



San Diego Unified School District
Instructional Support Services - Science



Grade 5 – Water Planet Earth Science Unit of Study

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**Science Vision for
San Diego Unified School District**
Science is an integral part of the intellectual development of a child. Interest in science begins with attitudes and values established in the earliest years through daily experiences. Students graduating from high school must have a foundation in scientific knowledge and evidence based reasoning.

Updated versions of this unit of study can be found online in the *Curriculum Resources for Teachers* section of www.sandi.net



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**Grade 5 – Water Planet
Module Overview**

Overview of the Unit

The Water Planet Module consists of five sequential investigations, each designed to introduce or reinforce concepts of earth science. The investigations start with Earth in the solar system, then focus on the dynamics of weather and water cycling in Earth's atmosphere.

Grade 5 Earth Science Conceptual Flow

Concept #1

The solar system consists of planets and other bodies that orbit the Sun in predictable paths.

Subconcepts

Investigation #1: Solar System

The solar system comprises eight planets and various other bodies orbiting the Sun, a typical star composed mostly of hydrogen and helium.

Solar-system bodies can be put into categories, such as gas giants, terrestrial planets, and satellites.

Gravity is a pulling force that constantly changes the direction of travel of planets to maintain them in orbit around the Sun.

Concept #2

A variable is anything that can change that might affect the outcome of an experiment.

Subconcepts

Investigation #2: Swingers

A pendulum is a mass that is free to swing around a point.

A variable is anything can change in an experiment that might affect the outcome.

In a controlled experiment the independent variable is changed in order to determine how that variable affects the outcome of the experiment. All other variables are controlled.

Concept #3

Water on Earth moves between the oceans and land through the processes of evaporation and condensation.

Subconcepts

Investigation #3: Water Vapor

Evaporation is the process by which liquid water changes into water vapor.

Temperature and surface area affect the rate of evaporation.

Condensation occurs when water vapor touches a cool surface and changes into liquid.

Evaporation and condensation contribute to the movement of water through the water cycle.

Subconcepts

Investigation #5: Weather

Most of Earth's water (97%) is salt water.

Weather is the condition of the atmosphere at a given place and time: the amount of heat, moisture, pressure, and movement.

Solar energy drives weather.

Severe weather occurs when one or more variables is extreme, resulting in conditions that are dangerous and destructive.

Weather maps display weather conditions and can be used to forecast weather.

Concept #4

Energy from the Sun heats Earth unevenly, causing air movements that result in changing weather patterns.

Subconcepts

Investigation #4: Heating Earth

The different energy-absorbing properties of earth materials can lead to uneven heating of Earth's surface.

Cold fluids are denser than warm fluids.

Convection currents result from uneven heating of Earth's surface.

Compressed air exerts pressure equally in all directions.

Earth's atmospheric pressure decreases with distance above Earth's surface.



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Grade 5 – Water Planet
California Science Standards



5th Grade Science Content Standards Addressed in this Module

Earth Sciences

ES3 Water on Earth moves between the oceans and land through the processes of evaporation and condensation. As a basis for understanding this concept:

- ES3a Students know most of Earth's water is present as salt water in the oceans, which cover most of Earth's surface.
- ES3b Students know when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water.
- ES3c Students know water vapor in the air moves from one place to another, can form fog or clouds, which are tiny droplets of water or ice, and can fall to earth as rain, hail, sleet, or snow.
- ES3d Students know that the amount of fresh water located in rivers, lakes, underground sources, and glaciers is limited and that its availability can be extended by recycling and decreasing the use of water.
- ES3e Students know the origin of the water used by their local communities.

ES4 Energy from the Sun heats Earth unevenly, causing air movements that result in changing weather patterns. As a basis for understanding this concept:

- ES4a Students know uneven heating of Earth causes air movements (convection currents).
- ES4b Students know the influence that the ocean has on the weather and the role that the water cycle plays in weather patterns.
- ES4c Students know the causes and effects of different types of severe weather.
- ES4d Students know how to use weather maps and data to predict local weather and know that weather forecasts depend on many variables.
- ES4e Students know that the Earth's atmosphere exerts a pressure that decreases with distance above Earth's surface and that at any point it exerts this pressure equally in all directions.

5th Grade Science Content Standards Addressed in this Module (continued)

- ES5 The solar system consists of planets and other bodies that orbit the Sun in predictable paths. As a basis for understanding this concept:
- ES5a Students know the Sun, an average star, is the central and largest body in the solar system and is composed primarily of hydrogen and helium.
 - ES5b Students know the solar system includes the planet Earth, Swingers, the Sun, eight other planets and their satellites, and smaller objects, such as asteroids and comets.
 - ES5c Students know the path of a planet around the Sun is due to the gravitational attraction between the Sun and the planet.

Investigation and Experimentation

- I&E6 Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
- I&E6a Classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria.
 - I&E6b Develop a testable question.
 - I&E6c Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.
 - I&E6d Identify the dependent and controlled variables in an investigation.
 - I&E6e Identify a single independent variable in a scientific investigation and explain how this variable can be used to collect information to answer a question about the results of the experiment.
 - I&E6f Select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.
 - I&E6g Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data.
 - I&E6h Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.
 - I&E6i Write a report of an investigation that includes conducting tests, collecting data or examining evidence, and drawing conclusions.



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Grade 5 – Water Planet
Pacing the Unit as a Whole

Recommended Pacing for FOSS California *Water Planet* - Pacing the Unit as a Whole

Essential = lessons that cover Content and/or Investigation & Experimentation standards; are tested on SDUSD Earth Science Benchmark and CST

Foundational = lessons that build concepts for future learning; may or may not be tested

Optional = lessons cover Investigation & Experimentation standards only and are not tested on SDUSD Earth Science Benchmark

Pre-Test				
Essential Day 1 Start Inv. 3 Part 1 A	Essential Day 2 A/W/R	Essential Day 3 Start Inv. 3 Part 2 A	Essential Day 4 Data Collection Day	Essential Day 5 Data Collection Day
Essential Day 6 Data Collection Day	Essential Day 7 A/W	Essential Day 8 R	Optional Start Inv. 3 Part 3 A	Optional No Science Day
Optional No Science Day	Optional A/W	Essential Day 9 Start Inv. 3 Part 4 R/A	Essential Day 10 A	Essential Day 11 A/W
Essential Day 12 A/W	Essential Day 13 R	Essential Day 13 R I-Check 3 <i>If Optional Days are not taught – remove item WP38 A-D.</i>	Essential Day 14 Review	Essential Day 15 Start Inv. 4 Part 1 A
Essential Day 16 A	Essential Day 17 A/W	Essential Day 18 R	Essential Day 19 Start Inv. 4 Part 2 A	Essential Day 20 A/W
Essential Day 21 R	Essential Day 22 Start Inv. 4 Part 3 A	Essential Day 23 A/W	Essential Day 24 R	Essential Day 25 I-Check 4
Essential Day 26 Review	Essential Day 27 Start Inv. 5 Part 1 A	Essential Day 28 A	Essential Day 29 A/W/R	Essential Day 30 Start Inv. 5 Part 2 A/R

