

Radioactive Decay Calculations

Name: _____ Teacher: _____ Date: _____

For each of the following artifacts, calculate the age in years. Is the artifact authentic? Why or why not?

Artifact 1: Mastodon vertebrae

This Mastodon vertebrae from an excavation site here in Indiana is claimed to be over 12,500 years old. A sample of this bone was analyzed and shows a carbon-14 activity of 14.2 decays per minute per gram of carbon. A recent rib bone from a dairy cow has a carbon-14 activity of 15.4 decays per minute per gram of carbon.

Artifact 2: Ancient honey

This sample of honeycomb is believed to have been recovered from Cleopatra's tomb and is said to be over 2,000 years old. A sample of this honey was analyzed and shows a carbon-14 activity of 11.9 decays per minute per gram of carbon. A recent sample of honey from Egypt has a carbon-14 activity of 15.3 decays per minute per gram of carbon.

Artifact 3: Burial cloth

This burial cloth was recovered from a recent archaeological dig that took place near Valsgärde in Sweden. The cloth is believed to have belonged to an elite warrior who pledged allegiance to a king in Uppsala. Experts claim this burial cloth is over 1,400 years old. A sample of this cloth was analyzed and shows a carbon-14 activity of 16.8 decays per minute per gram of carbon. A recent sample of sheep's wool was analyzed and shows a carbon-14 activity of 15.6 decays per minute per gram of carbon.

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Artifact 4: Ancient honey

This sample of honeycomb is believed to have been recovered from King Tutankhamun's tomb and is said to be over 3,300 years old. A sample of this honey was analyzed and shows a carbon-14 activity of 14.5 decays per minute per gram of carbon. A recent sample of honey from Egypt has a carbon-14 activity of 15.5 decays per minute per gram of carbon.

Artifact 5: Mastodon rib bone

This Mastodon rib bone from an excavation site here in Indiana is claimed to be over 12,500 years old. A sample of this bone was analyzed and shows a carbon-14 activity of 3.4 decays per minute per gram of carbon. A recent rib bone from a dairy cow has a carbon-14 activity of 15.5 decays per minute per gram of carbon.

Artifact 6: Burial cloth

This burial cloth was recovered from a recent archaeological dig that took place near Herlaugshaugen mound in Norway. The cloth is believed to have belonged to the historical figure Herlaug who has been mentioned in Norse sagas. Experts claim this burial cloth is over 1,300 years old. A sample of this cloth was analyzed and shows a carbon-14 activity of 13.1 decays per minute per gram of carbon. A recent sample of sheep's wool was analyzed and shows a carbon-14 activity of 15.4 decays per minute per gram of carbon.