Revised 2009-2010

Grade 4

Science

SCOPE & SEQUENCE

Redlands Unified School District

REDLANDS UNIFIED SCHOOL DISTRICT

Science

Scope & Sequence

INTRODUCTION:

The Science *Scope & Sequence* Committees have worked to develop pacing guides for grades Kindergarten through fifth that ensure RUSD curriculum addresses the Content Standards for California Public Schools. MacMillian/McGraw-Hill's *California Science*, are the adopted materials. With this in mind, teachers are to use this *Scope & Sequence* as the core of their Science instruction. Lessons listed in **bold** under "Instructional Support" are "core" lessons and have been selected to ensure that all students have access to the Content Standards for California Public Schools. Lessons listed in *italics* are suggested lessons. Due to the nature of the grade level, the Kindergarten curriculum does not indicate specific lessons for Extra Support or Challenge. Lessons to address the specific needs of English Learners are contained within a double box.

A WORD ABOUT THE DEVELOPMENT OF THE *SCOPE & SEQUENCE*:

The *Scope & Sequence* was developed by grade level groups of teachers from traditional and year-round schools. It is divided into trimesters. The Science committees used the 2004 Edition of the Science Framework for California Public Schools as a guide.

PACING:

Pacing for lessons is not specifically defined and should be planned trimester to trimester. Science lessons listed in the *Scope and Sequence* are considered the minimum of what should be covered in each grade level. Not all lessons in the Macmillian/McGraw-Hill textbook are listed in the *Scope and Sequence*. Only those lessons that adequately address the grade level standards are designated as "core" in this *Scope and Sequence*. Therefore, each trimester may be planned utilizing the following table that lists the number of lessons per trimester:

Lessons by Trimester

	Trimester 1	Trimester 2	Trimester 3
Grade 4			
Unit	Earth Science	Physical Science	Life Science
Chapters	3, 4, 5	6, 7	1, 2
Lessons	10	6	8

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RUSD Science
Scope and Sequence Distribution by Standard
Grade 4

	First Trimester	Second Trimester	Third Trimester
Earth Science			
4a	I I I		
4b	I		
Earth Science			
5a	~~I I I I~~		
5b	I		
5c	I I I		
Physical Science			
1a		I	
1b		I	
1c		I	
1d		I I	
1e		I	
1f		I	
1g		I	
Life Science			
2a			I I
2b			I I
2c			I
Life Science			
3a			I
3b			I I
3c			I
3d			I
Investigation and Experimentation			
6a	~~I I I I~~	I I	I I
6b	I		I
6c	I I	I I	I I I I
6d	I I	I I I	I
6e		I I	
6f	I I I I	I I	I I

STANDARD	OBJECTIVE	TEXT SUPPORT
Earth Science	ES 4.b Students know how to identify common rock-forming minerals (including quartz, calcite, feldspar, mica, and hornblende) and ore minerals by using a table of diagnostic properties. IE 6.a Differentiate observation from inference (interpretation) and know scientist' explanations come partly from what they observe and partly from how they interpret their observations. IE 6.b Measure and estimate the weight, length, or volumn of objects.	**Earth Science Unit** **Chapter 3 - Rocks and Minerals TE pp. 134-183** **Lesson 1- Minerals: The Building Blocks of Rocks TE pp. 138-147** **Explore - What makes rocks different from each other? TE p. 139** **Interactive Text p. 54-59** *Reading and Writing in Science pp. 47-54* *Quick Lab - Identify Minerals p. 145* *Activity Lab Book pp. 49-56* *Visual Literacy pp. 17-18* *Science Activity DVD 3.1* *English Learners TE p. 142* *Extra Support TE p. 143* *Challenge TE p. 147*
Earth Science	ES 4.a Students know how to differentiate among igneous, sedimentary, and metamorphic rocks by referring to their properties and methods of formation (the rock cycle) IE 6.c Formúlate and justify predictions base don cause and effect relationships.	**Lesson 2 - Igneous Rocks TE pp. 150-157** **Explore - How does growth rate affect the size of crystals? TE p. 151** **Interactive Text p. 60-63** *Reading and Writing in Science pp. 55-58* *Quick Lab - Observing Igneous Rocks TE p. 155* *Activity Lab Book p. 57-60* *Visual Literacy pp. 19-20* *Science Activity DVD 3.2* *Reading in Science - Meet Siser Mondal TE pp. 158-159* *English Learners TE p. 154* *Extra Support TE p. 155* *Challenge TE p. 157*

