teachers exploring their new units! @LabAids #SEPUP



10:04 PM · Oct 22, 2019

“I use *Science and Global Issues: Biology* designed at @SEPUP\_UCB and supported by @LabAids. Hands down the best HS Biology curriculum out there! Naturally 3 dimensional & phenomena-based before we even knew it was cool!”

— Ginny Rehberg

# WHAT MAKES IT A PROGRAM?

## It all works together.

Lab-Aids programs combine components to *make a system* for learning. Lab equipment and materials are as important as the well-written investigations and readings. Both are needed to make the unit storyline and phenomena come alive for students.



## Real-world issues make the content relevant

Intentional lesson sequencing drives concept and skill development.

- Use of anchoring/investigative phenomena
- Encourages sensemaking
- Three-dimensional learning
- Field-tested

## Complete equipment packages support up to 160 students

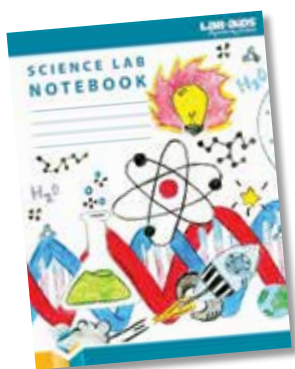
High quality materials designed for re-use year after year.

- Highly organized drawers
- Groups or partners; not demos
- Minimal consumable cost
- Various activity types

Choose the unit books and equipment that best meet your state's scope and sequence.



Lab notebooks are used in each lesson to guide students and help make the learning their own. Online teacher portals are included and provide a variety of tools to make teaching easier. Student access to the full curriculum and additional resources, like LABsent, are also available.



## Built-in literacy strategies support diverse learners

Use of the Lab-Aids Science Lab Notebook is highly recommended.

- Embedded writing frames and literacy tools
- Reinforced by notebook use
- Support for Common Core

## Teacher resources provide support now and in the future

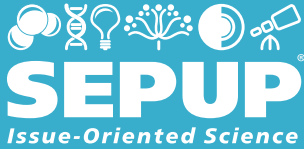
Designed for continued professional development.

- Universal platform
- Editable PowerPoint slides
- Interactive assessments
- Supports differentiated lessons

**Embedded literacy, assessments and online ancillaries are included with each unit.**

# ABOUT SEPUP

All Lab-Aids middle school programs are developed by SEPUP, at the Lawrence Hall of Science, University of California, Berkeley.



The **Science Education for Public Understanding Program** (SEPUP) began developing science instructional materials with funding from the National Science Foundation. Now SEPUP materials are used by millions of students in the United States.



THE LAWRENCE  
HALL OF SCIENCE

SEPUP is part of the University of California, Berkeley's **Lawrence Hall of Science**, a well-known center for the development of exemplary science instructional materials and practices. SEPUP's staff are former science and technology teachers, curriculum coordinators, science education faculty, and research scientists.

## Twenty years of research and evaluation shows that SEPUP programs:

- increase students' interest in science and perception of its relevance to their lives.
- lead to meaningful gains in student performance.
- improve students' content knowledge and ability to engage in scientific practices.



**books + equipment + online access**

# Middle School



## USING ISSUES TO ANCHOR AN NGSS UNIT

The issues in SEPUP's *Issues and Science* allow each unit to follow a coherent storyline and **provide context for the relevant anchoring and investigative phenomena**. These issues are the big ideas that students hear about and often directly experience in the world around them. They connect the why to the content and practice, "Why does it matter to learn this?"

Issue-oriented science forms the foundation of SEPUP's instructional materials and it is the only secondary science program to do so.

In *Issues and Science*, these kinds of issues help shape a **coherent storyline** for students' work and reflection. The connected activities and investigations also require students to make sense of scientific evidence and to analyze the trade-offs involved in personal and societal decisions. Connecting these experiences back to the issue **anchors the learning to specific, real-world conversations happening today**.

SEPUP believes that students should be able to explore and explain how people and their environment are affected by real-world phenomena, such as manufacturing waste or invasive species. These issues are carefully selected *because* they often lack clear or known solutions.

Students are intrinsically motivated to learn when the context of their activities and assessments feels **authentic** and when one activity to the next is coherently connected.

Pictured right: A visual connection between the issue, phenomena, and activities (including assessments) in *Chemical Reactions*, one of seventeen units from *Issues and Science: Designed for the NGSS*.

# Unit Issue

Provides context for relevant and connected anchoring and investigative phenomena within the unit.

Chemicals and chemical reactions are used to make and power useful products, including the batteries and circuits in electronics, but they also create waste. How can our understanding of science and engineering improve product design and methods to clean up waste?

# Unit Phenomena

What can we observe in science that makes us wonder?

Sometimes when we make a product, we get side products we don't want.

When you mix substances, they do things like fizz, change color, or temperature.

The amount of matter after a chemical reaction is the same as the total before.

When you mix chemicals, they get hot or cold or give off electricity or light.

Sometimes when we make a product, we get unwanted side products, but we can do something about it.

# Activities

Students use SEPs, DCI, and CCC to explain, justify, and argue a point of view about the issue.

design a circuit board

collect etching waste

observe chemical changes

reactions at the molecular scale

conservation of mass

design a battery

develop a product prototype

refine the design

solutions to waste pollution

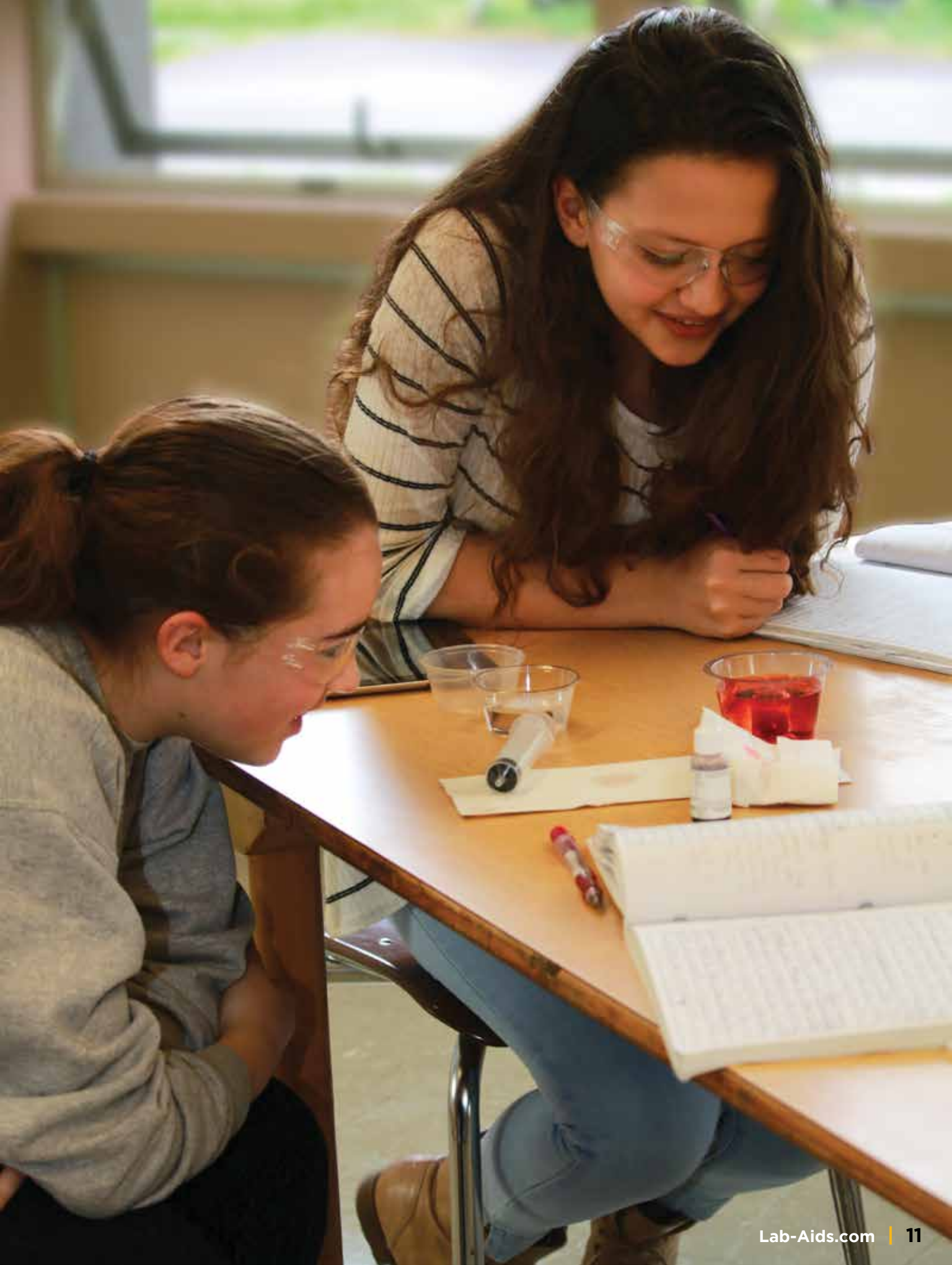
*Chemical Reactions, Issues and Science*

## STUDENT SENSEMAKING & CONCRETE EXPERIENCES

In the SEPUP 6–8 NGSS program, *Issues and Science*, **sensemaking is a dynamic process** where students build or revise an explanation in order to “figure something out”—to determine the mechanism underlying a phenomenon in order to resolve a gap or inconsistency in their understanding. As such, opportunities for sensemaking are consistently present so that students may progress in their understanding of the three dimensions and how those relate to the unit issue and phenomena.

At the beginning of each unit, **embedded strategies** encourage students to make connections to their experiences and communities, as well as share any background knowledge related to the phenomena under investigation. These prior and alternate ideas surface during the initial sharing and are later challenged with evidence as they revisit and revise their understanding.

Whenever possible, **students explore concepts by gathering data through direct, first hand, experience**. Rather than only reacting to a video or following the steps of a computer simulation, SEPUP students frequently manipulate scientific tools custom designed to investigate a specific problem or engineer a solution. By conducting valid experiments, **challenging and assessing their own initial ideas**, and applying their understanding to real-world issues, students in the classroom become scientists and engineers in their own right.



# IMPLEMENTING THE NGSS

The NGSS have the ability to transform how our students learn science and engineering – and that transformation will not happen overnight. Where is the best place to start? How do we ensure that our teachers will be supported in the process?

**Build awareness in year one** using SEPUP’s exemplary curriculum as a model and context for the NGSS and supported by customized Professional Development from Lab-Aids.

As teachers **transition into year two** Professional Development dives deeper into a three-dimensional classroom, adding more robust differentiation and literacy supports, embedding assessment, and customizing the curriculum to meet district and teacher needs.

## 1 Select and sequence units to best address your needs (choose any or all)

### EARTH

- Solar System and Beyond
- Earth’s Resources
- Geological Processes
- Weather and Climate
- Land, Water, and Human Interactions

### LIFE

- Body Systems
- From Cells to Organisms
- Reproduction
- Ecology
- Evolution
- Biomedical Engineering

### PHYSICAL

- Chemistry of Materials
- Chemical Reactions
- Force and Motion
- Fields and Interactions
- Energy
- Waves

## 2 Schedule Professional Development

PD needs vary greatly so we tailor sessions to best meet each school’s needs

### YEAR ONE

(over 2–4 sessions)

- Shift from teacher to student driven classroom
- Using overarching issues as content context
- Focus on engaging students in the Practices
- Notebooking & Student Ownership
- Using a spiraling curriculum
- Explore criteria setting with Evidence and Trade-Offs assessment variable

### YEAR TWO

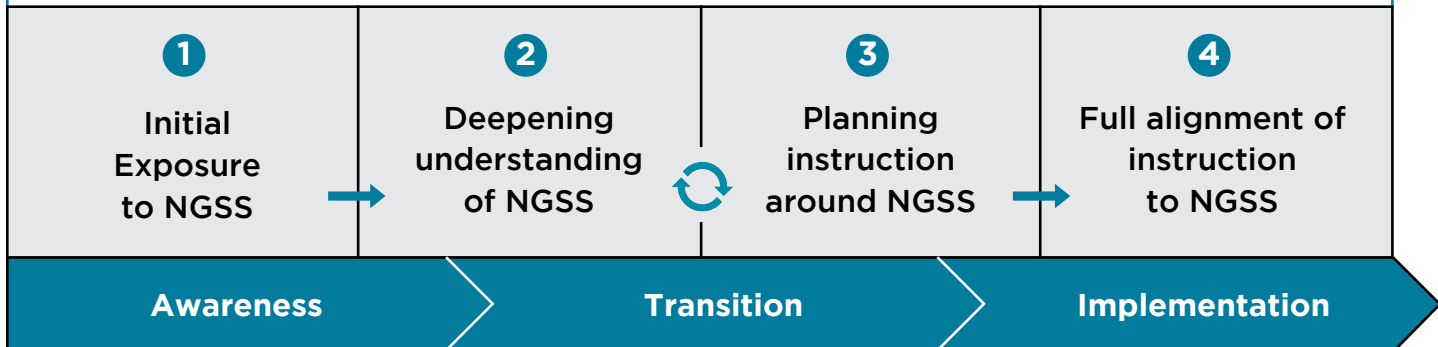
(over 2–3 sessions)

- Deeper focus on assessment, assessment variables, and student work
- More robust differentiation and literacy supports
- Making Crosscutting Concepts explicit
- Addressing misconceptions
- Group Interaction and Communication
- Guided dialog across grade levels

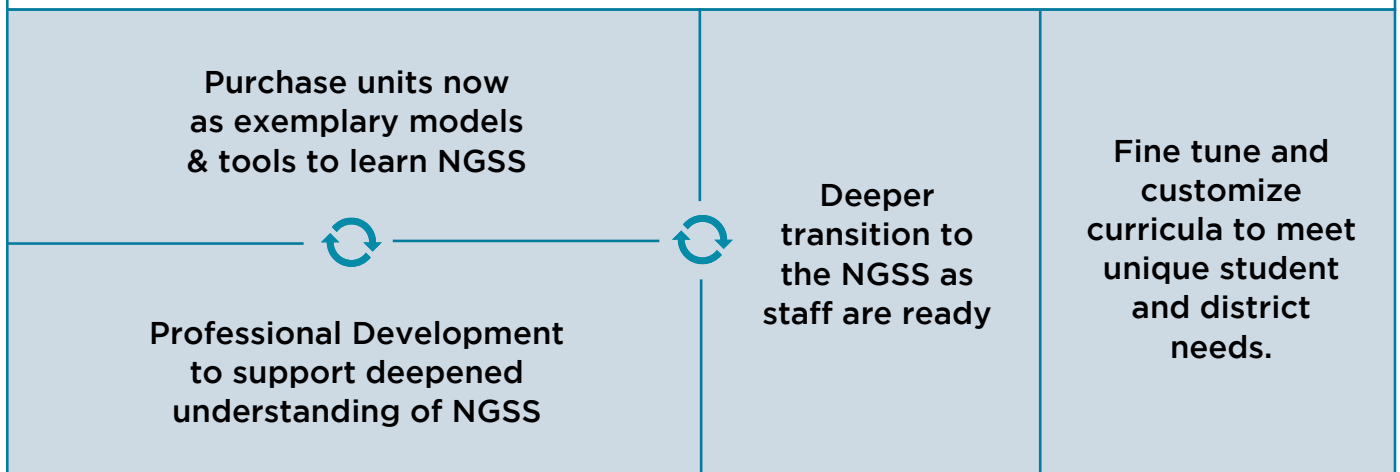
- ## 3
- Make adjustments to existing programs
  - Continued focus on assessment and measuring growth in student performance
  - Internal PD for continued growth (Lab-Aids Summer Academy and Train the Trainer)





## NGSS Implementation Pathway Model\*:



## Suggested Implementation Model Using SEPUP:



## PURCHASE OPTIONS:

Complete Equipment Package	+	Student Access
 <p><b>Equipment + Teacher Resources</b></p>	 <p><b>Student Book and/or Online Student Portal</b></p>	
Organized materials for up to 5 classes of 32 students, mobile storage cart, subscription to online Teacher Portal for one teacher, which includes online access to resources listed above.	and/or	Subscription to online student portal: English and Spanish student books and student sheets, LABsent, resource supplements.

See the following unit pages for pricing.

\* J. Spiegel and K. Bess, Y. Shimojyo, A. Quan. 2014.


# CUSTOMIZE YOUR SCOPE AND SEQUENCE

Unit books and equipment packages make it easier to customize a program based on your state standards and a recommended scope and sequence.

## Curriculum Customization

An example of one scope and sequence using the California integrated model.



### 6th Grade


 DESIGNED FOR NGSS  
**From Cells to Organisms**  
5–6 weeks

**Unit Issue**  
How should we prevent the spread of an infectious disease?

**PE Unit Bundle**  
LS1-1, LS1-2, LS1-6, LS1-7

Complete Equipment Package: SMS-CEL-3000  
Student Unit Book: SMS-CEL-3SB



 


 DESIGNED FOR NGSS  
**Body Systems**  
4 weeks

**Unit Issue**  
How do we know if a medicine is safe and effective?

**PE Unit Bundle**  
LS1-3, LS1-8

Complete Equipment Package: SMS-BOD-3000  
Student Unit Book: SMS-BOD-3SB



 

 DESIGNED FOR NGSS  
**Weather and Climate**  
6–7 weeks


**Unit Issue**  
How does the weather affect people and how do people affect the climate?

**PE Unit Bundle**  
ESS2-5, ESS2-6, ESS3-5, ETS1-3, ETS1-4

Complete Equipment Package: SMS-WEA-3000  
Student Unit Book: SMS-WEA-3SB



### 7th Grade


 DESIGNED FOR NGSS  
**Chemistry of Materials**  
6 weeks

**Unit Issue**  
What are the environmental impacts of producing, using, and disposing of materials?

**PE Unit Bundle**  
PS1-1, PS1-3, PS1-4

Complete Equipment Package: SMS-MAT-3000  
Student Unit Book: SMS-MAT-3SB



 


 DESIGNED FOR NGSS  
**Ecology**  
7 weeks

**Unit Issue**  
What are the effects of introduced species, and what can be done about them?

**PE Unit Bundle**  
LS2-1, LS2-2, LS2-3, LS2-4, LS2-5

Complete Equipment Package: SMS-ECO-3000  
Student Unit Book: SMS-ECO-3SB



 

 DESIGNED FOR NGSS  
**Biomedical Engineering**  
3 weeks


**Unit Issue**  
How can engineering be used to improve the lives of those living with medical conditions?

**PE Unit Bundle**  
ETS1-1, ETS1-2, ETS1-3, ETS1-4

Complete Equipment Package: SMS-BIO-3000  
Student Unit Book: SMS-BIO-3SB



### 8th Grade


 DESIGNED FOR NGSS  
**Force and Motion**  
5 weeks

**Unit Issue**  
How can we reduce the risk of motor vehicle accidents?

**PE Unit Bundle**  
ETS1-1, PS2-1, PS2-2, PS3-1

Complete Equipment Package: SMS-FOR-3000  
Student Unit Book: SMS-FOR-3SB


 DESIGNED FOR NGSS  
**Solar System and Beyond**  
5 weeks

**Unit Issue**  
What kinds of future space missions should we fund and conduct?

**PE Unit Bundle**  
ESS1-1, ESS1-2, ESS1-3

Complete Equipment Package: SMS-SPA-3000  
Student Unit Book: SMS-SPA-3SB



 

 DESIGNED FOR NGSS  
**Fields and Interactions**  
5–6 weeks


**Unit Issue**  
How do different types of force fields help us design transportation?

**PE Unit Bundle**  
PS2-3, PS2-4, PS2-5, PS3-2, ETS1-1, ETS1-2, ETS1-3, ETS1-4

Complete Equipment Package: SMS-FIE-3000  
Student Unit Book: SMS-FIE-3SB

For an interactive experience, using your state’s standards as the starting template, build your own custom middle school curriculum at [lab-aids.com/custom-curriculum](http://lab-aids.com/custom-curriculum).




DESIGNED FOR NGSS  
**Energy**  
6 weeks

**Unit Issue**  
How can people manipulate energy transfer and transformation to use energy more efficiently?

**PE Unit Bundle**  
PS3-3, PS3-4, PS3-5, MS-ETS1-4

Complete Equipment Package: SMS-ENE-3000  
Student Unit Book: SMS-ENE-3SB

**SEPUP** **Lab-aids**




DESIGNED FOR NGSS  
**Reproduction**  
3-4 weeks

**Unit Issue**  
What are the ethical issues involved in using genetic information?

**PE Unit Bundle**  
LS1-4, LS1-5, LS3-1, LS3-2

Complete Equipment Package: SMS-REP-3000  
Student Unit Book: SMS-REP-3SB

**SEPUP** **Lab-aids**



DESIGNED FOR NGSS  
**Land, Water and Human Interactions**  
5-6 weeks

**Unit Issue**  
Which areas of Boomtown are the best choice for construction?

**PE Unit Bundle**  
ESS2-2, ESS2-4, ESS3-3, ETS1-1, ETS1-2

Complete Equipment Package: SMS-IMP-3000  
Student Unit Book: SMS-IMP-3SB

**SEPUP** **Lab-aids**




DESIGNED FOR NGSS  
**Geological Processes**  
6-7 weeks

**Unit Issue**  
Where should we store nuclear waste?

**PE Unit Bundle**  
ESS2-1, ESS2-2, ESS2-3, ESS3-1, ESS3-2

Complete Equipment Package: MS-GEO-3000  
Student Unit Book: SMS-GEO-3SB

**SEPUP** **Lab-aids**



DESIGNED FOR NGSS  
**Chemical Reactions**  
3 weeks


**Unit Issue**  
How do people use chemical reactions to solve problems?

**PE Unit Bundle**  
ETS1-3, ETS1-4, PS1-2, PS1-5, PS1-6

Complete Equipment Package: SMS-REA-3000  
Student Unit Book: SMS-REA-3SB

**SEPUP** **Lab-aids**

To request a physical set of these cards, please contact your Curriculum Specialist.




