

Kolbe Academy Home School

GRADE SIX SCIENCE

Harcourt Science 5/6 (Purple)

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Teachers' Notes: Begin every class with a prayer. This is a good way to help the child memorize new prayers. Repeat the same ones every day until they are known. Be sure to explain the meanings of the prayers. Repetition in all areas of study is most beneficial. In most cases, Fridays have been left open. You may do a four-day week or use Friday as a "catch-up" day. While art and music should be worked in during the week, Friday is also a good day to concentrate on those subjects.

Your student may not need all of Week 8 for review. You can use this time to catch up and then go over the subject matter. If you intend to use the sample tests provided, look them over before teaching the subjects and make sure you teach the material in the tests. Some children have a difficult time doing written exams, but it is important for them to learn how to take them. If your sixth grader does poorly on them, give them to him a couple of days after he has taken them and average the grades.

COURSE TITLE: Science**COURSE DESCRIPTION:**

Sixth-grade Science is the continuation of an intermediate introduction to the life, earth, and physical sciences. The most important part of teaching science is helping the student see the wonders of God's world, and making him unafraid of the subject when he pursues in-depth science in later years. Children learn more from doing the experiments and investigations along with the reading of the textbook.

The Harcourt Science series has several FREE online learning tools available to anyone who purchases the textbook. The first is provided by the publisher. Simply go to www.harcourtschool.com and click on the Learning Site. This will take you to a login page in which you will be instructed how to access the site. *Be sure to put Kolbe Academy as the school!* This will help create fewer problems when you are trying to access the website. There are several supplementary activities for the student and teacher on this website. Another website is provided by the National Science Teachers Association (NSTA) at www.scilinks.org/harcourt. This website allows you to select the topic you are studying in the book, and will take you to a page of selected website links that can help you to enhance and further develop the topics that your child is studying. Be sure to select **Grade 6** to see the topics that correspond to the book you are using. The online resources are a wonderful addition to the activities provided within the text alone.

COURSE OBJECTIVES:

This course is a continuation of the work of the third and fourth grades in the further development of scientific skills necessary to apply the scientific method:

- ❖ the observation and examination of data
- ❖ experimentation
- ❖ formulations of explanations by means of hypotheses and theories
- ❖ testing the hypotheses
- ❖ making observations
- ❖ analyzing data
- ❖ drawing conclusions

Introduction to scientific concepts

- ❖ furthering science vocabulary in preparation for later coursework
- ❖ experience with the three main disciplines in science: life, earth, and physical science

SCOPE AND SEQUENCE:

1. **Life Science:** Living Things Grow and Respond
 - a. Plant growth and responses: plant responses to their environment
 - b. Types of plants: mosses, ferns, gymnosperms, angiosperms
 - c. Invertebrates: sponges, cnidarians, worms, mollusks, arthropods, echinoderms
 - d. Vertebrates: fish, amphibians, reptiles, birds, and mammals

2. **Earth Science:** Cycles in Earth and Space
- Movement of Earth's crust: Earth's layers, plate movement, earthquakes, and volcanoes
 - Rocks and rock cycle: igneous, sedimentary, and metamorphic rocks, and the rock cycle
 - Cycles in the Solar System: parts of the Solar System, planetary cycles, seasons, moon phases
 - Exploring the Universe: life cycle of a star, features of the galaxies, studying space
3. **Physical Science:** Forces and Machines
- Forces and motion: gravity, describing motion, and forces interact
 - Machines and work: levers, inclined planes, compound machines

SKILLS TO BE DEVELOPED:

- ❖ Observation and forming of hypotheses
- ❖ Keeping accurate notes
- ❖ Analyzing scientific data accurately
- ❖ Measuring with precision
- ❖ Drawing conclusions
- ❖ Reporting findings

INVESTIGATION MATERIALS:

The following are a list of the harder to find materials used in the corresponding investigations throughout the course. If at any point finding the materials becomes a hardship, the parent should feel free to skip the investigation for that week. **A comprehensive list of materials for the investigations is included at the very end of the course plan (located after the quarterly exams).**

SUGGESTED MATERIALS NEEDED FOR INVESTIGATIONS	INVESTIGATION PAGE
Safety Goggles, Hand lens (magnifying glass)	Several
Pinecone, pine needles, fern frond	B32
Flower (preferably a large lily or gladiolus)	B42
Lima bean, corn kernel	B50
20 bean seeds, Assorted colors of modeling clay	B4, D4, D12, D54, D128
Ruler with inches and centimeters	D4, D12
Drawing compass	D10, D76
2 blocks of wood	D54, F56
Packing peanuts	D54
3 rock samples	D62
2 thermometers	D92
3" plastic foam ball	D100
Marble	F12
Magnetic compass	F12
Toy car or roller skate	F22, F48
Wooden plank	F22
Spring or fish scale	F38, F48, F56

COURSE TEXT: *Harcourt Science, 6th Grade* (Copyright 2005), Purple book with tiger on cover

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COURSE PLAN METHODOLOGY: *Harcourt Science* is represented by the abbreviation **HAR**. Each weekly assignment is summarized in the first line of the week’s daily course plan. The specific daily assignments are outlined in the following lines indicated by the **MON**, **TUES**, **WED**, and **THUR** abbreviations.

