

SCIENCE

Discovery
EDUCATION™
SCIENCE

Discovery Education Science Middle

for Virginia Teacher Guide



VIRTUAL VOYAGE

PLAYING

What if you could turn yourself into energy, more specifically the energy of a sound wave? To travel with a sound, you'll have to change energy forms a few times. But to experience something like this, it's worth the hassle.

Someone just struck a key on a piano. Sound waves travel in all directions (right), but a person's ear picks up only a tiny section of the waves. You have only a couple of seconds to turn your flesh and bone into waves of pulsating energy. Sound waves travel through the air as a sound wave. Sound waves go—from here to "hear," you're of "sound" mind and body. The first pass-over destination is your ear—the fleshy collection point for all sound waves. The space you're flying through is funneling you past your ear canal. Sound waves crashed into the eardrum. Sound waves travel through the eardrum and the middle ear. You're of "sound" mind and body. The first pass-over destination is your ear—the fleshy collection point for all sound waves. The space you're flying through is funneling you past your ear canal. Sound waves crashed into the eardrum. Sound waves travel through the eardrum and the middle ear. You're of "sound" mind and body. The first pass-over destination is your ear—the fleshy collection point for all sound waves.

Discovery EDUCATION

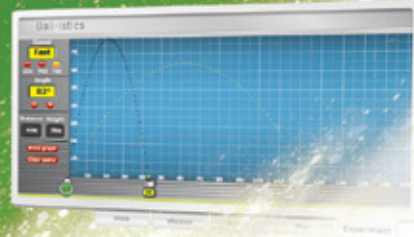
OLD-TECH NEW-TECH

Grades 6-8

About Discovery Education

As part of Discovery Communications (Discovery Channel, Animal Planet and many more), Discovery Education provides engaging digital resources to schools and homes with the goal of making educators more effective, increasing student achievement, and connecting classrooms and families to a world of learning. Discovery Education streaming services, including Discovery Education Science, are used by over half of the schools in the United States. Over the last several years, Discovery Education has transitioned from being a digital media library to become a comprehensive curriculum solution that includes digital media, instructional materials, assessment, and an online professional learning community of over 80,000 Discovery Educators. The transition has also been from a teacher presentation tool to an interactive digital resource for both teachers and students. Students can now log in to their own Student Center, which includes controlled access to digital resources as well as teacher-developed materials.

Discovery Education is a division of Discovery Communications, LLC, the leading global nonfiction media company. The leader in digital video-based learning, Discovery Education produces and distributes high-quality digital resources in easy-to-use formats in all core-curricular subject areas. Discovery Education is committed to creating scientifically proven, standards-based digital resources for teachers, students, and parents that make a positive impact on student learning. Through solutions like Discovery Education Streaming, Discovery Education Science, Discovery Education Health, and more, Discovery Education helps over one million educators and 35 million students harness the power of broadband and media to connect to a world of learning.



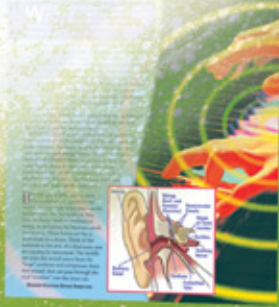


Table of Contents

Overview

| | |
|--|----|
| What Is Techbook? | 6 |
| Standards Alignment | 6 |
| What Are the Digital Resources Used?..... | 7 |
| What Is the Advantage of Digital Media?..... | 9 |
| Where Is It Being Used? | 11 |

Getting Started

| | |
|-----------------------|----|
| Grade Level Page..... | 12 |
| Unit Pages..... | 13 |

How Teachers Use Techbook

| | |
|------------------------------------|----|
| Instructional Pathways Chart | 15 |
| Experienced User | 16 |
| New User: Model Lessons | 20 |

Computer Access

| | |
|---|----|
| How Much Student Access Do I Need?..... | 25 |
|---|----|

Tools in the Navigation Bar

| | |
|-------------------------------|----|
| Teacher Center | 28 |
| Professional Development..... | 29 |
| My Content | 30 |
| My Builder Tools..... | 31 |

What Do Students See?

| | |
|-----------------------------|----|
| What Can Parents See? | 47 |
|-----------------------------|----|

Digital Resource Descriptions

| | |
|--|----|
| Reading Passages | 49 |
| Images | 50 |
| Videos and Video Segments..... | 51 |
| Explorations | 52 |
| Integrated Science Simulations | 53 |
| Interactive Videos | 54 |
| Interactive Glossary Terms..... | 55 |
| Interactive Periodic Table of Elements | 56 |
| Virtual Labs..... | 57 |
| Hands-On Activities | 58 |
| Hands-On Labs..... | 59 |
| Science Sleuths..... | 60 |
| MythBusters..... | 61 |
| About Discovery Education..... | 63 |

Overview of Techbook for Virginia

What Is Discovery Education Science Techbook for Virginia?

Discovery Education Science Techbook for Virginia is a complete digital science basal resource designed to engage students in real-world, inquiry-based science. With content organized by grade level and unit, the Virginia Techbook provides teachers with powerful tools for engagement, inquiry, exploration, and evaluation. Unlike a textbook copied into digital format, Techbook for Virginia uses a variety of digital resources: video, audio, text, and interactive experiences to provide science content while meeting the needs of students with different learning styles. The Virginia Techbook is designed to be used in classrooms with existing computer access.

For some teachers, the use of digital media as a primary tool for science instruction will require a change in how they address teaching and learning. For this reason, Discovery Education includes extensive **professional development** as part of the pricing for the adoption. This professional development is customized to the needs of the school district and includes both direct face-to-face opportunities as well as ongoing Web-based live support throughout the life of the adoption.

Virginia Science Standards of Learning Alignment

The Discovery Education Science Techbook for Virginia has been created from the ground-up for the state of Virginia. The student expectations for each of the Virginia Science Standards of Learning have been aligned to specific concepts within the Virginia Techbook. Concepts are then arranged in a recommended instructional order within each unit. Content for each specific Standard for Science can be found using the Standards of Learning button on the grade level course page.

Overview of Techbook for Virginia

What Are the Digital Resources Found in the Techbook for Virginia?

(These resources are explained in more detail at the end of this user guide.)

- **Model Lessons** utilize the 5E Instructional Model (Engage, Explore, Explain, Elaborate, Evaluate) providing a “how-to” guide for using Discovery Education Science Techbook for Virginia to help students achieve mastery of the Virginia Virginia Science Standards of Learning. The lessons model inquiry-based instruction, offering two pathways: directed inquiry and guided inquiry. The digital resources are linked to make them easy to access.
- **Objectives and Essential Questions** in each concept and lesson are derived from the Virginia Science Standards of Learning. These objectives and Essential Questions serve as a central focus of the model lesson. Students use the digital resources to develop answers to the questions.
- **Getting to Know** information passages provide an introduction and overview of the concept. These passages are particularly useful for sharing with parents.
- **Reading Passages** consist of engaging, leveled text (Lexiled) that provides teachers and students with detailed information about a concept. Some passages are available with Spanish translations.
- **Explorations** are simple, brief activities that invite students to explore a concept by setting variables and choosing from among options on the screen, then viewing and analyzing the results of their choices. Teacher and student guides provide exploration questions and directions.
- **Video Segments** are brief segments selected from the programs that focus on the specific concept. Video allows students to explore outside of their classroom, expand their conceptualization of science, and connect science to the real world. A video-specific teacher guide with additional activities accompanies most video programs.
- **Interactive Videos** contain “hot spots” that students click on during the video to learn more about what is being demonstrated on the screen.
- The **Interactive Glossary** is a comprehensive set of over 600 key science terms. Each term includes a definition, key context for the term, images and animation that help describe the term, and a video segment illustrating the term.

Overview of Techbook for Virginia

What Are the Digital Resources Found in the Techbook for Virginia?

(These resources are explained in more detail at the end of this user guide.)

- **Model Lessons** utilize the 5E Instructional Model (Engage, Explore, Explain, Elaborate, Evaluate) providing a “how-to” guide for using Discovery Education Science Techbook for Virginia to help students achieve mastery of the Virginia Science Standards of Learning. The lessons model inquiry-based instruction, offering two pathways: directed inquiry and guided inquiry. The digital resources are linked to make them easy to access.
- **Objectives and Essential Questions** in each concept and lesson are derived from the Virginia Science Standards of Learning. These objectives and Essential Questions serve as a central focus of the model lesson. Students use the digital resources to develop answers to the questions.
- **Getting to Know** information passages provide an introduction and overview of the concept. These passages are particularly useful for sharing with parents.
- **Reading Passages** consist of engaging, leveled text (Lexiled) that provides teachers and students with detailed information about a concept. Some passages are available with Spanish translations.
- **Explorations** are simple, brief activities that invite students to explore a concept by setting variables and choosing from among options on the screen, then viewing and analyzing the results of their choices. Teacher and student guides provide exploration questions and directions.
- **Video Segments** are brief segments selected from the programs that focus on the specific concept. Video allows students to explore outside of their classroom, expand their conceptualization of science, and connect science to the real world. A video-specific teacher guide with additional activities accompanies most video programs.
- **Interactive Videos** contain “hot spots” that students click on during the video to learn more about what is being demonstrated on the screen.
- The **Interactive Glossary** is a comprehensive set of over 600 key science terms. Each term includes a definition, key context for the term, images and animation that help describe the term, and a video segment illustrating the term.

Virginia Teacher Guide: Grades 6-8

Overview of Techbook for Virginia

What Is the Advantage of Using Digital Media for Instruction and Assessment?

- 1) *It's how today's students learn.* Today's students are digital natives who find answers to their questions through digital media. They readily locate content as they need it. Discovery Education Science Techbook for Virginia provides access to thousands of science digital resources within a safe, guided environment. Acquisition of twenty-first century skills includes self-directed learning and individual and collaborative problem solving. The Virginia Techbook provides student access to a variety of appropriate resources determined by the teacher so that students learn to make choices and take responsibility for their learning.
- 2) *Differentiated Instruction.* A major advantage of digital media is the variety of formats in which content can be delivered. Discovery Education Science Techbook for Virginia is designed to address different learning styles of students. Text, auditory, and visual support, as well as interactive experiences, provide similar content through a variety of media. Digital video is available for the visual learner who responds to sound, color, and action. Leveled reading passages are available for students who grasp concepts best through the written word. Explorations allow students to participate, make choices, and then answer Essential Questions. eBook versions of reading passages and on-demand audio support for all on-screen text in interactives open the content to struggling readers and English Language Learners and reinforce the content for auditory learners.
- 3) *Inquiry Learning.* Our knowledge of science is acquired in two ways: first by learning and synthesizing what other scientists have discovered and second by investigating phenomena and synthesizing the new information into what is already known. Discovery Education Science Techbook for Virginia mirrors how scientists acquire their knowledge by posing Essential Questions, and encouraging students to pose their own additional questions, then providing content in a variety of formats to answer those questions. An understanding of investigative design is acquired as students practice designing investigations first using Virtual Labs, then parallel Hands-On Labs and, at the highest level of understanding, reviewing and critiquing other's investigations, data and conclusions. Ultimately students should be independently capable of asking their own testable questions and seeking the answers through a designed investigation.
- 4) *Ongoing Formative Assessment.* Monitoring student learning and providing remediation is an integral part of good digital media. Online student assessments in the Techbook for Virginia provide a quick snapshot of learning and reports show trends in the data that can be used to plan instruction. Furthermore specific items are linked to resources that address the content, so that the teacher can directly assign remedial materials to individual students. Students who would otherwise "fall through the cracks" can catch up on missed content inside or outside of class time, allowing instruction to move on.

Virginia Teacher Guide: Grades 6-8

Overview of Techbook for Virginia

- 5) *Customization and Flexibility.* Discovery Education Science Techbook for Virginia allows teachers to choose which resources to use, in which order to use them, and which way to use them. Assignment Builder directs resources to students in ways that range from open-ended access to more directed use of resources. Assessment Builder is a tool that allows teachers to design formative assessments customized to their own class learning objectives as well as to individual student learning objectives rather than rely on pre-built assessments that may or may not provide useful feedback regarding their students' progress.
- 6) *Efficiency.* Quick access to model lessons and digital resources allows teachers to locate resources easily, quickly, and effectively via multiple paths. Teachers go directly to a model lesson or they can seek out resources on the concept page. Video, reading passages, eBooks, Interactive Glossary terms, and interactive experiences are also searchable through keyword or Virginia Science Standards of Learning searches. The organization of Techbook for each grade level is aligned to the Virginia Science Standards of Learning.
- 7) *Accessibility.* Digital resources can be accessed at any time or place where the Internet is available. This can allow students to access resources from home for homework, projects, or in situations that do not allow them to get to school. In addition, resources can be downloaded in advance or printed out for situations in which Internet access is limited.
- 8) *Currency.* The nature of science is change. Science constantly looks for new evidence and our knowledge grows and changes with it. Tsunamis occur, planets are discovered, and planets are re-assigned to dwarf planet status. Whereas print media can quickly become outdated when new events and discoveries occur, as a digital program Discovery Education Science Techbook for Virginia is constantly being reviewed and updated so that it is as current. Innovations in technology or any revision of state learning objectives during the adoption period can also be addressed.
- 9) *Digital Networking.* The **Discovery Educator Network (DEN)** consists of over 100,000 teachers across the nation who share ideas and support each other. All Discovery Education users have access to the DEN. This online community also provides weekly web-based seminars on specific topics such as teaching students to use video and images in their science reports, how to use Virtual Labs and Hands-On Labs to prepare students for science fair projects, and basic information on instructional strategies for using Techbook for Virginia. DEN members regularly participate in events with well-known scientists, such as Michio Kaku and when science news events take place, special guest scientists.
- 10) *Cost.* Because digital media requires no printing or storage of print materials and no replacement costs, Discovery Education Science Techbook for Virginia can be offered at a fraction of the typical cost of a textbook. For this same reason, the price for Techbook includes in person and web-based professional development at no additional charge.

Overview of Techbook for Virginia

Where Is It Being Used?

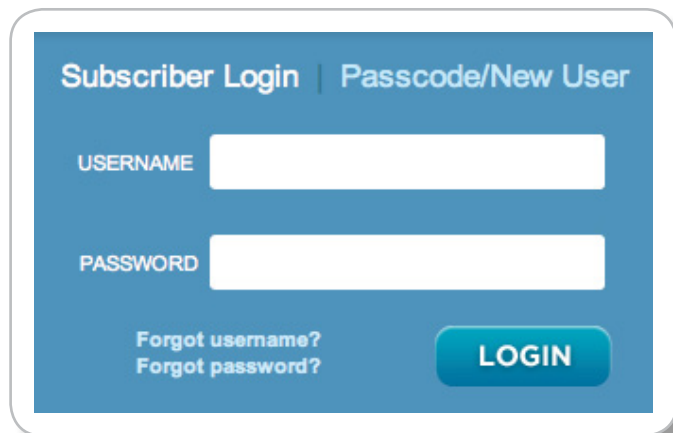
Discovery Education Science Techbook has been adopted in every state in which it has been reviewed and considered. In October 2009, Discovery Education Science was adopted in Oregon for Grades K-8 use as a primary basal resource. During the 2010 state textbook adoption cycle Discovery Education Science Techbook was presented to and adopted by the states of Louisiana, Florida, and Indiana as a digital alternative to traditional textbooks for use in Grades K-5 and 6-8. Most recently, Texas joined the states adopting this new type of digital resource for science in Grades 5-8.

School systems across the country have been using Discovery Education Science resources successfully. In Charlotte Mecklenburg, North Carolina, for example, Title 1 schools utilized the digital resources to enhance science instruction over a two-year period and as a result saw composite retest scores on the North Carolina End-of-Grade test for Grades 5 and 8 increase by 26 points.

Virginia Teacher Guide: Grades 6-8

Getting Started with Techbook for Virginia

From any browser, go to discoveryeducation.com and use the login and password provided to you. If you already have an account for Discovery Education and Techbook has become part of your suite of services you will be able to use your regular Discovery Education (DE) login and password. If not, you will be given information to create an account. Discovery Education online services use single-sign-in technology. That means you can use the same username and password for all Discovery Education services including DE Streaming, DE Health, DE Assessment, the DEN and more.



