

## Understanding Your Environment Storyline – Bedrock Geology – Chapter 1

Big Idea:

10. 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.
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.
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.

	<b>Activity 1 – Sedimentary Rocks</b>	<b>Activity 2 – Igneous Rocks</b>	<b>Activity 3 – Metamorphic Rocks</b>	<b>Activity 4 – Rock Units</b>	<b>Activity 5 – Structural Geology</b>	<b>Activity 6 – Reading the Geologic History</b>	<b>Activity 7 – Geology of the United States</b>
<b>Key Evidence Learned</b>	- identify and classify sedimentary rocks - describe three main types of sedimentary rocks - classification systems - determine environment a rock was deposited in	- identify igneous rocks using a chart - how do two main types form - understand classification system	- identify metamorphic rocks using a chart - agents of metamorphism - materials can change over time	- rocks are arranged as units - general shapes of rock units based on rock type - read and interpret geologic maps	- faults and folds - models help us understand the Earth - types of faults and how they form	- basic principles used to determine relative ages - unconformities and their role in geologic history - interpret geologic history of an area using the basic principles of superposition, original horizontality, lateral continuity and crosscutting relationships	- ages of rocks in the US - general geology of the US
<b>Connection to:</b>							
<b>Big Idea</b>	- uses for different sedimentary rocks - how sedimentary rocks are formed	- uses for different igneous rocks - how igneous rocks are formed	- uses for different metamorphic rocks - how metamorphic rocks are formed	- how our community has changed through time	- how our community has changed through time	- how the Earth has changed through time - how to interpret changes in the Earth	- where specific rock units are in the US - why certain environments exist in certain locations
<b>Real Life and Chapter Challenge</b>	- sedimentary rocks in our area - how those rocks formed	- igneous rocks in our area - how those rocks formed	- metamorphic rocks in our area - how those rocks formed	- geology of the Front Range	- where faults and folds are in the Front Range	- how to interpret the layers of the Front Range	- where our community fits in relation to others in the US
<b>Geosphere</b>	- how sedimentary rocks form	- how igneous rocks form	- how metamorphic rocks form	- how layers are formed and change over time	- how faults form - how folds form	- how Earth’s layers have changed over time	- rock units in the US
<b>Hydrosphere</b>	- how sedimentary rocks form	- how igneous rocks form under water		- how weathering and erosion changes layers		- how water has changed the layers we see	- where water has been in the past
<b>Atmosphere</b>	- how air changes sedimentary rocks	- how air changes igneous rocks	- how air changes metamorphic rocks	- how wind has changed layers through weath and erosion		- how wind has changed the layers we see	
<b>Cryosphere</b>							
<b>Biosphere</b>	- types of life that can exist on different rocks	- types of life that can exist on different rocks	- types of life that can exist on different rocks	- how different layers at the surface determine the type of ecosystem		- how life has changed over time as the surface has changed	- why different ecosystems are in different
<b>State Stand.</b>	4.1a	4.1a	4.1a	4.1c	4.1c	4.1c	4.1c
<b>Jeffco Stand.</b>	2.1a, 4.1 a	2.1a, 4.1a	2.1a, 4.1a	4.1c, 4.1d	4.1c, 4.1d	4.1c, 4.1d	4.1c, 4.1d
<b>CSAP Frame</b>				4.1.3a	4.1.3a, 4.1.3b	4.1.3a, 4.1.3b, 4.1.3d, 4.1.33	4.1.3a
<b>Jeffco PE</b>				3a, 3c	2c, 3a, 3c	2c, 3a, 3c	2c

## Understanding Your Environment – River Systems and Your Community – Chapter 2

Big Idea:

2. Earth’s dynamic equilibrium system contains subsystems from atoms to planetary spheres. Materials interact among these subsystems due to natural forces and energy that flows from sources inside and outside of the planet. These interactions, changes, forces and flows tend to occur in offsetting directions and amounts. Materials tend to flow in chains, cycles and webs that tend toward equilibrium states in which energy is distributed as uniformly as possible. The net result is a state of balanced change or dynamic equilibrium, a condition that appears to have existed for billions of years.
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.
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.

