

MOSCOW SCHOOL DISTRICT
CURRICULUM GUIDE
Subject/Course: Earth Science
Grade 9

Students are expected to know content and apply skills from previous grades.

Standard 1: Nature of Science

Students exercise the basic tenets of scientific investigation, make accurate observations, exercise critical thinking skills, apply proper scientific instruments of investigation and measurement tools, and communicate results in problem solving. Students evaluate the validity of information by utilizing the tools of scientific thinking and investigation. Students summarize their findings by creating lab reports using technical writing including graphs, charts, and diagrams to communicate the results of investigations.

<i>Goal – The student will:</i>	<i>Objectives (to be reached by the end of ninth grade)</i>	<i>Samples of Applications</i>	<i>Curriculum Materials (including technological resources)</i>	<i>Key Vocabulary for Standard 1</i>
Goal 1.1: Understand Systems, Order, and Organization	<ul style="list-style-type: none"> ● 8-9.ES.1.1.1 Explain the scientific meaning of system, order, and organization. (648.01a) ● 8-9.ES.1.1.2 Apply the concepts of order and organization to a given system. (648.01a) 	<ul style="list-style-type: none"> ● Geologic Time Line ● Geologic Time Line ● Phases of the Moon Activity ● Parallax Activity 	<ul style="list-style-type: none"> ● Meter sticks ● Meter sticks ● Shaded ● Tennis Balls 	<ul style="list-style-type: none"> ● Alternative explanations ● hypothesis ● model ● observation ● system
Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanation	<ul style="list-style-type: none"> ● 8-9.ES.1.2.1 Use observations and data as evidence on which to base scientific explanations. (648.02a) ● 8-9.ES.1.2.2 Develop models to explain concepts or systems. (648.02b) ● 8-9.ES.1.2.3 Develop scientific explanations based on knowledge, logic, and analysis. (648.02c) 	<ul style="list-style-type: none"> ● Weather Forecast ● Greenhouse Effect Lab ● Map Survey Activity ● Where In the World ● Am I? ● Weather Forecast 	<ul style="list-style-type: none"> ● Meter sticks ● Laptop ● Computers ● Internet ● MS Excel ● Vernier ● Probes ● Laptop ● Computers 	
Goal 1.3: Understand Constancy, Change, and Measurement	<ul style="list-style-type: none"> ● 8-9.ES.1.3.1 Measure changes that can occur in and among systems. (648.03b) ● 8-9.ES.1.3.2 Analyze changes that can occur in and among systems. (648.03b) ● 8-9.ES.1.3.3 Measure and calculate using the metric system. (648.03c) 	<ul style="list-style-type: none"> ● Stream Table Activity ● Columbia Plateau Activity ● Basalt Vs. Granite Lab ● Bean Hunter Lab ● Dot Hunter Lab 	<ul style="list-style-type: none"> ● Internet ● Laptop ● Computers ● NEC ● Projector ● Stream Table ● Metric Ruler ● Metric 	

			<ul style="list-style-type: none"> • Balances • Beakers • Graduated • Cylinders • Internet • Slides • NEC • Projector
Goal 1.4: Understand the Theory that Evolution is a Process that Relates to the Gradual Changes in the Universe and of Equilibrium as a Physical State No objectives in Earth Science			
Goal 1.5: Understand Concepts of Form and Function - No objectives in Earth Science			
Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills	<ul style="list-style-type: none"> • 8-9.ES.1.6.1 Identify questions and concepts that guide scientific investigations. (649.01a) • 8-9.ES.1.6.2 Utilize the components of scientific problem solving to design, conduct, and communicate results of investigations. (649.01b) • 8-9.ES.1.6.3 Use appropriate technology and mathematics to make investigations. (649.01c) • 8-9.ES.1.6.4 Formulate scientific explanations and models using logic and evidence. (649.01d) • 8-9.ES.1.6.5 Analyze alternative explanations and models. (649.01e) • 8-9.ES.1.6.6 Communicate and defend a scientific argument. (649.01f) • 8-9.ES.1.6.7 Explain the differences among observations, hypotheses, and theories. (649.01g) 	<ul style="list-style-type: none"> • Ozone Video • Global Warming Activity/Video • Heat Transfer Lab • Solar System • Activity/Presentations • Bread Into Rocks • Model Activity • Ozone Video • Sea Floor Spreading • Activity • Epicenter Activity • Origins DVD 	<ul style="list-style-type: none"> • VCR • NEC • Projector • Bunsen • Burner • Hot Plate • Heat Lamp • Thermometer • NEC • Projector • Laptop • Computers • Internet • NEC • Projector • SEISVOL • Software • Internet • DVD • NEC • Projector • Vernier • Probes • Laptop • Computers
Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors - No objectives in Earth Science			
Goal 1.8: Understand Technical Communication	<ul style="list-style-type: none"> • 8-9.ES.1.8.1 Analyze technical writing, graphs, charts, and diagrams. (658.02a) 	Greenhouse Effect Lab Mapping A Plate Boundary Activity	<ul style="list-style-type: none"> • DVD • NEC • Projector • Vernier • Probes • Laptop • Computers

Standard 2: Physical Science - No goals or objectives in Earth Science.

Standard 3: Biology - No goals or objectives in Earth Science.