A – Active Investigation sessions include hands-on work with materials, thinking about the concrete experiences, small-group discussion, writing in science notebooks, learning new vocabulary in context, and completing written embedded assessments to inform instruction. (Approximately 60 minutes)

W – Wrap-up sessions are teacher-directed vocabulary reinforcement and science content review. (Approximately 30 minutes)

R – Reading sessions (*Science Resources* book) include individual and interactive reading, answering review questions, and discussing the reading to ensure that students integrate the information. (Approximately 30 minutes)

I-Checks are short summative assessments. Students respond to written prompts. The next day, after the teacher has scored the assessments, students review their written responses to reflect on and improve their understanding. (Approximately 30 minutes)

Recommended Pacing for FOSS California *Water Planet* - Pacing the Unit as a Whole (continued)

<i>Essential</i> Day 31 A/W	<i>Essential</i> Day 32 Start Inv. 5 Part 3 A/R	<i>Essential</i> Day 33 A	<i>Essential</i> Day 34 W I-Check 5	<i>Essential</i> Day 35 Review
<i>Essential</i> Day 36 Start Inv. 5 Part 4 A	<i>Essential</i> Day 37 R	<i>Essential</i> Day 38 Start Inv. 1 Part 1 A	<i>Essential</i> Day 39 A/W	<i>Essential</i> Day 40 R
<i>Essential</i> Day 41 Start Inv. 1 Part 2 A/R	<i>Essential</i> Day 42 A/R	<i>Essential</i> Day 43 A/W	<i>Essential</i> Day 44 R	<i>Essential</i> Day 45 I-Check 1
<i>Essential</i> Day 46 R Review	<i>Foundational</i> Start Inv. 2 Part 1 A	<i>Foundational</i> A/W	<i>Foundational</i> Start Inv. 2 Part 2 A	<i>Foundational</i> A
<i>Foundational</i> W/R	<i>Foundational</i> Start Inv. 2 Part 3 A	<i>Foundational</i> A/W	<i>Foundational</i> R	<i>Foundational</i> R I-Check 2
<i>Foundational</i> Review	Day 57 DISTRICT Earth Science Benchmark			



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Grade 5 – Water Planet
Pacing Guide – Investigation 3: Water Vapor

Investigation Overview

Investigation 3: Water Vapor

Concept: Water on Earth moves between the oceans and lands through the processes of evaporation and condensation.

Students investigate the effect of surface area and air temperature on evaporation. They observe condensation and learn the conditions that lead to condensation. Students investigate the effect of temperature on condensation and think about evaporation and condensation at the molecular level. Students learn the origins of clouds, fog, dew, and frost. They select appropriate tools for making quantitative observations. They record and display data using charts and graphs and make inferences based on those data. Students manipulate and analyze variables to acquire data and make inferences. They write reports of investigations, including data and conclusions.

Part 1: Evaporation	Part 2: Evaporation Locations
<p><u>Summary</u> Students observe and consider a demonstration in which two paper towels are soaked with equal amounts of water and then left to evaporate, one in a closed cup and the other in an open cup.</p>	<p><u>Summary</u> Students investigate the effect of location/air temperature on the rate of evaporation. They measure equal amounts of water into four cups, place the cups in four locations and monitor the temperatures at the locations for 4 days. They measure and compare the amount of water remaining in the cups.</p>
<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ Evaporation is the process by which liquid water changes into water vapor, a gas. 	<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ Temperature affects the rate of evaporation.
<p><u>Time Allocation</u> Active Investigation: 1 day Wrap-Up/Reading: 1 day</p>	<p><u>Time Allocation</u> Active Investigation: 2 days Data Collection: 3 days Reading: 1 day</p>
<p><u>CA Science Standards</u> ES3b</p>	<p><u>CA Science Standards</u> ES3b, I&E6f, I&E6g</p>

Investigation Overview (continued)

<p>Investigation 3: Water Vapor Concept: Water on Earth moves between the oceans and lands through the processes of evaporation and condensation. Students investigate the effect of surface area and air temperature on evaporation. They observe condensation and learn the conditions that lead to condensation. Students investigate the effect of temperature on condensation and think about evaporation and condensation at the molecular level. Students learn the origins of clouds, fog, dew, and frost. They select appropriate tools for making quantitative observations. They record and display data using charts and graphs and make inferences based on those data. Students manipulate and analyze variables to acquire data and make inferences. They write reports of investigations, including data and conclusions.</p>	
<p>Part 3: Surface Area</p>	<p>Part 4: Condensation</p>
<p>Students measure equal amounts of water into four containers of different shapes. The surface area of the water is different in each container. After 4 days, students measure and compare the amount of water remaining in each container.</p>	<p><u>Summary</u> Students observe cups of ice water and room temperature water and observe the process of condensation. They set up a condensation chamber and consider the factors that cause condensation. They prepare a surface that is below the freezing point of water and observe the formation of frost.</p>
<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ The surface area of a volume of water affects the rate of evaporation. 	<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ Condensation occurs when water vapor touches a cool surface and changes into liquid. ▪ Evaporation and condensation contribute to the movement of water through the water cycle.
<p><u>Time Allocation</u> Active Investigation: 3 days No Science: 2 days Reading: 1 day</p>	<p><u>Time Allocation</u> Active Investigation: 2 days Reading: 1 day Assessment/Review: 2 days</p>
<p><u>CA Science Standards</u> ES3b, I&E6d, I&E6e, I&E6f, I&E6g</p>	<p><u>CA Science Standards</u> ES3b, I&E6f, I&E6g</p>



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Grade 5 – Water Planet
Pacing Guide – Investigation 3: Water Vapor

