San Diego Unified School District
Science Department

Grade 1 – Air and Weather

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 at www.sandi.net/science.

San Diego Unified School District
Science Department

Grade 1 – Air and Weather
Module Overview

Overview of the Unit

The Air and Weather Module consists of four sequential investigations, each designed to introduce concepts in physical and earth science. The investigations allow young students to explore the natural world by using simple tools to observe properties of air and to measure and monitor change in the weather from day to day and over the seasons.

Grade 1 Earth Science Conceptual Flow

Concept #1
Materials come in different forms (states), including solids, liquids, and gases. (Physical Science)

Subconcepts **Investigation #1: Exploring Air**
Air is matter
Air takes up space.
Air interacts with objects.
Air resistance affects how things move.
Air is all around objects.
Air can be compressed.
The pressure from compressed air can move things.
Air is a gas.

Grade 1 Earth Science Conceptual Flow (continued)

Concept #2

Weather can be observed, measured, and described. (Earth Science)

Subconcepts Investigation #2: Observing Weather	Subconcepts Investigation #3: Wind Explorations	Subconcepts Investigation #4: Looking For Change
Weather describes conditions in the outside air and changes over time.	Wind is moving air.	Weather conditions change over time.
The sun warms the land, air, and water.	Wind speed and wind direction are components of weather that can be measured with anemometers and wind vanes.	Weather observations can be organized, compared, and predicted.
Temperature, precipitation, and cloud types are components of the weather that can be described.	Wind scales are tools used to describe the speed of the wind.	The Sun heats the Earth during the day.
Meteorologists are scientists who study weather.		Each season has a typical weather pattern that can be observed, compared, and predicted.
There are different kinds of clouds.		
Rain is water that comes from clouds.		

First Grade Science Content Standards Addressed in this Module

Physical Science

PS1a Materials come in different forms (states), including solids, liquids, and gases. As a basis for understanding this concept:

PS1a Students know solids, liquids, and gases have different properties.

Earth Science

ES3. Weather can be observed, measured, and described. As a basis for understanding this concept:

ES3a Students know how to use simple tools (e.g., thermometer, wind vane) to measure weather conditions and record changes from day to day and across the seasons.

ES3b Students know that the weather changes from day to day but that trends in temperature or of rain (or snow) tend to be predictable during a season.

ES3c Students know the sun warms the land, air, and water.

Investigation and Experimentation

I&E4 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&E4a Draw pictures that portray some features of the thing being described.

I&E4b Record observations and data with pictures, numbers, or written statements.

I&E4c Record observations on a bar graph

Pacing the Unit as a Whole

Day 1 Start Inv. 1 Part 1 A/I	**Day 2** W	**Day 3** Start Inv. 1 Part 2 A/I	**Day 4** W	**Day 5** Start Inv. 1 Part 3 A/W/I
Day 6 Start Inv. 1 Part 4 A/W/I	**Day 7** Start Inv. 1 Part 5 A/I	**Day 8** W	**Day 9** Inv. 1 Part 6 A/W/I	**Day 10** R
Day 11 Review/ Interdisciplinary Extensions	**Day 12** Start Inv. 2 Part 1 A/I	**Day 13** A/W	**Day 14** Start Inv. 2 Part 2 A	**Day 15** W
Day 16 Start Inv. 2 Part 3 A/W	**Day 17** R	**Day 18** Start Inv. 2 Part 4 A	**Day 19** A/W/I	**Day 20** Review/ Interdisciplinary Extensions
Day 21 Start Inv. 3 Part 1 A/I	**Day 22** W	**Day 23** Start Inv. 3 Part 2 A/I	**Day 24** W	**Day 25** Start Inv. 3 Part 3 A/W/I
Day 26 Start Inv. 3 Part 4 A/W/I	**Day 27** R	**Day 28** Start Inv. 3 Part 5 A/I	**Day 29** W	**Day 30** Review/ Interdisciplinary Extensions
Day 31 Start Inv. 4 Part 1 A/W/I	**Day 32** R	**Day 33** Inv 4 Part 2 A (Fall)	**Day 34** A	**Day 35** **W**
Day 36 End-Of-Module Assessment	**Day 37** Review/ Interdisciplinary Extensions	**Day 38** Inv. 4 Part 2 (Winter)	**Day 39** Inv. 4 Part 2 (Winter)	**Day 40** Inv. 4 Part 2 (Spring)
Day 41 Inv. 4 Part 2 (Spring)				

A – Active Investigation sessions include firsthand observations about the weather, active thinking about the experiences, small group discussion, simulations, writing in science notebooks, learning new vocabulary in context, and completing written embedded individual assessments to inform instruction. (approximately 45 minutes)

W – Wrap-up sessions are teacher-directed vocabulary reinforcement and science content review. (Approximately 15 minutes)

I – Individual Assessment: The goal of the FOSS assessment system fall into three categories called assessment variables: (1) content knowledge, (2) conducting investigations, and (3) building explanations. **Content knowledge** reflects the "facts" of science that students learn throughout the module. **Conducting Investigations** focuses on skills needed for a successful scientific investigation. **Building Explanation** refers to students' discourse – how they communicate observation and how they organize their observation and interpretations of them.

