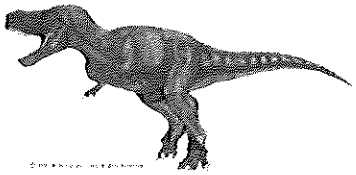
BRISCOE GEOLOGY PARK

Activity Sheet Grades 9-12



Activity: Go Green!

The history of land plants on Earth is re-created in the landscaping along the **Life Time Walk**. The Cambrian and Ordovician parts of the path are bare rock because at that time in Earth history there were no land plants except perhaps for tiny algae. The first true land plants were very distant relatives of today's mosses and liverworts.

To Do: Check out the plants along the **Life Time Walk**. Small signs tell you what kind they are. Where a plant is located along the **Life Time Walk** tells you when it lived millions of years ago. Use this information to answer the following questions. For each question give the geologic period and approximate age in millions of years ago.

About when did mosses and liverworts first appear on land in Earth history?

_____ _____

About when did horsetails appear in Earth history?_____ _____

When did ferns first appear in Earth history? _____ _____

When did conifers (plants like juniper or pine) first appear in Earth history?

_____ _____

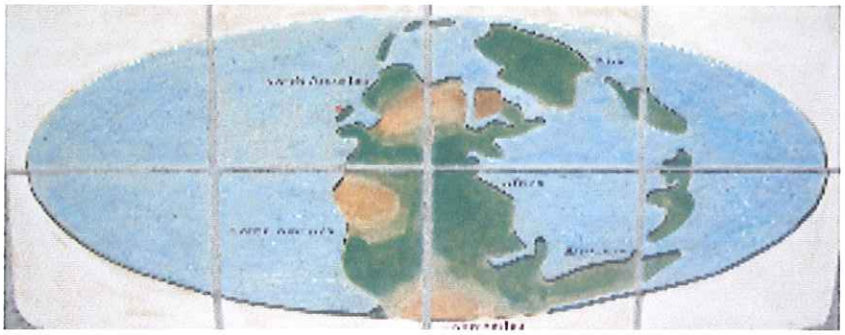
When did flowering plants first appear in Earth history? _____ _____

When did grasses first appear in Earth history? _____ _____

Draw a sketch of your
favorite plant here.

Activity: The Earth is All Cracked Up!

The Earth's crust is broken into many plates, sort of like the cracked shell of an egg. **Plate tectonics** is the name given to the study of the movement of these plates around the surface of the Earth. Most plates move about one to two inches per year. That may not seem like much, but over many millions of years that can add up to thousands of miles. At plate margins earthquakes occur and volcanos erupt as the plates slide past, collide or pull apart from each other. Tile maps along the **Life Time Walk** (and one map along the **Human Time Walk**) show the estimated position of continents in the past. They also show the presence (if any) of large amounts of ice at the poles (Ice Ages). On these tile maps the ancient position of Oregon is shown with a red dot.



To Do: Find all five plate tectonic maps on the **Life Time Walk**. Write down the geologic periods in which each one occurs.

1) _____ 2) _____ 3 _____

4) _____ 5) _____

Now use the maps to answer these questions.

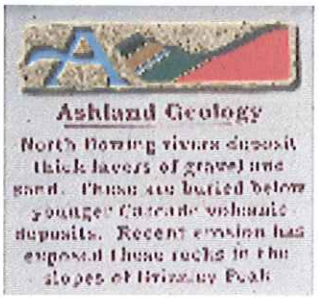
In what geologic period was Oregon in the southern hemisphere? (the equator is the line running horizontally across the middle of the tile map)_____

At one time almost all land was collected together into one giant landmass called Pangea. During which geologic period did this occur?_____

When was Oregon farthest from land? _____

Generally through Earth history continents have grown bigger as collisions between tectonic plates welds new land to the edges of continents. When did dry land make up the smallest percentage of the Earth's surface?_____

Activity: Ashland Rocks



Ashland Geology is described in several tiles along the **Life Time Walk,** on the Ashland Geology interpretive sign, and through the use of boulders of local rock types. (These boulders are located on the Laurel Street side of the park)

To Do: Find all five Ashland Geology tiles and read the information on them, then check out the signs for the boulders. Then review the Ashland Geology interpretive sign. Use all this informaiton to answer the following questions about the geologic history of Ashland. The questions go from the oldest to the youngest geologic event.