Subscriber Login | Passcode/New User

USERNAME

PASSWORD

[Forgot username?](#) [Forgot password?](#)

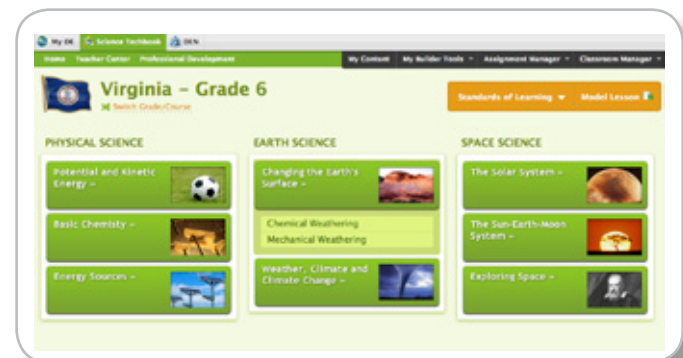
LOGIN

Each student will also have his or her own login and use the same login page. Upon login, students see their individual Student Center with assigned resources. They may move to the grade level page to see the same content organization as the teacher sees. Students can also use a keyword search to search for content.

What Are the Main Features of the Service?

Grade Level Page

Techbook opens to the grade that you teach. Should you need to switch grade levels, click on Switch Grade/Course right below the state name: Virginia.

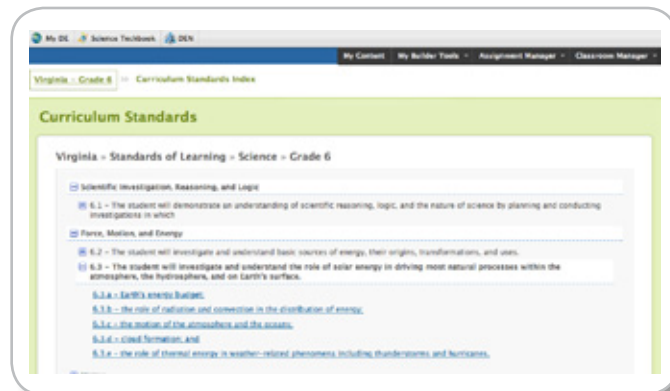


On the course page the units for the year are organized into three areas of science. Rolling your mouse over a unit displays a quick list of the concepts addressed in that unit in a suggested sequence.

Virginia Teacher Guide: Grades 6-8

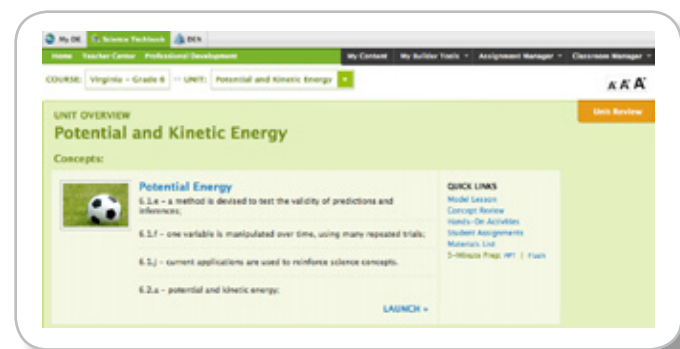
Getting Started with Techbook for Virginia

Above the lists of units, an **orange bar** includes several handy resources. The **Virginia Science Standards of Learning** for that grade can be opened to search for resources for each standard. Model Lessons are provided for each concept. You may access a model lesson from each concept page or from the unit page using Quick Links.



Unit Pages

Clicking on one of the units on the course page will open the Unit Overview page.



This is a more detailed listing of the concepts in the unit. Each concept shows the Virginia Science Standards of Learning addressed in that concept as well as QUICK LINKS that allow you to jump directly to the priority resources you need. The **orange bar** at the top right gives quick access to the **Unit Assessment** and the **Unit Review** documents. The Unit Review can be sent home with students to prepare for a test or just share with parents. The text size can be adjusted for this page by clicking on the text-size icon in the upper right hand corner.

Scroll down to see details about each concept in the unit. Note that the specific Virginia Science Standards of Learning addressed by each concept are displayed.

Virginia Teacher Guide: Grades 6-8

Getting Started with Techbook for Virginia

QUICK LINKS in the right-hand navigation

Model Lesson: A complete model lesson plan is provided for each concept. The model lessons contain links to all resources and provide an instructional pathway to use the resources in a 5E Inquiry Instructional Model approach. Both directed and guided inquiry methods are presented in each lesson.

Concept Review: A review sheet is provided for the concept. This sheet can be printed and sent home with the student to share with parents or to study for a test.

Hands-On Activities: Each concept includes at least one Hands-On Activity designed to allow students to explore the concept and practice science process.

Student Assignments containing links to DE resources are provided for each lesson. These can be reviewed and assigned to the class or individuals. Assignments may also be copied to your My Content folder and modified using the Assignment Builder Tool.

Materials List: A quick look at the materials that are needed for the model lesson in this concept is provided.

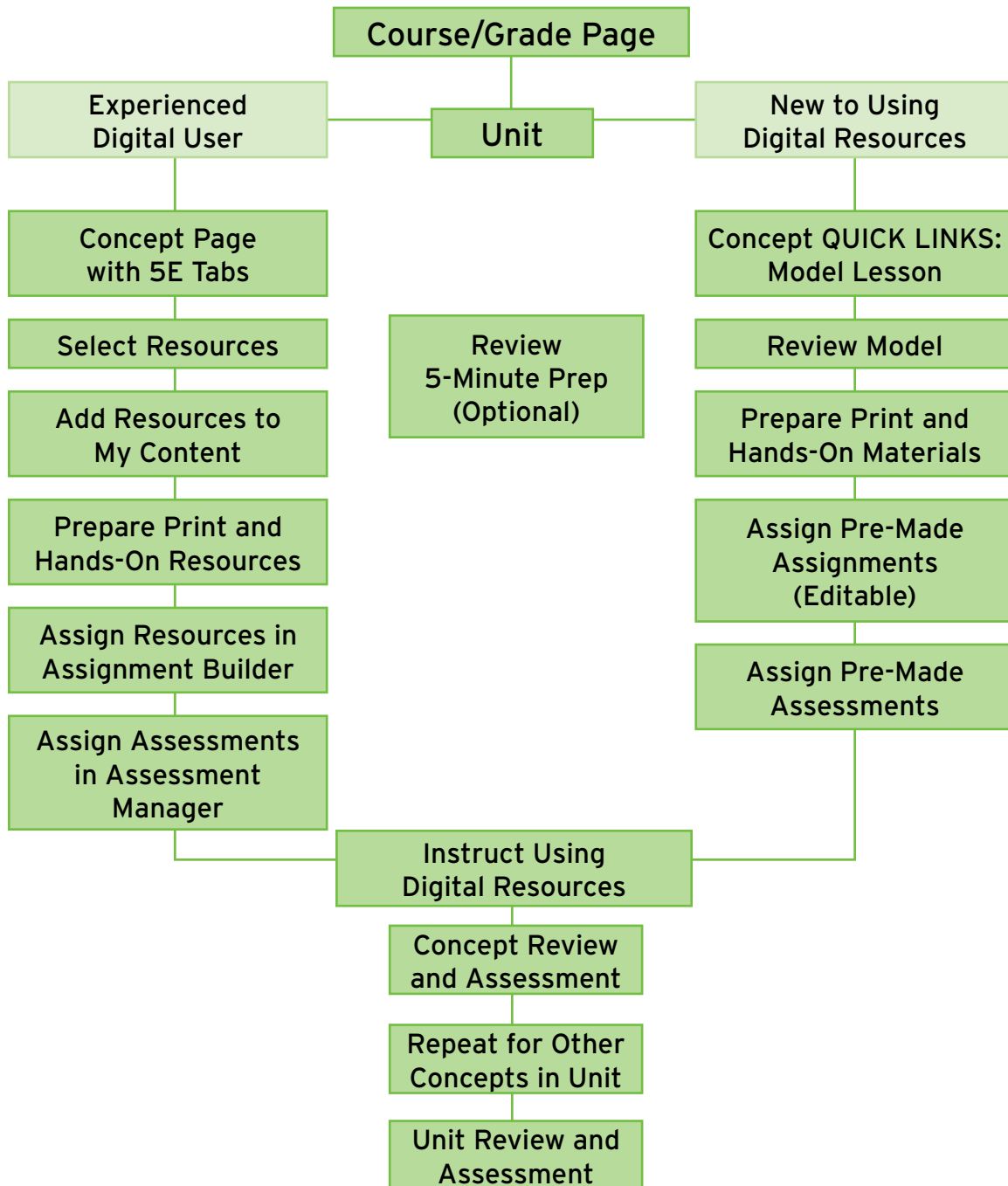
5-Minute Prep: For teachers who are new to teaching a concept or who need a review of the content, each concept has a 5-Minute Prep in two formats: a Flash presentation of less than five minutes and a PowerPoint version of that presentation with hyperlinks. 5-Minute Preps outline the critical elements of the concept and cite common student misconceptions. Sample Techbook resources are recommended for teacher review.

The Concept Pages

(Pathways for Instruction in the Concept Pages)

At this point, you will want to access one of the concept pages depending on how you would like to use Discovery Education Science Techbook for Virginia.

Discovery Education Science Techbook for
Virginia Instructional Pathways



Virginia Teacher Guide: Grades 6-8

How Do Teachers Use Techbook for Virginia?

From the Unit Overview page there are two basic choices for teachers:

If you are experienced using digital resources with students and are familiar with the science concept, click on a concept title and go straight to the **Concept Page** to choose the resources you want to use.

If you would prefer to use the model lesson for the concept, find that concept's **QUICK LINKS** and click on that concept's **Model Lesson**.

Experienced User: I Know What to Do. Where Are the Resources?

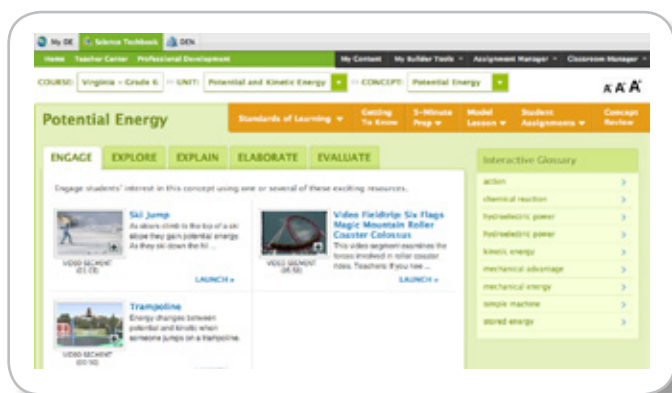
Concept Page

This page contains Discovery Education Science Techbook resources specifically chosen for this concept. The resources are placed in the particular 5E tab where they would most likely be used.

Using the Concept Pages

For the teacher who is experienced with using the **5E Instructional Model** and digital media with students, the concept page is set up with recommended resources for each of the 5E tabs: Engage, Explore, Explain, Elaborate, and Evaluate. You can access the resources from the concept page or choose resources you want and save them in your My Content folder and use that folder as a place to get started. You can assign individual resources to the class, groups of students or individual students. Students will see the resources appear in their Student Center when they log in. Use Assignment Builder (My Builder Tools) to build assignments for students. The assignments contain directions as well as the resources you want students to access for themselves. Assignments can also include assessments such as Brief Constructed Responses or online assessments. See the sections on Assignment Builder for details.

Keep in mind that many of the resources, such as reading passages, can be printed out for use away from a computer.

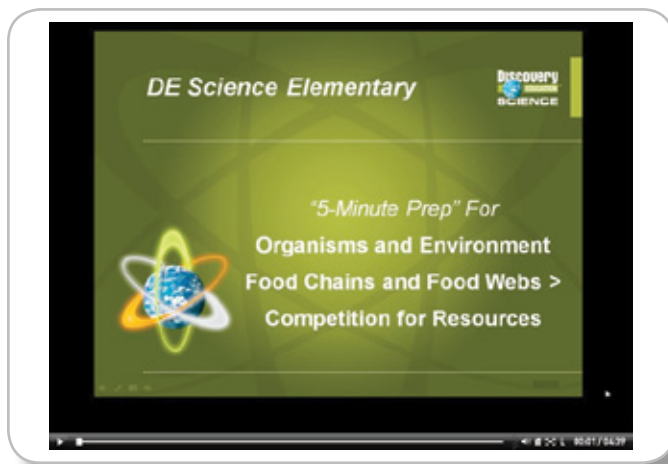


Virginia Teacher Guide: Grades 6-8

How Do Teachers Use Techbook for Virginia?

5-Minute Preps

5-Minute Preps are resources that allow teachers to refresh content knowledge while offering a focus for instruction. Educators can quickly review information about intended objectives, necessary prior knowledge, and misconceptions and the reality behind them. Also included are suggested Discovery Education Science resources and instructional ideas.



Lessons and Assignments

The model lesson for the concept can be accessed from this page as can the assignments that were created for that model lesson. Assignments can be immediately assigned to students or copied to your My Content folder and edited before being assigned using **Assignment Manager**.



Review Sheet

A concept review sheet is provided for students and can be sent home for study. This sheet contains Essential Questions for the concept with brief answers.

Virginia Teacher Guide: Grades 6-8

How Do Teachers Use Techbook for Virginia?

Interactive Glossary

The specific vocabulary for this concept is provided in the right-hand navigation area. Any of these glossary terms can be opened from this point.



Evaluate Tab: Assessments

For each concept, Discovery Education Science Techbook for Virginia provides online student self-check selected response concept assessments and concept level Brief Constructed Response written items. Any of these can be assigned to students and are included in the pre-created assignments as part of the Evaluate phase. You can also access these in the Assessment Manager to modify them for your needs. Assessment Manager allows you to create your own online assessment for any point during a unit of instruction. Assessments can be developed from an item bank and chosen by concept or state standard. Custom assessments can also be developed using teacher-created items. For pre-made items assessment reports recommend remediation resources for specific items that were missed on an assessment.

Virginia Teacher Guide: Grades 6-8

How Do Teachers Use Techbook for Virginia?

In addition, assessment in the 5E Instructional Model can come in other forms. Teachers can elicit written feedback through Scientific Explanations in science notebooks including drawings, have students answer questions as they work on an activity, or have students conduct a Hands-On Activity and observe how they handle the concept and skills.

The screenshot shows the Discovery Education Science Techbook interface. At the top, it displays 'My DE', 'Science Techbook', and 'DEN'. Below that are navigation links for 'Home', 'Teacher Center', and 'Professional Development'. The main content area is titled 'Potential Energy' and includes a breadcrumb trail: 'COURSE: Virginia - Grade 6 --> UNIT: Potential and Kinetic Energy --> CONCEPT: Potential Energy'. There are tabs for 'Standards of Learning', 'Getting To Know', and '5-Minute Prep'. Below the title are five tabs: 'ENGAGE', 'EXPLORE', 'EXPLAIN', 'ELABORATE', and 'EVALUATE'. The 'EVALUATE' tab is selected, showing the text: 'Evaluate your students' science knowledge and skills using these evaluative tools.' There are two icons for 'Potential Energy': one labeled 'ICR' with a 'LAUNCH >' button, and another labeled 'ASSESSMENT' with a 'LAUNCH >' button.

Getting to Know

The Getting to Knows (GTKs) are written for each concept. GTKs are designed to help students relate their prior knowledge and experiences to a specific science concept before delving deeper into it. The GTKs also provide students with a brief overview of the key content that they will be working with in a given concept. In addition, at the K-2 level, the GTKs are designed to evoke conversation about a concept prior to formal teaching.

