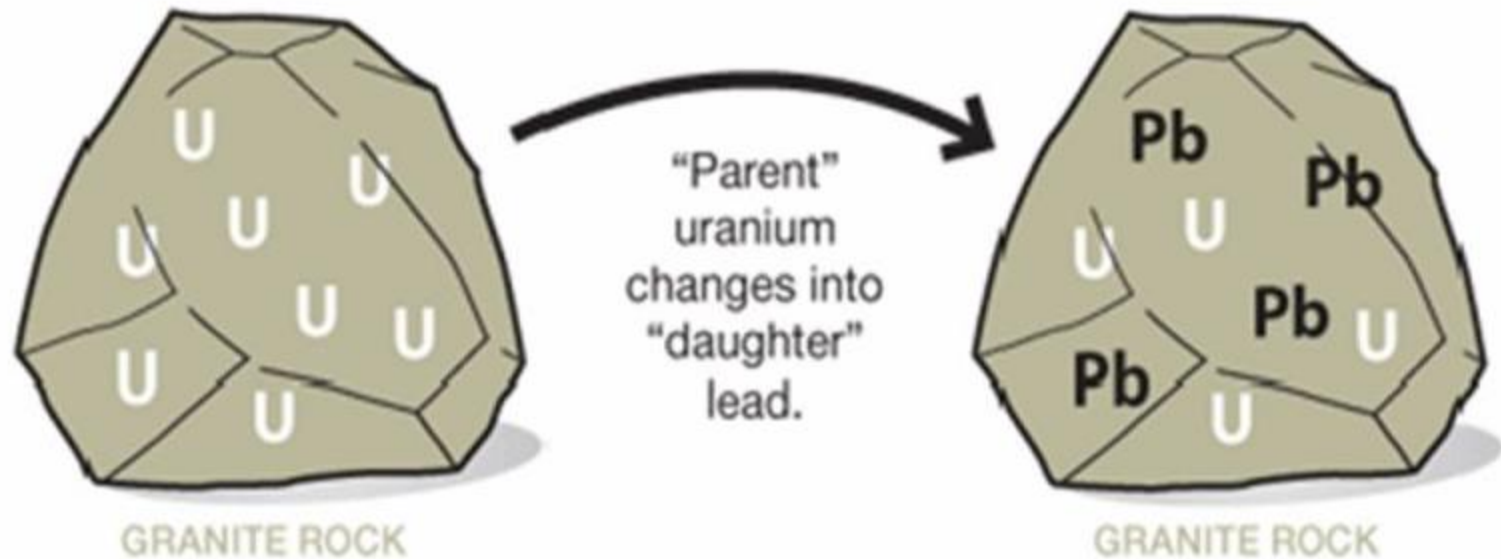
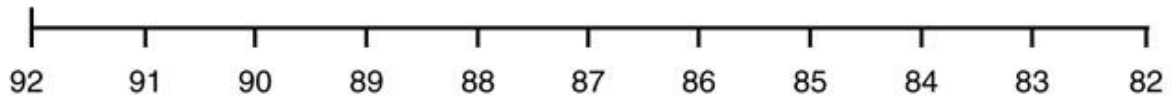
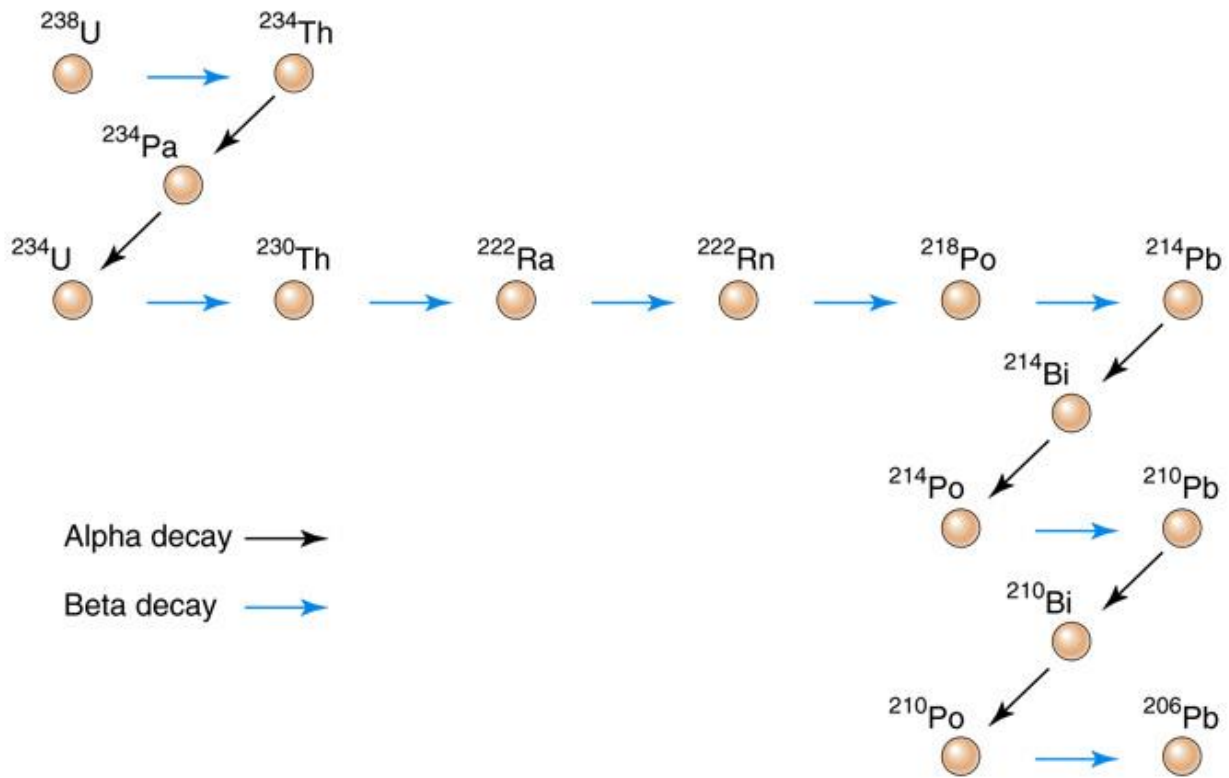
