

Subject: Accelerated Geology

Big Idea or Essential Question: What is groundwater? How do humans affect groundwater?

Standards	SHHS Learning Expectations	Skills	Assessment	Content (materials used to teach)
<p>*Know the hydrologic cycle and how humans can have an impact upon the water cycle</p> <p>*Know the factors that govern our use of groundwater resources</p> <p>*Know how water moves below the ground surface</p> <p>*know the geologic processes and features associated with groundwater</p> <p>*know how human activity has an impact on ground water and how humans can prevent that impact</p>	<p>*LE 1: Read, write and communicate effectively</p> <p>*LE 3: Study and work productively both independently and in groups</p> <p>*LE 4: Demonstrate personal, social and civic responsibilities</p> <p>*LE 5: Acquire, apply, integrate, analyze and synthesize knowledge</p> <p>*LE 7: Understand and apply principals of health and wellness</p> <p>*LE 8: Identify and apply appropriate technologies</p>	<p>*Create a model of the hydrologic cycle and within the model show how human activities have an impact upon the hydrologic cycle</p> <p>*Explain terms including permeability and porosity, aquifer, unconfined aquifer, confined aquifer and aquiclude and what types of ground materials are good for wells and reservoirs</p> <p>*Explore how humans use water and how humans can reduce the amount of water used</p> <p>*Understand what the groundwater table is and how terms such as unsaturated zone, saturated zone, recharge and discharge impact the groundwater table</p> <p>*Understand and describe how topography influences groundwater movement</p> <p>*Have an appreciation for the value of water conservation and protection through the completion of a research project and then use that research project to educate the community</p>	<p>*Reading response papers to handouts</p> <p>*Vocab posters</p> <p>*Models</p> <p>*Class discussions</p> <p>*Lab – Understanding Groundwater Movement (to come 2003-2004)</p> <p>*Quizzes</p> <p>*Chapter test</p> <p>*Groundwater research project on how human affect groundwater</p>	<p>*Chapter 12 in <i>Understanding Earth</i></p> <p>*Reading handouts from magazines and on-line resources such as non-point source pollution, who has access to water and who does not, how water is used in the United States compared to other countries</p> <p>*video on groundwater</p> <p>*Project resources: library resources (books, articles, encyclopedia), interviews with community members</p>

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Big Idea or Essential Question: The Geology of Rivers and Streams

Standards	SHHS Learning Expectations	Skills	Assessment	Content (materials used to teach)
<p>*Know how streams form and evolve</p> <p>*Know how erosion within a stream occurs</p> <p>*Know the factors associated with stream speed and discharge</p> <p>*Know why and how floods occur</p> <p>*Know the geologic features and processes associated with drainage networks and deltas</p> <p>*Know how humans effect rivers</p> <p>*Know how humans are effected by rivers</p>	<p>*LE 1: Read, write and communicate effectively</p> <p>*LE 3: Study and work productively both independently and in groups</p> <p>*LE 4: Demonstrate personal, social and civic responsibilities</p> <p>*LE 5: Acquire, apply, integrate, analyze and synthesize knowledge</p> <p>*LE 7: Understand and apply principals of health and wellness</p> <p>*LE 8: Identify and apply appropriate technologies</p>	<p>*Understand stream loads and sediment movement (terms including suspended load, bed load, dissolved load, capacity and competence) and understand how the amount of erosion and sedimentation is related to stream speed</p> <p>*Understand how rivers and streams form and evolve (terms including natural levees, oxbows, flood plain, stream channel) and understand the differences between the different types of stream channels</p> <p>*Describe what discharge is, how topography and stream shape effect discharge, how to calculate discharge</p> <p>*Explain what floods are and how they occur and the impacts of floods on nature and humans in terms of bringing nutrient rich soils and washing away houses and crops</p> <p>*Explore how human built levees effect rivers and flooding</p> <p>*Explore how human built levees effect humans</p> <p>*Understand the differences between dendritic drainage and the other three main drainage patterns and understand how dendritic drainage is at work in the Connecticut River Valley</p>	<p>*Lab – Measuring the Discharge of a River</p> <p>*Reading response papers to handouts and videos</p> <p>*Vocab posters</p> <p>*Models</p> <p>*Class discussions</p> <p>*Web quest on flooding and how humans effect rivers</p> <p>*Quizzes</p> <p>*Chapter test</p>	<p>*Chapter 13 in <i>Understanding Earth</i></p> <p>*Reading handouts from magazines and on-line resources</p> <p>*Nova video on flooding</p> <p>*Video on rivers, streams, and erosion</p> <p>*Internet web quest</p>