Kolbe Academy has worked diligently to create the best possible course plans with the home schooling family in mind. Remember, however, that our program is intended to be flexible. Per the principle of subsidiarity, these course plans are a **suggested** course of study. As the teacher, you should adapt and modify these course plans to meet the individual learning needs of your child. **Do not feel obligated to follow these course plans exactly.**

◆◆◆ **FIRST QUARTER** ◆◆◆

WEEK 1		
Throughout the year, there will be several opportunities for hands-on scientific investigations. These investigations will be a wonderful tool for understanding the material in each lesson. This week the students will concentrate mainly on reading about the processes involved in making a proper scientific investigation. This includes working safely and appropriately in the laboratory. Students will gradually learn how to formalize the scientific method by writing lab reports on a few of the investigations this year. These will be assigned in the 3 rd and 4 th quarters.		
HAR	Pages x – xvii Pages xxxii – xxiv	Goals: To understand how to apply the steps of the scientific method within an investigation. To understand how to analyze results and draw conclusions. To understand how to work safely in the laboratory while performing experiments.
MON	Read pages x – xii. Go over the steps of the scientific method with the student before beginning any investigations. You may choose to do the paperclip investigation outlined on these pages if you wish, although it is for demonstration of the scientific method only.	
TUES	Read pages xiii – xvii. These pages give good examples of the scientific method in action. For future investigations, students can be asked to research what materials may be needed for the upcoming week’s investigation.	
WED	Read pages xxii – xxiii. There will be some application of the students’ mathematics skills throughout the lessons and investigations. These pages will explain the importance of accurate measurements and the application of math skills to interpreting collected data.	
THUR	Read page xxiv. It is very important for student’s to continue to develop a sense of responsibility within the laboratory. Although the investigations are fairly safe, understanding safety at this age is important for preparing them to work safely in a laboratory environment in high school. Discuss each safety rule with the student and ask him what would happen if each rule were not followed.	
<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">Notes</div>		
WEEK 2		
◆◆◆ UNIT B: Living Things Grow and Respond ◆◆◆		
HAR	Chapter 1	Goals: To understand that plants grow from seeds and what plants need to grow. To be

	Lesson 1	able to compare phloem and xylem. To be able to understand the differences between vascular and non-vascular plants.
MON		Investigation pages B4 – B5: Germinating Seeds. The plants should be placed somewhere warm, but should not be in direct sunlight or over a heater. Be sure to save the sprouted seeds for next week’s investigation. The student will find that the seeds need air, water, and warmth to germinate. Have the student draw conclusions by writing the answers to the questions at the end of the investigation.
TUES		Read pages B6 – B7. Discuss the process of germination. Go over the materials plants need to survive (water, sunlight, oxygen, carbon dioxide and nutrients including nitrogen, phosphorus and sulfur). Discuss the process of photosynthesis and why it is so important for plants to survive (makes food for the plant which in turn provides the energy they need for survival). Have the student answer the embedded “check” questions orally.
WED		Read pages B8 – B9. Discuss with the student that vascular plants have tissues that carry water and other material throughout the plant and the difference between xylem and phloem. Have the student look at the illustration of the tree and read the captions and discuss with you the three main parts of the tree as well as the functions of each part. Have the student answer the embedded “check” questions orally.
THUR		Read pages B10 – B11. Have the student compare vascular and non-vascular plants. Answer Review questions at the end of the lesson on a separate piece of paper. Have the student answer the embedded “check” questions orally. Go over the questions to be sure the student understands the correct answers.
Notes		
WEEK 3		
HAR	Chapter 1 Lesson 2	Goals: To understand the ways in which plants respond to light, gravity, and touch. To understand how tropism help plants to survive. To be able to compare long-day and short-day plants.
MON		Investigation pages B12 – B13: Do all roots grow down? The plants need to be kept in a dark room at all times or within a dark shoe box. The student will find that that the roots grow downward whereas the shoots grow upward. Have the student draw conclusions by writing the answers to the questions at the end of the investigation.
TUES		Read pages B14 . Discuss tropism and how it relates to a plant’s response to light. Have the student look over the examples of tropism to further emphasize this concept. Have the student answer the embedded “check” questions orally.
WED		Read page B15. Discuss the grass seeding experiment on page B15 to show how tropism affects plants. Have the student answer the embedded “check” questions orally.
THUR		Read pages B16 – B17. Discuss the different ways in which plants respond to the changing seasons and the seasonal differences between long-day and short-day plants. Have the student answer the