



EARTH'S GEOLOGIC HISTORY

I-DAY LESSON

Purpose: Give students an analogy to model the history of Earth's geologic eons, as well as some biological events

Time Needed: About 70-minutes

Background Knowledge Required: N/A

Materials Included:

- Student worksheets
- Teacher PowerPoint and Instructions
- Answer Keys

Teacher Prep Time: About 8-minutes of the time it takes to make copies

Teaching Instructions:

1. Open the teacher PowerPoint and share the 3-2-1 activity on Slide 2. This makes a great Bell Ringer or Starter question for the day because it helps students start to think about changes to Earth over time.
2. Use slides 3-5 to help students understand how much "1 billion" is. HINT: It's A LOT!
3. Use slides 6-11 to help students understand what "scale" means. Feel free to use your own examples or recall knowledge you've already learned in your classroom. The video on slide 11 is optional, but a great example of why "scale models" are difficult to make.
4. Use slides 12-13 to help students understand what an "analogy" is. I always assumed they knew that word, but many students do not, so it is worth reviewing.
5. Pass out the student worksheet. Have students turn to the side that says "Geologic Time Analogy"
6. Use slides 14-22 to help students predict the amount of time each geologic eon lasted. It's most likely that students will evenly space these periods of time. I've found this is very common in teenagers. They have a subconscious desire of symmetry and consistency. Drawing out this misconception is so good for them!

Teacher To-Do List:

- Print this file
- Preview the Teacher PowerPoint and make any changes that will benefit your students
- Preview the answer key to ensure your own understanding of what students will be doing
- Make copies of the student calendars (double-sided works great!)
- Gather markers or colored pencils for your students to use

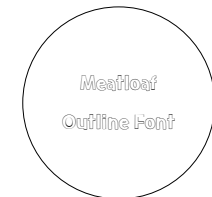
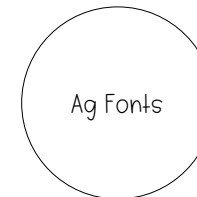
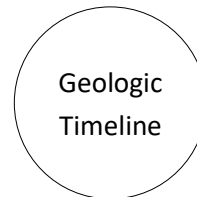
Teaching Instructions Continued:

7. Allow your students to compare their calendars to a partner or in a small group. What could everyone agree on? Did anyone have a strong opinion and believe that theirs was the right answer?
8. Have students turn the paper over so that they are now looking at the “Geologic Events” side of the paper.
9. Use slides 25-32 to share the correct answers with students. Have students draw BOXES around the correct dates.
10. Use slide 36 to have students predict which date on the calendar would correspond with each geologic or biologic event. Rather than having students mark their predictions, have each student point to the date on the calendar that they believe each event happens. For example, project slide 36 and ask everyone to point to the date they believe the formation of the Earth occurred. Then advance the animation to show the correct answer of January 1st. Repeat for the other 7 events.
11. Share slides 44-46 to help students analyze the activity. This is a great way to reflect on misconceptions and knowledge gained.
12. One final data point is covered on slides 47-50: the first modern humans on earth!
13. An optional exit question is included on slide 51, however, it is a philosophical question. Consider if this is the best approach for your students and make any necessary changes.

Enjoy!

Real Ms. Frizzle

Credits:



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Geologic Time Analogy

If we could condense the history of the Earth into a calendar year, where would each of the following events take place ?

Assign a color to each Eon below, then color the calendar dates to show how long **you think** each Eon lasted.

Hadean Eon (early earth, lava on the surface, toxic atmosphere, boiling oceans)

Archean Eon (no oxygen in the atmosphere, deep oceans, single-celled life, no large continents)

Proterozoic Eon (transition to an oxygen filled atmosphere, supercontinents that form and break up, multicellular organisms)

Phanerozoic Eon (explosion of plant and animal life, modern day oceans, modern day atmosphere)

<p>January</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p>	<p>February</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28</p>	<p>March</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p>	<p>April</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30</p>
<p>May</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p>	<p>June</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30</p>	<p>July</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p>	<p>August</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p>
<p>September</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30</p>	<p>October</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p>	<p>November</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30</p>	<p>December</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p>

Geologic Events

Listen to your teacher as they share the correct answers.