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

Grade 1 – Air and Weather
Pacing Guide – Investigation 1: Exploring Air

Investigation Overview

Investigation 1: Exploring Air
Concept: Materials come in different forms (states), including solids, liquids, and gases.
Students explore properties of a common gas mixture, air. Using vials, syringes, and tubes, students experience air as matter, discovering that it takes up space and can be compressed and that compressed air builds up pressure that can push objects around. They construct and compare parachutes and balloon rockets. Students read about air and where it's found.

Part 1: Air Is There	Part 2: Air Under Water	Part 3: Parachutes
Summary Students work with a set of objects to see how objects can be moved by and through air.	Summary Students use vials, paper towels, and basins to explore the idea that air takes up space.	Summary Students construct and observe parachutes dropping through air. They think about how air slows the descent of the parachute.
Subconcepts: ▪ Air is something real and is called matter. ▪ Air takes up space. ▪ Air interacts with objects.	Subconcepts ▪ Air is matter. ▪ Air takes up space. ▪ Air can be captured. ▪ Air can push other matter.	Subconcepts ▪ Air is all around objects. ▪ Air resistance affects how things move.
Time Allocation Active Investigation/Wrap-Up: 1 day	Time Allocation Active Investigation: 1 day Wrap-Up: 1 day	Time Allocation Active Investigation/Wrap-Up: 1 day
CA Science Standards PS1a, I&E4a, I&E4b	CA Science Standards PS1a, I&E4b, I&E4d	CA Science Standards PS1a, I&E4b

Investigation Overview (continued)

Investigation 1: Exploring Air

Concept: Materials come in different forms (states), including solids, liquids, and gases.

Students explore properties of a common gas mixture, air. Using vials, syringes, and tubes, students experience air as matter, discovering that it takes up space and can be compressed and that compressed air builds up pressure that can push objects around. They construct and compare parachutes and balloon rockets. Students read about air and where it's found.

Part 4: Pushing On Air	**Part 5: Air and Water Fountain**	**Part 6: Balloon Rockets**
Summary Students use syringes to investigate air. They discover that air can be compressed and that air under pressure can push objects around.	Summary Students put together tubes, a bottle, water, a rubber stopper, and two syringes to create a system. They add water and use air pressure to push the water around the system.	Summary Students set up a balloon-rocket system and find out how far the air in the balloon will propel the system along a flight line. They read about air and how we know it is all around us.
Subconcepts ▪ Air is matter and takes up space. ▪ Air can be compressed ▪ The pressure from compressed air can move things.	Subconcepts ▪ Air is matter and takes up space. ▪ Air pressure can move water.	Subconcepts ▪ Air can be compressed. ▪ The pressure from compressed air can move things.
Time Allocation Active Investigation/Wrap-Up: 1 day	Time Allocation Active Investigation: 1 day Wrap-Up: 1 day	Time Allocation Active Investigation: 2 days Curricular Extensions: 1 day
CA Science Standards PS1a, I&E4a, I&E4b	CA Science Standards PS1a, I&E4b, I&E4d	CA Science Standards PS1a, I&E4b

Grade 1 – Air and Weather
Pacing Guide – Investigation 1: Exploring Air

Pacing Guide – Investigation 1: Exploring Air

Day 1		Day 2		Day 3	
Prep	Instruction	Prep	Instruction	Prep	Instruction
❑ Read "At A Glance" *TG p. 38-39* ❑ Read "Science Background" *TG p. 40-41* ❑ Read "Teaching Children About Properties of Air" *TG p. 42-43* ❑ Review "Materials" and "Getting Ready" *TG p. 44-47*	Guiding the Investigation ❑ "Part 1: Air Is There" Steps 1-7 *TG 48-49*		Guiding The Investigation ❑ "Part 1: Exploring Air; Wrapping Up Part 1" Steps 8-9 *TG p. 50*	❑ Review "Materials" and "Getting Ready" *TG p. 51-52*	Guiding The Investigation ❑ "Part 2: Air Under Water" Steps 1-10 *TG p. 53-55*
Day 4		**Day 5**		**Day 6**	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Guiding The Investigation ❑ "Part 2: Air Under Water; Wrapping Up Part 2" Steps 11-12 *TG p. 55*	❑ Review "Materials" and "Getting Ready" *TG p. 56-57*	Guiding The Investigation ❑ "Part 3: Parachutes" Steps 1-9 *TG p. 58-60*	❑ Review "Materials" and "Getting Ready" *TG p. 61-62*	Guiding The Investigation ❑ "Part 4:Pushing On Air" *TG p. 63-66*

