



Radiometric

Dating

Review Note Cards

Decay

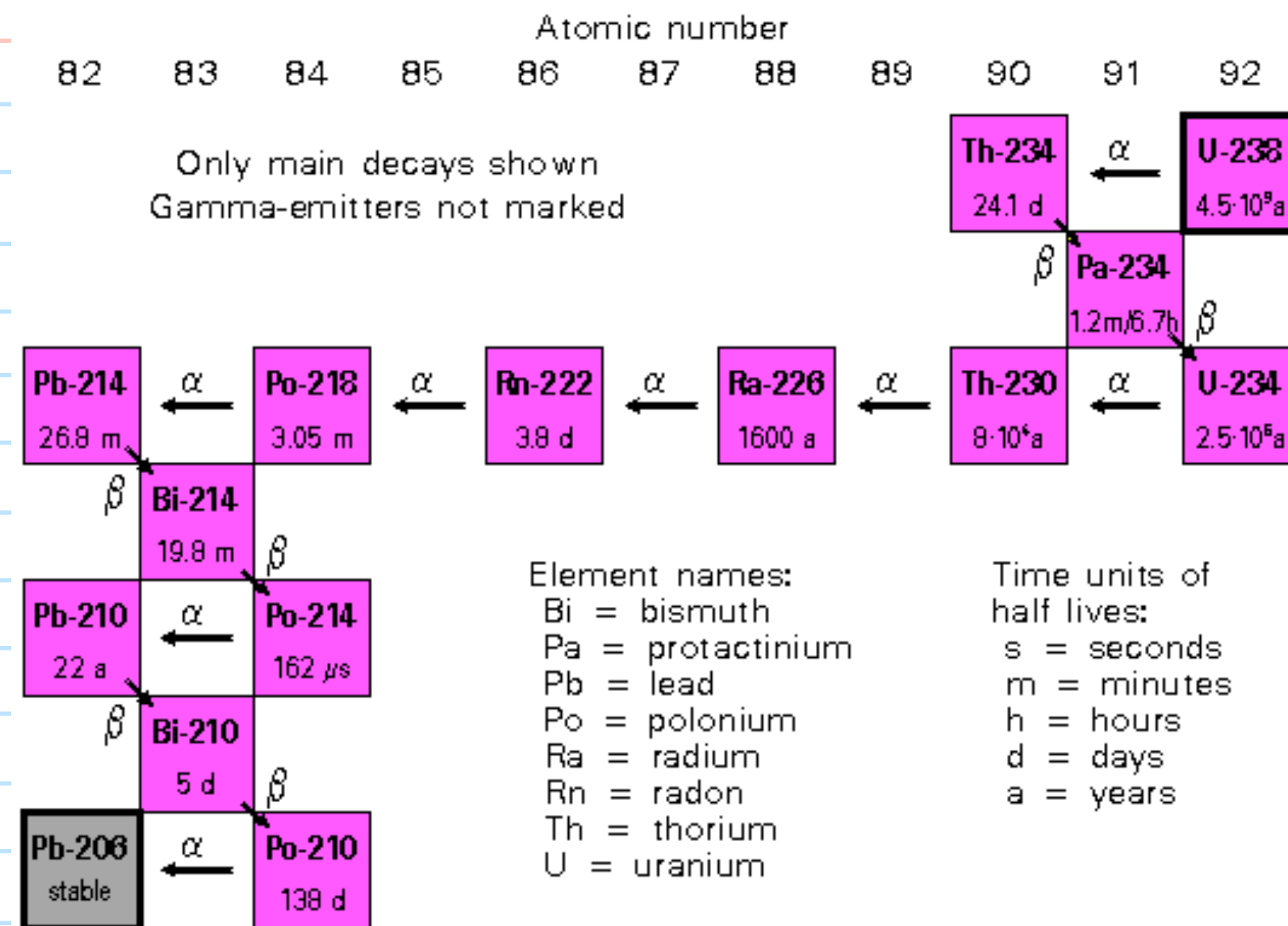
Radioactive Decay

- *The nuclei of an unstable atom breaks down.
- * Changes the original atom to its decay product

Decay

Radioactive Decay

The uranium-238 decay chain



Decay

Isotope

*Element with same number of protons but different number of neutrons.

Example: Uranium 235 & 238

Decay

Half-Life

- *The rate of radioactive decay. The time it takes for $1/2$ of the atoms of a substance to decay into another element.
- *Not affected by environmental conditions.