Pacing Guide – Investigation 3: Water Vapor

Day 1		Day 2		Day 3	
Prep	Instruction	Prep	Instruction	Prep	Instruction
<input type="checkbox"/> Read “At a Glance” <i>TG p. 108-109</i> <input type="checkbox"/> Read “Background for the Teacher” <i>TG p. 110-11</i> <input type="checkbox"/> Read “Teaching Children About Water Vapor” <i>TG p. 112-113</i> <input type="checkbox"/> Watch Video demo of Inv. 3, Pt 1 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 114-115</i>	Guiding the Investigation <input type="checkbox"/> “Part 1: Evaporation” Steps 1-3 <i>TG p. 116</i>		Guiding the Investigation <input type="checkbox"/> “Part 1: Evaporation/ Wrapping up Part 1 Steps 4-8 <i>TG p. 117-118</i> Reading in Science Resources <input type="checkbox"/> Steps 9-10 <i>TG p. 119</i> Student Reading: Science Resources p. 182-183 <input type="checkbox"/> Body of Evidence Prompt #3 <i>TG p. 257</i>	<input type="checkbox"/> Watch Video demo of Inv. 3, Pt 2 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 120-121</i>	Guiding the Investigation <input type="checkbox"/> “Part 2: Evaporation Locations; Steps 1-7 <i>TG p. 122-123</i>
Day 4		Day 5		Day 6	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Guiding the Investigation <input type="checkbox"/> “Part 2: Evaporation Locations; Step 6-7 <i>TG p. 123</i> CLASS DATA COLLECTION ONLY (10 minutes)		Guiding the Investigation <input type="checkbox"/> “Part 2: Evaporation Locations; Step 6-7 <i>TG p. 123</i> CLASS DATA COLLECTION ONLY (10 minutes)		Guiding the Investigation <input type="checkbox"/> “Part 2: Evaporation Locations; Step 6-7 <i>TG p. 123</i> CLASS DATA COLLECTION ONLY (10 minutes)

Pacing Guide – Investigation 3: Water Vapor (continued)

Day 7		Day 8		Optional Day	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Guiding the Investigation <input type="checkbox"/> “Part 2: Evaporation Locations/Wrapping up Part 2” Step 8-15 <i>TG p. 123-125</i> <input type="checkbox"/> Body of Evidence Prompt #4 <i>TG p. 258</i>		Reading in Science Resources <input type="checkbox"/> Steps 16-17 <i>TG p. 126</i> Student Reading: Science Resources p. 184-186	<input type="checkbox"/> Watch Video demo of Inv. 3, Pt 3 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 127-128</i>	Guiding the Investigation <input type="checkbox"/> Part 3: “Surface Area” Steps 1-4 <i>TG p. 129-130</i>
Optional Day		Optional Day		Optional Day	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	No Science Day (Water needs to evaporate)		No Science Day (Water needs to evaporate)		Guiding the Investigation <input type="checkbox"/> “Part 3: Surface Area/ Wrapping up Part 3” Step 5-11 <i>TG p. 130-132</i>
Day 9		Day 10		Day 11	
Prep	Prep	Prep	Instruction	Prep	Instruction
	Reading in Science Resources <input type="checkbox"/> Steps 12-13 <i>TG p. 133</i> Student Reading: Science Resources p. 187-188 Guiding the Investigation <input type="checkbox"/> Part 3: “Surface Area” Step 14 <i>TG p. 134</i> <input type="checkbox"/> Body of Evidence Prompt #5 <i>TG p. 262</i>		Guiding the Investigation <input type="checkbox"/> Part 3: “Surface Area” Step 14 (continued) <i>TG p. 134</i>	<input type="checkbox"/> Watch Video demo of Inv. 3, Pt 4 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 135-137</i>	Guiding the Investigation <input type="checkbox"/> Part 4: “Condensation” Step 1-7 <i>TG p. 138-139</i>

Pacing Guide – Investigation 3: Water Vapor (continued)

Day 12		Day 13		Day 14	
Prep	Prep	Prep	Instruction	Prep	Instruction
	Guiding the Investigation <input type="checkbox"/> Part 4: “Condensation”/ Wrapping up Part 4 Steps 8-15 <i>TG p. 140-142</i> <input type="checkbox"/> Body of Evidence Prompt #6 <i>TG p. 263</i>		Reading in Science Resources <input type="checkbox"/> Steps 16-17 <i>TG p. 143</i> Student Reading: Science Resources p. 189-193		Concluding Investigation 3 Reading in Science Resources <input type="checkbox"/> Steps 18-19 <i>TG p. 144</i> Student Reading: Science Resources p. 194-196 <input type="checkbox"/> I-Check 3 Step 14 <i>TG p.144, 406-411, 440-442</i>
Day 15					
Prep	Instruction				
	<input type="checkbox"/> Review <input type="checkbox"/> Interdisciplinary Extensions <i>TG p. 145-146</i> <input type="checkbox"/> Student Reading: Science Resources p. 197				



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Grade 5 – Water Planet
Pacing Guide – Investigation 4: Heating Earth

Investigation Overview

Investigation 4: Heating Earth

Concept: Energy from the Sun heats Earth unevenly, causing air movements that result in changing weather patterns.

Students observe that earth materials heat up at different rates. Soil heats rapidly; water heats slowly. They determine that the different rates at which earth materials heat up cause uneven heating of Earth’s surface. Students observe that warm water is less dense than cooler water and that warm water rises through cold water. They learn that uneven heating of Earth’s surface results in rising warm air and falling cold air in convection currents. Students learn that air is a mix of gases that has mass and takes up space. They discover that air can be compressed into a smaller space and that compressed air exerts pressure equally in all directions. Students learn that the weight of Earth’s atmosphere creates atmospheric pressure, which decreases with elevation.

Part 1: Heating Earth Materials	Part 2: Convection	Part 3: The Pressure Is On
<p><u>Summary</u> Students set up an investigation to monitor temperature changes when solar energy is absorbed by two different earth materials: water and dry soil. They record the temperature of the two earth materials every 3 minutes for 15 minutes in sunshine and then 15 minutes in shade. They graph the data to discover that dry soil heats up and cools down rapidly and water heats up and cools down slowly. The concept of uneven heating is introduced, and students read an article about uneven heating of Earth’s surface.</p>	<p><u>Summary</u> Students use water of different temperatures to discover the relationship between temperature and density. They put a layer of cold, blue water on the bottom of a vial of room-temperature water. They put a bag of hot water against the vial and watch the blue water rise as it warms. The blue water then cools and descends, creating a convection current. A reading describes how the same processes produce wind on Earth.</p>	<p>Students use syringes to explore the compressibility of air. They discover that compressed air pushes with a firm pressure. They look for evidence that shows that Earth’s atmosphere is exerting a constant pressure on everything. Students read an article about atmospheric pressure, learning that pressure declines with elevation and that atmospheric pressure is exerted equally in all directions.</p>
<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ Water heats up more slowly than soil. ▪ Water cools down more slowly than soil. ▪ The different energy-absorbing properties of earth materials can lead to uneven heating of Earth’s surface. 	<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ Cold water is denser than room-temperature water. ▪ Cold water sinks in room-temperature water. ▪ Warm water rises to the surface of room-temperature water. ▪ Convection currents result from uneven heating of Earth’s surface. 	<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ Air is matter; it occupies space and has mass. ▪ Air can be compressed. ▪ Compressed air exerts pressure equally in all directions. ▪ The pressure of Earth’s atmosphere decreases with distance above Earth’s surface.
<p><u>Time Allocation</u> Active Investigation: 3 days Reading: 1 day</p>	<p><u>Time Allocation</u> Active Investigation/Wrap-Up: 2 days Reading: 1 day</p>	<p><u>Time Allocation</u> Active Investigation/Wrap-Up: 2 days Reading: 2 days Assessment: 1 day</p>
<p><u>CA Science Standards</u> ES4a, I&E6c, I&E6d, I&E6f, I&E6g</p>	<p><u>CA Science Standards</u> ES4a, I&E6c, I&E6g</p>	<p><u>CA Science Standards</u> ES4e, I&E6h</p>