Pacing Guide – Investigation 1: Exploring Air (continued)

Day 7		Day 8		Day 9	
Prep	Instruction	Prep	Instruction	Prep	Instruction
❑ Review "Materials" and "Getting Ready" *TG p. 67-68*	Guiding The Investigation ❑ "Part 5: Air and Water Fountain" Steps 1-14 *TG p. 70-72*		Guiding The Investigation ❑ "Part 5: Air and Water Fountain" Steps 15-17 *TG p. 73*	❑ Review "Materials" and "Getting Ready" *TG p. 74-75*	Guiding The Investigation ❑ "Part 6: Balloon Rockets" Steps 9-11 *TG p. 76-79*
Day 10		**Day 11**			
Prep	Instruction				
	Reading in Science Resources ❑ Steps 12-16 *TG p. 80-81* Student Reading: Science Resources p. 3-7		❑ Review ❑ Interdisciplinary Extensions *TG p. 82-83*		

Grade 1 – Air and Weather
Pacing Guide – Investigation 2: Observing Weather

Investigation Overview

Investigation 2: Observing Weather
Concept: Weather can be observed, measured, and described.
Students record weather for 4-8 weeks on a class calendar and in weather journals. They measure temperature with a thermometer and rainfall with a rain gauge. They learn to identify three basic cloud types by matching their observations to a cloud chart. Students read about different kinds of weather.

Part 1: Weather Calendars	**Part 2: Measuring Temperature**
Summary The class shares what they know about weather and how it related to air. A class meteorologist begins recording daily weather observations on a class calendar. Students use symbols to indicate five basic types of weather.	Summary Students learn to use a thermometer and take turns measuring and recording the temperature. They construct a model thermometer and practice reading various temperatures.
Subconcepts ▪ The Sun warms the air, land, and water. ▪ Weather describes conditions in the air outside. ▪ Meteorologists are scientists who study the weather. ▪ Scientific notebooks record what is observable through drawings, numbers, and writing. ▪ Tools measure changes in the weather.	Subconcepts ▪ Temperature describes how hot or cold something is. ▪ Temperature is measured with a thermometer. ▪ Scientific notebooks record what is observable through drawings, numbers, and writing. ▪ Tools measure changes in the weather. ▪ The Sun warms the air, land, and water.
Time Allocation Active Investigation: 2 days	Time Allocation Active Investigation: 1 day Wrap-Up: 1 day
CA Science Standards ES3a, ES3c, I&E4b	CA Science Standards ES3a, ES3c, I&E4b

Investigation Overview (continued)

Investigation 2: Observing Weather

Concept: Weather can be observed, measured, and described.

Students record weather for 4-8 weeks on a class calendar and in weather journals. They measure temperature with a thermometer and rainfall with a rain gauge. They learn to identify three basic cloud types by matching their observations to a cloud chart. Students read about different kinds of weather.

Part 3: Watching Clouds	**Part 4: Measuring Rain**
Summary Students observe and compare several types of clouds and discus how they move across the sky. They read about clouds and find out they are made of tiny droplets of water. They see and read about different kinds of weather. The reading reinforces that the sun warms the land, air, and water.	Summary The class discusses the kinds of clouds that bring rain or snow and natural sources of water. Students use a rain gauge to measure rain or snowfall. The class meteorologist's daily report now includes weather conditions, temperature, cloud type, and amount of rainfall.
Subconcepts ▪ There are three main types of clouds: cirrus, cumulus, and stratus. ▪ Clouds are made of water drops. ▪ Wind moves clouds in the sky. ▪ Scientific notebooks record what is observable through drawings, numbers, and writing. ▪ Tools measure changes in the weather. ▪ Weather can change from day to day. ▪ The Sun warms the air, land, and water.	Subconcepts ▪ Meteorologists use rain gauges to measure how much rain or snow has fallen. ▪ Natural sources of water include streams, rivers, lakes (freshwater), and the oceans (salt water). ▪ Tools measure changes in the weather.
Time Allocation Active Investigation: 1 day Reading: 1 day	Time Allocation Active Investigation: 2 days Interdisciplinary Extensions: 1 day
CA Science Standards ES3a, ES3b, ED3c, I&E4b, I&E4b	CA Science Standards ES3a, I&E4b