DESIGNED FOR NGSS  
**Evolution**  
7 weeks

**Unit Issue**  
How are people affected by and affecting evolution?

**PE Unit Bundle**  
LS3-1, LS4-1, LS4-2, LS4-3, LS4-4, LS4-5, LS4-6

Complete Equipment Package: SMS-EVO-3000  
Student Unit Book: SMS-EVO-3SB

**SEPUP** **Lab-aids**




DESIGNED FOR NGSS  
**Earth's Resources**  
4 weeks

**Unit Issue**  
How is a growing human population affecting the availability of natural resources?

**PE Unit Bundle**  
ESS1-4, ESS3-1, ESS3-4

Complete Equipment Package: SMS-RES-3000  
Student Unit Book: SMS-RES-3SB

**SEPUP** **Lab-aids**



DESIGNED FOR NGSS  
**Waves**  
5 weeks

**Unit Issue**  
How are waves both helpful and harmful?

**PE Unit Bundle**  
PS4-1, PS4-2, PS4-3

Complete Equipment Package: SMS-WAV-3000  
Student Unit Book: SMS-WAV-3SB

**SEPUP** **Lab-aids**

# WHAT MAKES IT A PROGRAM?



## It all works together.



All SEPUP units contain components that combine to make a system of learning. Lab equipment and materials are as important as the well-written investigations and readings. All are needed to make the unit storyline come alive for students and to fully support teachers implementing the Next Generation Science Standards.

## ONLINE TEACHER AND STUDENT PORTALS PROVIDE ADDITIONAL RESOURCES:

- Assign homework and communicate with students
- Note taking & highlighting for students
- Online Student and Teacher books
- LABsent sheets & videos for absent students
- Integrated, online assessment system
- Editable PowerPoints for each lesson
- Spanish text and student sheets
- Single Sign-On (SSO) available



## PURCHASE OPTIONS:

Complete Equipment Package	+ Student Access
 <p data-bbox="286 1647 656 1671">Equipment + Teacher Resources</p>	 <p data-bbox="902 1647 1395 1671">Student Book and/or Online Student Portal</p>
<p data-bbox="109 1745 810 1815">Includes organized materials for up to 5 classes of 32 students, mobile storage cart, subscription to online Teacher Portal for one teacher, which includes online access to resources listed above.</p>	<p data-bbox="902 1745 1071 1815">Hard bound, non-consumable student books</p> <p data-bbox="1156 1708 1387 1851">Subscription to online student portal: English and Spanish student books, LABsent, student sheets, resource supplements.</p>

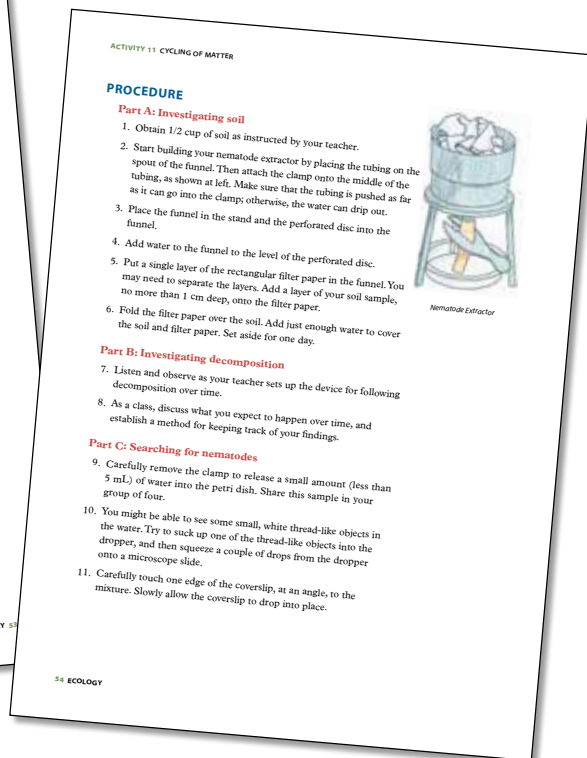
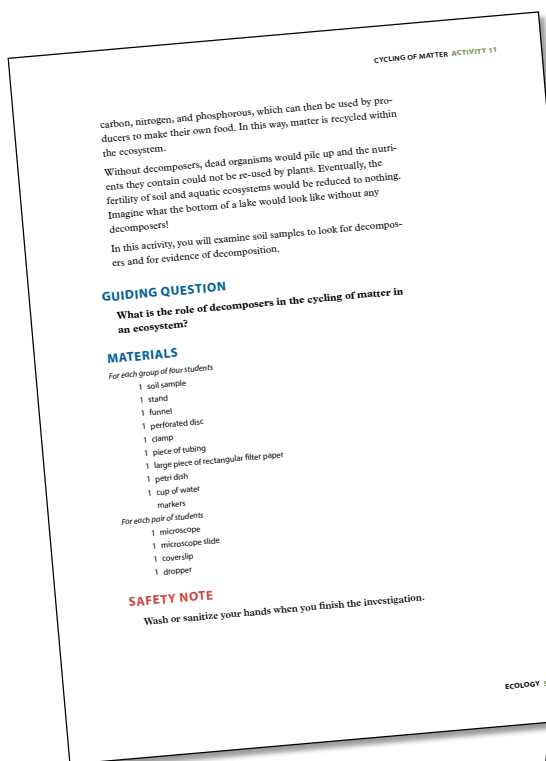


## PROGRAM COMPONENTS:

Individual components combine to form a complete learning system.

- Student book that seamlessly integrates investigations, labs, and readings into the context of the issue's storyline
- Equipment to carry out each embedded activity for 5 classes of 32 students (in groups of four, pairs or individuals)
- Online student and teacher bookshelf portals
- Student Science Lab notebook

Materials needed for embedded labs and activities are included in the Complete Equipment Package





## EARTH'S RESOURCES FOR NGSS

### How is a growing human population affecting the availability of natural resources?

Students will explore natural resources such as metals, fossil fuels, and freshwater along with the Earth processes that form them. They also investigate the technologies and trade-offs involved with obtaining these resources.

**Core Science Content:** Renewable resources, minerals, energy & groundwater resource distribution, human population growth, geological processes, resource consumption, geologic time, rock strata, fossil evidence

**PE Assessment Example:** How has an increase in human population and natural-resource consumption affected Earth? Support your answer with evidence.

ESS1-4, ESS3-1, ESS3-4

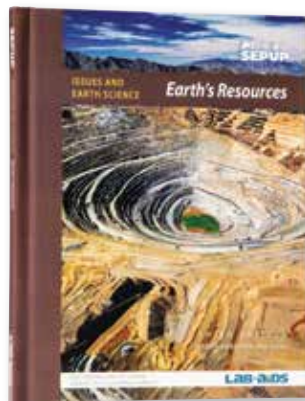
#### 4-6 WEEK UNIT

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)

ADD A GROUP

STEM LITERACY

REFILLABLE SPANISH



Single drawer shown. For full equipment images see page 37

EARTH'S RESOURCES THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-RES-3000	\$2,054.65
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-RES-3OLSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-RES-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-RES-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	No transition - brand new unit	
<b>REFILLS</b> Average cost of refills is \$60.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# GEOLOGICAL PROCESSES FOR NGSS

## Where should we store our nuclear waste?

Students learn about both gradual and sudden changes to the Earth’s surface, what causes them, and how they are monitored. They also explore how different kinds of rocks are formed and learn about some natural resources, where we find them, and how we use them.

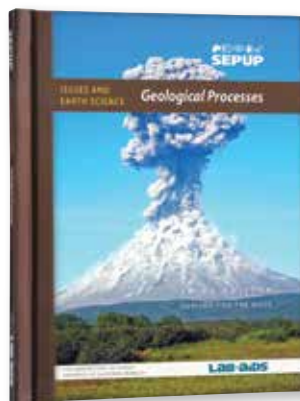
**Core Science Content:** Earth’s history, earthquakes, volcanoes, plate tectonics, mountain building, continental drift, natural resources

**PE Assessment Example:** Would you select one of the four suggested sites for storing nuclear waste? Explain. Use evidence from this unit to support your decision and identify any trade-offs.

**ESS2-1, ESS2-2, ESS2-3, ESS3-1, ESS3-2**



Single drawer shown. For full equipment images see page 39



**5-7 WEEK UNIT**

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)

**ADD A GROUP**

**LITERACY STEM**

**SPANISH REFILLABLE**

GEOLOGICAL PROCESSES THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-GEO-3000	\$2,225.75
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-GEO-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-GEO-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-GEO-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-GEO-3000T	\$1,537.90
<b>REFILLS</b> Average cost of refills is \$100 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# LAND, WATER, AND HUMAN INTERACTIONS FOR NGSS

## Which areas of Boomtown are the best choice for construction?

Students construct explanations based on evidence for how geoscience processes have changed Earth's surface. They will model how water cycles over and under the surface and through the air and have opportunities to apply scientific principles to design systems that can reduce the human impact on land and water.

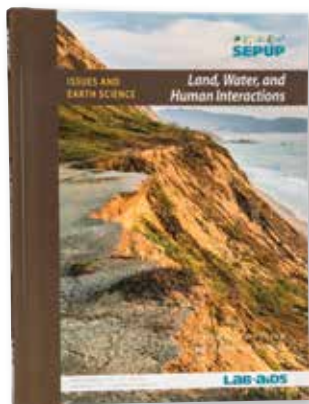
**Core Science Content:** Topography, erosion, deposition, landforms, human impact of building, nutrient pollution, water cycle, weathering

**PE Assessment Example:** Based on the evidence presented in this unit, which geological processes along the Mississippi: a. changed the land's surface features? b. over millions of years? c. over a short time period? d. will continue in the future? e. can be observed as a model? Explain how. Make sure to also identify the process(es), and include evidence.

**ESS2-2, ESS2-4, ESS3-3, ETS1-1, ETS1-2**

**5-6 WEEK UNIT**

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)



Single drawer shown. For full equipment images see page 39-40

- ADD A GROUP
- STEM LITERACY
- REFILLABLE SPANISH

LAND, WATER, AND HUMAN INTERACTIONS THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-IMP-3000	\$1,906.45
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-IMP-3OLSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-IMP-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-IMP-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-IMP-3000T	\$1,022.20
<b>REFILLS</b> Average cost of refills is \$105.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)





## SOLAR SYSTEM AND BEYOND FOR NGSS

### What kinds of future space missions should we fund and conduct?

Students take observations from their everyday life and build scientific models to try to understand how phenomena, such as changes in the moon's appearance, seasons, and gravity work. Through data collection and analyzation students later use their understanding of what can be learned through space missions to determine the trade-offs of different proposed space missions.

**Core Science Content:** Earth, moon, moon phases, seasons, axial tilt, Solar system, planetary motion, gravity

**PE Assessment Example:** Prepare a labeled diagram that includes a caption explaining how Earth's tilt and its orbit around the Sun cause each of the following: a. changes in the angle of sunlight hitting the Earth's surface. b. the seasons in the Southern Hemisphere to be opposite of the seasons in the Northern Hemisphere.

ESS1-1, ESS1-2, ESS1-3



Single drawer shown. For full equipment images see page 40



5 WEEK UNIT

For more information on our NGSS curriculum, please visit [lab-aids.com/Sinnovations](http://lab-aids.com/Sinnovations)

ADD A GROUP

LITERACY SPANISH

STEM NONCONSUMABLE

SOLAR SYSTEM AND BEYOND THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-SPA-3000	\$1,218.00
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-SPA-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-SPA-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-SPA-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-SPA-3000T	\$822.25
<b>REFILLS</b> No refills needed in the use of this unit		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# WEATHER AND CLIMATE FOR NGSS

## How does the weather affect people and how do people affect the climate?

Students analyze weather, climate, and factors affecting them through the eyes of scientists who study Earth’s weather and atmosphere. They also investigate the links between human activity and changes in global climate.

**Core Science Content:** Weather, weather forecasts, climate, solar energy, wind, Coriolis effect, water, ocean and wind currents, global climate change, global warming, greenhouse gases

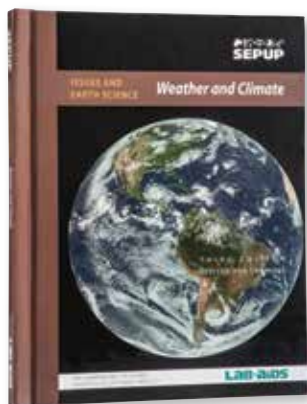
**PE Assessment Example:** Your friend claims that there is nothing that humans can do about global warming since Earth’s temperature is always slowly rising. a. Do you agree or disagree with your friend? Support your answer with evidence from this activity, and explain your reasoning. b. What other data, or evidence, would you like in order to better evaluate your friend’s claim?

ESS2-5, ESS2-6, ESS3-5, ETS1-3, ETS1-4

**6-7 WEEK UNIT**

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)

- ADD A GROUP
- STEM LITERACY
- REFILLABLE SPANISH



Single drawer shown. For full equipment images see page 40

WEATHER AND CLIMATE THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-WEA-3000	\$1,422.00
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-WEA-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-WEA-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-WEA-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-WEA-3000T	\$619.25
<b>REFILLS</b> Average cost of refills is \$125.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# BIOMEDICAL ENGINEERING FOR NGSS

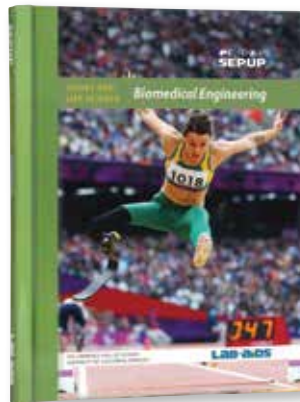
## How can engineering be used to improve the lives of those living with medical conditions?

Students develop, design, and optimize models for devices used to improve human health and safety. This unit focuses on the practice of engineers who use technology, mathematics, and knowledge of biological systems to solve biological or medical problems.

**Core Science Content:** Bioengineering, engineering design process, prototypes, prosthesis, technology

**PE Assessment Example:** There are two major types of artificial heart valves on the market. The first is a mechanical valve made of titanium and carbon, and the second is a bioprosthetic valve made of animal valve tissue. If the cost was about the same, which device is more appropriate for a. a healthy grandparent?, b. a young person? Explain what evidence you think is most important and what trade-offs you are willing to accept.

ETS1-1, ETS1-2, ETS1-3, ETS1-4



**3-4 WEEK UNIT**

For more information on our NGSS curriculum, please visit [lab-aids.com/Sinnovations](http://lab-aids.com/Sinnovations)

ADD A GROUP

LITERACY STEM

SPANISH REFILLABLE

Single drawer shown. For full equipment images see page 36

BIOMEDICAL ENGINEERING THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-BIO-3000	\$1,128.85
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-BIO-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-BIO-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-BIO-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-BIO-3000T	\$284.10
<b>REFILLS</b> Average cost of refills is \$135.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# BODY SYSTEMS FOR NGSS

## How do we know if a medicine is safe and effective?

Students investigate questions about how systems in their bodies work together and what happens if one of those systems isn't working properly. They also develop and use models to describe how their bodies turn food into energy their bodies can use.

**Core Science Content:** Body system structures and functions, system interactions, medicines and body systems, human health, clinical trials, matter and energy, nutrients, stimuli, digestion (systems include: circulatory, digestive, nervous, and respiratory)

**PE Assessment Example:** Imagine you just dipped your foot into a swimming pool. You expected the pool to be warm, but it was ice cold! Which of your body systems help you gather and synthesize information to react to this situation? Explain the cause and effect sequence that leads to your reaction.

LS1-3, LS1-8

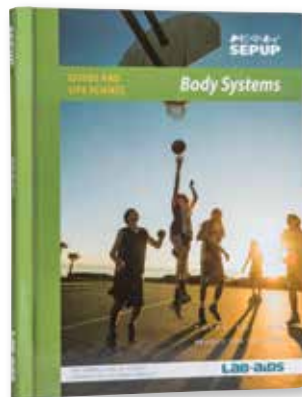
### 4 WEEK UNIT

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)

ADD A GROUP

STEM LITERACY

REFILLABLE SPANISH



Single drawer shown. For full equipment images see page 36

BODY SYSTEMS THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-BOD-3000	\$1,746.85
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-BOD-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-BOD-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-BOD-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-BOD-3000T	\$830.10
<b>REFILLS</b> Average cost of refills is \$128.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# ECOLOGY FOR NGSS

## What are the effects of introduced species, and what can be done about them?

Introduced species can cause disruptions to ecosystems. Students explore these potential impacts through the use of models and by analyzing and interpreting data on introduced species. Finally, they consider potential solutions for controlling invasive species.

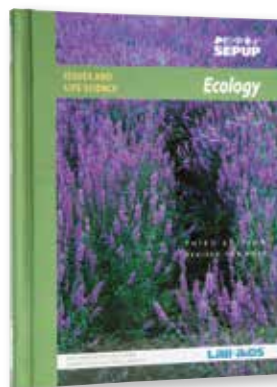
**Core Science Content:** Ecosystems, food webs, biotic and abiotic interactions, energy and matter, disruptions in ecosystems, invasive species

**PE Assessment Example:** “What effect can certain introduced species have on an environment? What, if anything, can or should be done to control these species?”

LS2-1, LS2-2, LS2-3, LS2-4, LS2-5



Single drawer shown. For full equipment images see page 37



**7 WEEK UNIT**

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)

ADD A GROUP

LITERACY STEM

SPANISH REFILLABLE

ECOLOGY THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-ECO-3000	\$1,216.00
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-ECO-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-ECO-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-ECO-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-ECO-3000T	\$518.85
<b>REFILLS</b> Average cost of refills is \$285.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# EVOLUTION FOR NGSS

## How are people affected by and affecting evolution?

Students explore Charles Darwin's theory of evolution by natural selection, how populations of organisms change over time and how new species arise while others go extinct. They also learn to interpret the many sources of evidence for the evolution of life on Earth now and in the past.

**Core Science Content:** Evolution by natural selection, speciation, extinction, humans and evolution, embryology, genes evolution, geologic time scale, fossils, evolutionary tree, genetic engineering, artificial selection

**PE Assessment Example:** Explain how environmental changes affect the sickle cell trait over time in your population. Use evidence, including mathematical representations, from your investigation to support your explanation.

LS3-1, LS4-1, LS4-2, LS4-3, LS4-4, LS4-5, LS4-6

### 5-6 WEEK UNIT

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)



Single drawer shown. For full equipment images see page 38

ADD A GROUP

LITERACY SPANISH

NONCONSUMABLE STEM

EVOLUTION THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-EVO-3000	\$1,643.80
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-EVO-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-EVO-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-EVO-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-EVO-3000T	\$876.00
<b>REFILLS</b> No refills needed in the use of this unit		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)

# FROM CELLS TO ORGANISMS FOR NGSS

## How should we prevent the spread of an infectious disease?

Students investigate how scientists first learned about cells and how this discovery led to new understandings of how infectious diseases spread. They gather evidence about the structures and functions of cells, develop models of cells, and explain how cells in animals and plants get the matter and energy they need to survive and grow.

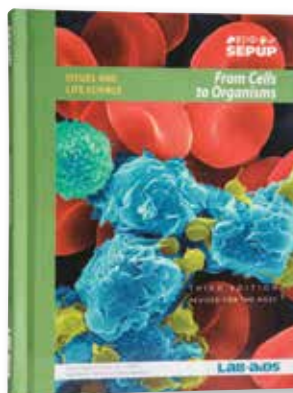
**Core Science Content:** Multicellular organism levels of organization, animal cell structure and function, plant cell structure and function, cell theory, germ theory of disease, cellular respiration, photosynthesis, matter and energy

**PE Assessment Example:** Based on what you have learned in the “Cells Alive!” activity and this activity, draw a diagram (or create another type of model) to show what happens to the food you eat. Your model should show the movement of matter and the release of energy stored in food.

LS1-1, LS1-2, LS1-6, LS1-7



Single drawer shown. For full equipment images see page 39



5-6 WEEK UNIT

For more information on our NGSS curriculum, please visit [lab-aids.com/Sinnovations](http://lab-aids.com/Sinnovations)

ADD A GROUP

LITERACY STEM

SPANISH REFILLABLE

FROM CELLS TO ORGANISMS THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-CEL-3000	\$2,053.50
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-CEL-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-CEL-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-CEL-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-CEL-3000T	\$1,127.65
<b>REFILLS</b> Average cost of refills is \$175.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



## REPRODUCTION FOR NGSS

### What are the ethical issues involved in using genetic information?

Students explore how organisms get their traits and what causes variation from one organism to another. They also analyze and interpret evidence for how certain traits affect reproduction. Students learn how both genes and the environment can influence traits and apply what is learned to a human genetic condition.

**Core Science Content:** Heredity, genes, sexual reproduction, asexual reproduction, genetic diversity, inheritance of traits, mutations, reproductive success, genetic disorders, nature vs nurture, pollination, animal behavior, DNA

**PE Assessment Example:** Think back to what you know about Marfan syndrome and fibrillin. Draw a labeled diagram that models the cause-and-effect relationship between the fibrillin gene, fibrillin protein, and traits/ symptoms for a. a person without Marfan syndrome, b. a person with Marfan syndrome.

LS1-4. LS1-5, LS3-1, LS3-2

#### 3-4 WEEK UNIT

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)

ADD A GROUP

STEM LITERACY

REFILLABLE SPANISH



Single drawer shown. For full equipment images see page 40

REPRODUCTION THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-REP-3000	\$1,025.65
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-REP-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-REP-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-REP-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-REP-3000T	\$354.05
<b>REFILLS</b> Average cost of refills is \$75.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# CHEMICAL REACTIONS FOR NGSS

## How do people use chemical reactions to solve problems?

Students analyze and interpret data to determine whether chemical reactions have taken place. They use models to explain what takes place at the atomic/molecular scale during a reaction. They also apply what they learn about chemical reactions to such problems as designing useful products and identifying processes for cleaning up chemical wastes.

**Core Science Content:** Chemical reactions, conservation of atoms and conservation of mass, exothermic and endothermic reactions, design of a product.

**PE Assessment Example:** Use the reaction you have just studied to design, test, and modify a device that can be used as a handwarmer.

PS1-2, PS1-5, PS1-6, ETS1-3, ETS1-4



Single drawer shown. For full equipment images see page 36



5-6 WEEK UNIT

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)

ADD A GROUP

LITERACY STEM

SPANISH REFILLABLE

CHEMICAL REACTIONS THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-REA-3000	\$2,771.70
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-REA-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-REA-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-REA-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	No transition - brand new unit	
<b>REFILLS</b> Average cost of refills is \$499.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



## CHEMISTRY OF MATERIALS FOR NGSS

### What are the environmental impacts of producing, using, and disposing of materials?

Students develop and use models to describe the composition of different materials and how those materials respond under various conditions. They gather and make sense of information about where those materials come from and how scientists and engineers decide which material is best for making a product.