Which geologic period has the oldest Ashland Geology tile?_____

What local geologic event happened during this geologic period?

_____

Which local mountain range is made up mostly of metamorphic and igneous rocks?

_____

What is the name of the rock layer deposited in this area during the Cretaceous geologic period?_____

Which local mountain range is made up mostly of volcanic rocks?

_____

About how many millions of years ago did the Cascade volcanic range start to form?_____

During which two geologic periods would you have expected to see Cascade volcanic eruptions in our area? _____ _____

Activity: The Tree of Life

The theory of biological evolution proposes that all life on Earth is related by descent with modifcation. Discover the history of life on Earth with the interpetive isgn on Evolution.
To Do: Use the Tree of Life diagram to examine current scientific thinking on the timing and connections between major branches of life.

Roughly how many millions of years ago, and in what geologic period, did the common ancestor between humans and fish live? _____ _____

What is an animal species on the **Life Time Walk** that lived about this time in Earth history?_____

Roughly how many millions of years ago, and in what geologic period, did the common ancestor between reptiles and amphibians live?_____ _____

What is an animal or plant species on the **Life Time Walk** that lived about this time in Earth history?_____

Roughly how many millions of years ago, and in what geologic period, did the common ancestor between mammals and dinosaurs live? _____ _____

What is an animal or plant species on the **Life Time Walk** that lived about this time in Earth history?_____

Roughly how many millions of years ago did the common ancestor between plants and fungi live? _____ _____

Roughly how many millions of years ago, and in what geologic period, did birds branch off from reptiles? _____

What is an animal species on the **Life Time Walk** that lived about this time in Earth history?
_____

Roughly how many millions of years ago did the common ancestor between trilobites and sea scorpions live?_____

Activity: Going... Going... Gone!

Species don't last forever, they go extinct on a slow but regular basis. In Earth history more than 99% of species that ever lived are now extinct. When an unusually large number of species go extinct all at once, we call that a Mass Extinction. There have been many mass extinctions in Earth history. The five biggest mass extinctions are marked by a tile on the **Life Time Walk**.

To Do: Use the "What Happened to the Dinosaurs?" interpretive sign and the mass extinction tiles on the **Life Time Walk** to learn about extinction of species in Earth history and answer the following questions.

Some species last only a few hundred thousand years, others last hundreds of millions of years before going extinct. What is the average duration of a species?_____

The worst mass extinction occurred at the end of the Permian geologic period, when more than 90% of species went extinct. About what percentage of species died out in the mass exctinction at the end of the Ordovician period? _____

About what percentage of species died out in the mass extinction at the end of the Triassic period? _____

At the end of which geologic period did trilobites go extinct?_____

At the end of which geologic period did ammonites go extinct?_____

About what percentage of species died out in this mass extinction ? _____

An asteroid or comet impact is commonly thought to have caused the mass extinction at the end of the Cretaceous period, 65 million years ago. What are some other proposed causes for mass extinctions?

1) _____

2) _____

3) _____

4) _____

Activity: The Big Freeze!

Ice Ages are times when Earth has extensive ice caps at the poles. In the last half billion years there have been only three Ice Ages, including the one we are in right now. For most of Earth history our planet was 5 to 20 degrees farenheit warmer than now.
The current concern about global warming is that human activity may be warming up Earth much faster and warmer than natural variation would during an Ice Age. If warming happens too fast, living things, including humans, will have a hard time adjusting.

To Do: Find the three Ice Age tiles on the **Life TIme Walk**. Write down the name of the geologic period in which each one of the three occurs.

1) _____ 2) _____3) _____

Which Ice Age is associated with a mass extinction? _____

Activity: Measure for Measure:

To Do: Use your measuring tape to measure the length (in meters) of two geologic time intervals you pick on the **Life Time Walk**, and record the age at the beginning and end of the period. Subtract the age at the begining from that at the end to get the duration. Divide the duration in years by the length in meters to get the scale of the time walk in years per meter, and to help answer the other questions. Do the same for the **Earth Time** and **Human Time Walks**.

