# Introduction

#### **Curriculum Overview**

This third-grade science course is an opportunity for your student to look at the world through the eyes of a scientist. Your student will learn to make observations, conduct experiments, and draw conclusions. The scientific concepts covered in this course will foster the student's curiosity and the ability to think analytically. The student will also be introduced to scientific careers and the work of famous scientists. Mathematical skills will be enhanced as the student uses charts and graphs to collect and analyze data. This outstanding course is based on the latest educational research and teaching methods, and will open the student's mind to an amazing learning experience.

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 <a href="https://www-k6.thinkcentral.com">www-k6.thinkcentral.com</a>. 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.

#### 3rd Grade Science

Science 3A is composed of three units. The first unit in the course includes Units 1 and 2 in *Texas Science Fusion*. These textbook units focus on the process and tools used in scientific investigations and the design process used by engineers to create new types of technology.

Unit 2 in this course covers the learning activities in Unit 3 of *Texas Science Fusion*. The student will be introduced to concepts related to the properties of matter, the three states of matter, and physical and chemical changes in matter.

Unit 3 in this course includes Units 4 and 5 in *Texas Science Fusion*. Unit 4 in the textbook presents the student with concepts related to different forms of energy. In textbook Unit 5, the student will learn about simple machines and how they help make work easier.

#### Chart for Units 1-3

Course Unit	Science Fusion Unit	Topics Covered	
1	1 and 2	Scientific investigation—tools and processes; design process	
2	3	Properties of matter	
3	4 and 5	Forms of energy; simple machines	

#### **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:

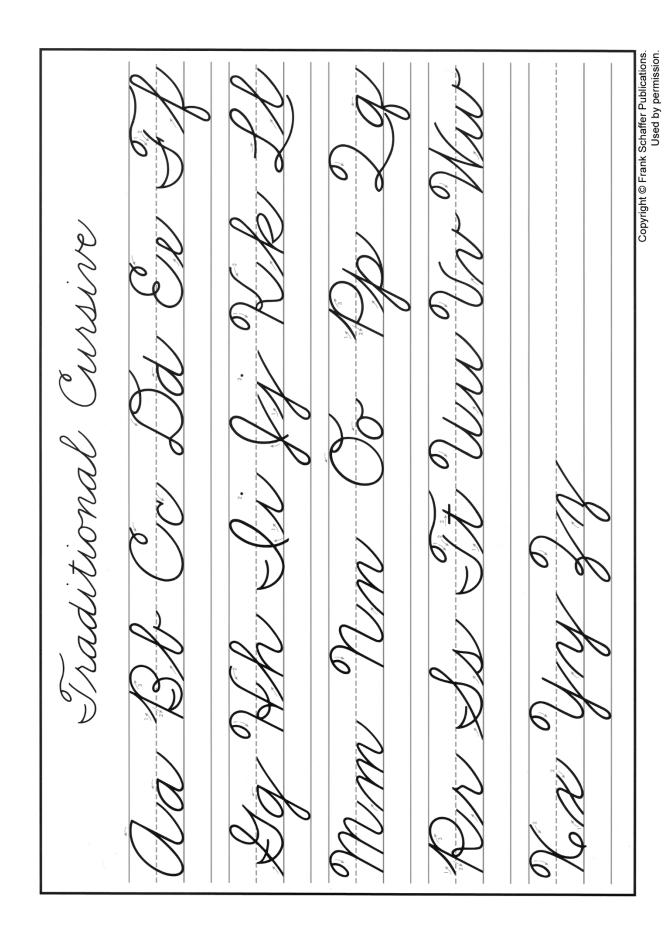
- 1. **Scientific investigation and reasoning**. The student conducts classroom and outdoor investigations following school and home safety procedures and environmentally appropriate practices. The student is expected to:
  - A. demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including observing a schoolyard habitat.
- 2. **Scientific investigation and reasoning**. The student uses scientific inquiry methods during laboratory and outdoor investigations. The student is expected to:
  - A. plan and implement descriptive investigations, including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a specific problem in the natural world;
  - B. collect data by observing and measuring using the metric system and recognize differences between observed and measured data:
  - C. construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data;
  - D. analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations;
  - E. demonstrate that repeated investigations may increase the reliability of results; and
  - F. communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion.
- 3. **Scientific investigation and reasoning**. The student knows that information, critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions. The student is expected to:
  - A. in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
  - B. draw inferences and evaluate accuracy of product claims found in advertisements and labels such as for toys and food; and