Draw a different colored BOX around each the following:

- Hadean Eon
- Archean Eon
- Proterozoic Eon
- Phanerozoic Eon

Choose a color, and fill in the calendar date for each of these events:

- Formation of Earth
- Formation of the oceans
- First life on Earth
- First plants on land
- First dinosaurs
- Dinosaur Extinction
- First flowers
- First modern humans

<p>January</p> <p>1 2 3 4 5 6 7</p> <p>8 9 10 11 12 13 14</p> <p>15 16 17 18 19 20 21</p> <p>22 23 24 25 26 27 28</p> <p>29 30 31</p>	<p>February</p> <p>1 2 3 4</p> <p>5 6 7 8 9 10 11</p> <p>12 13 14 15 16 17 18</p> <p>19 20 21 22 23 24 25</p> <p>26 27 28</p>	<p>March</p> <p>1 2 3 4</p> <p>5 6 7 8 9 10 11</p> <p>12 13 14 15 16 17 18</p> <p>19 20 21 22 23 24 25</p> <p>26 27 28 29 30 31</p>	<p>April</p> <p>1</p> <p>2 3 4 5 6 7 8</p> <p>9 10 11 12 13 14 15</p> <p>16 17 18 19 20 21 22</p> <p>23 24 25 26 27 28 29</p> <p>30</p>
<p>May</p> <p>1 2 3 4 5 6</p> <p>7 8 9 10 11 12 13</p> <p>14 15 16 17 18 19 20</p> <p>21 22 23 24 25 26 27</p> <p>28 29 30 31</p>	<p>June</p> <p>1 2 3</p> <p>4 5 6 7 8 9 10</p> <p>11 12 13 14 15 16 17</p> <p>18 19 20 21 22 23 24</p> <p>25 26 27 28 29 30</p>	<p>July</p> <p>1</p> <p>2 3 4 5 6 7 8</p> <p>9 10 11 12 13 14 15</p> <p>16 17 18 19 20 21 22</p> <p>23 24 25 26 27 28 29</p> <p>30 31</p>	<p>August</p> <p>1 2 3 4 5</p> <p>6 7 8 9 10 11 12</p> <p>13 14 15 16 17 18 19</p> <p>20 21 22 23 24 25 26</p> <p>27 28 29 30 31</p>
<p>September</p> <p>1 2</p> <p>3 4 5 6 7 8 9</p> <p>10 11 12 13 14 15 16</p> <p>17 18 19 20 21 22 23</p> <p>24 25 26 27 28 29 30</p>	<p>October</p> <p>1 2 3 4 5 6 7</p> <p>8 9 10 11 12 13 14</p> <p>15 16 17 18 19 20 21</p> <p>22 23 24 25 26 27 28</p> <p>29 30 31</p>	<p>November</p> <p>1 2 3 4</p> <p>5 6 7 8 9 10 11</p> <p>12 13 14 15 16 17 18</p> <p>19 20 21 22 23 24 25</p> <p>26 27 28 29 30</p>	<p>December</p> <p>1 2</p> <p>3 4 5 6 7 8 9</p> <p>10 11 12 13 14 15 16</p> <p>17 18 19 20 21 22 23</p> <p>24 25 26 27 28 29 30</p> <p>31</p>

Name **SUGGESTED ANSWER KEY** Date Class Period

Geologic Time Analogy

ASSUMING THE EARTH IS 4.6
BILLION YEARS OLD,

EACH MONTH = 383 MILLION
YEARS

EACH DAY = 12.6 MILLION YEARS

EACH HOUR = 525,114 YEARS

EACH MINUTE = 8,752 YEARS

EACH SECOND = 146 YEARS

	HADEAN EON (800 MILLION YEARS)
	ARCHEAN EON (1.3 BILLION YEARS)
	PROTEROZOIC EON (1.95 BILLION YEARS)
	PHANEROZOIC EON (550 MILLION YEARS)

January	February	March	April
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
May	June	July	August
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September	October	November	December
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