The screenshot shows the 'Getting to Know: Changes in States' page. At the top is the 'Discovery EDUCATION' logo. The title is 'Getting to Know: Changes in States'. Below the title is a paragraph: 'When you boil water for tea or pasta, you may notice that bubbles form in the pot and steam begins to rise. The bubbles are filled with water in a gaseous state. Water in this state is known as water vapor. Boiling is a physical change in the state of matter.' To the right is a photo of a person boiling water. Below the photo is a caption: 'When you boil water, you cause a change in mass from liquid to gas by heating liquid water to its boiling point.' Below the text is a 'Misconception 1' section with a warning icon: 'Misconception 1: when water boils, matter is lost. That's not correct. Actually, water changes state from liquid to gas when it boils, but none of the water is lost. If you collected all the water gas produced by boiling, its mass would exactly equal the mass of the liquid water that boiled. In fact, no mass is ever lost during any state change. This phenomenon is described by the Law of Conservation of Mass.'

Virginia Teacher Guide: Grades 6-8

How Do Teachers Use Techbook for Virginia?

New User: I'm New to Using Digital Resources in Science or This Is a New Topic for Me

The prepared model lesson for each concept is the easiest way to get started if you're new to the 5E Instructional Model and/or the use of digital media. Any model lesson can be accessed with three mouse clicks from the start of the service:

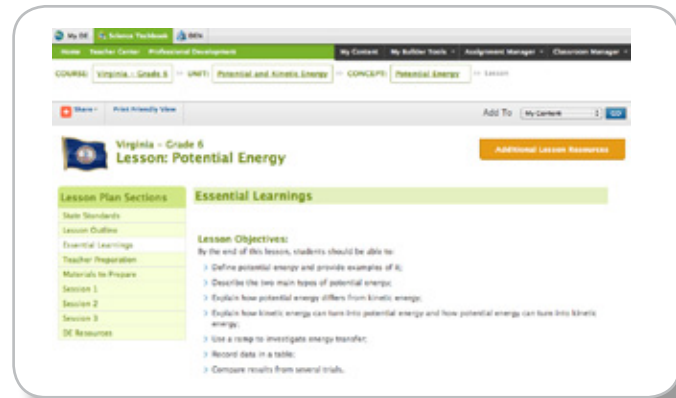
Course/Grade Page > Unit Page > QUICK LINK: Model Lesson

You may also access the model lesson from the concept page. Go to the orange bar and hover the cursor over Lesson. Select the DE Model Lesson.

Model Lessons

Each model lesson is a multi-day instructional pathway through the content using digital resources specifically chosen for the concept. Lesson objectives and lesson Essential Questions are the focus of the lesson and address the Virginia Science Standards of Learning for this concept. A printer-friendly version of the lesson is available.

- **Key Vocabulary** is provided and any terms that are available in the Interactive Glossary are hyperlinked.
- **State Standards** contains a listing of the Virginia Science Standards of Learning addressed by this concept's model lesson, including scientific investigation and reasoning skills.
- **Lesson Outline:** A lesson outline provides a recommended time frame for the lesson completion and an overview that allows the teacher to jump to any point in the lesson with a mouse click.
- **Teacher Preparation:** Background information for the teacher, common student misconceptions about the concept, and the prerequisite skills and knowledge that students need are listed in this section.



- **Materials to Prepare** contains a complete list of materials that need to be prepared in advance for the lesson and an approximate time frame for the preparation.

Click on Session 1 to begin reviewing how the 5E Instructional Model can be implemented. Each session is approximately one class period. All resources are linked so that you can review them before using them.

DE Resources option puts all of the concept resources for this lesson in one place for easy access. If you are showing resources to students, the Resources page allows you quick access to all of the lesson resources on one page.

It's All about the Essential Questions

The lesson centers on providing students with the resources to answer the Essential Questions. If students can sufficiently answer these, they have a grasp of the concept. Essential Questions are introduced in the Engage section of the lesson. Students should add their own Essential Questions to those that are provided in the lesson. The answers are sought during

Virginia Teacher Guide: Grades 6-8

How Do Teachers Use Techbook for Virginia?

the Explore section using the variety of resources through either directed or guided inquiry. Students provide answers and explain their thinking in the Explain section. Elaborate provides opportunities to expand on the knowledge or apply the knowledge to new situations, such as investigations. Evaluate provides a formal testing of the knowledge.

Scientific Investigation and Reasoning Skills

Although investigation and reasoning skills do not have a one-to-one correspondence with any particular concept, the prepared lessons identify specific skills and nature of science understandings that are practiced in that lesson. Hands-On Activities, Hands-On Labs, Science Sleuths, and Virtual Labs are some of the many resources that teachers can use to involve students in learning the investigative process of science. The **Process Skills Library** contains a collection of these resources as well as specially edited episodes of Mythbusters which can be used to critique the science skills of the famous team.

Using the Prepared Assignments

Assignments have been created for each point in the lesson plan where students need to access the resources on their own. To get to the assignments go to the concept page. In the orange bar, hover the cursor over Assignments. You can open any of the assignments and quickly assign them to students. You may also copy the assignments to the My Content folder and modify them using Assignment Builder.

Using the Prepared Assessments

Two types of formative assessments are included in the concept. Constructed response (called a BCR–Brief Constructed Response) assessments are found in the Evaluate section of the lesson. In addition, a student self-assessment is assignable, or students may be directed to the concept page from their student center where they can access the self-assessment. A concept-based assessment can also be accessed and customized through Assessment Manager.

Using the Review Sheet

A review sheet, based on the Essential Questions in the lesson plan, is provided for each concept. This sheet may be printed out and sent home with students to review or to share with parents. The unit review sheet is a compilation of the concept review sheets.

Directed Inquiry and Guided Inquiry

An important aspect of inquiry-based learning is that activities involve a student-centered learning approach rather than a teacher-centered delivery method. Moving beyond having the content “delivered” to them, students are presented with challenging questions, discrepant events, and seemingly conflicting ideas and then provided the tools and skills they need to successfully respond. Teachers are encouraged to allow students to use a variety of resources in their pursuit of answers. Learning how to select resources and collaborate in answering questions and solving problems are important twenty-first century skills. In these lessons, most of this interaction will take place during the Explore sections. Each Explore section begins with one or more Essential Questions that students will investigate. As part of the inquiry process, students will answer these questions and provide evidence to support their answers by reviewing the resources selected from the Explore page for that concept.

The extent to which a student independently explores these resources will depend on several factors including computer access and student preparedness to direct their own learning. To address these two factors, each Explore contains two alternate pathways for inquiry: Directed Inquiry (sometimes called Structured Inquiry) and Guided Inquiry. Following either pathway will enable students to answer the Essential Questions for that lesson. The crucial difference concerns the level of student independent thinking when selecting and exploring the resources.

Virginia Teacher Guide: Grades 6-8

How Do Teachers Use Techbook for Virginia?

In **Directed Inquiry**, teachers provide students with specified resources one by one, providing challenging questions and clear outcomes. As much as possible, students should still be given the opportunity to interact independently with each resource. However, the specific resources as well as the order in which students interact with them are prescribed by the teacher. Sometimes the teacher can rotate groups through several resources at the same time: e.g., reading passage, small group Hands-On Activity with the teacher, and online interactive resource.

In **Guided Inquiry**, students have more independence. Working from an assigned set of appropriate resources from the section titled Exploration Resources for Student Inquiry, located at the beginning of each Explore, students determine for themselves which resources they will Explore to answer the Essential Questions. It is important to note that each student will choose multiple resources, but no one student should try to use all the resources. Students also determine the order in which to explore these resources. In the 5E model, students bring their learning back to the group to share in the Explain section. The teacher helps to make sure their understandings are clarified. Each lesson includes suggestions to help teachers model Guided Inquiry for students who are new to the process but who nevertheless have the necessary skills to succeed.

Tips for Inquiry-Based Learning

- Encourage students to ask their own questions related to the Essential Questions for a particular concept; students are more likely to be engaged in the inquiry process if they are seeking to answer questions they have devised.
- Ask open-ended questions, and provide students with sufficient time to answer; use wait time so that all students have a chance to think through their response.
- Encourage students to work together to find solutions to problems rather than to wait for explicit instructions from the teacher. Always have students provide evidence that supports their findings.
- Move students gradually from Directed Inquiry to Guided Inquiry, increasing their choice of resources as their skills develop. Pay particular attention to students new to the process; be ready to provide more guidance to those who are struggling.
- Use a variety of assessment strategies, including online assessments and constructed responses. Utilize student notebooks and written responses, including sketches, diagrams, and organized text to monitor conceptual growth. Incorporate inquiry and science process into assessments as well so that students may demonstrate and apply their learning in more authentic ways.
- The project ideas listed at the end of each lesson are excellent opportunities to extend learning beyond the Essential Questions and to assess students' application of the concepts and skills they developed in the lesson.
- Consider using one of the Virtual Labs as a means of assessing student investigative and reasoning skills. After students have participated in several labs, have them complete one on their own and review their planning and data analysis to gauge how well they develop a testable question, plan the investigation, collect data, use data to support their conclusion, and present their results to others.

Virginia Teacher Guide: Grades 6-8

How Do Teachers Use Techbook for Virginia?

About the 5E Inquiry Instructional Model

Discovery Education Science lessons utilize the 5E Inquiry Instructional Model, which facilitates an inquiry approach to learning. The model is based on the idea that students continuously build their own understanding from their experiences and from new ideas to which they are exposed. The structure of the lessons, combined with the digital resources used, provide opportunities that encourage the development of the students' conceptual understanding.

The stages of the 5E model (Engage, Explore, Explain, Elaborate, and Evaluate) most often occur sequentially, although there is a high degree of flexibility in the frequency of the use of each "E" in a lesson. Thus a lesson may have several points where students Explore then Explain, then Elaborate, and go back to Explore more. Using this model, the instructional process is determined not only by the lesson plan, but also by the inquiry process itself. A brief description of the 5E model follows.

ENGAGE

Science teaching is most effective when students are engaged in the topic. Instruction should begin with an engagement activity in order to grab students' attention and focus on why the content and skills are important. The Engage stage should also pose real-world problems, make connections between present and past learning, and lay the groundwork for the lesson. Engage activities should be presented at the start of a lesson, but can also occur at various points throughout a lesson, where appropriate. Often, the Engage problem and questions that it evokes are revisited at the end of the learning cycle to bring closure. For instance, exciting video segments such as erupting volcanoes can be effective tools for engaging students, or teachers may opt for reading passages for students that are more inclined toward the written word. Interactives such as Explorations can also fire students' imaginations.

EXPLORE

During this stage, students become actively involved in exploring the concepts by using the available digital and other resources to build their understanding. Here the emphasis is on observation, analysis of data, and critical thinking. The teacher acts as a facilitator in this process, providing the digital and other resources and keeping students focused. Multiple explorations may take place in a single lesson. The teacher can also assess and guide students by constant interaction with individuals and groups as they explore. Discovery Education Science offers many digital resources that present information through multiple learning modalities. Reading passages, video segments, and interactive experiences all allow students to gain content as they explore a concept.

EXPLAIN

The Explain stage of the 5E model provides students with opportunities to reflect on what they have learned and communicate this among the members of their group and to the teacher. This stage is critical and should actually take place frequently in the 5E cycle, such as after each class activity or assignment. Throughout the process students use science process skills and prior knowledge to weigh evidence, interpret text, develop and support their own claims and then to critique the explanations of others. This gives the teacher a chance to assess the students' levels of understanding, root out misconceptions, provide clarification, and introduce formal vocabulary and explanations. In Discovery Education Science Techbook for Virginia the Brief Constructed Response assessment provides one means of allowing students to explain their thinking. The resources also provide tools for helping teachers summarize and clarify concepts.

Virginia Teacher Guide: Grades 6-8

How Do Teachers Use Techbook for Virginia?

ELABORATE

In this stage, students deepen and broaden their conceptual understanding and refine their skills by applying what they have learned, in new ways, to the world around them. Depending on the nature of the concept being learned, the interest level of the class, and the amount of time available, elaboration activities can be incorporated multiple times or simply once at the end of the lesson. A good example of elaboration activities in Discovery Education Science Techbook for Virginia are the Virtual Labs and Hands-On Labs in which students plan and conduct investigations using the concept they have just explored.

EVALUATE

The Evaluate stage, while it appears last on the list, should actually be an ongoing process throughout the lesson. This stage allows both the teacher and learners to assess their progress toward achievement of the lesson objectives. The evaluation process should start with a formal pre-assessment prior to the start of the lesson. Ongoing, frequent formal and informal formative assessments are important in that they

provide data for the teacher to make adjustments in instruction as the lesson progresses. Numerous methods of ongoing assessment include, but are not limited to: teacher observation of students, teacher-student interviews, review of student-completed work, student journals and/or portfolios, “thumbs-up, thumbs-down” surveys, and exit questions. A formal, summative assessment will provide the teacher and students with hard data measuring the degree of student achievement of the lesson objectives.

Discovery Education Science Techbook for Virginia contains an **Assessment Manager** that can be used to produce online assessments, targeted at specific concepts. The item bank is robust enough to provide different pre- and post-assessment items. Teachers can evaluate student comprehension with resources like Brief Constructed Responses and student self-assessments. Reports provide item-specific results for individuals and the whole class. Recommendations are made for digital resources within the service to provide remediation for individuals or groups of students based on specific items missed.

Virginia Teacher Guide: Grades 6-8

Computer Access

How Much Student Computer Access Do I Need?

One of the great myths about digital media is that all students need a computer to access all the resources. Discovery Education Science Techbook for Virginia contains as many resources that can be printed out and used by students as it does those viewed on the screen. Reading passages (focused on the specific topic), worksheets, assessment sheets, and data record sheets are among the many print materials. All resources can be viewed on a one-to-many computer-to-student ratio in full class, small group, or paired instruction. Hands-On Activities and Labs require no use of the computer.

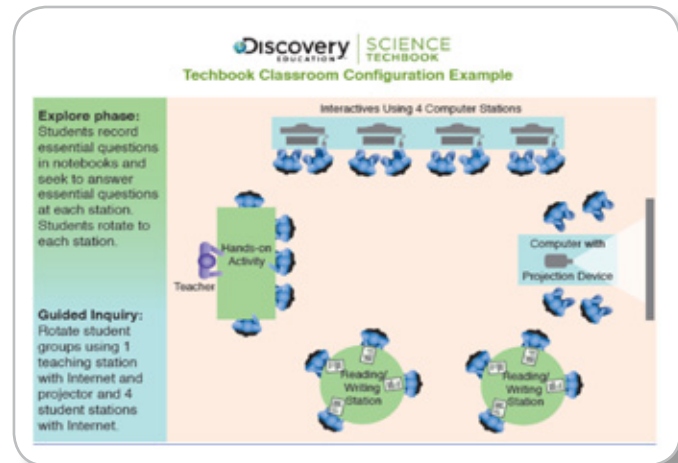
Consider also that netbooks and hand-held devices continue to multiply in classrooms. Discovery Education Science Techbook for Virginia digital resources are already available for devices with Internet access.

While most classrooms will have some combination of the following scenarios, they explain how with existing computer access, Discovery Education Science Techbook for Virginia can be used for instruction.

I've Got a Teaching Station and Some Student Stations with Internet Access

This configuration is excellent for instruction with Discovery Education Science Techbook for Virginia.

Many digital resources will be appropriate to use with the full class at the teaching station while other activities are appropriate for small group and individual work. Worksheets and science notebooks are completed by individuals or groups as they view the resource. Printed reading passages can be laminated (for repeated use) and provided to students. The whole class completes Hands-On Activities, and Hands-On Labs.



In this configuration of computers, lab stations are an excellent way to allow students to access content using a rotational or jigsaw* method. A common practice is for teachers to group students during the Explore phase in rotating groups. The focus is on answering the Essential Questions. Now the teaching station becomes a video viewing station. Reading passages are found at another station. A few computers provide paired students access to an Exploration, an Interactive Science Simulation, or an Interactive Video. And a teacher-directed or independent hands-on investigation is available at a fourth station.

*In a jigsaw, students form into small groups during the Explore phase. One representative from each group goes to a different station to gather answers to the Essential Questions. The representatives return to their small group and collectively they combine their answers and report to the class during the Explain phase.