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Grade 5 – Water Planet
Pacing Guide – Investigation 4: Heating Earth

Pacing Guide – Investigation 4: Heating Earth

Day 16		Day 17		Day 18	
Prep	Instruction	Prep	Instruction	Prep	Instruction
<input type="checkbox"/> Read “At a Glance” <i>TG p. 148-149</i> <input type="checkbox"/> Read “Background for the Teacher” <i>TG p. 150-156</i> <input type="checkbox"/> Read “Teaching Children About Water Vapor” <i>TG p. 157-158</i> <input type="checkbox"/> Watch Video demo of Inv. 4, Pt 1 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 159-161</i>	Guiding the Investigation <input type="checkbox"/> “Part 1: Heating Earth Materials” Steps 1-10 <i>TG p. 162-164</i> <input type="checkbox"/> Body of Evidence Prompt #7 <i>TG p. 264-265</i>		Guiding the Investigation <input type="checkbox"/> “Part 1: Heating Earth Materials” Steps 11-14 <i>TG p. 165</i>	<input type="checkbox"/>	Guiding the Investigation <input type="checkbox"/> “Part 1: Heating Earth Materials/ Wrapping up Part 1” Steps 15-21 <i>TG p. 166-168</i> <input type="checkbox"/> Body of Evidence Prompt #8 <i>TG p. 266</i>
Day 19		Day 20		Day 21	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Reading in Science Resources <input type="checkbox"/> Steps 22-23 <i>TG p. 169</i> Student Reading: Science Resources p. 198-201	<input type="checkbox"/> Watch Video demo of Inv. 4, Pt 2 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 170-171</i>	Guiding the Investigation <input type="checkbox"/> “Part 2: Convection” Steps 1-14 <i>TG p. 172-176</i>	<input type="checkbox"/>	Guiding the Investigation Part 2: “Convection” <input type="checkbox"/> Wrapping up Part 2 Steps 15-17 <i>TG p. 177</i> <input type="checkbox"/> Body of Evidence Prompt #9 <i>TG p. 268</i>

Pacing Guide – Investigation 4: Heating Earth (continued)

Day 22		Day 23		Day 24	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Reading in Science Resources <input type="checkbox"/> Steps 18-19 <i>TG p. 178</i> Student Reading: Science Resources p. 202-207	<input type="checkbox"/> Watch Video demo of Inv. 4, Pt 3 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 179-181</i>	Guiding the Investigation <input type="checkbox"/> “Part 3: The Pressure Is On” Steps 1-9 <i>TG p. 182-184</i>	<input type="checkbox"/>	Guiding the Investigation <input type="checkbox"/> Part 3: The Pressure Is On”/Wrapping up” Steps 10-18 <i>TG p. 185-189</i> <input type="checkbox"/> Body of Evidence Prompt #10 <i>TG p. 270</i>
Day 25		Day 26		Day 27	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Reading in Science Resources <input type="checkbox"/> Steps 19-20 <i>TG p. 190-191</i> Student Reading: Science Resources p. 208-213		Concluding Investigation 4 Reading in Science Resources <input type="checkbox"/> Steps 21-22 <i>TG p. 191-192</i> Student Reading: Science Resources p. 214-217 <input type="checkbox"/> I-Check 4 Step 23 <i>TG p.192, 407-412, 443-445</i>		Guiding the Investigation <input type="checkbox"/> Review I-Check 4 <i>TG p. 192</i> <input type="checkbox"/> Interdisciplinary Extensions <i>TG p. 193-195</i>



San Diego Unified School District
Instructional Support Services - Science



Grade 5 – Water Planet
Pacing Guide – Investigation 5: Weather

Investigation Overview

Investigation 5: Weather

Concept: Energy from the Sun heats Earth unevenly, causing air movements that result in changing weather patterns.

Students learn that most of Earth’s water (97%) is salt water in the oceans; Earth’s fresh water is found in many locations including the atmosphere, lakes, groundwater, and glaciers. They simulate the mechanisms of the water cycle and its function in redistributing water over Earth’s surface. Students learn how the ocean affects weather and that weather is the condition of the atmosphere at a given place and time. Students learn that the Sun’s energy drives weather and realize that weather is the amount of heat, moisture, pressure, and movement in the atmosphere. They use weather maps to forecast weather, learn the causes and effects of severe weather, and explore local use and recycling of water.

Part 1: Water Cycle

Summary

Students consider why Earth is called the water planet. They play catch with a globe, keeping track of how often their finger ends up on water. They take part in a demonstration that shows the relative amounts of fresh water and salt water, and their distribution on Earth. They do an activity that simulates the travels of a water molecule through the water cycle. Finally, students read an expository article that describes both the big pictures of the general water cycle and the complexity of the multitudes of cycles in which water evaporates from Earth’s surface, condenses in the atmosphere, and returns to the surface as solid or liquid precipitation.

Subconcepts

- Most of Earth’s water (97%) is salt water in the oceans.
- Earth’s fresh water is found in many locations, including the atmosphere, lakes, rivers, groundwater, and glaciers.
- The process in which water evaporates from Earth’s surface, moves through the atmosphere, condenses, and returns to Earth’s surface is the water cycle.

Time Allocation

Active Investigation: 2 days
Reading: 2 days

CA Science Standards

ES3a, ES3c, ES3d, ES4b

Part 2: Severe Weather

Summary

Students read an expository article about severe weather in the world. They are introduced to hurricanes, tornadoes, thunderstorms, droughts, heat, and cold, and they learn the particular conditions that cause them and the effects they have on life and property. Students read about the severe weather they might encounter in California.

Subconcepts

- Weather is the condition of the atmosphere at a given place and time.
- The sun is the source of energy that drives weather.
- Weather is defined by weather variables: the amount of heat, moisture, pressure, and movement in the atmosphere.
- Severe weather occurs when one or more variables is extreme, resulting in conditions that are dangerous or destructive.

