Grade 4 Science Course Overview

Content Area: **Science**
Course(s): **SCIENCE-4**
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Cover

EAST BRUNSWICK PUBLIC SCHOOLS

East Brunswick New Jersey

Superintendent of Schools

Dr. Victor P. Valeski

Science

Grade 4 Science

Course Number: 4104

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Course Overview

The K-12 science curriculum in all schools in New Jersey must be aligned with the Core Curriculum Content Standards. These standards focus on the processes of science as well as content in three major areas: earth, life and physical science. Each of these areas of science needs to be addressed at every grade level in order to foster a strong science knowledge base for students as well as an appreciation and understanding of how science works to help people solve problems.

One of the strong points of the East Brunswick Schools' science curriculum is the emphasis on hands-on investigations of the natural world. Our science program emphasizes doing science, not reading about it in a book. The fourth grade science curriculum consists of two modules that were selected from a nationally-recognized program – ***Science and Technology for Children (STC)***. The life science unit is ***Animal Studies,*** which examines the behavior of animals. The physical science unit is ***Motion and Design,*** which allows students to build model vehicles and investigate the variables that affect performance. The third unit of study in earth science unit is ***Astronomy*** using the Starlab planetarium and a curriculum which was developed by East Brunswick's fourth grade science teachers. It introduces students to the subject of astronomy with specific reference to the constellations as interpreted by different cultural groups.

Textbooks and other resources

Carolina STC Animal Studies, 2nd Edition, Copyright 2004

Carolina STC Motion & Design, 2nd Edition, Copyright 2004

Standards

SCI.3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
SCI.3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
SCI.3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
SCI.4-ESS2-2	Analyze and interpret data from maps to describe patterns of Earth's features.
SCI.4-LS1-2	Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

SCI.4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
SCI.4-PS3-2	Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
SCI.4-PS3-1	Use evidence to construct an explanation relating the speed of an object to the energy of that object.
SCI.4-PS3-3	Ask questions and predict outcomes about the changes in energy that occur when objects collide.
SCI.4-PS3-4	Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.
SCI.5-ESS1-2	Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
SCI.5-ESS1-1	Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.
SCI.MS-ESS1-1	Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
SCI.MS-ESS1-3	Analyze and interpret data to determine scale properties of objects in the solar system.
SOC.6.1.8.D.1.a	Compare and contrast gender roles, religion, values, cultural practices, and political systems of Native American groups.

Grading and Evaluation Guidelines

Grade level common assessments are used throughout the units.

Grade 4 Science Planning Guide

Instructional Objectives	**Instructional Activities/** Methods/Assignments	Materials/ Resources	Formative & Summa Assessment Strateg
Astronomy Unit - **Part 1-Introduction** The students will be able to: 1. Recognize that the sun is a star. 2. Recognize that	**Astronomy Unit** **Star Introduction** • Read and discuss "Introduction to Astronomy." • Students will discover the definition of a constellation	**Astronomy Unit** Astronomy Manual Unitedstreaming.com	**Astronomy Uni** • Class discuss (F) • Astronomy manual pages

some stars are brighter than others. 3. Discuss star colors and recognize that they are different colors based on temperature. 4. Associate magnitude with brightness of stars and how it is used as a tool for astronomers. 5. Name magnitude of several important stars. 6. Discover that constellations are pictures in the sky based on the imagination of people who view them.	and why people can view the same set of stars and see different pictures. • Read and discuss *A Daytime Star*-complete page 3 & 4 • Read and discuss "What is a Star" and "How Large is s Star." • Show Unitedstreaming videoà **A Spin Around the Solar System: Look to the Stars** • Talk about star color, and how stars are different colors based on temperature. Read "Are all Stars the Same Color?" Complete Astronomy manual page 9. • Read with the partner about the magnitude of stars on pages 10-12	**Astronomy Unit, cont'd., cont'd.**	12 (F) **Astronomy Unit, cont'd., cont'd.**
Astronomy Unit, cont'd., cont'd. **Part 2-Starlab** The students will be able to: 1. Recognize and locate various constellations in the night sky. 2. Recognize major stars and asterisms within the constellations. 3. Identify the correlation between	**Astronomy Unit, cont'd., cont'd.** **Native American Constellations** • Brief introduction to Native American Culture • Discuss the important role nature plays in the daily life of Native Americans. • Read and discuss myths related to these constellations—Astronomy	Starlab Astronomy Manual -	• Class discuss (F) • Native Ameri quiz (S) • Astronomy Manual page (S/F)

