

The “Look Mom, No Adding Machine Tape!” Geologic Timeline



Kids can make their own geologic timeline with annotated, illustrated tabs marking important dates in Earth’s geological and biological history...all without adding machine tape!

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Questions, Comments, Feedback? Contact Kelly Terry at kellytinpg@gmail.com.



Directions for The Adding Machine Tape-Free Annotated and Illustrated Geologic Timeline Model

Here are suggested directions for using this activity. This activity packet contains many materials and presents many options. This activity packet can be differentiated to accommodate the needs of students of all ability and interest levels. May you find this activity fun, flexible, and informative!

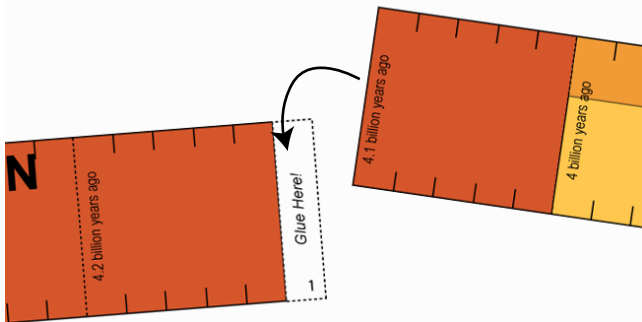
Dimensions of Finished Product

The timeline itself in color or black and white is 80 inches long by 5 ½ inches wide (with tabs but without “stacking” the tabs) and 9 ½ inches wide if you “stack” all the tabs. If you add the optional Cenozoic Era piece, the length increases to 82 inches. Please read the small notes on the “Glue Here” portion of the tabs for instructions on stacking tabs.

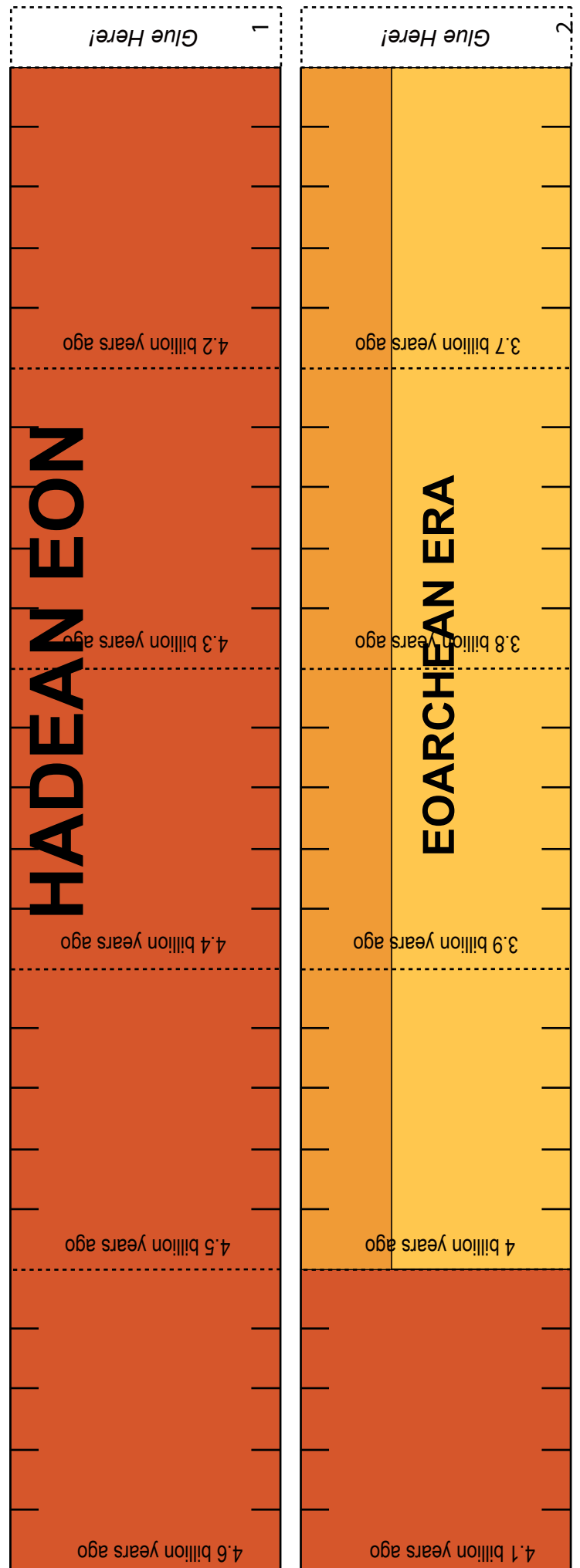
| <u>Activity</u> | <u>What needs to be printed and copied</u> | <u>Brief description</u> |
|--|---|---|
| Assembling a Full-color Geologic Timeline | Pages 3, 4, 5 (Page 11 optional) (print one of each per timeline) | Use a color printer. Print pages, cut and assemble timeline. Best for teacher made demo or for limited number of timelines because of colored ink. |
| Assembling a Full-color Geologic Timeline with Main Event or Other Tabs | Pages 3, 4, 5 for timeline (Page 9 optional) Page 12 for directions in color Page 14 for Main Events Tabs in color Page 16 for Biological Events in color Page 18 for Geological Events in color (print one of each per timeline) | Use a color printer. Print pages, cut and assemble timeline. Best for teacher made demo or for limited number of timelines because of colored ink. Be sure to use page 14 as it contains “the basics.” Page 16 and/or page 18 offer additional information. |
| Assembling a Black and White Geologic Timeline | Pages 6, 7, 8 (print one of each page per student or small student group) | Students use scissors and glue sticks to assemble simple timeline. They then color it using colored pencils or markers. |
| Assembling a Black and White Geologic Timeline with Main Event or Other Tabs | Pages 3, 4, 5 for timeline (Page 10 optional) Page 13 for directions in black and white Page 15 for Main Events Tabs in black and white Page 17 for Biological Events in black and white Page 19 for Geological Events in black and white (print one of each page per student or small student group) | In addition to the timeline pages (3-5), be sure to use page 14 as it contains “the basics.” Page 16 and/or page 18 offer additional information. The teacher might consider asking all students to complete the tabs on page 14 and allowing the faster students to complete the tabs on page 16 and/or page 18 as well. Students use colored pencils and/or markers to color the model. |
| Completing the Etymology Worksheet | Pages 20-21 (print one of each page per fast-finishing student) | This is a fairly challenging activity with a crossword puzzle. Recommended for advanced or super speedy students. |
| Completing the Scientific Notation Worksheet | Pages 22 (print one of each page per fast-finishing student) | This is a fairly challenging activity. Recommended for advanced or super speedy students. |
| Answers for Worksheets | Found on pages 23, 24, 25 | Answer keys |
| Blank tabs (for students to add their own information) | Found on page 26 | Students can use these tabs to create their own markers for important events |

