12.3 & 12.4 Notes

Structure of the Geologic Time Scale

- ________ is the longest segment of geologic time
- ________ divide _________
- ________ divide
- ________
- ________ divide
- ________

Different Eras

- Archean
  - The ________ era
  - Began when Earth formed ________ billion years ago
- Proterozoic
  - Began ________ billion years ago
  - Rocks contain _______________ of simple plants and worms that lived in the ____________
  - No evidence of ________ on _________ in Proterozoic Era
- Paleozoic
  - Began ________ million years ago
  - More abundant _______________ record
  - Rocks contain _______________ of both ________ and ________ plants and animals
- Mesozoic
  - Began ________ million years ago
  - Time of the _______________
- Cenozoic
  - ________ of the Eras (we are _________________ in it)
  - Began ________ million years ago
  - Includes events like the ________ ________ and the presence of ________
Measuring Absolute Time

1. ______________: Any ______________ that shows a __________ cycle
   o Examples: __________ or __________

2. __________ __________ aka Dendrochronology
   o Counting rings can provide __________ in __________ (each ring is _______ year)
   o Can also be used to tell what ________ conditions were like
      ▪ __________ Conditions = ______________ Rings

3. ______________ ________________
   o __________________ – when the nucleus of an atom (isotope) becomes _______________, they spontaneously __________ apart or __________
   o ______________ material – ______________ substance or isotope
   o ______________ material – ______________ that result __________ the __________
      ▪ Isotopes have ______________ number of neutrons!
   o __________________ – the amount of __________ necessary for __________ _____ of the nuclei in a sample (parent) to
      __________ to its ______________ isotope (daughter)
   o __________ radioactive isotope has been decaying at a ________________ __________ since the formation of the rocks in which it occurs.

Table 1 Radioactive Isotopes Frequently Used in Radiometric Dating

<table>
<thead>
<tr>
<th>Radioactive Parent</th>
<th>Stable Daughter Product</th>
<th>Currently Accepted Half-Life Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uranium-238</td>
<td>Lead-206</td>
<td>4.5 billion years</td>
</tr>
<tr>
<td>Uranium-235</td>
<td>Lead-207</td>
<td>713 million years</td>
</tr>
<tr>
<td>Thorium-232</td>
<td>Lead-208</td>
<td>14.1 billion years</td>
</tr>
<tr>
<td>Rubidium-87</td>
<td>Strontium-87</td>
<td>47.0 billion years</td>
</tr>
<tr>
<td>Potassium-40</td>
<td>Argon-40</td>
<td>1.3 billion years</td>
</tr>
</tbody>
</table>
o _____________________________ is the procedure of calculating the _______ ages of rocks and minerals that contain __________________________ isotopes.
o An ___________________ radiometric date can be obtained _________ if the mineral remained in a __________ system during the _______ period since its _____________________.
o ___________________________ Dating:
  ▪ Uses __________________
  ▪ Carbon-14 found in _____ ___________ _____________
  ▪ ___________________________ of Carbon-14 is ______________________
  ▪ Carbon-14 half-life is ___________ years
  ▪ Used for events of ___________ years or less