the constellations and the seasons. 4. Develop an understanding of the relationship between various cultures and the myths connected to the constellations. 5. Identify the significance of nature in cultures and constellations. - - - **Astronomy Unit, cont'd., cont'd.** **Part 2-Starlab** The students will be able to: 1. Recognize and locate various constellations in the night sky. 2. Recognize major stars and asterisms within the constellations. 3. Identify the correlation between the constellations and the seasons. 4. Develop an understanding of the relationship between various cultures and the myths connected	manual pages 13-28 • Visit the Starlab and locate constellations associated with the myths. - - - - **Astronomy Unit, cont'd.** **Greek Constellations** **Circumpolar** • Introduce the concepts of circumpolar, zenith, horizon, reference point, constellation and asterism. • Identify the circumpolar constellations. • Relate the position of the Big Dipper to the seasons. • Read and discuss myths related to these constellations—pages 30-35. • Visit the Starlab and locate constellations associated with the myths. **Fall Sky** • Identify Pegasus as the reference point of the fall	- **Astronomy Unit, cont'd.** Starlab Astronomy manual www.wingedsandals.com Starlab Astronomy manual www.wingedsandals.com - - - **Astronomy Unit, cont'd.**	- - - **Astronomy Unit, co** • Astronomy manual page (F) • Fall Sky Crossword pu page 43 (S)

to the constellations. 5. Identify the significance of nature in cultures and constellations. - - - **Astronomy Unit, cont'd.** **Part 2-Starlab** The students will be able to: 1. Recognize and locate various constellations in the night sky. 2. Recognize major stars and asterisms within the constellations. 3. Identify the correlation between the constellations and the seasons. 4. Develop an understanding of the	sky. • Identify the constellations, their major stars and their asterisms on a star map. • Read and discuss myths related to these constellations-Astronomy manual pages 36-43. • Visit the Starlab and locate constellations associated with myths. - - - **Astronomy Unit, cont'd.** **Winter Sky** • Identify Orion's belt as the reference point • Identify the constellations, their major stars and their asterisms on a star map • Read and discuss myths related to these constellations –astronomy manual pages 44-51 • Visit the Starlab and locate constellations associated with myths	Starlab Astronomy manual www.wingedsandals.com Starlab Astronomy manual www.wingedsandals.com - - - **Astronomy Unit, cont'd.** Starlab	– - **Astronomy Unit, co** • Class discuss (F) • Winter Sky Crossword pu page 51 (S) • Class discuss (F) • Spring Sky Crossword pu page 57 (S) - - - **Astronomy Unit, co**

relationship between various cultures and the myths connected to the constellations. 5. Identify the significance of nature in cultures and constellations. - - - - **Astronomy Unit, cont'd.** **Part 2-Starlab** The students will be able to: 1. Recognize and locate various constellations in the night sky. 2. Recognize major stars and asterisms within the constellations. 3. Identify the correlation between the constellations and the seasons. 4. Develop an understanding of the relationship between various cultures and	**Spring Sky** • Identify the Big Dipper as the reference point of the spring sky. • Identify the constellations, their major stars and their asterisms on a star map. • Read and discuss myths related to these constellations –astronomy manual pages 52-57. • Visit the Starlab and locate constellations associated with myths. - - – - - **Astronomy Unit, cont'd.** **Summer Sky** • Identify the summer triangle as the reference point of the summer sky. • Identify the constellations, their major stars and their asterisms on a star map. • Read and discuss myths related to these constellations –astronomy manual pages 58-65. • Visit the Starlab and locate constellations associated with myths.	Astronomy manual www.wingedsandals.com Astronomy Manual Astronomy Manual - - - **Astronomy Unit, cont'd.** Starlab Astronomy Manual	• Class discuss (F) • Summer Sky Crossword pu page 65 (S) • Written myth picture F/S) • Stars crosswo pages 66-67 (• Constellation crossword pa 68-69 (F) • Greek Constellation • Test (S) - - **Astronomy Unit, co**

the myths connected to the constellations. 5. Identify the significance of nature in cultures and constellations. - - - **Astronomy Unit, cont'd.** **Part 2-Starlab** The students will be able to: 1. Recognize and locate various constellations in the night sky. 2. Recognize major stars and asterisms within the constellations. 3. Identify the correlation between the constellations and the seasons. 4. Develop an	**Enrichment** • Student will create an original constellation and write a myth. **Greek Review & Test** • Play games to review for test. • Reread all stories and summarize to prepare for test. • Complete 'Stars' crossword puzzle • Complete 'Constellation' crossword puzzle • Take Greek Constellations test - - **Astronomy Unit, cont'd.** **Chinese Constellations** • Brief introduction to Chinese Culture. • Read and discuss myths related to these constellations—Astronomy manual pages 70-93. • Visit the Starlab and locate constellations • associated with the myths.	- - - **Astronomy Unit, cont'd.** Astronomy Manual Unitedstreaming.com -	• Class discuss (F) • Chinese Constellation (S) • Chinese crossword pa 93A (S/F) - **Astronomy Unit, co** • "Our Sun" (F • "Sunny Facts • "Learning Ab the Moon" pa 101-102 (F) • Astronomy Manual page 104 (F) • "The Planets'

