Introduction

Curriculum Overview

Have you ever asked a question and looked for an answer? Then you are a scientist! Welcome to Grade 2 Science. This year you will practice using inquiry skills, the scientific method, and the design process to explore matter, energy, force and motion, magnets, Earth materials, weather, the solar system, the needs of living things, animals and plants, and environments. You will conduct experiments and design solutions to problems. You will learn from books and online. You will also get to do projects of your choice during each unit!

This course contains online components that are another important way of learning, and really fun! Make sure you use the student resources from *Texas Science Fusion* at <u>www-k6.thinkcentral.com</u>. Your student will use this digital text for all assignments and independent practice.

This course is completed online in Blackboard using the PDF **Unit Lessons** and **Worksheets** documents.

Unit assessments in this course consist of two parts, the **Unit Test** and the **Unit Project**. The Unit Tests are online quizzes. For each Unit Project, scan or take digital photographs of the completed project showing the student's work. Combine the images for each assignment into a single PDF (see **Requirements for Creating PDFs** on the course home page) and upload the file for grading as instructed in the assignment.

2nd Grade Science

Science 2A is composed of three units. The first unit in the course includes Units 1 and 2 in *Texas Science Fusion*. Unit 1 in the textbook focuses on the inquiry skills and tools used in scientific investigations. Textbook Unit 2 emphasizes technology and the design process used by engineers to create new types of technology. This unit will provide an excellent foundation for scientific thinking throughout the science curriculum.

Unit 2 in this course includes Unit 3 and Unit 4 in *Texas Science Fusion*. Unit 3 in the textbook introduces the student to concepts related to changes in matter due to heating and cooling. In textbook Unit 4, students will learn about three types of energy; what force is and how to use it to move things and change directions; three types of motion, and how to make a magnet, use magnets, and the magnetic fields that are used every day.

Unit 3 in this course covers Unit 5 in *Texas Science Fusion*. In this unit, students will learn about natural resources, human-made resources, and how we can save our planet Earth by learning how to use, conserve, reuse, reduce, recycle, and dispose of real trash properly. Students will also get

to be rock hounds, learn about the two types of water, design ways to help buildings not be damaged in an earthquake, help save the Earth by recycling, and make new dirt.

Course Unit	Science Fusion Unit	Topics Covered
1	1 and 2	Scientific investigation—tools and processes; design process
2	3 and 4	Changes in matter; forms of energy; magnetism; force and motion
3	5	Natural resources and conservation

Chart for Units 1–3

Course Objectives

The <u>Texas Essential Knowledge and Skills</u> (TEKS) objectives are covered throughout the science curriculum. At the end of this course, the student should be able to do the following:

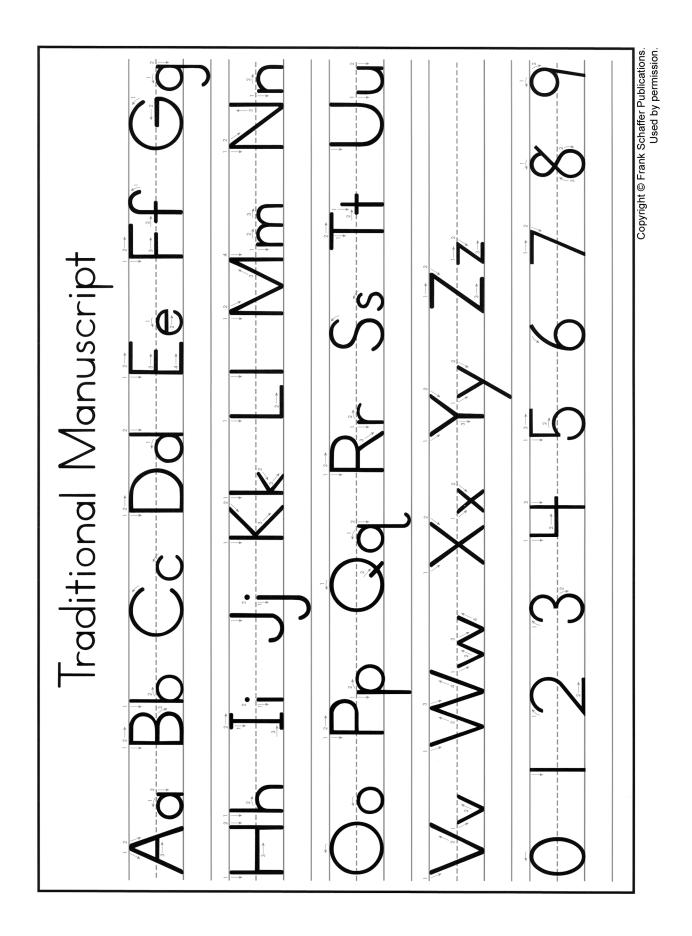
- 1. Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures. The student is expected to:
 - A. identify and demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including wearing safety goggles, washing hands, and using materials appropriately;
 - B. describe the importance of safe practices; and
 - C. identify and demonstrate how to use, conserve, and dispose of natural resources and materials such as conserving water and reuse or recycling of paper, plastic, and metal.
- 2. Scientific investigation and reasoning. The student develops abilities necessary to do scientific inquiry in classroom and outdoor investigations. The student is expected to:
 - A. ask questions about organisms, objects, and events during observations and investigations;
 - B. plan and conduct descriptive investigations such as how organisms grow;
 - C. collect data from observations using simple equipment such as hand lenses, primary balances, thermometers, and non-standard measurement tools;
 - D. record and organize data using pictures, numbers, and words;
 - E. communicate observations and justify explanations using student-generated data from simple descriptive investigations; and
 - F. compare results of investigations with what students and scientists know about the world.
- 3. Scientific investigation and reasoning. The student knows that information and critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions. The student is expected to:
 - A. identify and explain a problem in his or her own words and propose a task and solution for the problem such as lack of water in a habitat;

- B. make predictions based on observable patterns; and
- C. identify what a scientist is and explore what different scientists do.
- 4. Scientific investigation and reasoning. The student uses age-appropriate tools and models to investigate the natural world. The student is expected to:
 - A. collect, record, and compare information using tools, including computers, hand lenses, rulers, primary balances, plastic beakers, magnets, collecting nets, notebooks, and safety goggles; timing devices, including clocks and stopwatches; weather instruments such as thermometers, wind vanes, and rain gauges; and materials to support observations of habitats of organisms such as terrariums and aquariums; and
 - B. measure and compare organisms and objects using non-standard units that approximate metric units.
- 5. **Matter and energy.** The student knows that matter has physical properties and those properties determine how it is described, classified, changed, and used. The student is expected to:
 - A. classify matter by physical properties, including shape, relative mass, relative temperature, texture, flexibility, and whether material is a solid or liquid;
 - B. compare changes in materials caused by heating and cooling;
 - C. demonstrate that things can be done to materials to change their physical properties such as cutting, folding, sanding, and melting; and
 - D. combine materials that when put together can do things that they cannot do by themselves, such as building a tower or a bridge, and justify the selection of those materials based on their physical properties.
- 6. **Force, motion, and energy.** The student knows that forces cause change and energy exists in many forms. The student is expected to:
 - A. investigate the effects on an object by increasing or decreasing amounts of light, heat, and sound energy such as how the color of an object appears different in dimmer light or how heat melts butter;
 - B. observe and identify how magnets are used in everyday life;
 - C. trace the changes in the position of an object over time such as a cup rolling on the floor and a car rolling down a ramp; and
 - D. compare patterns of movement of objects such as sliding, rolling, and spinning.
- 7. **Earth and space.** The student knows that the natural world includes Earth materials. The student is expected to:
 - A. observe and describe rocks by size, texture, and color;
 - B. identify and compare the properties of natural sources of freshwater and saltwater; and
 - C. distinguish between natural and manmade resources.

Source: The provisions of this §112.13 adopted to be effective August 4, 2009, 34 TexReg 5063.