STANDARD	OBJECTIVE	TEXT SUPPORT
Earth Science	ES 4.a Students know how to differentiate among igneous, sedimentary, and metamorphic rocks by referring to their properties and methods of formation (the rock cycle) IE 6.a Differentiate observation from inference (interpretation) and know scientist' explanations come partly from what they observe and partly from how they interpret their observations IE 6.f Follow a set of written instructions for a scientific investigation.	**Lesson 3 - Sedimentary Rocks TE pp. 160-167** **Explore - What properties can help you infer how some rocks formed? TE p. 161** **Interactive Text p. 64-67** *Reading and Writing in Science pp. 61-64* *Quick Lab - A Model Sandstone Rock TE p. 165* *Activity Lab Book pp. 61-67* *Visual Literacy pp. 21-22* *Science Activity DVD 3.3* *Be a Scientist - What are the features of sedimentary rocks? TE pp. 168-169* *English Learners TE p. 164* *Extra Support TE p. 163* *Challenge TE p. 167*
Earth Science	ES 4.a Students know how to differentiate among igneous, sedimentary, and metamorphic rocks by referring to their properties and methods of formation (the rock cycle) IE 6.a Differentiate observation from inference (interpretation) and know scientist' explanations come partly from what they observe and partly from how they interpret their observations.	**Lesson 4 - Metamorphic Rocks TE pp. 170-181** **Explore - How can you interpret clues in rocks? TE p. 171** **Interactive Text p. 68-75** *Reading and Writing in Science pp. 65-68* *Activity Lab Book pp. 69-72* *Quick Lab - A Model Metamorphic Rock TE p. 175* *Visual Literacy pp. 23-24* *Science Activity DVD 3.4* *Math in Science - It Is Hard to Be a Rock TE p. 183* *English Learners TE p. 174* *Extra Support TE p. 175* *Challenge TE p. 181* ***Chapter Review TE pp. 184-185*** ***Assessment pp. 13-16***

STANDARD	OBJECTIVE	TEXT SUPPORT
Earth Science	ES 5.b Students know the natural processes, including freezing and thawing and the growth of roots, cause rocks to break down into smaller pieces. IE 6.c Formúlate and justify predictions based on cause and effect relationships. IE 6.f Follow a set of written instructions for a scientific investigation.	**Chapter 4 - Slow Changes on Earth TE pp. 188-227** **Lesson 1 – Weathering TE pp. 192-199** **Explore - How can freezing water change rock? TE p. 193** **Interactive Text p. 80-85** *Reading and Writing in Science pp. 75-78* *Activity Lab Book pp. 73-79* *Quick Lab - Chemical Weathering TE p. 197* *Visual Literacy pp. 25-26* *Science Activity DVD 4.1* *English Learners TE p. 196* *Extra Support TE p. 197* *Challenge TE p. 199*
Earth Science	ES 5.a Students know some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes ES 5.c Students know moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition). IE 6.f Follow a set of written instructions for a scientific investigation.	**Lesson 2 - Erosion and Deposition TE pp. 202-209** **Explore - How can sediments enter rivers? TE p. 203** **Interactive Text p. 86-89** *Reading and Writing in Science TE pp. 79-82* *Activity Lab Book pp. 81-88* *Quick Lab - Erosion Rate TE p. 207* *Visual Literacy pp. 27-28* *Science Activity DVD 4.2* *Be a Scientist - What is erosion and deposition? TE pp. 210-211* *English Learners TE p. 206* *Extra Support TE p. 207* *Challenge TE p. 209*

STANDARD	OBJECTIVE	TEXT SUPPORT
Earth Science	ES 5.a Students know some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes ES 5.c Students know moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition). IE 6.a Differentiate observation from inference (interpretation) and know scientist' explanations come partly from what they observe and partly from how they interpret their observations.	**Lesson 3 - Landforms: Changing Over Time TE pp. 212-223** **Explore - How does running water change the land? TE p. 213** **Interactive Text p. 90-97** *Reading and Writing in Science pp. 83-86* *Activity Lab Book pp. 89-92* *Quick Lab - How Sand Dunes Form TE p. 221* *Visual Literacy pp. 29-30* *Science Activity DVD 4.3* *Reading in Science - Looking Back at YOSEMITE National Park TE pp. 226-227* *English Learners TE p. 216* *Extra Support TE p.217* *Challenge TEp.223* ***Chapter Review TE pp. 224-225*** ***Assessment pp. 19-22***
Earth Science	ES 5.a Students know some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes ES 6.d Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.	**Chapter 5 - Fast Changes on Earth TE pp. 232-271** **Lesson 1 – Landslides TE pp. 236-269** **Explore - How does gravity affect materials on Earth? TE p. 237** **Interactive Text p. 102-105** *Reading and Writing in Science pp. 95-98* *Activity Lab Book pp. 93-99* *Quick Lab - Flooding the Land p. 241* *Visual Literacy pp. 31-32* *Science Activity DVD 5.1* *Focus on Inquiry Skills – Experiment TE pp. 244-245* *English Learners TE p. 240* *Extra Support TE p. 241* *Challenge TE p. 243*