Virginia Teacher Guide: Grades 6-8

Computer Access

I've Got a Teaching Station and Some Computer Lab Time or a Traveling Lab

This configuration also works very well for instruction with the Techbook for Virginia. Again, many digital resources will be appropriate to use with the full class at the teaching station and worksheets and science notebooks are completed by individuals or groups as they view the resource. Printed reading passages can be laminated (for repeated use) and provided to students. Hands-On Activities and Hands-On Labs are completed by the whole class.

In the computer lab, students can access video segments or specific interactive resources: Explorations, Science Sleuths, or Interactive Videos. Virtual Labs are especially powerful in a computer lab setting as different student groups work on different variables and report results to the class. The teacher guide for Virtual Labs explains this process in detail.

I've Got a Teaching Station and Regular Student Access to the Internet

In this configuration, it is still important to utilize whole class viewing, print materials, and Hands-On Activities and Labs as appropriate. But now students can be given more flexibility in choosing the digital resources that work best for them. Again, the focus of a lesson is the Essential Questions—the key concepts that students need to learn to be successful on the Virginia Standards of Learning Tests. However, students can now have a choice of which digital resources they use to uncover the answers to these questions. Most students utilize more than one modality for learning. This approach allows them to view a video, read a passage, explore with an interactive, and record their thinking in their lab notebooks.

What Happens if the Internet "Goes Down"?

Downloading is always a good idea. Many of the digital resources can be downloaded in advance of instruction. Videos, reading passages, and worksheets can be saved to the computer and/or printed out prior to class. A DVD of all interactive experiences (Explorations, Virtual Labs, Interactive Science Simulations, etc.) is provided as part of the adoption.

Printed Materials—Print reading passages and worksheets out in advance. Having a set ready for students allows you to continue to operate for the brief time the Internet is out.

Hands-On Activities require no Internet use. If you know that the Internet will be heavily used or not available in advance, plan on using that time for hands-on investigation using Hands-On Activities or Hands-On Labs from the service.

What Level of Technology Do I Need?

The teaching station should have a projection device of some sort. A television monitor will work, but will need to be large enough to show details. Interactive white boards provide opportunities for students to interact with resources as the entire class participates.

What Level of Technology Do My Students Need?

Student stations should have Internet access or access to stored files and the DVD provided for the Techbook for Virginia. The service works on all major platforms and all up-to-date browsers.

Computer Access

How Does Computer Access Affect My Decision to Use Directed or Guided Inquiry?

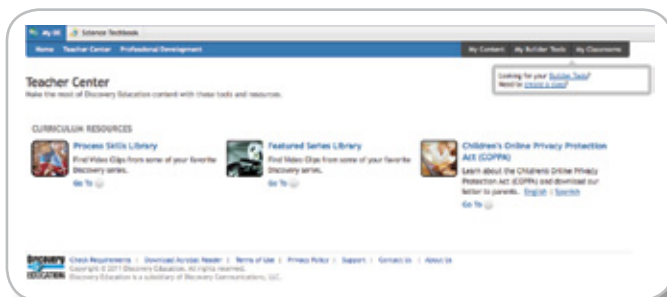
When using the **model lessons**, the decision to use the Directed or Guided Inquiry approach should take into consideration both access to technology and teacher and student readiness for guided inquiry. Guided Inquiry recommends that students make their own choices about the resources they use. Regular access to computers is more important in this model, although many classes with a few computer stations and weekly computer lab access can use this approach as well. More important is the process of students making their own choices as to which resources work for them. This gives students learning power. But note that some students will need guidance and gradual release in order to feel comfortable with this twenty-first century skill.

Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

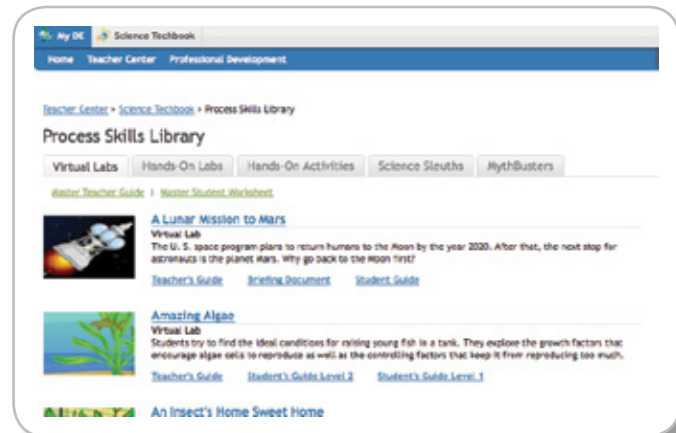
Teacher Center

Located in the green bar at the top of the page, the **Teacher Center** provides you with quality curriculum resources and access to additional educational information.



Process Skills Library

Science is more than a collection of facts; it is a way of thinking and learning. The **Process Skills Library** is designed to help students learn the process of investigative design. Discovery Education Science Techbook supports students' understanding of science inquiry by providing opportunities to observe and experience science investigation. A variety of media in the Process Skills Library addresses the critical thinking skills students must acquire in order to successfully engage in scientific methodology. Each of these experiences is connected to specific Discovery Education Science Techbook concepts and can also be accessed when browsing for content.



Virtual Labs are designed to give students the opportunity to practice designing and conducting virtual investigations in preparation for designing and conducting their own hands-on investigations. By using virtual investigations as a starting point, students can concentrate on developing the design, collecting data, and analyzing data without the distraction of materials management. Virtual Labs can also allow students to test designs that would be impossible in school due to constraints of time, resources, or safety. The labs are open-ended –that is, there is no “right” or “wrong” result. Students are challenged to draw conclusions and support those conclusions with evidence from the investigation.

Hands-On Labs allow students to transfer what they have learned about investigative design in a Virtual Lab to a parallel Hands-On Lab using real materials. The process is identical, except that this time students must manipulate materials and make their own measurements.

Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

Science Sleuths engage students in real-world challenges in which they become science detectives. Students are presented with a science mystery or possible (minor) crime and use articles, interviews, investigations, and video presentations to gather the information they need to solve the problem. Students take notes and collect data as they progress and present their findings to the Science Sleuth Headquarters when they are done. A teacher guide provides teachers with the solution to the mystery.

MythBusters episodes from the Discovery Channel's popular television series have been carefully selected and edited for school audiences to illustrate the careful use of the science process to either prove a science myth, or bust it! Students are provided with observation sheets and teachers receive a guide that enables them to critique science inquiry skills being used by MythBusters hosts Jamie and Adam.

Featured Series Library

Find video clips from some of your favorite Discovery series in the Featured Library Services area. Content includes clips from *Planet Earth*, *Life*, *The Jeff Corwin Experience*, *When We Left Earth*, and *Human Body: Pushing the Limits*.

Children's Online Privacy Protection Act (COPPA)

A letter to parents about this important student privacy concern is provided for your convenience.

Professional Development

Because the use of digital media is a new experience for teachers, the Discovery Education Science Techbook adoption comes with professional development as part of the agreement. On-site professional development is provided as well as continuing Web-based seminars and Web events for teachers.



Discovery Education offers a host of staff development options designed to help you make the most effective use of Discovery Education Science digital resources. Among the options are self-paced tutorials, best practice video segments, and staff development training materials.

5-Minute Preps

Use these resources to get quickly up to speed on science content and students' potential misunderstandings.

Trainer's Toolkit

Use the resources and materials in the Trainer's Toolkit to enhance your staff development workshops. Download digital versions of the User Guide, the QuickStart Guide, and other support documents.

Tech Talk

Visit Tech Talk to locate resources from the Discovery Education Science Implementation and Support Team. You'll find materials to help you successfully launch Discovery Education Science at your school or district and documents that address technical and network issues.

Tools in the Navigation Bar

Best Practices

View short, thirty-second video segments that profile science teachers and gain exciting strategies for inquiry-based instruction.

Discovery Educator Network: DEN

Over 100,000 strong, this collaborative network of professional educators provides support and new ideas to all Discovery Education users. DEN Stars provide Web-based opportunities to learn and share. From just getting started with Techbook for Virginia to utilizing Web 2.0 tools with students to demonstrate what they have learned, the Discovery Educator Network provides ongoing professional development throughout the life of the adoption.

My Content

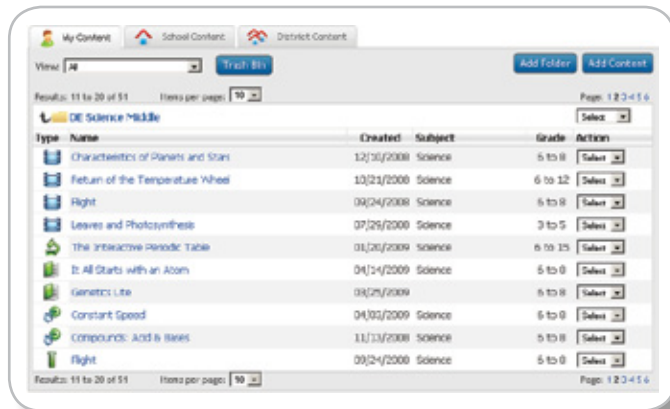
This dynamic feature allows you to collect, organize, retrieve, and assign your favorite Discovery Education Science Techbook media resources in one convenient place. Located in the green navigation bar near the top of the screen, "My Content" is accessible from anywhere on the site.

You can add Discovery Education Science content to folders you create in My Content. Stay organized by creating sub-folders within main folders to create hierarchies within content areas. Adding resources to My Content does not initiate a playing or downloading procedure. The purpose of My Content is to bookmark the resource to avoid searching for it again. All files and projects added to My Content are stored on Discovery Education servers.

The Trash Bin holds your deleted content. In the case that you accidentally delete content, you will be able to click on the Trash Bin button and restore that content to the appropriate folder.

Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

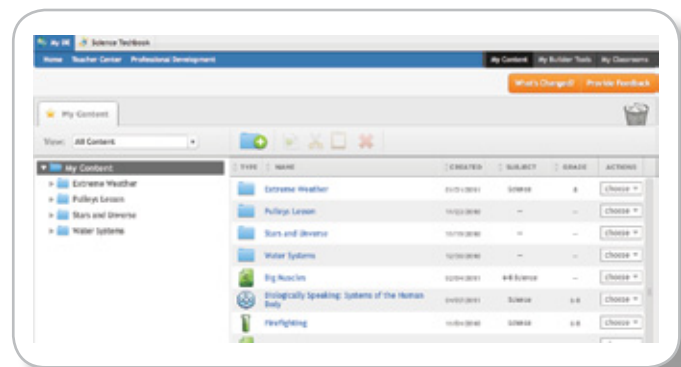


Add a Media Source to My Content

1. Locate a resource that you wish to add to My Content.
2. Click the link "Launch."
3. Click the link "Add to My Content."
4. A pop-up window will open. You may add the resource to the "My Content" default folder, select a folder, or add it to a new folder.
5. If you select "Add to New Folder," follow the prompts and enter a folder name and select a folder location. My Content allows you to create folders within folders.
6. Click the "Add" button and the window will display a confirmation message, telling you that your content has been added to My Content.
7. Click the link "Close Window."
8. Access your content any time by clicking the "My Content" link on the navigation bar at the top of the screen and then navigate to the correct folder.

My Builder Tools

At any point in Discovery Education Science Techbook for Virginia, click on the Builder Tools to get to powerful applications that allow you to customize the service.



Assignment Builder

Assignments are sets of digital resources along with teacher directions that are assigned to students to open in their Student Center and complete. Assignments are already provided as part of the model lessons for each concept in the pull-down box on the concept page. However, you may wish to edit or add to assignments. For example, you may wish to have students read a passage and compare what they learn in it to a video segment on the same concept. Then have students complete the Exploration for that concept and finish by completing an assessment. It's also possible to create your assignment following the easy steps on the screen in Assignment Builder.

Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

Edit an Existing Assignment

From a concept page, pull down the orange tab: Assignments and click on the assignment you wish to review or edit. An option will appear to Copy/Edit the assignment. To do so, you must first save the assignment to your My Content folder, then continue as if it were an assignment you are creating. Follow the steps along the top of the screen to edit, add content, and assign to students.

Creating a New Assignment

Access the Assignment Builder from anywhere on the site by clicking on My Builder Tools in the navigation bar at the top of the screen and selecting Assignment Builder. If you are starting from the beginning you will Create your assignment. If you are using an already created assignment, you will Edit the assignment. As you scroll over each area, helpful popup suggestions are provided.

Each assignment can have multiple sections, so you can provide assignment instructions, teacher notes, learning objectives, state standards, and more. You decide which of these sections will be visible to students. Furthermore, you can decide in what order to place those sections.

Start by giving your assignment a title, such as Food Chains. If this is an existing assignment, rename it. Choose the grade level(s) and subject area. Decide if you wish to be notified when each student has completed the assignment and check the box accordingly. Save and Continue.

The screenshot shows the 'Assignment Builder' interface. It includes the following elements:

- Enter Assignment Title:** A text input field containing 'Food Chains'.
- Select Grade(s):** A row of buttons for grades K through 12. The '7' button is highlighted with a red checkmark.
- Select Subject(s):** A dropdown menu with 'science' selected. Other options include Research/Study Skills, Social Studies, Teaching Practices, Visual and Performing Arts, and World Languages.
- Settings:** A checkbox labeled 'Receive email notification(s) when an assignment is updated.' is checked. A tooltip box next to it says 'Receive updates when a student edits, submits, or comments on an assignment.'
- Buttons:** 'Cancel' and 'Save and Continue' buttons are at the bottom right.
- Legend:** A red asterisk icon is labeled '* Required'.

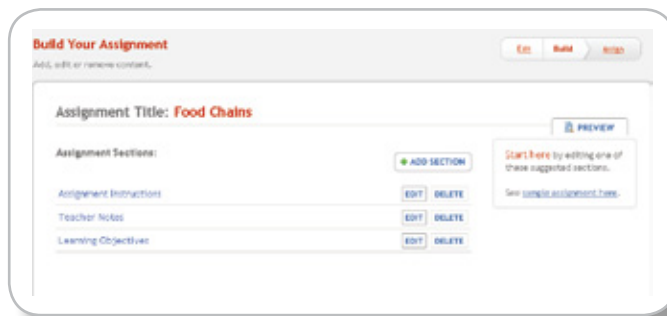
Next, add or edit a section to the assignment by clicking on Edit next to that section or double clicking on the section itself. You can also delete a section by clicking on Delete. Some assignments will only have one section. Others will have several.

Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

Now follow the order on the screen.

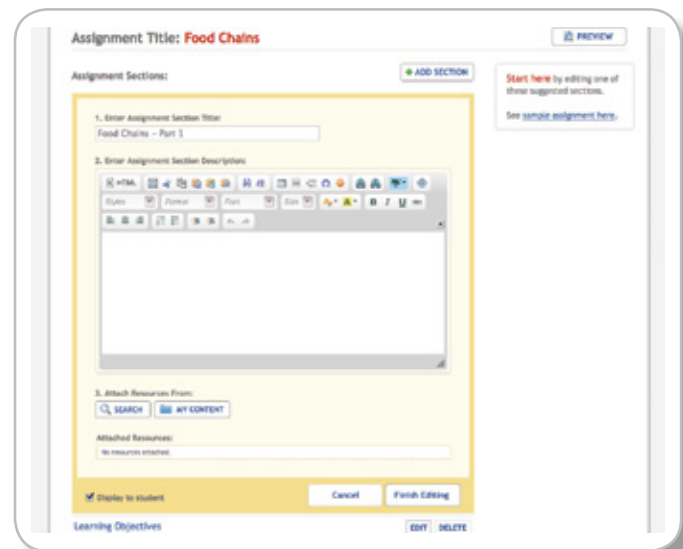
1. Add the assignment section title, such as "Assignment Instructions."



2. Use the provided text box to type in your text. You may change fonts, use numbering or bullets, create tables, and even hyperlink to outside websites. (To hyperlink, double click on a word and select the HTML link option from the menu.)

3. Attach the resources you want students to use in this assignment. You may search for them using a standard keyword search or get them from your My Content folders. (Note—A general recommendation is to store the resources you want to use with students ahead of time in a My Content folder. This makes them readily available for presentation and for assignment to students.)