Geologic Period:_____
Length in meters:_____
Age in millions of years at its start (the oldest part):_____
Age in millions of years at its end (the youngest part):_____
Duration in millions of years_____
Scale in millions of years per meter_____

Geologic Period:_____
Length in meters:_____
Age in millions of years at its start (the oldest part):_____
Age in millions of years at its end (the youngest part):_____
Duration in millions of years_____
Scale in millions of years per meter_____

Average scale for the **Life Time Walk:**_____

About how many millions of years do you take with each step on the **Life Time Walk**? _____

Pick two intervals of geologic time on the **Earth Time Walk** and calculate the scale in the same way you did for the Life Time Walk.

Geologic Eon:_____
Length in meters:_____
Age in millions of years at its start (the oldest part):_____
Age in millions of years at its end (the youngest part):_____
Duration in millions of years_____
Scale in millions of years per meter_____

Geologic Eon:_____
Length in meters:_____
Age in millions of years at its start (the oldest part):_____
Age in millions of years at its end (the youngest part):_____
Duration in millions of years_____
Scale in millions of years per meter_____

Average scale for the **Earth Time Walk:**_____

About how many millions of years do you take with each step on the **Earth Time Walk?** _____

Calculate the scale for the **Human Time Walk** in the same way you did for the Life Time and Earth Time Walks, but in thousands instead of millions of years.

Geologic Epoch: Holocene
Length in meters:_____
Age in thousands of years at its start (the oldest part):_____
Age in thousands of years at its end (the youngest part):_____
Duration in thousands of years_____
Scale in thousands of years per meter_____

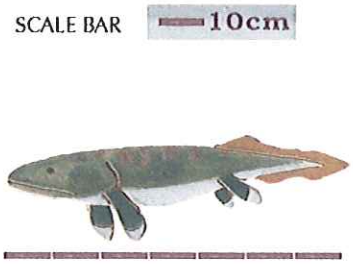
Geologic interval: Pleistocene
Length in meters:_____
Age in thousands of years at its start (the oldest part):_____
Age in thousands of years at its end (the youngest part):_____
Duration in thousands of years_____
Scale in thousands of years per meter_____

Average scale for the **Human Time Walk:**_____

About how many thousands of years do you take with each step on the **Human Time Walk?**
_____

Activity: Bigger Than a Bread Box

How big were the animals and plants shown on the tiles of the time walks?
There is a way to figure this out, and the clue is on each of the animal or plant tiles. On the tile there is a little bar with a number in millimeters, centimeters or meters next to it. (This is located either at the top of the tile, or at the bottom of the tile). Estimate how many of the little bars would fit across the animal, then multiply that number by the number in millimeters, centimeters or meters. Look at the example below to see how this works



7 scale bars across the length of the image on the tile = 70 centimeters

General name

Scientific name, genus (Panderichthys) and species (rhombolepis)

To Do: Find a tile with one of the scientific names on the list below, and write down the length in centimeters or meters of the animal, and what is its common name. Do as many as you can.

Drepanaspsis gemuendenensis _____ _____

Coelophysis sp. _____ _____

Tyrannosaurus rex _____ _____

Archaeopteryx lithographica _____ _____

Eurypterus remipes _____ _____

Acanthostega gunnari _____ _____

Coelurosauravus elivensis _____ _____

*Dimetrodon sp.*_____ _____

Phacops rana _____ _____

Platyhysterix sp. _____ _____

Hyracotherium sp. _____ _____

Hyaenodon gigas _____ _____

*Pteraspis rostrata*_____ _____

Cheiropyge koizumii _____ _____

Coelurosauravus elivensis _____ _____

*Rhamphorthynchus sp..*_____ _____

Eudimorphodon sp. _____ _____

Massetoagnathus sp.. _____ _____

Meganeuridae. _____ _____

Nectocaris pteryx _____ _____