Grade 5 Science Course Overview Copied from: Science, Copied on: 08/31/22

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EAST BRUNSWICK PUBLIC SCHOOLS

East Brunswick New Jersey

Superintendent of Schools

Dr. Victor P. Valeski

Science

Science Grade 5

Course Number: 4105

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Course Overview

The K-12 science curriculum in all schools in New Jersey must be aligned with the New Jersey Student Learning 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 fifth grade science curriculum consists of three modules that were selected from two nationally-recognized programs – *Full Option Science System (FOSS)* and *Science and Technology for Children (STC)*. The earth/environmental science unit is *Ecosystems (STC)* which focuses on ecological systems and how they function. The life science unit is *Microworlds (STC)* which introduces students to the study of microscopic organisms. The physical science unit is *Levers and Pulleys (FOSS)* which allows students to experiment with simple machines and how they work.

In addition to these science kits, the fifth grade curriculum includes two units of study that were developed by the teachers in the district. The *Trashpower* unit was developed to give students an understanding of how society deals with the waste and pollution that it generates from the activity of humans. The unit is particularly appropriate in this district because, not only do the students live in the most densely populated state in the nation, but the town itself is host to one of the largest sanitary landfills in the state (Edgeboro). The second unit is *Rocketry*. Students investigate the science behind the operation of rockets (Newton's Laws). They construct and launch model rockets as the culminating activity of the unit.

Textbooks and other resources

Delta FOSS Levers & Pulleys, 2nd Edition, Copyright 2005

TG Foss Levers & Pulleys

Carolina STC Ecosystems, 3rd Edition, Copyright 2013

Carolina STC Microworlds, 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.5-ESS2-1	Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
SCI.5-ESS2-2	Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
SCI.5-ESS3-1	Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
SCI.5-LS1-1	Support an argument that plants get the materials they need for growth chiefly from air and water.
SCI.5-LS2-1	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
SCI.5-PS1-1	Develop a model to describe that matter is made of particles too small to be seen.
SCI.5-PS2-1	Support an argument that the gravitational force exerted by Earth on objects is directed down.
SCI.5-PS3-1	Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
5-PS1-3	Make observations and measurements to identify materials based on their properties.
5-PS1-4.3.1	Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.
5-PS1-3.PS1.A.1	Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.)
5-PS2-1.7.1	Support an argument with evidence, data, or a model.

Grade 5 Science Planning Guide

Instructional Objectives		Instructional Activities/
		Methods/Assignments
Unit 1: Microworlds	Unit 1: Microworlds	
be able to:		
 Determining which of various objects 	Lesson 1: Pre-unit Assessment: Observing a Penny	

can magnify

- Using magnifiers to observe living and non-living specimens
- Using appropriate equipment and techniques to prep

microscope slides for viewing

(T.G. pps.3-8)

- Teacher assesses prior knowledge of magnifiers
- Students set up a notebook to record their observations and ideas
- Students learn to use hand magnifiers
- Students discover something new in an everyday object

Unit 1: Microworlds, cont'd.

Unit 1: Microworlds, cont'd.

Lesson 2:

Communicate Your Observations

(T.G. pps.9-14)

- microscope to observe basic cell
- structure

• Using a

- Communicating detailed observations through writing, drawing and discussion
- Making measurements of small objects, using

hair-widths and

millimeters

 Exploring ways to slow movement of living microscopic specimens for closer observation

- Students have more practice making detailed observations
- Students record their observations in both words and sketches

Unit 1: Microworlds,

cont'd.

- Using a microscope to structure
- Communicating detailed observations through writing, drawing and discussion
- Making measurements of Learning About Lenses small objects, using

hair-widths and

millimeters

• Exploring ways to slow movement of living microscopic specimens for closer observation

Unit 1: Microworlds, cont'd.

- Using a microscope to observe basic cell structure
- Communicating detailed observations through writing, drawing and discussion
- Making

observe basic cell | Unit 1: Microworlds, cont'd.

Lesson 3:

(T.G. pps. 15-20)

- Students experiment with different shapes to see which magnifies
- Students discover the properties common to all objects that act as magnifiers

measurements of small objects, using

hair-widths and

Unit 1: Microworlds, cont'd.

millimeters

• Exploring ways to slow movement of living microscopic specimens for closer observation Lesson 4:

Learning About Lenses:

(T.G. pps. 21-24)

- use lenses to explore several common objects
- review the properties of magnifying lenses

Unit 1: Microworlds, cont'd.

- Using a microscope to observe basic cell structure
- Communicating detailed observations through writing, drawing and discussion
- Making measurements of small objects, using

hair-widths and

millimeters

• Exploring ways to slow movement of living microscopic

specimens for	
closer observation	
Unit 1: Microworlds, cont'd.	Unit 1: Microworlds, cont'd.
microscope to	Learning to Use the Microscope (T.G. pps. 25-30) • Students acquire background information about the microscope • Students learn the function of the parts of the microscope and how to adjust the
hair-widths and	
millimeters	
Exploring ways to slow movement of living microscopic specimens for closer observation	
Unit 1: Microworlds, cont'd.	Unit 1: Microworlds, cont'd.
• Using a	

microscope to

observe basic cell **Lesson 6**: structure

- Communicating detailed observations through writing, drawing and discussion
- Making measurements of small objects, using

hair-widths and

millimeters

 Exploring ways to slow movement of living microscopic specimens for closer observation

Practicing with the Microscope:

(T.G. pps. 31-36)

- Students continue practicing using microscopes
- Students make detailed and careful observations of black and white newsprint dots that create images

Unit 1: Microworlds, cont'd.

• Using a microscope to observe basic cell |Lesson 7: structure

- Communicating detailed observations through writing, drawing and discussion
- Making measurements of small objects, using

hair-widths and

Unit 1: Microworlds, cont'd.

Field Of Vision:

(T. G. pps. 37-42)

• Students demonstrate an under-standing of field of view by measuring object u

millimeters

• Exploring ways to slow movement of living microscopic specimens for closer observation

Unit 1: Microworlds, cont'd.

- Using a microscope to observe basic cell structure
- Communicating detailed observations through writing, drawing and discussion
- Making measurements of small objects, using

hair-widths and

millimeters

 Exploring ways to slow movement of living microscopic specimens for closer observation

Unit 1: Microworlds, cont'd.

Lesson 8:

Preparing Slides

(T.G. pps. 43-53)

- Preparing wet mount and well slides
- Students learn to focus up and focus down with microscopes

Unit 1: Microworlds, cont'd.

- Using a microscope to observe basic cell structure
- Communicating detailed observations through writing, drawing and discussion
- Making measurements of small objects, using

hair-widths and

millimeters

 Exploring ways to slow movement of living microscopic specimens for closer observation

Unit 1: Microworlds, cont'd.

Unit 1: Microworlds, cont'd.

• Using a microscope to observe basic cell structure

Communicating detailed observations through writing, drawing and discussion

Making

Lesson 9:

What Is It?

(T.G. pps. 49-54)

- Identify an unknown specimen due to observations
- Application of viewing skills of 3-D objects under microscope
- Proper well slide preparation

measurements of small objects, using

hair-widths and

millimeters

• Exploring ways to slow movement of living microscopic specimens for closer observation

Unit 1: Microworlds, cont'd.

- Using a microscope to observe basic cell structure
- Communicating detailed observations through writing, drawing and discussion
- Making measurements of small objects, using

hair-widths and

millimeters

 Exploring ways to slow movement of living microscopic specimens for closer observation

Unit 1: Microworlds, cont'd.

Lesson 10

Exploring Common Objects

(T. G. pps. 55-60)

- Students make discoveries as they make observations
- Practice preparing slides of different types
- Perfect light adjustment and focusing techniques with microscopes

Unit 1: Microworlds, cont'd.

- Using a microscope to observe basic cell structure
- Communicating detailed observations through writing, drawing and discussion
- Making measurements of small objects, using

hair-widths and

millimeters

• Exploring ways to slow movement of living microscopic specimens for closer observation

Unit 1: Microworlds, cont'd.

- Using a microscope to observe basic cell structure
- Communicating

Unit 1: Microworlds, cont'd.

Lesson 11:

Looking Inside an Onion

(T.G. pps 61-66)

- Students examine and explore the internal structure of an onion
- Students observe and describe the cells of an onion

detailed observations through writing, drawing and discussion

 Making measurements of small objects, using

hair-widths and

millimeters

• Exploring ways to slow movement of living microscopic specimens for closer observation

Unit 1: Microworlds, cont'd.

Lesson 12

Unit 1: Microworlds, cont'd.

Looking at Living Things: Volvox

(T.G. 67-70)

- Students learn the best way to handle living creatures and prepare slides for the
- Students use microscope to observe microscopic creatures
- Using a microscope to observe basic cell structure
- Communicating detailed observations through writing, drawing and discussion
- Making measurements of small objects, using

hair-widths and

millimeters

• Exploring ways to slow movement

of living microscopic specimens for closer observation

Unit 1: Microworlds, cont'd.

Unit 1: Microworlds, cont'd.

- Using a microscope to observe basic cell structure
- Communicating detailed observations through writing, drawing and discussion
- Making measurements of small objects, using

hair-widths and

millimeters

 Exploring ways to slow movement of living microscopic specimens for closer observation

Lesson 13

Looking At Living Things: Blepharisma

(T.G. pps. 71-74)

- Students practice using microscope skills on living organisms
- Students recognize individual microbes on slides
- Students observe an organism reproducing by binary fusion

Unit 1: Microworlds, cont'd.

Unit 1: Microworlds, cont'd.

• Using a microscope to

observe basic cell structure

- Communicating detailed observations through writing, drawing and discussion
- Making measurements of small objects, using

hair-widths and

millimeters

 Exploring ways to slow movement of living microscopic specimens for closer observation

Unit 2: Levers and Pulleys

Investigation 1:

Levers

The be able to:

• Gain experience constructing and using levers.

Lesson 14

Looking At Living Things: Vinegar Eels

(T.G. pps. 75-78)

- Students use microscope skills to observe a very fast moving organism
- Students experiment with methods to slow down the Vinegar Eel

Unit 1: Microworlds, cont'd.

Lesson 15

(T.G. pps.79-82)

- Students discover that microbes have developed in the grass and hay infusion
- Students record their discoveries

Looking at Living Things: Hay and Grass Infusions

- Teacher evaluates individual student progress
- Learn the concepts of lever arm, fulcrum, load and effort.
- Experience one advantage that can be gained by using a leverreduced effort.

Unit 2: Levers and Pulleys, cont'd.

Investigation 1:

Levers

• Collect organize and analyze data from lever experiments

Unit 1: Microworlds, cont'd.