understanding of the relationship between various cultures and the myths connected to the constellations. 5. Identify the significance of nature in cultures and constellations. - - - **Astronomy Unit, cont'd.**	• Discuss the important role nature plays in the daily life of the Chinese people. - - **Astronomy Unit, cont'd.** **The Sun, Moon & Planets** • Read and discuss "Our Sun" and "Sunny Facts" • Talk about the Moon and explain how to Moon is Earth's satellite. Read and discuss page 98-102. • Introduce both a lunar and a solar eclipse. Read and discuss pages 103-104. • Show Unitedstreaming videoà **A Closer Look at the Moon: Space Science Series**. • Talk about the phases of the Moon-use pages 105-107. • Show Unitedstreaming videoà **Junior Space Scientist: Voyage to the Moon**. • Take time to do a brief review of the planets in general.	**Motion and Design** Teacher's Manual: STC Motion & Design **Motion and Design, cont'd**	• Astronomy Manual pages 132-134 (S/F) • Astronomy Manual page (S) • "True or Fals (S) - - - **Motion and Design** • Student respo during brainstorming sessions (F) • Teacher observation o vehicle desig • Responses in notebook (F) - **Motion and Design, cont'd.** • Students'
Part 3-The Solar System The students will be able to: 1. Describe the Earth as one of several planets that orbit the sun. 2. Identify the moon as a satellite of the Earth. 3. Compare and contrast between a solar eclipse and a lunar eclipse. 4. Demonstrate knowledge of phases of the moon by drawing them. 5. Identify the planets in our solar system and their location in relation to the sun and each other.			

Motion and Design The students will beable to: 1. Set up their science notebooks. 2. Record and share their ideas and questions about Motion and Design, cont'd. 3. Design and build a vehicle to meet certain requirements. **Motion and Design, cont'd.** 1. Make a record of the vehicles built in L1.	• Show Unitedstreaming videoà **A Closer Look at the Planets: Space Science Series.** • Take time to discuss each planet individually. Complete pages that correspond with each planet. (Astronomy manual pages 111-123). • Complete workbook activities when time allows. **Motion and Design** **Lesson 1: TE 3-14** • Brainstorm "What We Know about the Motion and Design, cont'd. of Vehicles" in science notebooks. • Share responses. • Brainstorm "What We Want to Find Out about Motion & Design." • Share responses. • Teams explore building pieces. • Teams build vehicle to meet design challenge. • Students record responses to questions about vehicle designs.	**Motion and Design, cont'd.** **Motion and Design, cont'd.**	drawings of vehicle fromI graph paper (• Students' responses to reading select (F) **Motion and Design, cont'd.** • Responses to **Record Shee A: Recordin How Our Ve Moves** (F) • Teacher Observation (**Motion and Design,**

2. Build a vehicle by following a technical drawing. 3. Identify important details in technical drawings. 4. Compare their own drawings with a technical drawing. 5. Read to learn about the challenges of technological design. **Motion and Design, cont'd.** 1. Set up a system to pull vehicle. 2. Compare and discuss how motion of vehicle changes with more or less weight. 3. Record observations in writing. 4. Draw conclusions about the effect of differing weight on the motion of vehicles.	**Motion and Design, cont'd.** **Lesson 2: TE 15-23** • Students draw their group's vehicle from L1 on graph paper. • Disassemble vehicles from L1. • Discuss drawings as blueprints. • Build a vehicle from a blueprint. • Compare completed vehicles and discuss. • Compare student drawing with technical drawing. • Read "The Race That Wasn't Run" with partners. • Make connections to Bobby in science notebook. **Motion and Design, cont'd.** **Lesson 3: TE 25-33** • Introduce instructions for **setting up a falling-weight system.** • Students complete investigation with falling-weight system. • Record findings on **Record Sheet 3-A**. • Share findings.	**Motion and Design, cont'd.**	**cont'd.** • Responses to **Record Shee A: Graphing Data** (F) • Teacher Observation (**Motion and Design, cont'd.** • Teacher

