Introduction

Curriculum Overview

Congratulations on choosing an outstanding fifth-grade curriculum! Using this curriculum, you and your student will be engaged in performing lab experiments, while learning about the solar system; along with the building blocks of matter, energy, motion, and a plethora of other activities. One of the true advantages in selecting Texas Tech University K-12 is that you will have an all-encompassing curriculum similar to what you would find in some of the most outstanding teachers' classrooms in our nation.

5th Grade Science

Units 4, 5, 6 of this course—which are identified in the textbook as units D, E, F—are a continuation of the concepts which began in the first semester of fifth-grade science. These concepts are expanded in the second semester to include information about our solar system and beyond, the building blocks of matter, and energy and motion. Each unit includes activities to help the student better understand the concepts to be taught, vocabulary words to increase the student's comfort level in reading scientific materials, and practice questions to assess the student's understanding and allow for re-teaching as necessary.

Course Objectives

This curriculum meets all the Texas Essential Knowledge and Skills (TEKS) objectives. At the end of the second semester, the student should be able to:

- **Scientific processes:**
  - ◊ demonstrate safe practices during field and laboratory investigations;
  - ◊ make wise choices in the use and conservation of resources and the disposal or recycling of materials;
  - ◊ plan and implement descriptive and simple experimental investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology;
  - ◊ collect information by observing and measuring;
  - ◊ analyze and interpret information to construct reasonable explanations from direct and indirect evidence;
  - ◊ communicate valid conclusions;
  - ◊ construct simple graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate information;

- ◊ analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
- ◊ draw inferences based on information related to promotional materials for products and services;
- ◊ represent the natural world using models and identify their limitations;
- ◊ evaluate the impact of research on scientific thought, society, and the environment;
- ◊ connect Grade 5 science concepts with the history of science and contributions of scientists;
- ◊ collect and analyze information using tools including calculators, microscopes, cameras, sound recorders, computers, hand lenses, rulers, thermometers, compasses, balances, hot plates, meter sticks, timing devices, magnets, collecting nets, and safety goggles;
- ◊ demonstrate that repeated investigations may increase the reliability of results;

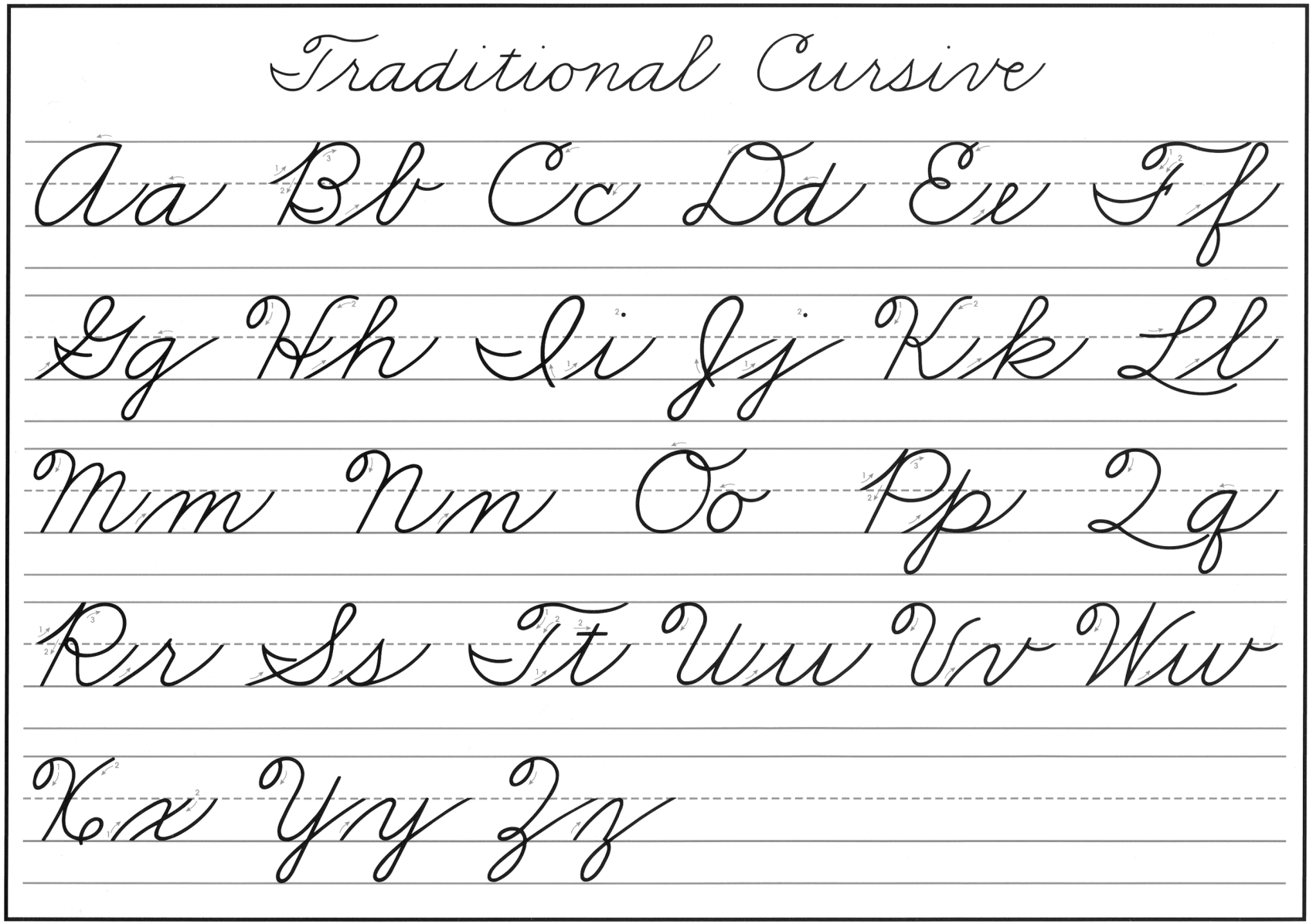
- **Science concepts:**
  - ◊ describe some cycles, structures, and processes that are found in a simple system;
  - ◊ describe some interactions that occur in a simple system;
  - ◊ identify events and describe changes that occur on a regular basis such as in daily, weekly, lunar, and seasonal cycles;
  - ◊ classify matter based on its physical properties including magnetism, physical state, and the ability to conduct or insulate heat, electricity, and sound;
  - ◊ demonstrate that some mixtures maintain the physical properties of their ingredients;
  - ◊ identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving sugar in water;
  - ◊ observe and measure characteristic properties of substances that remain constant such as boiling points and melting points;
  - ◊ differentiate among forms of energy including light, heat, electrical, and solar energy;
  - ◊ identify and demonstrate everyday examples of how light is reflected, such as from tinted windows, and refracted, such as in cameras, telescopes, and eyeglasses;
  - ◊ demonstrate that electricity can flow in a circuit and can produce heat, light, sound, and magnetic effects;
  - ◊ verify that vibrating an object can produce sound;
  - ◊ compare the adaptive characteristics of species that improve their ability to survive and reproduce in an ecosystem;
  - ◊ analyze and describe adaptive characteristics that result in an organism’s unique niche in an ecosystem;