Lesson 16

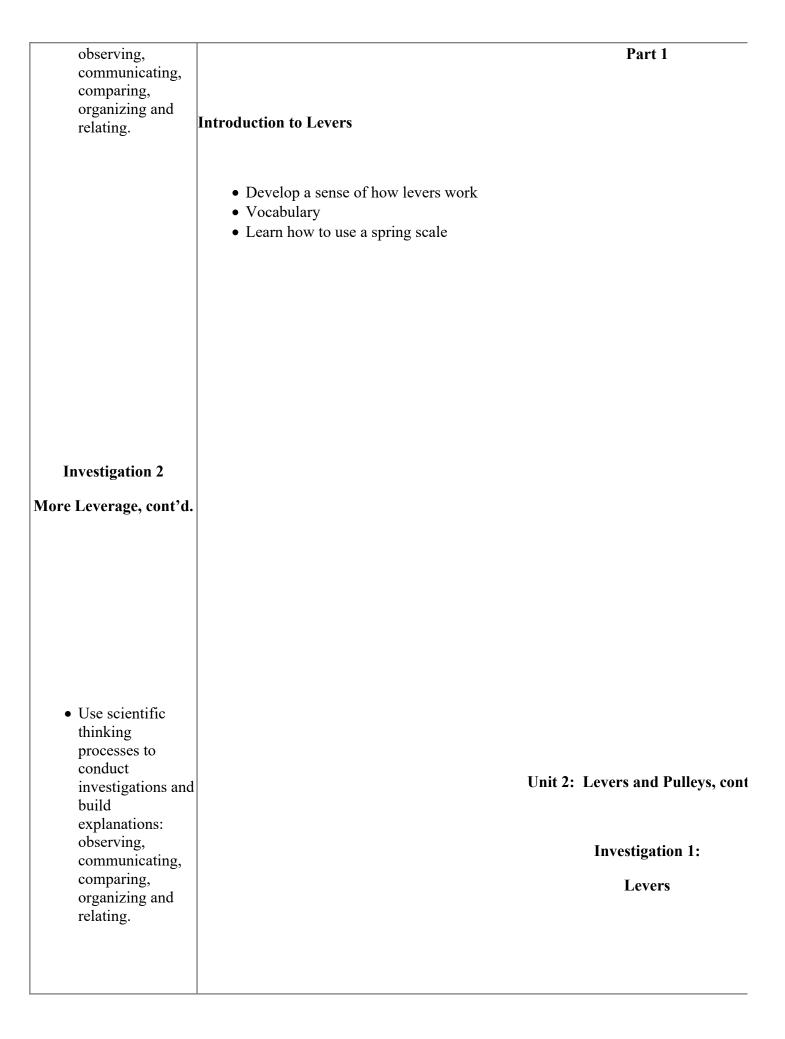
• Use scientific thinking processes to conduct investigations and (T. G. pps. 83-86) build explanations: observing, communicating, comparing, organizing, and

Looking at Living Things: Hay and Grass Infusions 2

- Students observe in greater detail microbes
- Students make more completed and detailed records of observations
- Teacher evaluates the student's progress

relating.	
Review for Summative Assessment	
Summative Assessment	
Unit 2: Levers and Pulleys, cont'd.	
Investigation 1:	
Levers	
Collect organize and analyze data from lever experiments	Unit 1: Microworlds, cont'd.
• Use scientific thinking	Lesson 17
processes to conduct	Post Unit Assessment
	(T. G. pps. 87-88)
explanations: observing, communicating,	
comparing, organizing, and relating.	
Review for Summative Assessment	
Summative Assessment	
Investigation 2	

More Leverage • Learn to identify Class 1, 2, and $\tilde{3}$ levers. • Diagram levers to show. placement and the direction of the load effort. • Analyze common tools in terms of levers. • Analyze pictures of tools in terms of levers **Investigation 2** More Leverage, cont'd. **Unit 2: Levers and Pulleys Investigation 1:** Levers • Use scientific thinking processes to conduct investigations and build explanations:



Part 2

Lever Experiment A

- Conduct experiment
- Discover relationship between load, fulcrum and effort
- Gather and graph data.

Investigation 2

More Leverage, cont'd.

• Use scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, organizing and relating.

Unit 2: Levers and Pulleys, cont

Investigation 1:

Levers

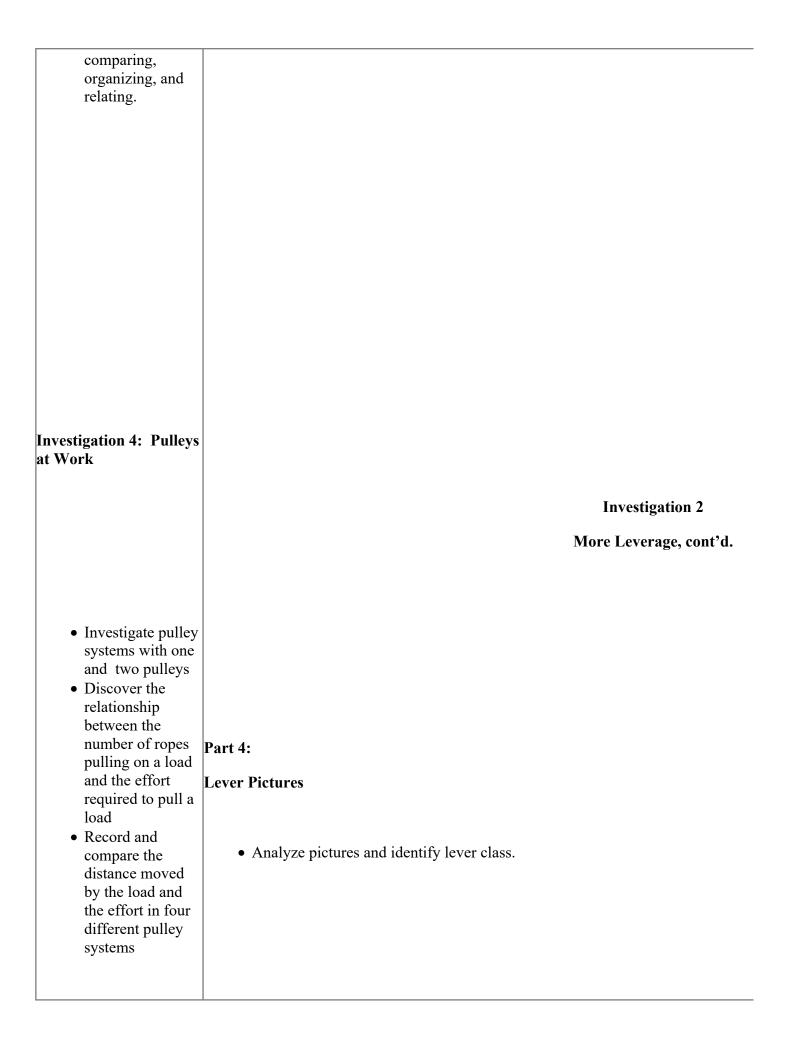
Part 3

Lever Experiment B

	 Conduct experiment Discover relationship between load, fulcrum and effort Gather and graph data.
Investigation 2	
More Leverage, cont'd.	
Review for Summative Assessment	
Summative Assessment	
	Investigation 2
	More Leverage
	Part 1: Lever Classes
	 Explore arrangements of the fulcrum, effort and load on the lever arm. Classify levers

Investigation 3: Pulleys	
 Assemble and investigate one-and two-pulley systems. Learn vocabulary associated with the pulley systems. Discover the advantages of using pulley: Diagram pulley systems. 	Investigation 2 More Leverage, cont'd.
	Part 2: Lever Diagrams • Use each class lever.
Investigation 3:	

Pulleys, cont'd. • Use scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, organizing, and relating. **Investigation 2** More Leverage, cont'd. **Investigation 3:** Pulleys, cont'd. Part 3: Real World Levers • Use scientific • Investigate tools and determine lever class. thinking processes to conduct investigations and build explanations: observing, communicating,



Investigation 4: Pulleys at Work, cont'd.	
• Using scientific thinking processes to conduct investigations and building explanations: observing, communicating, comparing, organizing, and relating	Investigation 2 More Leverage, cont'd.
Investigation 4: Pulleys at Work, cont'd.	
Review for Summative Assessment	
Summative Assessment	

Unit 3: Ecosystems	
 Students record and discuss their thoughts about how living things depend on each other. Students observe and discuss a riverbank 	Investigation 3: Pulleys Part 1: One-Pulley Systems
	 Set up one-pulley system Quantify and compare effort.

Unit 3: Ecosystems,	
cont'd.	
cont u.	
• Students share	
what they know	
about a terrestrial	
environment	
• Students think	
about the terraria	
and aquaria as models of	
• Students set up	Investigation 3:
	Pulleys, cont'd.
Students make	i uneys, cont u.
detailed records	
about items they	
have placed in	
their terraria	
• Students predict	
what will happen	Part 2: Two-Pulley Systems
in their terraria in	are 2. Two Tuney Systems
the next week	
	Investigate two pulleys used together
	Diagram 4 pulley systems

Unit 3: Ecosystems, cont'd.

- Students discuss the needs of organisms in an aquatic environment
- Students set up their aquaria by adding gravel, water, elodea, duckweed, and algae
- Students observe, quantify, and record information about the organisms they place in their aquaria

Investigation 3:

Pulleys, cont'd.

Part 3: Pulley Game

Unit 3: Ecosystems, cont'd.

- Students discuss the needs of organisms in an aquatic environment
- Students set up their aquaria by adding gravel,

- Play game setting up different pulley systems
- Review pulleys systems from previous lessons

- water, elodea, duckweed, and algae
- Students observe, quantify, and record information about the organisms they place in their aquaria

Investigation 4: Pulleys at Work

Unit 3: Ecosystems, cont'd.

Part 1: Effort in Pulley Systems

- Students discuss information on aquatic plants and algae gained through observation and reading
- Students complete their aquaria by adding mosquito fish and snails
- Students continue to record their observations of plants, algae, and animals in their aquaria and plants in their terraria

- Predict the effort required to lift the load
- Identify the direction of the effort
- Students collect data systematically for analysis

	Investigation 4: Pulleys at Work, cont'd.
Unit 3: Ecosystems, cont'd.	Part 2: Measuring Distance
	Determine the relationship between the mechanical advantage and the distant
 Students discuss what they have read and observed Students offer evidence of dependent and interdependent relationships in their ecosystems Students predict what changes might occur in both their aquaria and terraria Students read about germination 	Investigation 4: Pulleys at Work, cont'd.
	Part 3: Choosing Your Own Investigation
	Students investigate and design a lever or a pulley system
Jnit 3: Ecosystems, cont'd.	

• Students continue to observe plant growth in their terraria • Students make observations and record descriptions of the animals they add to their terraria • Students identify and record similarities and differences between crickets and isopo Unit 3: Ecosystems, cont'd. Unit 3: Ecosystems • Students continue Lesson 1: Pre-Unit Assessment: Thinking about Ecosystems to discuss their concepts of the word 'ecosystem' • Through reading, Students will use student investigation booklet students learn more about pp. 3-5 crickets and isopods Students will discuss food chains, food webs, and energy flow in the riverbank comm

Unit 3: Ecosystems, cont'd.	
and aquatic ecosystems from observations and	Unit 3: Ecosystems, cont'd.
consider the impact organisms have on one	Lesson 2: Setting Up the Terrarium
web of their terrestrial ecosystems	Observe materials using an observation table
and compare it with Lesson 5's aquatic web	Students fill out table of what will be in the terrarium
	Students build their terrarium
	Students fill out diagram
Unit 3: Ecosystems, cont'd.	MAKE 3 CLASS CONTROL MODELS FOR EACH CLASS YOU TEACH (THES)
• Students predict how one ecosystem might influence the other	

	Unit 3: Ecosystems, cont'd.
	Lesson 3: Setting Up the Aquarium
	Students build their aquaria
Unit 3: Ecosystems, cont'd.	Students observe the materials
	Students diagram their aquaria
compare stable and disturbed ecocolumns • Students become familiar with pH	Ecosystems Food Chains Land Biomes

• Students reflect through a self-assessment	Unit 3: Ecosystems, cont'd.
	Lesson 3: Setting Up the Aquarium, cont'd.
Unit 3: Ecosystems, cont'd.	
	Photosynthesis
• Students discuss and analyze the causes and effects	Plant Growth
of three types of	Seed Plants
pollution • Students plan	Six Kingdoms
experiments to study the effects of pollution	Soil
• Students determine	Plant Adaptations to Aquatic Life
variables and controls and	http://www.mbgnet.net/bioplants/adapt.html
prepare to use simulations in a scientific	
investigation	Farming in Space
• Students predict the possible effects of	http://voyager.cet.edu/iss/activities/newfarming.html
pollutants in their class model	
ecosystems	MAKE 3 CLASS CONTROL MODELS FOR EACH CLASS YOU TEACH (THESE
Unit 3: Ecosystems, cont'd.	Unit 3: Ecosystems, cont'd.
record the pH of our Ecosystems	Lesson 4: Adding Animals to the Aquarium
• Students	

implement their pollution	
experiments	
 Mix and measure 	A 111. 4
chemicals	Add animals to aquaria
 Students maintain 	
the record	
keeping system in	Observe plants and algae
their interactive notebook	
поцероок	
	Observe animals in aquaria and draw observations
	Society annuals in aquaria and araw observations
	Deading Calastian in Chydrot Layartiantiana Dead-lat an mana 26 20
	Reading Selection in Student Investigations Booklet on pages 26-28
Unit 3: Ecosystems,	
cont'd.	
cont u.	
• Students will	
write a formal lab	
report forming a	
hypothesis,	
analyzing data,	
answering	
questions, and	
form a conclusion	
based on evidence	Unit 3: Ecosystems, cont'd.

