Atomic structure.
**Radiometric dating** as illustrated by two groups of 12 atoms of a radioactive parent isotope. After one half-life, half of the 12 atoms of the parent isotope will have radioactively decayed (on average) to the daughter isotope. A closed system (closed box, near right) has a definite actual age with respect to the particular decay series: the time elapsed since the system and its surroundings ceased to exchange atoms of the parent and daughter elements. An open system (perforated box, far right), however, does not.

With a closed system, the apparent age estimated from the extent of radioactive decay (below, radioactive decay curve) approximates the actual age; but with an open system, it can be altogether meaningless. In the example, the closed box has an apparent age of one half-life (since it contains half of the original six parent atoms), which equals its actual age. The perforated box, however, has an apparent age much less than one half-life.
Earth’s endogenic heat budget, showing individual radioisotope’s contributions.
Problems of radiometrically dating sedimentary rock as illustrated on a cross section though the margin of a continental rift.
Global reservoir—2:1 isotope ratio, as might be known from meteorites

Reservoir A—samples would show 3:1 isotopic ratio

Reservoir B—samples’ 1:1 isotopic ratio would show that Reservoir B must be half the size of Reservoir A

Establishing reservoir sizes from isotopic ratios.
Today’s carbon cycle, with reservoir sizes and fluxes as percentages of the roughly 2600 Pg of elemental carbon in organisms and associated detritus.
Isotopic compositions of important carbon, nitrogen oxygen, and sulfur reservoirs.