			Observation (• Responses to questions (F) • Drawing of vehicle (F)
Motion and Design, cont'd. 1. Investigate the effects of a load on the motion of a vehicle. 2. Measure the time it takes for a loaded vehicle to move a given distance. 3. Graph results.	**Motion and Design, cont'd.** **Lesson 4: TE 35-45** • Students predict how adding blocks will change how vehicle moves in notebook. • Discuss predictions. • Practice using timers as student volunteer moves across classroom. • Brainstorm examples of motion that are measured with time. • Introduce instructions for **Testing the Motion of Vehicles Carrying a Load** • Complete the investigation for testing the motion of vehicles carrying a load • Record findings on **Record Sheet 4-A** • Respond to Final Activities questions in notebook • Discuss results of	**Motion and Design, cont'd.** **Motion and Design, cont'd.**	• Teacher Observation (• Responses to **Record Shee A: Evaluatin Our Vehicle Design for Rubber Ban Energy** (F) **Motion and Design, cont'd** • Teacher Observation (• Response to questions in notebook (F)
Motion and Design,			

cont'd. 1. Design vehicles and systems to pull vehicles to meet time requirements. 2. Apply previously collected data to design systems. 3. Read to learn about a specialized vehicle: **The Lunar Rover.** 1. Move vehicles using rubber band energy. 2. Evaluate the design of the standard vehicle for rubber band energy. **Motion and Design, cont'd.** 1. Predict and investigate how	investigation and graphs. **Motion and Design, cont'd.** **Lesson 5: TE 47-54** • Students write in notebooks, what caused vehicles to move slowly and fast (L3 & L4) • Share responses. • Students complete design challenge. • Respond to Final **Activities** questions in notebook. • Draw vehicle on graph paper. • Read **The Lunar Rover: Making Tracks on the Moon** in pairs. **Lesson 6: TE 57-62** • Students explore how rubber bands effect movement of the vehicle. • Discuss and demonstrate. • Carry out investigation. • Use **Record Sheet 6-A.** • Discuss observations.	**Motion and Design, cont'd.** **Motion and Design, cont'd.**	**Motion and Design, cont'd.** • Teacher Observation (• Responses to **Record Shee A: Evaluatin Vehicle Desi for Friction (** • Teacher Observation (• Responses to **Final Activit** questions (F) • **Student Self- Assessment** *A* **Motion and Design, cont'd.** • Teacher Observation (

variations in rubber band energy affect the distance vehicles travel. 2. Record results of investigation. 3. Identify patterns in group investigations. **Motion and Design, cont'd.** 1. Brainstorm what students know and want to know about friction. 2. Evaluate specific design features that reduce or increase friction on vehicles. 1. Brainstorm how a sail might affect the	**Motion and Design, cont'd.** **Lesson 7: TE 65-71** • Write predictions in notebook of how the number of turns of the rubber band will affect the distance traveled. • Discuss predictions. • Introduce instructions for **Collecting Data on Rubber Band Energy**. • Teams conduct investigation. • Compare paper strip distance results from each team. • Respond to **Final Activities** questions in notebook. • Discuss responses **Motion and Design, cont'd.** **Lesson 8: TE 73-79** • Investigate how wheel on vehicle spins. • Brainstorm what they know about friction and what questions they would like answered. • Discuss friction. • Complete observation	**Motion and Design, cont'd.**	**Motion and Design, cont'd.** • Teacher Observation (• Response to **I Activities** question in notebook (F) **Motion and Design, cont'd.** • Teacher Observation (• Responses to **Record Shee A: What Happens If..**

motion of the vehicle. 2. Adapt vehicles to hold a sail. 3. Identify the influence of a sail on the vehicle's motion. 4. Demonstrate understanding by completing self-assessment. **Motion and Design, cont'd.** 1. Test how air resistance influences motion. 2. Make connection between observations and real-world objects. 3. Understand the effect of air resistance. **Motion and Design, cont'd.**	cards. • Complete **Record Sheet 8-A.** • Share observations of vehicle design features. • Respond to **Final Activities** questions in notebook. • Discuss responses. **Lesson 9: TE 81-88** • Refer back to brainstorming list from L5 adding new ideas. • Hypothesize influences sail might have if added to vehicle. • Students sketch vehicle with sail. • Teams build designed vehicles. • Complete **Final Activities** questions in notebook. • Discuss responses. • Complete **Self-Assessment A**. **Motion and Design, cont'd.** **Lesson 10: TE 91-98** • Hypothesize the effect of the sail on the motion of the vehicle. • Introduce instructions for **Testing Air Resistance.** • Teams conduct investigations. • Discuss results. • Read "Shirley Muldowney-Drag Racer". • In notebooks, record ideas about the effect of the	**Motion and Design, cont'd.**	• Responses to **Record Shee A: Evaluatin the Cost of C Design** (F) **Motion and Design, cont'd.** • Responses to **Record Shee A: Planning Final Design Challenge** (F • List in notebc activities to d home or scho that relate to engineering a technological design. (F)