**Core Science Content:** Physical and chemical properties of substances, elements and compounds, chemical reactions, chemistry of materials, states of matter, particle movement, thermal and kinetic energy

**PE Assessment Example:** Develop a model that depicts water molecules in all three states—solid, liquid, and gas—and the relationship between these states. Your model should include the following: particle motion in each state, how particles interact within each state, the cause-and-effect relationship between addition or removal of thermal energy, particle movement, and state changes. *Hint:* Think about the models you created in the last two activities and how you can add any new ideas from this activity to your models.

PS1-1, PS1-3, PS1-4

#### 6 WEEK UNIT

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)

ADD A GROUP

STEM LITERACY

REFILLABLE SPANISH



Single drawer shown. For full equipment images see page 37

CHEMISTRY OF MATERIALS THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-MAT-3000	\$2,055.65
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-MAT-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-MAT-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-MAT-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-MAT-3000T	\$941.60
<b>REFILLS</b> Average cost of refills is \$110.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



## ENERGY FOR NGSS

### How can people manipulate energy transfer and transformation to use energy more efficiently?

Students learn about the transfer and transformation of energy in their everyday lives. They plan and carry out investigations and analyze and interpret data from experiments to investigate how energy is transferred and transformed. They also engage in engineering challenges to design and test devices to maximize and minimize energy transfer.

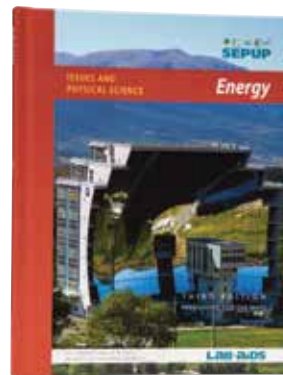
**Core Science Content:** Energy transfer and transformations, types of energy (kinetic, potential, thermal, light), energy efficiency, conservation of energy

**PE Assessment Example:** Design, test, evaluate, and redesign a solar oven that maximizes thermal energy transfer.

PS3-3, PS3-4, PS3-5, MS-ETS1-4



Single drawer shown. For full equipment images see page 37-38



6 WEEK UNIT

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)

ADD A GROUP

LITERACY STEM

SPANISH REFILLABLE

ENERGY THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-ENE-3000	\$1,700.00
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-ENE-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-ENE-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-ENE-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-ENE-3000T	\$795.25
<b>REFILLS</b> Average cost of refills is \$15.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# FIELDS AND INTERACTIONS FOR NGSS

## How do different types of force fields help us design transportation?

Students design solutions to transportation related problems by utilizing forces that are applied by different fields. Students plan and carry out investigations to understand the different properties of gravitational, electric, and magnetic fields. Through the use and development of models, students learn that objects in fields have potential energy due to their positions within those fields.

**Core Science Content:** electric, magnetic, and gravitational fields, forces, and potential energy

**PE Assessment Example:** Your friend says, “I think gravity is the same thing as magnetism.” Write an argument to convince your friend that gravity is a different phenomenon from magnetism. Use evidence from this and previous activities to support your claim and reasoning.

**PS2-3, PS2-4, PS2-5, PS3-2, ETS1-1, ETS1-2, ETS1-3, ETS1-4**

### 5 WEEK UNIT

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)



Single drawer shown. For full equipment images see page 38

ADD A GROUP

STEM LITERACY

REFILLABLE SPANISH

FIELDS AND INTERACTIONS THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-FIE-3000	\$2,349.15
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-FIE-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-FIE-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-FIE-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	No transition - brand new unit	
<b>REFILLS</b> Average cost of refills is \$10 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



## FORCE AND MOTION FOR NGSS

### How can we reduce the risks of motor vehicle accidents?

In this unit, students investigate the relationship between the kinetic energy, mass, and speed of a car. Students also examine forces and motion, and how they come into play in vehicle accidents. Using these scientific concepts, students design car and driver safety systems that help drivers avoid accidents.

**Core Science Content:** Newton's Laws, inertia, force, mass, acceleration, speed, friction, experimental design, automobile safety

**PE Assessment Example:** Imagine you are designing cars to be safer during the following collision: Car A is traveling at 25 mph when it hits Car B, which is stopped at a stop sign.

- In your design, how would you change the mass of Car A to minimize the change in motion of this car due to the collision? Explain your idea using Newton's third law, and support it with evidence from the system model used in this activity.
- In your design, how would you change the masses of both Car A and Car B to minimize the changes in motion for both cars involved in the collision? Explain your idea using Newton's third law, and support it with evidence from the system model used in this activity.

PS2-1, PS2-2, PS3-1



Single drawer shown. For full equipment images see page 38-39



5-6 WEEK UNIT

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)

ADD A GROUP

LITERACY SPANISH

STEM NONCONSUMABLE

FORCE AND MOTION THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-FOR-3000	\$2,057.90
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-FOR-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-FOR-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-FOR-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-FOR-3000T	\$1,103.50
<b>REFILLS</b> No refills needed in the use of this unit		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# WAVES FOR NGSS

## How are waves both helpful and harmful?

Students encounter a variety of technologies that make use of waves. They also investigate the harmful effects of certain waves and methods to mitigate the risks associated with these waves.

**Core Science Content:** Types of waves, wave properties, electromagnetic radiation, applications of waves, comparison of analog and digital transmission and storage capabilities

**PE Assessment Example:** Use what you learned from your hands-on investigation to explain why noise is more of a problem for analog vs digital signals, and why digital signals are more reliable to encode and transmit information.

PS4-1, PS4-2, PS4-3

**5 WEEK UNIT**

For more information on our NGSS curriculum, please visit [lab-aids.com/5innovations](http://lab-aids.com/5innovations)

- ADD A GROUP
- STEM LITERACY
- REFILLABLE SPANISH



Single drawer shown. For full equipment images see page 40

WAVES THIRD EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, online assessment system, LABsent, and supplemental resources)	SMS-WAV-3000	\$2,869.50
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	SMS-WAV-30LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	SMS-WAV-3SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SMS-WAV-3TETR	\$120.75
<b>TRANSITION PACKAGE</b> (from 2nd to 3rd edition)	SMS-WAV-3000T	\$1,223.00
<b>REFILLS</b> Average cost of refills is \$20.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)

## Meet a Few of Our Coaches

All of our coaches have extensive practice in the classroom with their PD curriculum and are either currently teaching or directly involved with students and local districts.



Virginia has taught at Tacoma Public Schools for 21 years as a high school science teacher and NGSS Biology Lead Teacher. In addition to being National Board Certified with an AYA Science specialization, she has presented at numerous regional and national conferences. Virginia says the best thing about leading PD is that A-HA moment! When you get that with teachers, you know they will take that learning back to the kids.

**Virginia Rehberg, Tacoma Public Schools, WASHINGTON**

In his 20 years as a Biology teacher Brian has written & received numerous grants, participated in several NSF-funded projects, and worked for the Delaware Dept. of Ed. Brian's favorite PD conversations to lead are about supporting student literacy through science.



**Brian Gross, Delcastle Technical High School, DELAWARE**



Over the last 10 years as a Board Certified Chemistry Teacher and Technology Coach, Brandon has used his real world experience to help chemistry content come alive. Brandon loves doing professional development because it allows him to connect with other educators around the country to learn and share new ideas.

**Brandon Watters, Vernon Hills High School, ILLINOIS**

Lisa earned a Ph.D. in Science Education with emphasis on Curriculum & Instruction and Nature of Science after a career in teaching. She is now a Professor and Department Chair of Science Education. Lisa most enjoys the topic of embedded student assessment.



**Lisa Martin-Hansen, California State University, Long Beach, CALIFORNIA**

## Testimonials

*I felt at ease after our PD knowing my teachers will be well-prepared to start the year strong. Though I have taught SEPUP already, I learned new things that will help me improve as a teacher and department leader.*

— **Michelle Littleton**  
Carver Middle School,  
Massachusetts

*The PD has been first rate; even teachers who were reluctant left feeling that the time was well spent. The knowledgeable staff even helped us to customize the curriculum to our state standards while maintaining the fidelity of the story line.*

— **Martha C. Fout**  
Horry County Schools,  
South Carolina

*Thank you for your generous support during our last professional learning session! Nearly 40 Biology teachers attended the all day session. You and your presenters offered the teachers ample opportunity to experience the learning as both student and teacher. The experience and wisdom shared throughout the day really made a difference us.*

— **Mary C. H. Weller**  
Howard County Public  
School System, Maryland

# EVERYTHING YOU NEED - ALL IN ONE PLACE.



Biomedical Engineering Drawer 1



Biomedical Engineering Drawer 2



Biomedical Engineering Drawer 3



Biomedical Engineering Drawer 4



Body Systems Drawer 1



Body Systems Drawer 2



Body Systems Drawer 3



Body Systems Drawer 4



Chemical Reactions Drawer 1



Chemical Reactions Drawer 2



Chemical Reactions Drawer 3



Chemical Reactions Drawer 4



Chemical Reactions Drawer 5



Chemical Reactions Drawer 6



Chemical Reactions Drawer 7



Lab-Aids programs include high-quality equipment for each activity. This includes innovative lab-ware to be used throughout the year, specific solutions and materials for unique labs, as well as items needed for card sorts, modeling, role-plays, and projects.



Chemistry of Materials Drawer 1



Chemistry of Materials Drawer 2



Chemistry of Materials Drawer 3



Chemistry of Materials Drawer 4



Earth's Resources Drawer 1



Earth's Resources Drawer 2



Earth's Resources Drawer 3



Earth's Resources Drawer 4



Earth's Resources Drawer 5



Earth's Resources Drawer 6



Ecology Drawer 1



Ecology Drawer 2



Ecology Drawer 3



Energy Drawer 1



Energy Drawer 2

# EVERYTHING YOU NEED - ALL IN ONE PLACE.



Energy Drawer 3



Energy Drawer 4



Evolution Drawer 1



Evolution Drawer 2



Evolution Drawer 3



Fields and Interactions Drawer 1



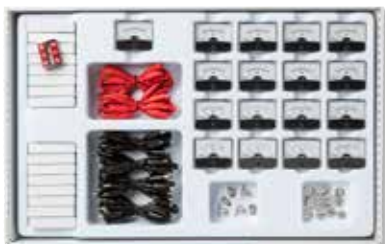
Fields and Interactions Drawer 2



Fields and Interactions Drawer 3



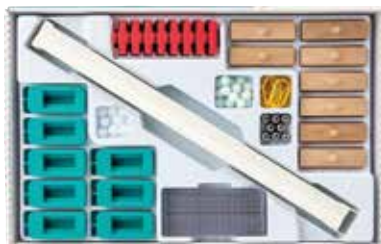
Fields and Interactions Drawer 4



Fields and Interactions Drawer 5



Fields and Interactions Drawer 6



Force and Motion Drawer 1



Force and Motion Drawer 2



Force and Motion Drawer 3



Force and Motion Drawer 4

Equipment is not purchased as “supplemental extras” – they are a critical component included in the program.



Force and Motion Drawer 5



From Cells to Organisms Drawer 1



From Cells to Organisms Drawer 2



From Cells to Organisms Drawer 3



From Cells to Organisms Drawer 4



Geological Processes Drawer 1



Geological Processes Drawer 5



Geological Processes Drawer 6



Geological Processes Drawer 4



Geological Processes Drawer 2



Geological Processes Drawer 3



Land, Water and Human Interactions Drawer 1



Land, Water and Human Interactions Drawer 2



Land, Water and Human Interactions Drawer 3



Land, Water and Human Interactions Drawer 4

# EVERYTHING YOU NEED - ALL IN ONE PLACE.



Land, Water and Human Interactions  
Drawer 5



Reproduction Drawer 1



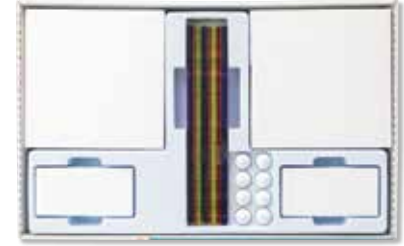
Reproduction Drawer 2



Solar System and Beyond Drawer 1



Reproduction Drawer 3



Solar System and Beyond Drawer 2



Solar System and Beyond Drawer 3



Waves Drawer 1



Waves Drawer 2



Waves Drawer 3



Waves Drawer 4



Weather and Climate Drawer 1



Weather and Climate Drawer 2



Weather and Climate Drawer 3

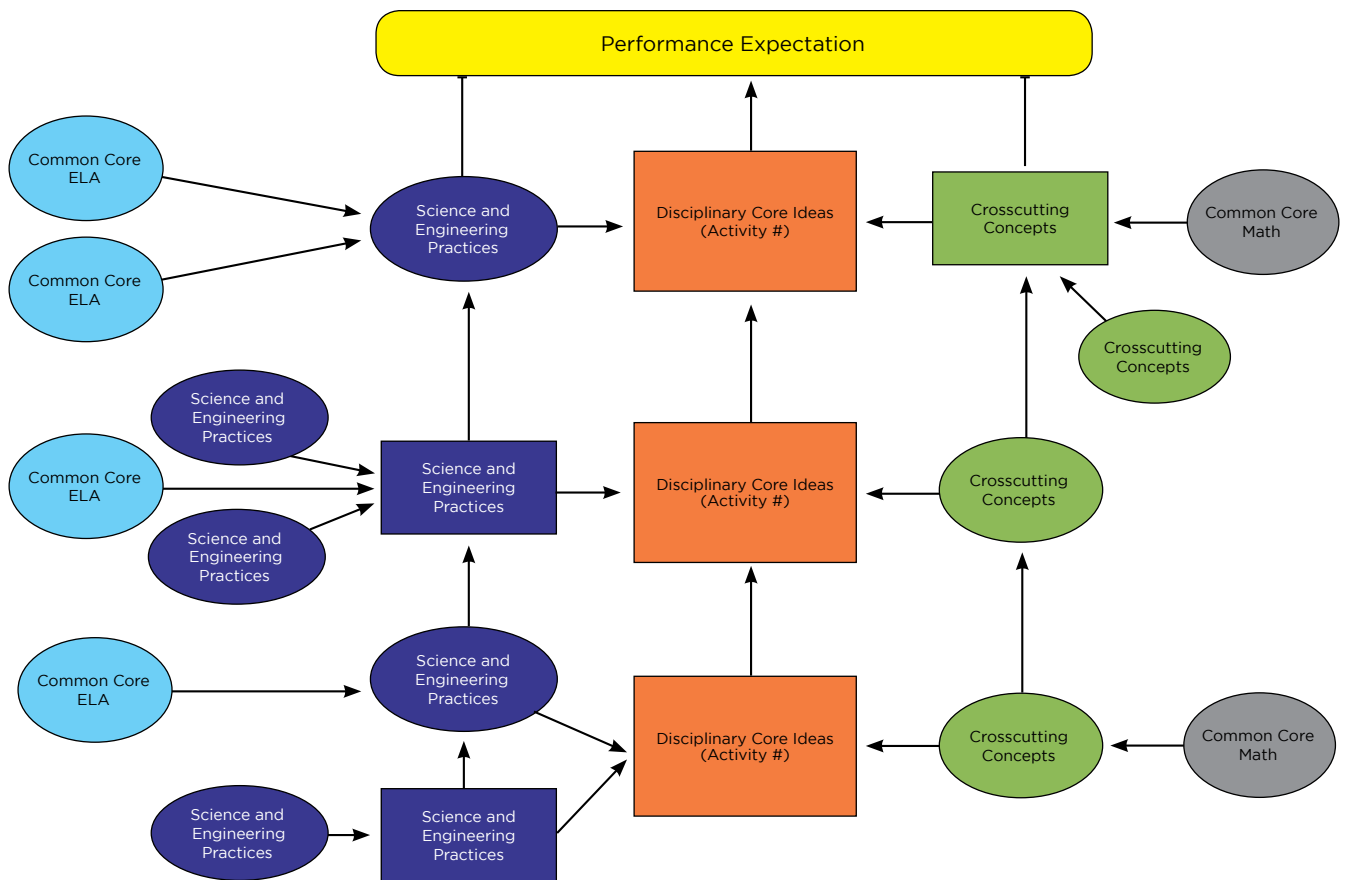


Weather and Climate Drawer 4

For a complete list of each unit's materials refer to the Unit Specific Pages in the back of each unit's Teacher Edition.

*Issues and Science* is purposefully designed to support teachers and learners in implementing the innovations of the Next Generation Science Standards (NGSS). Towards this aim, the SEPUP middle school program follows thoughtfully planned **NGSS Learning Pathways**.

**A Learning Pathway is a sequence of activities, from bottom to top, connecting the three-dimensions and maps a student’s mastery of a Performance Expectation (PE).** Each instructional unit bundles numerous PEs and therefore one activity may be part of several intertwined Learning Pathways. By the time students reach an embedded PE summative assessment, they will have meaningfully interacted with the content, practices, and crosscutting concepts, as well as several quick checks and formative assessments, numerous times in their learning journey.



**This model of an NGSS Learning Pathway** a student’s path as she moves from early unit activities, shown at the bottom, up through the unit to a summative assessment opportunity of the PE at the top. Connections on either side of the DCI show where the SEP and CCC, as well as Common Core ELA and Math standards, are interwoven into the activities illustrated in the pathway. Dimensions in rectangles are linked to the specified PEs while those in circles show other appropriate connections identified in the unit.

To view all the NGSS Learning Pathways for *Issues and Science*, including which PEs are bundled for each of the 17 units, visit [sepuplhs.org/pathways2](http://sepuplhs.org/pathways2)

## EQUITABLE ACCESS FOR ALL STUDENTS

*Issues and Science* is designed to be inherently accessible to all students by using **unit issues as common entry points, prioritizing concrete experiences** over the abstract, and centering activities around **group work**. That said, we recognize that **teachers need additional supports** even beyond excellent program design as they work to equitably include each student. To that end, the tools embedded into the SEPUP curriculum reflect a central mission to provide materials that facilitate culturally responsive learning experiences that diverse learners find meaningful and relevant to their lives.

### DIFFERENTIATED INSTRUCTION



In *Issues and Science*, classroom supports for differentiated instruction are embedded in each activity so that students are barely aware that there is any “additional” instruction. For teachers, comprehensive teacher guidance is provided in the teacher materials on how and when to implement each suggested strategy.

Instructional materials are **intentionally flexible for teachers** and contain suggestions for conducting the activities with more or less support for students as they move toward more self-directed learning. For example, the *Teacher Edition* may provide a sample lab procedure that can be distributed to students who are not yet prepared to design their own scientific investigation. For those students who are ready to be more independent, suggestions are also given to help reduce teacher guidance.

**Each activity has specific, research-based suggestions for differentiating instruction for three types of learners:** English learners, academically gifted, and students with learning disabilities. These instructional supports are embedded directly into the activity and may take on different forms depending on the goals of the activity. SEPUP’s field-test classrooms have demonstrated that these embedded instructional approaches in *Issues and Science* helps diverse populations of students succeed.

## LITERACY

Teaching *Issues and Science* provides consistent opportunities for students to improve English language skills and science literacy. For example, students are expected to read informational text and procedures, write clearly in student notebook entries, and use oral language skills during discussions. To support reading, writing and oral discourse, SEPUP **embeds strategies** throughout the units. These help students process new content, develop analytical skills, connect concepts, become more proficient readers, and express their knowledge. Students are able to further build their knowledge and appreciation of science and engineering while simultaneously improving their reading and communication skills.



Talking Drawings help students construct diagrams to visually communicate their ideas about a concept. Used before and after activities, the drawings can be adjusted to show new understanding.

Name \_\_\_\_\_ Date \_\_\_\_\_

### Possible Explanations: A Day On Earth

Idea	Diagram	Observations For Idea	Observations Against Idea
Earth moves farther away from the Sun at night and closer to it during the day.	Day 		
	Night 		
The Moon's shadow covers the Sun and makes it dark at night.	Day 		
	Night 		
Earth takes one day to spin completely around on its axis.	1 day 		
The Sun takes one day to go completely around Earth.			

©2015 The Regents of the University of California

Issues and Earth Science • Student Sheet 73.3

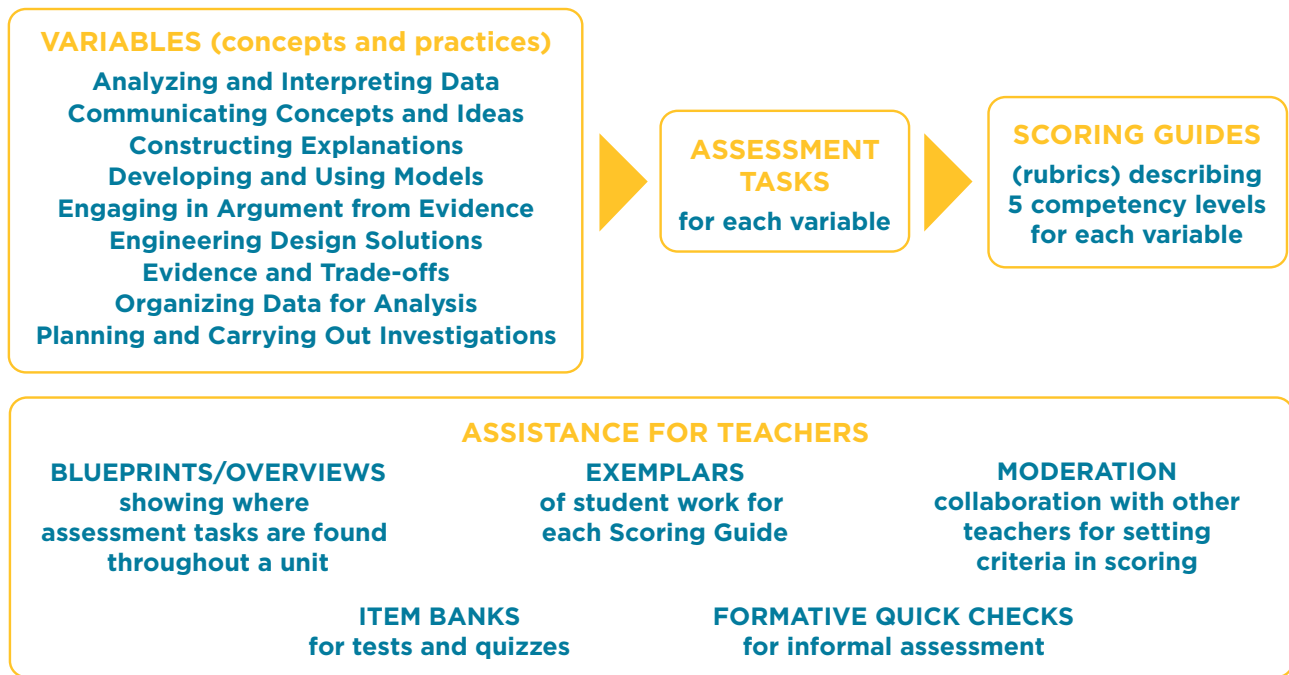
F-37

# ASSESSMENT SYSTEM

The SEPUP Assessment System is based on the idea that **students benefit from regular opportunities to demonstrate learning through performance *in the context of their work at hand***:

- a group redesigning a structure to prevent erosion may also be evaluated on their understanding of engineering design.
- feedback can be provided to strengthen a student’s argument as she considers additional evidence about fossilized footprints and explains the patterns.

