

## Section 10

### Science

#### Geology

As the pioneers traveled the Oregon trail they came across various landmarks which they used to identify their position along the way. Examples would be Chimney Rock (Nebraska) and Independence Rock (Wyoming). The Cayuse Indians also had a landmark rock that came from an Indian Legend. It is located at Wallula Junction and is known as the Ki-Use Girls.

Integrate geology into your curriculum by doing some of the following activities.

1. Review the three basic types of rocks: igneous, sedimentary, and metamorphic. Have examples of each rock type for students to handle and examine. Discuss the differences of these three rock types and identify the rocks which the pioneers saw or used. Various uses of different rocks could be discussed and researched. Groups can review and research types of rocks and write mini-reports.
2. Have the kids simulate Independence Rock by writing their names on a piece of butcher paper and including their own personal messages. Include a conservation message about why we don't carve our names on rocks and trees today.
3. Talk about hardness levels of different rocks. (Example-Limestone is a very "soft" rock, while granites and basalt are "harder" rocks.)
4. Have students bring in their own rock samples and match these with class samples. Students can also do this matching activity blindfolded and use only their sense of feel (hands only) to match up rocks by examining rock surfaces.
5. Have the students write about various uses of rocks (in the past and present). How did the pioneers and Indians use rocks? How do we use rocks today? Have uses for rocks changed through time? What materials do we use today instead of rocks? Why has the use of rocks increased or decreased over time?
6. Retell the Indian story of the Ki-Use Girls and have the students develop and write their own version of this legend. ([The Cayuse Indians](#), Ruby & Brown, pgs. 75-76, or see Oregon Trail Teacher's Guide — Language Arts.)
7. Study the continental divide and how the rivers will flow downward and towards the ocean. Have students locate the Oregon trail on a map as well as the major rivers. In which direction do the rivers flow? Why?

## **Soils**

Initial Questions to ask Students:

Why did Marcus Whitman settle at Waiilatpu?

Why did he not establish the Mission closer to the Columbia River where access to supplies would be easier?

Why did he not settle closer to the Blue Mountains where lumber was more abundant?

Why did Marcus Whitman consider farming important in order for his mission to survive?

Why did he consider farming important to the Cayuse Indians?

### **Possible Activities:**

1. Review different types of soil such as clay, sand, silt, loam, and rock.
2. Review difference in topsoil, subsoil and bedrock. (It helps to have samples of each soil type as well as a magnifying glass.)
3. During the spring, identify and research the crops that Hudson's Bay Company grew at Fort Vancouver. (These should be corn, wheat, squash, potatoes, tomatoes, peas, melons and other basic vegetables.) In groups, have the students plant these vegetables in a different soil type. Have students predict what will grow the best and in what type of soil. Verify whether predictions were accurate or not—discuss reasons for accurate or inaccurate predictions.
4. If possible, make adobe bricks using materials in the following combinations:
  - clay soil and straw
  - sandy soil and straw
  - sandy soil only
  - clay soil only
5. Predict which "adobe brick" will hold up best to weather and construct.

### **Adobe Brick Construction:**

- 1) It will be necessary to make a mold to form the bricks. Whitman used a mold which measured 20" x 10" x 5". A mold can easily be constructed using pre-cut lumber.
- 2) Adobe is made best from clay soil mixed with straw. Mix the soil with water until it becomes quite thick.
- 3) Once the mixture has thickened, place it into the wooden mold.
- 4) Let it bake in sun for one to two hours (depending on weather and thickness of clay).

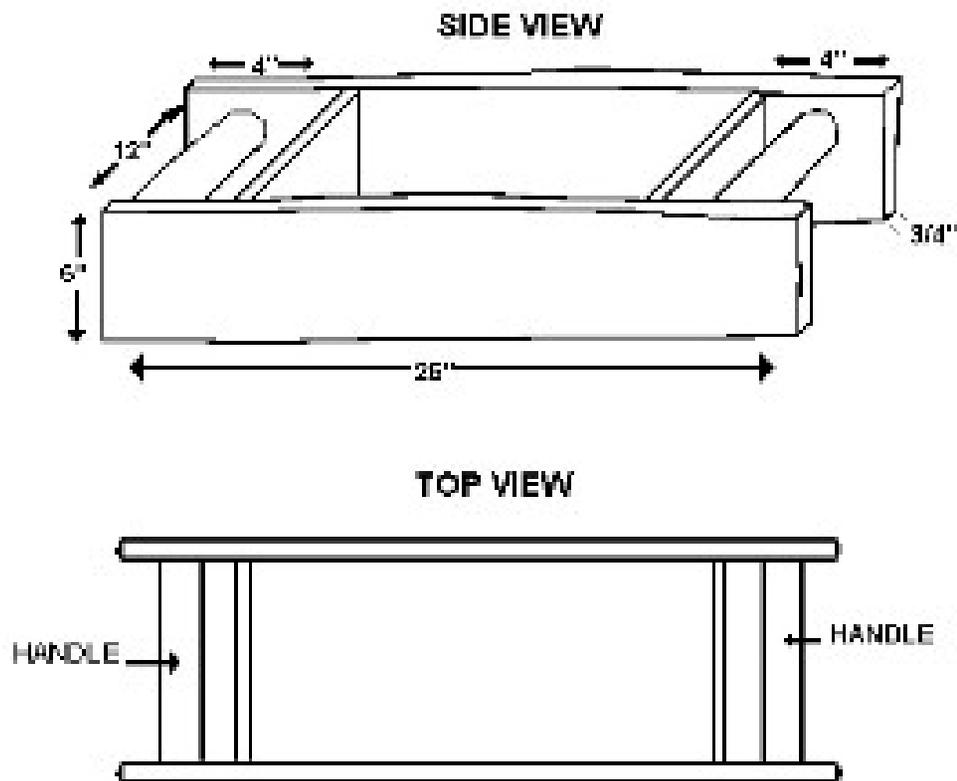
5) Once the clay has hardened, carefully take it out of the mold and lay this “brick” on end for an additional ten days before building.