	Lesson 5: Observing the Completed Aquarium
	Discuss living and non-living things in their ecosystems Discuss interdependent relationships
Unit 3: Ecosystems, cont'd.	Reading selection on page 31 in Student Investigations Booklet
 Students observe and record the effects pollutants have on the ecosystems Students observe the control ecocolumn 	Unit 3: Ecosystems, cont'd.
viability of the	Lesson 6: Adding Animals to the Terrarium
consumers within the eco-columns • Students understand the	Create a Venn Diagram to compare and contrast Aquarium plants and Terrarium plant
importance of plants in the environment	Observe and add animals to terraria
	Record animal characteristics using Observation Chart/ Diagram

	Reading Selection pages 38-40 in Student Investigations Booklet
Unit 3: Ecosystems, cont'd.	
	Unit 3: Ecosystems, cont'd.
 Students discuss the effects of pollutants and make final 	
observations • Student teams review data collected	Lesson 6: Adding Animals to the Terrarium, cont'd.
Students draw conclusions	Create a Venn Diagram to compare and contrast Aquarium plants and Terrarium plant
	Observe and add animals to terraria
	Record animal characteristics using Observation Chart/ Diagram
	Reading Selection pages 38-40 in Student Investigations Booklet
	Unit 3: Ecosystems, cont'd.
	Lesson 7: Joining the Terrarium and Aquarium
	Discuss the terms: producers, consumers, and scavengers

nit 3: Ecosystems,	
ont'd.	Discuss how the two ecosystems relate to each other
 Class draws conclusions about the effect of each 	Discuss and observe eco-columns and predict what might occur over time
	Make Terrestrial Food Chain Wheel
	Unit 3: Ecosystems, cont'd.
	Lesson 7: Joining the Terrarium and Aquarium, cont'd.
	Discuss the terms: producers, consumers, and scavengers
	Discuss how the two ecosystems relate to each other
it 3: Ecosystems, nt'd.	Discuss and observe eco0columns and predict what might occur over time
• Class draws	

Make Terrestrial Food Chain Wheel
Unit 3: Ecosystems, cont'd.
Lesson 8: Upsetting the Stability
Teachers will lead discussion about pollution and lead the acidity activity TG p. 85
Teachers will introduce vocabulary
Read about and discuss Acid Rain Student manual pp. 48-49
Read and discuss about Crops and Cows—What's the Problem Student manual p. 51
Read and discuss When Salt isn't Safe Student manual p. 52
**Teach in connection with Non-point Pollution pp. 48-54 in the Trash Power Manua
Unit 3: Ecosystems, cont'd.
Lesson 10: Planning Pollution Experiments

1,	
results • Read about the Chesapeake Bay	Option 1: Pollute half of the students eco-columns
	Option 2: Pollute the Teacher's class model
	Discuss the concept of a controlled experiment
	*discuss variables
	Eco-column pollutant activity planning TG p. 101-103
	*See fact sheets TG pp. 104-106
Unit 4: Trash Power	
	Unit 3: Ecosystems, cont'd.
	Lesson 11: Setting up our Pollution Experiment

	T
	Students will conduct experiment by polluting eco-columns
	Students will gather data using the table on activity sheet 11-A
	Unit 3: Ecosystems, cont'd.
Unit 4: Trash Power	
natural resources, renewable resources, and	Lesson 11: Setting up our Pollution Experiment
nonrenewable resources.	Students will conduct experiment by polluting eco-columns
 To sort and classify trash. 	Students will gather data using the table on activity sheet 11-A

•	To develop an
	understanding of
	human's
	influence on the
	ecological
	process.

• To develop a community profile of East Brunswick regarding solid waste management.

Unit 4: Trash Power, cont'd.

• To develop an understanding

of human's

need to find a

viable solution

to solid waste

management.

Unit 3: Ecosystems, cont'd.

Lesson 12: Observing Early Effects of Pollution

Students will observe the effects of the pollutants on their ecosystems and they will co

• To develop an understanding of alternative energy sources.

Unit 4: Trash Power, cont'd.	Unit 3: Ecosystems, cont'd.
• To develop an understanding of human's	Lesson 13: Where do the Pollutants Go?
need to find a viable solution	Students continue to observe ecosystems and comparing them to the control experime
to solid waste management.	Students will analyze their results to of the Pollution experiment using Record Sheet 1
To develop an understanding of alternative energy sources.	

Unit 4: Trash Power,	Unit 3: Ecosystems, cont'd.
cont'd.	Lesson 14: Drawing Conclusions about our Experiment
• To develop an understanding	Students will draw conclusions about the results of the pollutants in their eco-columns
of human's need to find a	Students will read the reading selection, "The Chesapeake Bay: An Ecosystem in Dar
viable solution to solid waste	Students will make connections from their reading to their experiments
management.	Students will view video Living on the Edge and make connections from their experim
To develop an understanding of alternative energy sources.	Unit 3: Ecosystems, cont'd.
	Students will draw conclusions about the results of the pollutants in their eco-columns

Students will read the reading selection, "The Chesapeake Bay: An Ecosystem in Dar
Students will read the reading selection, The Chesapeake Bay: An Ecosystem in Dai
Students will make connections from their reading to their experiments
Students will view video Living on the Edge and make connections from their experin
Unit 3: Ecosystems, cont'd.
Students will draw conclusions about the results of the pollutants in their eco-columns
Students will read the reading selection, "The Chesapeake Bay: An Ecosystem in Dan
Students will make connections from their reading to their experiments
Students will view video Living on the Edge and make connections from their experin
I and the second

Unit 4: Trash Power, cont'd.	Unit 4: Trash Power
• To define key terms – sanitary landfill, methane gas, leachate, clay liner, NIMBY, cap, source	**** ENRICHMENT ACTIVITIES
reduction, and ground water.	Use the Enrichment Activities section of the Trash Power manual to supplement
	****ADDITIONAL RESOURCES
• To review the concepts of "decomposers" as related to natural recycling	Use the websites and activities listed at the end of each unit
(sunlight ®	***** CURRENT EVENTS ***
plant and	be responsible for completing Current Event Articles
animal life ®	
decomposers	
® raw	
materials ®	
plant life).	Unit 4: Trash Power
	Section 1
Unit 4: Trash Power, cont'd.	Students will answer Trash Power questions on Student Manual page 2.
• To explore and	dissect classroom trash, categorize, record, and graph data (bar graph).

 Discuss with class terms natural, renewable, and nonrenewable resource using complete "Challenge" on Student Manual pages 11.
Unit 4: Trash Power, cont'd.
• Research on Materials (see additional resources)
• Discuss alternative energy sources pages 16-27.
• review and discuss solid waste facts and complete the Community Profile on
Additional Resources and Activi
DNR kids Website: Solid Waste and Recycling
http://www.metrokc.gov/DNR/kidStudents willeb/solid waste main.htm
Unit 4: Trash Power, cont'd.

• Write a formal lab

man anti-famma a	Trash Pizza (Activity)
report: form a hypothesis, list	Trash Fizza (Activity)
materials,	http://www.kid-at-art.com/htdoc/lesson
procedures,	
record observations,	
form conclusions	Natural Resources
from evidence.	http://www.eco-pros.com/naturalresour
	The state of the s
	http://www.brainpop.com/science/ourfragileenvironment/naturalresources/ (video and
	Mineral Search
	http://www.urbanext.uiuc.edu/world/minerals.html
Unit 4. Tuagh Daway	
Unit 4: Trash Power, cont'd.	
cont u.	
To introduce key	
terms – absorb,	
aquatic life,	
sludge, biodegradable,	
non-	
biodegradable,	Unit 4: Trash Power, cont'd.
refuse,	
contamination, water pollution,	
industrial waste,	
sewage, and	Solid Waste
algae.	
	http://www.brainpop.com/technology/scienceandindustry/wastemanagement/ (video a
• To explore and develop an	
understanding of	http://www.epa.gov/oStudents will/kids/index.htm (Planet Protectors Club interactive
the positive and	
negative aspects	
related to ocean dumping.	Fossil Fuels
aumping.	http://www.brainpop.com/technology/energytechnology/fossilfuels/ (video and quiz)

	Gas and Oil
	http://www.brainpop.com/science/energy/gasandoil/ (video and quiz)
Unit 4: Trash Power, cont'd.	
• To develop an understanding for the environmental impact of oil spills and the process of cleaning these spills.	Unit 4: Trash Power, cont'd.
	Plastic from Petroleum
 To provide an opportunity for students to work 	http://www.brainpop.com/science/matterandchemistry/plastic/ (video and quiz)
as team members to analyze	Air Pollution
	http://www.brainpop.com/science/ourfragileenvironment/airpollution/ (video and qui
	Alternative Energy Sources
	http://www.brainpop.com/science/energy/energysources/ (video and quiz)
Unit 4: Trash Power, cont'd.	
	·

• To introduce key terms – composting, natural garbage, decay, decomposition, bacteria, decomposer, nutrients, decomposable waste, and decomposition resistant waste.

Unit 4: Trash Power, cont'd.

Section – 2

Sanitary Landfills

• read and discuss pages 34-35 of the Student Manual.

To explore and develop the positive and negative aspects of composting.

Landfill / Ocean Dump Lab

• create a landfill and an ocean dump in closed containers with teacher assistant sketch and label each environment and record observations for approx. 6 week

Unit 4: Trash Power, cont'd.

Unit 4: Trash Power, cont'd.

• To introduce key terms – composting, natural garbage, decay, decomposition, bacteria, decomposer, nutrients, decomposable waste, and

decomposition

Section – 2, cont'd.

Sanitary Landfills

** need to bring in a closed container, and a variety of garbage from home. **

resistant waste.	record predictions and observations using Student Manual page 44.
• To explore and develop the positive and negative aspects of composting.	• view the video "The Rotten Truth About Garbage" and respond to questions c
Unit 4: Trash Power, cont'd.	Unit 4: Trash Power, cont'd.
	Section – 2, cont'd.
• To introduce key terms – incineration, resource recovery, dioxins, scrubber, and pollutants.	Sanitary Landfills
• To explore the positive and negative impacts of incineration	Diagram a Sanitary Landfill: draw and label a side view of a sanitary landfill, pipes and methane gas pipes and generator.
and resource recovery.	Sanitary Landfills
To provide an	*****Additional Resources***
opportunity for	
students to	The Garbage Story: Dealing with Solid Waste
work as team	http://gtm-media.discoveryeducation.com/videos/The%20Garbage%20Story%20Dealing%20wit
members to	Unit 4: Trash Power, cont'd.
debate	

	Water Pollution
issues.	Section – 3
environmental	
debate	Unit 4: Trash Power, cont'd.
members to	
work as team	
students to	
opportunity for	
1. To provide an	http://www.dmoz.org/Kids_and_Teens/School_Time/Science/Environment/Garbage/l
of incineration and resource recovery.	Landfill Links:
1. To explore the positive and negative impacts	http://www.eia.doe.gov/kids/energyfacts/saving/recycling/solidwaste/landfiller.html
1 77	Energy Kids Page
	http://www.kid-at-art.com/htdoc/educate.html
1. To introduce key terms – incineration, resource recovery.	What's a Landfill
Unit 4: Trash Power, cont'd.	Sanitary Landfills
	Section – 2, cont'd.
issues.	
environmental	

**Ecosystems coordinates with this se

Unit 4: Trash Power, cont'd.

- To introduce key terms litter and open dumping.
- To explore the
- Environmental impact of littering and open dumping.

• read and discuss vocabulary as Ocean Dumping is introduced to class using S

• Teacher will discuss with class what an oil spill is and its environmental effect

Unit 4: Trash Power, cont'd.

Section – 3, cont'd.