Time Allocation

Active Investigation/Reading: 2 days

CA Science Standards

ES4b, ES4c

Investigation Overview (continued)

<p>Investigation 5: Weather Concept: Energy from the Sun heats Earth unevenly, causing air movements that result in changing weather patterns. Students learn that most of Earth’s water (97%) is salt water in the oceans; Earth’s fresh water is found in many locations including the atmosphere, lakes, groundwater, and glaciers. They simulate the mechanisms of the water cycle and its function in redistributing water over Earth’s surface. Students learn how the ocean affects weather and that weather is the condition of the atmosphere at a given place and time. Students learn that the Sun’s energy drives weather and realize that weather is the amount of heat, moisture, pressure, and movement in the atmosphere. They use weather maps to forecast weather, learn the causes and effects of severe weather, and explore local use and recycling of water.</p>	
<p>Part 3: Weather Maps</p>	<p>Part 4: Local Water</p>
<p>Students read an expository article that discusses how meteorologists acquire weather data from three sources: surface measurements with traditional weather instruments, atmospheric measurements with balloons and radiosondes, and satellite images. They learn how those data are displayed symbolically on maps. Students are introduced to pressure centers, weather fronts, and the kinds of weather they generate. They practice predicting weather, using local weather maps.</p>	<p><u>Summary</u> Students use State of California resources to research the source and use of water in their community. They look at the amount of water needed to grow and/or process various food items. They put together a menu and calculate the “water price” of the meal. Students brainstorm ways to reduce the amount of water they use, based on eating habits and behaviors around their homes.</p>
<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ A weather map is a picture of the weather variables in an area at a given time. ▪ Weather maps are tools used by meteorologists to forecast weather. ▪ Weather maps display high and low pressure, weather fronts, and precipitation. 	<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ Human water supplies originate in rivers and lakes or groundwater aquifers.
<p><u>Time Allocation</u> Active Investigation/Reading: 2 days Reading: 2 days Assessment/Wrap-Up: 2 days</p>	<p><u>Time Allocation</u> Active Investigation: 1 day Reading: 1 day Assessment: 1 day</p>
<p><u>CA Science Standards</u> ES4d</p>	<p><u>CA Science Standards</u> ES3d, ES3e</p>



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Grade 5 – Water Planet
Pacing Guide – Investigation 5: Weather

Pacing Guide – Investigation 5: Weather

Day 28		Day 29		Day 30	
Prep	Instruction	Prep	Instruction	Prep	Instruction
<input type="checkbox"/> Read “At a Glance” <i>TG p. 198-201</i> <input type="checkbox"/> Read “Background for the Teacher” <i>TG p. 202-213</i> <input type="checkbox"/> Read “Teaching Children About Weather and Water” <i>TG p. 214-215</i> <input type="checkbox"/> Watch Video demo of Inv. 5, Pt 1 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 216-218</i>	Guiding the Investigation <input type="checkbox"/> “Part 1: Water Cycle” Steps 1-7 <i>TG p. 219-222</i> <input type="checkbox"/> Body of Evidence Prompt #11 <i>TG p. 219 and 226</i>		Guiding the Investigation <input type="checkbox"/> “Part 1: Water Cycle” Steps 8-18 <i>TG p. 222-226</i>		Guiding the Investigation <input type="checkbox"/> “Part 1: Water Cycle”; Wrapping up Part 1 Steps 19-20 <i>TG p. 227</i> Reading in Science Resources <input type="checkbox"/> Steps 21-24 <i>TG p. 228-229</i> Student Reading: Science Resources p.220-222, 223-226

Pacing Guide – Investigation 5: Weather (continued)

Day 31		Day 32		Day 33	
Prep	Instruction	Prep	Instruction	Prep	Instruction
<input type="checkbox"/> Watch Video demo of Inv. 5, Pt 2 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 230-231</i>	Guiding the Investigation <input type="checkbox"/> “Part 2: Severe Weather” Steps 1-4 <i>TG p. 232-233</i> Reading in Science Resources <input type="checkbox"/> Part 2: Severe Weather” Steps 5-6 <i>TG p. 233-234</i> Student Reading: Science Resources p. 227-235 <input type="checkbox"/> Body of Evidence Prompt #12 <i>TG p. 272</i>	<input type="checkbox"/>	Guiding the Investigation <input type="checkbox"/> Part 2: “Severe Weather/ Wrapping up” Step 7-9 <i>TG p. 234-235</i>	<input type="checkbox"/> Watch Video demo of Inv. 5, Pt 3 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 236-237</i>	Guiding the Investigation <input type="checkbox"/> “Part 3: Weather Maps” Steps 1-3 <i>TG p. 238</i> Reading in Science Resources <input type="checkbox"/> Part 2: Severe Weather” Steps 4-6 <i>TG p. 239-240</i> Student Reading: Science Resources p. 236-245 <input type="checkbox"/> Body of Evidence Prompt #13 <i>TG p. 273</i>

Pacing Guide – Investigation 5: Weather (continued)

Day 34		Day 35		Day 36	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Guiding the Investigation <input type="checkbox"/> “Part 3: Weather Maps” Steps 7-8 <i>TG p. 241</i>		Guiding the Investigation <input type="checkbox"/> Wrapping up “Part 3: Weather Maps” Steps 9-10 <i>TG p. 242</i> <input type="checkbox"/> I-Check 5 Step 11 <i>TG p.242, 446-449</i>		Guiding the Investigation <input type="checkbox"/> Review I-Check 5 Step 11 <i>TG p. 242, 419-425</i>
Day 37		Day 38			
Prep	Instruction	Prep	Instruction		
<input type="checkbox"/> Watch Video demo of Inv. 5, Pt 4 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 243-244</i>	Guiding the Investigation <input type="checkbox"/> Part 4: “Local Weather” Steps 1-8 <i>TG p. 245-247</i>		Concluding Investigation 5 Reading in Science Resources <input type="checkbox"/> Steps 9-10 <i>TG p. 248</i> Student Reading: Science Resources p. 248-250 <input type="checkbox"/> Interdisciplinary Extensions <i>TG p. 249</i>		