	<b>Activity 1 – High-Gradient Streams</b>	<b>Activity 2 – Low-Gradient Streams</b>	<b>Activity 3 – Sediments in Streams</b>	<b>Activity 4 – Rivers and Drainage Basins</b>	<b>Activity 5 – Parkland Field Study</b>
<b>Key Evidence Learned</b>	- characteristics of high-gradient streams - hazards and benefits from high-gradient streams	- characteristics of low-gradient streams - hazards and benefits from low-gradient streams	- describe and classify sediments - what happens to sediments as they travel in streams - relationship between stream velocity and particle size - relationship between transport distance and sediment size	- topographic maps - drainage basins - interactions between communities and river systems	- reservoirs, flux, inflows and outflows - changes in stream systems
<b>Connection to:</b>					
<b>Big Idea</b>	- landforms made by high-gradient streams - hazards and benefits - environments and ecosystems	- landforms made by low-gradient streams - hazards and benefits - environments and ecosystems	- how water weathers and erodes particles - deposition processes	- how drainage basins impact humans	- how communities rely on reservoirs for water supplies - what flux, inflows and outflows are and how humans impact them
<b>Real Life and Chapter Challenge</b>	- streams in Colorado - erosion and deposition processes	- streams in Colorado - erosion and deposition processes	- sedimentary layers in Colorado - how particle size is determined by distance and velocity	- where drainage basins are in Colorado – which one we live in	- where reservoirs are in Colorado
<b>Geosphere</b>	- change over time of the Earth’s surface	- change over time of the Earth’s surface	- change over time of the Earth’s surface	- what makes a drainage basin and what can change them	- changes in stream systems
<b>Hydrosphere</b>	- how water in high-gradient streams weather and erode materials - how water creates landforms	- how water in low-gradient streams weather and erode materials - how water creates landforms	- how velocity and distance of water transport change particles	- how water moves in a drainage basin	- how water is stored in the environment
<b>Atmosphere</b>					
<b>Cryosphere</b>					
<b>Biosphere</b>	- ecosystems created by high-gradient streams	- ecosystems created by low-gradient streams	- ecosystem impacts of stream deposits	- ecosystems in drainage basins	- ecosystems in stream systems
<b>State Standard</b>					
<b>Jeffco Stand.</b>					
<b>CSAP Frame.</b>					
<b>Jeffco PE</b>	2b	2b	2b		

## Understanding Your Environment – Land Use Planning and Your Community – Chapter 3

Big Idea:

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	<b>Activity 1 – Your Community's Water Resources</b>	<b>Activity 2 – Urban Development and Air Quality</b>	<b>Activity 3 – Flooding</b>	<b>Activity 4 – Slope of Land</b>	<b>Activity 5 – Soil and Land Use</b>	<b>Activity 6 – Surveying the Community of Land Use</b>
<b>Key Evidence Learned</b>	- local drainage basins - water sources in our community - importance of protecting water - location of watersheds and drainage divides for land use planning	- urban heat island effect - factors that cause heat island - how to minimize heat island	- areas that would be flooded - importance of floodplains in land use planning	- angle of repose for different materials - slopes in our area	- local soils and classification of them - how soils form, soil profiles - soil changes over time	- use a process to build consensus - appreciation for different points of view - land features and natural resources play an important role in land use planning
<b>Connection to:</b>						
<b>Big Idea</b>	- location of watersheds and drainage divides are located - how humans impact these systems	- how humans impact temperature locally	- human impact of flooding	- how slopes can cause change - impact of slope on ecosystems	- how soils are used by humans as a natural resource	- human impact on our resources
<b>Real Life and Chapter Challenge</b>	- where our water comes from in Colorado - why it's important to protect our water resources - water treatment locations	- why Denver's temps are different now than before DIA was built - how to minimize heat islands	- where floods can occur in the metro area and the mountains - how to minimize flooding - why Chatfield Reservoir was made	- slopes in the area - why Green Mountain was a bad building choice	- soils in our area - how soils can be changed over short and long periods of time	- how humans feel about certain issues and how to reach consensus
<b>Geosphere</b>	- how the land is naturally divided	- surface materials and their impact on temperatures	- impact of flooding on surface materials	- mass wasting processes	- how soils form	
<b>Hydrosphere</b>	- where water is located	- how urban heat islands can affect surface water temps	- how flooding can change the path of streams	- how mass wasting can change water flow patterns	- impact water has on soil formation	
<b>Atmosphere</b>		- how different materials create the urban heat island effect			- how wind and air can impact soil formation	
<b>Cryosphere</b>		- how local changes in temp can affect glaciers - how local changes in temp can affect ice on lakes				
<b>Biosphere</b>	- ecosystems in watersheds and drainage divides	- how urban heat island effects can impact ecosystems	- flooding impacts on ecosystems	- ecosystems in sloped areas and how they are different than flat areas	- types of plants and animals that can live in different soils	
<b>State Standard</b>	4.3a, 4.3b					
<b>JeffCo Stand,</b>	4.3c	4.2c			4.1e	
<b>CSAP Frame.</b>	4.3.2c	4.2.1d, 4.2.3.b	4.1.4a, 4.1.4b	4.1.4a	4.1.4a	
<b>Jeffco PE</b>						