Each unit includes a variety of **assessments embedded within the instruction** to provide consistent, actionable information to the teacher and students with minimal impact on instructional time.



At the core of the SEPUP assessment system are **nine variables**, identified in the diagram above. **Assessment items and tasks** are used to gather evidence of students’ learning within each variable, while **Scoring Guides** and **Exemplars** are provided for interpreting their responses.

These nine variables are used throughout *Issues and Science* so that students may demonstrate a deeper understanding and level of sophistication, not only as one unit progresses, but as they move from unit to unit across grade levels. These assessment tasks, partnered with **quick checks, 3-D formative assessment opportunities**, and unit tools such as **unit overviews, assessment blueprints, learning pathways**, and **item banks**, form the SEPUP assessment system.



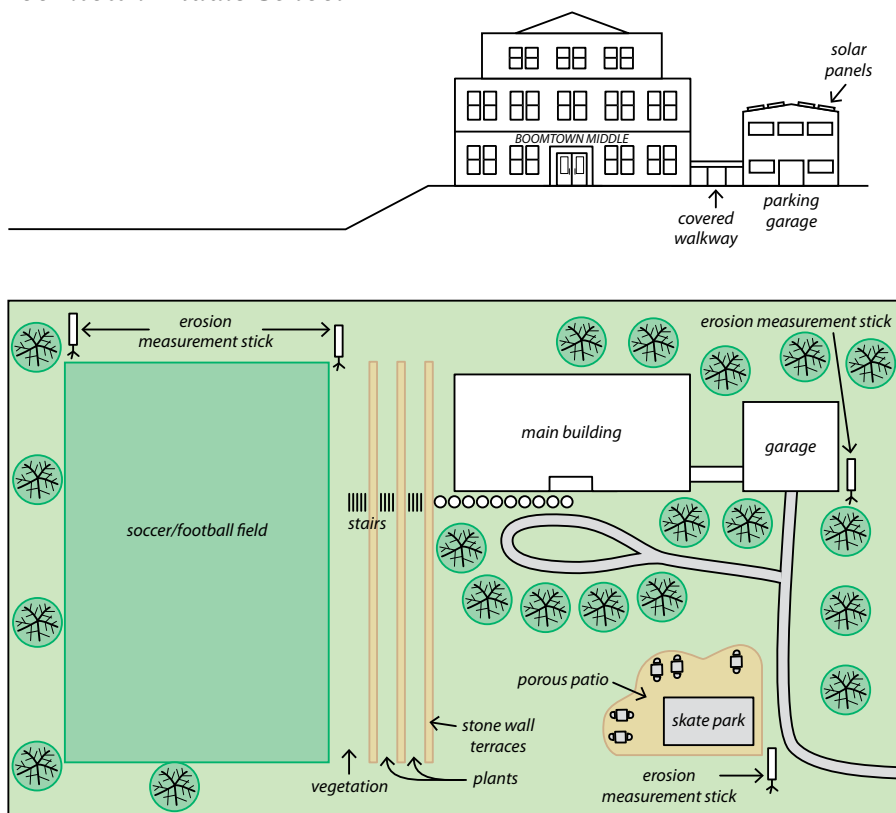
NGSS Learning Pathways (pictured on p. 41) visualize the three dimensional path students take in *Issues and Science* as they work up towards a Performance Expectation (PE). **Summative assessments are embedded** when students reach the PE, as well as formative assessments and quick checks along the way so students and teachers may evaluate their progress at multiple places throughout.

Shown here is the **start of a student response exemplar** where students have been asked to design a new school property, while mitigating the human impact on the environment. These level-4 exemplars are **provided for each assessment task** so teachers know what to expect.

This particular assessment comes at the end of a unit where students have been immersed in this topic and uses the *Communicating Concepts and Ideas* variable and scoring guide.

#### PROCEDURE STEP 5 LEVEL-4 STUDENT RESPONSE

##### *Boomtown Middle School*



*We made four preliminary designs and picked the best parts of each one and combined them for the final design. Since building often causes faster erosion, nutrient runoff, displaced sediment deposits, and reduced water quality, we mitigated the human impact with the following design elements:*

- *A three-story building instead of one-story to reduce the hard surface area on the ground*

# ONLINE COMPONENTS

Added as appropriate to enhance student learning, technology in the SEPUP program never replaces what is more effectively taught through first hand experiences.

## STUDENT PORTALS

Our online student portal allows access to the entire curriculum and includes:

## ONLINE SIMULATIONS

- simulations enhance a concrete classroom experience
- simulations are used as models when a first-hand experience is not possible



## LABSENT VIDEOS AND ACTIVITIES

Name \_\_\_\_\_ Date \_\_\_\_\_

### Volcanic Landforms

*Key Words: Magma*

**Getting Started:**  
1. Scientists use models - simplified representations of reality - to examine aspects of the natural world. Models can be used to explain and predict natural processes. In this activity, you will use a physical model to investigate volcanic eruptions.

2. Do you agree or disagree with the following statement: All volcanic eruptions are the same. Explain.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Read the introduction and Challenge to Activity 37, "Volcanic Landforms," in your Student Book.

**Procedure:**  
1. Read "Part A: Eruption of Less Gassy Magma" of the Procedure Steps 1-8 in your Student Book.  
2. Watch the LABsent video (found here: <https://vimeo.com/152302160>). Watch Part A of the video only, through 1:31. Record your observations in the data table provided.

Observing Eruptions		
Type of Eruption	Trial 1	Trial 2
Less gassy "magma"		

IAES Plate Tectonics: Activity 37 Absent Work

© 2014 The Regents of the University of California



## FOR ABSENT STUDENTS

Appropriate activities have been modified for a student away from the classroom. Students are given the tools they need to collect and analyze the data so that they may return to their group caught up and ready to move on.

## TEACHER PORTALS

Our online teacher portal allows access to the entire curriculum and includes:



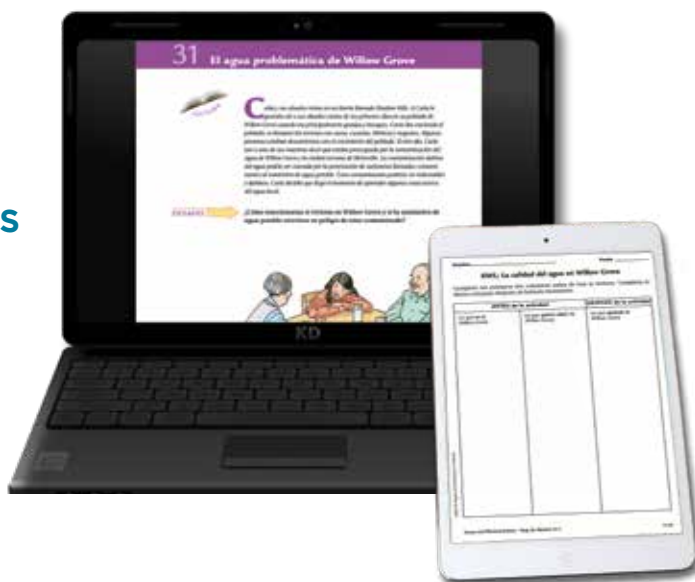
### EDITABLE POWERPOINTS

Every activity is supported by a PowerPoint that encourages a student-driven classroom.

Fully editable, the slides can be customized as needed to best support the unique needs of individual classrooms.

### SPANISH STUDENT BOOKS AND SHEETS

Accessible on both the student and teacher portals, Spanish student books and student sheets are available for every lesson.

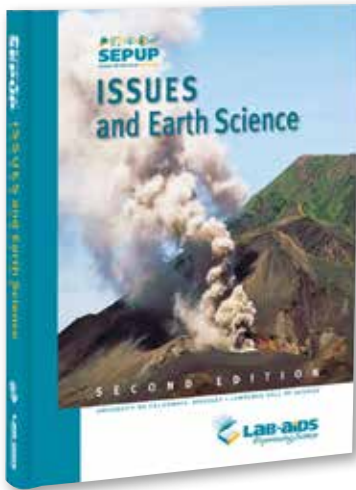


### PROFESSIONAL DEVELOPMENT VIDEOS

A variety of resources ready when you are. These videos can help with topics ranging from lesson planning and lab setup to delving deeper into pedagogy and best practices.

### INTEGRATED ASSESSMENT & HOMEWORK

Create and customize assessments and homework to print or assign online. Scoring and feedback can also be done within the Portal system.



How do Earth features influence where people live? What policies should guide our use of Earth’s resources? What kind of space exploration should we undertake in the future? Students collect evidence, make recommendations, and identify the trade-offs of their decisions behind the issues and phenomena in **ISSUES AND EARTH SCIENCE**.

*Issues and Earth Science* may be purchased as a full-year, discipline-based program in one hard bound book or as individual units to create a customized scope and sequence (on the following pages).

### ACCESS TO TEACHER’S ONLINE PORTAL

- Assign homework and communicate with students
- Note taking & highlighting for students
- Online Student and Teacher books
- LABsent sheets & videos for absent students
- Integrated, online assessment system
- Editable PowerPoints for each lesson
- Spanish text and student sheets
- Single Sign-On (SSO) available



- STEM LITERACY
- REFILLABLE SPANISH
- ADD A GROUP

ISSUES AND EARTH SCIENCE FULL-YEAR PROGRAM	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAES-2000	\$6,735.70
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAES-20LSP-1	\$5.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	IAES-2SB	\$99.95
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAES-2TETR	\$225.00
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)

For custom orders and standards correlations by state please see the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your state’s Science Curriculum Sales Specialist.

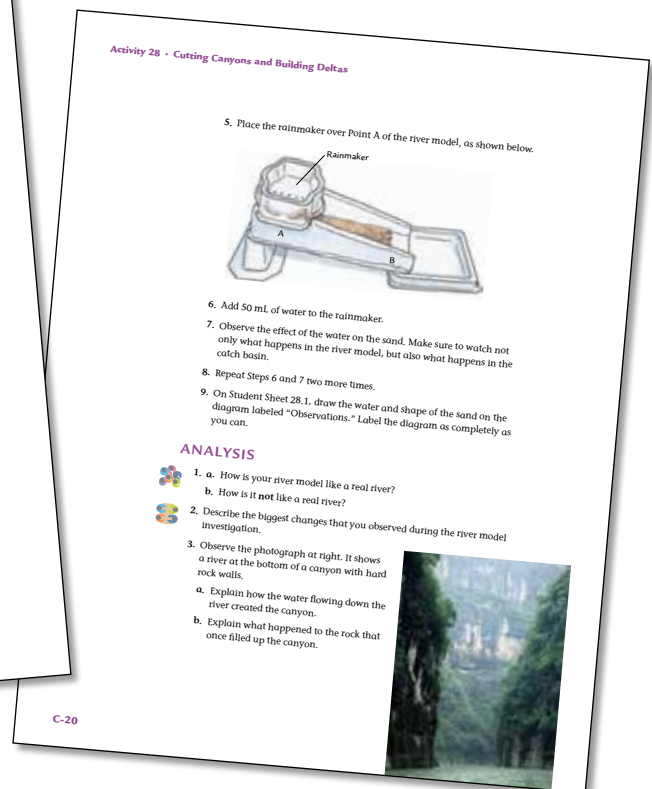
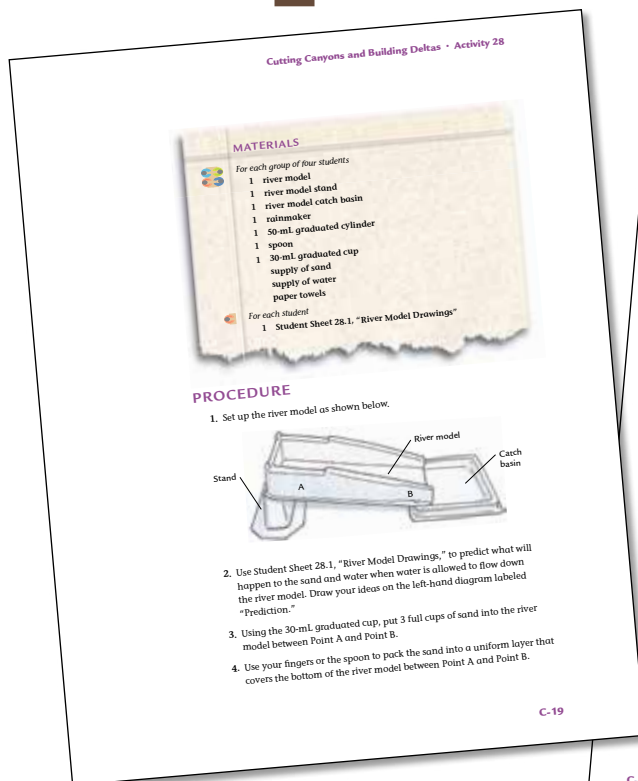


Materials needed for embedded labs and activities are part of the Complete Equipment Package

## PROGRAM COMPONENTS

Individual components combine to form a complete learning system.

- Student book that seamlessly integrates investigations, labs, and readings into the context of the issue's storyline
- Equipment to carry out each embedded activity for 5 classes of 32 students (in groups of four, pairs or individuals)
- Online student and teacher bookshelf portals
- Student Science Lab notebook





## STUDYING SOIL SCIENTIFICALLY

### Over-arching Issue: “Why don’t plants grow in the school garden?”

Beginning with a study of the properties of different types of soils in the context of preparing a school garden, students investigate soil profiles, organic and inorganic components, the use of fertilizers, and soil mapping.

**Core Science Content:** Observation, measurement, soil composition, soil fertility

**Key Assessment Task:** “Write a letter to the school principal that states your recommendation for the school garden. Convince the principal with evidence you gathered in this unit. Be sure to present the trade-offs of your recommendation.”

#### 4 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

- STEM LITERACY AG
- REFILLABLE SPANISH
- ADD A GROUP



STUDYING SOILS SCIENTIFICALLY SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAES-UA-2000	\$1,231.35
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAES-UA-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAES-UA-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAES-UA-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$56.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# ROCKS AND MINERALS

**Over-arching Issue: “How do diamonds produced in a lab compare to diamonds mined from the earth?”**

As they consider questions related to use of our natural resources, students investigate properties of rocks and minerals. The physical properties of individual specimens, such as luster, hardness, and color are investigated, as are main rock types - sedimentary, igneous, and metamorphic, and how rocks change from one form to another in the rock cycle.

**Core Science Content:** Rock cycle, rock formation, minerals, natural resources

**Key Assessment Task:** “You’ve decided to buy a large one-carat yellow diamond.  
 a. Which type of diamond – manufactured or mined – would you buy? b. Support your answer with evidence from the activity. c. Identify the trade-offs of your decision.”



**5 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

LITERACY STEM  
 SPANISH REFILLABLE  
 ADD A GROUP

ROCKS AND MINERALS SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAES-UB-2000NC	\$1,540.65
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAES-UB-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAES-UB-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAES-UB-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$15.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# EROSION AND DEPOSITION

## Over-arching Issue: “Which areas of Boomtown are safest for construction?”

The destructive and constructive forces of wind, wave, and water on landforms are investigated as students decide where to build a new housing development. Stream tables and topographic maps are used to study river action, deposition of sediments, and landform contours. Students then recommend the building site for the housing development and identify trade-offs of their decision.

**Core Science Content:** Topography, erosion, deposition, landforms

**Key Assessment Task:** “Where do you think Boomtown should build new housing – on Green Hill, the Delta Wetlands, or Seaside Cliff? Describe the evidence that you used to make your decision and how you weighed the advantages and disadvantages of each location.”

**5 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

- STEM LITERACY
- REFILLABLE SPANISH
- ADD A GROUP



EROSION AND DEPOSITION SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAES-UC-2000	\$1,643.35
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAES-UC-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAES-UC-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAES-UC-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$115.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# PLATE TECTONICS

## Over-arching Issue: “Where should we store our nuclear waste?”

Students explore the structure of the Earth and learn how the slow movements of the Earth’s plates help shape its features, continents, and oceans. They investigate the types of plate boundary movements that result in and create earthquakes, volcanoes, and mountains. Students examine plans and recommend a site to deposit radioactive waste based on information collected throughout the unit.

**Core Science Content:** Earth’s history, earthquakes, volcanoes, plate tectonics, mountain building, continental drift

**Key Assessment Task:** “Would you select one of the eight suggested sites, or would you suggest a different site [for storing nuclear waste]? a. State the site you would choose. b. Support your decision with as many pieces of evidence as you can. c. Discuss the trade-offs of your decision.”



5 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

LITERACY STEM

SPANISH REFILLABLE

ADD A GROUP

PLATE TECTONICS SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAES-UD-2000	\$1,333.85
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAES-UD-2OLSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAES-UD-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAES-UD-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$53.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# WEATHER AND ATMOSPHERE

## Over-arching Issue: “Is the growth of Sunbeam City affecting its weather, atmosphere, and water availability?”

Relationships between weather and climate are explored as students take on the STEM roles of a climatologist, hydrologist, meteorologist, or atmospheric scientist. The factors that cause weather and climate, including energy from the sun, the water cycle, and global ocean currents are experienced and explored. Students consider the present composition of the Earth’s atmosphere and how it has changed over time. They also explore a possible connection between changing weather patterns in an urban area with increasing population growth.

**Core Science Content:** Water cycle, clouds, sun as a source of energy, effect of oceans on climate, atmosphere (structure and properties), global patterns

**Key Assessment Task:** “Based on the evidence in the scientists’ reports, is there any possible relationship between population growth and the weather, atmosphere, or water availability of Sunbeam City? Support your answer with evidence from this unit.”

**6 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

- STEM LITERACY
- REFILLABLE SPANISH
- ADD A GROUP



WEATHER AND ATMOSPHERE SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAES-UE-2000	\$1,735.75
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAES-UE-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAES-UE-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAES-UE-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$47.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



## THE EARTH IN SPACE

### Over-arching Issue: “Would a different type of calendar be better? If so, why?”

Students explore the day-night cycle and Earth’s rotation on its axis. They analyze data, use models and a computer simulation to explore Earth’s axial tilt, revolution around the Sun, and explain Earth’s year and seasonal changes in day length and average temperature. Students investigate the reason for the phases of the moon, the relationship of the solar and lunar cycles to different calendars, and finally recommend a calendar with the fewest trade-offs.

**Core Science Content:** Earth, moon, day and year length, moon phases, seasons, axial tilt

**Key Assessment Task:** “Based on your discussion, would you recommend that the world switch to a proposed international calendar or continue with the calendars already in use? Write a letter to a government official, such as one of your United States Senators to express your recommendation. Discuss your reasons for and the trade-offs of your recommendation.”



5 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

SPANISH LITERACY

STEM NONCONSUMABLE

ADD A GROUP

THE EARTH IN SPACE SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAES-UF-2000NC	\$612.85
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAES-UF-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAES-UF-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAES-UF-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> No refills needed in the use of this unit		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# EXPLORING SPACE

## Over-arching Issue: “What kinds of future space missions should we conduct?”

In the context of issues related to space exploration, students investigate the objects that make up the Solar System. Space objects are classified based on their characteristics, and various models of the solar system are critiqued for accuracy. Technological advances, such as the development of telescope technology, remote sensing, and their role in discoveries about space are explored. Students collect more information about the Sun, gravity, and the space program and conclude by considering the benefits and trade-offs of piloted and unpiloted space exploration.

**Core Science Content:** Solar system, planetary motion, gravity

**Key Assessment Task:** “Write a letter to the National Government Council stating your recommendation for which of the four missions to fund [Kuiper Belt, Mars, Titan, or our Moon]. Convince the council with evidence you gathered in this activity and unit. Be sure to present the trade-offs of your recommendation.”

**5 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

- LITERACY SPANISH
- NONCONSUMABLE STEM
- ADD A GROUP



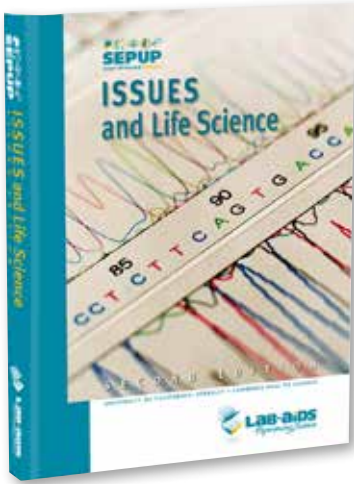
EXPLORING SPACE SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAES-UG-2000NC	\$716.80
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAES-UG-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAES-UG-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAES-UG-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> No refills needed in the use of this unit		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)

In *Developing Inquiry-Based Science Materials* (2001), Herb Thier and Bennett Daviss report a wonderful story about a Harvard professor who developed an interest in the acoustics of violins. As part of a study he collected a variety of violins, ranging from the cheapest violin to the finest Stradivarius. The professor then erected a small screen in a concert hall and assembled an audience. Yehudi Menuhin, a world-famous violinist, stood behind the screen and played each of the violins for the group. The professor asked the audience to select the best-sounding violin of the collection.

To the professor's amazement, each violin received about the same number of votes. Upon expressing his finding, and shock, to Menuhin, the great violinist provided a significant insight. Menuhin said, **"Yes, they sounded about the same. The difference was the Strad played itself, while I had to work like hell to make the cheap violin sound like anything at all"** (Thier and Daviss 2001).

— Rodger Bybee,  
*The Teaching of Science: 21st Century Perspectives*  
NSTA Press, 2010



Students will find that many of the issues they study in **ISSUES AND LIFE SCIENCE** appear frequently in the media. IALS allows students to explore and develop knowledge, skills, and understanding that will help them to make their own informed decisions on these issues. These relevant issues provide a framework for student work, reflection, and a context in which to understand concepts.

*Issues and Life Science* may be purchased as a full-year, discipline-based program in one hard bound book or as units to create a customized scope and sequence (on the following pages).

