

The Age of the Earth - answers

1. $4004 + 1904 = 5908$ yrs
2. That another source of heat, radioactivity in the rocks of the Earth, would keep the Earth warmer than if it had just cooled from a white-hot ball.
3. Alpha particles are doubly-ionised helium nuclei and, once emitted by uranium atoms, slow down in the rock and eventually gain electrons to become neutral helium atoms.
4. A few hundred million years old
5. Helium could leach out of the sample.
6. EMAN = radon-222
RAD.A = polonium-218
RAD.B = lead-214
7. Radon is a gas.
8. In a rock where decay of the isotopes has been going on for several billion years an equilibrium is reached where the decay rate of one element in a series is equal to the rate at which it's being created, hence the ratio of one element to another remains constant.
9. If the half-life of uranium-238 is 4.5 billion years and the earth is 4.4 billion years old then about 50% of the original uranium-238 remains.