- D. connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.
- 4. **Scientific investigation and reasoning**. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:
  - A. collect, record, and analyze information using tools, including microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, wind vanes, rain gauges, pan balances, graduated cylinders, beakers, spring scales, hot plates, meter sticks, compasses, magnets, collecting nets, notebooks, sound recorders, and Sun, Earth, and Moon system models; timing devices, including clocks and stopwatches; and materials to support observation of habitats of organisms such as terrariums and aquariums; and
  - B. use safety equipment as appropriate, including safety goggles and gloves.
- 5. **Matter and energy**. The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to:
  - A. measure, test, and record physical properties of matter, including temperature, mass, magnetism, and the ability to sink or float;
  - B. describe and classify samples of matter as solids, liquids, and gases and demonstrate that solids have a definite shape and that liquids and gases take the shape of their container;
  - C. predict, observe, and record changes in the state of matter caused by heating or cooling; and
  - D. explore and recognize that a mixture is created when two materials are combined such as gravel and sand and metal and plastic paper clips.
- 6. **Force, motion, and energy**. The student knows that forces cause change and that energy exists in many forms. The student is expected to:
  - A. explore different forms of energy, including mechanical, light, sound, and heat/thermal in everyday life;
  - B. demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons; and
  - C. observe forces such as magnetism and gravity acting on objects.
- 7. **Earth and space.** The student knows that Earth consists of natural resources and its surface is constantly changing. The student is expected to:
  - D. explore the characteristics of natural resources that make them useful in products and materials such as clothing and furniture and how resources may be conserved.

Source: The provisions of this §112.14 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 science. In Kindergarten, Grade 1, and Grade 2, manuscript is the preferred technique; in Grades 3, 4, and 5, cursive is preferred. When teaching your child handwriting, please consider the appropriate letter and number formation and spacing. Please refer to the cursive 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.



Texas Tech University K-12

SCI 3A, v.3.0 • Intro-5

# **Books and Materials for SCI 3 this Semester**

#### Textbook:

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 3 (2015). Houghton Mifflin Harcourt, Inc. ISBN 978-0-544-06776-9
- Print: *Texas Science Fusion*, Level 3 (2015). Houghton Mifflin Harcourt, Inc. ISBN 978-0-544-02549-3

#### **Other Books**

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

- Arato, R. (2010) Design It! The Ordinary Things We Use Every Day and the Not-So-Ordinary Ways They Came To Be. Toronto, Ontario: Tundra Books.
- Woodford, C., & Woodcock, J. (2010). *Cool Stuff 2.0 and How It Works*. New York, NY: DK Publishing.
- Dr. Seuss. (1949). Bartholomew and the Oobleck. New York, NY: Random House.
- Green, D., & Basher, S. (2008). *Physics: Why Matter Matters*. New York, NY: Kingfisher Publications.
- Bailey, Jacqui. (2005) *Investigating Science: What is a Force?* London, ENG: Franklin Watts.
- Kessler, C. (2011). A Project Guide to Light and Optics. Hallandale, FL: Mitchell Lane Publishers.
- Oxlade, C. (2012). *Using Electricity*. Chicago, IL: Heinemann-Raintree.
- Schwartz, H.E. (2010). *The Science of a Racecar: Reactions in Action*. Mankato, MN: Capstone Press.
- Stewart, M. (2011). *Inside Lightning*. New York, NY: Sterling Children's Books.
- Walker, S.M. (2011). *Investigating Light*. Minneapolis, MN: Lerner Classroom
- Whiting, J. *The Science of Hitting a Home Run: Forces and Motion in Action*. Mankato, MN: Capstone Press.

#### **Materials**

#### Required:

- advertising or labels for the toys or food products
- alarm clock

- aluminum foil
- assortment of objects, some magnetic and others non-magnetic (examples: metal paper clips, plastic paper clips, screws, piece of paper, small cardboard box)
- a variety of solid objects:
  - ♦ one object that is large and light
  - ♦ one object that is small and heavy
  - ♦ irregular shapes and cubes (small enough to fit in the graduated cylinder)
- baking equipment
- baking soda
- ball
- balloon
- balloons of various shapes, such as round and elongated; one large; one helium-filled
- beakers, 2
- block cubes, wooden; one thin, flat, and rectangular
- books to stack
- bottles, empty, 4 identical
- bowls, 2, one large
- boxes, small cardboard, such as shoe boxes
- · bread dough
- bubble solution and wand
- butter, margarine, or some other easily melted solid
- cardboard
- cardboard boxes, small, 2
- cardboard tube from paper towel roll
- chilled canned drink
- classroom objects such as a stapler, small book, hole punch, paint jar, small boxes of pencils or crayons
- clock, watch, or timer
- cloth, 2 pieces
- coffee cup
- collar, chew toy, or any objects related to a pet dog (pictures or real objects)
- collecting net
- colored pencils
- compass