In the lower left-hand corner is a box that will allow you to show this section of the assignment to students or keep that part just for teachers to view. Click on Finish Editing and you will be taken back to the Assignment Sections screen.



Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

Add as many assignment sections as you need. Note that you can change the order of the sections by simply dragging them into the order you want. Preview what the assignment will look like by clicking on the Preview button.

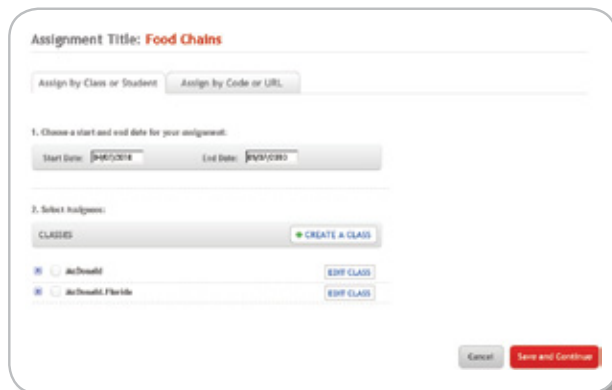
Click on Save and Continue to get to the Assign to Students section.

Assigning Assignments to Students

Choose a start and end date for your assignment. Before or after those dates, the assignment is not accessible to your students.

Select a class or create a new class to make the assignments. You may click on the + buttons next to classes to assign the work to individual students. Only students who are registered with log-ins to Discovery Education Science and who are assigned to your class (see Create Classes) can receive assignments.

Click on Save and Continue and you will see a message indicating that the assignment has been made. The next time students log in, they will have access to your assignment in their Student Center.



Assignment Title: **Food Chains**

Assign by Class or Student | Assign by Code or URL

1. Choose a start and end date for your assignment.

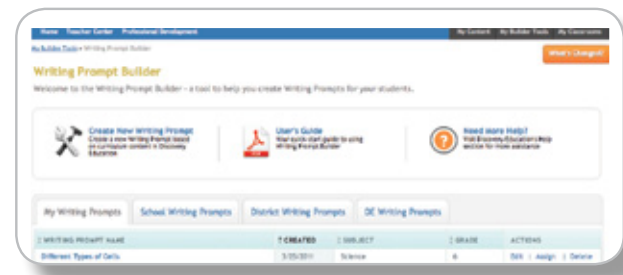
Start Date: 1/25/2016 | End Date: 1/25/2016

2. Select a class(es):

CLASSES

AllWorld |

AllWorld, Florida |



Writing Prompt Builder

The main difference between Writing Prompts and Assignments is that students can respond in writing to the prompt and send that response to the teacher. Teachers can review the written responses and comment on them back to the student. The Writing Prompt Builder is a useful tool to help you create Writing Prompts for your students. You can use this tool to create prompts that integrate a variety of resources such as Explorations, reading passages, video segments, and assessments to give students writing practice. Students access writing prompts through the DE Science Student Center.

Creating a New Writing Prompt

Access the Writing Prompt Builder from anywhere on the site by clicking on My Builder Tools in the navigation bar at the top of the screen. To get started, click on "Create New" from the Writing Prompt Builder home page and follow these easy steps:

Step 1: Create Your Writing Prompt (or Edit Your Writing Prompt)

Enter a title for your writing prompt and select the grade level and subject. Note that often these writing prompts may double as an English writing as well as science assignment. Decide whether or not to receive e-mail notifications each time a student submits a response to the prompt. Note that if you have a lot of students, this option can quickly fill your mailbox.

Complete this step by saving the writing prompt to a location in your My Content folder.

Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

Step 2: Build Your Writing Prompt

Attach digital resources either by searching by keyword or choosing a resource already stored in your My Content folder. Provide a caption for the resource.

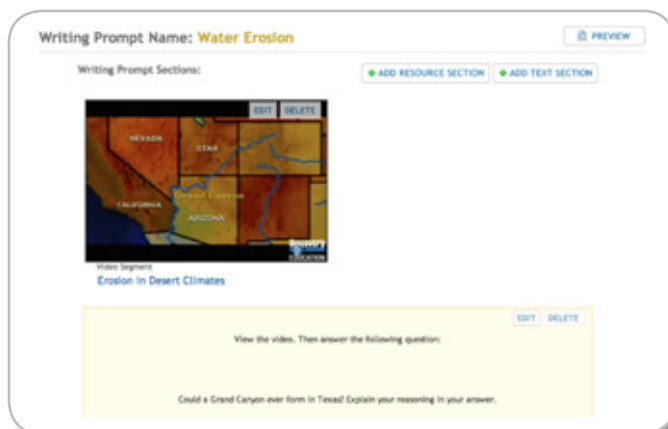
Click Finish Editing and then choose edit to add text to the prompt.

You may add more sections to the prompt so that this becomes a multiple resource writing response.

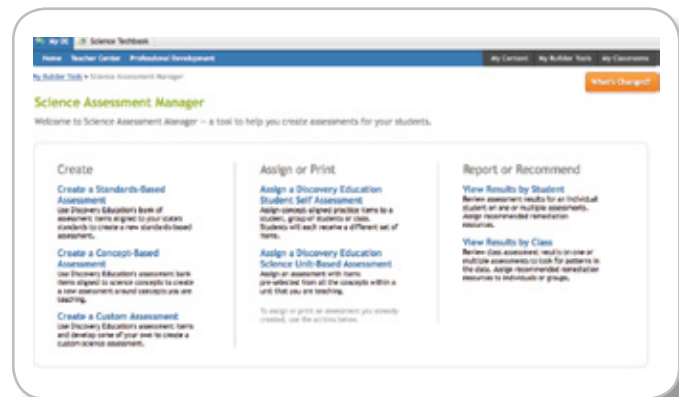
You may preview the writing prompt before assigning it.

Step 3: Assign

You can assign your writing prompt to a class or individual student. Simply select a Class, or drill down in a class to a student or students, and click "Assign." Students access their writing prompts through the DE Science Techbook Student Center.



Science Assessment Manager



Create a Standards-Based Assessment

Access the Assessment Manager from anywhere on the site by clicking the My Builder Tools link in the dark gray navigation bar near the top of the screen. You can create a standards-based assessment in five easy steps. To begin, click the link "Create an assessment using state standards" located in the Create section.

Step 1: Create

Start by providing information about your assessment students will see in the form provided. The Assessment Title, the grade/course, and Instructions are required fields. Objectives assessed may be added and are seen by students. Notes are only seen by teachers. Once complete, select "Save and Continue." Select where to save the assessment. You may save to an existing folder in My Content, or add a new folder.

Step 2: Choose Standards

Discovery Education Science gives you the ability to select your state standards at the most granular level. Based on the

Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

grade level you chose in Step 1, you will see that grade's Virginia Science Standards of Learning and may drill down and view the sub standards. Check the box next to the standard(s) you wish to select. You may select one or multiple standards. To advance to Step 3, scroll to the bottom of the screen and click the "Save and Continue" button.

Step 3: Choose Items

Based on the standards you selected, the Assessment Manager will provide a list of all the assessment items in the Discovery Education Science Techbook for Virginia Item Bank that are aligned to that (those) Virginia Science Standards of Learning. You can select as many of these items as you wish. Note that items that are already included in the student self-assessment are marked. *(This is a Student Self-Assessment question)* You may or may not wish to add these to your formative concept assessment as students may have already seen and tried these items. When you have selected the items you need, save and continue. To advance to Step 4, scroll to the bottom of the screen and click the "Save and Continue" button.

Step 4: Order Items

This step gives you the ability to arrange the items in a specific sequence or have them presented to different students in a different, random order. Once you have the items sorted, save and continue.

Step 5: Assign

Determine the start and end date for the assessment. After the end date, students will not be able to take the assessment unless you extend the date. Assign the assessment to an entire class or to groups or individuals. You may preview the assessment to see how students will view it. You can always go back a step and make changes. You may also print out a copy of the assessment in either the student version or the teacher version which has the answers marked.

Create a Concept-Based Assessment

From Assessment Manager, choose Create a Concept-Based Assessment.

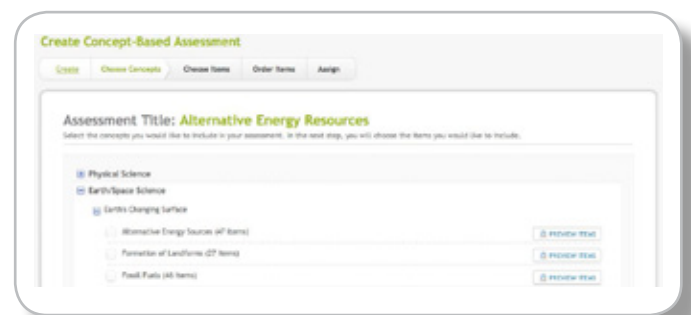
Step 1: Create

Enter a title for the assessment. Choose the service (Science Techbook) and the grade level. Create Overview by adding to the instructions (a default set is provided), adding objectives and notes. Notes are only seen by the teacher(s). Save and Continue.

Choose where you would like to store the assessment in your My Content folders.

Step 2: Choose Concept

Use the organizational structure (which matches your grade level unit structure) to locate the concept from which you wish to create the concept-based assessment. Either preview the items or save and continue.



Tools in the Navigation Bar

Step 3: Choose Items

Scroll down the list of items for this concept and check the box to the right of the item if you wish to add it to your concept-based assessment. Note that items that are already included in the student self-assessment are marked (*This is a Student Self-Assessment question*). You may or may not wish to add these to your formative concept assessment as students may have already seen and tried these items. When you have selected the items you need, save and continue.

Step 4: Order Items

This step gives you the ability to arrange the items in a specific sequence or have them presented to different students in a different, random order. Once you have the items sorted, save and continue.

Step 5: Assign

Determine the start and end date for the assessment. After the end date, students will not be able to take the assessment unless you extend the date. Assign the assessment to an entire class or to groups or individuals. You may preview the assessment to see how students will view it. You can always go back a step and make changes. You may also print out a copy of the assessment in either the student version or the teacher version which has the answers marked.

Create a Custom Assessment

Access the Assessment Manager from anywhere on the site by clicking the My Builder Tools link in the dark gray navigation bar near the top of the screen. You can create a custom assessment in five easy steps. To begin, click the link "Create a new custom assessment" located in the Create section.

Step 1: Create

Start by providing information about your assessment students will see in the form provided. The Assessment Title is a required field. Objectives assessed may be added and are seen by students. Notes are only seen by teachers. Once complete, select "Save and Continue." Select where to save the assessment. You may save to an existing folder in My Content, or add a new folder.

Step 2: Add Items

You may create your own item or search for items from the Discovery Education Science Techbook for Virginia item bank by keyword. The search will return all the items related to that keyword. Click on the +Add option on the right for each item you wish to add to the assessment. Click on Add Items to the Assessment to return to the Add Items screen. You may add your own items to conduct a different keyword search for more items from the bank. You may preview the assessment from this screen as well. Click save and continue to go on.

Step 3: Assign

Determine the start and end date for the assessment. After the end date, students will not be able to take the assessment unless you extend the date. Assign the assessment to an entire class or to groups or individuals. You may preview the assessment to see how students will view it. You can always go back a step and make changes. You may also print out a copy of the assessment in either the student version or the teacher version which has the answers marked.

Virginia Teacher Guide: Grades 6-8

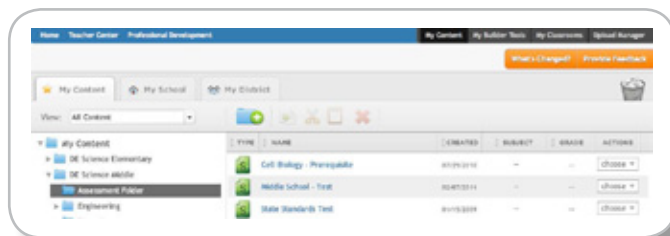
Tools in the Navigation Bar

How Do I Print Out Copies of an Assessment?

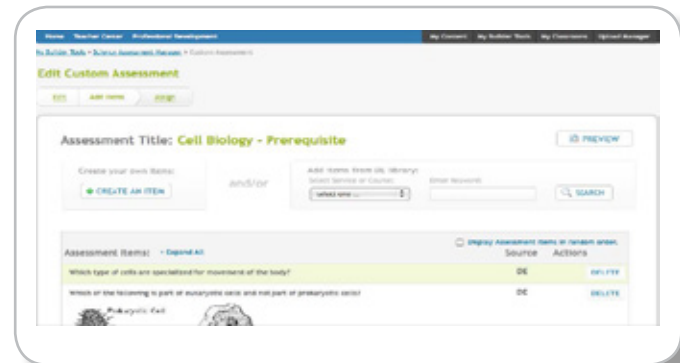
You may access an assessment through Assessment Manager or through your My Content folder. Choose to Edit the assessment and, once it is opened in Assessment Manager, jump to step 5, Assign. From there you can print a copy of the teacher version and/or the student version.

Edit an Assessment (and Add Items to It)

You can access any of the assessments you have developed or saved by accessing it in your **My Content** folder. On the far right of the list is an Actions pull-down button marked “choose.” Select Edit to get to the assessment in edit mode.



When you click the “Edit” button, you will see Step 1 of the assessment creation process and you will have access to all stages in the process. You have the ability to change all of the initial elements that you created and add or remove items. You can also assign the assessment to a single class, group of classes, group of students, or even an individual student. Click directly on any of the steps in the process chain to jump to a specific step, or make changes for each step and then click the “Save and Continue” button at the bottom of the screen.



You may also access your assessments by clicking the “My Content” link at the top of the screen and navigating to the folder to which you saved the assessment. Preview your assessment by clicking on the assessment name. Use the Action pull-down menu to edit, copy, move, assign, or delete the assessment.

Assign a Previously Created Assessment to Students

You can do this two ways:

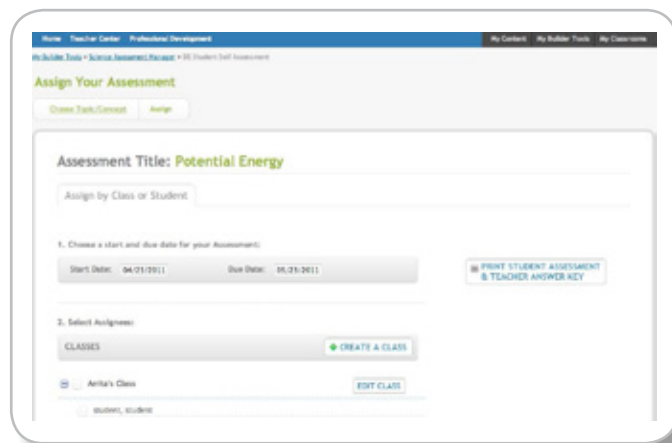
- First, from the Builder Tools page, under Assessment Manager, choose My Assessments. Once on the page, scroll down to see all the assessments that are currently in your collection. You may edit, assign, or delete the assessment.
- Second, from My Content, locate the assessment where you have it stored. In the right hand column, Choose to Edit the assessment. You may further edit the assessment or jump to the Assign step to assign it to additional students.

Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

Assigning a Discovery Education Science Techbook Prepared Assessment

The Assessment Manager contains an extensive databank of pre-created assessments that support Discovery Education Science Techbook for Virginia content at both the Topic and Concept levels. This provides you with significant flexibility to measure student understanding and identify learning gaps.



To begin, click the “Assign A Discovery Education Science Assessment” link located in the Assign section of the Assessment Manager. Select to view by Topic or Concept and either Middle School or Elementary and click Search. The Assessment Manager

will return a list of assessments. Click an assessment name to view the available questions for this concept or topic. Discovery Education Science will select a subset of these questions on a random basis, so each student who takes the assessment will see different questions. This allows your students to take the assessment more than once without seeing the same questions repeatedly.

Next, click the “Assign” button. You can assign an assessment to multiple classes, a single class, groups of students, or an individual student. A message will appear, confirming the assessment has been assigned. Students will access assessments via Discovery Education Science Student Center.