Grade 5 – Water Planet
Pacing Guide – Investigation 1: Solar System

Investigation Overview

<p>Investigation 1: The Solar System Concept: The solar system consists of planets and other bodies that orbit the Sun in predictable paths. Students recognize the Sun as a star, learn its composition, and understand its role in the solar system. They identify the planets and other bodies in the solar system and determine similarities and differences between them. Students classify planets by their various properties. They learn how the pulling force of gravity keeps solar-system bodies in their orbits. Students record and display the organization of the solar system graphically.</p>	
<p>Part 1: Solar-System Cards</p>	<p>Part 2: Solar System Gravity</p>
<p><u>Summary</u> Students work in pairs with a set of 18 solar-system cards. The cards have an image of a solar-system body (e.g., the Sun) on one side, and statistical information about the body on the reverse side. Based on previous knowledge, information on the cards, and information provided by the teacher, students organize the objects into a model of the solar system. In the process they organize the bodies into categories that help them understand other characteristics of the solar system. They record the categories in science notebooks. This part ends with a reading about the solar system.</p>	<p><u>Summary</u> Students observe a demonstration of a ball swinging in a circle on the end of a string. They analyze the circular orbit of the ball to determine why it travels in a circle. The concept of a force pulling on the ball to continuously change its direction of travel is transferred to the solar system to explain the circular orbits of planets. Gravity is introduced as the force that pulls on planets to change their direction of travel to produce the circular orbits. Students read a technical article on gravitational attraction and two short biographies—solar researcher Ramon Lopez and astronaut Mae Jemison. The investigation ends with a summary video about the solar system.</p>
<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ The Sun is an average star and is composed mostly of hydrogen and helium. ▪ The solar system includes the Sun and the objects orbit it, including Earth, moon, seven other planets and their satellites, and smaller objects, including asteroids and comets. ▪ The objects in the solar system vary in size, composition, and other characteristics, and can be classified based on those characteristics. ▪ The planets are classified as terrestrial or as gas giants. 	<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ The pulling force of gravity keeps the planets and other objects in orbit by continuously changing their direction of travel.
<p><u>Time Allocation</u> Active Investigation: 2 days Reading: 1 day</p>	<p><u>Time Allocation</u> Active Investigation: 3 days Reading: 2 days Assessment: 1 day</p>
<p><u>CA Science Standards</u> ES5a, ES5b, I&E6a, I&E6g</p>	<p><u>CA Science Standards</u> ES5c</p>



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Grade 5 – Water Planet
Pacing Guide – Investigation 1: Solar System

Pacing Guide – Investigation 1: Solar System

Day 39		Day 40		Day 41	
Prep	Instruction	Prep	Instruction	Prep	Instruction
<input type="checkbox"/> Read “Overview” <i>TG p. 1-29</i> <input type="checkbox"/> Read “At a Glance” <i>TG p. 42-43</i> <input type="checkbox"/> Read “Background for the Teacher” <i>TG p. 44-47</i> <input type="checkbox"/> Read “Teaching Children About The Solar System” <i>TG p. 48-49</i> <input type="checkbox"/> Watch Video demo of Inv. 1, Pt 1 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 50-52</i> <input type="checkbox"/> Administer FOSS Grade 5 Earth Science Pretest <i>TG p. 427-434</i>	Guiding the Investigation <input type="checkbox"/> “Part 1: Solar System Cards” Steps 1-16 <i>TG p. 53-56</i> <input type="checkbox"/> Body of Evidence Prompt #1 <i>TG p. 251</i>		Guiding the Investigation <input type="checkbox"/> “Part 1: Solar System Cards; Wrapping up Part 1” Steps 17-18 <i>TG p. 57</i>		Reading in Science Resources <input type="checkbox"/> Steps 19-20 <i>TG p. 58</i> Student Reading: Science Resources p. 145-158

Pacing Guide – Investigation 1: Solar System (continued)

Day 42		Day 43		Day 44	
Prep	Instruction	Prep	Instruction	Prep	Instruction
<input type="checkbox"/> Watch Video demo of Inv. 1, Pt 2 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 59-60</i>	Guiding the Investigation <input type="checkbox"/> “Part 2: Solar System Gravity; Steps 1-4 <i>TG p. 61-62</i> <input type="checkbox"/> Reading in Science Resources Step 5-6 <i>TG p. 62</i> Student Reading: Science Resources p. 160-161		Guiding the Investigation <input type="checkbox"/> Reading in Science Resources Step 7 <i>TG p. 63</i> <input type="checkbox"/> “Part 2: Solar System Gravity; Steps 8-9 <i>TG p. 63-64</i> Student Reading: Science Resources p. 159, 162-163		<input type="checkbox"/> “Part 2: Solar System Gravity; Wrapping up Part 2” Step 10-11 <i>TG p. 65</i>
Day 45		Day 46		Day 47	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Reading in Science Resources <input type="checkbox"/> Step 12-13 <i>TG p. 66</i> Student Reading: Science Resources p. 164-166	<input type="checkbox"/>	Concluding Investigation 1 <input type="checkbox"/> I-Check 1 Step 14 <i>TG p. 66, 210-215, 396-399</i>		<input type="checkbox"/> Review <input type="checkbox"/> Interdisciplinary Extensions <i>TG p. 67-69</i> Student Reading: Science Resources p. 166-168



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Grade 5 – Water Planet
Pacing Guide – Investigation 2: Swingers

Investigation Overview

<p>Investigation 2: Swingers Concept: A variable is anything that can change that might affect the outcome of an experiment. Students identify, manipulate, and control variables. They learn to distinguish among independent, dependent, and controlled variables. Students conduct controlled experiments to find out what variables affect the number of cycles a pendulum will complete in a unit of time. They relate length of a pendulum to the number of cycles it completes in a unit of time. Students make T-tables as well as concrete, pictorial, and two-coordinate graphs of experimental results. They use graphs to check for experimental error and to make inferences (predictions).</p>		
Part 1: Exploring Swingers	Part 2: Testing Variables	Part 3: Predicting Swings
<p><u>Summary</u> Students follow written instructions to build standard pendulums made from string and pennies. They establish a procedure for determining the number of swings the pendulum will make in 15 seconds. They identify variables that might affect the number of swings the pendulum makes in 15 seconds.</p>	<p><u>Summary</u> Using controlled experimentation, students test the variables of mass, release position, and length to see how they affect how many times a pendulum swings in a given amount of time. Students display their results on a concrete graph, in a T-table, and on a pictorial graph. They use the graphs to look for questionable data and to identify the relationship between the independent variable and the dependent variable. Students read an article about Galileo and his discovery of the principles governing the behavior of pendulums.</p>	<p><u>Summary</u> Students are introduced to two-coordinate graphs. They plot the swinger data on a graph and compare it to the concrete and pictorial graphs of the same information. Students use the graph to make predictions (inferences) and create pendulums with new lengths to test their predictions. Students read an article in which a two-coordinate graph is used to predict the solution to a puzzle.</p>
<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ A pendulum is a mass that is free to swing around a point. ▪ A variable is anything that you can change in an experiment that might affect the outcome. 	<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ In a controlled experiment only one variable, the independent variable, is changed in order to determine how that variable affects the outcome of the experiment. All other variables are controlled. ▪ As the length of a pendulum increases, the number of swings in a unit of time decreases. 	<p><u>Subconcepts</u></p> <ul style="list-style-type: none"> ▪ Two-coordinate graphs can display the outcome of a controlled experiment. ▪ Graphs can expose relationships, which in turn, can be used to make predictions (inferences).
<p><u>Time Allocation</u> Active Investigation: 2 days</p>	<p><u>Time Allocation</u> Active Investigation: 2 days Reading: 1 day</p>	<p><u>Time Allocation</u> Active Investigation: 2 days Reading: 1 day Assessment/Review: 2 days</p>
<p><u>CA Science Standards</u> I&E6d</p>	<p><u>CA Science Standards</u> I&E6d, I&E6e</p>	<p><u>CA Science Standards</u> I&E6g</p>