### ACCESS TO TEACHER'S ONLINE PORTAL

- Assign homework and communicate with students
- Note taking & highlighting for students
- Online Student and Teacher books
- LABsent sheets & videos for absent students
- Integrated, online assessment system
- Editable PowerPoints for each lesson
- Spanish text and student sheets
- Single Sign-On (SSO) available



- STEM LITERACY
- REFILLABLE SPANISH
- ADD A GROUP

ISSUES AND LIFE SCIENCE FULL-YEAR PROGRAM	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IALS-2000	\$7,625.10
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IALS-20LSP-1	\$5.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	IALS-2SB	\$99.95
<b>TEACHER EDITION AND TEACHER ESOURCES</b> (printed)	IALS-2TETR	\$225.00
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)

For custom orders and standards correlations by state please see the "Your State" page on [lab-aids.com](http://lab-aids.com) to contact your state's Science Curriculum Sales Specialist.

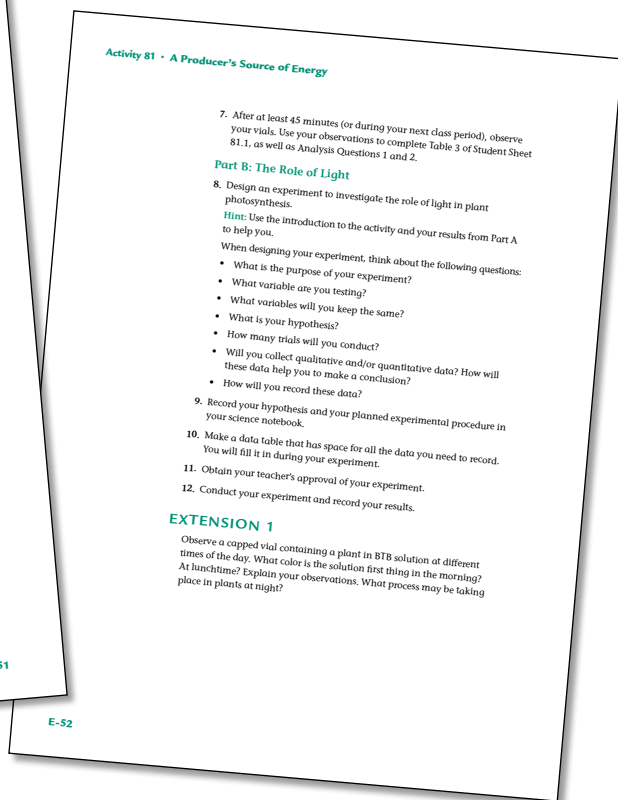
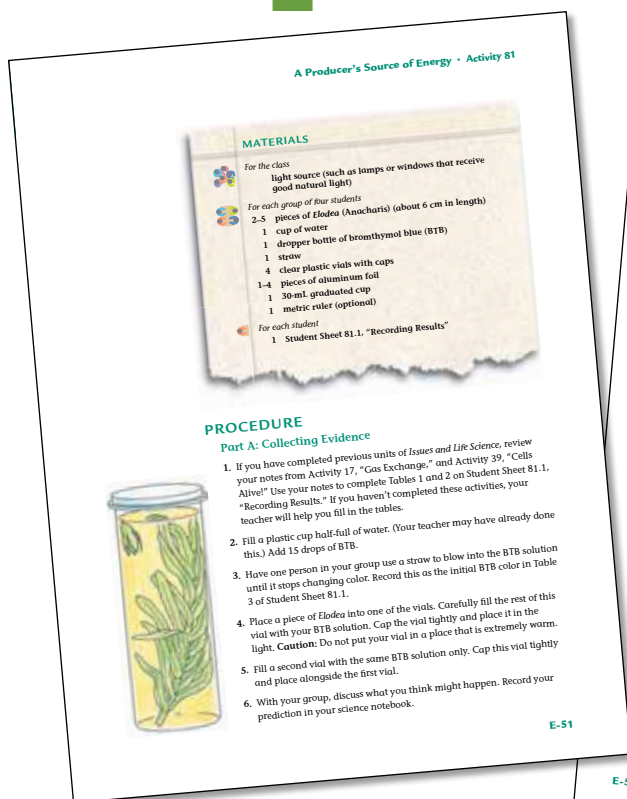


Materials needed for embedded labs and activities are part of the Complete Equipment Package

## PROGRAM COMPONENTS

Individual components combine to form a complete learning system.

- Student book that seamlessly integrates investigations, labs, and readings into the context of the issue's storyline
- Equipment to carry out each embedded activity for 5 classes of 32 students (in groups of four, pairs or individuals)
- Online student and teacher bookshelf portals
- Student Science Lab notebook





## STUDYING PEOPLE SCIENTIFICALLY

**Over-arching Issue: “How should drugs be tested to make sure they are safe and effective?”**

Student investigations address important ideas about the nature of science, the traditional scientific method, and experimental design. At the end of the unit, they evaluate several proposed studies for the quality of their scientific design.

**Core Science Content:** Observations, hypothesis, data collection, evidence, experimental design, variable, range, recording procedures, placebo, and nervous system

**Key Assessment Task:** “You find out that the NIH has only enough money to fund one [clinical trial] study and plans to fund the best proposal. Explain which study you would fund. Support your answer with evidence and identify the trade-offs of your decision. (Hint: To write a complete answer, first state your opinion. Provide two or more pieces of evidence that support your opinion. Then consider all sides of the issue and identify the trade-offs of your decision.)”

### 4 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

- STEM LITERACY
- REFILLABLE SPANISH
- ADD A GROUP



STUDYING PEOPLE SCIENTIFICALLY SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IALS-UA-2000NC	\$355.85
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IALS-UA-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IALS-UA-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IALS-UA-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$17.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)





## BODY WORKS

### Over-arching Issue: “How do our choices affect our health?”

Students explore the role of various organ systems in providing nutrients and oxygen to the body and transporting and eliminating wastes. There is an in-depth focus on the circulatory system as students investigate heart disease, nutrition, and exercise.

**Core Science Content:** Body systems structure and function: skeletal, circulatory, respiratory, excretory, reproductive, digestive, muscular

**Key Assessment Task:** “Imagine you are a doctor and Ms. McDonald visits you to discuss her health. She says, ‘I just took a look at risk factors for heart disease. I fall into a lot of high-risk categories. I work long hours and don’t have much spare time. I eat a lot of fast food hamburgers and fries, and I exercise only on Saturdays. Does this mean that I will definitely have heart disease?’ What would you tell Ms. McDonald about her risk for heart disease? Support your answer with evidence and discuss any trade-offs involved in your recommendation.”



### 6-7 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

LITERACY STEM

SPANISH REFILLABLE

ADD A GROUP

BODY WORKS SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IALS-UB-2000	\$1,906.30
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IALS-UB-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IALS-UB-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IALS-UB-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$210.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



## CELL BIOLOGY AND DISEASE

### Over-arching Issue: “What can you do to reduce the risk of catching an infectious disease?”

Students explore concepts in microbiology through investigating how infectious diseases can spread and what we can do to mitigate transmission of such diseases. In various parts of the unit they take on the role of an epidemiologist, further their research skills and knowledge by creating a public service announcement, develop skits emphasizing the discoveries of various scientists and their impact leading to cell theory and the germ theory of disease, and design an experiment to improve their hand washing technique. They also further explore microbiology, specifically cell size, structure, function, and permeability; and systems of classification.

**Core Science Content:** Microscopy, cell structure and function, microbes, disease, antibiotic resistance, emerging diseases, epidemiology

**Key Assessment Task:** “Now that your CDC team has discovered how this disease [Maracondo Fever] spreads, you must recommend ways to reduce the spread of the disease, both within and outside of Maracondo. Recall what you know about viruses, as well as the information provided in this activity. Provide at least two recommendations to stop the spread of Maracondo Fever. Support them with evidence and identify the trade-offs involved in your recommendations.”

#### 8-10 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

- STEM LITERACY
- REFILLABLE SPANISH
- ADD A GROUP



CELL BIOLOGY AND DISEASE SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IALS-UC-2000	\$2,672.85
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IALS-UC-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IALS-UC-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IALS-UC-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$183.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# GENETICS

## Over-arching Issue: “What are the ethical issues involved in using genetic information?”

The fundamental principles of Mendelian genetics in pea plants and humans is explored. Students study asexual and sexual reproduction, the process of cell division, and the role of nature and nurture in determining traits. They model the use of DNA technologies to solve real problems.

**Core Science Content:** Asexual and sexual reproduction, heredity, probability, nature and nurture, DNA fingerprinting

**Key Assessment Task:** “Imagine you are a judge trying to make a fair and final decision about whether to reunite the children from Samarra with their biological families from Namelia. Write your ruling and your explanation. Be sure to discuss any difficult ethical trade-offs you have had to make.”



**5-7 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

**LITERACY** **STEM**  
**SPANISH** **REFILLABLE**  
**ADD A GROUP**

GENETICS SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IALS-UD-2000	\$888.25
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IALS-UD-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IALS-UD-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IALS-UD-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$56.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# ECOLOGY

## Over-arching Issue: “What can the introduction of a new species do to an ecosystem?”

Students consider what happens when a new species is introduced into an ecosystem. They model ecological relationships within an ecosystem; simulate the effect of competition, predation, and other factors on population size; and investigate local ecosystems.

**Core Science Content:** Introduced species, classification, energy flow in food webs, populations, habitats, producers, consumers, predator, prey, carrying capacity

**Key Assessment Task:** “Write a letter to the editor of a local newspaper describing the situation of an introduced species. Explain what, if anything, you think should be done about the species. Support your answer with evidence and discuss the trade-offs of your decision.”

### 5-7 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

- STEM LITERACY
- REFILLABLE SPANISH
- ADD A GROUP



ECOLOGY SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IALS-UE-2000	\$1,540.85
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IALS-UE-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IALS-UE-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IALS-UE-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$232.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# EVOLUTION

## Over-arching Issue: “What are the trade-offs in deciding whether to save an endangered species or to re-create an extinct one?”

Should an extinct species be brought back to life? Students examine fossils, consider the lines of evidence for evolution, natural selection, and the role of genetic mutations. They then evaluate the impact of humans on the extinction and evolution of species.

**Core Science Content:** Adaption, competition, endangered species, extinction, fossil record, geological time, law of superposition, mutation, variation, natural selection

**Key Assessment Task:** “Imagine that advances in science and technology allow genetic engineers to re-create living dodo birds. Should dodos be re-created and released into the ecosystem of modern Mauritius? Support your answer with evidence and identify the trade-offs of your decision.”



**3-5 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on **lab-aids.com** to contact your Curriculum Sales Specialist.

**LITERACY** **STEM**  
**SPANISH** **REFILLABLE**  
**ADD A GROUP**

EVOLUTION SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IALS-UF-2000NC	\$1,025.35
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IALS-UF-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IALS-UF-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IALS-UF-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$21.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to **lab-aids.com**



## WHERE IT ALL GETS PUT TOGETHER

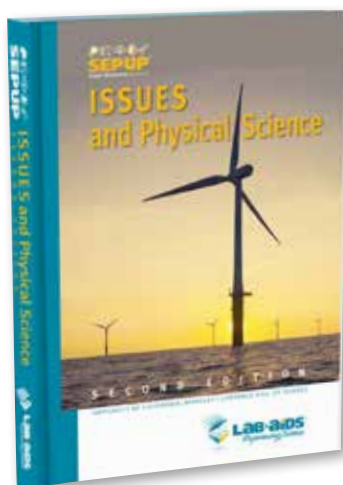
Rooted firmly in the American dream, Lab-Aids started in the garage of a science teacher who saw a need in science education and believed he could make a difference. Today we maintain that dream through local job creation at our manufacturing facility on Long Island, New York.

Local production is one of our principal values. Our full-time manufacturing team has an average of fifteen years working with Lab-Aids. We are proud of our history supporting American jobs and manufacturing.

From the specialists working directly with schools to the folks putting it all together, we are a dedicated team with a dream for revolutionizing science education.

**LAB-aids**<sup>®</sup>





All students need to develop an understanding of science and technology to make informed personal and community decisions. Using **ISSUES AND PHYSICAL SCIENCE**, students learn how to gather and interpret scientific evidence about issues of interest to them and their community. As a result, they begin to appreciate the power and also some of the limitations of science. They also begin to recognize that science is much more than a set of answers to be learned, but rather, a way of asking questions.

*Issues and Physical Science* may be purchased as a full-year, discipline-based program in one hard bound book or as units to create a customized scope and sequence (on the following pages).

### ACCESS TO TEACHER'S ONLINE PORTAL

- Assign homework and communicate with students
- Note taking & highlighting for students
- Online Student and Teacher books
- LABsent sheets & videos for absent students
- Integrated, online assessment system
- Editable PowerPoints for each lesson
- Spanish text and student sheets
- Single Sign-On (SSO) available



- STEM LITERACY
- REFILLABLE SPANISH
- ADD A GROUP

ISSUES AND PHYSICAL SCIENCE FULL-YEAR PROGRAM	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAPS-2000	\$10,088.85
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAPS-20LSP-1	\$5.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	IAPS-2SB	\$99.95
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAPS-2TETR	\$225.00
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)

For custom orders and standards correlations by state please see the "Your State" page on [lab-aids.com](http://lab-aids.com) to contact your state's Science Curriculum Sales Specialist.



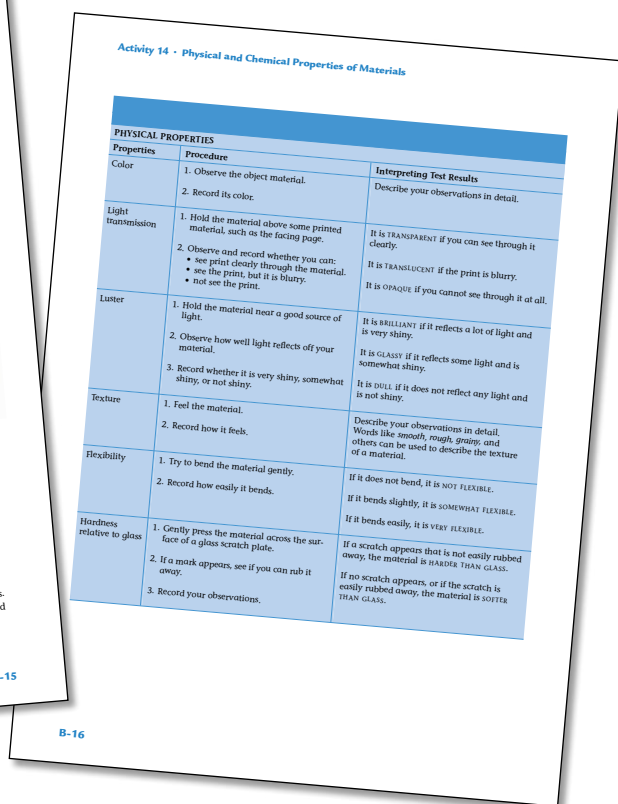
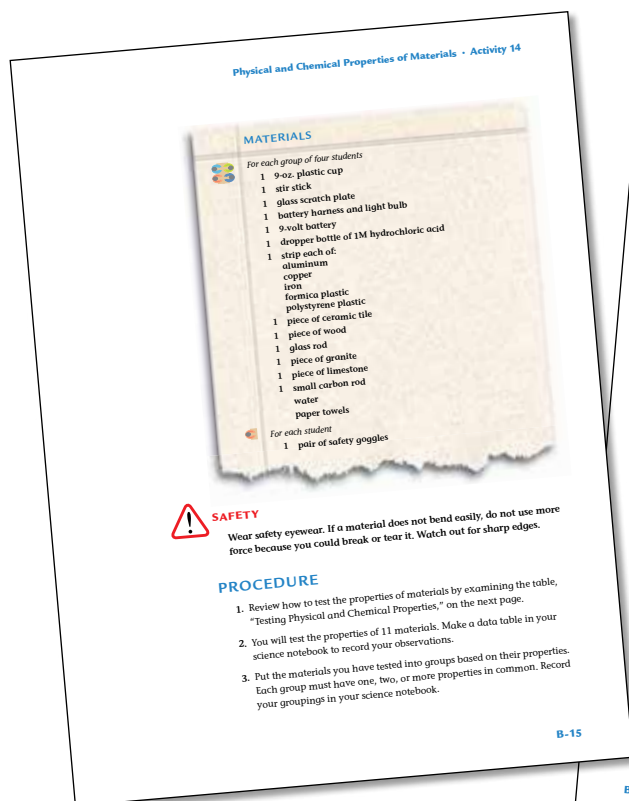


Materials needed for embedded labs and activities are part of the Complete Equipment Package

## PROGRAM COMPONENTS

Individual components combine to form a complete learning system.

- Student book that seamlessly integrates investigations, labs, and readings into the context of the issue's storyline
- Equipment to carry out each embedded activity for 5 classes of 32 students (in groups of four, pairs or individuals)
- Online student and teacher bookshelf portals
- Student Science Lab notebook





## STUDYING MATERIALS SCIENTIFICALLY

### Over-arching Issue: “How should hazardous materials be handled?”

Students investigate the properties of different materials. They identify unknown substances, and separate mixtures using a variety of chemical and physical properties, including density. As they learn about hazardous materials and the safety procedures used in handling them, students apply their understanding to evaluate the safety, effectiveness, storage, and handling of cleaning products used in a hospital.

**Core Science Content:** Laboratory safety, handling hazardous materials, physical and chemical properties, density, identifying unknown substances

**Key Assessment Task:** “Which glass cleaner have you selected [for the hospital]? a. State your decision. b. Support your decision with as many pieces of evidence from this activity as you can. c. Discuss the trade-offs of your decision.”

### 3 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

- STEM LITERACY
- REFILLABLE SPANISH
- ADD A GROUP



STUDYING MATERIALS SCIENTIFICALLY SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAPS-UA-2000	\$1,535.70
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAPS-UA-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAPS-UA-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAPS-UA-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$69.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# THE CHEMISTRY OF MATERIALS

**Over-arching Issue:** “When you buy a new product, do you think about what materials it is made of? What will happen to it when you no longer have a need for it?”

Students construct product life cycles of drink containers: from raw materials through the end of its useful life. Moving from the atomic level to the material level, students investigate what conservation of matter means in light of the product life cycle and how this can affect manufacturing decisions. They then determine ways to reduce the environmental impacts of a computer circuit boards life cycle.

**Core Science Content:** Physical and chemical properties of substances, elements and compounds, The Periodic Table, chemical reactions, chemistry of materials, conservation of mass

**Key Assessment Task:** “Which proposal would you recommend the district choose for its Green Computer Giant? State your opinion, citing evidence from Student Sheet 29.3, ‘Comparing Computer Proposals,’ and previous activities. Include a discussion of the trade-offs involved in your decision.”



**8 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

**LITERACY** **STEM**  
**SPANISH** **REFILLABLE**  
**ADD A GROUP**

THE CHEMISTRY OF MATERIALS SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAPS-UB-2000	\$2,627.45
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAPS-UB-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAPS-UB-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAPS-UB-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$164.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# WATER

## Over-arching Issue: “What does your community do to make its water safe to drink? Whose responsibility is it?”

Students investigate water quality issues in the fictional community of Willow Grove, the biological and chemical risks in drinking water, and then explore chemical pollution. Through their investigations, students learn about water’s properties as a solvent, the properties of acids and bases, and the movement of contaminants through the water cycle. They interpret water quality reports, perform water quality tests, conduct the steps in municipal water treatment, and apply that learning to treat a contaminated water sample. Students make recommendations about Willow Grove’s water treatment and sources in the culminating activity.

**Core Science Content:** Water quality, elements and compounds, atoms and molecules, mixtures and solutions, solubility, particle theory of matter, acids and bases

**Key Assessment Task:** “If you were Carla, would you: a. want to join the Willow Grove Water District or continue to use well water? Be sure to explain the trade-offs involved and the advantages and disadvantages of each water source based on information you gathered over the course of the unit. b. drink water from the tap or buy bottled water for drinking?”

### 9 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

- STEM LITERACY AG
- REFILLABLE SPANISH
- ADD A GROUP



WATER SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAPS-UC-2000	\$2,730.30
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAPS-UC-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAPS-UC-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAPS-UC-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$221.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# ENERGY

## Over-arching Issue: “What energy improvements should a family invest in to make their home more energy efficient?”

In the context of household energy usage, students explore energy transfer and conservation. The activities explore key energy concepts, including the variety of types of energy, energy transfers within and between systems, the energy chains involved when energy is transformed from one type to a more desired type, and the methods used to quantify energy and determine the efficiency of energy transfers.

**Core Science Content:** Energy transfer and transformations, types of energy (kinetic, potential, heat, solar, chemical, electrical), electrical currents, measuring energy, energy efficiency

**Key Assessment Task:** “Write a report that gives your energy-improvement recommendation for your family within the budget given. In the report, explain why you recommend the improvement(s). Include a discussion of the trade-offs involved in the choices you made.”



**8 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

- LITERACY
- STEM
- SPANISH
- REFILLABLE
- ADD A GROUP

ENERGY SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAPS-UD-2000	\$2,537.90
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAPS-UD-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAPS-UD-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAPS-UD-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$47.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



## FORCE AND MOTION

### Over-arching Issue: “How can we reduce the risks of motor vehicle accidents?”

Students investigate concepts related to force and motion in the context of vehicle safety issues. The unit begins with investigations of speed, motion graphs, and the impact of mass and speed on vehicle accidents. Students investigate force, acceleration, mass and friction and are introduced to Newton’s Laws of Motion. Students recommend ways to reduce the risk of vehicle collisions.

**Core Science Content:** Newton’s Laws, inertia, force, mass, acceleration, speed, friction, experimental design, automobile safety

**Key Assessment Task:** “Write a letter to the head of the U.S. Senate Committee for Highway Safety, explaining your position on whether cars should be required by law to be alike. Use evidence to support your position and describe at least one trade-off of your decision.”

#### 7 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

LITERACY SPANISH

NONCONSUMABLE STEM

ADD A GROUP



FORCE AND MOTION SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAPS-UE-2000	\$1,185.30
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAPS-UE-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAPS-UE-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAPS-UE-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> No refills needed in the use of this unit		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)

## Over-arching Issue: “How can waves be hazardous to your health?”

By exploring the decibel scale, students come to recognize the range of human hearing. The concepts of frequency, wavelength, wave types, and transmission through different media are applied to sound waves. Understanding the various nature of waves students then transition to exploring electromagnetic waves. In doing so, they consider the increased health risks of cataracts and skin cancers due to ultraviolet wave exposure for individuals with different exposure and risk factor profiles. They investigate the varying energy levels of electromagnetic waves and explore selective transmission, reflection, and absorption. They design and conduct an experiment to compare the ability of sunscreen to absorb or reflect ultraviolet waves.