Decay

Decay Product

*What the isotope changes into

*Sometimes called the Daughter Product

Decay

Carbon-14 Dating

- *Used for young, no older than 57,000 year old materials.
- *Very short half life
- *Used for dating organic objects.
- *Changes into N-14

Decay

K-40, U-238,
Rb-87

*Used for very old rocks

*Very long half lives

Decay

Radioactive Decay Rates

Radioactive Decay Data

RADIOACTIVE ISOTOPE	DISINTEGRATION	HALF-LIFE (years)
Carbon-14	$C^{14} \rightarrow N^{14}$	5.7×10^3
Potassium-40	$K^{40} \begin{matrix} \rightarrow Ar^{40} \\ \rightarrow Ca^{40} \end{matrix}$	1.3×10^9
Uranium-238	$U^{238} \rightarrow Pb^{206}$	4.5×10^9
Rubidium-87	$Rb^{87} \rightarrow Sr^{87}$	4.9×10^{10}

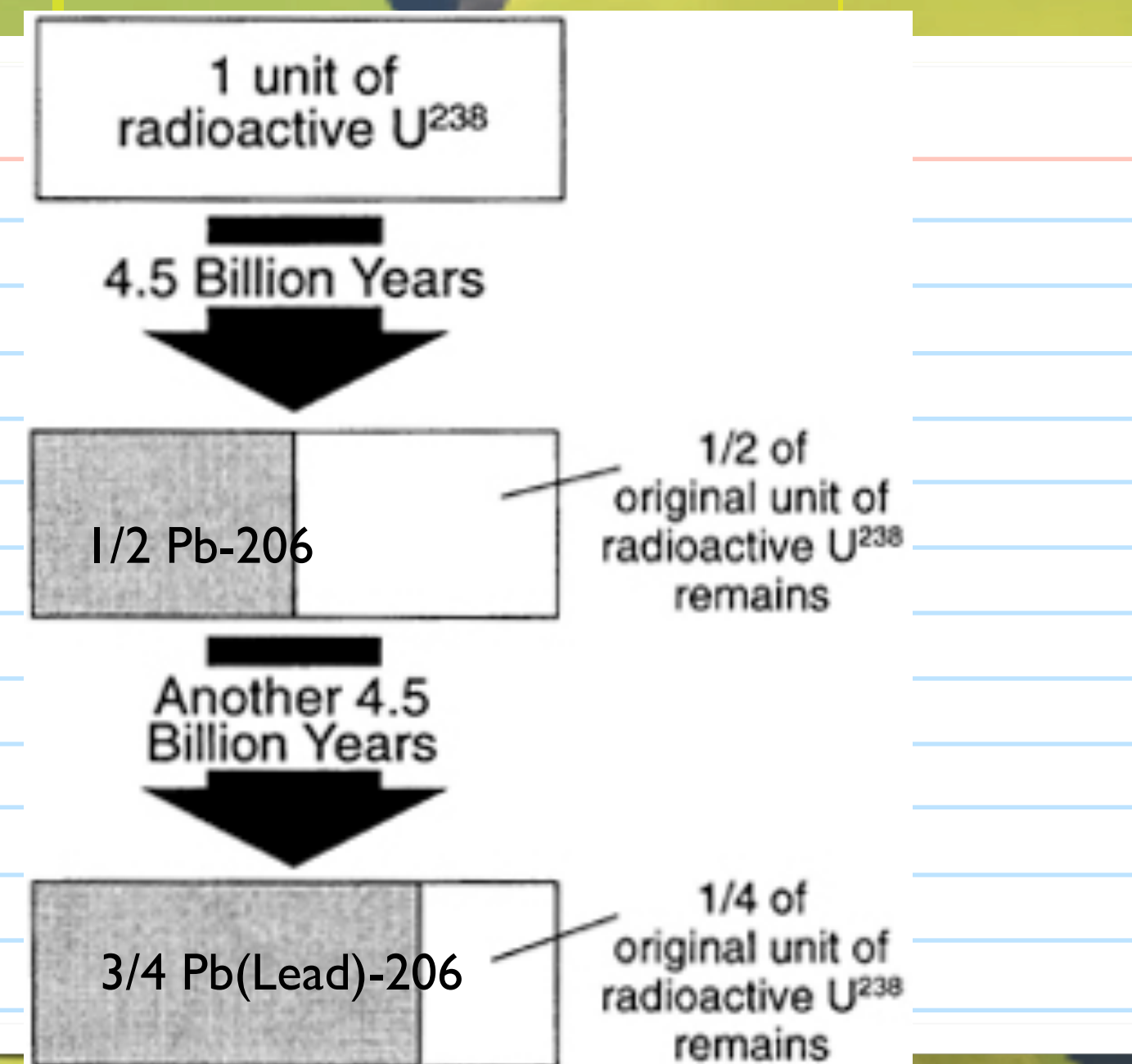
Decay

Half-Life Period

Half-Life
Periods
of
Uranium-238

1st half-life

2nd half-life



Decay

Parent Material

*The original unstable (radioactive) material before it decays.