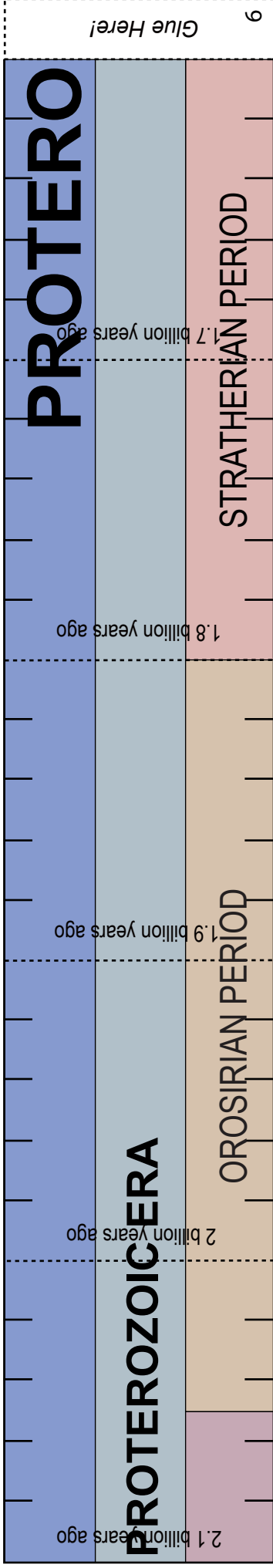
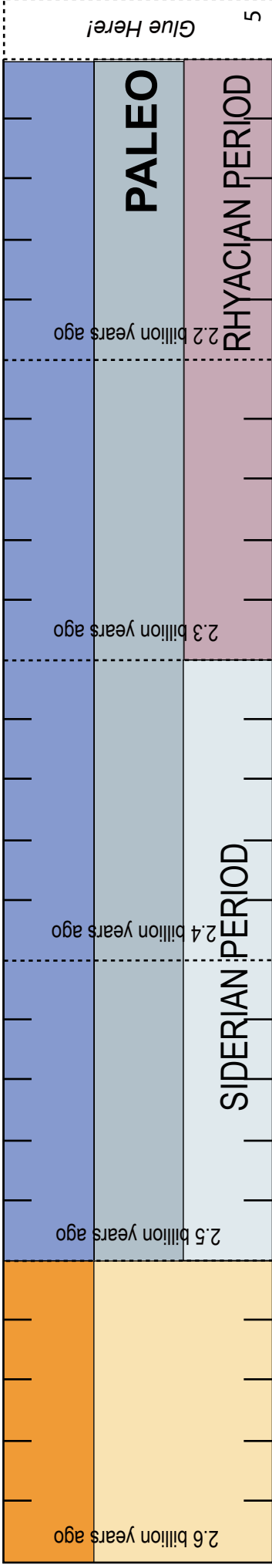
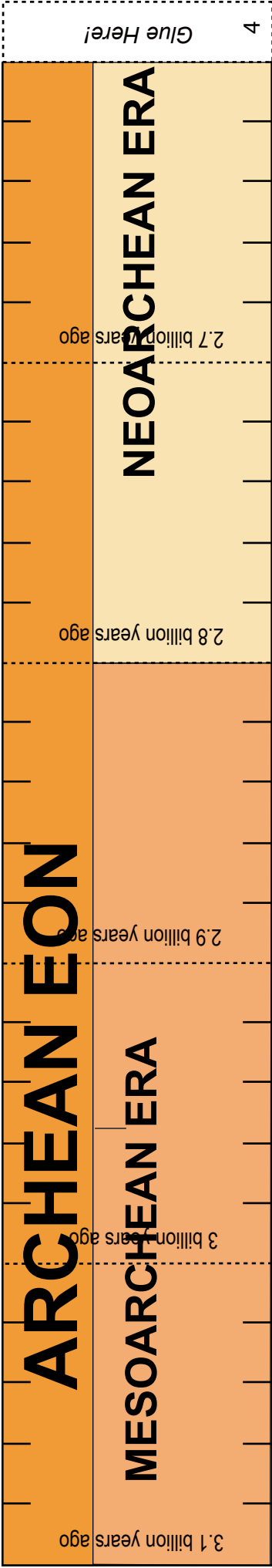
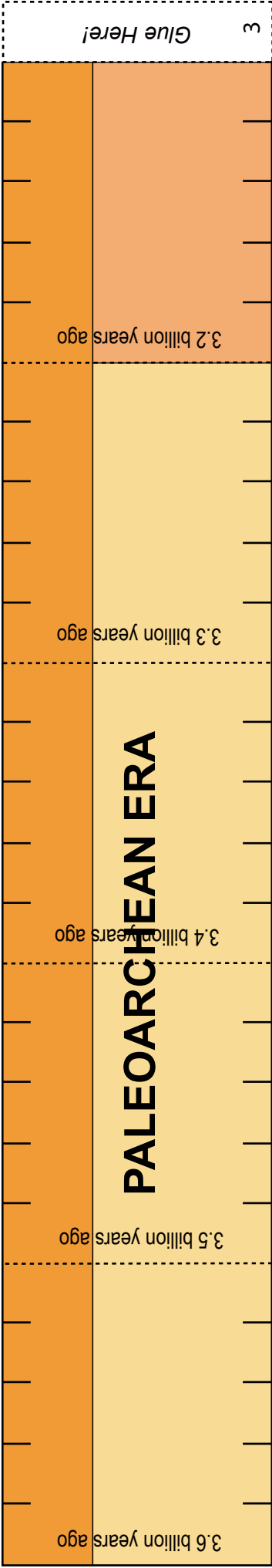
Directions:

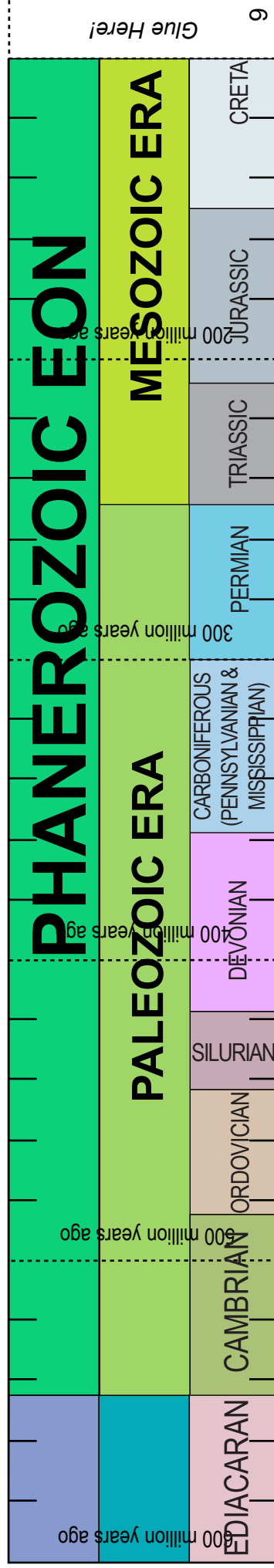
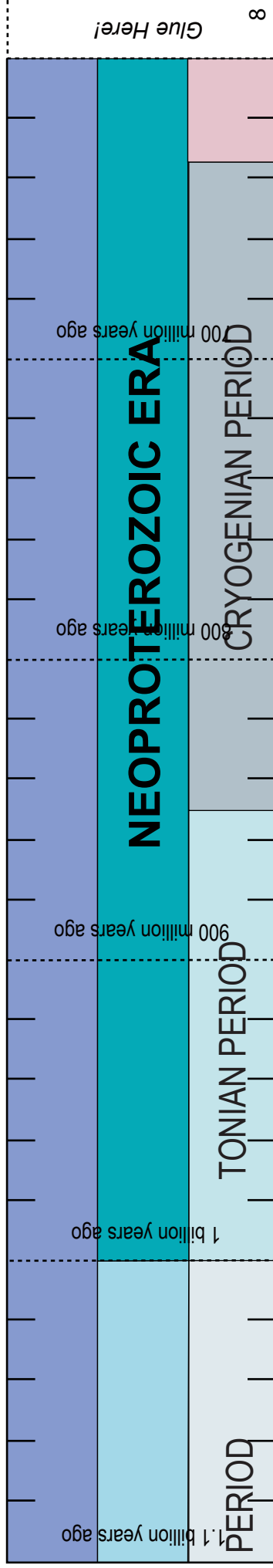
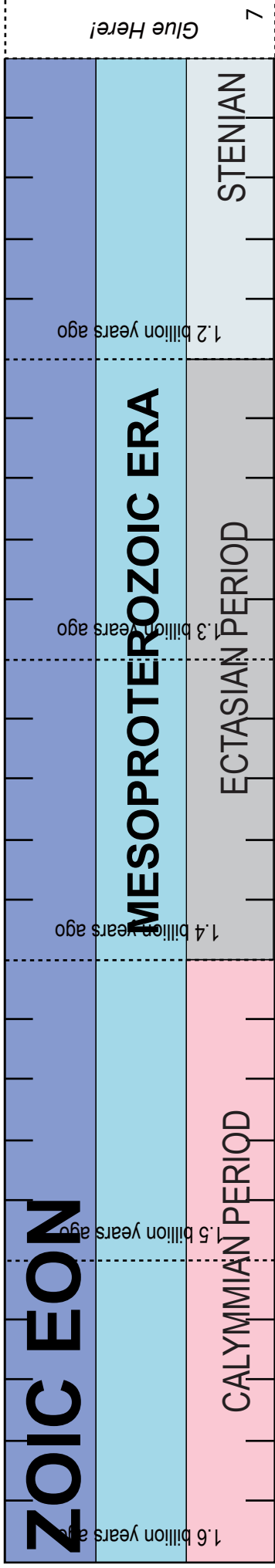
1. Cut out each of the 10 strips carefully along the outer solid lines.
2. Use a glue stick to put glue on the “Glue Here” tab of strip #1.
3. Place the end of strip #2 (the end without a tab) over the “Glue Here” tab on strip #1. Press.



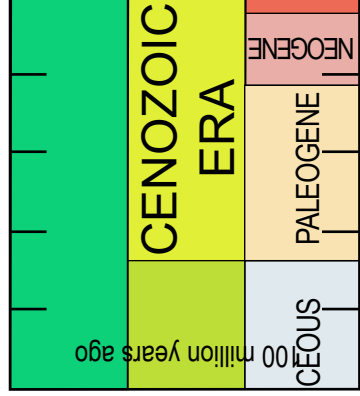
4. Repeat steps 2 and 3 for each of the 10 strips (Strip #10 is very short) until all pieces are used. Your finished strip will be nearly 3 meters long!