Grade 1 – Air and Weather
Pacing Guide – Investigation 2: Observing Weather

Pacing Guide – Investigation 2: Observing Weather

Day 12		Day 13		Day 14	
Prep	Instruction	Prep	Instruction	Prep	Instruction
❑ Read "At A Glance" *TG p. 86-87* ❑ Read "Science Background" *TG p. 88-89* ❑ Read "Teaching Children About Weather" *TG p. 90-91* ❑ Review "Materials" and "Getting Ready" *TG p. 92-93*	Guiding The Investigation ❑ "Part 1: Weather Calendars" Steps 1-7 *TG p. 95-97*		Guiding The Investigation ❑ "Part 1: Weather Calendars" Steps 8-12 *TG p. 97-98* ❑ "Part 1: Weather Calendars; Wrapping Up Part 1" Steps 13-14 *TG p. 99* ❑ **Body of Evidence Prompt #1** ***TG p. 191***	❑ Review "Materials" and "Getting Ready" *TG p. 100-102*	Guiding The Investigation ❑ "Part 2: Measuring Temperature" Steps 1-9 *TG p.103-105* ❑ **Body of Evidence Prompt #2** ***TG p. 192***

Pacing Guide – Investigation 2: Observing Weather (continued)

Day 15		Day 16		Day 17	
Prep	Instruction	Prep	Instruction		
	Guiding The Investigation ❑ "Part 2: Measuring Temperature Wrapping Up Part 2" Steps 10-11 *TG p. 106*	❑ Review "Materials" and "Getting Ready" *TG p. 107-108*	Guiding The Investigation ❑ "Part 3: Watching Clouds" Steps 1-8 *TG p. 109-110*		Reading In Science Resources ❑ Steps 9-13 *TG p. 112-113* Student Reading: Science Resources p. 8-15 ❑ **Body of Evidence Prompt #3** ***TG p. 195***
Day 18		**Day 19**		**Day 20**	
Prep	Instruction	Prep	Instruction		
❑ Review "Materials" and "Getting Ready" *TG p. 114-115*	Guiding The Investigation ❑ "Part 4: Measuring Rain" Steps 1-4 *TG p. 116*		Guiding The Investigation ❑ "Part 4: Measuring Rain" Steps 5-9 *TG p.* 116-118 ❑ **Body of Evidence Prompt #4** ***TG p. 196***		❑ Review ❑ Interdisciplinary Extensions

Grade 1 – Air and Weather
Pacing Guide – Investigation 3: Wind Explorations

Investigation Overview

Investigation 3: Wind Explorations
Concept: Weather can be observed, measured, and described.
Students look for evidence of moving air. They observe and describe wind speed using pinwheels, an anemometer, and a wind scale. They observe bubbles and construct wind vanes to find the wind's direction. Flying kites, they feel they strength of the wind and its direction. Students read how meteorologists gather information on the weather.

Part 1: Bubbles In The Wind	Part 2: Wind Speed	Part 3: Pinwheels
Summary Students use bubble wands to blow bubbles outside. They investigate how the air moves bubbles in a variety of locations around the school.	Summary Students go outside to feel and observe the wind. They are introduced to a descriptive wind scale (an adaptation of the Beaufort scale) and an anemometer, a tool used by scientist to accurately measure the speed of the wind.	Summary Students construct a pinwheel and observe how it operates when they blow on it, move it through air, and hold it in front of a fan. They compare the action of the pinwheels to the class anemometer.
Subconcepts: ▪ Bubbles are filled with air. ▪ Wind is moving air. ▪ Bubbles can show the changing direction and speed of the wind.	Subconcepts ▪ Meteorologists use a wind scale to describe the strength of the wind. ▪ Meteorologists use anemometers to measure the speed of the wind.	Subconcepts ▪ Meteorologists use anemometers to measure the speed of the wind. ▪ A pinwheel provides evidence about how fast the wind is blowing.
Time Allocation Active Investigation: 1 day Wrap-Up: 1 day	Time Allocation Active Investigation/Wrap-Up: 2 days	Time Allocation Active Investigation: 1 day
CA Science Standards: ES3a	CA Science Standards ES3a, I&E4b	CA Science Standards ES3a

Investigation Overview (continued)

Investigation 3: Wind Explorations

Concept: Weather can be observed, measured, and described.

Students look for evidence of moving air. They observe and describe wind speed using pinwheels, an anemometer, and a wind scale. They observe bubbles and construct wind vanes to find the wind's direction. Flying kites, they feel they strength of the wind and its direction. Students read how meteorologists gather information on the weather.