Handwriting

Handwriting is taught in the Language Arts course. However, good handwriting skills are necessary in all subjects including math. In Kindergarten, Grade 1, and Grade 2, manuscript is the preferred technique. When teaching your child handwriting, please consider the appropriate letter formation and spacing. Please refer to the manuscript chart included on the next page to assist you in appropriately teaching your child handwriting. Please reinforce the importance of good handwriting in all subject areas.



Books and Materials for SCI 2 this Semester

Textbooks

You are required to purchase the digital textbook in order to access all lesson materials. Purchase of the print textbook is strongly suggested, as well.

- Digital: *Texas Science Fusion*, Level 2 (includes *ScienceSaurus Grade 2-3, TX*). (2015). Houghton Mifflin Harcourt, Inc. ISBN 978-0-544-06775-2
- Print: *Texas Science Fusion*, Level 2 (2015). Houghton Mifflin Harcourt, Inc. ISBN 978-0-544-02547-9
- Print: ScienceSaurus Grade 2-3, TX (2015). ISBN 978-0-544-05783-8

Other Books

These books can be purchased from any book vendor or borrowed from your public library.

Required:

- Branley, Franklyn M., and Crockett Johnson, Mickey's Magnet
- Baylor, Byrd, *Everybody Needs a Rock*

Optional

- Braun, Eric, Mad Margaret Experiments with the Scientific Method (In the Science Lab)
- Lehn, Barbara, What Is a Scientist?
- Dotlich, Rebecca Kai, What Is Science?
- Lunis, Natalie, and Nancy White, *Being a Scientist*
- Lunis, Natalie, *Investigating Your Backyard*
- Zoehfeld, Kathleen Weidner, *What Is the World Made Of? All About Solids, Liquids, and Gases* (Let's Read and Find Out; Science, Level 2)
- Garrett, Ginger, Solids, Liquids, and Gases (Rookie Read-About Science)
- Ross, Michael Elsohn, What's the Matter in Mr. Whiskers' Room?
- Mason, Adrienne, Change It !: Solids, Liquids, Gases and You (Primary Physical Science)
- Rosinsky, Natalie M., Sound: Loud, Soft, High, and Low (Amazing Science)
- Pfeffer, Wendy, Sounds All Around (Let's Read and Find Out; Science, Level 1)
- Rosinsky, Natalie M., Light: Shadows, Mirrors, and Rainbows (Amazing Science)
- Pfeffer, Wendy, Light Is All Around Us (Let's Read and Find Out; Science, Level 2)

- Bradley, Kimberly Brubaker, *Energy Makes Things Happen* (Let's Read and Find Out; Science, Level 2)
- Porter, Esther, Sun Power: A Book about Renewable Energy (Earth Matters)
- Bradley, Kimberly Brubaker, *Forces Make Things Move* (Let's Read and Find Out; Science, Level 2)
- Stille, Darlene R., Motion: Push and Pull, Fast and Slow (Amazing Science)
- Mason, Adrienne, Move It !: Motion, Forces, and You (Primary Physical Science)
- Branley, Franklyn M., *What Makes a Magnet?* (Let's Read and Find Out; Science, Level 2)
- Fowler, Allan, *What Magnets Can Do* (Rookie Read-About Science)
- Rosinsky, Natalie M., Magnets: Pulling Together, Pushing Apart (Amazing Science)
- Hughes, Monica Lozano, *Magnet Max*
- Christian, Peggy, If You Find a Rock
- Rosinsky, Natalie M., Rocks: Hard, Soft, Smooth, and Rough (Amazing Science)
- Gans, Roma, Let's Go Rock Collecting (Let's Read and Find Out; Science, Level 2)
- Zoehfeld, Kathleen Weidner, Rocks and Minerals (National Geographic Readers)
- Tomecek, Steve, Jump into Science: Rocks and Minerals
- Green, Jen, Why Should I Recycle? (Why Should I? Books)
- Barraclough, Sue, *Earth's Resources* (Investigate!)
- Hicks, Kelli, *Natural or Man-Made?* (My Science Library)
- Spilsbury, Louise, *Natural Resources* (Investigate Geography)
- Royston, Angela, *Materials* (My World of Science)
- MacAulay, Kelley, Why Do We Need Soil? (Natural Resources Close-Up)
- MacAulay, Kelley, *Why Do We Need Water*? (Natural Resources Close-Up)
- MacAulay, Kelley, Why Do We Need Rocks and Minerals? (Natural Resources Close Up)
- MacAulay, Kelley, *Why Do We Need Air?* (Natural Resources Close-Up)
- Rosinsky, Natalie M., Dirt: The Scoop on Soil (Amazing Science)
- Parr, Todd, The EARTH Book
- Gibbons, Gail, Recycle!: A Handbook for Kids
- Showers, Paul, *Where Does the Garbage Go?* Revised Edition (Let's Read and Find Out; Science, Level 2)
- Green, Jen, *Why Should I Save Water*? (Why Should I? Books)
- Rosinsky, Natalie M., Water: Up, Down, and All Around (Amazing Science)
- Nelson, Robin, *How I Reduce, Reuse, and Recycle* (First Step Nonfiction—Responsibility in Action)
- Garrett, Leslie, *Earth Smart: How to Take Care of the Environment* (DK Readers, Level 2)