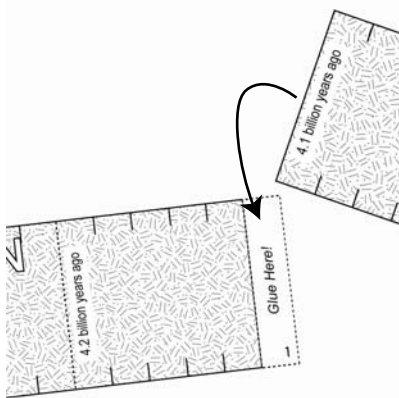


← Strip # 10



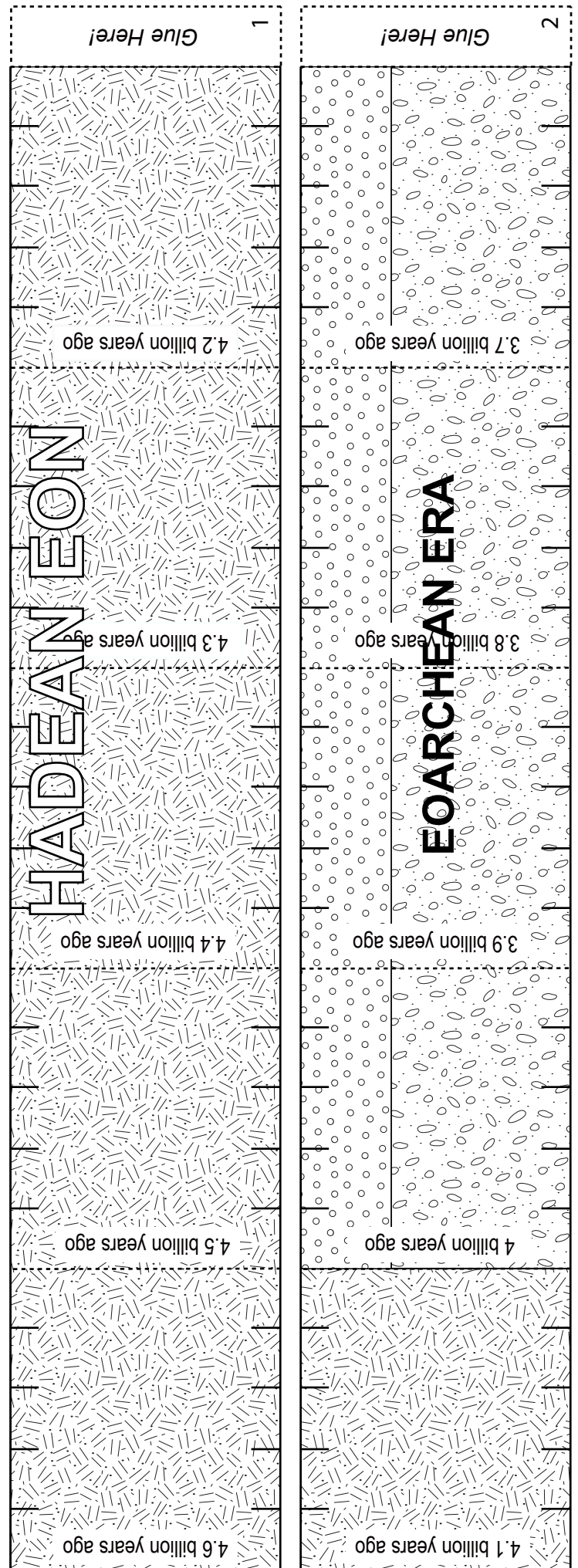
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4. Repeat steps 2 and 3 for each of the 10 strips (Strip #10 is very short) until all pieces are used. Your finished strip will be nearly 3 meters long!

5. Color each time period carefully!



3.6 billion years ago

3.5 billion years ago

3.4 billion years ago

3.3 billion years ago

3.2 billion years ago

PALEOARCHAIC ERA

Glue Here!

3

3.1 billion years ago

3 billion years ago

2.9 billion years ago

2.8 billion years ago

2.7 billion years ago

ARCHAIC EON

MESOARCHAIC ERA

NEOARCHAIC ERA

Glue Here!

4

2.6 billion years ago

2.5 billion years ago

2.4 billion years ago

2.3 billion years ago

2.2 billion years ago

PALEO

SIDERIAN PERIOD

RHYACIAN PERIOD

Glue Here!

5

2.1 billion years ago

2 billion years ago

1.9 billion years ago

1.8 billion years ago

1.7 billion years ago

PROTEROZOIC ERA

PROTERO

ROSIRIAN PERIOD

STRATHERIAN PERIOD

Glue Here!

6

ZOIC EON

1.6 billion years ago

1.5 billion years ago

1.4 billion years ago

1.3 billion years ago

1.2 billion years ago

MESOPROTEROZOIC ERA

CALYMIAN PERIOD

ECTASIAN PERIOD

STENIAN

Glue Here!

7

1 billion years ago

900 million years ago

300 million years ago

00 million years ago

NEOPROTEROZOIC ERA

TONIAN PERIOD

CRYOGENIAN PERIOD

Glue Here!

8

600 million years ago

300 million years ago

100 million years ago

00 million years ago

PHANEROZOIC EON

PALEOZOIC ERA

EDIACARAN

CAMBRIAN

SILURIAN

ORDOVICIAN

DEVONIAN

CARBONIFEROUS (PENNSYLVANIAN & MISSISSIPPIAN)

PERMIAN

TRIASSIC

JURASSIC

CRETA

MESOZOIC ERA

Glue Here!

9

100 million years ago

00 million years ago

CENOZOIC ERA

PALEOGENE

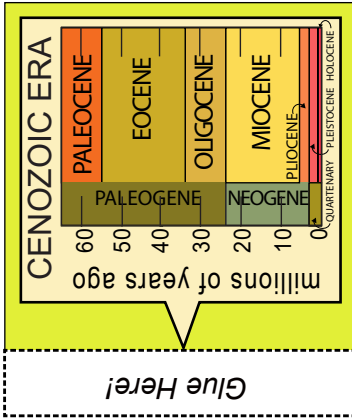
NEOGENE

Glue Here!

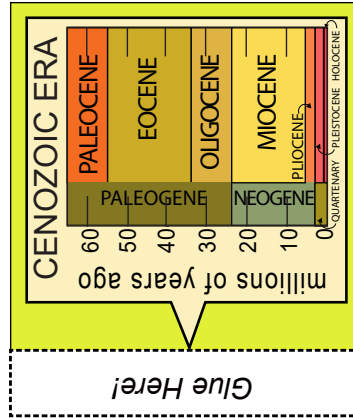
10

Optional Enlarged Cenozoic Era - Paper Saving Multiple Page

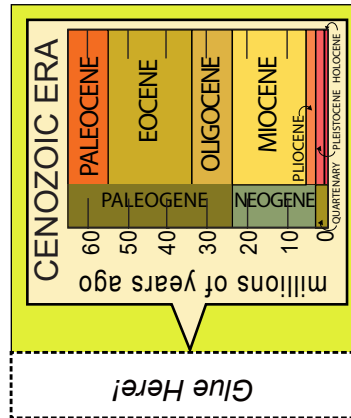
(Can be added to end of timeline to allow students to better see recent time periods)



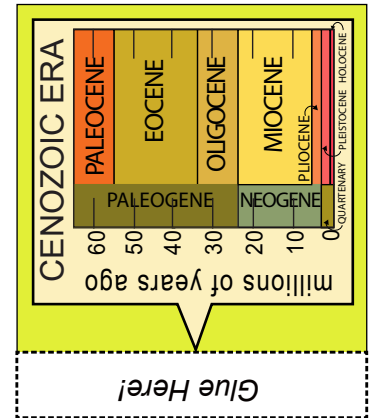
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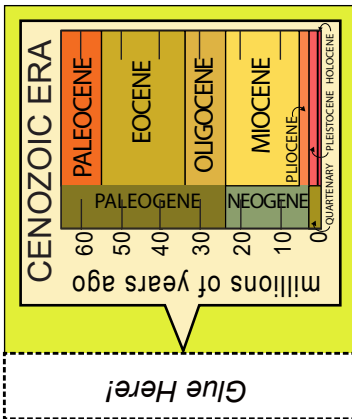
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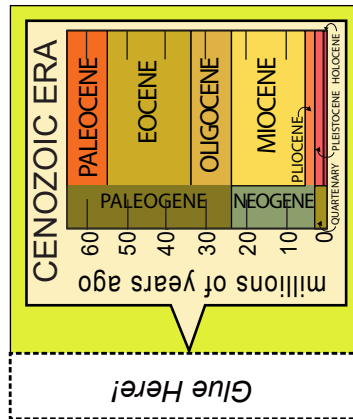
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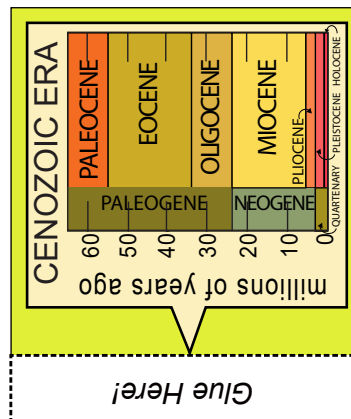
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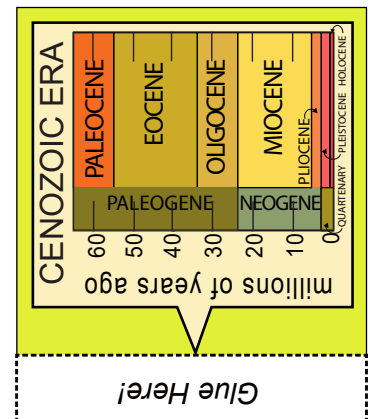
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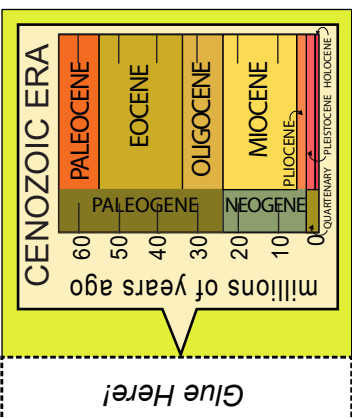
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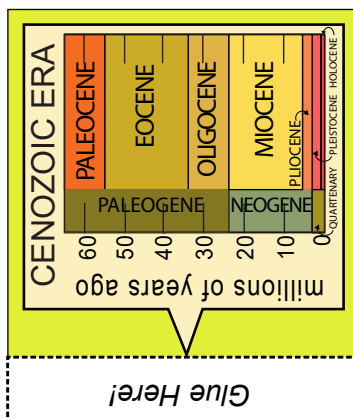
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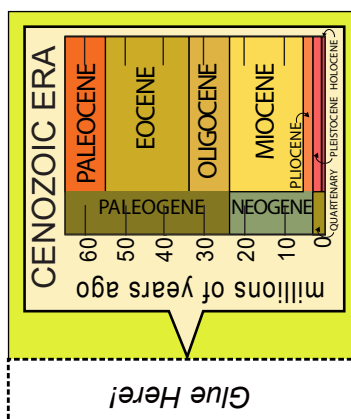
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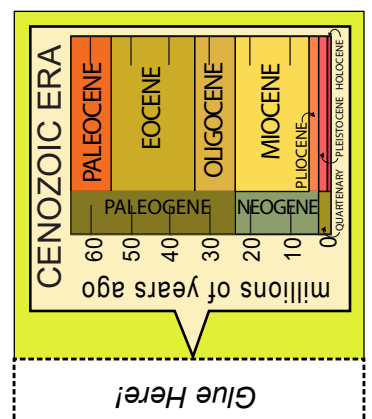
Strip # 11 (optional)