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		*Explain how deltas form at the mouth of a river and how tide and wave energy effect the formation of deltas		

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Big Idea or Essential Question: Oceans

Standards	SHHS Learning Expectations	Skills	Assessment	Content (materials used to teach)
<p>*Understand how waves and tides shape the shoreline</p> <p>*Know how beaches form and how they can change to due natural factors and human activities</p> <p>*Know the major components of the continental margins and adjacent ocean floor</p> <p>*Know how humans effect oceans</p> <p>*Know the geologic features and processes of the deep ocean floor</p> <p>*Know the geologic differences between the different oceans</p> <p>*Know how coral reefs form</p>	<p>*LE 1: Read, write and communicate effectively</p> <p>*LE 3: Study and work productively both independently and in groups</p> <p>*LE 4: Demonstrate personal, social and civic responsibilities</p> <p>*LE 5: Acquire, apply, integrate, analyze and synthesize knowledge</p> <p>*LE 7: Understand and apply principals of health and wellness</p> <p>*LE 8: Identify and apply appropriate technologies</p>	<p>*Understand how waves form and how they effect the shoreline in terms of erosion and deposition of sediment</p> <p>*Explain what longshore current and longshore drift are and how they shape the coastline</p> <p>*Understand and discuss the difference between hard stabilization (structures including jetties, breakwaters, groins, and seawalls) and soft stabilization and how they effect the shoreline</p> <p>*Understand and describe the different parts of the shoreline including swash zone, surf zone, backshore, offshore, foreshore, continental margins, continental slope and continental rise, spits, barrier islands, and stacks</p> <p>*Describe the features on the oceanic floor and how they form – these features include deep sea trenches, mid ocean ridges, abyssal plains, sea mounts, submarine fans, hills, plateaus, submarine canyons</p> <p>*Understand that different oceans have different geologic structures – mostly due to plate tectonics</p> <p>*Explain how coral reefs form, where they form and the different types of coral reefs</p>	<p>*Reading response papers to handouts and videos</p> <p>*Vocab posters</p> <p>*Models</p> <p>*Class discussions</p> <p>*Research project on oceans</p> <p>*Lab – Measuring the Beach Front: Summer vs. Winter (to come 2003 – 2004)</p> <p>*Quizzes</p> <p>*Chapter test</p>	<p>*Chapter 17 in <i>Understanding Earth</i></p> <p>*Reading handouts from magazines and on-line resources including international laws on oceans, how humans are effecting oceans both positively and negatively, human made structures such as jetties and breakwaters and how they effect the coastline</p> <p>*Video on coastlines and erosion</p> <p>* Project resources: library resources (books, articles, encyclopedias)</p>

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Big Idea or Essential Question: Glaciers