View Assessment Results

The Assessment Manager helps you measure progress by providing detailed assessment results by individual student or by class. You can use Assessment Manager’s reporting functions to determine what students know and identify learning gaps. Based on assessment results, you can assign additional Discovery Education Science content for students to review. Students access recommended content through Discovery Education Student Center.

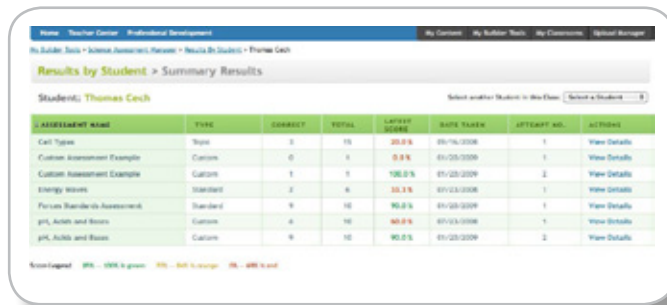
Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

View Results by Student

When you view assessment results by student, you have the ability to see how a student has performed across multiple assessments, or you can view detailed results for a single assessment.

1. Click the link View Results by Student in the Report and Recommend section of the Science Assessment Manager. A list of your class periods will appear.
2. Select a class period to view a list of students.
3. Select an individual student. Discovery Education Science will display a list of all the assessments the student has completed to date, along with their latest level of proficiency.



| ASSESSMENT NAME | TYPE | COUNT | TOTAL | LATEST SCORE | DATE TAKEN | ATTEMPT NO. | ACTIONS |
|----------------------------|----------|-------|-------|--------------|------------|-------------|--------------|
| Carl Topic | Topic | 0 | 0 | 0.0% | 01/16/2008 | 1 | View Details |
| Custom Assessment Example | Custom | 0 | 0 | 0.0% | 01/25/2009 | 1 | View Details |
| Custom Assessment Example | Custom | 1 | 1 | 100.0% | 01/25/2009 | 2 | View Details |
| Energy Waves | Standard | 2 | 6 | 33.3% | 01/13/2008 | 1 | View Details |
| Force Standards Assessment | Standard | 0 | 0 | 0.0% | 01/25/2009 | 1 | View Details |
| pH, Acids and Bases | Custom | 4 | 16 | 60.0% | 01/13/2008 | 1 | View Details |
| pH, Acids and Bases | Custom | 0 | 0 | 0.0% | 01/25/2009 | 2 | View Details |

NOTE: Students may take an assessment multiple times. Discovery Education Science Techbook will display their latest score as the current proficiency level.

4. Review individual assessment details by clicking on View Details in the Actions column. Techbook provides the following information on the Results page:

Total Score on the Assessment

- Total number of questions
- Total number of correct questions

Detailed Score by Concept

- Concepts addressed within the assessment

Total Number of Questions

- Total number of correct questions

5. Review individual assessment question results by clicking the "Review" link. This provides more specific information so you can see how the student performed on each assessment question.

Virginia Teacher Guide: Grades 6-8

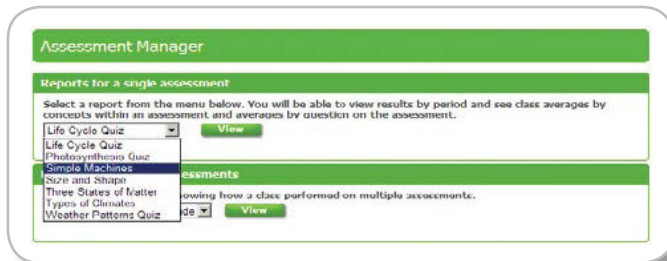
Tools in the Navigation Bar

View Class Progress on an Assessment

The Assessment Manager helps you determine how your class is performing on a given assessment and provides the tools you need to determine what students know and identify learning gaps. Based on assessment results, you can assign additional content for students to review. Students access the recommended content through the Student Center.

View a Report on a Single Assessment

1. Begin by clicking the link "View Results By Class" located in the Report and Recommend section of the Assessment Manager.

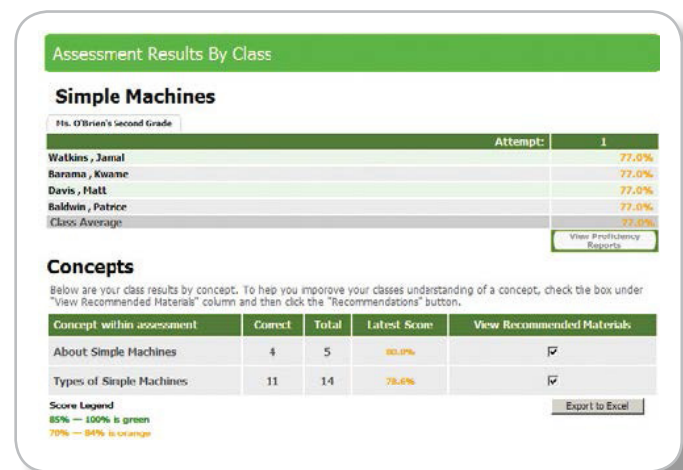


2. Select the assessment that you wish to view from the pull-down menu within "Reports On A Single Assessment" and click the "View" button.
3. The Assessment Manager will display the assessment results by student. You can view information on individual students across multiple assessments, information on student results for an individual assessment, or you can examine class performance on an assessment.

View Class Performance Results

The Assessment Manager provides three Class Performance Reports to help you determine class understanding on a given assessment. This enables you to identify learning gaps and modify your instruction accordingly.

1. Begin by clicking on the link "View Results By Class" located in the Report and Recommend section of the Assessment Manager.
2. Select the assessment that you wish to view from the pull-down menu within "Reports On A Single Assessment" and click the "View" button.
3. Click the "View Proficiency Reports" button.



Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

Proficiency Graph will illustrate the percentage of your students who are performing at Mastery, Partial Mastery, and Non-Mastery levels by concept for both Discovery Education Science-created assessments and by standards for Standards-Based Assessments.



Student Score will show individual student scores for each assessment, itemized by concept and standard.




Averages by Question will detail class level performance on each assessment question. Data includes the score per question, the total number of students who received this question, and the number of students with incorrect answers.

Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

View Class Performance across Multiple Assessments

Click the link "View Results By Class" located in the Report and Recommend section of the Assessment Manager. Select the class you wish to review from the pull-down menu within "Reports on Multiple Assessments" and click the "View" button.



| Assessment | Cell Types | Energy Matter | pH, Acids and Bases |
|--------------|------------|---------------|---------------------|
| Caik, Thomas | 25.0% | 25.0% | 50.0% |
| Chu, Warren | | 50.0% | 50.0% |
| Carl, Gerry | | 16.7% | 50.0% |

The Assessment Manager provides two class performance reports to help you determine class understanding across multiple assessments.

Proficiency Graph will illustrate the percentage of your students who are performing at Mastery, Partial Mastery, and Non-Mastery levels for each assessment.

Student Score will provide class totals and individual scores for each assessment.

View Results and Assign Recommended Remediation Resources

The Assessment Manager provides you with the ability to assign recommended instructional resources to the entire class, groups of students, or to an individual student.

1. Click the link "View Results By Class" located in the Report and Recommend section of the Assessment Manager.
2. Select the assessment that you wish to view from the pull-down menu within "Reports For A Single Assessment" and click the "View" button.
3. Click the "View Proficiency Reports" button.
4. Click the "Averages by Question" tab.
5. Select the check boxes for the questions that you wish to review recommended instructional resources for and then scroll to the bottom of the screen and click the "Continue-Select Students" button.
6. The screen will refresh and display the Student Roster. Students who answered the question incorrectly have been pre-selected. You may deselect a student or assign an unchecked student. Select the students you wish to assign materials to and click the "Continue-View Recommendations" button.
7. The Assessment Manager will return a list of all the instructional resources that address the learning objective that the question was designed to address. You have the ability to open and review each instructional resource directly from this page to determine the best fit.
8. Select the check boxes next to the resources you wish to assign and click the "Assign" button. The next time this student logs into Discovery Education Science, these materials will be available to him or her in the Student Center.

Tools in the Navigation Bar

My Classrooms

Classroom Manager: Manage Classrooms

Note that Discovery Education has the capability of importing student data from your school district that may eliminate the need for you to enter student names and other data individually in order to build your classrooms. Check with your district's instructional technology leader to determine if this can be done.

Step 1: Create a Classroom

The Classroom Manager is located in My Classrooms. To begin, click the button "Create a Classroom." Follow the prompts to add a class name, start date, and end date and then click the "Save/Continue" button.



Step 2: Add Students to Your Classroom

Your school or district may have previously entered students into the Discovery Education Science system. These names will appear in the Current School Roster list on the left side of the screen. To add students from the Current School Roster list, simply select a student name and click the right arrow. The student's name will appear in the box on the right side of the screen, indicating that student is now in your Classroom. To remove the student from your Classroom, select the student and click the left arrow.

You can also create new students by clicking "Add a Student" and completing the fields in the popup window. Click the "Submit" button when you have entered all of the required fields.

Classroom Manager: Manage Content

Begin by locating your Classroom within the Classroom Manager. Under Actions, select "View Assignments/Results."

This page displays the content you have currently assigned to the class and to individual students. Here you can edit the assigned date and due date of content you have already assigned, delete assigned content, and add new content.

To manage content assigned to individual students, click the pull-down menu in the top right corner and select a student. The window will refresh and display the content assigned to that student.

Virginia Teacher Guide: Grades 6-8

Tools in the Navigation Bar

Search Tools

Effective search tools and dynamic browsing capability enable you to quickly locate a variety of media assets and refine your search results by subject, grade, media type, and more.

Keyword Search

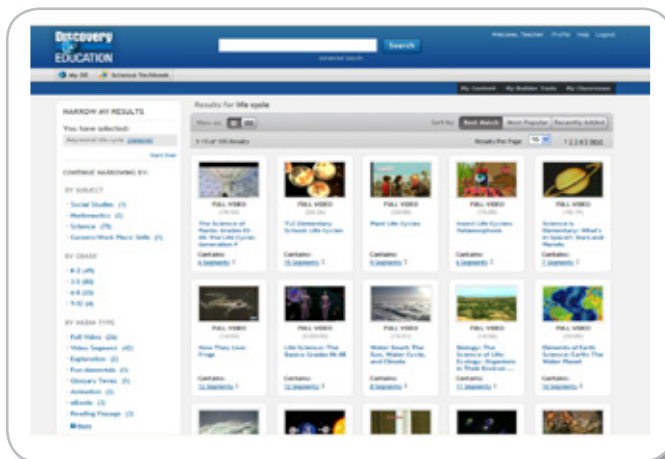
Use the Keyword Search to conduct targeted searches for specific media types such as video segments, images, articles, and clip art. The search results will return video titles and descriptions that contain the keyword you entered. The power of Boolean query allows you to include and exclude words or phrases, for example: revolution NOT industrial. If you use quotation marks to search for a phrase, for example, you will constrain your search to media that includes the entire phrase in the title or description.

More Search Options

When you click in the search field, you are given more options to refine your search. Quick access pull-down menus allow you to limit your search by service, content, or grade level. These additional filters are optional when performing a search.

Advanced Search

The Advanced Search keyword option supports more powerful searching capabilities that allow you to focus on a specific media publisher or limit your search to include only editable, closed captioned, world language, or new titles. You can also choose to exclude classic titles from your search results.

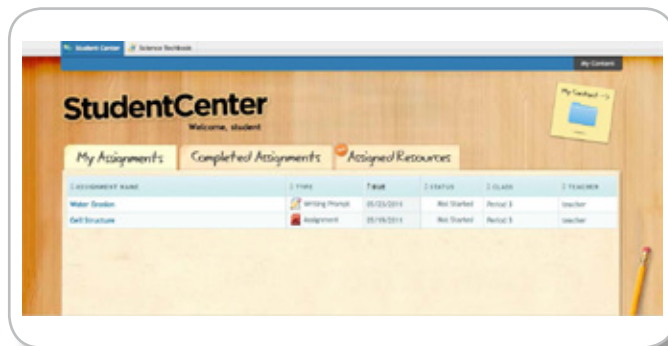


Virginia Teacher Guide: Grades 6-8

What Do Students See?

Student Center

The Student Center comes up on login showing “Welcome,” and the student’s name. This page enables students to view important information about the content you assign, including assignment type, due date, and grade. Students have access to folders of content you have assigned that may contain a variety of media types, from videos and Explorations to reading passages and assessments, so they can easily access material for an entire lesson or project.



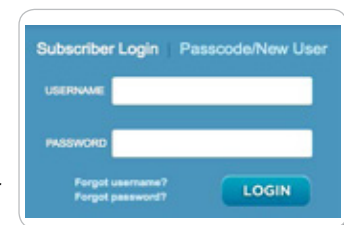
In addition to assignment and assigned resources folders, students have their own **My Content** folder to save resources. Students can get to a student version of the Techbook for Virginia course/grade page by clicking on Science Techbook in the navigation bar. Hidden from them are teacher resources and instructional details for the resources such as Lexile scores for reading passages.

Students also have access to the **Keyword Search** including optional advanced search features such as Boolean logic searches.



How Do Students Log In?

1. Students go to www.discoveryeducation.com.
2. Students enter their username and password in the Subscriber Login area and click “Login.”



Accessing Assignments

When students log in, they will have access to the Discovery Education services to which their school or district subscribes.

Students access assignments from the welcome screen under the My Assignments tab.

Students use the Student Center to view their progress to date on assignments, view due dates for upcoming assignments, and click an assignment name to launch it.

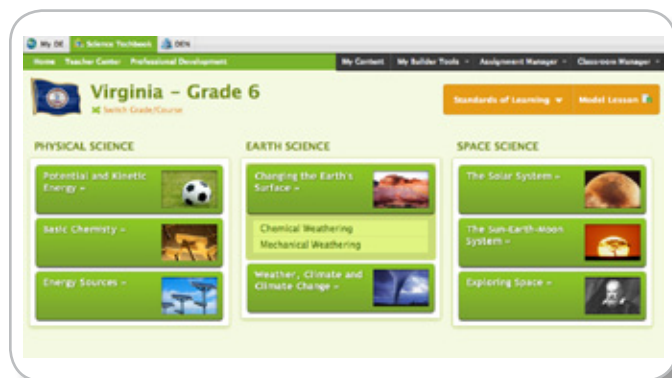
Accessing Assigned Resources

Individual resources can also be quickly assigned and appear under the Assigned Resources tab. When a new resource is assigned, the “New” button pops up.

What Do Students See?

Browsing the Content

Students have access to the grade level page with all units and concept resources organized the same way the teacher sees them. To get to this page, students go to the navigation bar and click on Techbook.



Resources appear to students without the details that teachers see, such as Lexile reading levels or teacher guides. Quick links to assignments and assessments are provided from the browse pages.

What Can Parents See?

Parents have access to their student's account through the student login and password. Thus they can see all the same assignments, assigned resources, assessments, and results that the student sees. Getting to Knows and concept and unit review sheets can also be sent home to parents in order for them to guide the student. From any Internet-accessible computer or device, parents can conduct searches for content just as students do.

Virginia Teacher Guide: Grades 6-8

Digital Resource Descriptions

Resource Descriptions and Instructional Suggestions

Discovery Education Science Techbook contains thousands of science resources to engage students and sustain learning. These resources allow you to differentiate instruction and maintain interest with their variety.

A keyword search (see the Search section of this guide) allows you to view any of the different types of resources by typing in the topic (e.g. cells) and seeing a rich return of digital media. The navigation bar on the left of the search return page allows you to limit the view to a particular resource type. Each of the following sections describes the resource types and how they can be used for instruction.