\*\* An alternative method would be to scale down the adobe bricks to a more manageable classroom size. (Approximately 2" x 4") Additionally, other items could easily be used as molds rather than having to construct them from scratch.

For example:

- small milk cartons
- plastic blocks
- cardboard shoe boxes
- Tupperware containers

From these smaller molds, smaller bricks would be produced, and it would be feasible to construct semi-scaled models of the mission buildings.



## Health

Compare diseases of yesterday and today. Mini-reports on various diseases would be appropriate. Reports could include causes of different diseases, numbers of people

afflicted by various diseases, whether or not a disease was/is contagious, various symptoms, and available treatments or cures.

### **Diseases of Yesterday (During 1800's to early 1900's)**

- Dysentery
- Measles
- Influenza
- Cholera
- Scurvy
- High Infant Mortality
- Low Life Expectancy

### **Diseases of Today**

- Cancer
- Heart Disease
- Drug Abuse
- Alcoholism
- Obesity
- High Blood Pressure
- AIDS/Sexually Transmitted Diseases

### **Seasons**

The early pioneers left St. Louis and Independence in early to late spring. They traveled the Oregon Trail and would arrive in Oregon in late fall.

- Why did they leave St. Louis when they did?
- Why not later when the water runoff in the rivers was lower (as it would be later in the summer?)
- Have the students look into average rainfall and snowfall (precipitation) throughout a year in various locations in the United States.
- Which states receive more rainfall than other states?
- Which states receive less rainfall than others?
- What are some of the reasons different areas receive varying levels of rainfall (or precipitation?)
- Following the route of the Oregon Trail, determine and discuss various hazards or benefits of traveling during different times of the year.

### **Classroom Activities:**

1. Talk about the relationship of the sun to the earth. Review the tilt of the earth and its axis. Why do we have four seasons?

2. The Indians had a yearly cycle where they would perform certain activities in particular months . In the Cayuse section of this teacher's guide, there is a cycle showing what they did at various times of the year. Review these activities and discuss why they had this cycle. Did the pioneers have a seasonal cycle? Do we have a similar cycle today? Why or why not?

3. The Indians had no written language. Instead, the Indians used songs as a form of expression. Nature was extremely important to the Indians and the weather/seasons cycle dictated when certain songs were sung or new songs were created. Have students listen to traditional native songs (not to understand the language, but to listen carefully for the way the songs were sung—paying attention to the beat, rhythm, instruments, voices, etc...) The students then could perform their own songs based on nature/seasons, or other areas of personal interest.

4. To use in conjunction with the above: Have students look for modern day songs that have a nature/season theme. Compare their creations with the ones they found and discuss the differences.

5. Have the students work in groups of 2-3. With butcher paper, create a mural depicting a particular activity or activities occurring during a selected season. Make sure that all the seasons are being represented and upon completion, all the murals could be combined and displayed for discussion.

## **Agriculture**

1. Set up a touch table that has grains, fruits, and vegetables (wheat, barley, peas, corn, beans, berries, and squash). Present the whole plant as well as its seeds. Using magnifying glasses, have students observe, touch, and record their individual observations.

2. As a class project, make whole wheat bread. Students can work in small groups of two or three, and then make their own loaves of bread.

3. Take a cup of oatmeal or corn meal. Slice a potato in half and place inside your cup of meal. Meal worms will eventually become evident. Have students observe and record their observations. They can also graph individual days and the results. (For example, the total numbers of meal worms they count each day.)

4. Have students grow wildflowers much like the pioneers did when they reached the Oregon country. Study different kinds of flowers and describe the growth of these flowers. How do they spread (or reproduce?) What type of seeds do they have? What do they look like?

5. Pioneers encountered many different types of trees along the trail. Trees were very important since the pioneers needed firewood and eventually, shelter. Logs were dragged behind wagons when travelers needed to slow down their speed when

negotiating steep hills or grades. Logs were also attached to the wagons when floating across streams, because logs would float and provide buoyancy.

6. On construction paper, trace the outline of leaves found in your area. Take your class for a nature walk and have students identify the trees by comparing the leaves. You will find several basic leaf outlines below. You will have to add to these, but this will give you a good idea of what to look for and how to create your own leaf outlines. Cottonwoods and willow trees are typically found along streams and rivers, so these types of trees were well known to the pioneers.