Standards	SHHS Learning Expectations	Skills	Assessment	Content (materials used to teach)
<p>*Know how glaciers form and how they move</p> <p>*Know the differences between valley and continental glaciers</p> <p>*Know what is meant by the term “ice ages” and know the factors that caused them and the factors that may cause another ice age in the future</p> <p>*Know how glaciers erode bedrock, transport and deposit sediments and how they shape the landscape</p> <p>*Know the various landforms that glaciers create and how they form</p>	<p>*LE 1: Read, write and communicate effectively</p> <p>*LE 3: Study and work productively both independently and in groups</p> <p>*LE 4: Demonstrate personal, social and civic responsibilities</p> <p>*LE 5: Acquire, apply, integrate, analyze and synthesize knowledge</p> <p>*LE 8: Identify and apply appropriate technologies</p>	<p>*Understand how glaciers form and how climate, altitude and latitude have an influence on glacial formation</p> <p>*Describe the differences between valley and mountain glaciers in terms of size, location, landforms created and movement</p> <p>*Explain the three types of slip in glacial movement</p> <p>*Explain glacial budget (ablation and accumulation) and the factors that influence a glacier’s existence</p> <p>*Describe what an ice age is and what the world climate was like during ice ages (lowered ocean levels, cooler climate, etc)</p> <p>*Understand that changes in ocean currents, atmospheric currents and plate movement had a influence in causing ice ages to occur</p> <p>*Understand and describe that current research reveals that a new ice age may occur due to global warming – which will change the ocean currents</p> <p>*Create a model to show how glaciers move sediment and that in the erosion and deposition process, landforms including moraines, drumlins, striations, kettle ponds, eskers, horns, arêtes, fjords, erratics, and varves can form</p>	<p>*Reading response papers to handouts and videos and guest speaker presentation</p> <p>*Vocab posters</p> <p>*Poster presentations</p> <p>*Model of glacial landforms</p> <p>*Class discussions</p> <p>*Research essay on causes of the ice age</p> <p>*Quizzes</p> <p>*Chapter test</p>	<p>*Chapter 15 in <i>Understanding Earth</i></p> <p>*Reading handouts from magazines and on-line resources</p> <p>*Nova video: “Cracking the Ice Age”</p> <p>*Video on glaciers</p> <p>*Internet (web quest)</p> <p>*Essay resources: library resources (books, articles, encyclopedias)</p>

Standards	SHHS Learning Expectations	Skills	Assessment	Content (materials used to teach)
*Know how to read the glacial history of an area using the landforms the glacier left behind		*Explain how to use landforms to read the glacial history of a region (glaciers were present, direction of glacial movement)		

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Big Idea or Essential Question: Minerals

Standards	SHHS Learning Expectations	Skills	Assessment	Content (materials used to teach)
<ul style="list-style-type: none"> * Know what defines a mineral *Know the basic properties of a mineral *Know the major rock forming minerals *Know how humans use minerals 	<ul style="list-style-type: none"> *LE 1: Read, write and communicate effectively *LE 3: Study and work productively both independently and in groups *LE 4: Demonstrate personal, social and civic responsibilities *LE 5: Acquire, apply, integrate, analyze and synthesize knowledge *LE 8: Identify and apply appropriate technologies 	<ul style="list-style-type: none"> *Understand and explain the difference between a mineral and a rock *Describe the basic properties of a mineral *Identify the most common minerals such as quartz, talc, apatite, muscovite, biotite, galena, pyrite, graphite, and others *Understand and explain at least 10 different items that minerals are used for in every day life 	<ul style="list-style-type: none"> *Internet web quest on how humans use minerals *Class discussions *Reading response papers to handouts *Mineral identification test 	<ul style="list-style-type: none"> *Chapter 2 in <i>Understanding Earth</i> *Reading handouts from magazines and on-line resources *Internet (web quest) *Mineral collection

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Big Idea or Essential Question: Where does all that stuff come from?