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Grade 5 – Water Planet
Pacing Guide – Investigation 2: Swingers

Pacing Guide – Investigation 2: Swingers

<i>Foundational – Day 48</i>		<i>Foundational – Day 49</i>		<i>Foundational – Day 50</i>	
Prep	Instruction	Prep	Instruction	Prep	Instruction
<input type="checkbox"/> Read “At a Glance” <i>TG p. 72-73</i> <input type="checkbox"/> Read “Background for the Teacher” <i>TG p. 74-75</i> <input type="checkbox"/> Read “Teaching Children About Pendulums” <i>TG p. 76-77</i> <input type="checkbox"/> Watch Video demo of Inv. 2, Pt. 1 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 78-79</i>	Guiding the Investigation <input type="checkbox"/> “Part 1: Exploring Swingers” Steps 1-13 <i>TG p. 80-82</i>		Guiding the Investigation <input type="checkbox"/> “Part 1: Exploring Swingers; Wrapping up Part 1” Steps 14-15 <i>TG p. 83</i>	<input type="checkbox"/> Watch Video demo of Inv. 2, Pt. 2 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 84-86</i>	Guiding the Investigation <input type="checkbox"/> “Part 2: Testing Variables” Steps 1-12 <i>TG p. 87-91</i>
<i>Foundational – Day 51</i>		<i>Foundational – Day 52</i>		<i>Foundational – Day 53</i>	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Guiding the Investigation <input type="checkbox"/> “Part 2: Testing Variables” Steps 13-14 <i>TG p. 91-92</i>		Guiding the Investigation <input type="checkbox"/> “Part 2: Testing Variables; Wrapping up Part 2” Steps 15-17 <i>TG p. 93</i> <input type="checkbox"/> Reading in Science Resources Steps 18-19 <i>TG p. 94</i> Student Reading: Science Resources p. 169-171 <input type="checkbox"/> Body of Evidence Prompt #2 <i>TG p. 255</i>	<input type="checkbox"/> Watch Video demo of Inv. 2, Pt. 3 <input type="checkbox"/> Review “Materials” and “Getting Ready” <i>TG p. 84-86</i>	Guiding the Investigation <input type="checkbox"/> “Part 3: Predicting Swings” Steps 1-7 <i>TG p. 97-100</i>

Pacing Guide – Investigation 2: Swingers (continued)

<i>Foundational – Day 54</i>		<i>Foundational – Day 55</i>		<i>Foundational – Day 56</i>	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Guiding the Investigation <input type="checkbox"/> “Part 3: Predicting Swings; Wrapping up Part 3” Steps 8-9 <i>TG p. 100</i>		Reading in Science Resources <input type="checkbox"/> Steps 10-11 <i>TG p. 101</i> Student Reading: Science Resources p. 172-177		Concluding Investigation 2 Reading in Science Resources <input type="checkbox"/> Steps 12-13 <i>TG p. 102</i> Student Reading: Science Resources p. 178-180 <input type="checkbox"/> I-Check 2 Step 14 <i>TG p.102, 400-405 437-439</i>
<i>Foundational – Day 57</i>		Day 58			
Prep	Instruction	Prep	Instruction		
	<input type="checkbox"/> Review <input type="checkbox"/> Interdisciplinary Extensions <i>TG p. 103-106</i> Student Reading: Science Resources p. 181		<input type="checkbox"/> Administer Grade 5 Earth Science Benchmark Assessment		



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Grade 5 – Water Planet
Recommended Body of Evidence

Overview

This guide is intended to support the collection of a Body of Evidence. A student’s Body of Evidence should, at a minimum, include work from the listed prompts and in-class investigations that demonstrate a student’s level of proficiency. The FOSS pre-assessment given at the beginning of the unit, the I-checks given after each investigation, and Grade 5 DISTRICT Earth Science Benchmark Assessment given at the end of the unit (post-assessment) may also be included in the body of evidence.

Download samples of proficient work at <https://eteams.sandi.net/sites/sbrc>

Recommended Body of Evidence – Grade 5 Earth Science

Concept #1

The solar system consists of planets and other bodies that orbit the Sun in predictable paths. (CA Standards ES5a, ES5b, ES5c)

Prompt #1: (I&E) FOSS: Water Planet: Investigation 1: Solar System- Part 1: Solar System Cards
(TG p. 251 – Solar System Data – No. 1 – Science Notebook)

1. Record the planets and other solar-system objects in order, starting with the Sun. Use the table on the left side of this sheet. If a planet has a moon, write its name in the space below the planet. 2. Use a colored pencil to lightly shade the planets that are made of gas. Use another color to shade the planets that are made of rock. 3. How big are the planets? Write the names of the planets in order from largest diameter to smallest diameter. (Use the first two letters of the planet’s name). 4. How long does it take for a planet to orbit the Sun? Write the names of the planets in order from shortest to longest orbit time. 5. How are the planets from the Sun? Write the names of the planets in order from closest to farthest from the Sun. 6. What is the surface temperature of the planets? Write the names of the planets in order from highest to lowest surface temperature.

Concept #2

A variable is anything that can change that might affect the outcome of an experiment. (I&E6d, I&E6e)

Prompt #2: (I&E6d, I&E6e) FOSS: Water Planet: Investigation 2: Swingers Part 2: Testing Variables
(TG p. 255 – Response Sheet – Swingers- No. 5 – Science Notebook)

What do you think Peter’s response should be? Why do you think that? Describe what a controlled experiment is.

Concept #3

Water on Earth moves between the oceans and land through the processes of evaporation and condensation.
(CA Standards ES3a, ES3b, ES3c, S3d, ES3e)

Prompt #3: FOSS: Water Planet: Investigation 3: Water Vapor - Part 1: Evaporation
(TG p. 257 – Wet Paper Towels – No. 7 – Science Notebook)

1. Use pictures and labels to show the balance at the start and end of the demonstration. 2. Describe what happened to the balance, the paper towels, and the water.

Recommended Body of Evidence – Grade 5 Earth Science (continued)

Prompt #4: (I&E) FOSS: Water Planet: Investigation 3: Water Vapor Part 2: Evaporation Locations

(TG p. 258 – Evaporation Location Charts – No. 8 – Science Notebook)

What tools will you use to measure the water? What units will you use to report the amount of water? Chart 1: Record the amount of evaporation and the average temperature in the four evaporation locations. Chart 2: Put the locations in order from most to least evaporation. Results and Inferences 1. At which location did the greatest amount of water evaporate? 2. At which location did the smallest amount of water evaporate? 3. Which location was warmest? 4. Describe the relationship between temperature and evaporation.