Water Pollution

• view the video "Bottom of the Barrel" and respond to questions on Student M

Oil Spill Lab

- explore means of cleaning up an oil spill using items brought in from home ar
- view the video "Down the Drain" and respond to questions on Student Manua

Unit 4: Trash Power,	
cont'd.	
	Unit 4: Trash Power, cont'd.
To introduce key	
terms – litter and open dumping.	Section – 3, cont'd.
open dumping.	Section – 3, cont u.
	Water Pollution
• To explore the	
effects of open dumping.	
dumping.	read and analyze various water pollution case studies using Student Manual page 1.
• Environmental	**** Additional Resources ***
impact of littering and open	
dumping.	
	Clean Water Program
	http://www.oceansidecleanwaterprogram.org/kids.asp
	Dayya Dish Determent Fighting to Halm Animal Oil Smill Victims
	Dawn Dish Detergent Fighting to Help Animal Oil Spill Victims

	Unit 4: Trash Power, cont'd.
Unit 4: Trash Power,	
cont'd.	Section – 3, cont'd.
	Water Pollution

	Water Pollutants
• To introduce key terms – reuse, reduce, and recycle.	http://www.worldalmanacforkids.com/WAKI-ViewArticle.aspx?pin=x-wa017800a&article_id=192&chapter_id=4&chapter_title=Environment&article_title=
	Non-Point Source Pollution
To interpret data in order to recycle	http://www.epa.gov/nps/kids/
	http://www.chewonki.org/cleanwater/water_pollution.asp (facts, activities and teach)
To develop an	
understanding	
of the recycling	
processes.	
	Unit 4: Trash Power, cont'd.
	Section – 3, cont'd.
	Water Pollution
	http://www.brainpop.com/science/ourfragileenvironment/waterpollution/ (video an
	http://www.water-pollution.org.uk/ (interactive site)
Unit 4: Trash Power, cont'd.	http://response.restoration.noaa.gov/audience_catalog.php?RECORD_KEY%28audie (audience_chosen)=2 (oil spill information)
	http://library.thinkquest.org/CR0215471/oil_spills.htm (oil spill facts, excellent graph

• To introduce key

terms – reuse,	Unit 4: Trash Power, cont'd.
reduce, and recycle.	one ii Trash Tower, cone di
	Section – 3, cont'd.
To interpret data in order to recycle	Water Pollution
To develop an	
understanding	
of the recycling	http://www.chewonki.org/cleanwater/energy_choices.asp (facts, activities and teacher
processes.	
Unit 4: Trash Power, cont'd.	
• To introduce key terms – reuse, reduce, and recycle.	Unit 4: Trash Power, cont'd.

	Section – 4
To interpret data in order to recycle	Composting
To develop an	
understanding	• read and discuss "Garbage to Soil" on Student Manual page 73.
of the recycling	
processes.	• read and discuss composting using Student Manual pages 74-78.
	Garbage Eater Lab
	identify the benefits of composting organic materials. Student
	Manual page 79.
	Unit 4: Trash Power, cont'd.
Unit 4: Trash Power,	
cont'd.	Section – 4, cont'd.
	Composting
• To introduce key terms – reuse, reduce, and	Students create a compost heap using construction paper to make soil, organic
recycle.	Rotting Bananas Lab

To interpret data in order to recycle	• predict, observe the effects of yeast on bananas (keep a control). complete a v decomposition, and draw conclusions from evidence.
• To develop an	
understanding	
of the recycling	
processes.	
	Unit 4: Trash Power, cont'd.
	Section – 4, cont'd.
	**** Additional Resources ***
	Earth 911
	http://earth911.org/composting/
	Composting for Kids
	http://sustainable.tamu.edu/slidesets/kidscompost/cover.html
Unit 4: Trash Power, cont'd.	
	Kids Recycle
	http://www.kidsrecycle.org/composting.php
To introduce key	
terms – reuse, reduce, and	United Streaming Video: "Grossology: Kid Rot"
recycle.	http://player.discoveryeducation.com/index.cfm?guidAssetId=76EA436F-B721-4F23
 To interpret data 	

	Unit 4: Trash Power, cont'd.
• To develop an	
understanding	Section – 5
of the recycling	Incineration and Description Description
processes.	Incineration and Resource Recovery
	• read and discuss Student Manual pages 82-83.
	• To Burn or to Not to Burn Student Manual pages 84-86.
	Mock Town Council Meeting
	• Class will be divided into research and presentation teams to answer problem (
	****Additional Resources***
Unit 4: Trash Power, cont'd.	Unit 4: Trash Power, cont'd.
	Section – 6
	Littering and Open Dumping
• To introduce key terms – reuse, reduce, and recycle.	Introduction questions about littering Student Manual page 106.
To interpret data in order to recycle	• read and discuss open dumping and the related health hazards as a result of so 107.

	T.
• To develop an	
understanding	take a walking field trip around school to collect litter.
of the recycling	
processes.	
	Unit 4: Trash Power, cont'd.
	Section – 6, cont'd.
	I :
	Littering and Open Dumping
Unit 4: Trash Power,	• chart items from their litter collection on Student Manual page 108.
cont'd.	
	**** Additional Activities ***
	Littering and Environmental Issues
• To introduce key terms – reuse,	http://www.brainpop.com/science/ourfragileenvironment/humansandtheenvironment/
reduce, and	
recycle.	
• To interpret data	
in order to recycle	
To develop an	

understanding	Unit 4: Trash Power, cont'd.
of the recycling	
processes.	
	Section – 7
	Packaging
	 explore the package problem by going on a package hunt to locate items with pages 112-114.
	work with a partner to evaluate a packaged item that they have brought from l
Unit 4: Trash Power, cont'd.	
	Unit 4: Trash Power, cont'd.
• To introduce key terms – reuse, reduce, and recycle.	
	Section – 8
To interpret data in order to recycle	
	Reducing, Reusing, and Recycling
• To develop an	
understanding	• review key terms and set up an experiment "Reusing Your School Waste" on 5 for about 1 week.
of the recycling	Tor about 1 week.
processes.	

• complete conclusion on Student manual page 89. cet their lunch trash and complete Student Journal pages 120-121.
ct their lunch trash and complete Student Journal pages 120-121.
4: Trash Power, cont'd.
tion — 8, cont'd. ucing, Reusing, and Recycling
 Trash Art Turn Trash Into Treasure Student Manual page 122.
 learn the steps to recycling paper, plastic and glass. Recycling Processes: plas page 134.
4: Trash Power, cont'd.
1

Section – 8, cont'd.

Reducing, Reusing, and Recycling

Trash Art

***** OPTIONAL ACTIVITIES *:

Unit 5: Rocketry

United Streaming: Reducing, Reusing, a Environmental ConcernA segment of Re

Students will be able to understand Recycling: Environmental Concerns

• Students will be key terms involved in the operation of http://player.discoveryeducation.com/index.cfm?guidAssetId=427F2D1C-A09D-4D8 rockets -Newton's Third Law of Motion, thrust, lift, gravity, drag, telemetry, ignition, lift off, burnout, coasting period, apogee, ejection, soft landing, Robert Goddard, friction, and force.

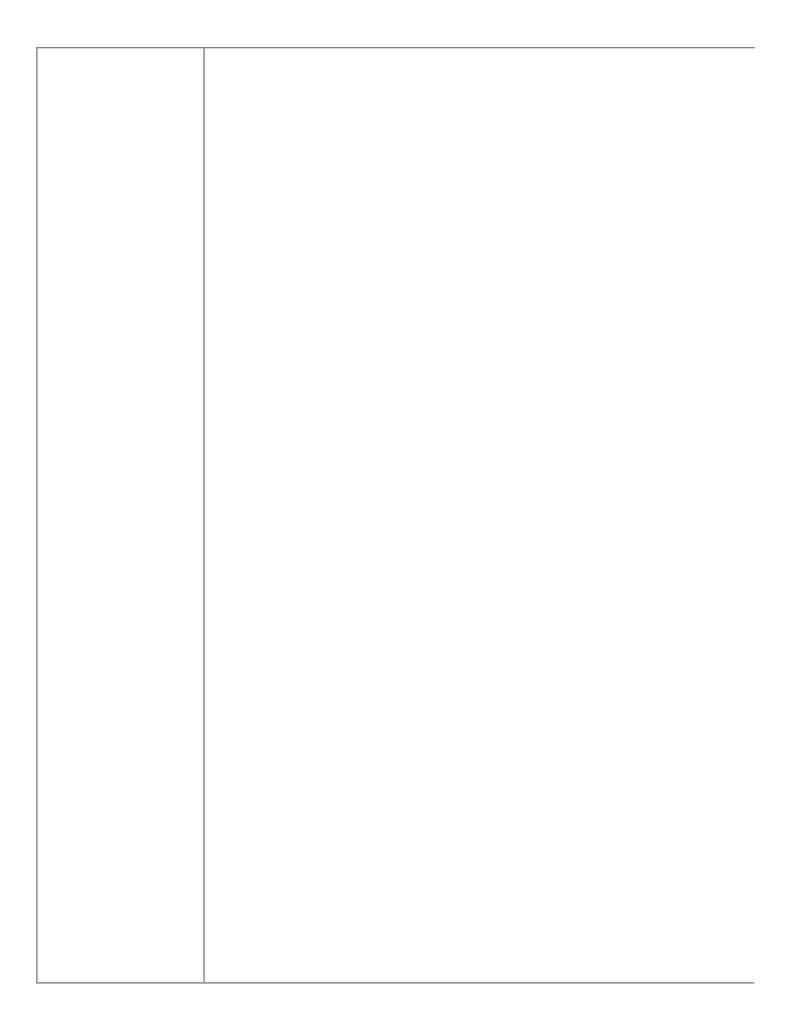
Unit 5: Rocketry

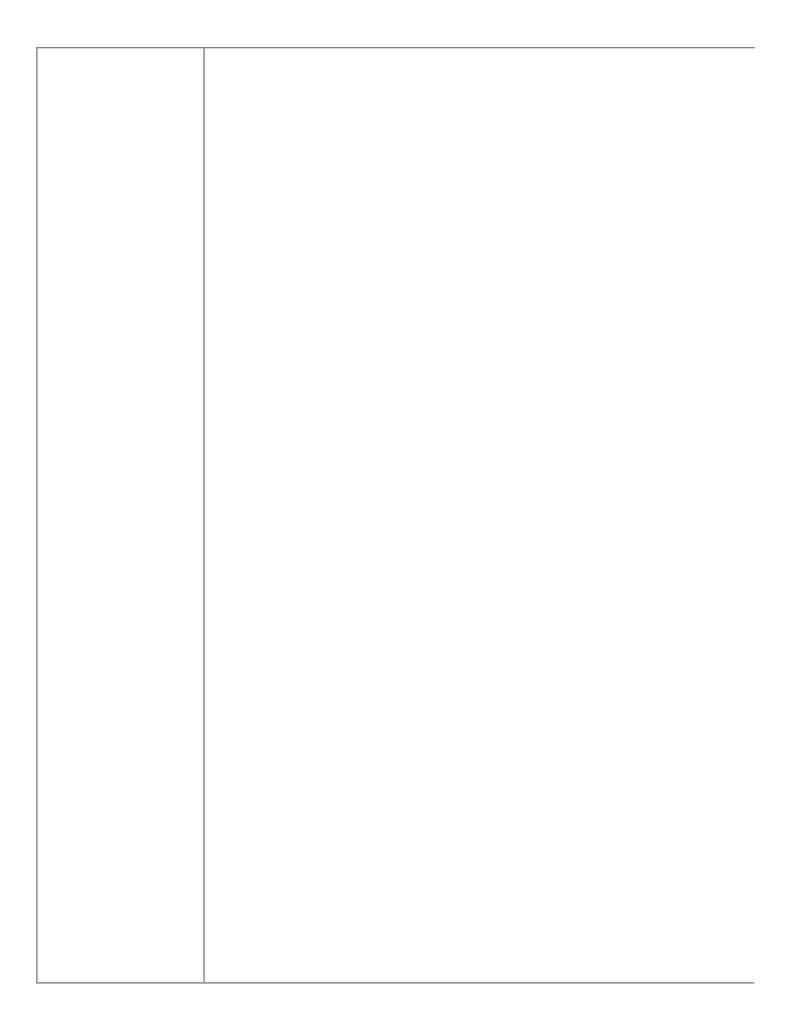
• Students will be introduced to a short history of rockets and the key terms asso