1. Brainstorm what is known about propeller-driven vehicles. 2. Identify design features needed for propeller-driven vehicles. 3. Build propeller-driven vehicles from technical drawing. 4. Compare axle-driven vehicle to propeller-driven vehicle.	shape of Shirley's vehicle on its motion. **Motion and Design, cont'd.** **Lesson 11: TE 101-107** • Brainstorm what is known about propeller-driven vehicles. • Observe assembled propeller unit. • Make hypothesis about vehicle design features necessary to move vehicles with a propeller. • Compare technical drawing of propeller-driven vehicle to drawing in L2. • Teams build propeller-driven vehicle. • Record in notebook observations of vehicles' motion. • Teams present completed vehicles to class. • Respond to **Final Activities** questions in notebook. • Discuss comparison of axle-driven vehicle to propeller-driven vehicle. • Modify brainstorming list.	**Motion and Design, cont'd.**	**Motion and Design, cont'd.** • Teacher observation (I • Presentation (• Reflective wr activity (S)
Motion and Design, cont'd. 1. Analyze the features of propeller-driven vehicles. 2. Compare features of propeller-driven vehicles to features of previously built vehicles. 3. Propose design changes for propeller-driven vehicles that will not affect	**Motion and Design, cont'd.**	**Animal Studies**	**Motion and Design, cont'd.** • Evaluate notebook responses fro entire unit (S) • Design challe (S) • Student Self-Assessment E

performance. 1. Determine the cost of their propeller-driven vehicles. 2. Modify vehicles to reduce cost. 3. Evaluate the strength and performance of their modified vehicles. **Motion and Design, cont'd.** 1. Record and collect solutions to a challenge. 2. Present plans to class. 3. Understand about engineering as a career.	**Lesson 12: TE 109-115** • Teams use **Record Sheet 12-A** to evaluate design features of propeller-driven vehicles. • Teams complete investigation. • Share responses. • Discuss comparison of axle-driven vehicle to propeller-driven vehicle from L11. • Modify brainstorming list from L11. **Lesson 13: TE 117-122** • Discuss cost factor in designing and building a product. • Model use of **Record Sheet 13-A.** • Teams complete activity using **Record Sheet 13-A.** • Brainstorm changes to reduce cost of vehicles. • Teams redesign and modify vehicles to reduce cost. • Teams determine cost of modified vehicles. • Share responses with class **Motion and Design, cont'd.** **Lesson 14: TE 125-136**	Teacher's Manual: STC Animal Studies, cont'd. **Animal Studies, cont'd.** **Animal Studies, cont'd.**	**Animal Studies** • Student respo during brainstorming sessions (F) • Responses in notebook (F) • Responses to **Record Shee A: Studying Animals** **Animal Studies, con** • Notes about organism surv (F)

- - - **Motion and Design, cont'd.** 1. Implement plans from L15 by building, testing and evaluating vehicles and the systems for moving them. 2. Determine cost of designs. 1. Present solutions to a design challenge. 2. Evaluate each team's solution for meeting the design requirements. 3. Apply knowledge of technological design to the real world. 4. Make a final record of design. **Motion and Design,**	• Review the brainstorming list from L1 and make changes. • Review responsibilities of team roles. • Teacher hands out design challenge cards and students independently sketch ideas. • Teams use design challenge card and **Record Sheet 14-A** to complete challenge together using their individual ideas. • Each team presents the solution to the class. • Teams modify plans and sketches as needed. • Read "Making the Switch from Kids' Stuff to Engineering." • List in notebook activities to do at home or school that relate to engineering and technological design. - - - **Motion and Design, cont'd.** **Lesson 15 TE 139-143** • Teams refer back to their plan from L14 and decide what materials they need to build and test their vehicles. • Teams build and test vehicles based on plans. • Complete **Record Sheet 13-A.**	**Animal Studies, cont'd.** **Animal Studies, cont'd.**	**Animal Studies, con** • Notebook responses (F) • Teacher observation (I **Animal Studies, con**

