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## *Unit 6: The Land Environment (20 Days)*

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### **Lesson 1: Class Notes 6.1 Earth Structures**

#### **Objective(s):**

To cite the location and organization of characteristics of the earth's structures and to construct the evolution of the Rock Cycle

#### **Topics:**

- Continental and oceanic crust
- Composition of the mantle and core
- Lithospheric plates
- Plate boundaries
- Rock Cycle
- Examples and characteristics of 3 types of rock
- Stages of coal

#### **Procedure:**

Follow all of the general guidelines given in Unit 1 on Day 2 for consistent class presentations.

#### **Content Background:**

See selected sections of the text that pertain to the topics to be discussed. Assign appropriate sections or pages in the textbook for student reading.

#### **Suggested Teaching Strategies:**

Order rock samples from supply companies or collect local samples to show students. Pieces of basalt are much heavier than students will expect for their size and make a good opener to pass around before the lesson.

#### **Student Homework:**

Ask students to bring to school any rocks that they have collected. Have an old fashioned "show and tell" giving each student time to tell where they found the rock and if they know its name. Depending on your school locations, a rock collection can be assigned or perhaps extra credit can be given to students who visit a museum and photograph rock and mineral collections.

## Unit 6: The Land Environment

### **Vocabulary:**

*Crust*

*Asthenosphere*

*Convection currents*

*Plate boundary*

*Ring of Fire*

*Magma and lava*

*Radiometric age-dating*

*Intrusive and extrusive igneous rocks*

*Weathering*

*Erosion*

*Clastic sedimentary rocks*

*Peat, lignite, bituminous, and anthracite*

*Foliated metamorphic rock*

### **Lesson 2: Lab 6:21 Rock Cycle, Weathering and Sediments**

#### **Objective(s):**

To observe and compare the processes that weather and erode rocks and to evaluate sediments by general physical parameters

#### **Skills attained:**

Measure the size and grain shape of sediments

Recreate the conditions for causing physical and chemical weathering

Observe the effect of weathering and record data

Sort sediments using the Wentworth scale

Identify parent rock, sketch, mass and sort sediments

#### **Procedure and Materials list:**

Follow the directions given in the Lab Manual. Run Part 1 on mechanical weathering concurrently with Part 2 on chemical weathering. Set up the experiment and mass each initial sample. Provide students with a few minutes each day for 5 days to record new data as directed. Students should complete Part 3 at this time.

#### **Content Background:**

See Class Notes

### Lesson 3: Class Notes 6.2 Minerals and Mining

#### Objective(s):

To expand the distinction between the terms mineral, element, rock and compound and inspect the types of mineral mining

#### Topics:

- Differentiate between minerals, elements, rocks and chemical compounds
- Types of mineral resources
- Properties of minerals
- Types of mining
- Global mineral reserves

#### Procedure:

Follow all of the general guidelines given in Unit 1 on Day 2 for consistent class presentations.

#### Content Background:

See selected sections of the text that pertain to the topics to be discussed. Assign appropriate sections or pages in the textbook for student reading.

#### Vocabulary:

Mineral

Ore

Mohs scale

Strip mining

Tailings

Gangue

Metal depletion

Surface Mining and Reclamation Act 1977

Antarctica Treaty System 1961 and 1991

#### Wrap-Up Activity

Allow a few minutes for collecting data for Lab 6.21

## Unit 6: The Land Environment

### Lesson 4: Class Notes 6.3 Soil

#### Objective(s):

To look at soil characteristics and explain the use of the Soil Triangle and Munsell Color system

#### Topics:

- Soil horizons
- Soil particle sizes
- Characteristics of soil
- Effect of erosion

#### Procedure:

Follow all of the general guidelines given in Unit 1 on Day 2 for consistent class presentations.

#### Content Background:

See selected sections of the text that pertain to the topics to be discussed. Assign appropriate sections or pages in the textbook for student reading.

