# Introduction

## Curriculum Overview

Congratulations on choosing an outstanding fifth-grade curriculum! Using this curriculum, you and your student will be engaged in conducting experiments and investigations, reading nonfiction selections, making observations, collecting and assessing data, constructing tables, charts, and graphs, 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.

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 Test 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.

## 5th Grade Science

Semester A of fifth-grade science will focus on two units of life science and one unit of Earth science. The required textbook is *Harcourt Science* by Harcourt School Publishers (2000). This book covers all of the required Texas Essential Knowledge and Skills (TEKS). Science is a subject of discovery, and the book includes many experiments for the student to complete.

A master list of materials needed for the experiments is included in this Introduction. A list of materials is also provided at the beginning of each unit and each day's lesson. It is a good idea to plan ahead and gather any materials needed before beginning each lesson or experiment. Some materials may need to be prepared beforehand.

Vocabulary cards are included in each Unit folder in the online course. Print them, cut them out, and let your student use them to play Concentration. Since vocabulary is a very important part of science, the student will be asked throughout each unit to use these cards for review. It is helpful for the student to try to match the words to the correct definitions. Blank cards are provided to add words not in the listed vocabulary with which the student may be unfamiliar. An answer key for the vocabulary cards is provided for the teacher in the **Lesson Answer Key** in the **Resources** section of this course.

At the end of each unit, the student is required to submit a completed unit test and a unit project. The project lists are located in each unit folder. Before beginning the lessons for each unit, the

student should look at and decide on a project to complete for grading. The student will need to find time to work on the selected project to ensure that it is finished on time.

Unit A of *Harcourt Science* (Unit 1 in this course) focuses on life science. This unit discusses how all living things are made of cells. Cells are the basic unit of every living thing. Cells work together to form tissues. The tissues form organs and eventually body systems. Seven of our body systems and their functions are discussed in this unit. The student will learn about animal growth and reproduction. Various life cycles are described in this unit. Complete and incomplete metamorphosis and direct development are explained. Dominant and recessive traits are discussed to show how offspring inherit characteristics from their parents. Plants have a variety of structures that help them carry out their life processes. They have different adaptations that help them survive in their own environments. The textbook contains discussions on how plants make food through the process of photosynthesis and how plants respond to light and gravity. The student will also learn how humans depend on plants for many different uses.

Unit B (Unit 2 in this course) discusses how every living thing interacts with its environment. The student will learn how many substances in nature are recycled. The water cycle, the carbon dioxide-oxygen cycle, and the nitrogen cycle are all continuously at work cleaning and producing the substances we need to live. This unit also discusses ecosystems and how energy flows through each. Many organisms compete with each other and depend on each other for food and energy. The sun is the source of energy for all living organisms. The student will also learn what it means for a living thing to be threatened, endangered, or extinct. Characteristics of different land biomes and water ecosystems are also discussed. The unit ends with information about how people can harm or improve ecosystems.

Unit C (Unit 3 in this course) discusses Earth science. It begins with how the Earth is constantly changing by many different processes that occur on the surface, inside the Earth, in the atmosphere, and in the oceans. Landforms on Earth are always changing due to forces such as wind, ice, water, and waves that cause erosion and deposition. Other forces within the Earth cause mountains and volcanoes to form and earthquakes to occur. The student will learn the differences between renewable and nonrenewable resources and how they are created. This unit also discusses how the weather is created due to factors such as temperature, humidity, and air pressure. It then describes how winds are created and how climates can change. The unit ends with a discussion of the oceans. Oceans interact with the land and are affected by the gravitational pull of the moon and the sun to create tides. Today, oceans are explored by people using many different resources.

## Course Objectives

This curriculum meets all the Texas Essential Knowledge and Skills (TEKS) objectives. At the end of the first 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;
- ◊ 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;