cont'd. 1. Demonstrate understanding of concepts learned in Motion and Design, cont'd. Unit. **Animal Studies** The students will beable to: 1. Discuss ways scientists learn about animals. 2. Brainstorm what they know about frogs, crabs and millipedes. 3. Compare and contrast frogs, crabs and millipedes. 4. Record what they know about animal survival.	**Lesson 16 TE 145-150** • Teams present their solutions to the challenge • Have students discuss each team presentation • Students make a final record of their vehicle on graph paper • Students complete reflective writing activities in notebooks • Have students share ideas **Motion and Design, cont'd.** **Lesson 17 TE 153-158** • Brainstorm in notebooks a list of concepts students now know about designing vehicles and how vehicles move • Make chart of student ideas • Compare to brainstormed list from L1. • Teams work together to complete the final design challenge. • Teams test their final vehicle. • Teams will share final design with class. • Complete **Student Self-Assessment B**	**Animal Studies, cont'd**	• **Record Shee A: Observing Frog** (F) • **Record Shee B: Drawing t Frog** (F) • Teacher Observation (**Animal Studies, con** • Notebook responses (F) • Teacher observation (I • Student respo to reading (F) **Animal Studies, con** • Teacher

Animal Studies, cont'd. 1. Describe living and non-living elements of the school environment. 2. Learn about the natural habitats of the 3 organisms. 3. Apply information from readings to list elements necessary for each organism's classroom habitat. 4. Compare 3 habitats to identify each organism's basic and special survival needs.	**Animal Studies** **Lesson 1: TE 3-9** • In notebooks students write what they know about frogs, crabs and millipedes. • Students share responses and teacher records class data • As a class, compare frogs, crabs and millipedes. • Respond to **Final Activities** questions in notebook. • Complete **Record Sheet 1-A**	**Animal Studies, cont'd.**	Observation (• Responses to **Record Shee A: Observing Frogs** (F) • **Record Shee A: Observing Crab** (F) • **Record Shee B: Drawing t Crab** (F) • **My Habitat** s (F)
			Animal Studies, con
		Animal Studies, cont'd.	• Teacher Observation (• **Student Self-Assessment**
Animal Studies, cont'd. 1. Review living and non-living elements	**Animal Studies, cont'd.** **Lesson 2: TE 11-19** • Students spend several minutes observing living and non-living parts of the classroom. • Create web chart entitled 'School' • Students share observations and help group on the web chart • Refer back to **Record Sheet 1-A** to brainstorm		

necessary to frog habitat. 2. Create a habitat for frog and record elements in it. 3. Discuss frog care and feeding schedules. 4. Observe frogs and record questions about them. 5. Create an animal log checklist.	ideas about what is needed to bring animals into the classroom. • Groups learn about one of the three organisms and record in notebook how the class could meet its survival needs. (**Animal Background 2-A, 2-B, 2-C**) • Have groups share ideas for how to meet needs of organism to survive in the classroom.		**Animal Studies, con** • Teacher Observation (• Notebook responses (F)
Animal Studies, cont'd.	**Animal Studies, cont'd.**	**Animal Studies, cont'd.**	
Animal Studies, cont'd. 1. Discuss the purpose of scientific drawings and elements that should be included. 2. Observe, describe and record characteristics of a frog.	**Lesson 3: TE 21-35** • Using information from L2, review important elements of a frog's home. • Students decide what materials are needed for frog habitats based on proposals. • Groups make frog habitat and introduce frog • Teach students how to feed the frogs • Respond in notebook to questions about observations of feeding the frogs. • With class create a Venn circle for living and no-living elements of the frog. • Discuss frog schedule with the class	**Animal Studies, cont'd.**	**Animal Studies, con** • Teacher Observation (• **Record Shee A** (F) • **Record Shee B** (F)
Animal Studies, cont'd.	• Students write down		

1. Create 'Habitat Information Table' 2. Identify necessary elements of a habitat for crabs. 3. Create a habitat for crabs 4. Record living and non-living elements necessary to crab habitat. 5. Observe crabs and record questions. 6. Learn about real life research on animal behavior and the value of long term observation and record keeping.	questions they have about frogs. • Students set up notebooks to record observations. • Students observe frogs and record observations **Animal Studies, cont'd.** **Lesson 4: TE 37-47** • Brainstorm ideas about characteristics of the frog to focus on when observing • Complete **Record Sheet 4-A** • Complete **Record Sheet 4-B** • Students discuss observations within groups and add new questions to the class list • Students share observations and drawings	**Animal Studies, cont'd.**	**Animal Studies, con** • Teacher Observation (• Responses to **Record Shee A: Our Investigation**
Animal Studies, cont'd. 1. Observe, describe and record characteristics of a crab in words and drawings. 2. Analyze student habitats.	**Animal Studies, cont'd.** **Lesson 5: TE 49-62** • Complete 'Habitat Information Table' for basic frog needs. • Using information from L2, review important elements of a crab's home. • Students decide what materials are needed for		**Animal Studies, con** • Responses to **Record Shee A: My Schoo Habitat** (F) • Responses to