#### Suggested Teaching Strategies:

Ask students to find out why the Dust Bowl migrants were called “Okies.” If your state is located in the Plains, students may have family pictures or stories to share. Students may want to read about the plight of Dust Bowl migrants in John Steinbeck’s novel *The Grapes of Wrath*.

#### Vocabulary:

*Humus*

*Sand*

*Clay*

*Silt*

*Loam*

*Sorting*

*Porosity*

*Munsell Color System*

*Textural Soil Triangle*

*Permeability*

*Great Dust Bowl*

#### Wrap-Up Activity

Allow a few minutes for collecting data for Lab 6.21

## Unit 6: The Land Environment

### Lesson 5 Lab 6:22 Soil Quality Testing

#### Objective(s):

To conduct various tests to evaluate soil quality and to interest students in gardening

#### Skills attained:

Collect and grade soil samples  
Use the Munsell Color Scale  
Sort sediments using the Wentworth scale  
Test for permeability and porosity  
Analyze soil nutrients  
Design an original Green Thumb contest

#### Procedure and Materials list:

Follow the directions given in the Lab Manual. Students should complete Parts 1 and 2.

#### Content Background:

See Class Notes

#### Student Homework:

Part 5 of the lab has the suggestions for the Green Thumb contest. Teachers may give the directions or allow students to design their own parameters. Plants can be grown at school or at home as independent research project.

#### Internet Resources:

Research the soil nutrients needed by your plant and any other limiting factors.

#### Wrap-Up Activity

Allow a few minutes for collecting data for Lab 6.21

### Lesson 6: Finish Lab 6:22 Soil Quality Testing

#### Objective(s):

To complete Lab 6:22 started on Lesson/Day 5.

#### Procedure and Materials list:

Follow the directions given in the Lab Manual. Students should complete Parts 3 and 4.

#### Performance Assessment:

Collect the lab at the end of class

## Unit 6: The Land Environment

### Lesson 7: Finish Lab 6:21 Rock Cycle, Weathering and Sediments

**Objective(s):**

To complete Lab 6:21 started on Lesson/Day 2.

**Procedure and Materials list:**

Follow the directions given in the Lab Manual. Finish collecting weathering data and answer the conclusion questions.

**Content Background:**

See Class Notes

**Performance Assessment:**

Collect the lab at the end of class

### Lesson 8: Class Notes 6.4 Land Use and Green Consumerism

**Objective(s):**

To list and define the types of public land use and evaluate the problems associated with Eminent Domain

**Topics:**

- Type of public lands
- Eminent Domain
- Green consumerism
- Green washing

**Procedure:**

Follow all of the general guidelines given in Unit 1 on Day 2 for consistent class presentations.

**Content Background:**

See selected sections of the text that pertain to the topics to be discussed. Assign appropriate sections or pages in the textbook for student reading.

**Vocabulary:**

*Conservation Biology*

*Eminent Domain*

*Regulatory takings*

*Wilderness Act*

*Wild and Scenic River Systems Act*

## Unit 6: The Land Environment

### Lesson 9: Class Notes 6.5 Ethnobotany

#### Objective(s):

To deduce the connections between the land and the development of culture

#### Topics:

- Rise of civilization from nomadic lifestyles
- Trade routes for the acquisition of spices
- Diseases influencing culture
- Plants influencing culture
- Animals and the development of wealth
- New technologies from the land

#### Procedure:

Follow the all of the general guidelines given in Unit 1 on Day 2 for consistent class presentations.

#### Content Background:

See selected sections of the text that pertain to the topics to be discussed. Assign appropriate sections or pages in the textbook for student reading.

#### Suggested Teaching Strategies:

When student arrive for class, ask them to write on the board the name of the country(s) where their family or ancestors originated. After the notes, discuss if the land might have influences their family's immigration to the United States.

#### Vocabulary:

*Ethnobotany*

*Pharmacology*

*Aquaculture*

*Hydroponics*