

Teacher \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

Period(s) \_\_\_\_\_

Grade: 5 Course: Science

Lesson Topic: The Rock Cycle

Objectives		Correlation to State Documents		
The student should be able to:		COS	SAT	AHSGE/EXIT
1) Identify spheres of Earth, including geosphere, atmosphere, & hydrosphere: describing the rock cycle				
2) Identify questions that can be answered through scientific investigation		4: 1		
3) Use appropriate tools & technology resources to gather, analyze, & interpret data.		4: 2		
Activities/Methods		Resource Materials		Assessment
1. Prior to activity, lay the A4 "product" sheets around the room in the order found on <i>the rock cycle</i> sheets. These sheets are <i>non-italicized</i> .			Textbook	Check homework
2. Introduce the three types of rock to students: Igneous, Sedimentary, and Metamorphic.			Overhead Masters	Test/Quiz
3. Divide class into 4 teams. Give each group a copy of <i>the rock cycle</i> handout, and "rock cycle products" (photos and small-scale samples).			Workbook/Handouts	X Project
4. Have each group lay samples and photos at the correct location of the rock cycle on the <i>red</i> sheets around the room.			Multimedia Materials	X Participation
5. After all groups have placed all products, place the teacher samples and photos at correct A4 rock cycle sheets.		X	Hands-On Materials	Class work
6. Explain the processes that change one product to the next and place the italicized "processes" sheets according to <i>the rock cycle</i> sheet.		X	Reference Materials	Review
7. Explain timescales of the processes, & place the corresponding "timings" sheets by each "process" sheet.			Other Supplies	Presentation
8. The end result is a large-scale rock cycle with samples & photographs of the products, joined by descriptions of the processes that link them with a description of the timescale of each process.				Oral Responses
9.				X Teacher Observation
10.				Other
11.			Textbook	Check homework
Comments:		Accommodations	Initials	Remediation Activities
Set up includes: A4 sheet arrangement & distribution of products to groups				
Materials include A4 sheets, Rock cycle handouts, containers of sand soil, photos, and rock sets.				
				<b>Enrichment Activities</b>
				Cooperative learning
				<b>Character Education</b>
<b>Homework:</b>				Respect for environment

Non Instructional Events \_\_\_\_\_

## “Teacher Cheat Sheet”

### Set Up:

Sheets with bold print are referred to as A4 sheets and can be found on the CDROM in the 5<sup>th</sup> Grade folder. Print prior to activity.

Place NON-italicized A4 “products” printed sheets around the room in order found on ‘the rock cycle’ sheet. (See Table 1. below)

Explain the process of the rock cycle and describe the 3 types of rocks: sedimentary, igneous, and metamorphic.

Divide class into teams of 3.

Give each group the following rock cycle “products”:

- A copy of the rock cycle sheet
- One container of sand, one container of soil
- One set of 3 laminated photos (rocks at earth’s surface, sedimentary sequences, and spewing lava)
- One set of sedimentary rocks
- One set of metamorphic rocks
- One set of igneous rocks

### Experiment:

1. Have each team distribute the rock cycle “products” in the correct A4 sheet of the rock cycle around the room.
2. After all student “products” have been placed, discuss the correct answers while placing the larger teacher “products” (sand , soil, pics) with the correct A4 “products” sheet. (See Table 1. below)
3. Link each ‘product’ to the next one in the cycle by placing the “processes” A4 sheets in the gaps between each pair of adjacent products and then discuss what the various terms mean.
4. After suitable discussion and explanation, add the italicized “timings’ A4 sheets to the “processes” A4 sheets to indicate the variable and sometimes very lengthy time scales involved in the rock cycle.

### Directing discussions:

The rock cycle is continuous group of changes that occur in the 3 types of rocks: *igneous*, *sedimentary*, and *metamorphic*.

Igneous rock is formed from *magma* - hot liquid made of melted minerals from deep in the earth. The magma is cooled in the Earth’s crust (*intrusive*) or as it reaches the surface as lava and quickly cools (*extrusive*). Examples of igneous rock include pumice, basalt, & obsidian.

As igneous rock is weathered by wind and water on the Earth’s surface, the pieces, called *sediments*, can be carried way and buried in layers where they can become cemented together over thousands of years. Examples of sedimentary rocks include limestone, conglomerate & sandstone

*Metamorphic* rock, such as schist, quartzite, and marble, are formed by heat from pressure and movement in the Earth’s crust. This heat can “bake” and create crystals in the rock. Metamorphic rock in the earth’s surface can be melted into lava to become igneous rock or can uplifted at the earth’s surface and worn away to become sedimentary rock as the cycle is repeated.

**Table1.** Resources required for the activity

<b>Rock cycle products A4 sheets</b>	<b>Specimens, etc</b>	<b>Rock cycle processes A4 sheets</b>	<b>Rock cycle timings A4 sheets</b>
Rocks at the Earth's surface	Photo of exposed rocks		
		<i>Weathering</i>	Tens to hundreds of years
Rotten rocks and soil	Container of soil		
		<i>Erosion and transport</i>	Seconds to tens of years
Mobile sediments	Container of sand		
		<i>Deposition</i>	Seconds to thousands of years
Sedimentary sequences	Photo of layers of sediments or layered sedimentary rock		
		<i>Compaction and cementation</i>	Tens to millions of years
Sedimentary rocks	Specimens of conglomerate, mudstone, limestone		
		<i>Metamorphism</i>	Millions of years during mountain-building episodes
Metamorphic rocks	Specimens of slate, schist, marble and quartzite		
		<i>Melting</i>	Tens to millions of years
Magma	Photo of lava from volcano		
		<i>Rising</i>	Days (extrusion) to millions of years (intrusion)
		<i>Crystallization under the Earth's surface</i>	Hundreds of thousands to millions of years
		<i>Extrusion</i>	Seconds to weeks
Extrusive igneous rocks	Specimens of pumice and basalt		
		<i>Deformation (folding, faulting, metamorphism)</i>	Seconds (faulting at active Earth zones)  Seconds to millions of years (faulting, folding metamorphism during mountain-building episodes)