Standards	SHHS Learning Expectations	Skills	Assessment	Content (materials used to teach)
<p>*Know how metal-bearing mineral deposits form</p> <p>*Know how minerals are mined</p> <p>*Know why minerals are being mined</p> <p>*Know the environmental impacts of mining</p> <p>*Know the impacts upon humans due to mining</p> <p>*Know mined land can be reclaimed and restored</p>	<p>*LE 1: Read, write and communicate effectively</p> <p>*LE 3: Study and work productively both independently and in groups</p> <p>*LE 4: Demonstrate personal, social and civic responsibilities</p> <p>*LE 5: Acquire, apply, integrate, analyze and synthesize knowledge</p> <p>*LE 7: Understand and apply principals of health and wellness</p> <p>*LE 8: Identify and apply appropriate technologies</p>	<p>*Understand and describe how minerals form: hydrothermal (vein and disseminated deposits), igneous (pegmatites, ore deposits, kimberlites), and sedimentary (physical and chemical)</p> <p>*Understand that there are three major ways in which minerals are mined and describe what those processes entail</p> <p>*Understand and explain at least 10 different items that minerals are used for in every day life</p> <p>*Describe and explain the environmental impacts of mining including water pollution, smog, air pollution, degradation of soil and land</p> <p>*Describe and explain how humans are effected by mining in terms of diseases, human rights abuses, and economically</p> <p>*Discuss the processes use to reclaim land after it has been mined and what land can be used for at it has been restored</p>	<p>*Lab: Cookie Mining</p> <p>*Internet web quest</p> <p>*Poster presentations</p> <p>*Reading response papers to handouts</p> <p>*Class discussion</p> <p>*Chapter test</p>	<p>*Chapter 22 in <i>Understanding Earth</i></p> <p>*Reading handouts from magazines and on-line resources including information on types of mining, uses of minerals, environmental impacts of mining, impacts upon humans due to mining</p> <p>*Internet (web quest)</p>

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Big Idea or Essential Question: What are we going to do with all that trash?

Standards	SHHS Learning Expectations	Skills	Assessment	Content (materials used to teach)
<p>*Know the qualifications for a landfill site</p> <p>*Know how recycling impacts the environment</p> <p>*Know how to read geologic maps</p> <p>*Know how landfills can be used once they are filled</p>	<p>*LE 1: Read, write and communicate effectively</p> <p>*LE 2: Define, analyze and solve complex problems and communicate results</p> <p>*LE 3: Study and work productively both independently and in groups</p> <p>*LE 4: Demonstrate personal, social and civic responsibilities</p> <p>*LE 5: Acquire, apply, integrate, analyze and synthesize knowledge</p> <p>*LE 7: Understand and apply principals of health and wellness</p> <p>*LE 8: Identify and apply appropriate technologies</p>	<p>*Create a map, using a series of geologic maps, to determine the best place to put a landfill</p> <p>*Research and discuss how recycling metals and other materials impacts the environment in terms of less mining, less materials in landfills</p> <p>*Research and discuss how landfills can be used once they have been capped off</p>	<p>*Map of proposed landfill sites</p> <p>*Written report that discusses the pros and cons of proposed land sites, the importance of recycling metals and other materials, how landfill area will be used once it is filled</p> <p>*Presentation to “town board” about recommendations</p>	<p>*Reading handouts from magazines and on-line resources</p> <p>*Topo maps</p> <p>*Surface Geology maps</p> <p>*Depth to Bedrock maps</p> <p>*Flood maps</p> <p>*Internet (researching)</p>

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Big Idea or Essential Question: What are other planets like?

Standards	SHHS Learning Expectations	Skills	Assessment	Content (materials used to teach)
<p>*Know geologic history of another planet or moon</p> <p>*Know reasons why life can or cannot exist on that planet or moon</p>	<p>*LE 1: Read, write and communicate effectively</p> <p>*LE 3: Study and work productively both independently and in groups</p> <p>*LE 4: Demonstrate personal, social and civic responsibilities</p> <p>*LE 5: Acquire, apply, integrate, analyze and synthesize knowledge</p> <p>*LE 8: Identify and apply appropriate technologies</p>	<p>*Create a geologic model of planet or moon which is well labeled</p> <p>*Explain how the planet formed including the major geologic features, what the planet is made of, the chemical make-up of the atmosphere, and other vitals of the planet</p> <p>*Discuss reasons why life could or could not exist on planet or moon</p>	<p>*model of planet</p> <p>*Research project</p> <p>*Oral presentation</p>	<p>*Reading handouts</p> <p>*Internet (for research)</p> <p>*Library resources</p>