Materials

Required:

- access to a freezer
- access to yard or other outdoor space
- backpack OR student's science book
- baking pan or deep cookie sheet, 9×12
- balloons
- beach ball or other ball you can blow up yourself
- blocks, wooden, 2 the same size
- bottles, plastic, 2
- bowls, large and small, at least 1 plastic
- box cutter
- boxes, cardboard, 3
- candle
- cardboard
- cartons, such as shoebox, cardboard drink carrier, etc.
- compostable items: leaves, grass clippings, fruit and vegetable scraps, coffee grounds (you won't need a lot)
- cookie
- corrugated cardboard
- craft sticks
- crayons, small box
- cup, 16-oz. plastic
- cups, clear plastic, several small
- cups, paper
- dropper
- dry erase board and markers
- eggs, raw, 2
- empty tin cans with no sharp edges
- flashlight
- flowers, live or artificial, two different kinds
- foil
- food coloring, 2 colors of your choice

- glass measuring cup with markings for milliliters, cups, and ounces
- glasses or plastic cups, clear, 2
- gloves, kitchen
- glue stick
- hammer or smashing object
- hand lens or magnifying glass
- ice
- ice pack
- index card
- juice
- juice pop mold or other container
- laser pointer
- leaves, real or artificial, assortment
- light bulb
- magnets: 2 strong bar magnets; horseshoe; at least 2 ring magnets
- markers, including black permanent
- measuring cups, different sizes
- newspaper or paper towels
- Objects to measure:
 - \diamond book
 - \diamond crayon
 - \diamond paper
 - ♦ pencil
 - ♦ ball
 - ♦ your child's bicycle
 - ♦ your family's car
- pan
- paper: construction, plain white
- paperclips, steel, small and large
- pencil, mechanical
- pencils, #2
- plastic lid or small plastic plate
- plastic wrap
- plate, colored

- Play-Doh® or other modeling clay
- poster board
- reusable materials (string, buttons, balls, material, aluminum can tabs, etc.)
- rocks from outdoors, or rock collection
- rubber bands
- ruler with both inches and centimeters
- ruler, thin plastic
- safety pins
- safety scissors
- salt
- small magnetic and non-magnetic items
- small objects such as paperclips, coins, erasers, toy cars, plastic animal figures, small blocks, etc.
- soil
- spoon or wooden craft stick
- spoon, large plastic
- sticky notes, 3
- stopwatch or timer
- straw
- string
- sugar cubes, 3 (can use 3 small soap bars if sugar cubes are unavailable)
- tape measure with inches and centimeters
- tape: masking and transparent
- teaspoon
- thermometers with Celsius and Fahrenheit measures (C and F), 2
- thermometer, medical
- toilet paper tube or paper cup with bottom removed
- tray or plastic plate
- water
- wax paper
- wide-ruled spiral notebook with 4 sections
- yardstick
- yarn, several different lengths
- your home or a store where student can do a human-made resource hunt
- ziplock bags, 3