Part 4: Wind Vanes	**Part 5: Kites**	
Summary Students learn about wind vanes, a tool to determine wind direction. They compare the movement of the wind vane to that of bubbles and clouds. They read about the weather instruments a meteorologist uses to monitor air conditions.	Summary Students construct kites. They use the anemometer and wind vane to help them determine the best location and direction for flying kite.	
Subconcepts ▪ Meteorologists use wind vanes to observe the direction of the wind. ▪ A wind vane points in the direction the wind is coming from.	Subconcepts ▪ Wind pushes kites into the sky. ▪ An anemometer can give evidence that there is a good wind for kite flying. ▪ A wind vane can be used to determine the direction that kites will fly.	
Time Allocation Active Investigation: 1 day Reading: 1 day	Time Allocation Active Investigation: 1 day Interdisciplinary Extensions: 1 day	
CA Science Standards ES3a, I&E4b	CA Science Standards ES3a	

Grade 1 – Air and Weather
Pacing Guide – Investigation 3: Wind Explorations

Pacing Guide – Investigation 3: Wind Explorations

Day 21		Day 22		Day 23	
Prep	Instruction	Prep	Instruction	Prep	Instruction
❑ Read "At A Glance" *TG p. 124-125* ❑ Read "Background for Teacher" *TG p. 126-127* ❑ Read "Teaching Children About Wind" *TG p. 128-129* ❑ Review "Materials" and "Getting Ready" *TG p. 130-131*	Guiding The Investigation ❑ "Part 1: Bubbles In The Wind" Steps 1-6 *TG p. 132-133*		Guiding The Investigation ❑ "Part 1: Bubbles In The Wind; Wrapping Up Part 1" Steps 7-9 *TG p. 133*	❑ Read "Materials" and "Getting Ready" *TG p. 134-135*	Guiding The Investigation ❑ "Part 2: Wind Speed" Steps 1-8 *TG p. 136-137*
Day 24		**Day 25**		**Day 26**	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Guiding The Investigation ❑ "Part 2: Wind Speed; Wrapping Up Part 2" Steps 9-20 *TG p. 138* ❑ **Body of Evidence Prompt #5** ***TG p. 198***	❑ Read "Materials" and "Getting Ready" *TG p. 139-140*	Guiding The Investigation ❑ "Part 3: Pinwheels" Steps 1-10 *TG p. 141-143*	❑ Read "Materials" and "Getting Ready" *TG p. p. 144-146*	Guiding The Investigation ❑ "Part 4: Wind Vanes" Steps 1-9 *TG p. 147-149* ❑ **Body of Evidence Prompt #6** ***TG p. 199***

Pacing Guide – Investigation 3: Wind Explorations (continued)

Day 27		Day 28		Day 29	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Reading In Science Resources ❑ Steps 10-13 *TG p. 150-151* Student Reading: Science Resources p. 16-21 ❑ **Body of Evidence Prompt #7** ***TG p. 200***	❑ Read "Materials" and "Getting Ready" *TG p. 152-153*	Guiding The Investigation ❑ "Part 5: Kites" Steps 1-10 *TG p. 154-156*		Guiding The Investigation ❑ "Part 5: Kites; Wrapping Up Part 5" Steps 11-12 *TG p. 157*

Day 30	
Prep	Instruction
	❑ Review/ Interdisciplinary Extensions

Grade 1 – Air and Weather
Pacing Guide – Investigation 4: Looking For Change

Investigation Overview

Investigation 4: Looking For Change
Concept: Weather can be observed, measured, and described.
Students organize monthly weather data, using graphs to describe weather trends. They continue to measure and record weather throughout the year, to compare the seasons. Students read about the seasonal weather patterns.

Part 1: Weather Graphs	Part 2: Comparing the Seasons
Summary Students organize and graph the class weather data recorded over a period of 4 weeks. They compare number of days with different kinds of weather.	Summary The class moves from recording weather data on a calendar to creating seasonal graphs of the weather, temperature, and precipitation. Each season, they create new graphs and compare them to the preceding seasons. Students read how weather differs with the seasons, but people can often predict what the seasonal weather will be like.
Subconcepts: ▪ Weather conditions change over time. ▪ Weather observations can be organized and used to make comparisons.	Subconcepts ▪ Daily changes in temperature, precipitation, and weather type can be observed, compared, and predicted. ▪ Each season has a typical weather pattern that can be observed, compared, and predicted. ▪ The Sun can be seen only in the day. ▪ The Sun heats the earth during the day.
Time Allocation Active Investigation: 2 days (Note: 1 day will occur after another 4 weeks of weather data collection)	Time Allocation Active Investigation: 6 days (Note: 2 days will occur during each of the upcoming seasons—1 day to discuss data collection and 1 day later in the season for data comparison) Reading: 1 day Interdisciplinary Extensions: 1 day End-Of-Module Assessment: 1 day
CA Science Standards ES3a, ES3b, I&E4b, I&E4c	CA Science Standards ES3b, ES3c, I&E4b, I&E4c