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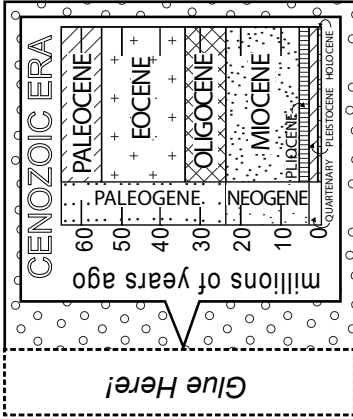


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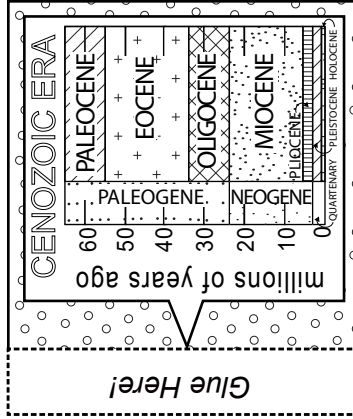
Please note that the Cenozoic Era is divided into three periods: the Paleogene, Neogene, and Quaternary Periods. These are further divided into epochs. The Paleocene, Eocene, Oligocene, Miocene, Pleistocene, and Holocene are epochs.

Optional Enlarged Cenozoic Era - Paper Saving Multiple Page

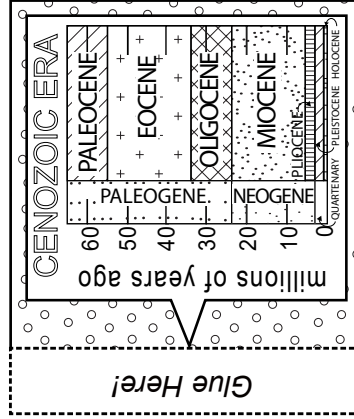
(Can be added to end of timeline to allow students to better see recent time periods)



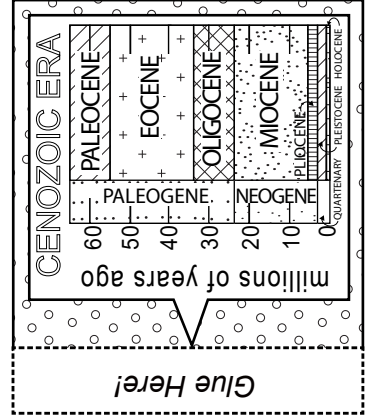
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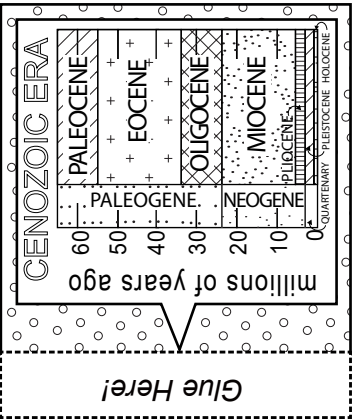
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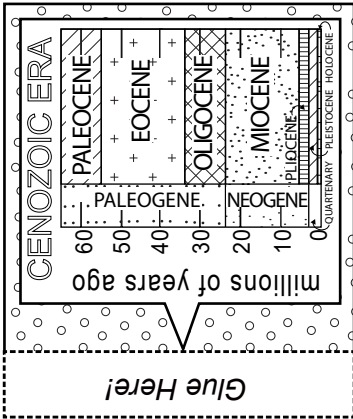
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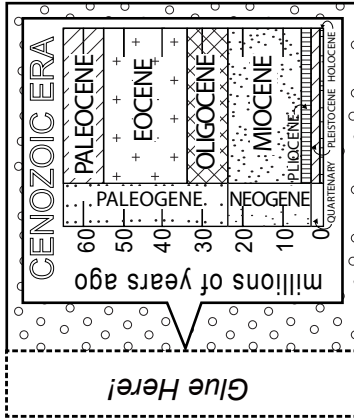
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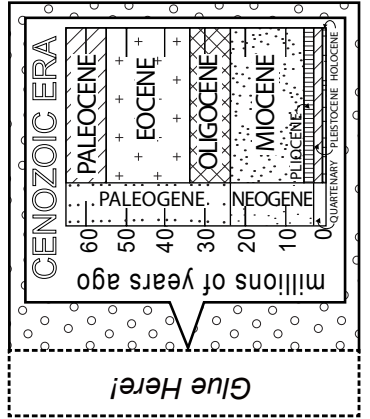
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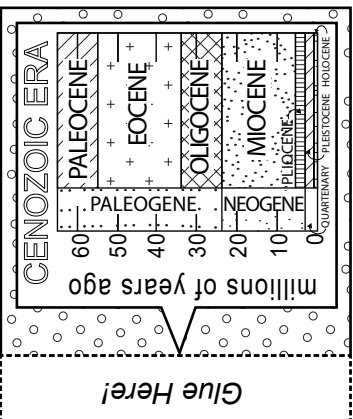
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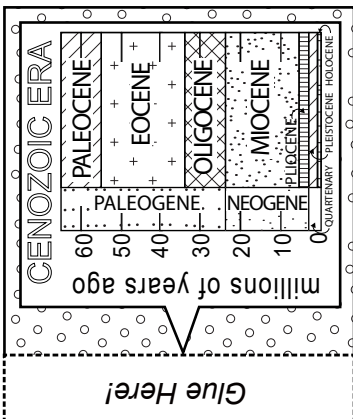
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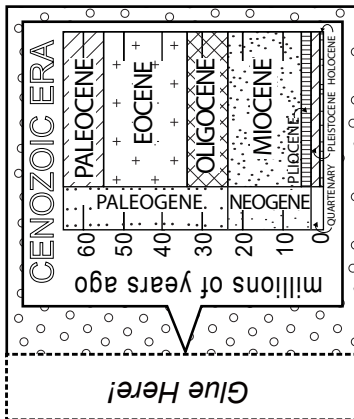
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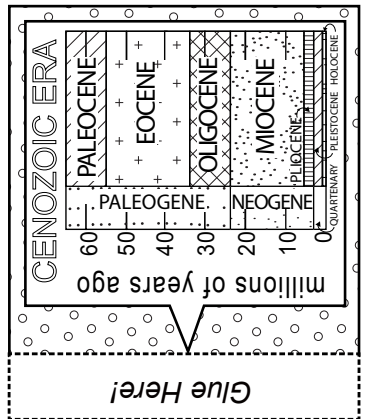
Strip # 11 (optional)



Strip # 11 (optional)



Strip # 11 (optional)

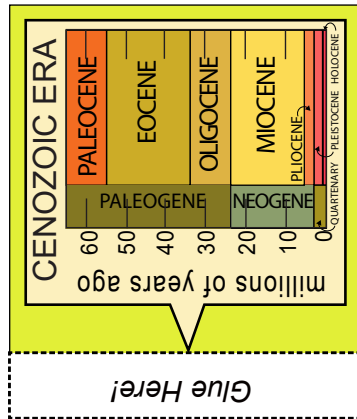


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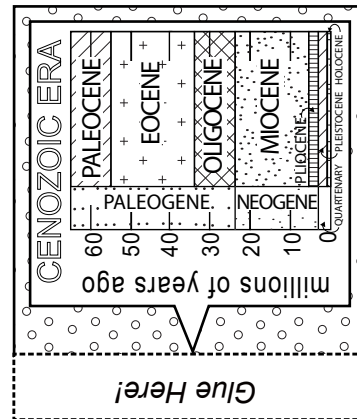
Please note that the Cenozoic Era is divided into three periods: the Paleogene, Neogene, and Quaternary Periods. These are further divided into epochs. The Paleocene, Eocene, Oligocene, Miocene, Pliocene, and Holocene are epochs.

Optional Enlarged Cenozoic Era - Page to Print for Single Copy

(Can be added to end of timeline to allow students to better see recent time periods)



Strip # 11 (optional)

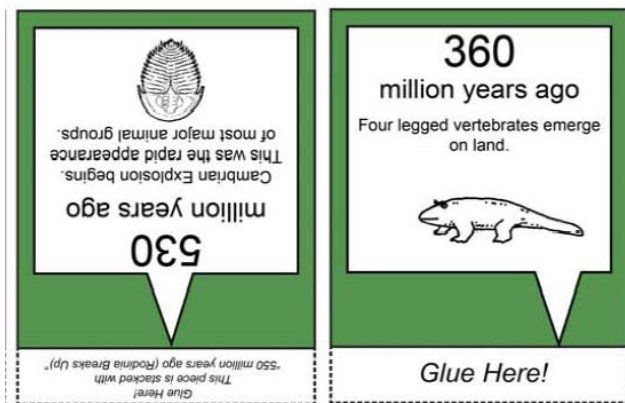


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Please note that the Cenozoic Era is divided into three periods: the Paleogene, Neogene, and Quaternary Periods. These are further divided into epochs. The Paleocene, Eocene, Oligocene, Miocene, Pleistocene, and Holocene are epochs.

