**Name**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Period**: \_\_\_\_\_\_\_\_\_\_\_

**“How the Earth Was Made”**

**Anticipation Guide**: Directions: Complete the first prediction column of the anticipation guide before the movie and the actual answer column at the end of the movie.

**Predictions Questions Actual Answer** (circle one)

True/False Scientists believe that Earth is 4.5 billion years old. True/False

True/False Pangea is the only theorized supercontinent formation. True/False

True/False Without the burning of Earth’s core, life would not survive. True/False

True/False Scientists believe that we are living between 2 ice ages. True/False

True/False Pangea Ultima is believed to form in 2 million years from now. True/False

True/False Earth’s core will one day cool and share the fate of Mars. True/False

**Introduction Questions**:

Directions: Answer each question for the introduction of the movie.

1. How did scientists discover the age of the Earth?

2. Who is known as the father of modern geology?

3. What was Hutton’s conclusion based on his observations?

4. How old did Arch Bishop Usher claim that the Earth was?

5. What year did Hutton find his proof?

6. What was the proof he found?

7. What did Lord Kelvin believe about the Earth?

8. Who discovered Radiometric Dating?

**Timeline**:

Directions: Complete the timeline below during the movie.

**4.5 Billion Years Ago**

• Earth forms from \_\_\_\_\_\_\_\_\_\_\_\_\_\_ colliding

• The surface is a molten ocean

• Earth is preparing to change into \_\_\_\_\_\_\_\_­­­­­­\_\_\_\_\_\_\_\_\_\_­­­­­­­­­

• When is pillow lava formed? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4.4 Billion Years Ago**

• Gradual cooling of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is allowing the planet to solidify

• Water begins to form on the surface

• Surface rocks begin emitting \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4 Billion Years Ago**

• Thick \_\_\_\_\_\_\_\_\_\_\_\_\_\_ form from large amounts of water \_\_\_\_\_\_\_\_\_\_\_\_\_\_ off the surface.

• The water in the atmosphere rained down for millions of years on the Earth causing \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the surface to be covered with water.

• Small volcanic islands appear

• The seas are \_\_\_\_\_\_\_\_\_\_\_\_\_\_ rich, giving them a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ color

• CO2 covered the skies causing them to appear \_\_\_\_\_\_\_\_\_\_\_\_\_\_

• Temperature exceeded \_\_\_\_\_\_\_\_\_\_\_\_\_\_ degrees F

**3.5 Billion Years Ago**

• Underwater volcanoes gave rise to \_\_\_\_\_\_\_\_\_\_\_\_\_\_

• This granite begins the formation of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_

• Granite is produced by superheated water and basaltic water

o Why is granite special?

o Why is granite good material for continental plates?

**2.5 Billion Years Ago**

• Single celled organisms trigger the production of oxygen

o What is the name of this organism?

o Where can you find these organisms today?

• Why was the discovery of stromatolites a revolution in the fossil record?

**1.5 Billion Years Ago**

• Iron begins to leave the oceans

• Increased \_\_\_\_\_\_\_\_\_\_\_\_\_\_ levels make the sky and ocean look blue

• Earth begins to resemble the planet we know

• The continents begin to move

o What is the science of Plate Tectonics?

o What fresh water organism was used to link the theory of plate tectonics?

o What year was the Theory of Continent Drift proposed?

o Who was the scientist who proposed this theory?

o Why did geologists have a hard time believing Wegner?

**1 Billion Years Ago**

• The first \_\_\_\_\_\_\_\_\_\_\_\_\_\_is formed. It is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_

• This continent is very different because it does not support life.

• Rodinia triggers SNOWBALL EARTH due to:

• The land begins to freeze which reflects the sun’s light away from the planet

o Why is it called SNOWBALL EARTH?

**700 Million Years Ago**

• Surface temperatures on Earth are below \_\_\_\_\_\_\_\_\_\_\_\_\_\_degrees F

• Oceans are covered in an ice sheet \_\_\_\_\_\_\_\_\_\_\_\_\_\_mile deep

• Much of the life in the oceans is dying

o What is causing the death of these organisms?

**650 Million Years Ago**

• Beneath the ice, \_\_\_\_\_\_\_\_\_\_\_\_\_\_were erupting breaking the continent apart

• The heat from the eruptions creates a temporary \_\_\_\_\_\_\_\_\_\_\_\_\_\_effect and melts the snowball.

• Ice retreats to the poles

**500 Million Years Ago**

• Life in the oceans begins to become complex due to the increase in \_\_\_\_\_\_\_\_\_\_\_\_\_\_levels.

o This is known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_explosion

• Diamond mines are discovered to be the mouths of very deep volcanoes

• Movement of the continents caused the super eruptions which bear these diamonds

• Over the next few 100 million years, life will flourish and large animals called dinosaurs will rule the Earth.

**65 Million Years Ago**

• Vegetation is lush

• Dinosaurs rule the Earth

o \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is found large amounts in the tombstone layer

• An enormous meteor lands in Mexico.

• Along with \_\_\_\_\_\_\_\_\_\_\_\_\_\_ eruptions, the meteor causes a huge cloud of dust which\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

• This dust cloud causes \_\_\_\_\_\_\_\_\_\_\_\_\_\_ % of the Earth’s life to become extinct.

**50 Million Years Ago**

• Life begins to recover

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_begin to flourish

• Plate tectonics, weathering and erosion create the continents that we know today.

o How was the Alpine chain formed?

o What do the quartz crystals reveal?

**6 Million Years Ago**

• How was the Grand Canyon formed?

• What makes the Colorado River so powerful?

**2 Million Years Ago**

• Ancestors of humans begin to spread out of Africa

•\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the North Pole begin to descend

• Earth enters the first ice age.

o What is believed to have caused the ice ages?

• How was the “Ice Age Theory” formed?

o What is some evidence that supports this theory?

**The future**

• What are some of the theories that scientists have about the future of Planet Earth?