- containers of various shapes, such as beakers, graduated cylinders, trays, drinking glasses, several plastic cups or bowls; at least one clear plastic, some with lids
- corks
- corn oil
- cornstarch
- craft sticks
- cups: 1 foam, 3 plastic
- dictionary
- dishwashing liquid
- drinking glass, small
- dropper
- dry erase board and markers
- erasers
- eyeglasses
- fish bowl
- fishing weights
- flashlight
- food boxes, small, empty
- forceps or tweezers
- funnel
- glass, large
- glasses, 8, all the same size
- glow stick
- glue
- graduated cylinder, tall
- gravel
- hamburger bun
- hand warmer, disposable
- hot plate
- ice cube tray
- ice cubes
- images of an email, a letter with a stamped envelope, and a telegraph
- images of tree houses online or in books

- index cards
- insulating materials, such as packing peanuts, cotton batting, foam, fabric, newspapers
- jar, large
- labels
- lamps with different types of bulbs: incandescent, fluorescent, and heat lamp
- magnets: bar, circular, horseshoe
- magnifying box
- magnifying glass
- maple syrup
- marbles in bag
- markers
- measuring cup
- measuring tape, metric
- meter stick
- mirror
- modeling clay
- mop
- nail or thumbtack
- object that makes sound (empty can or cardboard box)
- objects student can measure (suggestions: book, ball, empty cup, beans, paper clip)
- objects that differ in color, size, shape, texture, and hardness, such as beads, toys, rocks, paper clips, erasers, silverware, blocks, stuffed animals
- objects that will fit in a shoe box (flower, pine cone, pine needles, lemon, banana, peppermint candy)
- orange or any fragrant fruit
- pan
- pan balance and weights
- paper cup
- paper plates
- paper towels
- paper: blank colored, construction (large sheet), graph, plain white
- paperclips, large and small, metal and plastic
- paperweight, clear
- parsley or any similar plant

- pebbles, small
- pencils, at least one hexagonal
- pennies, 10
- photos of different kinds of boats
- plastic wrap
- plastic, flat piece
- Possible materials to create instrument:
  - ◊ cardboard
  - ♦ card stock
  - ♦ cardboard tubes
  - ♦ straws
  - ♦ boxes
  - ♦ empty cans
  - ◊ rubber bands
  - ♦ plastic cups
  - ♦ cloth
  - ♦ wax paper
- poster board or cardboard
- prism
- rice
- rocks, one large and one small
- rubber ball
- rubber band
- ruler, metric, wooden or metal
- safety goggles
- salt
- sand
- sandpaper
- saucer
- scale
- Science Notebook—tablet, spiral-bound, or loose-leaf
- scissors, safety
- screw

- screwdriver
- shampoo
- sieve
- small items such as beans, rice, paper, salt, small pieces of paper, or sand
- sound recorder
- spoiled fruit or vegetable or moldy bread
- sponge
- spoons: metal, plastic, and wooden
- spring scale
- stick or any object that can be used to hit a can or box to produce sound
- stopwatch or kitchen timer
- straws
- string
- stuffed toy dog or picture of a dog
- tablespoon
- tape
- tennis ball
- thermometer with Fahrenheit and Celsius scales (cooking, medical, weather)
- thread spools, empty
- timer
- toy car
- toys or food products
- various classroom or household objects (examples: metal and plastic paper clips, pencils, crayons, plastic toys, nails, screws)
- vase, glass
- vegetable oil
- vinegar
- water
- waterproof clay (from an art supply store)
- wheels on axles
- yard stick

#### Optional:

• aluminum foil, heavy-duty

- binoculars or telescope
- cardstock
- clay
- crumpled paper
- drawing paper
- highlighter
- levers
- mesh screening
- microscope
- newspaper
- pen
- plates or bowls, small
- pulleys
- thermometer, digital
- tissue paper

## **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 3** button to access the digital lessons.

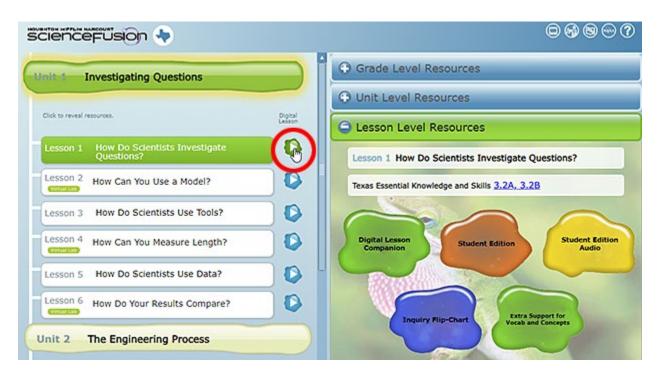
These **optional** resources may be used before, during, or after the lessons outlined in the Science 3 course. The digital lessons reinforce the concepts taught in the lessons in *Texas Science Fusion*. They provide interactive experiences using simulations, animations, and videos. The inquiries (virtual 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.