STANDARD	OBJECTIVE	TEXT SUPPORT
Earth Science	ES 5.a Students know some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes IE 6.a Differentiate observation from inference (interpretation) and know scientist' explanations come partly from what they observe and partly from how they interpret their observations. IE 6.d Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.	**Lesson 2 – Earthquakes** **TE pp. 246-255** **Explore - What happens when the ground moves? TE p. 247** **Interactive Text p. 106-111** *Reading and Writing in Science pp. 99-102* *Activity Lab Book pp. 101-108* *Quick Lab - Types of Faults TE p. 251* *Visual Literacy pp. 33-34* *Science Activity DVD 5.2* *Math in Science - Shake, Rattle, and Roll TE p. 259* *Writing in Science - Remembering an Earthquake TE p. 258* *English Learners TE p. 250* *Extra Support TE p. 253* *Challenge TE p. 255*
Earth Science	ES 5.a Students know some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes IE 6.f Follow a set of written instructions for a scientific investigation.	**Lesson 3 – Volcanoes** **TE pp. 260-269** **Explore - Where are Earth's volcanoes?** **TE p. 261** **Interactive Text p. 112-117** *Reading and Writing in Science pp. 105-108* *Activity Lab Book pp. 109-112* *Quick Lab - Model Hawaiian Islands Formation TE p. 265* *Visual Literacy pp. 35-36* *Science Activity DVD 5.3* *English Learners TE p. 264* *Extra Support TE p. 267* *Challenge TE p. 269* ***Chapter Review TE pp. 272-273*** ***Assessment pp. 25-28***

GRADE: 4 ***TRIMESTER 2***

STANDARD	OBJECTIVE	TEXT SUPPORT
Physical Science	PS 1.e Students know electrically charged objects attract or repel each other.	**Physical Science Unit** **Chapter 6 – Electricity** **TE pp. 280-319** **Lesson 1 - Static Electricity** **TE pp. 284-293**
Physical Science	IE 6.c Formulate and justify predictions based on cause and effect relationships. IE 6.e Construct and interpret graphs from measurements.	**Explore - How do rubbed balloons interact? TE p. 285** **Interactive Text p. 122-129** *Reading and Writing in Science pp. 115-118* *Activity Lab Book pp. 113-120* *Quick Lab - Producing Static Electricity TE p. 289* *Visual Literacy pp. 37-38* *Science Activity DVD 6.1* *Focus on Inquiry Skills - Analyze Data TE pp. 294-295* *English Learners TE p. 288* *Extra Support TE pp. 289,291* *Challenge TE p. 293*
Physical Science	PS 1.a Students know how to design and build simple series and parallel circuits by using components such as wires, batteries, and bulbs. IE 6.c Formúlate and justify predictions based on cause and effect relationships. IE 6.d Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.	**Lesson 2 - Electric Circuits** **TE pp. 296-305** **Explore - What makes a bulb light?** **TE p. 297** **Interactive Text p. 130-135** *Reading and Writing in Science pp. 119-122* *Activity Lab Book pp. 121-128* *Quick Lab - Make a Series/Parallel Circuit TE p. 301-303* *Visual Literacy pp.39-40* *Science Activity DVD 6.2* *Be a Scientist - How do many loads affect electric current in a circuit? TE pp. 306-307* *English Learners TE p. 300* *Extra Support TE p. 303* *Challenge TE p. 305*