Standard 4: Earth and Space Systems

Students describe the current theory explaining the formation of the solar system. Students explain earth processes, events (erosion, uplifting, earthquakes, volcanic eruptions, etc.), and geological time. Students explain Earth's heat sources.

<i>Goal – The student will:</i>	<i>Objectives (to be reached by the end of ninth grade)</i>	<i>Samples of Applications</i>	<i>Curriculum Materials (including technological resources)</i>	<i>Key Vocabulary for Standard 4</i>
Goal 4.1: Understand Scientific Theories of Origin and Subsequent Changes in the Universe and Earth Systems	<ul style="list-style-type: none"> 8-9.ES.4.1.1 Explain the current scientific theory that suggests that the solar system formed from a nebular cloud of dust and gas. (654.01a) 8-9.ES.4.1.2 Identify methods used to estimate geologic time. (654.01b) 8-9.ES.4.1.3 Show how interactions among the solid earth, oceans, atmosphere, and organisms have changed the earth system over time. (654.01c) 	<ul style="list-style-type: none"> Origins DVD Which is Older Activity Half-life Lab Greenhouse Lab/Discussion, Global Warming Discussion 	<ul style="list-style-type: none"> DVD NEC Projector Pennies Laptop Computers Laptop Computers Guest Speaker 	<ul style="list-style-type: none"> atmosphere geologic time nebular cloud theory
Goal 4.2: Understand Geo-chemical Cycles and Energy in the Earth System	<ul style="list-style-type: none"> 8-9.ES.4.2.1 Explain the internal and external energy sources of the earth (654.02a) 	<ul style="list-style-type: none"> Rock Cycle Activity Discussion Water Cycle Plate Tectonic Map Activity Why Volcanoes Go Boom Activity 	<ul style="list-style-type: none"> Overhead Projector Bunsen Burner Erlenmeyer Flasks 	

Standard 5: Personal and Social Perspectives; Technology

Students understand that science and technology interact and impact both society and the environment.

Students describe issues such as water and air quality, hazardous waste, renewable and nonrenewable resources.

<i>Goal – The student will:</i>	<i>Objectives (to be reached by the end of ninth grade)</i>	<i>Samples of Applications</i>	<i>Curriculum Materials (including technological resources)</i>	<i>Key Vocabulary for Standard 5</i>
Goal 5.1: Understand Common Environmental Quality Issues, Both Natural and Human Induced	<ul style="list-style-type: none"> 8-9.ES.5.1.1 Analyze environmental issues such as water and air quality, hazardous waste, and depletion of natural resources. (656.01a) 	<ul style="list-style-type: none"> Global Warming Activities Guest Speaker Columbia Plateau Activity Mineral Identification Lab 	<ul style="list-style-type: none"> NEC Projector Mineral Samples Mineral Id. Key 	<ul style="list-style-type: none"> hazardous waste nonrenewable resources renewable resources technology
Goal 5.2: Understand the Relationship between Science and Technology	<ul style="list-style-type: none"> 8-9.ES.5.2.1 Explain how science advances technology. (655.01a) 8-9.ES.5.2.2 Explain how technology advances 	<ul style="list-style-type: none"> Video-Deep Sea Vents Planet Model Activity 	<ul style="list-style-type: none"> Internet 	

	<p>science. (655.01a)</p> <ul style="list-style-type: none"> 8-9.ES.5.2.3 Explain how science and technology are pursued for different purposes. (655.01b) 	<ul style="list-style-type: none"> The Cost of Cool Video 	<ul style="list-style-type: none"> Laptops NEC Projector Video NEC Projector 	
<p>Goal 5.3: Understand the Importance of Natural Resources and the Need to Manage and Conserve Them</p>	<ul style="list-style-type: none"> 8-9.ES.5.3.1 Describe the difference between renewable and nonrenewable resources. (656.03a) 	<ul style="list-style-type: none"> Global Warming Activities (discussion of fossil fuel consumption) Mineral Id. Lab Mining in Idaho Video 	<ul style="list-style-type: none"> NEC Projector Mineral Samples Video 	

Terms of significance that are not derived from a particular standard

abiotic
 absorb
 absorption
 adaptation
 additives
 antibiotic
 atomic mass
 atomic number
 ATP
 autotroph
 average
 bacterium
 biotic
 blastocyst
 cell transport
 cellular respiration
 centimeter
 chemical reactivity
 chloroplast
 competition
 concentration
 daughter cell
 decaying
 decline
 decomposer
 dilated
 differentiation
 dispersion
 distribute
 divergence
 dominant
 durable
 ecosystem
 elements
 embryonic
 equivalent
 fossil fuels
 gene

glucose
 habitat
 heterogeneous
 heterotroph
 homogenous
 hormone
 inherited
 isolation
 lipid
 mean
 meiosis
 meiotic
 metals
 micrometer
 mitochondria
 mitochondrion
 mitosis
 mitotic
 molecule
 mutations
 nanometer
 native
 non-metals
 non-native
 nucleotide base
 nucleus
 organelle
 oxygenation
 percent
 phenotype
 plausible
 population
 predation
 primary consumer
 producer
 product
 protein
 protein synthesis

pyruvate
radioactive decay
rate
reactant
recessive
recombination
replication
resistant

sediment
selection
silt
starch
stimuli
turgor
vacuole
zygote