Animal Studies, cont'd. 1. Observe and record the crabs' and frogs' behavior. 2. Identify questions they can now answer. 3. Use a self-assessment to reflect on learning. **Animal Studies, cont'd.**	crab habitats based on proposals. • Groups make crab habitat and introduce crab • Teach students how to feed the crabs • Respond in notebook to questions about observations of feeding the crabs. • With class create a Venn circle for living and no-living elements of the crab. • Discuss crab schedule with the class • Students write down questions they have about crabs. • Students set up notebooks to record observations. • Record what they know about people who study dolphins and read "Diving into Dolphin Behavior." • Have students record 2 or 3 things they discovered about people who study dolphins. • Share discoveries from reading. **Animal Studies, cont'd.** **Lesson 6: TE 65-73** • Revise **Record Sheet 4-A** based on observations of crabs • Complete **Record Sheet 6-A** • Complete **Record Sheet 6-B** • Students discuss observations within groups and add new questions to	**Animal Studies, cont'd.**	**Record Shee** **B: Observing Humans** (F) • Notebook responses (F) **Animal Studies, con** • Responses to **Record Shee** **A: Animal Behavior Research** (F) • Teacher observation (I

1. Add information about crabs to the 'Habitat Information Table'. 2. Identify necessary elements of a habitat for millipedes. 3. Create a habitat for millipedes. 4. Record living and non-living elements necessary to millipede habitat. 5. Observe millipedes and record questions. **Animal Studies, cont'd.** 1. Observe, describe and record characteristics of a millipede. 2. Record questions about millipedes. 3. Compare elements	the class list. • Students share observations and drawings. • Distribute the **My Habitat** sheet for children to work on at home **Animal Studies, cont'd.** **Lesson 7: TE 75-85** • Continue observing organisms and work on animal logs. • Revise **Record Sheet 4-A.** • Revise **Record Sheet 6-A.** • Share information about each animal from the logs and record sheets. • Compare how the behaviors of the two animals and alike and different. • Make additions to the class Frogs and Crabs lists. • Complete **Student Self-Assessment**		**Animal Studies, con** • Teacher observation (l • Responses to **Record Shee A: Humans- Structures a Behaviors** (F **Animal Studies, con** • Teacher observation (l • Responses to **Record Shee A:Dwarf Afr Frog- Struct and Behavio 14-B: Fiddle Crab- Struct and Behavio or 14-C: Millipede- Structures a**

of the frog, crab and millipede habitats. **Animal Studies, cont'd.** 1. Identify daily behaviors of the 3 organisms. 2. Identify elements of the organisms' habitats that could change. 3. Outline an experiment to test the animals' responses to a change in one element in their habitats. 4. Predict, test, observe and record each animal's response to a change in its habitat. 5. Analyze how test results relate to each animal's normal behavior.	**Animal Studies, cont'd.** **Lesson 8: TE 87-94** • Complete 'Habitat Information Table' for basic crab needs. • Using information from L2, review important elements of a millipede's home. • Students decide what materials are needed for a millipede habitat based on proposals. • Groups make millipede habitat and introduce millipede • Teach students how to feed the millipedes • Respond in notebook to questions about observations of feeding the millipedes. • With class create a Venn circle for living and non-living elements of the millipede's habitat. • Discuss millipede schedule with the class • Students write down questions they have about millipedes. • Students record observations. **Animal Studies, cont'd.**		**Behaviors,** (F • Responses to **Final Activit** questions (S) **Animal Studies, con** • Responses in questions on TE159(S) • Responses to **Final Activit** questions rela to reading selection. (S) **Animal Studies, con** • Responses in notebooks to questions abo class findings

Animal Studies, cont'd. 1. Identify where and how there basic needs are met in their homes. 2. Decide whether or not their school habitat meets all their basic needs. 3. Observe, describe, and record human characteristics. 4. Brainstorm why they think humans can live in many different environments.	**Lesson 9: TE 97-104** • Copy characteristics from **Record Sheet 6-A** to **Record Sheet 9-A.** • Observe millipedes and complete **Record Sheet 9-B.** • Discuss observations and add any new questions to class list. • Share observations and drawings. • Combine Venn circles to make a Venn diagram. • Add millipede information to the 'Habitat Information Table'		• Responses to **Final Activit** questions (F) **Animal Studies, con** • Evaluate notebook responses (S) • Responses to **Record Shee A: Studying Animals** (S).
Animal Studies, cont'd. 1. Identify a specific animal behavior to study in detail.	**Animal Studies, cont'd.** **Lesson 10: TE 107-112** • Share observations of animal's daily behavior from animal logs. • Focus on the habitat elements in the intersection of the Venn diagram. • Identify which of these habitat elements could change and discuss how each change would affect the organism. • Complete **Record Sheet**		