Optional:

- chenille sticks
- Dancing Bear rock & mineral collection activity kit
- elastic
- fabric
- <u>Lakeshore magnet kit</u> (includes all magnets needed for course)
- marble
- plastic bags
- stapler
- swimming pool noodle
- Velcro

Technology Resources

Refer to the **Online Resources** section in this Introduction for information on how to access the digital textbook and other resources on the <u>*ThinkCentral*</u> website. In the **My Library** section of *ThinkCentral*, click the **Student Resources Grade 2** button to access the digital lessons.

These **optional** resources may be used before, during, or after the lessons outlined in the Science 2A course. The digital lessons reinforce the concepts taught in the lessons in *Texas Science Fusion*. They provide interactive experiences using simulations, animations, and videos. The inquiries (virtual labs) provide opportunities for your student to apply laboratory and scientific



thinking skills by conducting exciting virtual experiments. These inquiries provide advantages in safety, time, and cost of materials.



Below is an outline of the lessons and inquiries that are available online.

Course Unit 1

Textbook Unit 1

- Lesson 1: How Do We Use Inquiry Skills?
 - ♦ Days 2–5
 - ◊ Digital Lesson
 - ♦ *Science Fusion*, pages 3–12
- Lesson 2: What Are Science Tools?
 - ♦ Days 6–8
 - ♦ Digital Lesson
 - ♦ *Science Fusion*, pages 13–22
- Lesson 3: What Tools Can We Use?
 - ♦ Day 9
 - ♦ Inquiry
 - ♦ *Science Fusion*, pages 25–26

Textbook Unit 2

- Lesson 1: What Is the Design Process?
 - ♦ Days 17–18
 - ♦ Digital Lesson
 - ♦ *Science Fusion*, pages 45–56
- Lesson 2: How Can We Use the Design Process?
 - ♦ Day 19
 - ♦ Inquiry
 - ♦ *Science Fusion*, pages 57–58

Course Unit 2

Textbook Unit 3

- Lesson 1: What Is Matter?
 - ♦ Days 27–29
 - ◊ Digital Lesson
 - ♦ *Science Fusion*, pages 81–94

- Lesson 4: How Do Scientists Think?
 - ♦ Days 10–12
 - ◊ Digital Lesson
 - ♦ *Science Fusion*, pages 27–36
- Lesson 5: How Do We Solve a Problem?
 - ♦ Day 13
 - ♦ Inquiry
 - ♦ *Science Fusion*, pages 37–38

- Lesson 3: What Is Technology?
 - ♦ Days 20–21
 - ♦ Digital Lesson
 - ♦ *Science Fusion*, pages 59–70
- Lesson 4: How Can We Improve Technology?
 - ♦ Day 22
 - ♦ Inquiry
 - ♦ *Science Fusion*, pages 71–72
- Lesson 2: How Does Matter Change?
 - ♦ Days 30–32
 - ◊ Digital Lesson
 - ◊ *Science Fusion*, pages 95–106

- Lesson 3: How Can Water Change States?
 - ♦ Day 33
 - ♦ Inquiry
 - ♦ *Science Fusion*, pages 109–110

Textbook Unit 4

- Lesson 1: What Is Energy?
 - ♦ Day 36
 - ♦ Digital Lesson
 - ♦ *Science Fusion*, pages 119–130
- Lesson 2: How Does the Sun Warm Our Homes?
 - ♦ Day 37
 - ♦ Inquiry
 - ♦ *Science Fusion*, pages 131–132
- Lesson 3: What Are Forces?
 - ♦ Day 39
 - ♦ Digital Lesson
 - ♦ *Science Fusion*, pages 135–144

