

## Investigating Earth Systems Correlation to the Minnesota Earth and Space Science Standards, Grade 8

	Astronomy	Climate and Weather	Dynamic Planet	Energy Resources	Fossils	Materials and Minerals	Oceans	Rocks and Landforms	Soil	Water as a Resource
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**Grade 8**

**I. HISTORY AND NATURE OF SCIENCE**

**A. Scientific World View**

**Standard: The student will understand that science is a way of knowing about the world that is characterized by empirical criteria, logical argument and skeptical review.**

1. The student will explain and give examples of how science can be used to make informed ethical decisions by identifying likely consequences of particular actions.	●	●	●	●	●	●	●	●	●	●
2. The student will explain the development, usefulness and limitations of scientific models in the explanation and prediction of natural phenomena.	●	●	●	●	●	●	●	●	●	●

**B. Scientific Inquiry**

**Standard: The student will understand that scientific inquiry is used by scientists to investigate the natural world in systematic ways.**

1. The student will know that scientific investigations involve the common elements of systematic observations, the careful collection of relevant evidence, logical reasoning and innovation in developing hypotheses and explanations.	●	●	●	●	●	●	●	●	●	●
2. The student will describe how scientists can conduct investigations in a simple system and make generalizations to more complex systems.	●	●	●	●	●	●	●	●	●	●

**Standard: The student will use multiple skills to design and conduct scientific investigations.**

1. The student will specify variables to be changed, controlled and measured.	●	●	●	●	●	●	●	●	●	●
2. The student will use sufficient trials and adequate sample size to ensure reliable data.	●	●	●	●	●	●	●	●	●	●
3. The student will use appropriate technology and mathematics skills to access, gather, store, retrieve and organize data.	●	●	●	●	●	●	●	●	●	●

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<b>C. Scientific Enterprise</b>										
<b>Standard: The student will know that science and technology are human efforts that both influence and are influenced by civilizations and cultures worldwide.</b>										
1. The student will evaluate the credibility and validity of scientific and technological information from various sources.	●	●	●	●	●	●	●	●	●	●
<b>D. Historic Perspectives</b>										
<b>Standard: The student will understand how scientific discovery, culture, societal norms and technology have influenced one another in different time periods.</b>										
1. The student will relate personal experiences in scientific investigation to the experiences of scientists throughout history.	●	●	●	●	●	●	●	●	●	●
2. The student will cite examples of how science and technology contributed to changes in agriculture, manufacturing, sanitation, medicine, warfare, transportation, information processing or communication.	●	●	●	●	●	●	●	●	●	●
<b>III. EARTH AND SPACE SCIENCE</b>										
<b>A. Earth Structure and Processes</b>										
<b>Standard: The student will identify Earth's composition, structure and processes.</b>										
1. The student will explain how earthquakes, volcanoes, sea-floor spreading and mountain building are evidence of the movement of crustal plates.			●				●			
2. The student will describe how features on the Earth's surface are created and constantly changing through a combination of slow and rapid processes of weathering, erosion, sediment deposition, landslides, volcanic eruptions and earthquakes.			●		●	●	●	●	●	●
3. The student will describe the various processes and interactions of the rock cycle.			●		●	●		●	●	
4. The student will interpret successive layers of sedimentary rocks and their fossils to document the age and history of the Earth.			●		●			●		

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5. The student will recognize that constructive and destructive Earth processes can affect the evidence of Earth's history.			●		●	●	●	●	●	●
6. The student will classify and identify rocks and minerals using characteristics including but not limited to density, hardness and streak.			●			●		●	●	
<b>Standard: The student will investigate the impact humans have on the environment.</b>										
1. The student will identify and research an environmental issue and evaluate its impact.		●	●	●						
<b>B. The Water Cycle, Weather and Climate</b>										
<b>Standard: The student will investigate how the atmosphere interacts with the Earth system.</b>										
1. The student will define radiation, conduction and convection and explain their effects on weather and climate.		●								
2. The student will identify the forces that create currents and layers in the Earth's atmosphere and water systems.		●		●			●			●
3. The student will describe the effect of Earth's rotation on the winds and ocean currents.	●	●					●			●
4. The student will collect and use data to predict the weather.		●								
5. The student will identify the composition and structures of the atmosphere.	●	●					●			●
6. The student will describe climate changes that have occurred over time.		●					●			
<b>C. The Universe</b>										
<b>Standard: The student will compare objects in the solar system and explain their interactions with the Earth.</b>										
1. The student will recognize that the sun is the principal energy source for the solar system and that this energy is transferred in the form of radiation.	●			●			●			
2. The student will explain how the combination of the Earth's tilted axis and revolution around the sun causes the progression of seasons and weather patterns.	●									

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3. The student will compare and contrast the planets, taking into account their composition, mass and distance from the sun and recognize the conditions that have allowed life to flourish on Earth.	●									
4. The student will use the predictability of the motions of the Earth, and sun to explain the length of day, length of year, phases of the moon, eclipses, tides and shadows.	●									
<b>Standard: The student will describe the composition and structure of the universe.</b>										
1. The student will recognize that the universe consists of many billions of galaxies, each containing many billions of stars and that there are vast distances that separate these galaxies and stars from one another.	●									
2. The student will recognize that the sun is a medium-sized star and is the closest star to Earth. It is the central and largest body in the solar system and is one of billions of stars in the Milky Way Galaxy.	●									