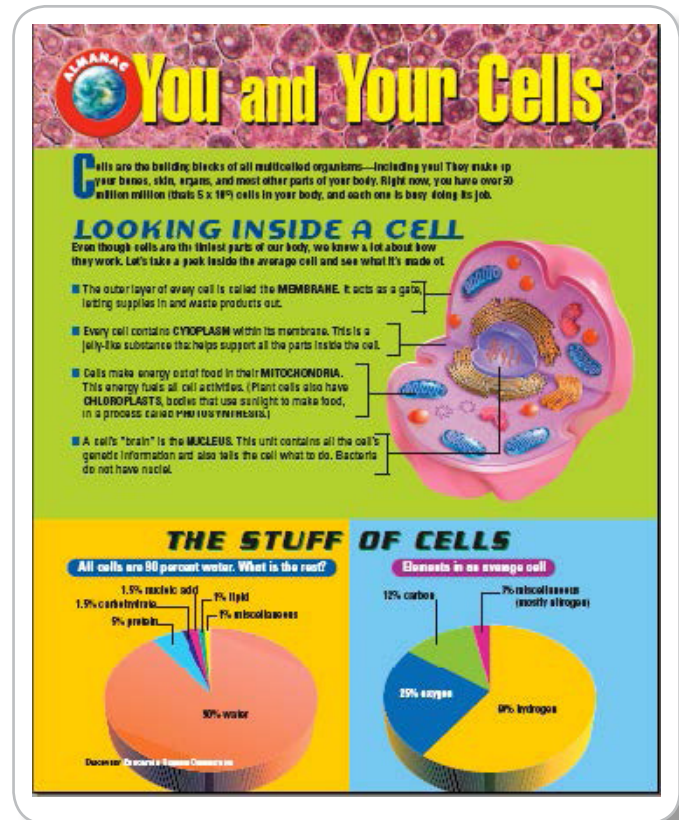
Reading Passages

Features of Reading Passages

Reading passages provide the teacher with a means of incorporating reading in science instruction as well as easy access to written scientific information. Reading passages are brief, straightforward, and informative. They incorporate and define important science concepts and connect them to real-world science events. Reading passages use a colorful magazine format. They contain multiple reading forms including brief illustrated articles, biographies, historical anecdotes, diagrams, data, and even directions for hands-on science investigations. Reading passages may be accessed and read by students on the computer or may be printed and photocopied for distribution by the teacher.

Using Reading Passages in the Classroom

Reading passages have multiple uses and could be incorporated at virtually any point along the instructional pathway. Passages provide students with a way to quickly access information about a particular concept. They may be assigned for homework or in



class for individual reading followed by small group or whole class discussion. The best results are achieved by previewing the text and presenting one or two key conceptual questions for the students in advance to consider while reading. Then, follow up the reading with small group or whole class discussion of those questions. Learning is reinforced by assignment of the hands-

Virginia Teacher Guide: Grades 6-8

Digital Resource Descriptions

on activity in the reading passages to small groups of students to carry out, followed by small group or whole class discussion of the results and conclusions of each group. Reading passages make excellent review and reinforcement tools as follow-ups to instruction. They also serve as information sources for students assigned to complete long-term research projects.

Note that reading passages are written at a Grade 7 independent reading level. However, their brevity and use of graphic cues make it possible for most students to access the information in them.

Spanish Passages

Many of the reading passages have been translated to Spanish. The Spanish version of the passage is on grade level to the English equivalent passage. Both versions of the passages were created with similar sentence and paragraph structure, and though Spanish speakers were the focus audience, with good guidance from the teacher they can also be used with native English speakers, especially in a bilingual classroom.



Productores y consumidores

●●●●

Todos los organismos necesitan energía para vivir y llevar a cabo las tareas diarias. Obtienen esta energía de los alimentos. Los científicos pueden clasificar los seres vivos según la forma en que obtienen su alimento. Por ejemplo, los productores pueden fabricar su propio alimento, pero los consumidores tienen que hallar el alimento en su ambiente.

Las plantas son productores. Fabrican su propio alimento a través de la fotosíntesis. Durante la fotosíntesis, la planta usa luz solar, agua y dióxido de carbono para fabricar azúcar y oxígeno. Las plantas usan la energía del azúcar para vivir, crecer y reproducirse.

Los científicos dividen los consumidores en tres categorías según el tipo de alimento que comen. Los herbívoros comen en su mayoría plantas. Los ciervos, caballos y saltamontes son ejemplos de herbívoros. Los carnívoros comen en su mayoría otros animales. Los tigres y halcones son ejemplos de carnívoros. Algunos consumidores comen tanto plantas como animales. Se llaman omnívoros. Los chimpancés y los pájaros carpinteros son omnívoros.

Unos pocos tipos de plantas son no solo productores, sino también consumidores. Tal vez conozcas la venus atrapamoscas. Es una planta que tiene hojas especiales para atrapar insectos. Cuando un insecto se posa sobre una hoja abierta, la hoja se cierra repentinamente y atrapa el insecto adentro. La planta es capaz de digerir el insecto lentamente con el tiempo. La venus atrapamoscas absorbe y usa los nutrientes del insecto.



La venus atrapamoscas obtiene energía del alimento que fabrica durante la fotosíntesis. Obtiene algunos nutrientes de los insectos.



¿Qué clase de consumidor eres tú?

Virginia Teacher Guide: Grades 6-8

Digital Resource Descriptions



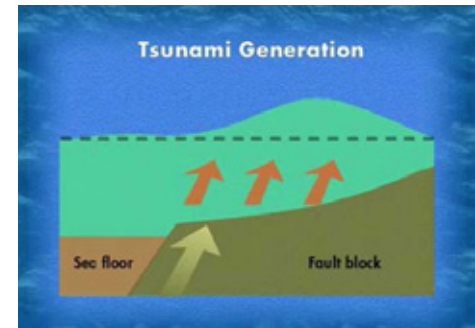
Images

Features of Images

The image library includes over 6,000 still photographs and labeled diagrams covering virtually every field of science. Images are accessible through a keyword search and may be downloaded by teachers and students. Images can be shown on the service or downloaded and used in presentation and reporting software.

Using Images in the Classroom

Both teachers and students can use images. Teachers may use them to engage students at the start of a lesson and/or as visual aids during a class lecture or discussion. Students can include images in presentations and reports.



Virginia Teacher Guide: Grades 6-8

Digital Resource Descriptions

Videos and Video Segments

Features of Video Segments

Video provides an audio-visual experience about science content, science process, or science history that is not as easily or as well delivered through lecture or text. Video segments allow teachers to virtually take students to places and show them events outside of their classroom. Taken from full-length programs from Discovery Education Science Techbook's vast video library, video segments vary in length but are usually no longer than five minutes. Since "a picture is worth a thousand words," these video segments can be used to clarify those concepts that can be hard for some students to understand, especially visual learners.

Rather than present an entire full-length program to students, each informative segment focuses on specific science concepts. However, once the segment file is opened, the video player allows the teacher or student the option of viewing the entire program or any segment from the full video. Often, this additional viewing occurs as a natural extension or connection to the initial content.



Using Video Segments in the Classroom

For teacher presentation, video segments on specific concepts can be found quickly by browsing within a science content area. Teachers may also perform a keyword search to bring up just the right video that illustrates a concept. On-demand video segment searches work well in response to student questions or during a discussion that leads to a "teachable moment."

Video segments can be used virtually anywhere along an instructional pathway. They can be shown to the entire class or small groups, or assigned to individual students to view on a student computer anywhere with Internet access, including after school and at home.

As a "hook" when beginning instruction in the Engage phase of a lesson, video segments can engage students, stimulating their curiosity about a concept and connecting it to real life. As a part of the instructional process, video segments provide important information that students can use in constructing knowledge about a concept. Selected ahead of time, the video segments can also be assigned to students who are working on independent assignments or projects. Video segments also make excellent review and reinforcement tools for concepts already taught by providing an alternative means of presentation to students.

When key conceptual questions are posed ahead of the viewing, students become more engaged as they consider the questions and then look for the answers as they view the videos. The students then benefit from either small group discussion of the questions or a teacher-led, whole class reflection.

Virginia Teacher Guide: Grades 6-8

Digital Resource Descriptions

Explorations

Features of Explorations

Explorations are brief interactive activities that allow students to manipulate various pieces of information to either test their understanding of a concept or determine how changing factors can affect outcomes. Each Exploration begins with an introduction, giving the student some background about the concept being explored and directions for proceeding. The Student Worksheet contains a topic overview as well as three questions on which to focus attention before students begin, instructions for completing the Exploration, and space for recording data. The comprehensive Teacher Guide includes a summary sentence, objectives for the Exploration, a description of the Student Worksheet and procedure that the student should follow, directions for the teacher, and the three student questions with answers provided. An additional discussion question, with key answer points, rounds out the Teacher Guide.

Using Explorations in the Classroom

As part of the learning experience, Explorations may be assigned to individual students or to small groups working collaboratively in a computer lab in the classroom, in an after school program, or for homework. Alternatively, where student computer access is limited, the teacher may carry out the Exploration with the entire class at once with a single computer and a monitor at the front of the classroom. If computer stations are available, the teacher may wish to run the first part of the Exploration. Then students may be assigned to complete the Exploration on their own as they rotate to the computer stations.

The follow-up discussion and reflection are an important part of the Exploration process. The discussion question in the Teacher



Guide provides opportunities for helping students to internalize the concept, for encouraging higher order thinking skills, and for extension and enrichment. Depending on the nature of the class, the teacher might assign this question to the small groups to think about and discuss, use it as a basis for an all-class discussion, or assign it to selected students.

Explorations can serve as excellent activities for review and reinforcement after a concept has already been taught. Again, they are suitable for individual, small group, or whole class assignment, either in class or for homework.

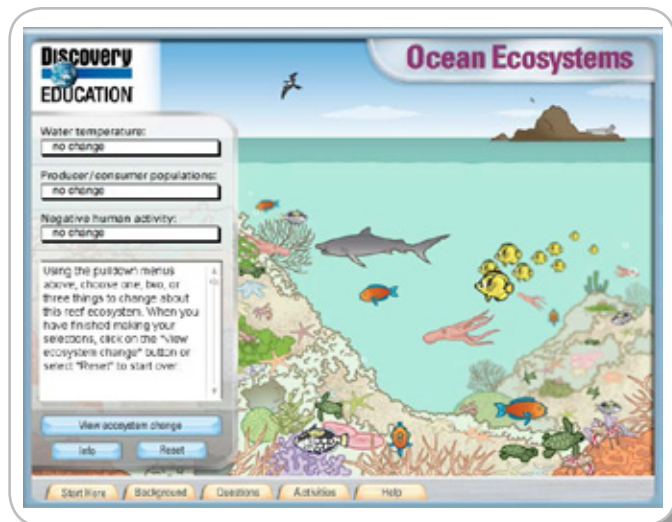
For students working independently or in small groups on projects, Explorations can be made available for students to use as a resource, providing them with a source of data to use in formulating their response to the problem.

Digital Resource Descriptions

Integrated Science Simulations

Features of Integrated Science Simulations

Integrated Science Simulations (ISS) are interactive experiences focused on specific scientific concepts. Students explore each concept by manipulating variables to determine how changing them can influence outcomes. Each ISS begins with a narrated Real World Connection, giving the student some background about the concept, and asking engagement questions. This is followed by an explanation of what the student will be doing and some questions for the student to consider while working



on the ISS. A set of activity worksheets is available for the teacher to assign to the student. This variety of activities gives the Integrated Science Simulations a wide range of instructional applications. Each activity worksheet has a slightly different

focus and contains an introduction containing background information, instructions with embedded questions, and a place to record data. A special Help section gives a detailed explanation for completing the ISS. Some of the Integrated Science Simulations have multiple parts, progressing from simple to more complex, providing opportunities for more in-depth learning at a more advanced level of study. Their design makes them useful for students with varied learning styles.

Using Integrated Science Simulations in the Classroom

As part of the learning experience, Integrated Science Simulations (ISS) may be assigned to individual students or to small groups working collaboratively in a classroom computer lab or for homework. Alternatively, where computer access is limited, the teacher may carry out the ISS with the entire class at once with a single computer and a large monitor at the front of the classroom. The follow-up discussion is an important part of the ISS.

Integrated Science Simulations can serve as excellent activities for review and reinforcement after a concept has already been taught. They may be useful as formative assessments because they require application of learned concepts. They involve higher level thinking and problem solving skills and make excellent extension and enrichment activities for more advanced students. Many of them require knowledge of several related concepts or topics and may be assigned at the conclusion of instruction of multiple concepts, topics, or even units.

For students working independently or in small groups on projects, Integrated Science Simulations can be made available for students to use as a resource, providing them with sources of data to use in formulating their response to these problems.

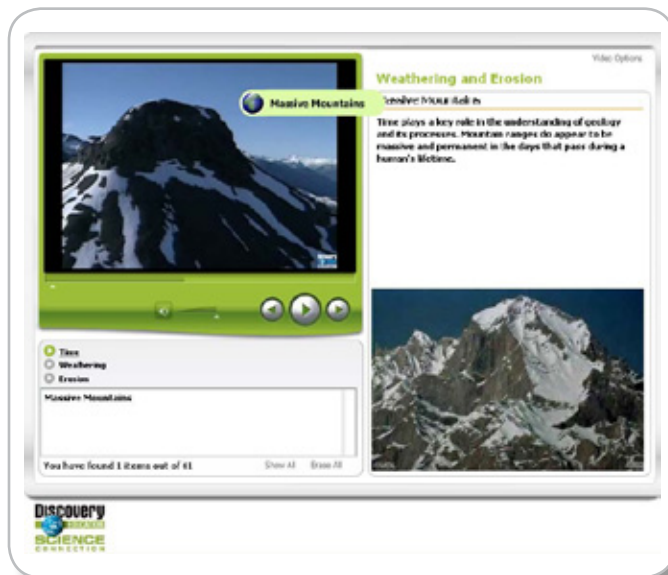
Virginia Teacher Guide: Grades 6-8

Digital Resource Descriptions

Interactive Videos

Features of Interactive Videos

Interactive Videos are Flash versions of selected video clips from the Discovery Education Science video library. As students scroll over “hot spots” within the active video window, pop-ups of key terms appear. When clicked, these pop-ups reveal additional content related to the topic. A list of the terms that have been clicked appears at the bottom of the screen and the information for each term can be reviewed by clicking on that term in the list. Terms are organized into subgroups for easy access. During the viewing, the player can be set to stop each time an object is clicked or to continuously run as the terms are found and recorded.



Using Interactive Videos in the Classroom

Interactive Videos can be used anywhere along an instructional pathway. They can be shown to the entire class, small groups, or assigned to individual students to view on a student computer anywhere with Internet access, including after school and at home.

For teacher presentation, Interactive Videos can be used as part of a discussion. As the teacher scrolls the cursor across the screen, students can read out terms that pop up. The teacher can click on individual “hot spots” and discuss the informational text that appears.

Selected ahead of time, the Interactive Videos can also be assigned to students either as an extension to the topic or as review and reinforcement tools for concepts already taught. Individual students can record key ideas from the pop-up text or groups can focus on a specific subgroup of the terms as their specialty. A jigsaw-type activity can allow them to share information from their subgroup of terms.

Virginia Teacher Guide: Grades 6-8

Digital Resource Descriptions

Interactive Glossary Terms

Features of Interactive Glossary Terms

A comprehensive set of more than 600 key science terms is found in the Interactive Glossary. An appropriate subset of the entire glossary is provided on the right-hand side of each concept page. The terms selected for a page are specific to that topic and concept.

Clicking on each Interactive Glossary term opens up a window to show an animation of the term. Also available are the definition, key context for the term, images, and a video segment illustrating the term. Because the visual image is often a more powerful memory tool for students, glossary terms contain content that reaches different modalities of learning.

Using the Interactive Glossary in the Classroom

Understanding key vocabulary in science has been demonstrated to improve student conceptualization and response on assessments. Systematic instruction of content vocabulary, specifically using linguistic and non-linguistic cues, is a demonstrated best instructional practice.



Glossary terms can be quite handy as reference tools before, during, or after a unit of study. Prior to first time use, it is recommended that teachers provide students with direct instruction in the use of glossary terms so that students understand how to access this resource. Teachers should walk students through the first use, highlighting the features found for each term—definition (in English and Spanish), animation, video, and images.

Students may be encouraged to use the glossary terms to find unknown words that they come across while they work through other resources. Teachers may assign particular words from the glossary terms to build student understanding before, during, or after lessons.