STANDARD	OBJECTIVE	TEXT SUPPORT
Physical Science		*Reading and Writing in Science pp. 123-126* *Activity Lab Book pp. 129-132* *Quick Lab - How much electrical energy do you use? TE p. 313* *Visual Literacy pp.41-42* *Science Activity DVD 6.3* *Writing in Science - I'd Like to Make a Toast TE p. 316* *Reading in Science - Hybrid POWER TE pp. 318-319* *English Learners TE p. 312* *Extra Support TE p. 313* *Challenge TE p. 315* ***Chapter Review TE pp. 320-321*** ***Assessment pp. 31-36***
Physical Science	PS 1.b Students know how to build a simple compass and use it to detect magnetic effects, including Earth's magnetic field. PS 1.f Students know differences in chemical and physical properties of substances are used to separate mixtures and identify compounds. IE 6.a Differentiate observation from inference (interpretation) and know scientist' explanations come partly from what they observe and partly from how they interpret their observations. IE 6.d Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.	**Chapter 7 – Magnetism TE pp. 324-361** **Lesson 1 – Magnets TE pp. 328-337** **Explore - How do magnets interact? TE p. 329** **Interactive Text p. 144-149** *Reading and Writing in Science pp. 135-138* *Activity Lab Book pp. 133-139* *Quick Lab - What is a compass? TE p. 336* *Visual Literacy pp.43-44* *Science Activity DVD 7.1* *English Learners TE p. 332* *Extra Support TE p. 335* *Challenge TE p. 337*

STANDARD	OBJECTIVE	TEXT SUPPORT
Physical Science	PS 1.d Students know the role of electromagnets in the construction of electric motors, electric generators, and simple devices, such as doorbells and earphones. IE 6.f Follow a set of written instructions for a scientific investigation.	**Lesson 3 - Motors and Generators TE pp. 350-357** **Explore - How can you use magnets to produce motion? TE p. 351** **Interactive Text p. 154-159** *Reading and Writing in Science pp. 143-146* *Activity Lab Book pp. 149-152* *Quick Lab - Make a Generator TE p. 355* *Visual Literacy pp. 47-48* *Science Activity DVD 7.3* *Reading in Science - Motors at Work TE pp. 360-361*
Physical Science		*Math in Science - Using Graphs TE p. 359* *English Learners TE p. 354* *Extra Support TE p. 355* *Challenge TE p. 357* ***Chapter Review TE pp. 362-363*** ***Assessment pp. 37-40***

STANDARD	OBJECTIVE	TEXT SUPPORT
Life Science	LS 2.a Students know plants are the primary source of matter and energy entering most food chains. IE 6.a Differentiate observation from inference (interpretation) and know scientist' explanations come partly from what they observe and partly from how they interpret their observations. IE 6.f Follow a set of written instructions for a scientific investigation.	**Life Science Unit** **Chapter 1 - Living Things Need Energy TE pp. 20-73** **Lesson 1 - Plants and Sunlight TE pp. 24-33** **Explore - How are leaves different from each other? TE p. 25** **Interactive Text p. 2-7** *Reading and Writing in Science pp. 3-6* *Activity Lab Book pp. 1-7* *Quick Lab – Photosynthesis TE p. 29* *Visual Literacy pp. 1-2* *Science Activity DVD 1.1* *Focus on Inquiry Skills – Observe TE pp. 34-35* *English Learners TE p. 28* *Extra Support TE p. 31* *Challenge TE p. 33*
Life Science	LS 2.a Students know plants are the primary source of matter and energy entering most food chains. LS 2.b Students know the consumers and the producers (herbivores, carnivores, omnivores, and decomposers) are related in the food chains and food webs and may compete with each other for resources in an ecosystem.	**Lesson 2 - Food Chains TE pp. 36-47** **Explore - How much energy do living things use? TE p. 37** **Interactive Text p. 8-13** *Reading and Writing in Science pp. 7-10* *Activity Lab Book p. 9-16* *Quick Lab - Find a Food Chain p. 43* *Visual Literacy pp. 3-4* *Science Activity DVD 1.2*