Course Unit 3

Textbook Unit 5

- Lesson 1: What Are Rocks?
 - ♦ Days 52–55
 - ♦ Digital Lesson
 - ♦ *Science Fusion*, pages 167–176
- Lesson 2: What Are Sources of Water?
 - ♦ Days 56–59
 - ♦ Digital Lesson
 - ♦ *Science Fusion*, pages 179–188
- Lesson 3: What Are Resources?
 - ♦ Days 60–63
 - ♦ Digital Lesson
 - ♦ *Science Fusion*, pages 189–200

- Lesson 4: How Do Forces Make Objects Move?
 - ♦ Day 40
 - ♦ Inquiry
 - ♦ *Science Fusion* pp. 145–146
- Lesson 5: What Are Magnets?
 - ♦ Days 42–46
 - ♦ Digital Lesson
 - ♦ *Science Fusion*, pages 147–156
- Lesson 6: How Strong Is a Magnet?
 - ♦ Day 47
 - ♦ Inquiry
 - ♦ *Science Fusion*, pages 159–160
- Lesson 4: How Can We Classify Plant Products?
 - ♦ Day 64
 - ♦ Inquiry
 - ♦ *Science Fusion*, pages 201–202
- Lesson 5: How Can We Save Resources?
 - ♦ Day 67–72
 - ♦ Digital Lesson
 - ♦ *Science Fusion*, pages 207–216

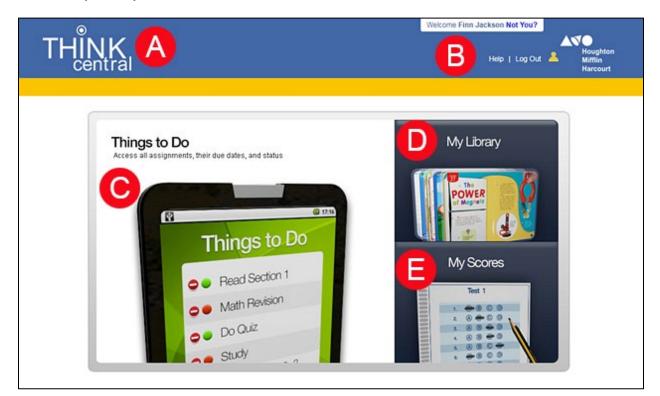
Online Resources

from ThinkCentral Help, © 2018 Houghton Mifflin Harcourt. All Rights Reserved.

Navigate ThinkCentral

To move around in *ThinkCentral*:

→ Click one of the areas on the *ThinkCentral* home page to open that page: **Things to Do**, **My Library**, or **My Scores**.



Descriptions of each area is provided in the following table.

Area	Area Name	Description
A	ThinkCentral logo	Returns you to the <i>ThinkCentral</i> home page.

Area	Area Name	Description		
B	Banner Links	 Help – Opens an online help system that provides detailed instructions for ThinkCentral tasks. 		
		 Log Out – Logs you out of ThinkCentral. 		
		 Account linking icon – If you have more than one account (accounts in more than one school or more than one class), this allows you to select and open another account. 		
С	Things to Do	Opens the Things to Do page, which lists all of the tests and assignments your teacher has assigned to you. You can even find your old assignments after you are done with them.		
D	My Library	Opens the My Library page, where you can find all of your online classroom resources, such as books, movies, sound files, worksheets, and more.		
8	My Scores	Opens the My Scores page, which lists the scores that you received on tests and assignments that you have taken. If your teacher has written a comment on your assignment, you can find it here. You can even look at your old tests to see how well you did on each question.		

→ Once you open a page, you can move to a different page by clicking the area with the page name on the left panel.

Things to Do	Things to Do Click the "Done" button to	let your teacher know yo	u've completed y	our assignment.	
Things to Do	Today is Wednesday, Man	ch 2, 20		Show: All A	ssignments 🗸
My Scores	Assignment	Teacher	Subject	Due Date	
	Science 2	Shea	Science	Mar. 09, 2016	Done
	Science test	Shea	Science	Mar. 09, 2016	Done
My Library Prover				Old	Assignments

 $continued \rightarrow$

Using My Library

The **My Library** page lists all of the library items available to you, including online classroom books, movies, sound files, worksheets, and more.