**Core Science Content:** Longitudinal waves, transverse waves, mechanical waves, electromagnetic waves, wave properties, sound, light, reflection, transmission, absorption, sound intensity, risks of UV radiation

**Key Assessment Task:** “Prepare a personal ultraviolet protection plan by making a list of all of the things you can do to reduce your ultraviolet exposure while still participating in the outdoor activities that you enjoy the most. Then identify any trade-offs that are part of your new strategy.”



**3 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

LITERACY STEM  
SPANISH REFILLABLE  
ADD A GROUP

WAVES SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal for one teacher, includes online subscription to Teacher Edition and Resources, Student Book in English/Spanish (E/S), student sheets (E/S), visual aids (E/S), PowerPoints, Assessments, LABsent, and supplemental resources)	IAPS-UF-2000	\$1,706.45
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to English and Spanish student books, LABsent, student sheets, resource supplements)	IAPS-UF-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover) (unit bundling prices available - please contact us)	IAPS-UF-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	IAPS-UF-2TETR	\$115.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
<b>REFILLS</b> Average cost of refills is \$24.00 after use by at least 160 students		

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)

# WHAT MAKES IT A PROGRAM?

## It all works together.

Lab-Aids high school programs combine components to *make a system* for learning. Lab equipment and materials are as important as the well-written investigations and readings. Both are needed to make the unit storyline come alive for students.



### Real-world issues make the content relevant

Intentional lesson sequencing drives concept and skill development.

- Issue-based storyline
- Integrated literacy strategies
- Three-dimensional learning
- Field-tested



### Complete equipment packages support up to 160 students

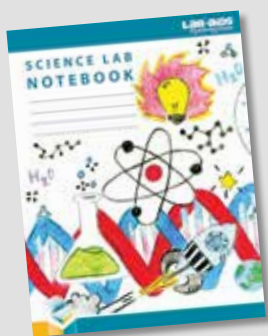
High quality materials designed for re-use year after year.

- Highly organized drawers
- Groups or partners; not demos
- Minimal consumable cost
- Various activity types

Choose the unit books and equipment that best meet your state's scope and sequence.



Lab notebooks are used in each lesson to guide students and help make the learning their own. Online teacher portals are included and provide a variety of tools to make teaching easier.



## Built-in literacy strategies support diverse learners

Use of the Lab-Aids Science Lab Notebook is highly recommended.

- Embedded writing frames
- Reinforced by notebook use
- Support for Common Core

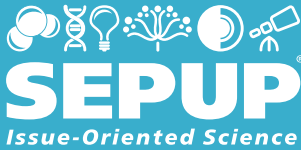


## Teacher resources provide support now and in the future

Designed for continued professional development.

- Universal platform
- Editable PowerPoint slides
- Interactive assessment
- Supports differentiated lessons

**Embedded literacy, assessment and online ancillaries are included with each unit.**



SEPUP designs issue-oriented curricula for secondary science classrooms. The curriculum materials present standardsbased science content in the context of personal and societal issues. These issues range from personal medical issues, such as whether to be tested for a genetic disease, to societal issues such as the sustainable use of resources.

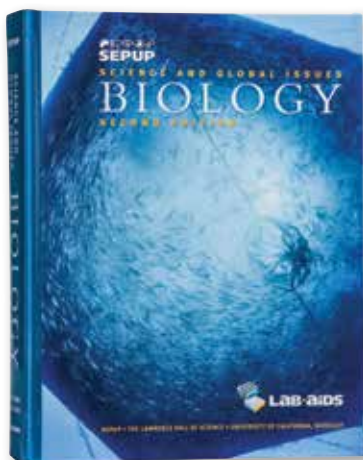
**SEPUP instructional materials are designed to encourage student sensemaking and promote the use of scientific principles, processes, and evidence in public decision making.** SEPUP programs are extensively tested in local and national centers to ensure they are effective with diverse groups of students in a variety of settings.

The SEPUP approach also enhances the role of teachers as facilitators of student learning and as educational leaders within their communities by having them share in the development, implementation, and assessment of issue-oriented science materials and programs.

# High School

Biology





**SCIENCE AND GLOBAL ISSUES: BIOLOGY** (*SIG: Biology*) makes biology come to life in your classroom. Students see how their studies relate to their own lives and how it impacts their environment and the planet. Field tested in classrooms across the country, the activities in *SIG: Biology* have a proven track record of engaging students in scientific inquiry.

*SIG: Biology* supports many of the Next Generation Science Standards and provides built-in literacy strategies and assessments.

*SIG: Biology* may be purchased as a full-year discipline based program in one hard bound book or as units to create a customized scope and sequence (on the following pages).

## ACCESS TO TEACHER'S ONLINE PORTAL

- Assign homework and communicate with students
- Note taking & highlighting for students
- Online Student and Teacher books
- LABsent sheets & videos for absent students
- Integrated, online assessment system
- Editable PowerPoints for each lesson
- Single Sign-On (SSO) available

STEM LITERACY  
REFILLABLE AG  
ADD A GROUP



SCIENCE & GLOBAL ISSUES: BIOLOGY FULL-YEAR PROGRAM	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials [except electrophoresis chambers] for up to 5 classes of 32 students, mobile storage cart, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition and Resources, online Student Book, and supplemental resources)	SIG-B-2000	\$9,882.85
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to online book, student sheets, supplemental resources)	SIG-B-2OLSP-1	\$5.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	SIG-B2SB	\$99.95
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SIG-B2TETR	\$235.00
<b>LAB-AIDS ELECTROPHORESIS CHAMBER</b> (four needed for a class of 32)	SIG-P011	\$257.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
Small class sizes for 5 sections of 16 students might consider our <b>COMPLETE EQUIPMENT PACKAGE FOR 16 STUDENTS PER CLASS</b>	SIG-BH2000	\$6,041.05

For custom orders and standards correlations by state please see the "Your State" page on [lab-aids.com](http://lab-aids.com) to contact your state's Science Curriculum Sales Specialist.



## PROGRAM COMPONENTS

Individual components combine to form a complete learning system.

- Student book that seamlessly integrates investigations, labs, and readings into the context of the issue's storyline
- Equipment to carry out each embedded activity for 5 classes of 32 students (in groups of four, pairs or individuals)
- Online student and teacher bookshelf portals
- Student Science Lab notebook

Materials needed for embedded labs and activities are part of the Complete Equipment Package

JAFFREY CITY'S PROBLEM • ACTIVITY 5

**Challenge**  
 ► How can phosphate and nitrate indicators help identify the contamination problem in Jeffrey Lake?

**MATERIALS**

**FOR THE CLASS**  
 40 dropper bottles of Jeffrey Lake water (locations 1-40)

**FOR EACH GROUP OF FOUR STUDENTS**  
 Chemplate™  
 dropper  
 set colored pencils

**FOR EACH PAIR OF STUDENTS**  
 12 phosphate- or nitrate-test strips  
 phosphate or nitrate color-comparison chart  
 cup with rinsed water  
 paper towels  
 white scrap paper

**FOR EACH STUDENT**  
 Student Sheet 5.1, "Jeffrey Lake Water Testing"  
 safety goggles

**Safety**  
 Wear safety eyewear and avoid skin contact with the solutions.

**Procedure**

1. Of the 40 possible locations to test in the lake, your group was paid to conduct 12 tests for each substance. Create a data table in your science notebook where you will record the results of the tests. You will record the water location number, the Chemplate cup number, and the test results for nitrate and phosphate.
2. In your group, decide which pair of students will test for nitrate and which will test for phosphate.

SCIENCE & GLOBAL ISSUES/BIOLOGY • SUSTAINABILITY

3. With your group, look at Student Sheet 5.1, "Jeffrey Lake Water Testing," and select three of the locations numbered 1-40 on the map to test first. Choose locations you think will most likely contain high concentrations of the substances. Record in your notebook why you predicted these locations.
4. To begin the testing, take your Chemplate to the "lake area" and find the three bottles with the matching location numbers. Place 5 drops from each location in separate Chemplate cups and bring it back to your table. Record the location numbers and the corresponding Chemplate cup numbers in your data table.
5. Test the three waters for your substance, as described in the testing procedure below. Record the data in your table.

**TESTING PROCEDURE:**

- a. Place the white paper on top of the paper towel.
- b. Label the test strip with the location number.
- c. Put one drop of location water on the end of the test strip.
- d. For the phosphate test, compare the test strip to the color chart. For the nitrate test, wait one minute before comparing.
- e. Record the result in your table.
- f. Rinse out the dropper with water in the rinsing cup.

6. Using the results from your tests, begin to complete Student Sheet 5.1, "Jeffrey Lake Water Testing." Choose different colored pencils to represent the levels of each substance, and fill in the key using the scales shown on the color-comparison chart. Identify your map as either "nitrate" or "phosphate" concentrations, depending on the substance you are testing.
7. Share your data with the other pair in your group. As a group, choose three additional locations to test that are based on the results.
8. Repeat Steps 4-7 until you have tested 12 locations.
9. Compare maps and look for any patterns in the concentration levels and locations of the substances. Compare your data to the county standards and show below:

Phosphate in Jeffrey Lake	
NATURAL CONCENTRATION (PPM)	LOCAL LIMIT (PPM)
0-5	0.1

Nitrate in Jeffrey Lake	
NATURAL CONCENTRATION (PPM)	LOCAL LIMIT (PPM)
<2	10



# SUSTAINABILITY

## Over-arching Issue: How can a sustainability plan be developed for a community that will balance the interests of all of the stakeholders?

One of the most critical global issues of our time is how to live in ways that will sustain our planet’s systems and resources. In this introductory unit to Science and Global Issues: Biology, you will identify sustainability challenges in towns, countries, and larger regions around the world. You will learn about communities that have applied scientific knowledge and technology to address their local resource challenges.

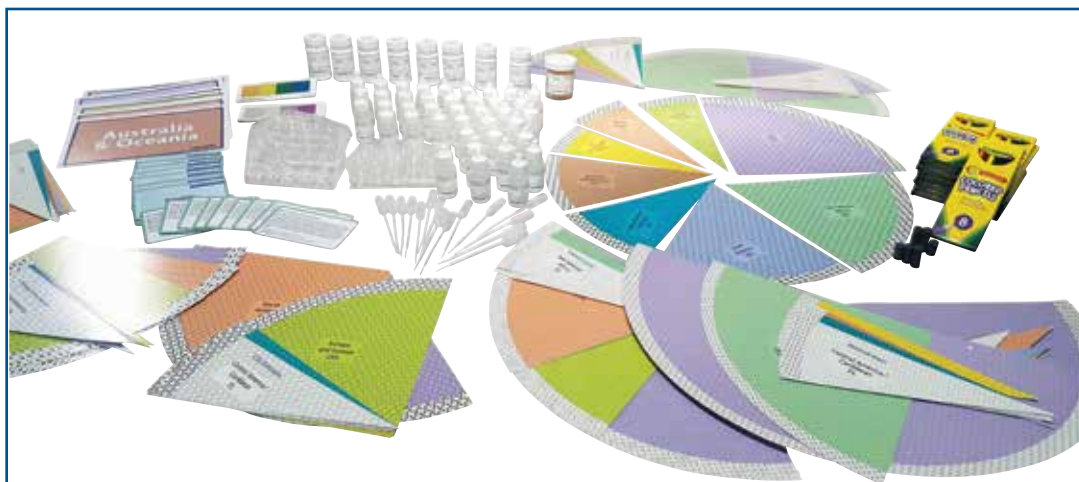
**Core Science Content:** Ecological systems resiliency, resource use and availability, ecological footprint, making sustainable decisions

**Key Assessment Task:** Describe the proposal idea you voted for and state the major evidence that most influenced your choice. Then describe the trade-offs of the proposal. The trade-offs should include the social, economic, and environmental impacts on the community. **Supports elements of NGSS Performance Expectations: ETS1-1, ETS1-3 (for full three-dimensional alignment lab-aids.com/high-school)**

### 2-3 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

- STEM LITERACY
- REFILLABLE AG
- ADD A GROUP



SUSTAINABILITY	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition and Resources, online Student Book, and supplemental resources)	SGI-BA-2000NC	\$922.35
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to online book, student sheets, supplemental resources)	SGI-BA-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	SGI-BA-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SGI-BA-2TETR	\$120.75
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95



## ECOLOGY: LIVING ON EARTH

### Over-arching Issue: How would you design policies to make a fishery sustainable?

Understanding the complex web of relationships within ecosystems is essential to understanding their sustainability. In this unit students examine a variety of ecological issues including the impact of human activities on ecosystems. They see the results of pollution in an area vital to organisms, and learn about invasive species and their impact on established ecosystems. Students then recommend actions to sustain a fishery and its ecosystems.

**Core Science Content:** Flow of energy through ecosystems, global ecosystems, population ecology, photosynthesis and respiration

**Key Assessment Task:** “How do you think it would affect the ecosystem if the communities near Avril Gulf continued fishing spotted flying fish instead of Avril Gulf tuna?” **Supports elements of NGSS**

**Performance Expectations:** ETS1-1, ETS1-3, LS1-5, LS1-6, LS1-7, LS2-3, LS2-4, LS2-5, LS2-6, LS2-7 (for full three-dimensional alignment [lab-aids.com/high-school](http://lab-aids.com/high-school))

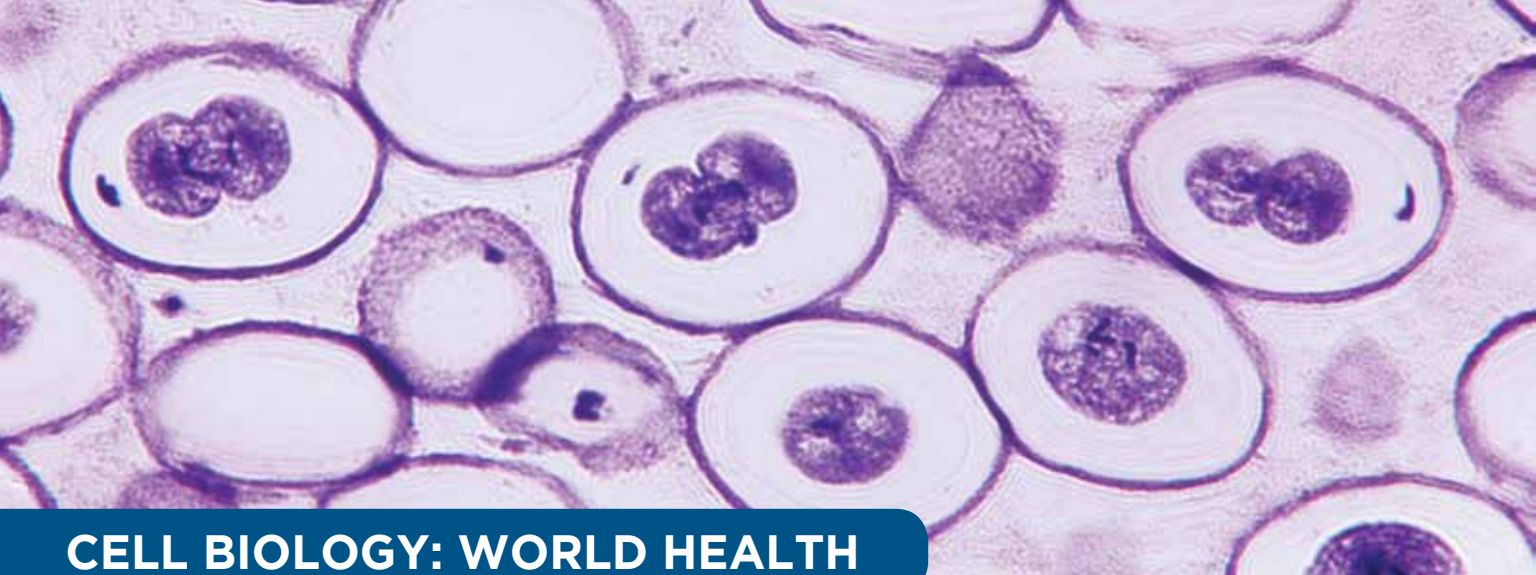


6-9 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

LITERACY STEM  
AG REFILLABLE  
ADD A GROUP

ECOLOGY: LIVING ON EARTH	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition and Resources, online Student Book, and supplemental resources)	SGI-BB-2000NC	\$2,452.70
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to online book, student sheets, supplemental resources)	SGI-BB-2OLSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	SGI-BB-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SGI-BB-2TETR	\$120.75
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95



## CELL BIOLOGY: WORLD HEALTH

**Over-arching Issue:** How should we assist developing countries face public health challenges from preventable disease? What are the social, economic, and environmental trade-offs?

Understanding the mechanisms of a disease is essential to our ability to prevent, eradicate, or cure them. In this unit, students examine several diseases and their social, environmental, and economic consequences. They learn about the mechanism of these diseases at the cellular level and investigate the structures and functions of normal cells and the processes that occur inside these cells. At the end of the unit, they make recommendations for how best to allocate limited funding to address world health problems.

**Core Science Content:** Structure and function of animal and plant cells, cell specialization, basic biochemistry, disease-causing microbes

**Key Assessment Task:** “Describe how you think the limited funds from the foundation should best be distributed among the proposals. For example, should all of the proposals receive equal funding, should all of the proposals receive some funding but with some getting more than others, or should one or two receive all of the funding? Explain the evidence and reasoning for your decision, and discuss the trade-offs of your decision.” **Supports elements of NGSS Performance Expectations: ETS1-1, ETS1-3, LS1-1, LS1-2, LS1-4, LS1-5, LS1-6, LS1-7, LS3-2 (for full three-dimensional alignment visit [lab-aids.com/high-school](http://lab-aids.com/high-school))**

### 6-8 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

- STEM LITERACY
- REFILLABLE AG
- ADD A GROUP



CELL BIOLOGY: WORLD HEALTH	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition and Resources, online Student Book, and supplemental resources)	SGI-BC-2000NC	\$3,322.05
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to online book, student sheets, supplemental resources)	SGI-BC-2OLSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	SGI-BC-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SGI-BC-2TETR	\$120.75
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95





## GENETICS: FEEDING THE WORLD

### Over-arching Issue: What evidence can inform our decisions about producing and using GMO food crops?

A dynamic, and sometimes controversial, technology that has emerged from genetics is genetic modification. Scientists place genes from one species into another to give the target species a specific, desirable trait, such as pest resistance. However, there are concerns that this may lead to unintended consequences for the environment and/or human health. In this unit, students investigate how genes and patterns of inheritance function in organisms over generations. They also learn the procedures and results of genetic modification, and the benefits and trade-offs of producing genetically modified organisms.

**Core Science Content:** Phenotype, genotype, traits, DNA replication, mutations, protein synthesis, gene expression, mitosis, meiosis, genetic engineering

**Key Assessment Task:** “Describe how your recommendation will affect the social, economic, and environmental sustainability of your country” **Supports elements of NGSS Performance Expectations: ETS1-1, ETS1-3, LS1-1, LS1-4, LS3-1, LS3-2, LS3-3 (for full three-dimensional alignment visit [lab-aids.com/high-school](http://lab-aids.com/high-school))**

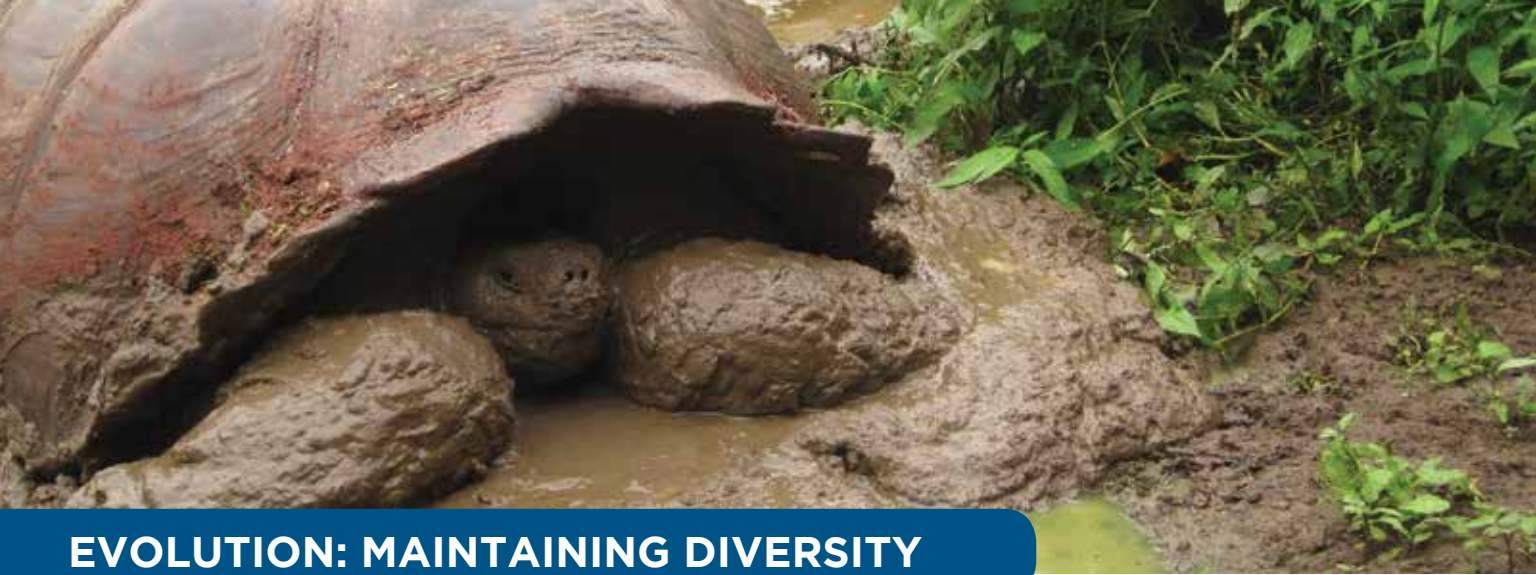


**6-9 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

**LITERACY** **STEM**  
**AG** **REFILLABLE**  
**ADD A GROUP**

GENETICS: FEEDING THE WORLD	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition and Resources, online Student Book, and supplemental resources)	SGI-BD-2000NC	\$2,623.35
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to online book, student sheets, supplemental resources)	SGI-BD-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	SGI-BD-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SGI-BD-2TETR	\$120.75
<b>LAB-AIDS ELECTROPHORESIS CHAMBER</b> (four needed for a class of 32)	SGI-P011	\$257.50
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95



## EVOLUTION: MAINTAINING DIVERSITY

### Over-arching Issue: How can we promote evolution by conserving biodiversity?

There is great variety within and between the earth’s ecosystems. All of these levels of variation comprise the earth’s biodiversity which is the product of billions of years of evolution. In this unit, students investigate the levels of biodiversity and evolutionary processes that increase, decrease, or maintain biodiversity. They also examine humans’ social, environmental, and economic influences on biodiversity. Billions of years of evolution have created great variety within and between the earth’s ecosystems. In the final task, students make recommendations for which area should be conserved on a fictitious island.