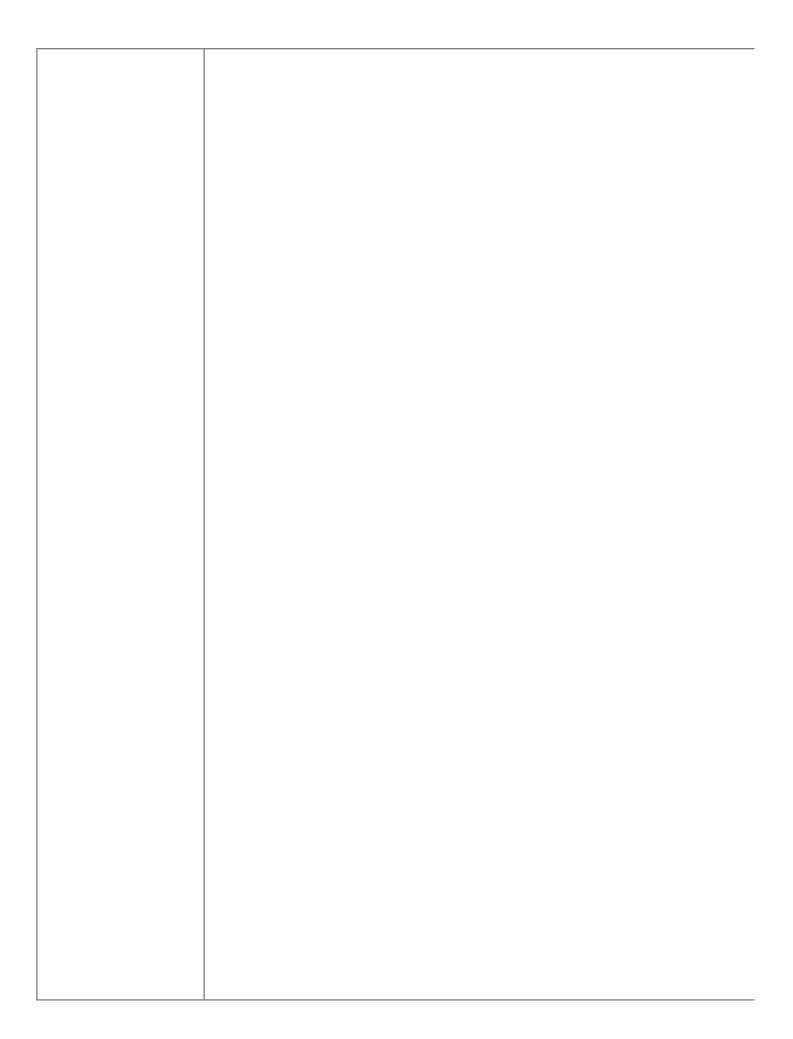
	Students will watch a virtual rocket launch to become familiar with a launch s http://inventors.about.com/library/inventors/blrocket.htm
Unit 5: Rocketry, cont'd.	• Students will review the parts of a model rock assembly and the functions of ϵ
• Students will be able to identify the various parts of the model rocket and the function of each part.	Unit 5: Rocketry , cont'd.
 To create a direct correlation between concepts 	Students will study the flight phases of a model rocket and the terms associate
trajectory and airplane flight with the	• Students will develop an understanding for Newton's Third Law of Motion th action there is an equal and opposite reaction – Blow up a balloon and let it go in the balloon goes down).
trajectory, powers, and flight	Students will engage in "force & motion experiments" to investigate Newton
of a rocket.	Unit 5: Rocketry, cont'd.
• To recognize that motion can be slowed or delayed by forces such as friction and air resistance.	begin assembling their model rockets following the specific instructions provi
Unit 5: Rocketry,	• review model rocketry safety code using <i>Estes website</i> .

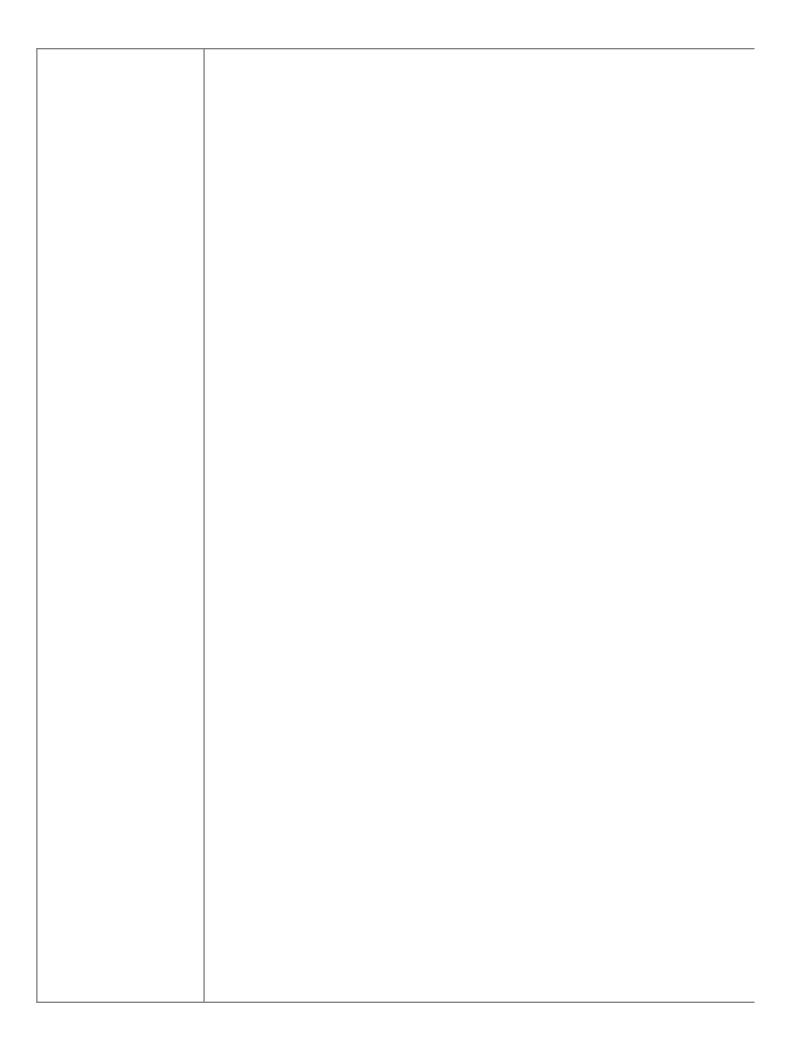
	• use <u>altimeter device</u> to track the model rockets altitude, plot data on chart, an
• To recognize that everything on or near the earth is pulled toward the earth's center by gravitational force.	• launch model rockets on "Rocket Day".
To develop an	
understanding of	Unit 5: Rocketry, cont'd.
the principles of	
flight as related to	Teacher will lead a debriefing about "Rocket Day".
Newton's Third	
Law of Motion,	***** OPTIONAL ACTIVITIES *
and the	
correlation of	• On "Rocket Day" students can watch the videos "October Sky" and/or "Apoll
flight pattern and	**** Please note these videos are rated PG-13 and you need to have parent permissic
distance.	
Unit 5: Rocketry,	
cont'd.	
• To provide an opportunity for	
students to work	
collaboratively to assemble and	

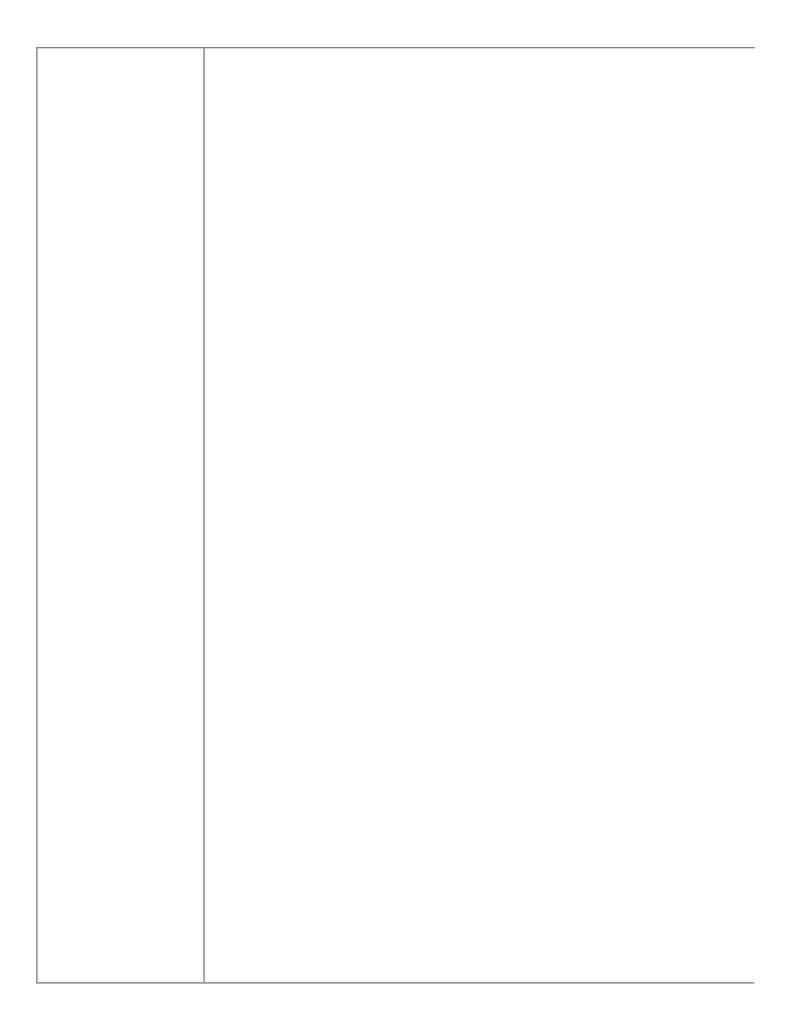
launch a model	
rocket.	
I	I .

