

Layered Earth Meteorology Correlations

For Georgia State Science Standards



Middle School: Grades 5-8		Lesson Plans
S6E3	Students will recognize the significant role of water in earth processes	C3, D1-2
b.	Relate various atmospheric conditions to stages of the water cycle	D1-2
d.	Explain the causes of waves, currents and tides	C3
S6E4	Students will understand how the distribution of land and oceans affects climate and weather	B1, D2, D4
a.	Demonstrate that land and water absorb and lose heat at different rates and explain the resulting effects on weather patterns	B1, D2
b.	Relate unequal heating of land and water surfaces to form large global wind systems and weather events such as tornados and thunderstorms	D2, D4
c.	Relate how moisture evaporating from the oceans affects the weather patterns and weather events such as hurricanes	D4
S6E6	Students will describe various sources of energy and with their uses and conservation	B1-4
a.	Explain the role of the sun as the major source of energy and its relationship to wind and water energy.	B1-4

High School: Grades 9-12		Lesson Plans
SES5	Students will investigate the interaction of insolation and Earth systems to produce weather and climate	B2-3, C3, D2, E3, F2, F4
a.	Explain how latitudinal variations in solar heating create atmospheric and ocean currents that redistribute heat globally	C3
b.	Explain the relationship between air masses and the surfaces over which they form	D2
c.	Relate weather patterns to interactions among ocean currents, air masses, and topography	C3, D2
d.	Describe how temperature and precipitation produce the pattern of climate regions (classes) on Earth	E3
e.	Describe the hazards associated with extreme weather events and climate change (e.g., hurricanes, tornadoes, El Niño/La Niña, global warming)	D4, F2, F4
f.	Relate changes in global climate to variation in Earth/Sun relationships and to natural and anthropogenic modification of atmospheric composition	B2-3, E2, F4
SM1	Students will relate the formation, structure and composition of Earth's atmosphere to the processes that cause weather	A1-4, B2, C1
a.	Describe how atmospheric activity such as meteor bombardment, led to the formation of Earth's early atmosphere	A1
b.	Examine the chemical composition, location and characteristics of the layers of Earth's present day atmosphere	A1-4
c.	Analyze the effect insulation has on the relative amount of heat energy in the atmosphere and how temperature differences give rise to phenomena such as Hadley cells and Ferrel cells	B2
d.	Analyze the influence that the Coriolis Effect has on the movement of Earth's air masses	C1
e.	Compare the amount of water vapor in the atmosphere to characteristic atmospheric conditions	A1
SM2	Students will investigate energy transfer to types of clouds formed, precipitation, and air	B1-2, D2
a.	Explain the relationship between air masses and the areas over which they form	D2

b.	Differentiate the four types of fronts, their structure, and the clouds and precipitation associated with each front	D2
c.	Relate weather events to the energy transfer within the Earth's atmosphere	B1-2
d.	Examine the role of energy transfer in the development of global weather patterns	B1-2
SM3	Students will explore the science of weather forecasting	D3-4
a.	Analyze a surface weather map	D3
b.	Predict weather for a specific location using knowledge of air mass, frontal, and cyclone movement	D3
c.	Investigate and describe the formation of severe weather including severe thunderstorms, hurricane, tornadoes and their role in energy transfer	D4
SM4	Students will analyze the relationship of weather and society	A3, D4, F4
a.	Analyze the implications of severe weather events (droughts, floods, thunderstorms, tornadoes, winter weather, hurricanes, etc.) on local, national, and global economies	D4
b.	Interpret the relationship between weather and pollution (smog, ground level ozone, acid rain, etc.) and the impact of pollution on the economy, health, and the environment	F4
d.	Compare and contrast the reasons for decreasing stratospheric ozone and its implications to humans	A3
SM5	Students will differentiate the climates of Earth, how climate changes through time, and the theories regarding current climate change.	D4, E2-3, F2-4
a.	Compare and contrast the various climates found on Earth	E3
b.	Demonstrate knowledge of the reasons for continual climate change	E2
c.	Evaluate the effects of El Nino-Southern Oscillation (ENSO) and the North Atlantic Oscillation (NAO) on climate	F2-3
d.	Analyze current methods of climate prediction. (Predictions of ENSO, NAO, long-range outlooks, etc.)	F3
e.	Explore radioactive equilibrium and demonstrate the differences between the greenhouse effect and global warming	F4
f.	Judge the current theories explaining global warming and argue the potential implications of global warming on global weather patterns and severe weather events	D4, F4