Pacing Guide – Investigation 4: Looking For Change

Day 31		Day 32		Day 33	
Prep	Instruction	Prep	Instruction	Prep	Instruction
❑ Read "At A Glance" *TG p. 162-163* ❑ Read "Science Background" *TG p. 164* ❑ Read "Teaching Children About Change" *TG p. 165* Review "Materials" and "Getting Ready" *TG p. 166-167*	Guiding The Investigation ❑ "Part 1: Weather Graphs" Steps 1-5 *TG p. 169-170*		Guiding The Investigation ❑ Wrapping up "Part 1: Weather Graphs" Steps 6-7 *TG p. 169*	❑ Read "Materials" and "Getting Ready" *TG p. 172-174*	Guiding The Investigation ❑ "Part 2: Comparing The Seasons" Fall Data Collection Steps 1-4 *TG p. 175-176*

Pacing Guide – Investigation 4: Looking For Change (continued)

Day 34		Day 35		Day 36	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	Guiding The Investigation ❑ "Part 2: Comparing The Seasons" Steps 5-6 *TG p. 175*-176 **THESE STEPS ARE CONTINUED THROUGHOUT THE SEASONS.** **PLAN FOR 2 DAY ADDITIONAL DAYS OF INSTRUCTION ONCE OBSERVATIONS HAVE BEEN COMPLETED.**		❑ Part 2: Wrapping Up Part 2 Steps 7 -12 *TG p. 178-179* ❑ Reading In Science Resources Steps 9-11 *TG p. 178-179* Student Reading: Science Resources p. 21-27 ❑ **Body of Evidence Prompt #8 *TG p. 201*** ❑ **Body of Evidence Prompt #9 *TG p. 202***		❑ END-OF-MODULE ASSESSMENT Step 13 *TG p. 179* *TG p. 248-251*

Pacing Guide – Investigation 4: Looking For Change (continued)

Day 37		Day 38		Day 39	
Prep	Instruction	Prep	Instruction	Prep	Instruction
	❑ Review/ Interdisciplinary Extensions		ADDITIONAL DAY OF INSTRUCTION DURING WINTER. Guiding The Investigation ❑ "Part 2: Comparing The Seasons": Winter Data Collection Steps 1-4 *TG p. 175*-176		ADDITIONAL DAY OF INSTRUCTION DURING WINTER. Guiding The Investigation ❑ "Part 2: Comparing The Seasons": Winter Data Comparison Steps 5-6 *TG p. 176*
Day 40		**Day 41**			
Prep	Instruction	Prep	Instruction		
	ADDITIONAL DAY OF INSTRUCTION DURING SPRING. Guiding The Investigation ❑ "Part 2: Comparing The Seasons": Spring Data Collection Steps 1-4 *TG p. 175-176*		ADDITIONAL DAY OF INSTRUCTION DURING SPRING. Guiding The Investigation ❑ "Part 2: Comparing The Seasons" Spring Data Comparison Steps 5-6 *TG p. 176*		

San Diego Unified School District
Science Department

Grade 1 – Power Pals
Pacing Guide – Enrichment Materials

Please refer to the Energy Efficiency Education Program website at http://www.k12e3.org for more information about this program and professional development opportunities.

Investigation Overview

Investigation: Power Pals
Concept: Energy is the ability to do work - if an object is doing something, or has the ability to do something or cause something to happen, it has energy. The energy we use comes from energy resources. Humans can conserve energy to save resources.

Lesson 1: Weather and Temperature	Lesson 2: Sun's Energy and Temperature	Lesson 3: Solar Energy Absorption and Color
Summary Students correlate the kinds of clothing they wear, and how they feel, to the temperature and weather. They will review descriptive words for the temperature (warm, cold, cool, hot), and note and record weather conditions for the week.	Summary Students sense and discuss how warm or cold they feel in a sunny location and in a shady one (under a tree if possible). They then correlate their sense of the temperature with the readings on a thermometer. They recognize that a shade tree can help cool a building.	Summary Students compare the temperature inside envelopes made of black and white construction paper placed in the sun. They compare their sense of how warm each color envelope is with that measured temperature using a thermometer. They discuss other ways to keep warm or cool, and consider what they can do to reduce energy use for heating and cooling.
Subconcepts ▪ The weather can affect how warm or how cold you feel. ▪ Different clothing is suitable for different kinds of weather. ▪ Thermometers measure temperature (how warm or cold it is). ▪ Temperature and weather can change from day to day.	Subconcepts ▪ The sun produces light and heat, which warms objects on earth. ▪ Shade blocks the sun's rays, and so protects us from the energy from the sun, keeping us cooler. ▪ Objects that provide shade can help keep our homes cooler.	Subconcepts ▪ Dark objects absorb more solar energy than white objects. ▪ When energy is absorbed, the object gets warmer.
Time Allocation 45 minutes	Time Allocation 45 minutes	Time Allocation 45 minutes
CA Science Standards ES3b, I&E 4a, I&E 4b	CA Science Standards ES3c, I&E4b	CA Science Standards ES3c, I&E4b

Investigation Overview (continued)

Investigation: Power Pals
Concept: Energy is the ability to do work - if an object is doing something, or has the ability to do something or cause something to happen, it has energy. The energy we use comes from energy resources. Humans can conserve energy to save resources.