- ◊ predict some adaptive characteristics required for survival and reproduction by an organism in an ecosystem;
- ◊ identify and observe actions that require time for changes to be measurable, including growth, erosion, dissolving, weathering, and flow;
- ◊ draw conclusions about "what happened before" using data such as from tree-growth rings and sedimentary rock sequences;
- ◊ identify past events that led to the formation of the Earth's renewable, non-renewable, and inexhaustible resources;
- ◊ interpret how land forms are the result of a combination of constructive and destructive forces such as deposition of sediment and weathering;
- ◊ describe processes responsible for the formation of coal, oil, gas, and minerals;
- ◊ identify the physical characteristics of the Earth and compare them to the physical characteristics of the moon;
- ◊ identify gravity as the force that keeps planets in orbit around the Sun and the moon in orbit around the Earth.

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.

Traditional Cursive



Books and Materials for SCI 5 This Semester

Textbooks:

- Frank et al., *Harcourt Science*, 5th grade (Harcourt School Publishers, 2000), ISBN 978-0-15-311208-9

Materials:

Required

- aluminum can (e.g., soft drink can)
- aluminum foil
- apples
- apron
- baking powder
- baking soda
- balance scale (if not available, see instructions for making one on Day 102)
- ball, Styrofoam
- balloons, large, 6, one filled with helium
- bar magnets, small, 2
- basin or sink
- bathroom scale
- batteries, C or D, 2
- beads, 37 (1 red and 36 of another color), slightly over 1 cm diameter
- beaker, glass
- binoculars
- blocks, wooden
- body ball
- books, several
- bowls: 1 large, 1 shallow
- box, sealed
- bulb, small (similar to one used in a flashlight)
- butter knife, metal
- button, large
- calculator
- candle, small
- cardboard carton from milk or juice
- cardboard cutout of the student's state
- cardboard tubes, 2, or lightweight cardboard
- cardboard, large piece
- chalk or dry erase markers
- chalkboard or dry erase board
- charcoal, 1 piece
- clay, ball of
- clipboard
- clock
- clothespin or pot holder
- coin
- colored markers
- colored pencils
- compass (to tell direction)
- compass (for drawing circles)