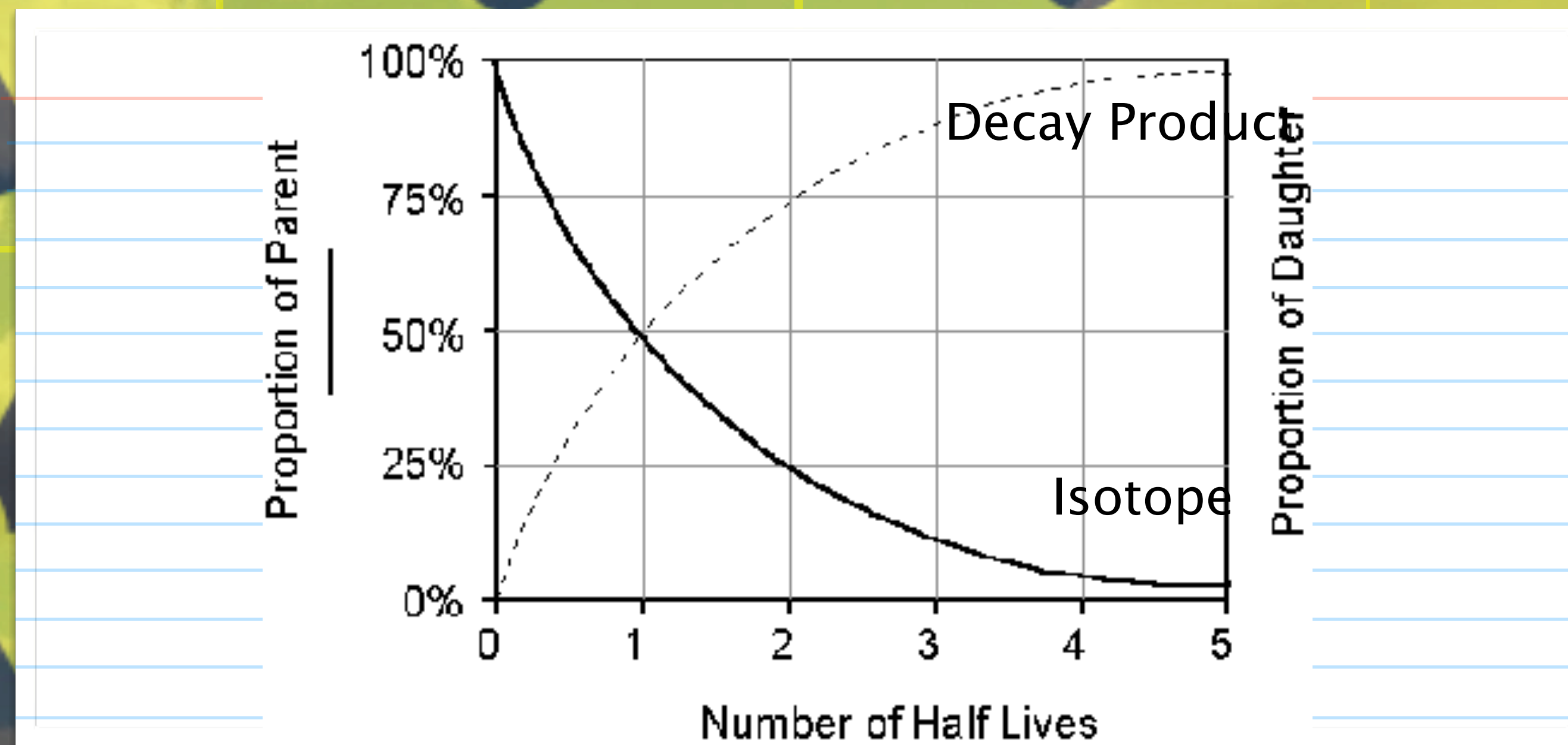
Decay

Daughter Material

- *The final product of radioactive decay, a stable (non-radioactive) material .
- *Called the Decay Product

Decay

Decay Product Ratios



Decay

Scientific Notation

*Scientific notation is the way that scientists easily handle very large numbers or very small numbers.

Instead of writing 0.0000000056, we write 5.6×10^{-9} .
5.6 is the digit term and 10^{-9} is the exponential term.

Decay

Exponential Notation

- * The exponent of 10 is the number of places the decimal point must be shifted to give the number in long form.
- * A positive exponent shows that the decimal point is shifted that number of places to the right.
- * A negative exponent shows that the decimal point is shifted that number of places to the left.



The End