Lesson 4: Energy and Energy Resources	Lesson 4: Converting Energy	
Summary Students learn the concept of energy resources. They begin thinking about the energy they use to move and be active, and then identify devices in the room that use energy. They will note that the devices need to be plugged in, that they require electricity. They then learn that electricity is electricity is produced in power plants, using the energy stored in resources such as coal.	Summary Students will learn about using and conserving energy through the Energy Ticket game. The connection is made to using energy more efficiently in their daily lives, and how this can conserve energy resources. Students will create and sign an energy saving contract, and share what they have learned with their families.	
Subconcepts ▪ Whenever anything happens (movement, or light, or heat given off), energy is involved. ▪ Many everyday devices we use are powered by electricity. ▪ Electricity is produced in power plants using the energy stored in resources such as coal and natural gas, or from wind and moving water.	Subconcepts ▪ We get the energy we use from natural resources. ▪ There is a limited supply of some energy resources, therefore energy must not be wasted. ▪ Humans can conserve energy, so that we use fewer resources. ▪ Energy efficiency means getting what we need with less energy.	
Time Allocation 45 minutes	Time Allocation 45 minutes	
CA Science Standards Foundation for Gr. 2 ES3e and Gr. 3 PS1a, PS1b, PS1c	CA Science Standards Foundation for Gr. 3 PS1b, PS1c	

Grade 1 – Power Pals
Pacing Guide – Enrichment Materials

Pacing Guide – Power Pals

Day 1		Day 2		Day 3	
Prep	Instruction	Prep	Instruction	Prep	Instruction
❒ Read "For the Teacher – About Energy", *TG p. ii* ❒ Read "Overview" and "Background for the Teacher" *TG p. 1-2* ❒ Review "Materials" *TG p. 1*, "Vocabulary" *TG p. 2,* and "Notebook Page 1" *TG p. 5*	❒ Guiding the Activity *TG p. 2-4*	❒ Read "Overview" and "Background for the Teacher" *TG p. 7* ❒ Review "Materials" and "Vocabulary" *TG p. 7,* and "Notebook Page 2" *TG p. 10*	❒ Guiding the Activity *TG p. 8-9*	❒Read "Overview" and "Background for the teacher" *TG p. 11-13* ❒ Review "Materials" *TG p. 11,* "Vocabulary" *TG p. 12,* and "Notebook Page 3" *TG p. 16*	❒ Guiding the Activity *TG p. 14-15*

Day 4		Day 5	
Prep	Instruction	Prep	Instruction
❒Read "Overview" and "Background for the teacher" *TG p. 17-18* ❒ Review "Materials" *TG p. 17,* "Vocabulary" *TG p. 18,*and "Notebook Page 4" *TG p. 21*	❒ Guiding the Activity *TG p. 18-20*	❒Read "Overview" and "Background for the teacher" *TG p. 22-24* ❒ Review "Materials" *TG p. 22* and "Vocabulary" *TG p. 23*	❒ Guiding the Activity *TG p. 24-26*

Grade 1 – Air and Weather
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 form the listed prompts and in-class investigations. Other class work and assessments that demonstrate a student's level of proficiency may be included. Download samples of proficient work at https://eteams.sandi.net/sites/sbrc

Note: Administer Grade 1 Earth Science End-of-Module assessment (can also be used as a pre-assessment at the beginning of the unit).

FOSS Air and Weather Investigation 1: Exploring Air addresses first grade Physical Science Standard 1a (Students know solids, liquids, and gases have different properties.) and will be reflected in the Recommended Body of Evidence for Physical Science. Investigation 1 explores the properties of air (a gas) and teaches the knowledge and skills that prepare students for subsequent Investigations in the Air and Weather Module.