To access any digital lesson or inquiry, click the **Digital Lesson button** to the right of the lesson title (see screenshot on the next page).

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

#### **Course Unit 1**

#### **Textbook Unit 1**

- Lesson 1: How Do Scientists Investigate Questions?
  - ♦ Days 1–4
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 3–14
- Lesson 2: How Can You Use a Model?
  - ♦ Day 5
  - **♦** Inquiry
  - ♦ Science Fusion, pages 15–16
- Lesson 3: How Do Scientists Use Tools?
  - ♦ Days 6–7
  - ♦ Digital Lesson
  - ♦ *Science Fusion*, pages 17–26

- Lesson 4: How Can You Measure Length?
  - ♦ Day 8
  - **♦** Inquiry
  - ♦ Science Fusion, pages 27–29
- Lesson 5: How Do Scientists Use Data?
  - ♦ Days 9–11
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 31–44
- Lesson 6: How Do Your Results Compare?
  - ♦ Day 12
  - ♦ Inquiry
  - ♦ Science Fusion, pages 45–46

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#### **Textbook Unit 2**

- Lesson 1: How Do Engineers Use the Design Process?
  - ♦ Days 15–16
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 55–66
- Lesson 2: How Can You Design a Tree House?
  - ♦ Day 17
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 67–68

#### **Course Unit 2**

#### **Textbook Unit 3**

- Lesson 1: What Are Some Physical Properties?
  - ♦ Days 26–30
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 91–106
- Lesson 2: How Can We Measure Magnetism?
  - ♦ Day 32
  - ♦ Inquiry
  - ♦ Science Fusion, pages 107–108
- Lesson 3: What Physical Properties Can We Observe?
  - ♦ Day 33
  - ♦ Inquiry
  - ♦ Science Fusion, pages 111–112

#### **Course Unit 3**

#### Textbook Unit 4

- Lesson 1: What Are Some Forms of Energy?
  - ♦ Days 51–53
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 149–158

- Lesson 3: How Are Technology and Society Related?
  - ♦ Days 18–20
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 69–82
- Lesson 4: How Can We Improve a Design?
  - ♦ Day 21
  - ♦ Inquiry
  - ♦ Science Fusion, pages 83–84
- Lesson 4: How Is Temperature Measured?
  - ♦ Day 34
  - ♦ Inquiry
  - ♦ Science Fusion, pages 113–114
- Lesson 5: What Are the States of Matter?
  - ♦ Days 36–39
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 115–126
- Lesson 6: What Are Some Changes to Matter?
  - ♦ Days 40–44
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 127–140
- Lesson 2: What Is Sound?
  - ♦ Days 55–56
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 161–172

- Lesson 3: How Are Sounds Changed?
  - ♦ Day 57
  - ♦ Inquiry
  - ♦ Science Fusion, pages 173–174
- Lesson 4: How Does Light Move?
  - ♦ Days 58–60
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 177–188

#### **Textbook Unit 5**

- Lesson 1: What Are Some Simple Machines?
  - ♦ Days 65–67
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 209–220
- Lesson 2: What Are Some Other Simple Machines?
  - ♦ Days 68–71
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 223–234

- Lesson 5: What Are Some Heat Sources?
  - ♦ Days 61–63
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 189–200
- Lesson 6: Where Can Heat Come From?
  - ♦ Day 64
  - ♦ Inquiry
  - ♦ Science Fusion, pages 201–202
- Lesson 3: How Do Simple Machines Affect Work?
  - ♦ Day 72
  - **♦** Inquiry
  - ♦ Science Fusion, pages 235–236
- Lesson 4: What Is Gravity?
  - ♦ Days 73–74
  - ♦ Digital Lesson
  - ♦ Science Fusion, pages 239–250