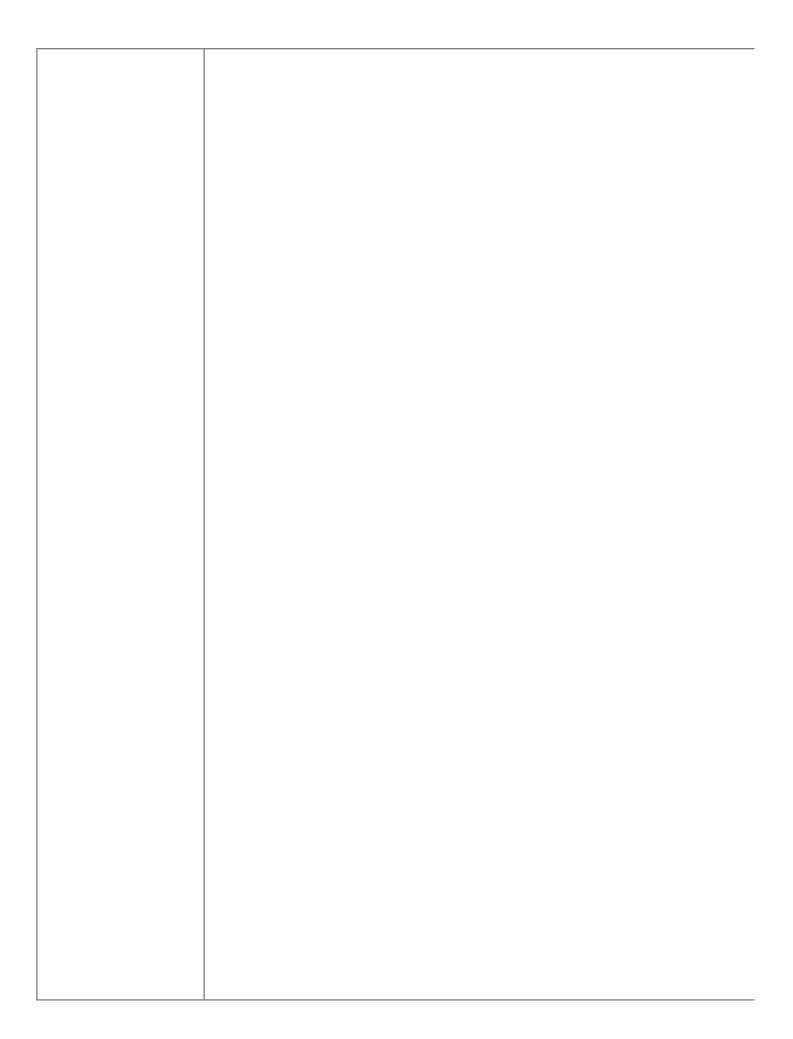


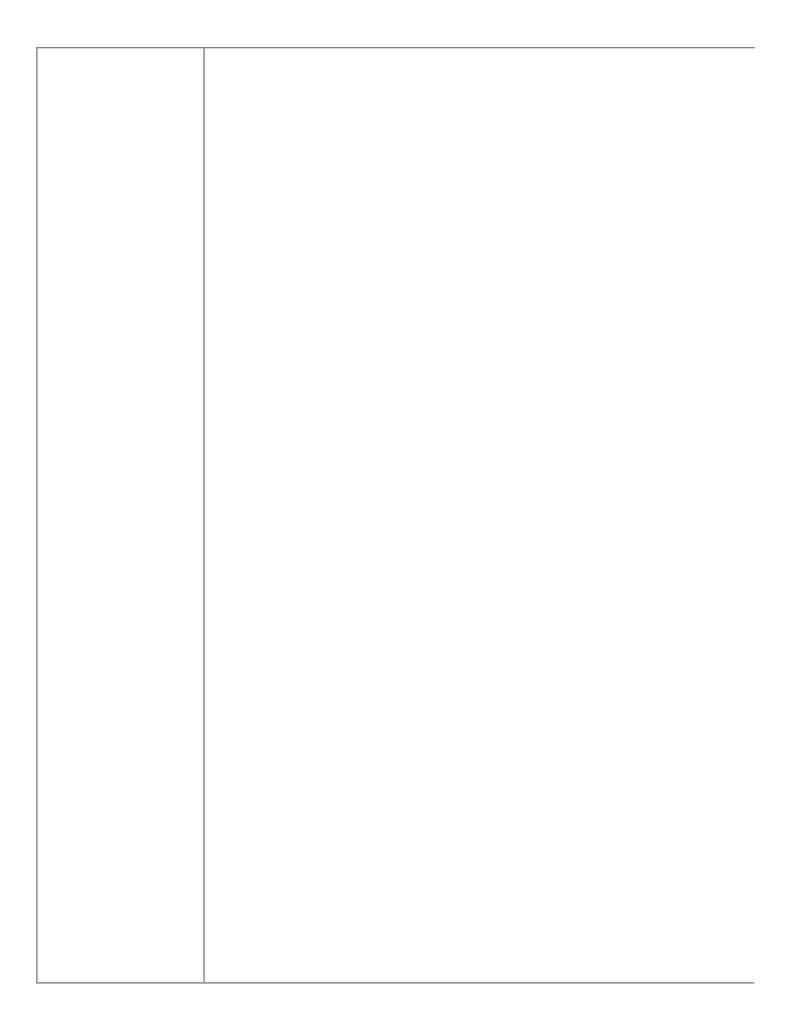


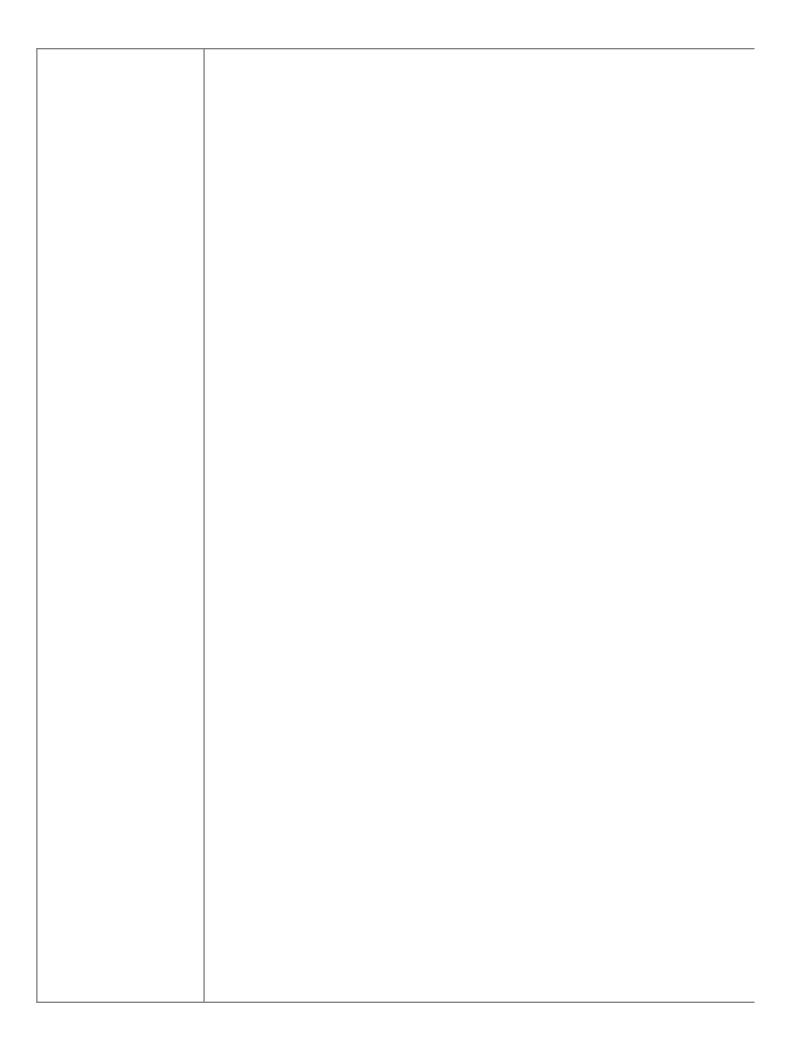


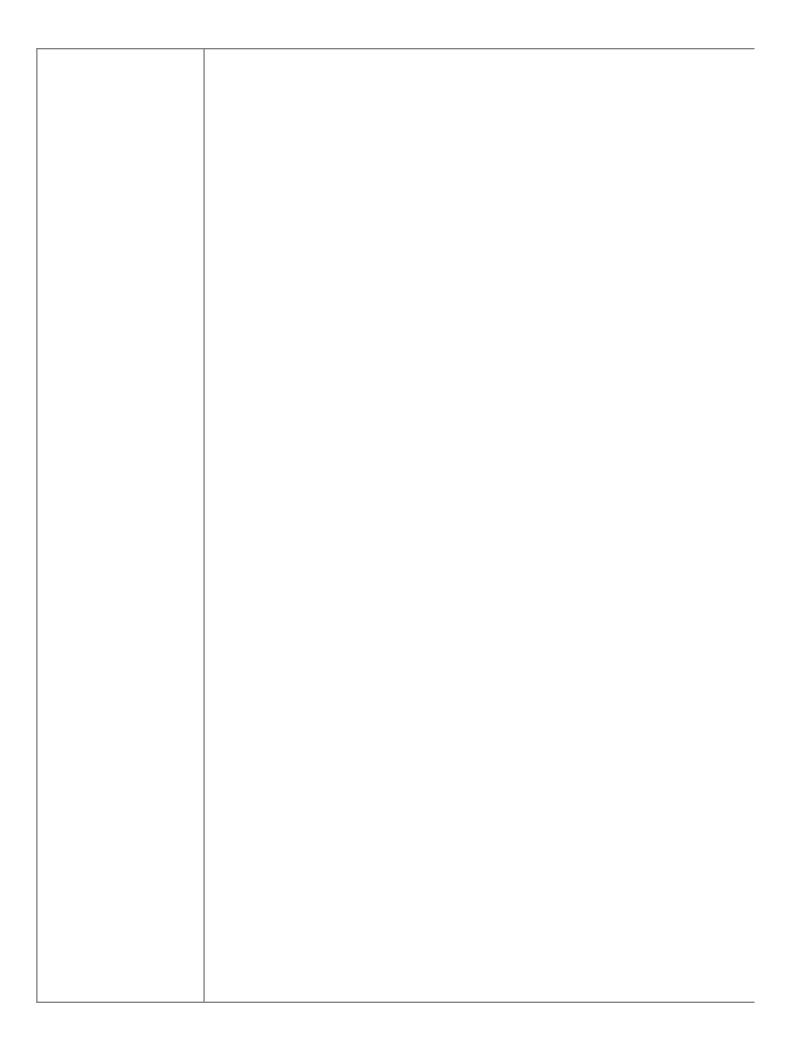


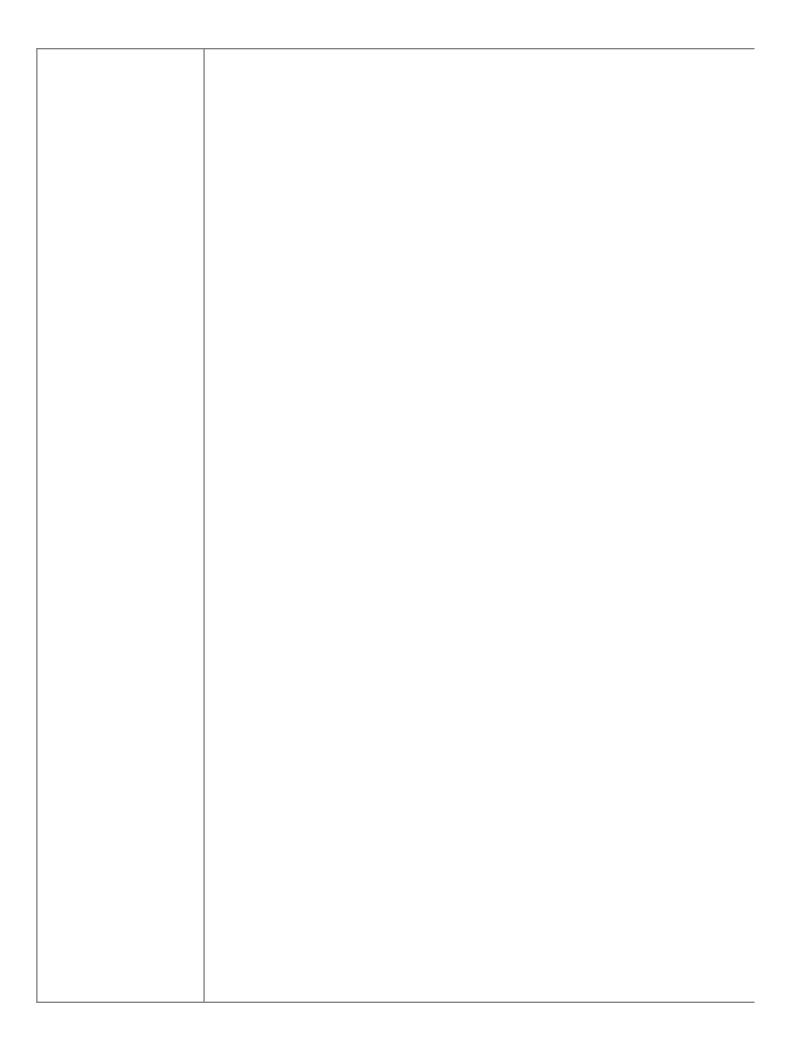


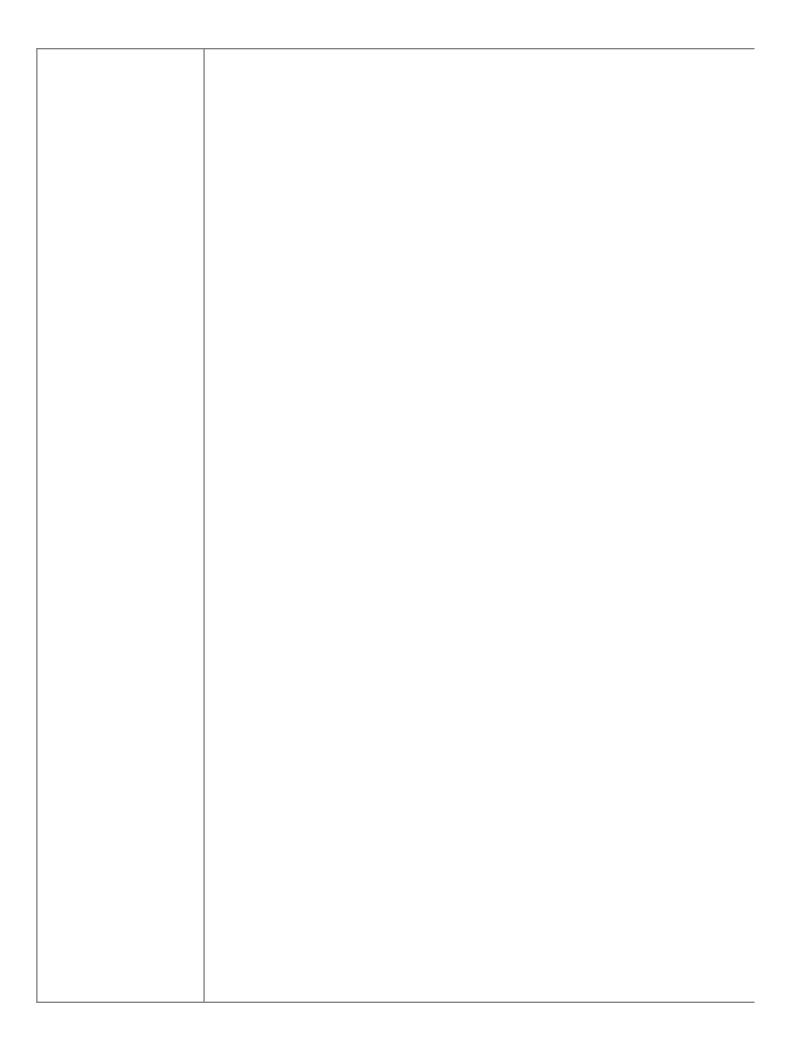


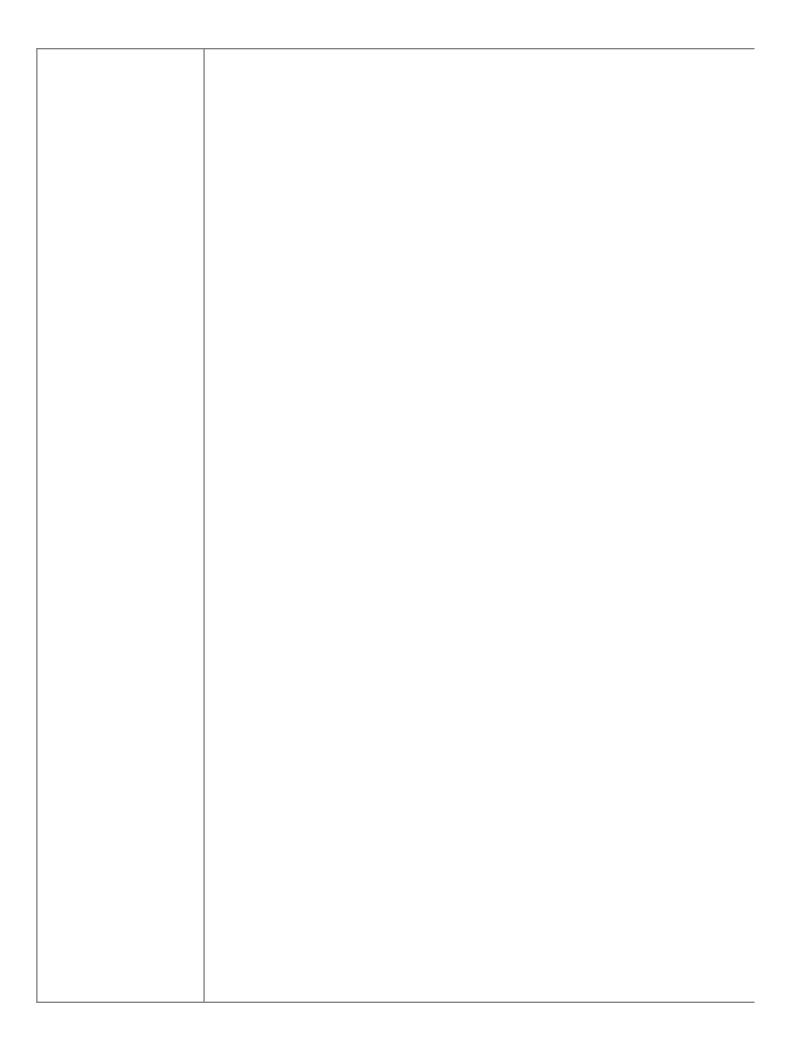


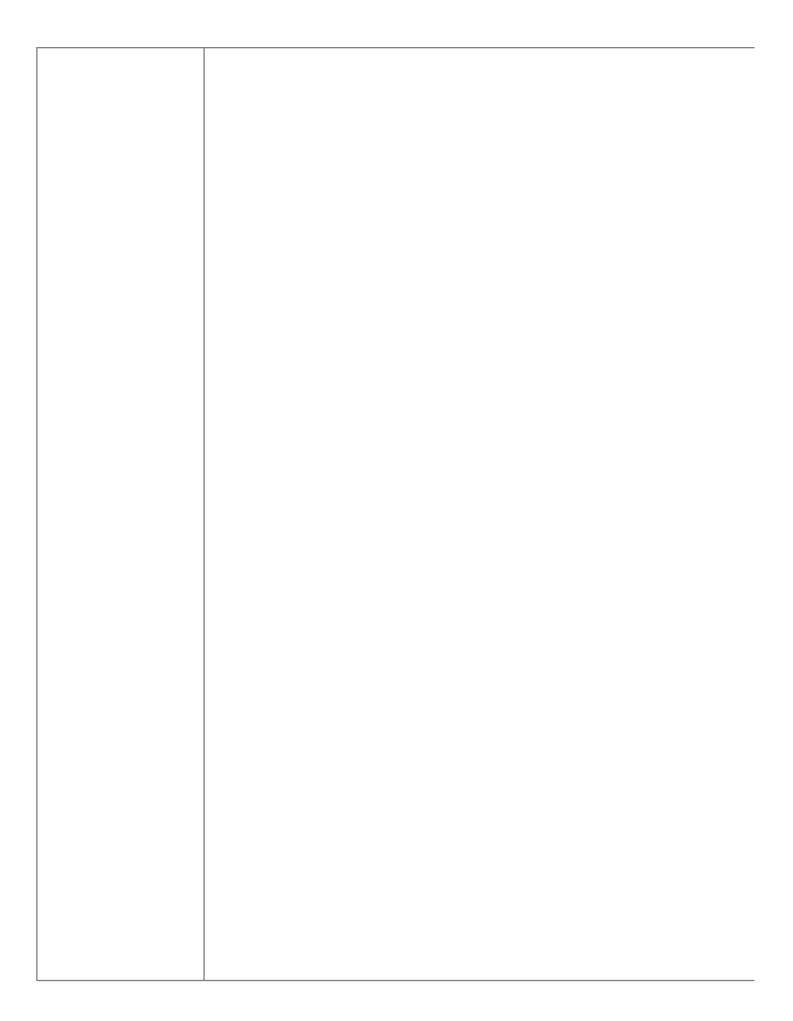


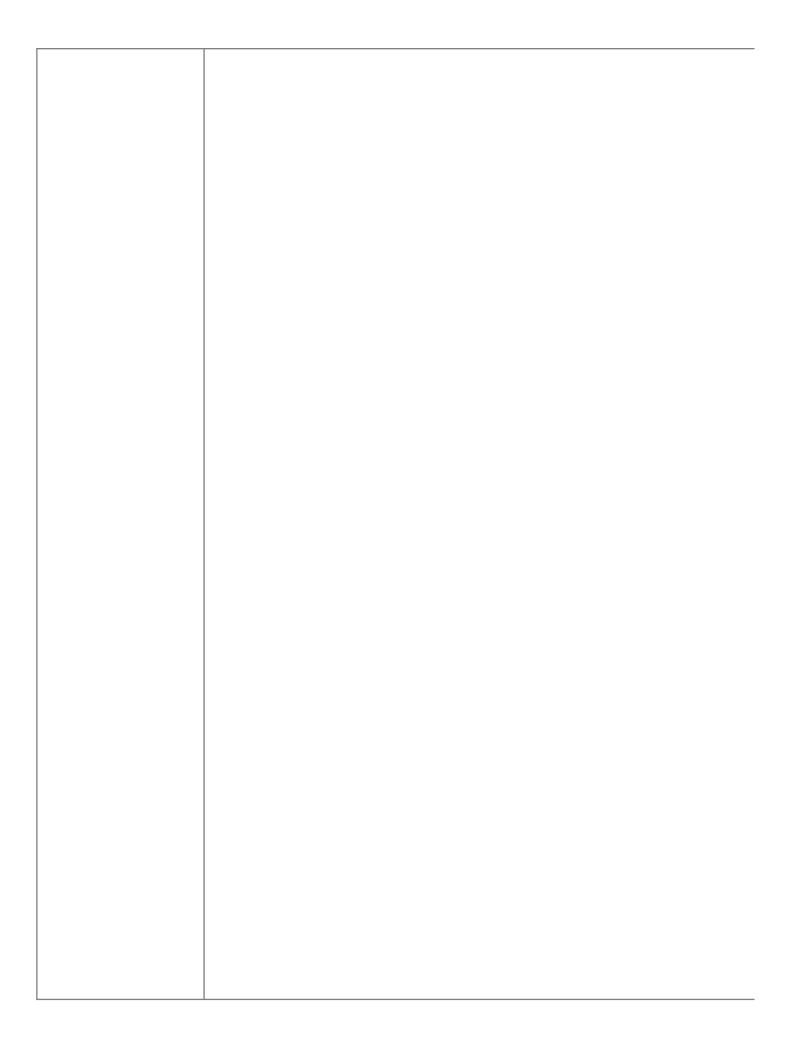