7. Explain why it was necessary for the pioneers to take along a supply of dried fruit (to prevent scurvy). As an activity, dry some fruits and vegetables and share these with the class. Can they determine what the different fruits are? Do they taste the same as fresh fruit? Relate the pioneers on the Oregon Trail to the pioneers of space (astronauts) and explain how dried fruit was and is important to both while on their long journeys.



**Cottonwood**



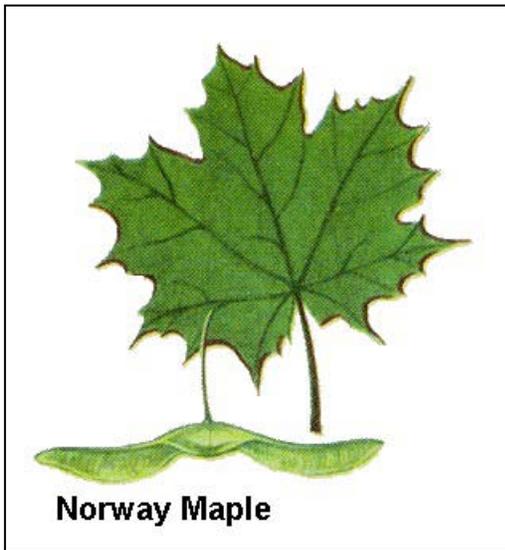
**Crack Willow**



**Sandbar Willow**



**American Elm**



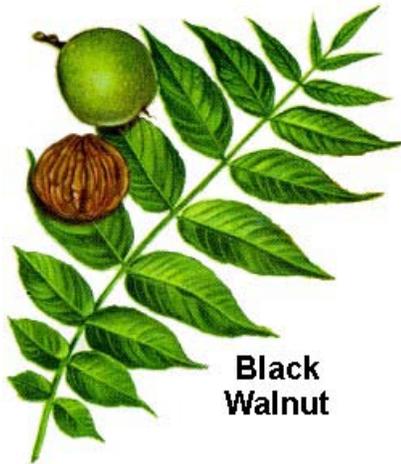
**Norway Maple**



**Silver Maple**



**Staghorn Sumac**



**Black Walnut**



**American Sycamore**

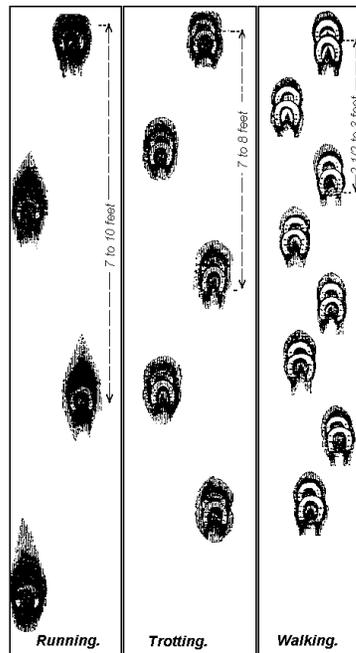
### **Wildlife Biology (Tracking)**

One important skill for the pioneer to possess along the Oregon Trail was the ability to trail or track animals. To become truly adept at this skill requires years of practice. Obviously, this skill was necessary because food supplies began to run low or become completely exhausted as the emigrants got closer to the Oregon country. Below are a few activities which highlight this skill.

1. How can you tell if an animal is running, trotting, or walking? The picture below shows an example of horse tracks. Run off copies of this page and have the students determine these differences between running, trotting, and walking. Note how the detail of the track becomes more obscure as the pace of the animal increases. Also, the length of stride increases as well. For an activity, have students go outside and make tracks of their own. Other students can then look at the tracks and guess who made them (possibly, by looking at tread) and the pace, (running, trotting, or walking).

2. Match up the animal with the animal track. The attached pages show a list of animals and the corresponding tracks they make. Copy, cut out, and laminate these onto colored construction paper and hand out to groups of students. Have them match the name of the animal to the corresponding track.

3. Develop a touch center using different animal pelts or fur. Attach the sample animal pelts or fur to a piece of tagboard. Have students try to guess the animal from which it came from. They can keep a journal of this and record their observations. How do the pelts differ? In what ways are they alike?



HORSE-TRACKS AT ORDINARY SPEED

### Common Animal Tracks

Use this with the page entitled "Common Tracks of Animals". The numbers next to the animal's name correspond to the number next to the animal's track.

1. Moose
2. Elk
3. Mountain Goat
4. Bighorn Sheep
5. Deer
6. Pronghorn Antelope
7. Horse
8. Domestic Cat
9. Large Dog or Wolf
10. Coyote
11. Red Fox
12. Mountain Lion
13. Badger
14. Striped Skunk
15. Long Tail Weasel
16. Beaver
17. Muskrat
18. Rock Chuck
19. Pine Squirrel
20. Deer Mouse
21. Meadow Vole
22. Shrew
23. Black Tailed Jackrabbit
24. Cottontail Rabbit
25. Raccoon

# COMMON TRACKS OF ANIMALS

## MAMMALS