Directions for Using Main Events Tabs (Color)

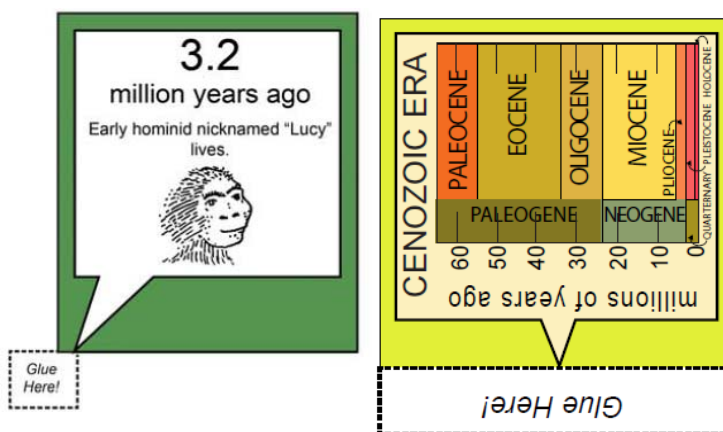
1. Did you notice that the outer portion of each tab is green if the event is mostly biological and brown if the event is mostly geological?
2. Carefully color each tab.
3. Carefully cut out each tab.
4. To attach the tabs to your timeline, carefully find the location of the date on the tab on the timeline. Line up the pointer on the tab with that date.
5. Put a little glue on the “Glue Here” portion of the tab and place it beneath the correct portion of the timeline. Press and hold until the tab sticks on its own. Tape can also be used for this.



HINTS:

By looking at whether the text is upside-down or right-side-up, you can tell whether the tab should be glue above or below the timeline.

Some of the tabs “Glue Here” parts of the tabs have special directions on them. Following these directions will help you to make a nice looking finished product.



Strip # 11 (optional)

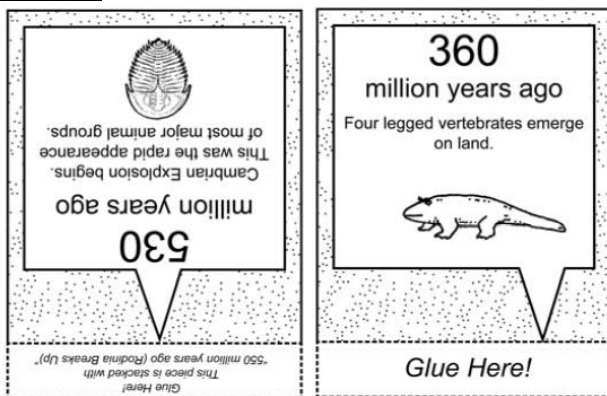
Some of the tabs have unusual shapes that will guide you in knowing where to place them. You might consider placing these tabs last so that fitting them correctly will be easier.

Finally, if you use optional Strip #11, do not attach tabs to that strip. The scale for that strip is different than the scale used for the other strips.

Directions for Using Main Events Tabs (Black and White)

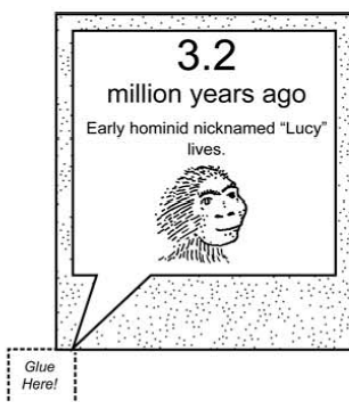
1. Did you notice that the outer portion of each tab is speckled if the event is mostly biological and has a diagonal pattern if the event is mostly geological?
2. Carefully color each tab.
3. Carefully cut out each tab.
4. To attach the tabs to your timeline, carefully find the location of the date on the tab on the timeline. Line up the pointer on the tab with that date.
5. Put a little glue on the “Glue Here” portion of the tab and place it beneath the correct portion of the timeline. Press and hold until the tab sticks on its own. Tape can also be used for this.

HINTS:



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Strip # 11 (optional)


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Finally, if you use optional Strip #11, do not attach tabs to that strip. The scale for that strip is different than the scale used for the other strips.

Main Events in the History of Earth

4.5
billion years ago

Formation of Earth's moon, possibly due to giant impact



Glue Here!

4.4
billion years ago


First free water found on Earth's atmosphere



Glue Here!

4.2
billion years ago


First oceans emerge.
(This date is disputed...some scientists think the oceans emerged around 3.8 billion years ago).



Glue Here!

200,000
years ago

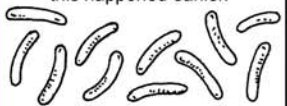
Modern humans evolve



Glue Here!

3.5
billion years ago


First bacterial and archean life on Earth. Some scientists think this happened earlier.



Glue Here!

2.7
billion years ago


First oxygen-producing bacteria.



Glue Here!

1.8
billion years ago


Appearance of the first eukaryote (a single cell organism with a complex inner structure)



Glue Here!

3.2
million years ago


Early hominid nicknamed "Lucy" lives.



Glue Here!

1
billion years ago

Multi-cellular organisms appear.



Glue Here!

530
million years ago


Cambrian Explosion begins. This was the rapid appearance of most major animal groups.



Glue Here!
This piece is stacked with
-550 million years ago (Frodina Breaks Up!)

360
million years ago


Four legged vertebrates emerge on land.



Glue Here!

200
million years ago


Supercontinent Pangaea begins to break apart.



Glue Here!

65
million years ago

The Cretaceous-Tertiary mass extinction - also known as the K/T extinction - wipes out the dinosaurs.

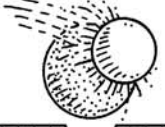


Glue Here!

Main Events in the History of Earth

4.5
billion years ago

Formation of Earth's moon, possibly due to giant impact



Glue Here!

4.4
billion years ago


First free water found on Earth's atmosphere



Glue Here!

4.2
billion years ago

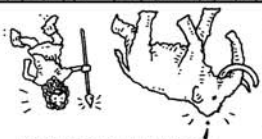
First oceans emerge.
(This date is disputed...some scientists think the oceans emerged around 3.8 billion years ago).



Glue Here!

Modern humans evolve

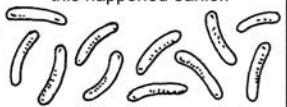
200,000
years ago



Glue Here!

3.5
billion years ago


First bacterial and archean life on Earth. Some scientists think this happened earlier.



Glue Here!

2.7
billion years ago


First oxygen-producing bacteria.



Glue Here!

1.8
billion years ago


Appearance of the first eukaryote (a single cell organism with a complex inner structure)



Glue Here!

3.2
million years ago


Early hominid nicknamed "Lucy" lives.



Glue Here!

1
billion years ago

Multi-cellular organisms appear.



Glue Here!

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Cambrian Explosion begins. This was the rapid appearance of most major animal groups.



Glue Here!

360
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Four legged vertebrates emerge on land.



Glue Here!

200
million years ago

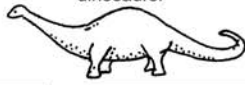
Supercontinent Pangaea begins to break apart.



Glue Here!

65
million years ago

The Cretaceous-Tertiary mass extinction - also known as the K/T extinction - wipes out the dinosaurs.



Glue Here!

Other Important Events in Earth's Biological History



2 billion years ago

Organisms leave the ocean, begin to live on land. Some scientists think this happened much earlier.

Glue Here!



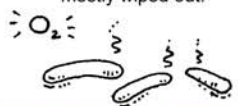
450 million years ago

Arthropods come onto land and evolve into spiders, scorpions, and millipedes.

Glue Here!
This piece is stacked with "443 million years ago (Ordovician-Silurian...)"

2.4 billion years ago

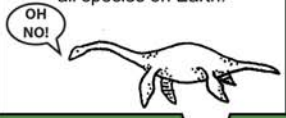
Oxygen catastrophe takes place. Earth's anaerobic inhabitants mostly wiped out.



Glue Here!

200 million years ago

The Triassic-Jurassic mass extinction wiped out about half of all species on Earth.



Glue Here!
This piece is stacked with "240 million years ago (Earliest dinosaurs)"



443 million years ago

The Ordovician-Silurian mass extinction wiped out 85% of sea life.

Glue Here!
This piece is stacked with "450 million years ago (Arthropods...)"




248 million years ago

Permian mass extinction wiped out 96% of all species on Earth.

Glue Here!
This piece is stacked with "250 million years ago (Pangaea forms...)"

420 million years ago


Land plants evolve.



Glue Here!
This piece is stacked with "440 million years ago (Plants and Fungus...)"

555 million years ago

Multi-cellular marine life common.



Glue Here!




60 million years ago

First primates appeared.

Glue Here!

160 million years ago

Dinosaurs were found in great numbers all over Earth.



Glue Here!




380 million years ago

Giant armored fish dominated Earth's oceans.

Glue Here!

1.25 billion years ago

Stromatolites, mats of cyanobacteria, reach their peak.



Glue Here!

340 million years ago

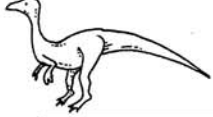
Vast forests dominated the landscape.



Glue Here!

240 million years ago

Earliest dinosaurs. These were only about 2-3 feet tall.