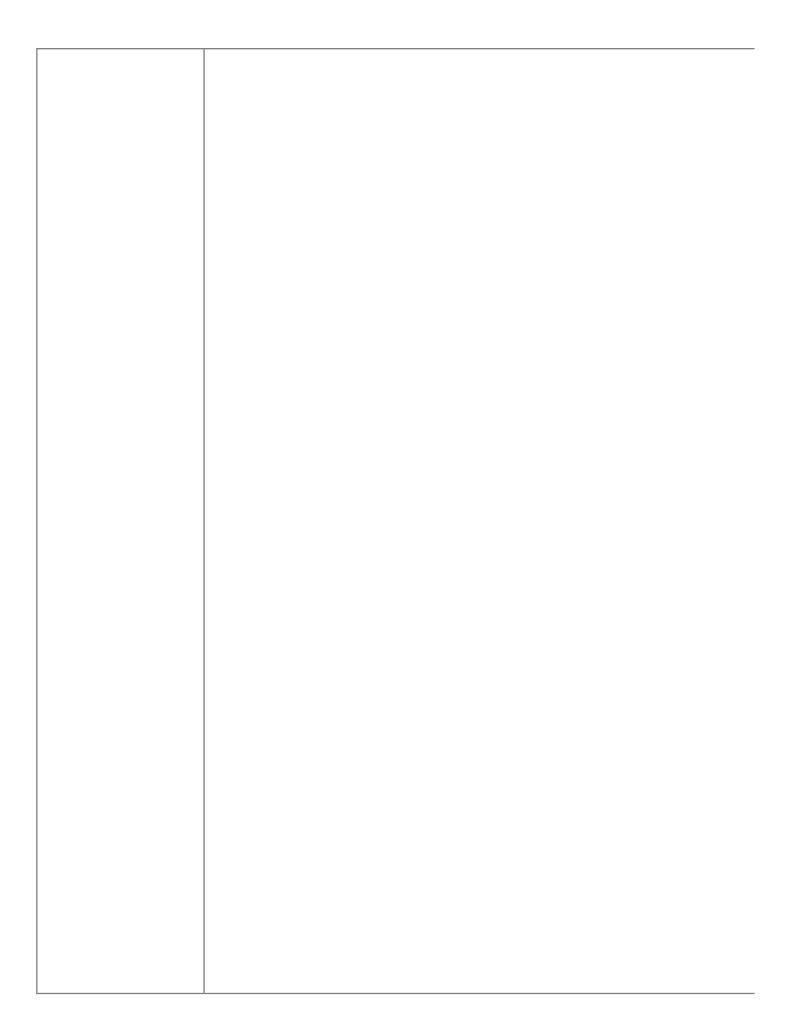


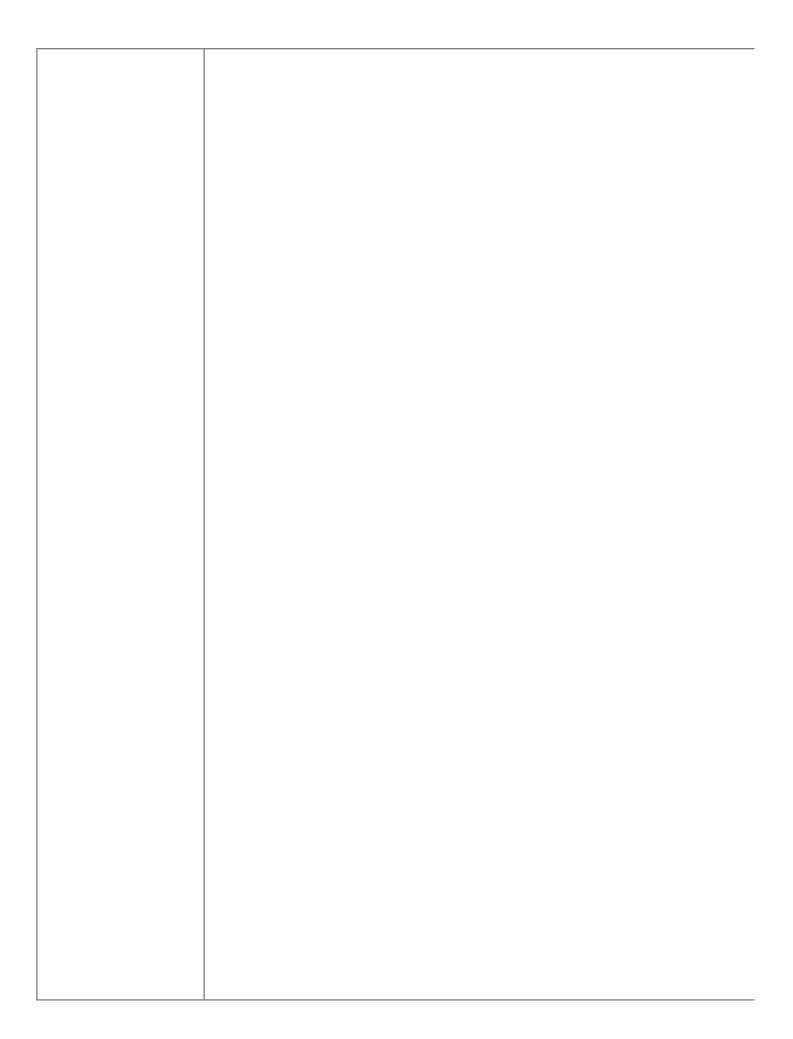


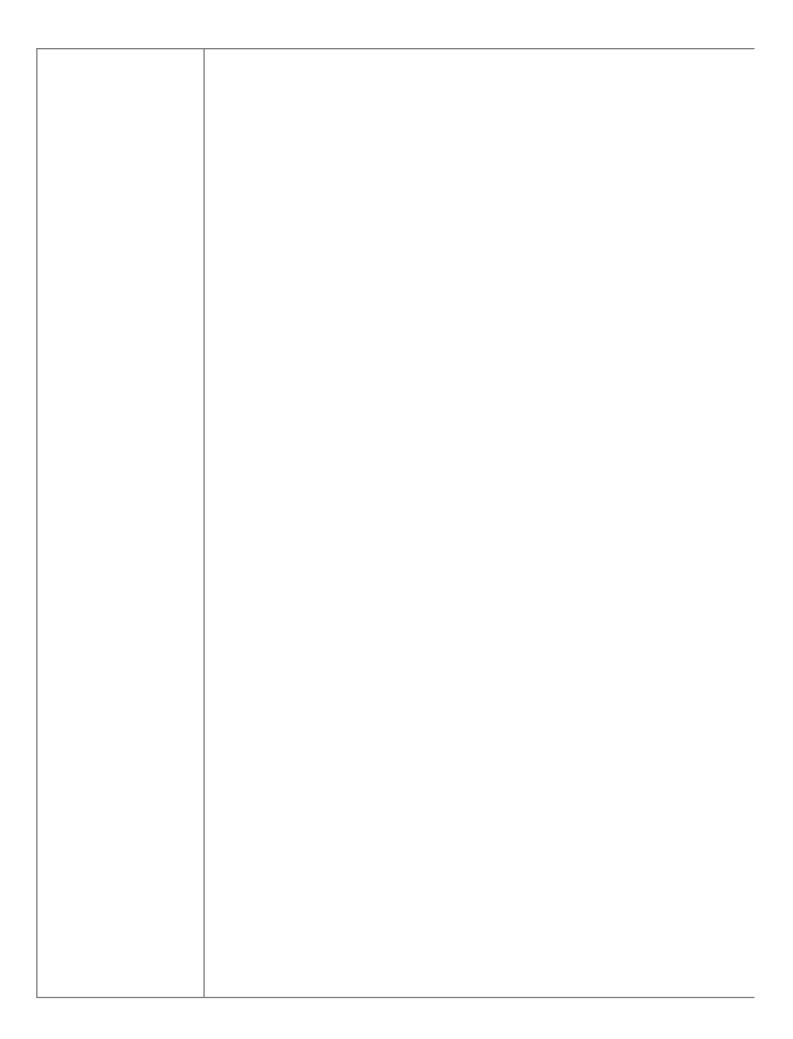


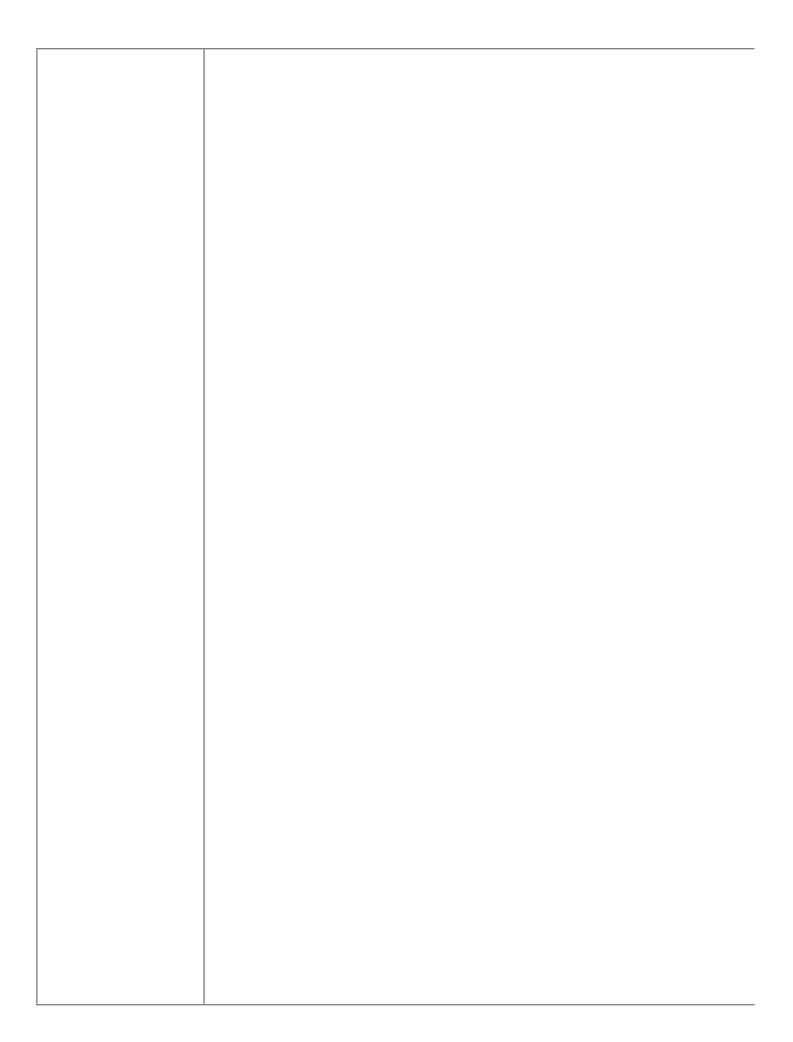


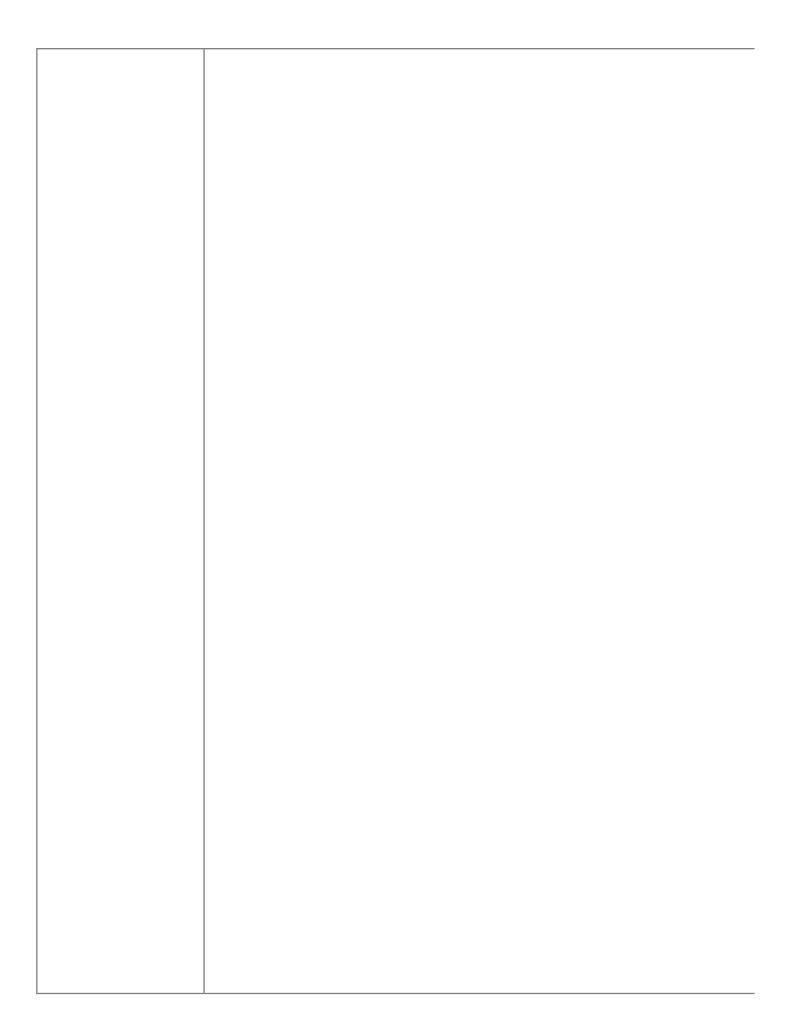


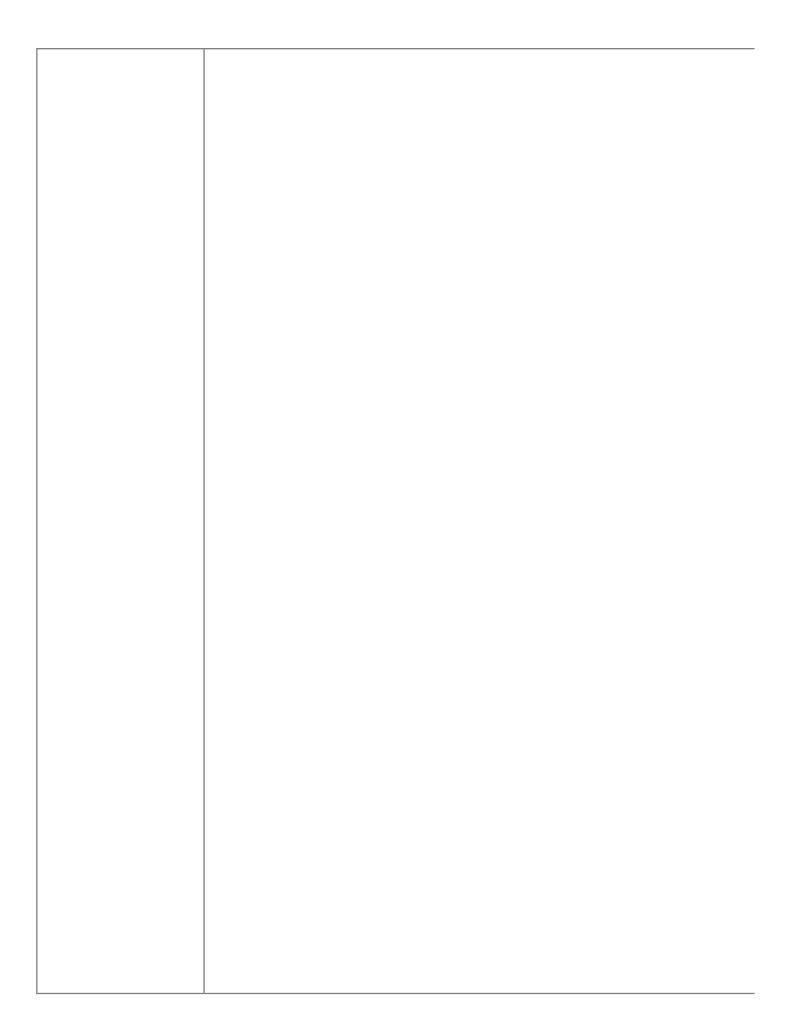












Grading and Evaluati	on Guidelines used throughout the units.
Common assessments are	used throughout the units.
Other Details	
SCED	
52725 Sajanga (Crada 5)	
53235 Science (Grade 5) Science (Grade 5) courses	build on the study of various systems. They may include identification and
description of cycles, comparisons of forms of matter and energy, forces, or content consistent with state	
academic standards. Students may make comparisons and interpret and analyze information.	