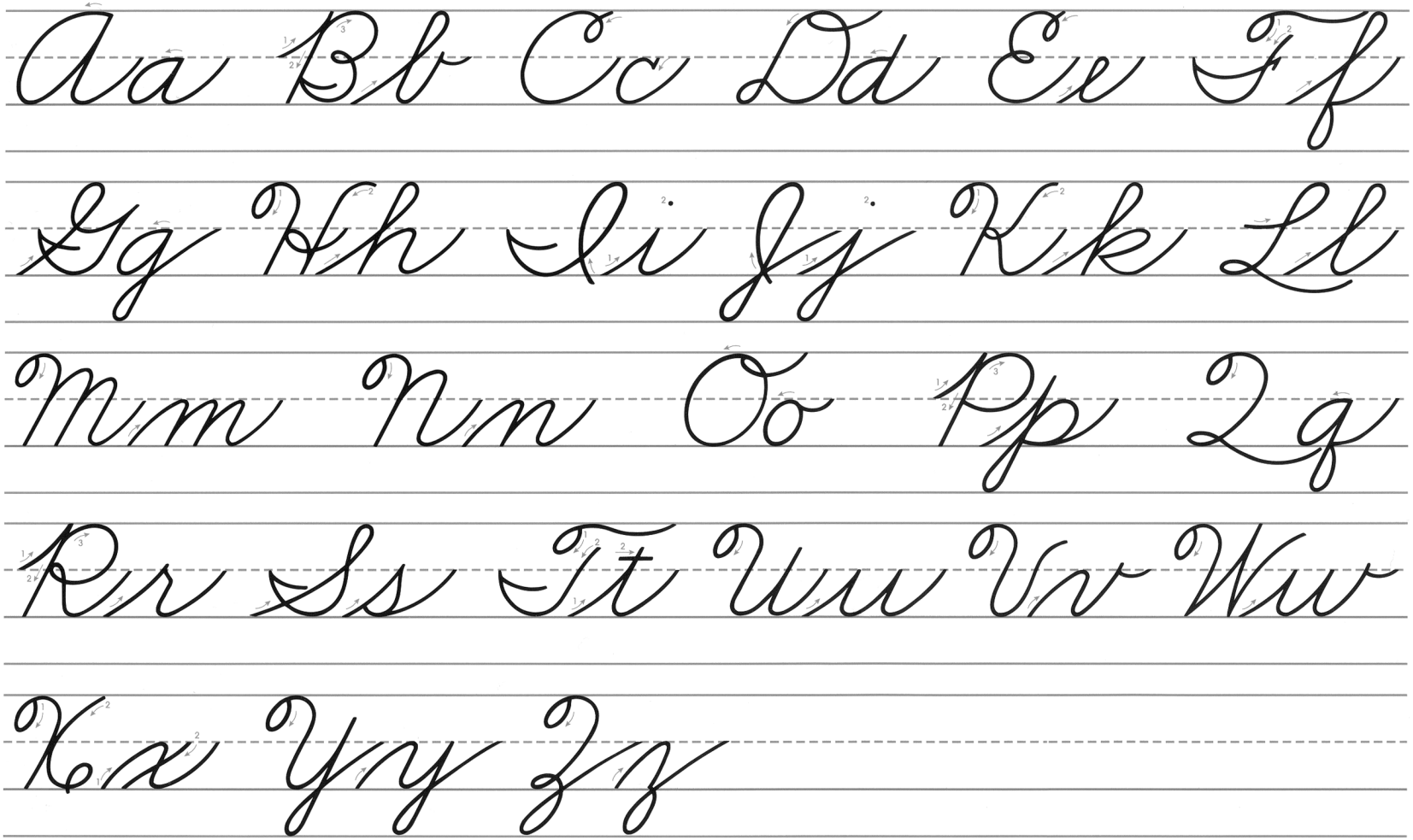
- **Science concepts:**
  - ◊ describe some cycles, structures, and processes that are found in a simple system;
  - ◊ describe some interactions that occur in a simple system;
  - ◊ identify events and describe changes that occur on a regular basis such as in daily, weekly, lunar, and seasonal cycles;
  - ◊ identify the significance of the water, carbon, and nitrogen cycles;
  - ◊ describe and compare life cycles of plants and animals;
  - ◊ classify matter based on its physical properties including magnetism, physical state, and the ability to conduct or insulate heat, electricity, and sound;
  - ◊ identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving sugar in water;
  - ◊ 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;

- ◊ 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 traits that are inherited from parent to offspring in plants and animals;
- ◊ give examples of learned characteristics that result from the influence of the environment;
- ◊ 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.

## 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 Science This Semester

### Textbooks:

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

### Materials:

- bath towel, folded
- beaker, 500-mL, or a pan
- book, heavy
- bottle with squeeze spout (like a shampoo or dishwashing detergent bottle)
- chalk
- clock
- colored pencils
- crayons (optional)
- cup, small plastic
- drinking straws, 2
- dry soil
- eggs, raw, 9
- floor, uncarpeted (cement sidewalk, tiled floor, etc.)
- flower, fresh
- freezer
- glass plate or clear glass bowl or cup
- gloves, disposable plastic
- glue or glue stick
- graduate or measuring cup
- graham crackers, 2
- hand lens
- hazelnut or other round nut
- hot pad or pot holder
- hot plate or stove burner
- ice cube

- knives, plastic, 2
- magnet
- mirror
- newspaper
- old magazines or newspapers
- pan
- pan, rectangular
- paper towels
- paper: computer (optional), construction, white drawing, light-colored or manila (optional), notebook/writing
- peanut butter, 1 jar
- pen or marker (optional)
- pencils
- pillow, thick
- plant, potted
- plastic bag, small
- ruler with centimeters
- safety goggles
- sandpaper, 2 pieces
- sandwich bag, plastic
- scissors
- sidewalk in the sun
- soil or sand, 1 cup
- sponges, 2 rectangular
- spoon
- stopwatch, clock, or watch with second hand
- tape
- thermometers, 2
- tin cans, 2 (lids removed)
- tongs
- water
- zip-close plastic bags, 4

# 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. (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 1:

- Days 23-24: Complete the Unit 1 Project
- Day 25: Administer the Unit 1 Test
  Submit the Unit 1 Project

### Unit 2:

- Day 49: Complete the Unit 2 Project
- Day 50: Administer the Unit 2 Test
  Submit the Unit 2 Project

### Unit 3:

- Days 73-74: Complete the Unit 3 Project
- Day 75: Administer the Unit 3 Test
  Submit the Unit 3 Project

## Unit Projects

Your student must complete a project for each unit. 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.