

## Earth System Evolution Storyline – Changing Life

Below are storylines that were designed by Cheryl Mosier, an Earth Science Teacher at Columbine High School in Littleton, Colorado.

Big Idea:

3. Change through time produced Earth, the net result of constancy, gradual changes, and episodic changes over human, geological, and astronomical scales of times and space.
6. Fluid spheres within the Earth system include the hydrosphere, atmosphere, and cryosphere, which interacts and flow to produce ever-changing weather, climate, glaciers, seascapes, and water resources. These affect human communities, shape the land, transfer Earth materials and energy, and change surface environments and ecosystems. Natural hazards associated with Earth processes and events include drought, floods, storms, volcanic activity, earthquakes and climate change. They pose risks to humans, their property and communities. Earth science is used to study, predict, and mitigate natural hazards so that we can assess risks, plan wisely, and acclimate to the effects of natural hazards.
7. Dynamic environments and ecosystems are produced by the interaction of all the geospheres at the Earth's surface, and include many different environments, ecosystems, and communities that affect one another and change through time.
8. In order to sustain the presence and quality of human life, humans and communities must understand their dependency on Earth resources and environments, realize how they influence Earth systems, appreciate Earth's carrying capacity, manage and conserve nonrenewable resources and environments, develop alternate sources of energy and materials needed for human sustenance, and invent new technologies.

	Activity 1 – Present-Day Climate in Your Community	Activity 2 – Paleoclimates	Activity 3 – How do Earth's Orbital Variations Affect Climate?	Activity 4 – How do Plate Tectonics and Ocean Currents Affect Global Climate?	Activity 5 – Carbon Dioxide Concentration and Atmospheric Global Climate
<b>Key Evidence Learned</b>  <b>Connection to:</b>	<ul style="list-style-type: none"> <li>- factors of the physical environment</li> <li>- topo maps</li> <li>- climate data interpretation</li> <li>- compare and contrast climate data</li> <li>- how physical features can impact climate</li> </ul>	<ul style="list-style-type: none"> <li>- Climate change as evidenced by: <ul style="list-style-type: none"> <li>- tree rings</li> <li>- ice cores</li> <li>- geologic sediments</li> <li>- glacial sediments</li> <li>- fossil pollen</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- axial tilt is 23 ½ degrees</li> <li>- cause of seasons</li> <li>- how our orbit impacts climate</li> <li>- insolation</li> </ul>	<ul style="list-style-type: none"> <li>- REVIEW of information previously covered in other units</li> </ul>	<ul style="list-style-type: none"> <li>- compare CO2 levels and relationships</li> <li>- predict future using data</li> <li>- causes of warming</li> </ul>
<b>Big Idea</b>	<ul style="list-style-type: none"> <li>- how different climate and ecosystems are formed</li> <li>- understanding our place on Earth</li> </ul>	<ul style="list-style-type: none"> <li>- how climate has changed over time</li> </ul>	<ul style="list-style-type: none"> <li>- how orbit and tilt create seasons</li> <li>- how changes in orbit or tilt change climates</li> </ul>		<ul style="list-style-type: none"> <li>- how human activity impacted climate</li> </ul>
<b>Real Life and Chapter Challenge</b>	<ul style="list-style-type: none"> <li>- our place on Earth</li> <li>- our ecosystem</li> </ul>	<ul style="list-style-type: none"> <li>- how climate has changed over time</li> </ul>	<ul style="list-style-type: none"> <li>- seasons</li> <li>- how changes in orbit and/or tilt would impact climate and seasons</li> </ul>		<ul style="list-style-type: none"> <li>- how human activity impacted climate</li> </ul>

<b>Geosphere</b>	- how topography plays a role in climate	- geologic sediments - glacial sediments			
<b>Hydrosphere</b>	- how water affects local climate	- ice core data			
<b>Atmosphere</b>	- how climate regions impact the weather	- ice core data	- seasons		- global c
<b>Cryosphere</b>	- how location determines the presence of ice	- ice core data - glacial sediments			
<b>Biosphere</b>	- different climates	- tree rings - fossil pollen	- seasons		- global c
<b>State Standard</b>	4.3.d, 4.2.c, 4.2.e	4.2.e	4.4.a, 4.4.b		4.2.e
<b>Jeffco Standard</b>	4.2.d, 4.2.e, 4.3.c	4.2.e	4.4.a, 4.4.b		4.2.e
<b>CSAP Frame.</b>	4.2.5.a	4.2.1.d, 4.2.5.b, 4.2.5.c	4.4.1.a		4.2.5.b, 4
<b>Jeffco PE</b>	W&C 3a	W&C 3b	U 2c		W&C 3b

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