**Core Science Content:** Levels of biodiversity, introduction to phylogeny, evolutionary processes and natural selection, speciation, evidence for natural selection

**Key Assessment Task:** “Describe three indicators you would recommend using to monitor the success of the conservation over the next 10 years if your recommendation from Question 1 were implemented. These indicators can be any observations that will help determine if the recommendation is successful.”

**Supports elements of NGSS Performance Expectations: ETS1-1, ETS1-3, LS4-1, LS4-2, LS4-3, LS4-5, LS4-6 (for full three-dimensional alignment visit [lab-aids.com/high-school](http://lab-aids.com/high-school))**

#### 4-7 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

LITERACY STEM AG

NONCONSUMABLE

ADD A GROUP



EVOLUTION: MAINTAINING DIVERSITY	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition and Resources, online Student Book, and supplemental resources)	SGI-BE-2000NC	\$1,353.95
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to online book, student sheets, supplemental resources)	SGI-BE-20LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	SGI-BE-2SB	\$34.50
<b>TEACHER EDITION AND TEACHER RESOURCES</b> (printed)	SGI-BE-2TETR	\$120.75
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95



# High School

Environmental Science



Help your students understand that science is not only a part of their everyday lives, but that the decisions they make play a role in their local communities. The **SCIENCE AND SUSTAINABILITY** (S&S) course uses themes and activities related to local and global sustainability to present key concepts from the life, earth, chemical, and physical sciences.

Supports the use of interdisciplinary bundles of NGSS Performance Expectations for instruction as well as support for Common Core ELA and Mathematics. Science and Sustainability is a truly integrated approach to understanding the complex environmental issues of today.

*Science and Sustainability* may only be purchased as a full-year program in one hard bound book with equipment packages. Explore the units on the following pages.

## ACCESS TO TEACHER'S ONLINE PORTAL

- Assign homework and communicate with students
- Note taking & highlighting for students
- Online Student and Teacher books
- Single Sign-On (SSO) available
- Printable and downloadable student sheets and visual aids



**STEM** **LITERACY**  
**REFILLABLE** **AG**

SCIENCE AND SUSTAINABILITY FULL-YEAR PROGRAM	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (all materials for up to 5 classes of 32 students, mobile storage cart, Online Portal access for one teacher which includes e-book versions of the Teacher Edition, and Student Book, student sheets and visual aids)	SS-R1000	\$6,792.85
<b>ONLINE PORTAL FOR STUDENTS</b> (Online subscription to student book)	SS-ROLSP-1	\$5.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	SS-RISB	\$99.95
<b>MATERIAL WORLD BOOK</b> (hardcover; not included in Complete Equipment Package)	SS-1MWB	\$41.15
<b>TEACHER EDITION</b> (printed)	SS-RITE	\$225.00
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95
Small class sizes for 5 sections of 16 students might consider our <b>COMPLETE EQUIPMENT PACKAGE FOR 16 STUDENTS PER CLASS</b>	SS-R1H-1000	\$3,939.85

For custom orders and standards correlations by state please see the "Your State" page on [lab-aids.com](http://lab-aids.com) to contact your state's Science Curriculum Sales Specialist.



## PROGRAM COMPONENTS

Individual components combine to form a complete learning system.

- Student book that seamlessly integrates investigations, labs, and readings into the context of the issue's storyline
- Equipment to carry out each embedded activity for 5 classes of 32 students (in groups of four, pairs or individuals)
- Online student and teacher bookshelf portals
- Student Science Lab notebook

Materials needed for embedded labs and activities are part of the Complete Equipment Package

Disposing of Toxic Heavy Metals 25.1

**Part A "Fixing" the Copper Ions in a Solid Mixture**

**Materials**

■ For each group of four students	■ For each team of two students
1 180-ml bottle of sodium silicate	1 clear plastic cup
1 sample of Portland cement	1 plastic spoon
1 120-ml dropper bottle of 50,000 ppm copper sulfate solution	1 30-ml graduated cup
paper towels	■ For each student
	1 pair of safety glasses

**Safety Note** Portland cement can irritate your eyes and lungs. Avoid breathing its dust. Wear safety glasses. Do not wash glassware containing Portland cement in the sink, since it will permanently clog the drain. Use wet paper towels to wipe out cups and clean your hands. Then throw the used paper towels in the trash.

**Procedure**

- Your teacher will assign you an amount of sodium silicate and Portland cement to add to the copper sulfate solution. Prepare a data table similar to the one below and circle the amounts of Portland cement and sodium silicate your group has been assigned. You will use this data table again in Part C.

**Table 1 Solid and Filtrate Observations**

Copper Sulfate Solution (mL)	Cement (m <sup>3</sup> )	Sodium Silicate (mL)	Adjustments of Mixture		Color of Filtrate		Estimated Copper Concentration
			When Wet	After Drying	From Simulated Acid Rain	After Adding Ammonia	
10	20	0					
10	0	20					
10	5	15					
10	10	10					
10	15	5					

299

By-Products of Materials Production

**By-Products of Materials Production 25**

**25.1 Disposing of Toxic Heavy Metals**

**Purpose** Detect low concentrations of dissolved copper and convert this copper-bearing solution into a solid that can be disposed of safely.

**Introduction**

As you observed in Activity 24, "Material Resources: Metals," acid solutions can release, or **leach**, metals from their ores. Rain water or groundwater can also leach metals from contaminated soil and landfills. Small amounts of heavy metals, such as copper, lead, and chromium, can be toxic to living organisms. Water moves easily through the environment. If it contains dissolved metals or other toxic chemicals, it can contaminate soil and water supplies and cause health problems for organisms throughout the food web.

In this investigation, you will use the waste solution you produced during Activity 24.1, "Extracting Metal From a Rock." In Part B of this activity you will estimate the amount of copper in your waste solution by performing a serial dilution and then using a test to detect low concentrations of copper in solution. A **serial dilution** is a procedure that creates a series of solutions in which each solution has a concentration that is an exact fraction, such as  $\frac{1}{2}$  or  $\frac{1}{10}$ , of the previous one. In Parts A and C you will investigate a method for treating wastewater containing dissolved copper sulfate so that it will resist leaching when disposed of in a landfill.

298

Activity 25



## LIVING ON EARTH

**Over-arching Issue:** Sustainable practices can reduce impact on ecosystems. What are the personal, community, and global perspectives that best inform our actions?

11 WEEK UNIT

Introduces the concept of sustainability by examining survival needs of living organisms and concepts related to these needs. Environmental impacts of human activities - past, present, and future are investigated, as well as the role of science and technology.

**Core Science Content:** Homeostasis & survival needs, population dynamics, heat & energy transfer, food webs & energy flow, energy use

**Key Assessment Task:** “What additional information would you like to have before you would be confident in saying that increased levels of CO<sub>2</sub> in the atmosphere definitely do or do not lead to increased surface temperatures? Explain why this information is important.” **For NGSS info, see: <https://tinyurl.com/y7tvb4yk>**



## FEEDING THE WORLD

**Over-arching Issue:** What are the trade-offs between society’s need to provide people with adequate nutrients and the ecological impacts of modern methods of food production?

8 WEEK UNIT

In this unit, students investigate the chemical nature of food, chemical and biological processes involved in food production, and techniques for increasing availability of food.

**Core Science Content:** Cell structure & function, elements, photosynthesis, plant genetics, genetic engineering

**Key Assessment Task:** “The current debate over genetic engineering involves healthcare professionals, ecologists, ethicists, social and political thinkers, agricultural experts, officials in government agencies, and political leaders. What can you do in your lifetime to affect the debate on genetic engineering? Use at least one specific example from each side of the debate.” **For NGSS info, see: <https://tinyurl.com/y7tvb4yk>**



## USING EARTH'S RESOURCES

**Over-arching Issue:** How can we reduce our impact on the environment as we explore and use Earth's resources to produce material goods?

9 WEEK UNIT

In addition to food production, humans use Earth's natural resources for many other purposes. This unit examines how material use affects the standard of living and quality of life.

**Core Science Content:** Hydrocarbon & polymer chemistry, metal extraction & refining, catalysts & enzymes, degradability, food preservation, gas laws

**Key Assessment Task:** "If you were responsible for deciding how the World Bank should spend its \$100 million among these proposals, how would you spend it? Explain your reasoning, using evidence." **For NGSS info, see:** <https://tinyurl.com/y7tvb4yk>



## MOVING THE WORLD

**Over-arching Issue:** What is the critical interplay between energy production, energy use, and sustainable development?

7 WEEK UNIT

Energy drives most aspects of society. This unit investigates energy production and use.

**Core Science Content:** Energy use & biofuels, exothermic & endothermic reactions, nuclear reactions, electromagnetic waves

**Key Assessment Tasks:** "Do you think that global societies could be sustained at current and future population levels if everyone in the world used energy at the same rate as an average U.S. resident? Explain." "How do you propose—on an individual level, a national level, and a global level—that humans prepare to meet future energy demands? What trade-offs are involved in your proposals?" **For NGSS info, see:** <https://tinyurl.com/y7tvb4yk>



*EDC: Earth Science* is an initiative between the Oceans of Data Institute and the Learning and Teaching Division at the Education Development Center, Inc. (EDC). For more than 50 years, EDC has been a leader in efforts to solve a wide range of educational, health, and social problems and is recognized for the high quality of its program and product development, research, technical assistance, and professional and organizational development.

***EDC Earth Science* is designed for the Framework for Science Education and centers around the belief that students are capable of rigorous and in-depth explorations in science when given adequate support, structure, and motivation for learning.** Students perform data-intensive investigations set in real-world contexts and engage in a variety of activities that build critical data-using skills.

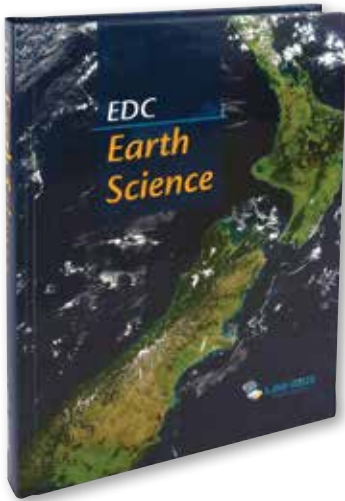




# High School

Earth Science

# EDC EARTH SCIENCE

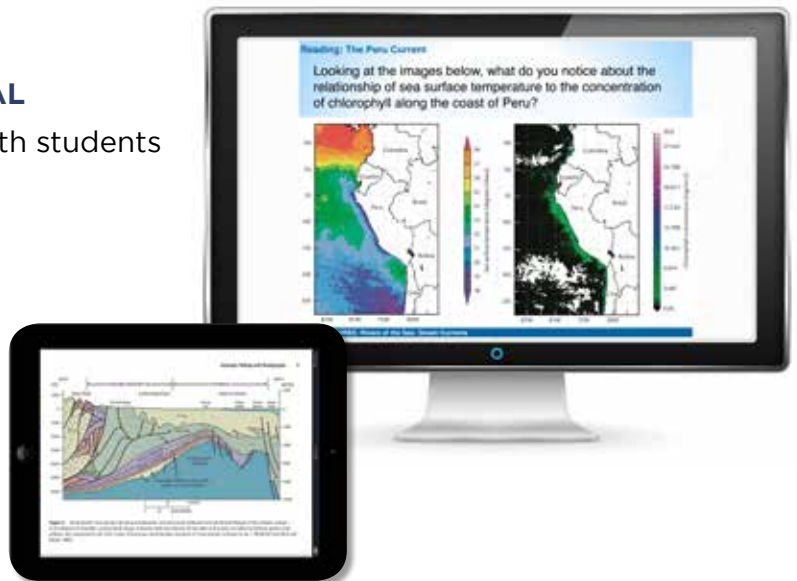


Designed using *A Framework for Science Education*, **EDC EARTH SCIENCE** involves students by challenging them with thought-provoking investigations and questions they hear in the news or at their family dining table. The course opens with an exciting excerpt from the novel *Red Mars* and mid-way through the year students prepare a news story and make predictions about what Earth will be like in the year 2100. In the End-of-Year Challenge students apply the knowledge they have gained during this course to prepare an essay or presentation predicting what Earth will be like when its interior cools completely.

*EDC Earth Science* may be purchased as a full-year discipline-based program in one hard bound book OR as units to create a customized scope and sequence (on the following pages).

## ACCESS TO TEACHER'S ONLINE PORTAL

- Assign homework and communicate with students
- Note taking & highlighting for students
- Online Student and Teacher books
- Integrated, online assessment system
- Editable PowerPoints for each lesson
- Single Sign-On (SSO) available



**STEM** **LITERACY**  
**REFILLABLE** **ADD A GROUP**

EDC EARTH SCIENCE FULL-YEAR PROGRAM	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, mobile storage cart, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition, online Student Book, and supplemental resources)	EDCE-1000	\$7,925.35
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to student book, student sheets, resource supplements)	EDCE-10LSP-1	5.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	EDCE-1SB	\$99.95
<b>TEACHER EDITION</b> (printed)	EDCE-1TE	\$235.00
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)

For custom orders and standards correlations by state please see the "Your State" page on [lab-aids.com](http://lab-aids.com) to contact your state's Science Curriculum Sales Consultant.



Materials needed for embedded labs and activities are part of the Complete Equipment Package

## PROGRAM COMPONENTS

Individual components combine to form a complete learning system.

- Student book that seamlessly integrates investigations, labs, and readings into the context of the issue's storyline
- Equipment to carry out each embedded activity for 5 classes of 32 students (in groups of four, pairs or individuals)
- Online student and teacher bookshelf portals
- Student Science Lab notebook

CHAPTER 11 • SLEEPING DRAGON! SUBDUCTION-ZONE VOLCANOES

**FIGURE 11.8**  
Mount St. Helens is an example of a stratovolcano (see left). This sequence of diagrams shows the formation of a stratovolcano (SOS) in three steps. Magma is very viscous (thick) which prevents bubbles of volcanic gases and gases from escaping the magma. As the magma reaches the surface, the pressure drops and the bubbles expand, causing the magma to explode, spraying the air and rock fragments. Most of these fragments fall close to the vent, forming a cone, and are not enough to form a cone after layer of ash and rock fragments accumulate and eventually form a cone-shaped mountain.

**Materials**

**FOR EACH GROUP OF STUDENTS**

- 60-mL bottle of less-gassy "magma" (red)
- 60-mL bottle of more-gassy "magma" (colorless)
- plastic volcano model (cone and base)
- "magma chamber" (clear plastic tube)
- rubber stopper
- vial of baking soda
- white plastic scoop
- 30-mL graduated cup
- cup of water
- metric ruler
- access to a timer or a clock with a second hand
- paper towels and/or a sponge

**FOR EACH STUDENT**

- safety eyewear

**SAFETY**

Both types of "magma" contain dilute acid. Wear safety goggles and avoid direct contact with skin and eyes. Wash your hands after completing the activity.

**Pre-Activity Discussion**

Discuss the following topics with your classmates to help you prepare for the investigation. Record your answers in your notebook.

1. Based on the information in *Setting the Stage: Volcanic Eruptions*, compare and contrast the types of eruptions that occur in 1) shield volcanoes such as those in Hawaii, 2) divergent boundaries, and 3) stratovolcanoes along subduction zones.
2. Explain why mountains formed by shield volcanoes have a different shape than those formed by stratovolcanoes.

**Procedure**

Record all your observations in your science notebook.

**Part A: Eruptions with Less-Gassy Magma**

1. Carefully observe the two types of "magma" and describe any similarities and differences.
2. Set up your volcano model as shown below by following these steps:
  - a. Use the white scoop to carefully add one scoopful of baking soda into the "magma chamber." Try to get as little as possible stuck on the sides of the tube.
  - b. Carefully push the "magma chamber" down through the "crater" of the white volcano cone.
  - c. Push the bottom of the "magma chamber" down into the hole of the white volcano base.
3. Use the graduated cup to measure, then pour 5-mL of less-gassy "magma" into the "magma chamber."
4. Without disturbing the model, observe it carefully for 2 minutes.

299

FDC EARTH SCIENCE • UNIT 4 • PLATE TECTONICS

### ACTIVITY 2

## A Lava Flow or an Explosion?

#### Setting the Stage: Volcanic Eruptions

##### Types of Eruptions

Volcanoes exist around the world, and each has a unique history. Volcanoes differ in the type and amount of material they erupt, and knowing a particular volcano's history can give you an indication of the likely nature of future eruptions.

Some volcanoes, such as Hawaii's Mauna Loa and its neighbor Kilauea, which is located on a **hot spot** (a location where a hot and relatively stationary convection current is rising toward the surface within the mantle) in the middle of the Pacific Plate, have historically produced mostly thin, fluid lava flows, or **flows**, of the magma that flows from the Hawaiian hot spot volcanoes erupts fairly peacefully, moving slowly enough that it is not dangerous to people, although gentle neighborhoods of houses in Hawaii have been gradually enveloped by gently sloping shapes, shown in Figure 11.7.

During volcanic eruptions along divergent boundaries, where plates are moving apart, magma generally flows from long fissures in the crust. Most of these eruptions occur at the bottom of the ocean, so they are difficult to observe and rarely affect people.

The eruptions at subduction zone volcanoes, such as Mount St. Helens in Oregon (and Mount Rainier in Washington), can be much more violent than the eruptions of shield volcanoes like those in Hawaii or along divergent boundaries. This is because they are sometimes made explosive by the violent expansion of gases. Magma generated in subduction zones are lower in temperature, higher in gas content, and higher in silica content, which results in a gasier but high-viscosity (sticky) magma. This thick, sticky magma traps the gases until pressures build to dangerous levels and violent eruptions result. These types of volcanoes are called **stratovolcanoes** and can be recognized by their steep surface slopes, as shown in Figure 11.8.

**FIGURE 11.7**  
Mauna Loa is an example of a shield volcano. (Bottom left) The sequence of diagrams shows the formation of a shield volcano (SOS). (a) Magma rises from the mantle through a vent. (b) Magma reaches the surface and bubbles expand, causing the magma to explode, spraying the air and rock fragments. (c) Magma and rock fragments accumulate and eventually form a low, broad, shield-shaped mountain.

298

# HYDROSPHERE: WATER IN EARTH'S SYSTEMS

**Essential Question:** Water is critical for all life on Earth. How does its movement and distribution affect our society and global economy?

Students consider how access to clean water is critical to human survival. Students first develop knowledge about how water is obtained the science behind surface and ground water supplies. They then learn about the voyage of Kon-Tiki and investigate the science of ocean currents, major circulation patterns, and determine the chance of a successful voyage.

**Practices and Cross-cutting Concepts:** Analyzing and interpreting data, constructing explanations, patterns, cause and effect, energy and matter

**Key Assessment Task:** “Describe how an ENSO event might have affected Thor Heyerdahl’s journey.”

## 3-4 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

**STEM** **LITERACY**  
**REFILLABLE** **ADD A GROUP**



HYDROSPHERE: WATER IN EARTH'S SYSTEMS	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition, online Student Book, and supplemental resources)	EDCE-1-1000NC	\$1,334.80
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to student book, student sheets, resource supplements)	EDCE-1-10LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	EDCE-1-1SB	\$34.50
<b>TEACHER EDITION</b> (printed)	EDCE-1TE	\$235.00
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# ATMOSPHERE AND CLIMATE

## Essential Questions: What is the science behind global climate change, and what possible actions can we take to minimize its impact?

Students start their exploration of climate close to home, learning about the climate in their local area land comparing to a chosen travel destination. Students learn how climate is measured and how it affects the flora and fauna of a landscape. Later, students research the factors that influence global climates as they read about a community in Alaska that is threatened by global warming, noting that local inhabitants have filed a lawsuit that says energy companies should pay to relocate the town. Finally, students explore two time periods in Earth’s past when climate was very different from today - the warm Cretaceous and glacial interval of the Pleistocene. Students study evidence - recorded in rock and ice - and explore the factors that have contributed to these changes.

**Practices and Cross-cutting Concepts:** Analyzing and interpreting data, using mathematics, using models, engaging in argument from evidence, patterns, cause and effect, systems and system models, energy and matter, stability and change

**Key Assessment Task:** “Describe two methods scientists use to reconstruct Earth’s climate history and the type of information each of these methods provides. Also, describe how far back in time climate data can be obtained using each of these methods.”



**5-8 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on **lab-aids.com** to contact your Curriculum Sales Specialist.

LITERACY STEM  
ADD A GROUP REFILLABLE

ATMOSPHERE AND CLIMATE	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition, online Student Book, and supplemental resources)	EDCE-2-1000NC	\$1,623.05
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to student book, student sheets, resource supplements)	EDCE-2-10LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	EDCE-2-1SB	\$34.50
<b>TEACHER EDITION</b> (printed)	EDCE-1TE	\$235.00
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95

Individual group packages available for small or large class sizes - refer to **lab-aids.com**



## EARTH'S PLACE IN THE UNIVERSE

**Essential Questions:** How did the Earth and planets form? How do we know what we know about the structure and composition of the Earth?

Students learn methods for dating the age of earth and other objects in the universe, then compare different models that account for the birth of the solar system and the life and death of stars. They conduct a mock trial to examine evidence for the solar nebular condensation theory, and examine line spectra use by astronomers to investigate the composition of deep space objects. By creating a journey into the earth, students also explore Earth's internal structure, communicating scientific information about what they would encounter along the way.

**Practices and Cross-cutting Concepts:** Developing and using models, planning and carrying out investigations, constructing explanations, obtaining, evaluating, and communicating information, energy and matter, systems and system models

**Key Assessment Task:** "Describe where the energy comes from that drives movements and changes within Earth, based on what you've learned about the conditions in Earth's interior, explain why people haven't yet penetrated through Earth to the core."