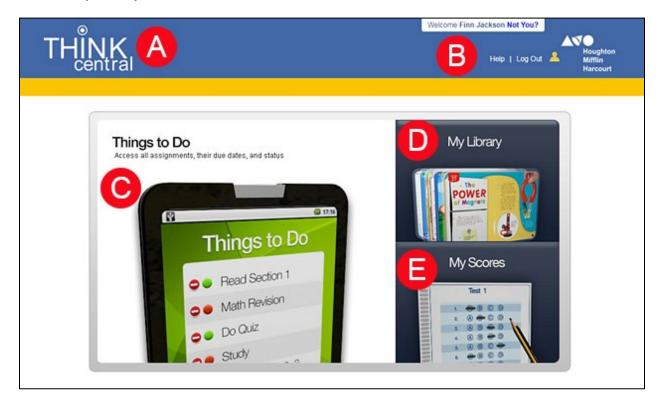
# **Online Resources**

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# **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**.

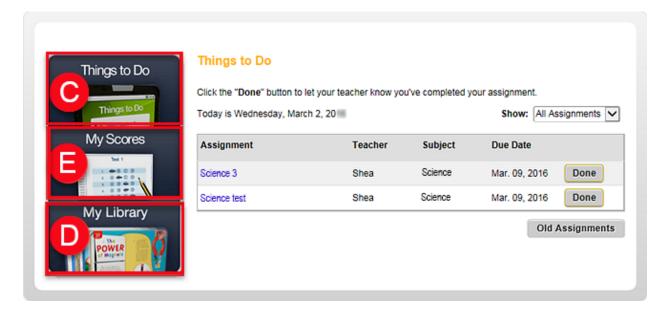


Descriptions of each area is provided in the following table.

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.	
0	Things to Do	Opens the <b>Things to Do</b> 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 <b>My Library</b> page, where you can find all of your online classroom resources, such as books, movies, sound files, worksheets, and more.	
<b>(3</b>	My Scores	Opens the <b>My Scores</b> 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.



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# **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.

→ 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 3** is an exact copy of the *Texas Science Fusion* Write-In Student Edition.
- The **Student Resources Grade 3** 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:

→ 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.

- → Click My Library to see all of your items again.
- → 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:

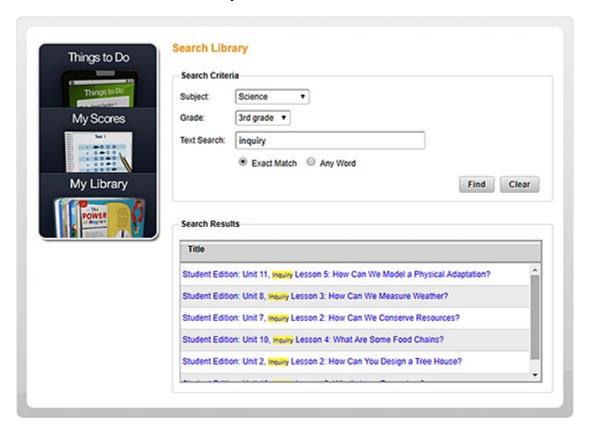
1. In My Library, click the Search Library magnifying glass. The Search Library page appears.

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.



- 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.

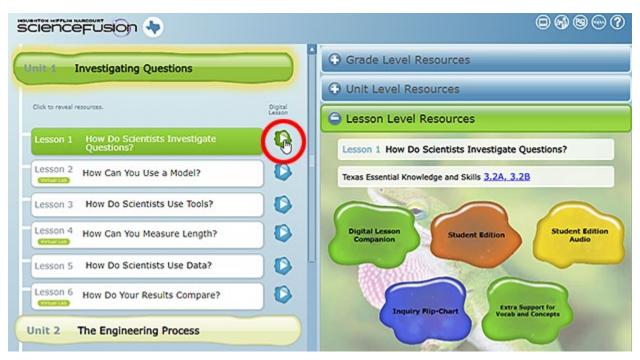
## **Digital Lessons and Inquiries**

In the My Library section of *ThinkCentral*, click the **Student Resources Grade 3** button to access the digital lessons.

Student Resources

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To access any digital lesson or inquiry, click the **Digital Lesson button** to the right of the lesson title:



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 23: Complete the Unit 1 Project.

• Day 24: Review for the Unit 1 Test.

• Day 25: Administer the Unit 1 Test.

Submit the Unit 1 Project.

#### Unit 2:

• Day 48: Complete the Unit 2 Project.

• Day 49: Review for the Unit 2 Test.

• Day 50: Administer the Unit 2 Test.

Submit the Unit 2 Project.

#### Unit 3:

• Day 73: Complete the Unit 3 Project.

• Day 74: Review for the Unit 3 Test.

• Day 75: Administer the Unit 3 Test.

Submit the Unit 3 Project.