 \rightarrow To open the My Library page, click My Library on the left panel, then click Science at the bottom of the panel.



- The Student Edition Grade 2 is an exact copy of the *Texas Science Fusion* Write-In Student Edition.
- The **Student Resources Grade 2** are the resources that will be referred to in these lessons. Click on the corresponding unit name and follow the instructions in the lesson for the appropriate lesson or inquiry lab.

On the My Library page, you can do any of the following:

 \rightarrow Open a library item by clicking the item. The item opens in a separate window.

Note: When you close an item, the My Library page is still open.

 \rightarrow Click My Library to see all of your items again.

 \rightarrow Click the Search Library magnifying glass.



Search My Library

My Library lists all of the library items that are available to you. You can search for a specific library item using the Search Library option.

To search My Library:

1. In My Library, click the Search Library magnifying glass. The Search Library page appears.

You can search for a library item by subject, by words, or by both subject and words.

- 2. In the **Subject** list, select the subject of the item.
- 3. In the **Text Search** box, type a word or words that identify the item.

Note: To empty the Search Criteria area and start a new search, click Clear.

4. Click Find. The items that match your search filters are listed in the Search Results area.

Things to Do	Search Library		
	Search Criteria		
Things to Do	Subject: Science v		
My Scores	Grade: 2nd grade 💌		
5e1	Text Search: skills		
	Exact Match Any Word		
My Library	Find Clear		
POWER O	Search Results		
	Collapse All		
	Title		
	Student Edition: Unit 1, Lesson 1: How Do We Use Inquiry see ?		
	How Do We Use Inquiry SKIN?		
	How Do We Use Inquiry Skills?		
	Texas Student Edition Audio Unit 1 Lesson 1 - How Do We Use Inquiry Salls?		
	4		

- 5. To open an item in the list, click the name of the item. The item opens in a separate window.
- 6. To return to My Library, click My Library on the left side of the page.

Digital Lessons and Inquiries

In the **My Library** section of *ThinkCentral*, click the **Student Resources Grade 2** button to access the digital lessons.

These **optional** resources may be used before, during, or after the lessons outlined in the Science 2 course. The digital lessons reinforce the concepts



taught in the lessons in *Texas Science Fusion*. They provide interactive experiences using simulations, animations, and videos. The inquiries (virtual labs) provide opportunities for your student to apply laboratory and scientific thinking skills by conducting exciting virtual experiments. These inquiries provide advantages in safety, time, and cost of materials.



Example of Student Resources screen for one Unit on ThinkCentral

Grading Procedures and Unit Assignment Checklists

Grades are calculated for Unit 1, Unit 2, and Unit 3. The semester grade is an average of the three unit grades. The unit grades will include a test and a project for each unit. The Units 1 and Unit 2 Tests and Projects are located in their respective Unit folders in this online course; the Unit 3 Test and Project are the Final Exam folder.

The Unit Tests and Projects will be submitted **separately** to Texas Tech University K-12 to be graded. The Unit Test is an online quiz and the Unit Project is an upload assignment.

Scan or photograph each Unit Project. Combine multiple images into a *single* PDF. When you save your documents, use the naming convention given for each Unit Test or Unit Project as the name of your file. Upload the file according to the instructions given in the assignment.

Schedule for tests and projects

Unit 1:

- Day 24: Review for the Unit 1 Test.
- Day 25: Administer the Unit 1 Test. Submit the Unit 1 Project.

Unit 2:

- Days 48–49: Review for the Unit 2 Test.
- Day 50: Administer the Unit 2 Test. Submit the Unit 2 Project.

Unit 3:

- Days 73–74: Review for the Unit 3 Test.
- Day 75: Administer the Unit 3 Test. Submit the Unit 3 Project.