STANDARD	OBJECTIVE	TEXT SUPPORT
Life Science		*Be a Scientist - Can an environment have more than one food chain? TE pp. 48-49* *English Learners TE p. 40* *Extra Support TE p. 39-45* *Challenge TE p. 47*
Life Science	LS 2.b Students know the consumers and the producers (herbivores, carnivores, omnivores, and decomposers) are related in the food chains and food webs and may compete with each other for resources in an ecosystem. IE 6.c Formúlate and justify predictions based on cause and effect relationships.	**Lesson 3 - Food Webs TE pp. 50-59** **Explore - How can living things be part of more than one food chain? TE p. 51** **Interactive Text p. 14-19** *Reading and Writing in Science pp. 11-14* *Activity Lab Book pp. 17-20* *Quick Lab - Changes in Food Webs TE p. 55* *Visual Literacy pp. 5-6* *Science Activity DVD 1.3* *Writing in Science - A Call for Help TE p. 60* *Math in Science - How Many Monarchs? TE p. 61* *English Learners TE p. 54* *Extra Support TE pp. 55-56* *Challenge TE p. 59*
Life Science	LS 2.c Students know decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals. LS 3.d Students know that most microorganisms do not cause disease and that many are beneficial. IE 6.d Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.	**Lesson 4 – Microorganisms TE pp. 62-71** **Explore - How can tiny living things change plant material? TE p. 63** **Interactive Text p. 20-25** *Reading and Writing in Science pp. 17-20* *Activity Lab Book p. 21-24* *Quick Lab - Observing Decomposers TE p. 69* *Visual Literacy pp. 7-8*

STANDARD	OBJECTIVE	TEXT SUPPORT
Life Science		*Science Activity DVD 1.4* *English Learners TE p. 66* *Extra Support TE p. 69* *Challenge TE p. 71* **Chapter Review TE pp. 74-75** **Assessment pp. 1-4**
Life Science	LS 3.a Students know ecosystems can be characterized by their living and nonliving components. IE 6.c Formúlate and justify predictions based on cause and effect relationships. IE 6.f Follow a set of written instructions for a scientific investigation.	**Chapter 2 - Living Things and Their Environment TE pp. 78-125** **Lesson 1 – Ecosystems TE pp. 82-91** **Explore - What are some living and nonliving things in your environment? TE p. 83** **Interactive Text p. 30-35** *Reading and Writing in Science pp. 27-30* *Activity Lab Book pp. 25-32* *Quick Lab - Soils of Different Ecosystems TE p. 89* *Visual Literacy pp. 9-10* *Science Activity DVD 2.1* *Focus on Inquiry Skills – Predict TE pp. 92-93* *English Learners TE p. 86* *Extra Support TE p. 89* *Challenge TE p. 91*
Life Science	LS 3.c Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter. IE 6.b Measure and estimate the weight, length, or volume of objects.	**Lesson 2 - Living Things Need Each Other TE pp. 94-101** **Explore - How do plants and animals depend on each other? TE p. 94** **Interactive Text p. 36-39** *Reading and Writing in Science pp.31-34* *Activity Lab Book pp. 33-36* *Quick Lab - Flower Parts TE p. 99* *Visual Literacy pp. 11-12* *Science Activity DVD 2.2*

STANDARD	OBJECTIVE	TEXT SUPPORT
Life Science		*Writing in Science - The Moth That Needed the Tree TE p. 102* *English Learner TE p. 98* *Extra Support TE p. 99* *Challenge TE p. 107*
Life Science	LS 3.b Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all. IE 6.c Formúlate and justify predictions based on cause and effect relationships.	**Lesson 3 - Changes in Ecosystems TE pp. 104-111** **Explore - How can change to ecosystems affect living things? TE p. 105** **Interactive Text p. 40-43** *Reading and Writing in Science pp. 37-40* *Activity Lab Book pp. 37-40* *Quick Lab - Crowded Ecosystems p. 109* *Visual Literacy pp. 13-14* *Science Activity DVD 2.3* *Reading in Science - Mail Call TE pp. 112-113* *English Learner TE p. 108* *Extra Support TE p. 109* *Challenge TE p. 111*
Life Science	LS 3.b Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all. IE 6.a Differentiate observation from inference (interpretation) and know scientist' explanations come partly from what they observe and partly from how they interpret their observations. IE 6.c Formúlate and justify predictions based on cause and effect relationships.	**Lesson 4 – Adaptations TE pp. 114-123** **Explore - How does the shape of a bird's beak affect what it eats? TE p. 115** **Interactive Text p. 44-49** *Reading and Writing in Science pp. 43-46* *Activity Lab Book pp. 41-48* *Quick Lab - Absorbing Heat TE p. 121* *Visual Literacy pp. 15-16* *Science Activity DVD 2.4* *Be a Scientist - How are some animals adapted to swimming? TE pp. 124-125* *English Learner TE p. 118* *Extra Support TE p. 119* *Challenge TE p. 123* ***Chapter Review TE pp. 126-127*** *Assessment pp. 7-10*