Prompt #5: (I&E) FOSS: Water Planet: Investigation 3: Water Vapor Part 3: Surface Area

(TG p. 262 – Water Vapor – No. 12 – Science Notebook)

Rita said, I wear a T-shirt when I swim so I won't get sunburned. When I come out of the water, I keep the shirt on. After awhile it is dry. I wonder how the wet shirt gets dry. What would you tell Rita to help her understand how the shirt gets dry? What would you suggest Rita do to get the shirt dry as fast as possible? Explain why your suggestion would make the shirt dry quickly.

Prompt #6: (I&E) FOSS: Water Planet: Investigation 3: Water Vapor Part 4: Condensation

(TG p. 263 – Condensation Observations – No. 13 – Science Notebook)

1. Write a sentence to describe any changes you observed in the condensation chamber the day after you set it up. 2. Draw and label a picture of what you observed. 3. Where did the water on the sides of the cup come from? 4. How did the water get on the sides of the cup? 5. What causes frost?

Prompt #11: FOSS: Water Planet: Investigation 5: Weather Part 1: Water Cycle

(TG p. 219 – Step #1 Assess Ideas: Quick Write and 226 Step #18 Assess Progress: Self-Assessment)

What is the water cycle?

Prompt #12: FOSS: Water Planet: Investigation 5: Weather Part 2: Severe Weather

(TG p. 272 – Severe Weather Questions – No. 22 – Science Notebook)

1. What causes tornadoes? 2. What causes hurricanes? 3. How does the water cycle affect weather in California? 4. How does the ocean influence the weather in California?

Prompt #13: FOSS: Water Planet: Investigation 5: Weather Part 3: Weather Maps

(TG p. 273 – Weather Map Questions – No. 23 – Science Notebook)

1. What weather variables do meteorologists measure when they are preparing to make a weather forecast? 2. Describe three kinds of fronts and the weather they produce. 3. What causes wind? 4. Look at the sample weather map. Where do you think it is raining? Where will it be raining tomorrow? 5. Look at the high- and low-pressure centers. Where do you think the wind is blowing? What direction? 6. Where is it likely to be cold and dry?

Concept #4

Energy from the Sun heats Earth unevenly, causing air movements that result in changing weather patterns.

(CA Standards ES4a, ES4b, ES4c, ES4d, ES4c)

Prompt #7: (I&E) FOSS: Water Planet: Investigation 4: Heating Earth Part 1: Heating Earth Materials

(TG p. 264-265 – Heating Earth Materials – No. 14 and No. 15 – Science Notebook)

Heating Earth Materials A Plan an experiment to find out what happens to earth materials when they are put in the sun and the put in the shade. Question; Materials; Procedure; Heating Earth Materials B Data table

Prompt #8: FOSS: Water Planet: Investigation 4: Heating Earth - Part 1: Heating Earth Materials

(TG p. 266 – Graph of Earth Materials Temperatures – No. 16 – Science Notebook)

1. What was the dependent variable in this experiment? 2. What variables did you control in this experiment?

Prompt #9: (I&E) FOSS: Water Planet: Investigation 4: Heating Earth - Part 2: Convection

(TG p. 268 – Heating Earth – No. 18 – Science Notebook)

Bernard and Sylvia were having hot chocolate. Bernard stirred his cup of hot chocolate with a spoon. He watched the chocolate swirl around in his cup. He said, "Look, I made a convection current!" Sylvia said, "I don't think so, That's not how convection currents work." Write what you think Sylvia told Bernard about how convection currents work.

Prompt #10: (I&E) FOSS: Water Planet: Investigation 4: Heating Earth - Part 3: The Pressure Is On

(TG p. 270 – Atmospheric Pressure At Work – No. 20 – Science Notebook)

1. Explain why pulling the plunger out on syringe 1 makes the plunger in syringe 2 go in. 2. Explain why the water bottle collapsed.



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Grade 5 – Water Planet
Module Materials and Equipment

Materials Provided

The FOSS kit comes with most of the supplies that are needed to teach the unit. The kits will be delivered to the school site prior to the start of the 12-week unit of instruction. At the end of the 12-weeks, the kit will be returned to the Science Resource Center where it will be refurbished and prepared for its next use. Please review the refurbishment calendar for kit drop-off and return dates. Kits must be returned according to the refurbishment calendar to ensure that all kits are checked and restocked with consumable materials.

Materials Supplied by the Teacher or School Site

Be aware that the classroom teacher or school site must supply a few items. These are indicated in the materials list for each part of the investigation with an asterisk (*). Here is a summary of those items.

<p>Investigation 1: Solar System</p> <ul style="list-style-type: none"> ▪ 1 Earth Globe (optional) ▪ 1 Flip Chart or Chart Paper ▪ 1 VCR and Monitor 	<p>Investigation 2: Swingers</p> <ul style="list-style-type: none"> ▪ 1 Cardboard Strip 6.5 x 81 cm ▪ 1 Sheet of Chart Paper (optional) ▪ Glue ▪ 16 Index cards or Scratch Paper ▪ 1 Marking Pen ▪ Masking Tape ▪ Overhead Projector (optional) ▪ Overhead-Transparency Marker (optional) ▪ Clear packing tape (optional) ▪ 16 Pencils ▪ 40 Pennies ▪ 1 Pair of Scissors ▪ 2 Transparencies (optional) ▪ Watch or clock with second hand 	<p>Investigation 3: Water Vapor</p> <ul style="list-style-type: none"> ▪ 1 Sheet of Chart Paper (optional) ▪ Assorted Containers (optional) ▪ Hand Lenses (optional) ▪ Ice ▪ Objects for freezing, such as metal object, bag of sand, water bottle (optional) ▪ Paper Towels ▪ Water at Various temperatures 	<p>Investigation 4: Heating Earth</p> <ul style="list-style-type: none"> ▪ 1 Clock or watch ▪ 1 cooler (optional) ▪ 1 Cup, clear, plastic large ▪ 1 Fork, metal ▪ 16 Colored Pencils or pens (optional) ▪ 1 Penny ▪ Newspaper (optional) ▪ 1 Thermos bottle (optional) ▪ Water at various temperatures ▪ 1 Water Bottle, plastic ½ liter 	<p>Investigation 5: Weather</p> <ul style="list-style-type: none"> ▪ Chart Paper ▪ 9 Clipboards or cardboard and binder clips (optional) ▪ 1 Marking Pen ▪ 1 Overhead projector (optional) ▪ 1 Overhead –transparency marker (optional) ▪ 1 Transparency (optional) ▪ 1 water-supply map ▪ Local weather maps for 4 consecutive days
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