Shape of Life
The Story of the Animal Kingdom

Major Earth Event Cards: Life-Page 1
Student's Edition

Intergovernmental Panel on Climate Change (IPCC) report Strongly links humans to climate change	First Earth Day Held to encourage environmental awareness.	First Modern Humans
"Lucy" Australopithecus afarensis, an early human relative	Non-avian Dinosaur Extinction	Early Flowering Plants
Archaeopteryx (first bird)	Early Mammals	Early Dinosaurs
"The Great Dying" Permian Extinction The largest of the five known extinction events. Over 90% of species went extinct.	Time of the Burgess Shale	Middle of the Cambrian Explosion
First Modern Cell	Photosynthesis Evidence of bacteria that produces its own food and energy	First Evidence of Life

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Major Earth Event Cards: Physical-Page 2
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Carbon Dioxide Level is 368.5 Parts Per Million As measured in the air at Mauna Loa Observatory	Ocean pH is 8.09 decreased nearly .10% in 120 years which represents 30% increase in acidity	Carbon Dioxide Level is 279 Parts Per Million As measured in Antarctic ice cores (from 1510 to 1900 the recorded change was 13.1 ppm)
Beginning of Most Recent Global Ice Age Scientists think we are in the fourth major ice age (yet in an interglacial period that began approximately 12,000 years ago)	Modern Continents Form	Siberian Traps Volcanic Eruptions Scientists think these eruptions lasted for around 900,000 years.
Carboniferous Period The trapped carbon from huge trees and swamps dying was transformed into fossil fuels, now used to power our cars and heat our houses.	Oxygen Levels Near Present Day	Great Mountain Ranges Form Two of Rodinia's former land blocks collide creating rocky formations (earliest parts of the Appalachian mountain range).
Ozone Layer in Place Except for bacteria, life has been in the oceans where risk of UV radiation is reduced. But now oxygen levels are high enough to form this protective layer.	First Snowball Earth In this period, there are thought to have been two ice ages (out of four total) resulting in ice covering the entire planet.	First Supercontinent Forms (Rodinia) Landmasses collide and break up over a billion years in three cycles. This is the oldest (Pannotia and Pangaea more recent).
Breathable Air	Ocean Forms As Earth cooled, water vapor escaped from the new surface crust. The resulting storms are thought to have flooded the Earth.	Formation of Earth

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Major Earth Event Card Key-Page 3
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Note: These are approximations as of 2018. Per the nature of science, dates may change as new discoveries are made (and more quickly than this lesson is updated).

YEARS AGO	EVENT
Carbon dioxide level is 385.5 parts per million	X years ago (measurement from 2009)
IPCC report links human to climate change	X years ago (published in 2007)
Ocean pH is 8.09	X years ago (measurement from 2000)
First Earth Day	X years ago (1970)
Carbon dioxide level is 279 parts per million	Over 250 years ago (1750)
First modern humans	200,000 years ago
"Lucy"	3,200,000 years ago
Beginning of most recent ice age	2.6 million years ago
Non-avian dinosaur extinction	66 million years ago
Early flowering plants	120 million years ago
Archaeopteryx (first bird)	140 million years ago
Modern continents form	175 million years ago
Early mammals	210 million years ago
Early dinosaurs	247 million years ago
"The Great Dying"-Permian extinction event	251 million years ago
Siberian Traps volcanic eruptions	252 million years ago
Carboniferous Period	354 million years ago
Oxygen level near present	400 million years ago
Great mountain ranges form	425 million years ago
Time of the Burgess Shale	508 million years ago
Middle of the Cambrian explosion	550 million years ago
Protective ozone layer in place	600 million years ago
First snowball Earth	635-800 million years ago
First supercontinent-Rodinia	1.1 billion years ago
First breathable air	2.4 billion years ago
First modern cell	2 billion years ago
Evidence of photosynthesis	3.7 billion years ago
First evidence of life	3.8-4.2 billion years ago
Oceans form	4.2 billion years ago
Formation of Earth	4.6 billion years ago

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Name_____ Period/Class_____ Date_____

Major Earth Events, Part Two-Page 4

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Note: You will be using this timeline throughout the next few lessons.

Timeline of Schoolyard History

1. Create a timeline of your schoolyard below.
   - Draw a vertical line below or on a separate sheet of paper. Title it "Schoolyard Timeline."
   - The top of the timeline represents present time. Decide what the bottom of your schoolyard represents (development of schoolyard site, construction of school, existence of ecosystem/site before school) and label it. Record the date or guess at the age of that time.
   - Based on your observations and inferences in the schoolyard, add major events and/or features in the schoolyard's history in chronological order on the timeline. *Remember oldest events are closer to the bottom. Recent events are closest to the top.*

Name_____ Period/Class_____ Date_____

Major Earth Events, Part Two-Page 5

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How do scientists figure out and sequence major events in Earth's history?

Note: You will be using the following timelines throughout the next few lessons.

Personal Timeline

2. Create a personal timeline below.
   - Use a metric ruler to draw a vertical line below or on a separate sheet of paper that is as many centimeters as you are old.
   - Think of three to five major life events (things that have happened in your life that have shaped who you are). Label them along the timeline at the appropriate measurement. *The bottom of the timeline represents when you were born so oldest events should be at the bottom.*

Name_____ Period/Class_____ Date_____

Major Earth Events, Part Two-Page 6
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Earth's Timeline

2. Create a timeline representing Earth's history below or on a separate sheet of paper.
   - Title the top of the page "Earth's timeline." Draw a vertical line the length of the page.
   - The top of the timeline represents present time. The bottom of the timeline represents Earth's formation. Label both and record a numeric guess of how old the Earth is. Add the Cambrian Explosion to where you think it belongs.
   - In the next lesson, you'll look at other major Earth event and add them to the timeline. *Remember oldest events should be at the bottom.*