Glue Here!
This piece is stacked with "200 million years ago (Triassic-Jurassic Extinction)"

Optional labels:

- MEZOZOIC ERA
"Age of the Reptiles"
- CARBONIFEROUS & PERMIAN ERAS
"Age of the Amphibians"
- SILURIAN AND DEVONIAN ERAS
"Age of the Fish"
- CAMBRIAN AND ORDOVICIAN ERAS
"Age of the Invertebrates"

Other Important Events in Earth's Biological History

(Dates are approximate)



2 billion years ago

Organisms leave the ocean, begin to live on land. Some scientists think this happened much earlier.

Glue Here!



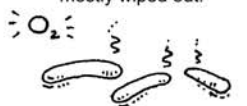
450 million years ago

Arthropods come onto land and evolve into spiders, scorpions, and millipedes.

Glue Here!
This piece is stacked with "443 million years ago (Ordovician-Silurian...)"

2.4 billion years ago

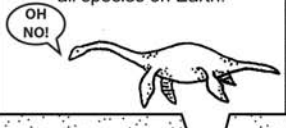
Oxygen catastrophe takes place. Earth's anaerobic inhabitants mostly wiped out.



Glue Here!

200 million years ago

The Triassic-Jurassic mass extinction wiped out about half of all species on Earth.



Glue Here!
This piece is stacked with "240 million years ago (Earliest dinosaurs)"



443 million years ago

The Ordovician-Silurian mass extinction wiped out 85% of sea life.

Glue Here!
This piece is stacked with "450 million years ago (Arthropods...)"



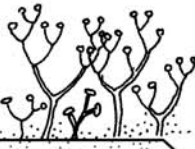
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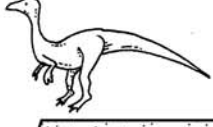
Vast forests dominated the landscape.



Glue Here!

240 million years ago

Earliest dinosaurs. These were only about 2-3 feet tall.




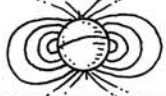


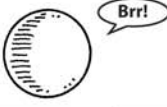






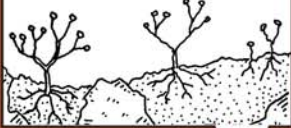
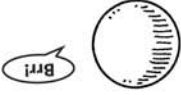

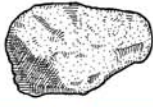
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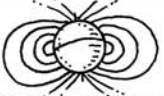






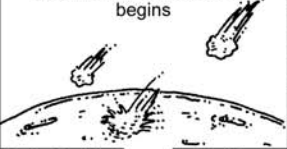


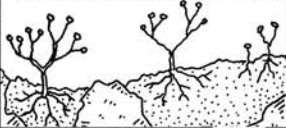
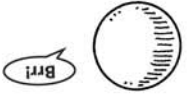

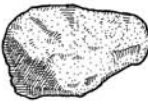
Other Important Events in Earth's Geological History

(Dates are approximate)

| | | | |
|--|---|---|--|
|  <p>Pangaea forms. 250 million years ago</p> <p><i>Glue Here!</i></p> <p><small>*248 million years ago (Permian mass extinction) This piece is stacked with</small></p> |  <p>Oldest record of Earth's magnetic field... it was only half as strong as it is today. 3.5 billion years ago</p> <p><i>Glue Here!</i></p> | <p>3.9 billion years ago Late Heavy Bombardment ends</p>  <p><i>Glue Here!</i></p> | <p>3 billion years ago Supercontinent Ur forms.</p>  <p><i>Glue Here!</i></p> |
| <p>2.6 billion years ago First Snowball Earth period begins.</p>  <p><i>Glue Here!</i></p> |  <p>Supercontinent Columbia forms, covering about 1/3 of the land area found on Earth today. 1.8 billion years ago</p> <p><i>Glue Here!</i></p> |  <p>Supercontinent Rodinia forms. 1 billion years ago</p> <p><i>Glue Here!</i></p> |  <p>Supercontinent Rodinia breaks up, triggering a Snowball Earth period. 550 million years ago</p> <p><i>Glue Here!</i></p> <p><small>*530 million years ago (Cambrian Explosion) This piece is stacked with</small></p> |
| <p>4.1 billion years ago Late Heavy Bombardment begins</p>  <p><i>Glue Here!</i></p> |  <p>Earth forms a thin black crust of basalt. This is a time of intense volcanic eruptions. 4.4 billion years ago</p> <p><i>Glue Here!</i></p> | <p>2 billion years ago Great Oxidation Event allows ozone layer to form, protecting life on Earth from ultraviolet radiation.</p>  <p><i>Glue Here!</i></p> | <p>440 million years ago Plants and fungus break down rocks, allow clay and soil to form.</p>  <p><i>Glue Here!</i></p> <p><small>This piece is stacked with *420 million years ago (Land Plants evolve.)</small></p> |
|  <p>Earth is covered from pole to pole with glaciers. 750 million years ago</p> <p><i>Glue Here!</i></p> | <p>1.5 billion years ago Supercontinent Columbia breaks up.</p>  <p><i>Glue Here!</i></p> | <p>3.8 billion years ago Oldest rocks found on Earth today are formed.</p>  <p><i>Glue Here!</i></p> | |

Other Important Events in Earth's Geological History

(Dates are approximate)

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Name: _____

Geologic Timeline: What do those all those crazy words mean?

The geologic timeline is divided up into eons, eras, periods, epochs, and ages. Epochs and ages are usually only noted during the Cenozoic, the most recent time period. Have you ever wondered where those complicated names given to each of those time periods come from? Check out the tables below.

Here are some word roots used in the geologic timeline that come from Greek and Roman.

| | | | |
|---------------------------------------|---|--|--|
| archae- , arche- old | carbon- containing carbon, such as coal | ceno- , cen- new | creta- , cret- chalk, limestone |
| eo- dawn of, meaning "new" | gene- relating to being born | hade- relating to the fiery underworld | holo- whole, entire, entirely |
| mezo- , meso- middle | mio- less | neo- new | paleo- ancient |
| pre- before | protero- , proto- earlier, first | tri- three | zoo- having to do with animal life |

Here are some names of people and places used in names found on the geologic timeline. Most of these are the names of places where fossils were found or of the people who lived in those places.

| | | |
|--|--|---|
| Jura Mountains found in Europe | Cambria The classical name for Wales, in the UK | Perm A place in Russia |
| Devon A place in England in the UK | Ordovices A tribe that lived in Wales, in the UK | Pennsylvania A place in the United States |

Now try this! Use the tables above to match the name of the geologic time period with its definition. Not all of the words above will be used.

- | | |
|---|--|
| <p>_____ 1. Period of new birth</p> <p>_____ 2. When the earth was like the fiery underworld</p> <p>_____ 3. Eon of "earlier life"</p> <p>_____ 4. Era of new life</p> <p>_____ 5. Before the time when all the many animals whose fossils were found in Wales were alive</p> <p>_____ 6. Epoch of "less new" animal life</p> <p>_____ 7. Epoch of entirely new living things</p> <p>_____ 8. Period when great coal beds were formed</p> <p>_____ 9. Period when great chalky layers of limestone were laid down</p> <p>_____ 10. The old eon</p> <p>_____ 11. The ancient old epoch</p> | <p>a. proterozoic</p> <p>b. archean</p> <p>c. cretaceous</p> <p>d. neogene</p> <p>e. miocene</p> <p>f. carboniferous</p> <p>g. Hadean</p> <p>h. precambrian</p> <p>i. paleoarchean</p> <p>j. holocene</p> <p>k. cenozoic</p> |
|---|--|

Feel like a challenge? Based on what you've learned about word roots in the geologic timeline, can you figure which word goes with each definition?

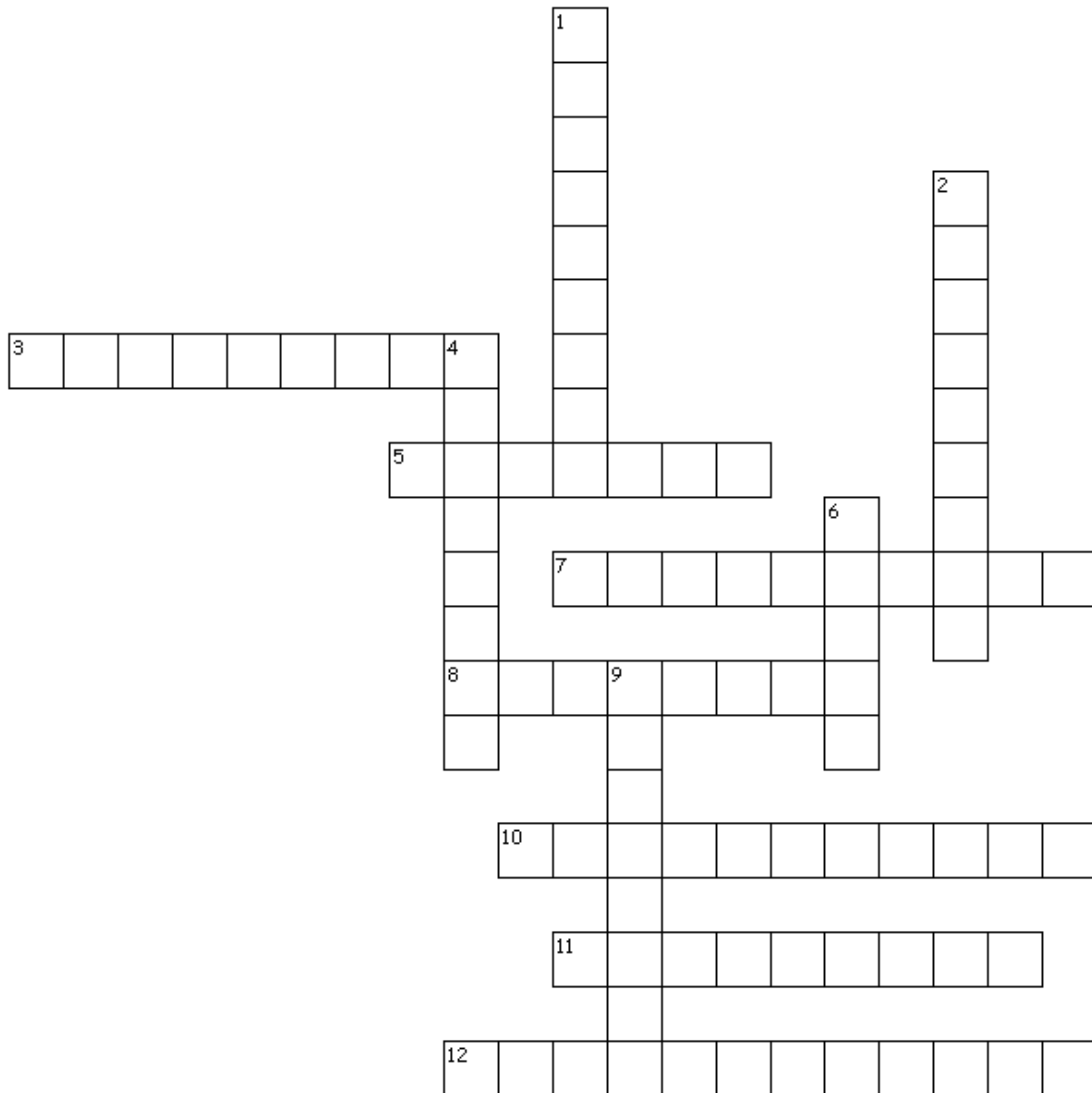
Here's the word bank:

zoology
preschool
Hades

concrete
neophyte
tricycle

generation
protozoan
paleontology

archaeology
myocardia
mezzanine



Across

- 3. earliest type of living thing
- 5. the study of animal life
- 7. new people born around the same time
- 8. a three wheeled vehicle
- 10. the study of old times
- 11. in a building, a low floor in the middle of two others
- 12. the study of ancient time, a LONG time ago

Down

- 1. where children go before they go to kindergarten
- 2. fewer heart beats, a medical condition
- 4. a beginner, someone new to something
- 6. the god of the fiery underworld
- 9. the material found in chalk bound together as a building material

Name: _____

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| <u> g </u> | 2. When the earth was like the fiery underworld | b. archaean |
| <u> a </u> | 3. Eon of "earlier life" | c. cretaceous |
| <u> k </u> | 4. Era of new life | d. neogene |
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| <u> f </u> | 8. Period when great coal beds were formed | h. precambrian |
| <u> c </u> | 9. Period when great chalky layers of limestone were laid down | i. paleoarchean |
| <u> b </u> | 10. The old eon | j. holocene |
| <u> i </u> | 11. The ancient old epoch | k. cenozoic |

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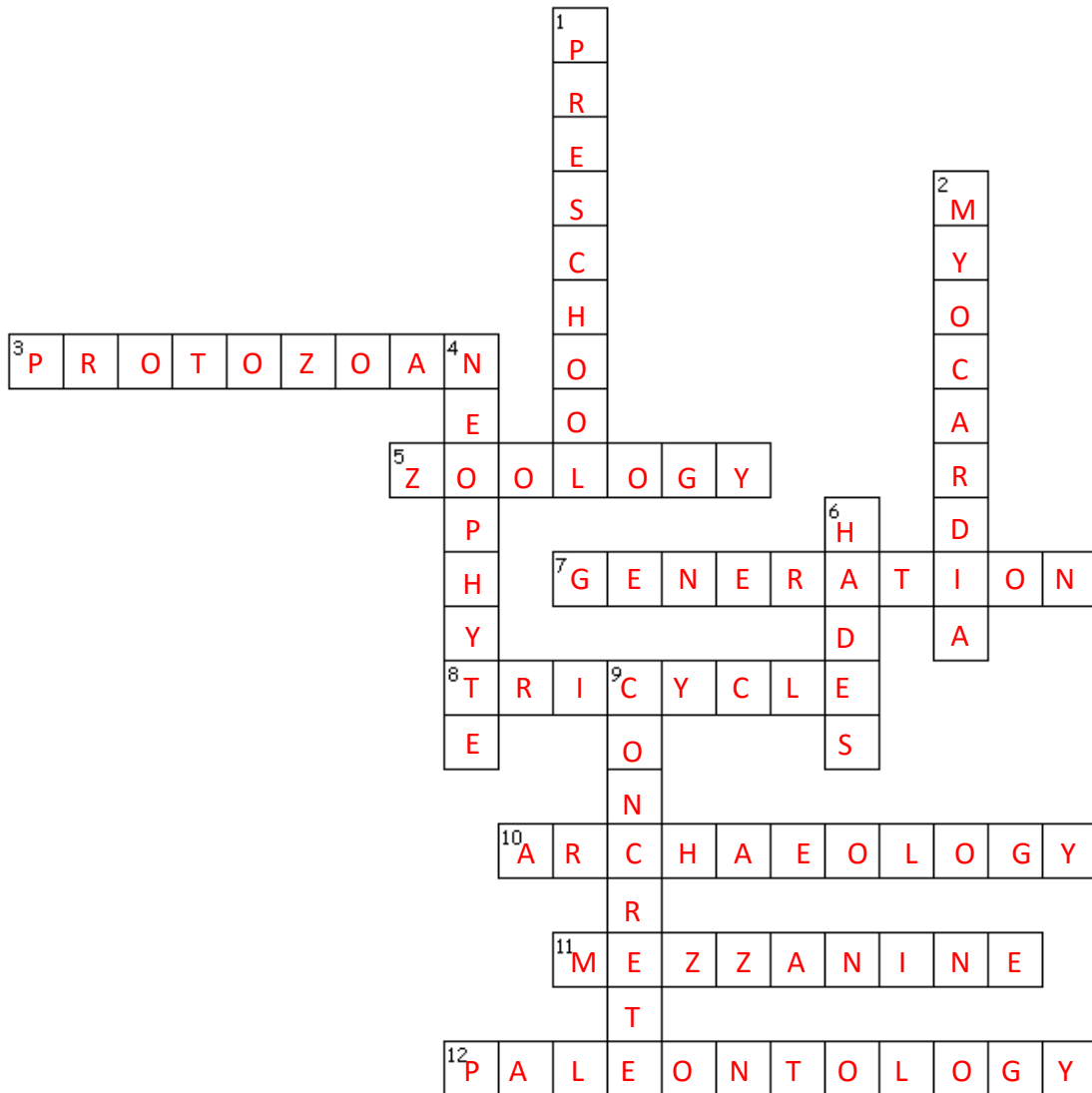
Here's the word bank:

zoology
preschool
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concrete
neophyte
tricycle

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protozoan
paleontology

archaeology
myocardia
mezzanine



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Name: _____

Geologic Timeline: Scientific Notation Practice

Scientists use scientific notation to write very large and very small numbers. The geologic timeline involves some very big numbers, so it provides a great opportunity to practice scientific notation.

The geologic timeline is divided up into eons, eras, periods, epochs, and ages. But what do those words mean? Use your scientific notation skills to write about how long those periods are.

| <u>Unit of Time</u> | <u>How long is that?</u> | <u>Number written in standard form</u> | <u>Number written in scientific notation</u> |
|---------------------|---|--|--|
| Eon | Half a billion years or more | 500,000,000 | |
| Era | Measured in hundreds of millions of years | 100,000,000 | |
| Period | A period varies in length of time | | |
| Epoch | Measured in tens of millions of years | 10,000,000 | |
| Age | Measured in millions of years | 1,000,000 | |

Can you write the approximate time when these events occurred in scientific notation?

| Event | When it happened (approximately) written in standard form | When it happened (approximately) written in scientific notation |
|--|--|--|
| The moon formed. | 4,500,000,000 years ago | |
| First archean life appears (maybe...it could have been earlier). | 3,500,000,000 years ago | |
| Multicellular organisms appear. | 1,000,000,000 years ago | |
| Earth is covered with ice from pole to pole. | 750,000,000 years ago | |
| Cambrian explosion introduces many new life forms. | 530,000,000 years ago | |
| Four legged vertebrates appear on land. | 360,000,000 years ago | |
| Permian mass extinction kills about 95% of all life on Earth. | 248,000,000 years ago | |
| Dinosaurs could be found all over the earth. | 160,000,000 years ago | |
| Dinosaurs disappear in the K-T mass extinction. | 65,000,000 years ago | |
| Earliest primates evolved. | 60,000,000 years ago | |
| "Lucy," an early hominid, lived. | 3,200,000 years ago | |
| Modern humans emerge. | 200,000 years ago | |
| Earth's most current "ice age" began. | 110,000 years ago | |
| Neanderthals died out. | 50,000 years ago | |
| Woolly mammoths became extinct. | 3,600 years ago | |
| Human beings begin the Industrial Revolution. | 250 years ago | |