### 3-4 WEEK UNIT

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the "Your State" page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

LITERACY ADD A GROUP

NONCONSUMABLE STEM



EARTH'S PLACE IN THE UNIVERSE	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition, online Student Book, and supplemental resources)	EDCE-3-1000NC	\$1,437.80
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to student book, student sheets, resource supplements)	EDCE-3-10LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	EDCE-3-1SB	\$34.50
<b>TEACHER EDITION</b> (printed)	EDCE-1TE	\$235.00
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# PLATE TECTONICS

**Essential Questions:** How have plate tectonics shaped the current surface of the Earth? What hazards result from plate movement and why is it important to understand the potential dangers?

The 1906 San Francisco earthquake sets the context for studying the transform – fault boundary along the coast of California. Students develop a physical model of the San Andreas fault zone and explore computer models used by scientists to forecast when and where earthquakes will occur. They examine the relationship of the Cascade volcanoes in Washington, Oregon, and California to the subduction zone along the Northwest coast. Students explore the process of seafloor spreading occurring along the Mid-Atlantic Ridge, looking for patterns in maps of earthquake distribution, seafloor topography, ocean crust age, and paleomagnetic data.

**Practices and Cross-cutting Concepts:** Developing and using models, Analyzing and interpreting data, Using mathematics and computational thinking, Constructing explanations, Obtaining, evaluating, and communicating information, Energy and matter, Scale, proportion, and quantity, Structure and function, Stability and change, Cause and effect, Systems and system models

**Key Assessment Task:** “Choose two from the four following types of maps: volcano map, earthquake locations map, ocean crust age map, and seafloor bathymetry map, describe exactly what kind of information each provides regarding the seafloor.”



**5-7 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

LITERACY STEM  
ADD A GROUP REFILLABLE

PLATE TECTONICS	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition, online Student Book, and supplemental resources)	EDCE-4-1000NC	\$799.05
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to student book, student sheets, resource supplements)	EDCE-4-10LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	EDCE-4-1SB	\$34.50
<b>TEACHER EDITION</b> (printed)	EDCE-ITE	\$235.00
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)



# THE ROCK CYCLE

**Essential Questions:** How and where are different types of rock formed?  
 How do the forces of erosion and deposition affect human activities?

Students investigate how river deltas build new land, specifically New Orleans in the aftermath of Hurricane Katrina. They explore the role the river played in forming the land in Louisiana and why the land beneath New Orleans is sinking now. Students examine samples of the rocks and minerals that make up the crust and learn how to recognize clues that tell them other stories in Earth’s history.

**Practices and Cross-cutting Concepts:** Analyzing and interpreting data, developing and using models, constructing explanations, engaging in argument from evidence, patterns, cause and effect, systems and system models, stability and change, energy and cycles

**Key Assessment Task:** “The continents have been constantly shifting position since tectonic plate movements began early in Earth’s history. Scientists have found evidence in rocks of Earth’s crust that supercontinents existed several times in Earth’s history. How do you think a change in position of the continents might affect ocean currents and conditions in Earth’s atmosphere? How do you think the movement of continents might affect the evolution of life? Explain your thinking about these relationships.”

**3-6 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

**STEM LITERACY**  
**REFILLABLE ADD A GROUP**



THE ROCK CYCLE	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition, online Student Book, and supplemental resources)	EDCE-5-1000NC	\$1,570.75
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to student book, student sheets, resource supplements)	EDCE-5-10LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	EDCE-5-1SB	\$34.50
<b>TEACHER EDITION</b> (printed)	EDCE-1TE	\$235.00
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95





# EARTH RESOURCES

**Essential Questions:** How and where are fossil fuels and other valuable earth minerals formed? How has the location and use of these resources affected society and the environment?

Students explore the surprising extent to which they rely on Earth’s crust for the materials in their possessions. Putting themselves in the shoes of mineral prospectors, they gain expertise in the way mineral ores concentrate within Earth’s crust and contemplate how they would find them. The Rub al kahli in Saudi Arabia provides the context to investigate how oil reservoirs form naturally in the Earth’s crust and how geologist find and extract this precious resource.

**Practices and Cross-cutting Concepts:** Developing and using models, planning and carrying out investigations, constructing explanations, obtaining, evaluating, and communicating information, energy and matter, systems and system models

**Key Assessment Task:** “Imagine that a businessperson is trying to convince you to invest in an oil exploration prospect. The person is seeking money to drill in a brand-new location where oil has never been found before. What questions would you ask before giving the businessperson your money? List at least three.”



**3-6 WEEK UNIT**

For custom orders, discounted unit bundle pricing, and standards correlations by state visit the “Your State” page on [lab-aids.com](http://lab-aids.com) to contact your Curriculum Sales Specialist.

**LITERACY STEM**  
**ADD A GROUP REFILLABLE**

EARTH RESOURCES	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE</b> (materials for up to 5 classes of 32 students, Online Portal access for one teacher which includes assessments, PowerPoints, online Teacher Edition, online Student Book, and supplemental resources)	EDCE-6-1000NC	\$1,107.25
<b>ONLINE PORTAL FOR STUDENTS</b> (online subscription to student book, student sheets, resource supplements)	EDCE-6-10LSP-1	\$1.00 per student per year
<b>STUDENT BOOK</b> (hardcover)	EDCE-6-1SB	\$34.50
<b>TEACHER EDITION</b> (printed)	EDCE-1TE	\$235.00
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95

Individual group packages available for small or large class sizes - refer to [lab-aids.com](http://lab-aids.com)

## A NATURAL APPROACH TO CHEMISTRY

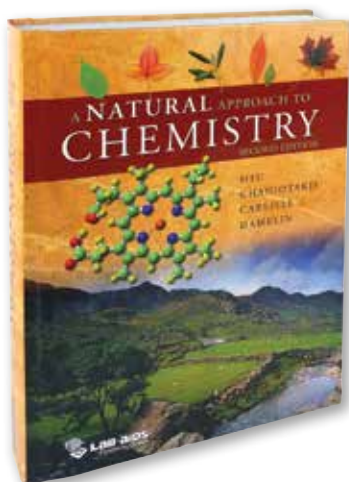
***A Natural Approach to Chemistry* gives students the opportunity to do chemistry, not just read about it.** In this program students learn the science to understand how chemistry is relevant to their lives.

The developers saw an opportunity in chemistry curricula, with students using college books that were written at the wrong reading level for them, emphasizing problem-solving without spending enough time on conceptualizing the big picture of chemistry. They felt chemistry instruction needed examples in order to make connections with students, it must be experienced at an appropriate level, and it must be relevant to their lives. In the end the program aims to teach students by posing a question, showing them how to investigate and solve problems without giving them the answers.



# High School

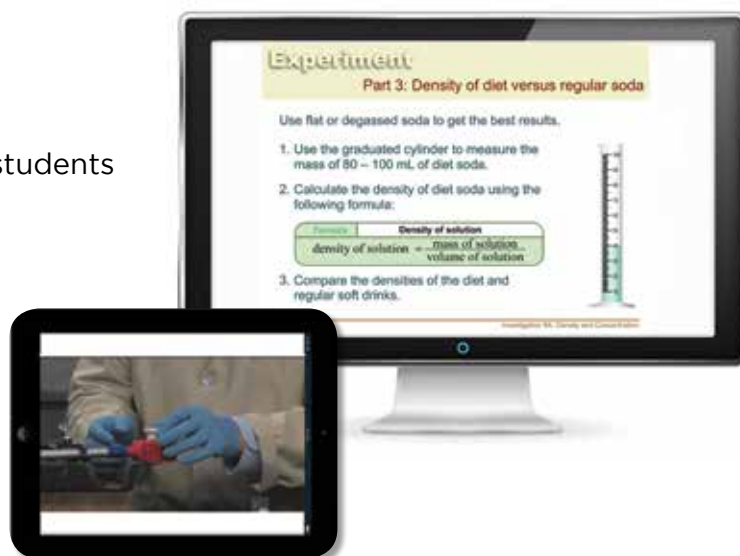
Chemistry



The central premise of **A NATURAL APPROACH TO CHEMISTRY** is that chemistry is all around each of us, every day. Chemistry is us. We eat chemistry. We drink chemistry. Chemistry is the complex choreography of atoms and molecules that sustain life. Chemistry is both how we create the materials of human technology, and also how the natural world builds and renews itself.

### ACCESS TO TEACHER'S ONLINE PORTAL

- Assign homework and communicate with students
- Note taking & highlighting for students
- Online Student and Teacher books
- Online Lab Investigation podcasts
- Videos for every lab investigation
- Integrated, online assessment system
- Editable PowerPoints for each lesson
- Single Sign-On (SSO) available



**STEM** **LITERACY**  
**REFILLABLE** **ADD A GROUP**

A NATURAL APPROACH TO CHEMISTRY, SECOND EDITION	ITEM NO.	PRICE
<b>COMPLETE EQUIPMENT PACKAGE (FOR A GROUP OF 4, UNLIMITED SECTIONS)</b> (includes: Lab-Master System, atomic structure model, molecular modeling kit, condensation apparatus, spectroscopy cards, dimensional analysis cards, laboratory hardware and glassware)	NAC-M01	\$967.95
<b>A NATURAL APPROACH TO CHEMISTRY, SECOND EDITION ONLINE PORTAL FOR STUDENTS</b> (includes: Student Book, Lab Investigations Manual, Lab Investigation videos and podcasts)	NAC-20LSP-1	\$5.00 per student per year
<b>A NATURAL APPROACH TO CHEMISTRY, SECOND EDITION ONLINE PORTAL FOR TEACHERS</b> (includes: Teacher Edition, Student Book, Lab Investigations Manual, PowerPoint slides, assessments, Differentiated Skill Sheets, lab investigation videos and podcasts)	NAC-20LTP-7	\$299.00
<b>STUDENT BOOK BUNDLE</b> (Student Book in hardcover and Laboratory Investigations Manual in softcover)	NAC-2SBLM	\$120.75
<b>TEACHER EDITION</b> (printed)	NAC-2TE	\$235.00
<b>LAB-MASTER SYSTEM</b> (includes: spectrophotometer, heater, temperature probe, and voltage probe)	NAC-LM-TS	\$748.05
<b>CORE CHEMICALS EQUIPMENT PACKAGE FOR ONE GROUP OF 4 STUDENTS</b>	NAC-CS1	\$334.75
<b>BULK CHEMICALS EQUIPMENT PACKAGE FOR 6 GROUPS OF 4 STUDENTS</b> (lasts 6 class periods)	NAC-CB1	\$1,189.65
<b>SCIENCE LAB NOTEBOOK</b> (bulk pricing available)	SLN-1	\$8.95



Materials needed for embedded labs and activities are part of the Complete Equipment Package

Name: \_\_\_\_\_ Section: \_\_\_\_\_ Date: \_\_\_\_\_

A NATURAL APPROACH TO  
**CHEMISTRY**

### 13B: Titration of Vinegar

*How can we determine how much acetic acid is in vinegar?  
How accurate is the advertised amount of acetic acid in vinegar?*

**Materials**

- Vinegar (normal strength)
- Erlenmeyer flask
- Distilled water
- Phenolphthalein indicator
- 50 mL graduated cylinder
- 10 mL graduated cylinder
- Beral pipet
- Dropper bottle of 1.0 M NaOH
- Mass balance

The acetic acid in vinegar comes from the apples or grapes used to make it. Commercial vinegar contains mostly water, and it is advertised as approximately 5% acetic acid by mass. In this investigation we will titrate vinegar with standardized NaOH. Titration is a process used to determine the moles of an acid or base in an aqueous solution. We will slowly add drops of NaOH to the vinegar, and our solution will change from water, we need equal amounts of acid and base. Titrations use indicators to signal when the endpoint is near.

The acid-base reaction carried out in this experiment is


$$\text{CH}_3\text{COOH}(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{NaCH}_3\text{COO}(\text{aq})$$

Our goal is to completely "neutralize" the acetic acid ( $\text{CH}_3\text{COOH}$ ). If we add just the right amount of NaOH to the solution, we will end up with water ( $\text{H}_2\text{O}$ ) and salt ( $\text{NaCH}_3\text{COO}$ , sodium acetate). When the solution is neutral, we can say that the endpoint has been reached.

At the equivalent point, also called the endpoint, the moles of acid are equal to the moles of base. This is the most important aspect of the titration process.

#### Part 1: Titration procedure

1. Weigh a clean, dry 125 mL Erlenmeyer flask.
2. Measure 1.6 mL of vinegar in a small graduated cylinder, and add it to the Erlenmeyer flask.
3. Weigh the flask and the vinegar so that you can calculate the exact mass of vinegar you are titrating.
4. Add approximately 25 mL of distilled water to the flask. Swirl to mix.
5. Add 3–4 drops of phenolphthalein indicator to the vinegar. Swirl to mix.
6. Using a beral pipet, calibrate the number of drops in one milliliter. You may have done this before. It is very important. It allows you to estimate the volume you use to titrate. Once you know how many drops are in one milliliter, you can begin.
7. Add drops of NaOH slowly to your Erlenmeyer flask. Swirl to mix after each drop.



**107**

A NATURAL APPROACH TO CHEMISTRY

### Investigation 13B: Titration of Vinegar

8. You are looking for a pink color that persists throughout the solution for 30 to 60 s. To accomplish this, you must swirl often and add your drops slowly. One drop can cause you to go too far. If your solution is too pink and does not go away, this means you have gone too far past your "endpoint" and your solution is now basic. You actually want your solution to be neutral.
9. Repeat Steps 1–8 three times to obtain a reliable and (hopefully) reproducible result.
10. Rinse your titration down the sink with water and clean your glassware.

#### Part 2: Thinking about it

1. What does the pink color tell you about your titration?
2. How can you determine the volume of the base you used? Explain.

#### Part 3: Calculations

1. Enter your data in Table 1. For comparison, gather some other data from other groups.

Mass of vinegar (g)	Volume of NaOH (mL)	Moles of NaOH	Moles of acetic acid	Percent by mass of acetic acid

2. Determine the number of moles of NaOH you used to titrate your vinegar using the molarity formula.  $M = X \text{ moles} / (\text{volume in liters})$ .
3. The mole ratio is one to one based on the chemical reaction. Knowing the moles of NaOH allows you to find the moles of acetic acid.
4. Next, convert the moles of acetic acid to grams of acetic acid ( $\text{CH}_3\text{COOH}$ ) using the molar mass. Show your calculations and enter your results on Table 1.
5. Lastly, determine the percent by mass of acetic acid.
6. Record your value in Table 1. Determine the percent by mass of each of your trials.

$$\% \text{ by mass} = \frac{\text{mass of } \text{CH}_3\text{COOH}}{\text{mass of vinegar}} \times 100$$

#### Part 4: What did you learn?

- a. Is it true that commercial vinegar is approximately 5% by mass? Explain.
- b. List two sources of experimental error that may have affected your results.
- c. If you overshot and your solution was too pink, how would this affect your percent by mass of acetic acid? Explain.
- d. Show the Lewis structure of acetic acid ( $\text{CH}_3\text{COOH}$ ).
- e. Which hydrogen atom is the one that is lost when acetic acid reacts with the base ( $\text{NaOH}$ )? acid and the number of moles of base? Explain.
- f. When the endpoint of your titration is reached, what should be true about the number of moles of

**108**

A NATURAL APPROACH TO CHEMISTRY

# NAC SCOPE AND SEQUENCE

## PART 1 CHAPTERS 1-4: FUNDAMENTALS

4-5 WEEK UNIT

The introductory chapters present a comprehensive overview of the main ideas in chemistry such as the atomic nature of matter, systems, temperature and energy. The design of Part 1 is to see the “big picture” before digging down to understand the details.

### Chapter 1: The Science of Chemistry

### Chapter 2: Matter and Atoms

\*2B The Chemical Formula

\*2C One in a Million

### Chapter 3: Temperature, Energy and Heat

\*3A Heat and Temperature

\*3B Specific Heat

### Chapter 4: Physical and Chemical Change

## PART 2 CHAPTERS 5-14: CORE CONCEPTS

20-24 WEEK UNIT

These chapters present in-depth coverage of all major topic areas. They develop a usable understanding of the big ideas laid out in the first four chapters. The treatment includes strong conceptual development as well as algebra-based quantitative problem solving.

### Chapter 5: The Structure of the Atom

\*5C Spectroscopy

### Chapter 6: Elements and The Periodic Table

\*6C Valence - Using the atom model board

### Chapter 7: Bonding

\*7B The Geometry of Molecules Using Lab-Aids Molecular Model

### Chapter 8: Compounds and Molecules

\*8A Formula of a hydrated salt using the Lab-Master heater

### Chapter 9: Water and Solutions

### Chapter 10: Chemical Reactions

### Chapter 11: Stoichiometry

### Chapter 12: Reaction Rates and Equilibrium

### Chapter 13: Acids and Bases

\*13A pH - Using the Lab-Master spectrophotometer

### Chapter 14: Gases

\* Selected labs - a sampling from each of the labs in each chapter

## PART 3

### CHAPTERS 15-21: APPLICATIONS

4-8 WEEK UNIT

The final seven chapters provide extension and deeper exploration of significant areas of interest in chemistry.

#### Chapter 15: Electrochemistry

\*15B Voltage and the Electrochemical Cell

#### Chapter 16: Solids and Liquids

#### Chapter 17: Organic Chemistry

\*17B Distilling Aromatic Hydrocarbons using the world's safest heater and condenser

#### Chapter 18: The Chemistry of Living Systems

#### Chapter 19: The Chemistry of Earth

#### Chapter 20: Nuclear Chemistry and Radioactivity

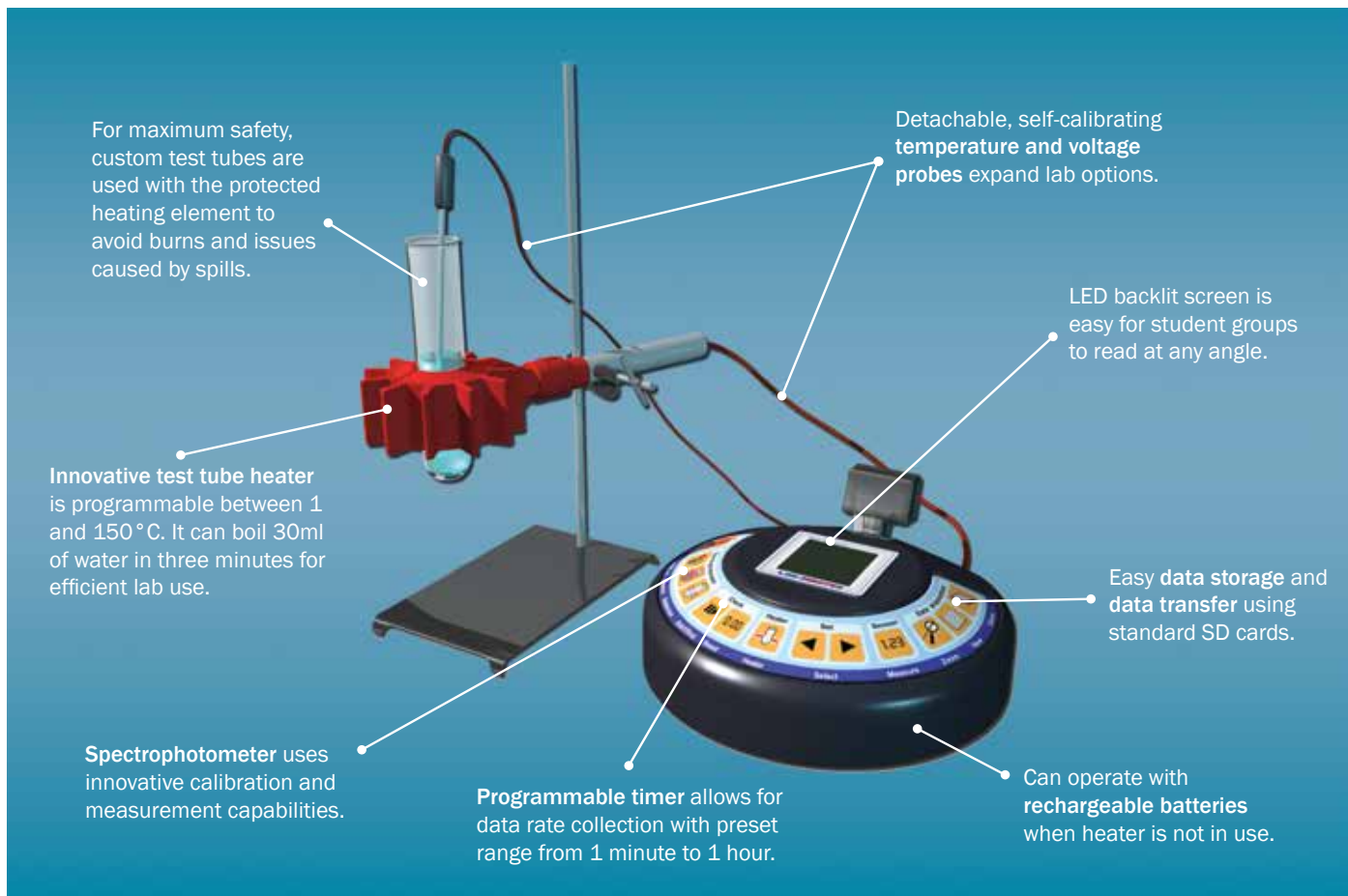
#### Chapter 21: The Chemistry of the Solar System

\* Selected labs - a sampling from each of the labs in each chapter



# LAB-MASTER SAFETY PACKAGE

The Lab-Master is an innovative, easy-to-use, probeware system consisting of an integrated RGB spectrophotometer, temperature probe, and voltage probe. Instead of an open flame the Lab-Master system uses a safe, electric control-point heater to heat solutions in test tubes.



## LAB-AIDS® LAB-MASTER SAFETY PACKAGE

Kit #NAC-M-TSP

The complete Lab-Master Safety Package includes Lab-Master Control Unit: data logger - spectrophotometer, Lab-Master Control point heater, Lab-Master Temperature Probe, Lab-Master Voltage Probe, Lab-Master Power Adapter and Power cable, 6 feet, Insulation ring, Condenser unit, Extension ring, 2 clamps, 6 Cuvettes, 6 Test tubes (glass, 25x100mm), Cuvette-Test Tube Holder and Lab-Master Desiccator. The full A Natural Approach to Chemistry, Laboratory Investigations and 7 year access to Online Portal for Teachers; A Natural Approach to Chemistry, 2nd Edition, is also included.

**Accommodates 1 group of 4 students for unlimited classes.**

Kit No. NAC-M-TSP (Lab-Master Safety Package) \$912.50

Kit No. NAC-LM-TS (Lab-Master System on page 115) \$748.05

A Natural Approach to Chemistry Full Program see page 104





# NOTES

# NOTES