2. Identify potential research questions that can be answered only through behavioral. observation. 3. Create outline for research. 4. Research a particular animal's specific behavior. **Animal Studies, cont'd.** 1. Identify specific characteristics of humans that enable them to survive in a variety of habitats. 2. Identify human structures and behaviors and how these relate to living in a variety of habitats. 3. Conduct research on a specific animal behavior.	**10-A** • Discussing one animal at a time, each group will share what they predicted and why. • Groups will decide if responses fit with their observations of animal's behavior under normal habitat conditions. **Animal Studies, cont'd.** **Lesson 11: TE 115-133** • Students share their home habitat studies and descriptions of their daily behaviors. • Focusing on the "school" web, have students identify the living and nonliving elements of their school habitat. Add to the web. • Teams complete **Record Sheet 11-A** to indicate ways the school provides for their needs. • Discuss results. Have students decide if they think that the habitats of the frog, crab, and millipede are complete. • Students complete **Record Sheet 11-B** and write notes in their animal logsas they observe humans. • Students share observations. • Students respond to questions about why students can live in		

Animal Studies, cont'd. 1. Identify structures and behaviors that enable animals to survive in the habitats. 2. Learn facts about frogs, crabs, and millipedes that are not easily observed in the classroom. 3. Record the ways certain structures and behaviors help animals survive in the habitats. **Animal Studies, cont'd.**	different places in their notebooks. • Add humans to the "Habitat Information Table" **Animal Studies, cont'd.** **Lesson 12: TE 123-133** • Discuss the study of dolphin behavior at the DolphinResearchCenter. • Brainstorm with class behaviors that could be researched further through behavioral observation. • Teams work to complete **Record Sheet 12-A** to choose a behavior and formulate a question. • Teams share research questions. • Teams work on the planning section of the research. • Teams share the log sheets that they designed. • Discuss methods that students can use to present their results. • Begin research (will be continued as lessons 13- 15 are done over the next 5-10 days).		

1. Identify similarities and differences in animal structures and behaviors. 2. Compare animal structures and behaviors that illustrate differences between life in different habitats. 3. Understand how animals can alter their environments to survive. **Animal Studies, cont'd.** 1. Discuss research results. 2. Determine whether another team's findings support their observations. 3. Present results to class.	**Animal Studies, cont'd.** **Lesson 13: TE 135-140** • Class completes **Record Sheet 13-A** as they focus on specific body structures and behaviors. • Students respond to questions about how humans get what they need from their habitat in their notebooks. • With class discuss the function of one human structure and how it helps humans meet their needs. • Teams choose a particular body structure and record how it helps humans meet their needs. • Teams share results. • Teams complete the "behaviors section of **Record Sheet 13-A.** **Animal Studies, cont'd.** **Lesson 14: TE 143- 154** • Teams complete **Record Sheet 14-A, 14-B, or 14-C** as they focus on one animal. • Teams share observations		

Animal Studies, cont'd. 1. Demonstrate understanding of concepts learned in Animal Studies, cont'd.	and drawings. • Students read "Did You Discover….?" • Share connections with class. • Respond in notebook to the **Final Activities** questions. **Animal Studies, cont'd.** **Lesson 15 TE 157- 163** • Brainstorm what structures or behaviors reveal differences in animals and their ways of life. • With class complete "Comparing Animals" table. • Each group records information about one structure. • Groups share response. • Students respond in notebook to questions on page TE159. • Read "What Makes Beavers Special?". • In notebook, respond to **Final Activities** questions related to reading selection.		

	- - **Animal Studies, cont'd.** **Lesson 16 TE 165-168** • Teams share results of research with other teams who researched same animal. • Students respond in notebooks to questions about class findings. • Teams share results of research with class. • Discuss why some research questions could not be answered completely. • Compare research methods used in class with those used by scientists at the DolphinResearchCenter in notebooks (**Final Activities** questions). **Animal Studies, cont'd.** **Lesson 17 TE 169-171**		

	• Brainstorm with class what students now know about animals compared to what they wanted to know in the beginning of the unit. • Students decide if facts from original lists about each animal are true or not and edit. • Have students respond to questions on TE170 in their notebooks. • Students complete **Record Sheet 1-A**.		

Other Details

SCED

53234 Science (Grade 4)
Science (Grade 4) courses typically explore complex systems, such as plant and animal adaptation, forces and motion, and physical and chemical changes in matter, or content consistent with state academic standards. Students may identify causes and effects of change, make predictions, and gather data from multiple sources.