Name: _____

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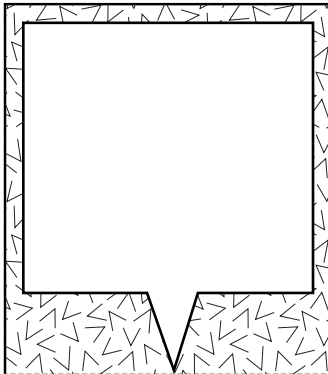
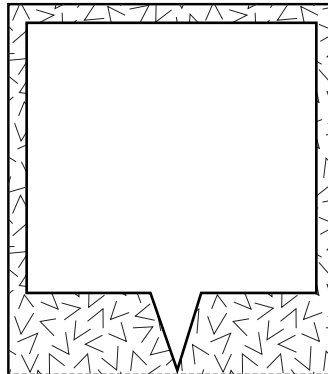
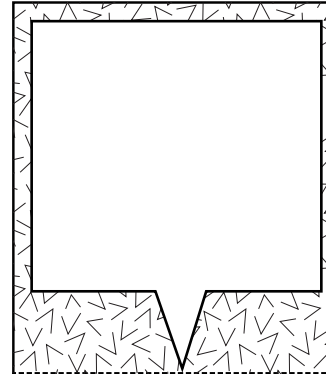
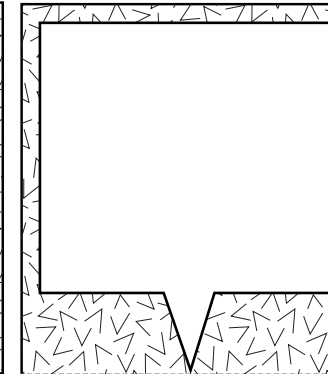
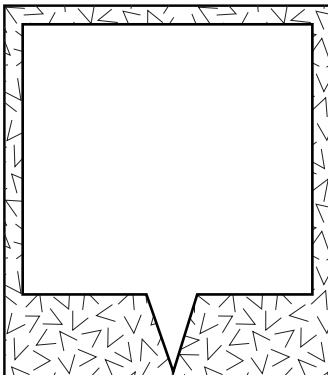
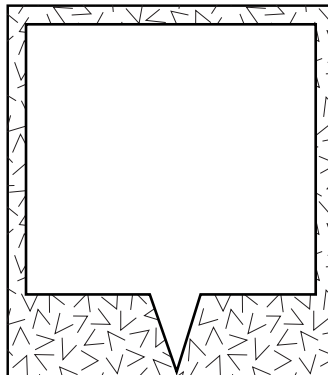
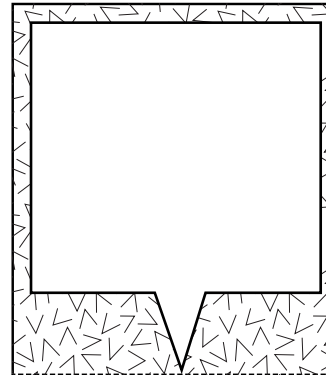
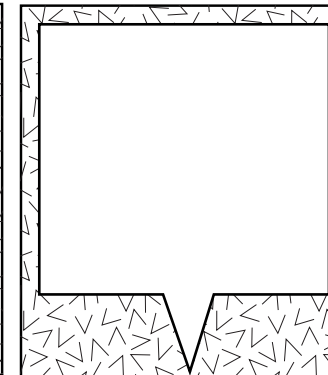
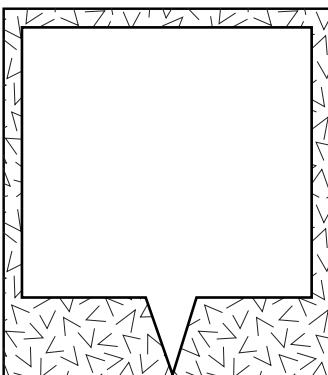
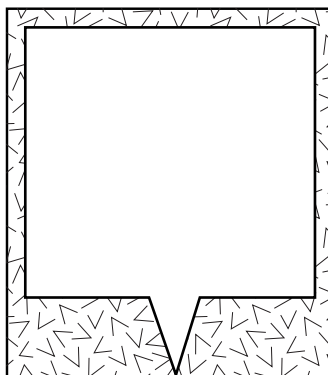
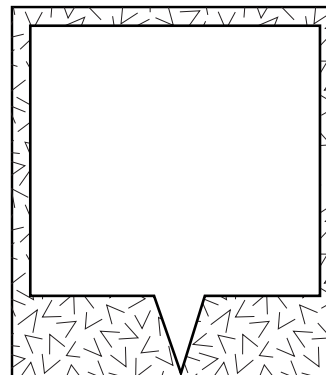
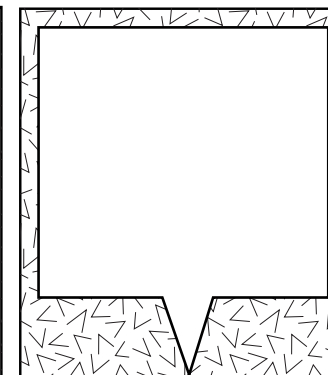
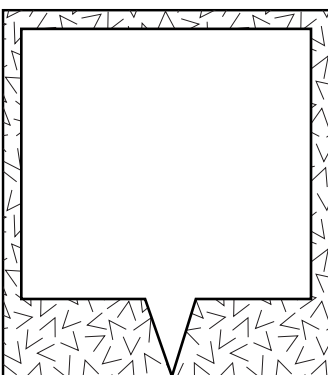
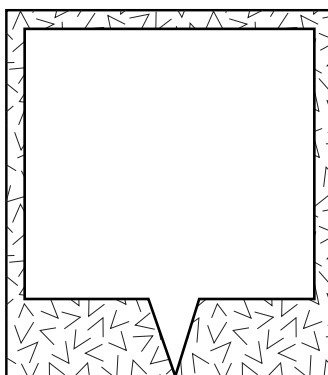
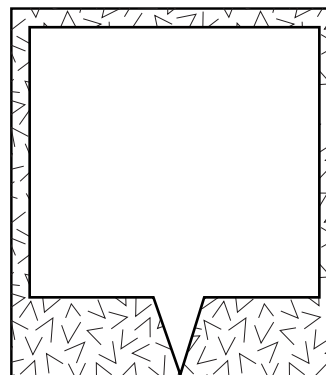
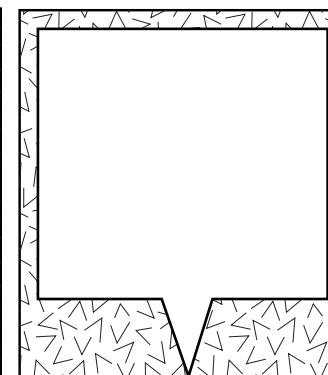
The geologic timeline is divided up into eons, eras, periods, epochs, and ages. But what do those words mean? Use your scientific notation skills to write about how long those periods are.

| <u>Unit of Time</u> | <u>How long is that?</u> | <u>Number written in standard form</u> | <u>Number written in scientific notation</u> |
|---------------------|---|--|--|
| Eon | Half a billion years or more | 500,000,000 | 5×10^8 |
| Era | Measured in hundreds of millions of years | 100,000,000 | 1×10^8 |
| Period | A period varies in length of time | | |
| Epoch | Measured in tens of millions of years | 10,000,000 | 1×10^7 |
| Age | Measured in millions of years | 1,000,000 | 1×10^6 |

Can you write the approximate time when these events occurred in scientific notation?

| Event | When it happened (approximately) written in standard form | When it happened (approximately) written in scientific notation |
|--|--|--|
| The moon formed. | 4,500,000,000 years ago | 4.5×10^9 |
| First archean life appears (maybe...it could have been earlier). | 3,500,000,000 years ago | 4.5×10^9 |
| Multicellular organisms appear. | 1,000,000,000 years ago | 1×10^9 |
| Earth is covered with ice from pole to pole. | 750,000,000 years ago | 7.5×10^8 |
| Cambrian explosion introduces many new life forms. | 530,000,000 years ago | 5.3×10^8 |
| Four legged vertebrates appear on land. | 360,000,000 years ago | 3.6×10^8 |
| Permian mass extinction kills about 95% of all life on Earth. | 248,000,000 years ago | 2.48×10^8 |
| Dinosaurs could be found all over the earth. | 160,000,000 years ago | 1.6×10^8 |
| Dinosaurs disappear in the K-T mass extinction. | 65,000,000 years ago | 6.5×10^7 |
| Earliest primates evolved. | 60,000,000 years ago | 6×10^7 |
| "Lucy," an early hominid, lived. | 3,200,000 years ago | 3.2×10^6 |
| Modern humans emerge. | 200,000 years ago | 2×10^5 |
| Earth's most current "ice age" began. | 110,000 years ago | 2×10^5 |
| Neanderthals died out. | 50,000 years ago | 5×10^4 |
| Woolly mammoths became extinct. | 3,600 years ago | 3.6×10^3 |
| Human beings begin the Industrial Revolution. | 250 years ago | 2.5×10^2 |

Blank Tabs for Labeling Significant Events in Earth's History

| | | | |
|--|--|---|--|
|  <p><i>Glue Here!</i></p> |  <p><i>Glue Here!</i></p> |  <p><i>Glue Here!</i></p> |  <p><i>Glue Here!</i></p> |
|  <p><i>Glue Here!</i></p> |  <p><i>Glue Here!</i></p> |  <p><i>Glue Here!</i></p> |  <p><i>Glue Here!</i></p> |
|  <p><i>Glue Here!</i></p> |  <p><i>Glue Here!</i></p> |  <p><i>Glue Here!</i></p> |  <p><i>Glue Here!</i></p> |
|  <p><i>Glue Here!</i></p> |  <p><i>Glue Here!</i></p> |  <p><i>Glue Here!</i></p> |  <p><i>Glue Here!</i></p> |

Thank you!

Thank you for purchasing this product!



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