Glossary terms may be used with the whole class, small group, or individual students. In classrooms where computers are limited, teachers may guide students through the use of glossary terms on an individual computer with a projection device or whiteboard.

In classrooms where computers are more readily available, students may work in pairs or individually to locate glossary terms.

If computer stations are available, teachers may wish to assign particular glossary terms as part of a learning station rotation during class work time. This can occur during science or at any part of the school day. Then the terms can be discussed when the class next comes together for science.

In a computer lab or where at least a two-to-one student-to-computer ratio exists, teachers may allow students to search for glossary terms on their own.

Glossary terms can also be assigned as one of a set of digital resources from Discovery Education Science. Teachers can use Assignment Builder to collect a set of resources on the same concept and assign them to all or some students. The set might

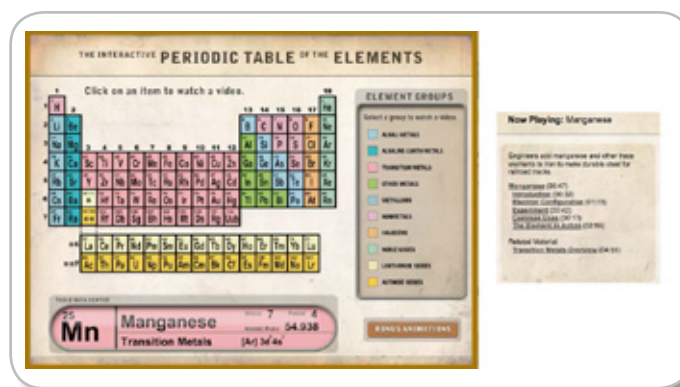
Virginia Teacher Guide: Grades 6-8

Digital Resource Descriptions

include reading passages, eBooks, Explorations, and video segments. The teacher can either assign specific resources or allow students to determine which ones they wish to use to learn about a concept. This approach allows for different learning styles to be addressed.

Interactive Periodic Table of the Elements

Each element contains a set of video segments that show what the element looks like, its unique atomic structure, an experiment with the element, common uses, and the element in action.



Using the Interactive Periodic Table in the Classroom
Students can be challenged to view and compare different elements, looking for commonalities and differences that make an element unique. This tool is also valuable during demonstrations and discussions about specific elements.

Virginia Teacher Guide: Grades 6-8

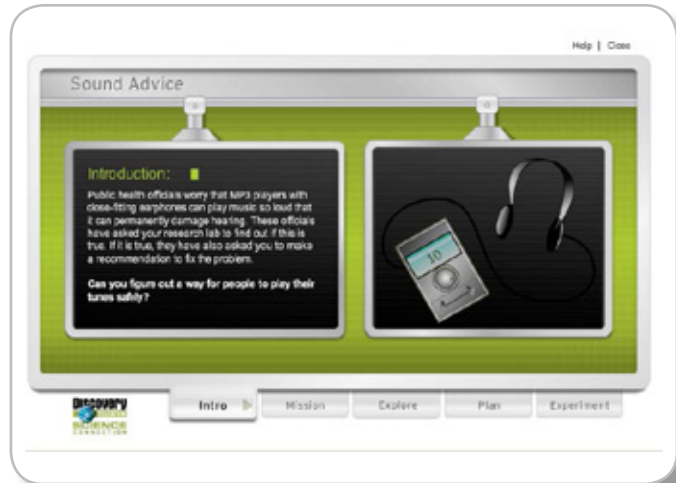
Digital Resource Descriptions

Virtual Labs

Features of Virtual Labs

Virtual Labs provide students with an opportunity to practice designing and conducting science investigations in a guided setting. Virtual Labs always begin with a real-world problem scenario and provide students with the tools they need to investigate it. Students have to think like scientists as they plan their particular experiment. The labs emphasize a collaborative model in which small student groups investigate parts of the problem separately and then bring what they have learned back to the larger group to arrive at a solution to the larger problem.

In each Virtual Lab, students practice and learn about the process of scientific investigation as they expand their knowledge of important science content. They develop a testable question, make a hypothesis, and design an experiment to answer the question. Each lab presents several independent variables that students can control; different combinations of variables can be used to address different testable questions. Students design



their own data chart and use it to collect and report data. As they work, students deepen their understanding of significant science problems as they carry out their experiments and share their results.

Virtual Labs allow a range of investigations that would not be possible in a real-life environment or field study because of safety, time, or cost constraints, or because the measurements would require more precision than middle school students can easily achieve. The structure of Virtual Labs makes them appropriate instructional tools for visual, kinesthetic, and auditory learners. Each Virtual Lab includes a detailed Briefing Document for students and a comprehensive Teacher's Guide.

Using Virtual Labs in the Classroom

Virtual Labs emphasize scientific skills and processes. Therefore, they are best assigned to small groups of students who will work collaboratively in a computer lab. This allows groups of students to investigate different parts of the problem separately and then to consolidate their findings to solve the problem. Where computer stations are limited, however, the teacher can carry out the lab with the entire class at once using a single computer and a large monitor at the front of the classroom.

Virtual Labs integrate different scientific concepts and topics and so are best utilized after coverage of multiple concepts or topics in class, such as at the conclusion of a unit. They are highly suitable for use as extension or enrichment activities as well as for ongoing review and reinforcement of scientific skills and processes.

In Discovery Education Science Techbook for Virginia, Virtual Labs are paired with Hands-On Labs so that students first design investigations in a virtual environment, then design them in the real world of hands-on.

Digital Resource Descriptions


Hands-On Activities

Features of Hands-On Activities

Each concept contains a Hands-On Activity that involves at least one science process skill and/or a concept about the nature of science. Activities such as sorting rocks, observing fish, or measuring liquid volume and mass are valid science tasks, but are not full experimental investigations. Each Hands-On Activity is part of the concept lesson plan, but also exists as a stand-alone resource on the concept page. Depending on the nature of the activity, it will be located within a particular E. Materials listed for the Hands-On Labs are readily available.

Using Hands-On Activities in the Classroom

Depending on the activity, teachers may wish to use the activity in any of the 5E's. An activity on sorting rocks can Engage students before they learn how rocks are classified by scientists. A guided investigation into how water forms under plastic wrap can be part of the Explore phase of a lesson. Reviewing predator-prey relationships can be included as clarification in the Explain phase. An extension of the study of force to provide motion to toy cars can Elaborate on the concept. It may even be possible to Evaluate students' measurement or observation skills by incorporating a Hands-On Activity in that phase of a lesson.

Discovery Education Science


Hands-On Activity

An Evaporated Solution

In this activity, students will demonstrate the following Inquiry Skills:

- Gather Data
 - Use senses to observe
 - Tasting (sour, sweet, bitter, salty)


MATERIALS:

- Plastic cups (enough for each child to have two)
- Packets of salt
- Spoons
- Small pitchers of water (one for each group)
- A large pitcher of water
- 2 Glass jars: one with a lid
- Powdered lemonade (enough for each member of the class to have a drink)

Tell students they will dissolve substances in water. Model pouring a packet of salt into a plastic cup. Pour water into the cup. Stir the salt. Ask students how they can tell that the water has salt in it. NOTE: The teacher should save her salt solution for use in a later experiment.

Have students make two salt water solutions; one solution with cool water and one solution with warm water. Ask students to determine how the temperature of the water affects dissolving. Once students have mixed the salt water solutions have them place one of the solutions in a glass jar with a lid and one without a lid. Tell students they will be checking to see what happens to the salt water in the open container and what happens to the water in the closed container (this will take several days).

Digital Resource Descriptions



Hands-On Lab: Algae in Space!

Summary
In this activity, students investigate how water temperature, the amount of nutrients, and the type of lighting affect the growth of algae.

Time Needed
Preparation: 1–2 weeks (for algae growth), plus 45 minutes active time
Activity Time: two 45 minute class periods, plus 10 minutes a day for 5 days
Analysis Time: one 45-minute class period
Extension: four to seven 45-minute class periods

Objectives
After completing the activity and participating in discussion, students will be able to:

- Ask a valid testable question about the factors that affect algal growth.
- Make a valid hypothesis about the effects of changing one variable on algal growth.
- Test a single variable while keeping all other variables constant.
- Make accurate qualitative observations (measurements) about algal growth.
- Explain how changing one variable affects the rate of algal growth.
- Relate the results of the investigation to the scenario *Algae in Space!* and propose a solution to the problem identified in the scenario.
- Identify problems with the investigation and propose modifications to improve the investigation.

Materials List

Per Class:

- one 4-oz bottle of liquid plant food (fertilizer)
- 2–4 L of algae culture from pond OR commercially prepared algae culture

Per Group:

- four clear plastic water or soda bottles, filled with pond water (each set of bottles should be the same size, either 1 L or 20 oz)

Hands-On Labs

Features of Hands-On Labs

As a complement or supplement to each Virtual Lab, Discovery Education Science Techbook contains Hands-On Labs. These are meant to take the investigative design that students learn and practice in a Virtual Lab and extend it to hands-on experience. Just as in Virtual Labs, students develop their own investigative plan with a testable question, have it approved, and conduct the investigation. They collect data and analyze that data to form a conclusion. Materials listed for the Hands-On Labs are readily available.

Using Hands-On Labs in the Classroom

By their nature, Hands-On Labs can take several class periods to complete. The scenario and the concept are reviewed by the teacher with the whole group. This may include an example in which the teacher conducts a think-aloud about designing the investigation to model the process for students, beginning with a testable question. It may be necessary to make sure students know how to use such simple equipment as thermometers or safety goggles. It is important for students to know the design limitations of available resources, time, and safety. Once students are introduced to the lab, they are challenged to design their own investigation. The teacher becomes a guide, helping small groups or individuals with the design, set-up, and conduction of the investigation. Students usually need a group session after data collection to learn how to look at the data they have collected and to make sense of it in light of their testable question. Finally, students prepare a report on the results of the investigation using data to support their conclusions. Questions that arise from the investigation are excellent jumping off points for science fair investigations. The investigative design skills learned in the process prepare students to complete such projects successfully.

Virginia Teacher Guide: Grades 6-8

Digital Resource Descriptions

Science Sleuths

Features of Science Sleuths

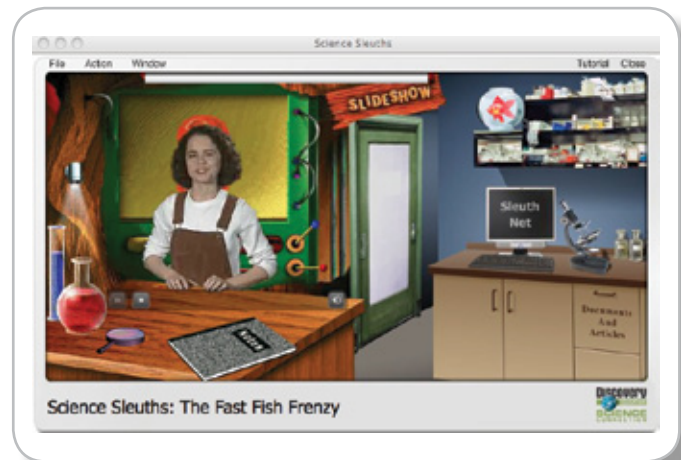
Science Sleuths are interactive science investigations where students act as detectives to solve scientific mysteries. A fellow online detective using inquiry skills guides students. The online detective asks questions through an interview format, while students listen to the interviews, take notes, and gather research through a number of online resources such as an encyclopedia and a glossary. Once students have gathered evidence, they attempt to “solve” the mystery by submitting their conclusions to the “Sleuth Net.”

Using Science Sleuths in the Classroom

Science Sleuths are highly engaging interactive science investigations. They allow students to conduct research and use inquiry skills through authentic problem solving. Typically Science Sleuths require more than one session to complete.

Science Sleuths can be used in conjunction with other resources during the study of a concept to provide students with a better understanding of concepts. They can also be used as stand-alone lessons to focus on science investigations and inquiry skills.

Science Sleuths may be used as whole class, small group, or individual activities. In classrooms where computers are limited, teachers may guide students through Science Sleuths on an individual computer with projection device or whiteboard. Teachers may guide students through or allow students to take turns. Class discussions could revolve around next steps, inquiry skills, or possible conclusions. Upon completion, teachers may want to lead students through further discussion, and new “mysteries” may be formulated that can be solved later in the classroom through investigation.



In classrooms where computers are more readily available, students may work through Science Sleuths in pairs or individually. If computer stations are available, teachers may wish to assign Science Sleuths as part of a learning station rotation during class work time. This can occur during science or at any part of the school day. The Science Sleuths can be discussed when the class next comes together for science. In a computer lab or where at least a two-to-one student-to-computer ratio exists, teachers may allow students to work at their own pace, or they may want to stop and start at points to discuss the Science Sleuths where relevant.

In classrooms where students work at their own pace, discussion between students in pairs or in small groups of students in close proximity, should be encouraged. The session may end with a whole-class discussion.

Virginia Teacher Guide: Grades 6-8

Digital Resource Descriptions

MythBusters Episodes (Specially Edited for Techbook)

Features of MythBusters

MythBusters, taken from the famous Discovery Channel series, is a set of brief, related videos which allow students to review inquiry skills through real-life science investigations. Each MythBusters episode has been specially selected and edited for student use. In each episode, the MythBusters explore a scientific “myth” or widely held belief. As the MythBusters use scientific investigation to test the myth, students can observe and critique the science process being used. The goal is to sharpen student understanding of science process by trying to “catch” the MythBusters making errors in their investigations.

A Teacher Guide and a Student Guide are provided as resources. The Teacher Guide provides information about inquiry skills from the National Science Education Standards and how they can be addressed by observing the MythBusters in the classroom. Procedures for classroom use are also provided. The



Student Worksheets ask students to record their observations of how well the MythBusters investigations were conducted. MythBusters programs can be found in the Process Skills Library of the Teacher Center. The videos can be saved or added to assignments by choosing “Add to My Content” or “Add to Assignment” from the drop-down menu.

Using MythBusters in the Classroom

MythBusters can be great fun to use in a classroom. They allow students to get a first-hand look at real-life science investigations while focusing on inquiry skills. While MythBusters episodes ideally should be related to science content being taught, their main purpose is to test student understanding of science process and inquiry.

The engagement “hook” used by MythBusters is to determine the veracity of commonly held science beliefs. Students will become engaged and excited to find out if, in fact, the beliefs are true or not. At the same time, students have a chance to observe science process in action. MythBusters are just as effective as a whole class activity as they are for small group or individual use. In classrooms where computers are limited, teachers may guide students through MythBusters on an individual computer with a projection device or whiteboard. Teachers may guide students through a Student Worksheet, or students may be encouraged to jot down notes on their individual worksheets. Teachers should lead a discussion about concepts or inquiry skills found in the video segment after viewing to check for student understanding, to add to the depth of knowledge, and/ or to review concepts.

Digital Resource Descriptions

In classrooms where computers are more readily available, students may view MythBusters segments in pairs or individually. If computer stations are available, teachers may wish to assign segments from the MythBusters as part of a learning station rotation during class work time. This can occur during science or at any part of the school day. The segments viewed can be discussed when the class next comes together for science. In a computer lab or where at least a two-to-one student-to-computer ratio exists, teachers may allow students to work at their own pace, or they may want to stop and start at points to discuss the MythBusters where relevant.

In classrooms where students work at their own pace, discussion among students in pairs or in small groups of students in close proximity may be encouraged. The session may end with a whole-class discussion.



Discovery Education Science Middle for Virginia

Discovery Education Science propels your middle school science curricula with up-to-date, standards-based Virtual Labs, Simulations, Reading Passages, and more. Coupled with a real-time assessment component that measures students' progress, it recommends individualized resources that reinforce classroom instruction.

- > Covers physical, earth and space, and life sciences
- > Engages students, encourages exploration, stimulates critical thinking, and deepens understanding of science
- > Advances your classroom through digital media combined with virtual and hands-on science experiments



www.DiscoveryEducation.com

Discovery Education | 800-323-9084
One Discovery Place, Silver Spring, MD

Discovery Education Science is a service of Discovery Education.
Copyright © 2011 Discovery Education. All rights reserved.
Discovery Education is a division of Discovery Communications, LLC.