- containers: 1 small, 9 with lids (all the same size)
- convex lenses, 2
- cornstarch
- corrugated cardboard, 10-cm square
- craft knife
- cup, Styrofoam
- dime
- dowel, wooden
- encyclopedias or periodicals
- eyedroppers, 3
- fishbowl, small, round
- flashlight
- football field, access to
- gameboard
- glasses, drinking, 6
- glue
- green peas, 2
- hand lens
- holes punched from paper, 20
- hot plate or stove
- ice
- index cards, 3” × 5”, 139
- iodine solution
- items to weigh, several
- jar or glass
- knives: 1 metal, 1 plastic
- lamp with 40-watt bulb
- lamp with 60-watt bulb
- lamp, small
- lid from small shoe box
- light bulbs, small, 2
- magnet
- marble
- margarine
- marker
- mass, 30-g
- match
- measuring cup
- measuring spoon
- measuring tape, metric
- metal washers of different sizes, several
- meterstick
- microscope slide or small piece of glass
- mirror, small
- nails, iron, 2 (1 large)
- needle, sewing
- nickels, 5
- pail with handle, small
- pan, metal, small
- paper clips, steel (iron), 8
- staples
- paper cups, small, 3
- paper plates, white, 28
- paper: 10-cm square, graph (9 sheets), notebook, plain white, scrap, tag board or construction paper (4 sheets—2 of one color and 2 of another color)
- pencil “lead” (graphite)
- pencils, at least one with eraser and one sharpened at both ends
- pennies, 822
- petroleum jelly
- photocopy machine, access to
- plastic bottle, 1 liter
- plastic disks, 10-cm, 2
- poster putty (removable adhesive)

- printed materials (newspaper, magazine, etc.)
- protractor
- pushpins, 3, different colors
- quarter
- ring stand
- rock or other irregularly-shaped object
- rolling pin
- rubber bands of various thicknesses
- rubber comb
- ruler, metric
- safety goggles
- saucepan
- scissors
- seeds (radish, flower, or bean)
- shovel
- soap, dishwashing
- soil
- solder, lead
- spoon, stainless steel
- spring
- spring scale
- stairs
- stapler
- sticks or stakes, 10
- stopwatch
- straws, long, non-bending, 2
- string, lightweight
- Styrofoam, thin, small piece
- sugar
- sulfur
- table knife, stainless steel, kept in freezer
- talcum powder
- tape: duct, masking, transparent
- teaspoon
- telescope, small
- tennis ball
- test tubes, 3
- thermometers, 3
- tissue paper
- toilet paper, 1 roll
- tongs, rubber-coated
- toothpick, flat
- toy car, small
- tube, plastic, 1 cm diameter
- vinegar
- water
- wax paper
- weight
- wire stripper
- wire, 24-gauge, 30-cm length
- wire, copper, insulated
- zip-top plastic bag

Optional

- brass coins or tokens
- drawing paper
- picture frame, small
- prism
- **Materials to make a balance scale (Day 102):**
  - ◊ coat hanger

- ◊ cups, small, 2
- ◊ kitchen scale
- ◊ nail
- ◊ pennies
- ◊ scissors
- ◊ string
- ◊ tape, transparent

Grading Procedures and Unit Assignment Checklists

Grades are calculated for Unit 4, Unit 5, and Unit 6. 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 4 and Unit 5 Tests and Projects are located in their respective Unit folders in this online course; the Unit 6 Test and Project are the Final Exam folder. Unit 5 requires **two** projects.

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. (For audio or video projects, see "Audio Help" and "Video Help" on the course home page for information about saving these formats for upload.) Combine multiple images into a ***single*** **PDF** (see "Requirements for Creating PDFs" on the course home page). When you save the document, use the naming convention given for each 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 4

- Days 97-99: Work on the Unit 4 Project
- Day 100: Administer the Unit 4 Test
  Finish and submit the Unit 4 project

Unit 5

- Days 122-124: Work on the Unit 5 Projects (2)
- Day 125: Administer the Unit 5 Test
  Finish and submit the Unit 5 projects

Unit 6

- Days 147-149: Work on the Unit 6 Project
- Day 150: Administer the Unit 6 Test
  Finish and submit the Unit 6 project

continued →

Unit Projects

Your student must complete a project for each unit (Unit 5 requires **two** projects). The student has the option of creating his or her own project or choosing one of those listed in **Suggested Projects** in this course. If the student chooses a topic, he or she must choose a topic based on the information presented in the unit, and it must be approved by Texas Tech University K-12. The student must also complete a **Unit Topic Planner**. Please submit these to Texas Tech University K-12 no later than one week after your student begins the unit.

The student's teacher will send feedback regarding whether or not your project has been approved. You will find it in the **My Grades** area of this course.