Recommended Body of Evidence – Grade 1 Earth Science

Concept #1 Weather can be observed, measured, and described. (CA Standards ES3a, ES3b, ES3c)
Prompt #1: **FOSS: Air and Weather: Investigation 2: Observing Weather Part 1: Weather Calendars (TG p. 191 – Weather Conditions – No. 9 – Science Notebook)** Record the date, draw a picture, and write words to describe the weather conditions today. ***Prompt #2:*** **FOSS: Air and Weather Investigation 2: Observing Weather Part 2: Measuring Temperature (TG p. 192 – Weather and Temperature – No. 10 – Science Notebook)** What do we use to measure temperature? Why is it helpful to know the temperature? ***Prompt #3:*** **(I&E) FOSS: Air and Weather Investigation 2: Observing Weather Part 3: Watching Clouds (TG p. 195 – What's The Weather Today? Review – No. 13 – Science Notebook)** 1.What is weather? 2. Tell about different kinds of weather. 3. What are clouds? 4. Tell about different kinds of clouds. 5. What warms the land, air, and water? ***Prompt #4:*** **(I&E) FOSS: Air and Weather Investigation 2: Observing Weather Part 4: Measuring Rain (TG p. 196 – Weather And Rain – No. 14 – Science Notebook)** Write the date and draw a picture to show what the weather is like today. Include information about weather conditions, the temperature, cloud type, and use the rain gauge to measure how much rain has fallen. (If there is no rain; use the prompt *If I were a meteorologist, I would use a rain gauge to…*)

Recommended Body of Evidence – Grade 1 Earth Science (continued)

Prompt #5: **FOSS: Air and Weather Investigation 3: Wind Explorations Part 2: Wind Speed**
(TG p. 198 – Weather And An Anemometer – No. 16 – Science Notebook)
Draw a picture and write about today's weather.

Prompt #6: **FOSS: Air and Weather Investigation 3: Wind Explorations Part 4: Wine Vanes**
(TG p. 199 – Weather And A Wind Vane – No. 17 – Science Notebook)
Draw a picture to show the day's weather and write a few words including wind direction.

Prompt #7: **FOSS: Air and Weather Investigation 4: Looking For Change Part 1: Weather Graphs**
(TG p. 200 – Understanding The Weather Review – No. 18 – Science Notebook)
1. What is a meteorologist? 2. What does a meteorologist do? 3. Tell about different kinds of dangerous weather storms.

Prompt #8: **(I&E) FOSS: Air and Weather Investigation 4: Looking For Change Part 2: Comparing The Seasons**
(TG p. 201 – Weather Graph – No. 19 – Science Notebook)
Compare seasons using Weather Graphs from at least two seasons. Which season was the rainiest? Sunniest? Most cloudy? Which season had the coldest temperatures?

Prompt #9: **(I&E) FOSS: Air and Weather Investigation 4: Looking For Change Part 2: Comparing The Seasons**
(TG p. 202 – Seasons – No. 20 – Science Notebook)
Select one of the four seasons and describe the general weather conditions during that time.

Grade 1 – Air and Weather
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.

Investigation 1: Exploring Air	**Investigation 2: Observing Weather**	**Investigation 3: Wind Exploration**	**Investigation 4: Looking for Change**
▪ Chairs ▪ Flip chart or chart paper ▪ Crayons ▪ Metal Fork ▪ Paper Towels ▪ Marking Pens Different Colors ▪ Marking Pens, Permanent Black ▪ Paper Napkins 15 cm (6 inches) square folded ▪ Pitcher or 2 liter soda bottle ▪ Scissors ▪ Scratch Paper ▪ 32 pieces or writing or drawing paper	▪ Piece each color or fadeless art paper or construction paper, orange, yellow, green blue, purple ▪ Buckets ▪ 11 pieces of construction paper red 23 cm x 30 cm. (9 inches x 12 inches) ▪ 11 pieces of construction paper, white or light colored 23 cm x 30 cm - ▪ (9 inches x 12 inches) ▪ Contact paper, clear (optional) ▪ Crayons ▪ Cups or envelopes ▪ Cup pebbles or marbles ▪ Duct tape ▪ White glue or glue sticks ▪ Marking pens, colored ▪ Marking pens, permanent black ▪ Overhead-transparency pens ▪ Paper towels ▪ Ruler ▪ Scissors ▪ Soda bottle plastic 2 liter ▪ Water – hot and cold	▪ Soda Bottles, plastic 2 liter ▪ Lightweight cardboard or poster board ▪ Compass, magnetic (optional) ▪ Light Corn Syrup or glycerin 6 teaspoons (optional) ▪ Crayons or markers ▪ 32 Paper cups 5-6 oz ▪ Liquid dishwashing detergent 1 cup ▪ Fan or hairdryer, variable speed ▪ Marking pen, permanent black ▪ Measuring cup ▪ Measuring teaspoon ▪ Paper towels ▪ Scissors ▪ Tub ▪ Watch with second hand or stopwatch ▪ Water	▪ Strips of contraction paper, blue 4.5 cm- 1.75 inches ▪ Glue (optional) ▪ Local Newspaper, weather page ▪ Scissors ▪ Tack or pushpins ▪ Transparent Tape