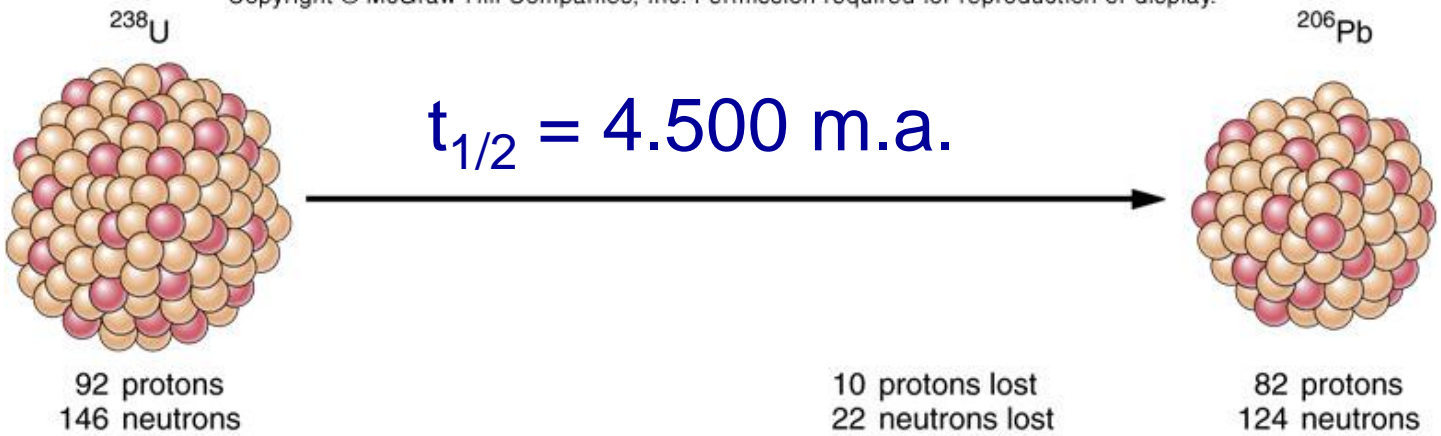




# Tema 9: Datación absoluta

# Método radiométrico

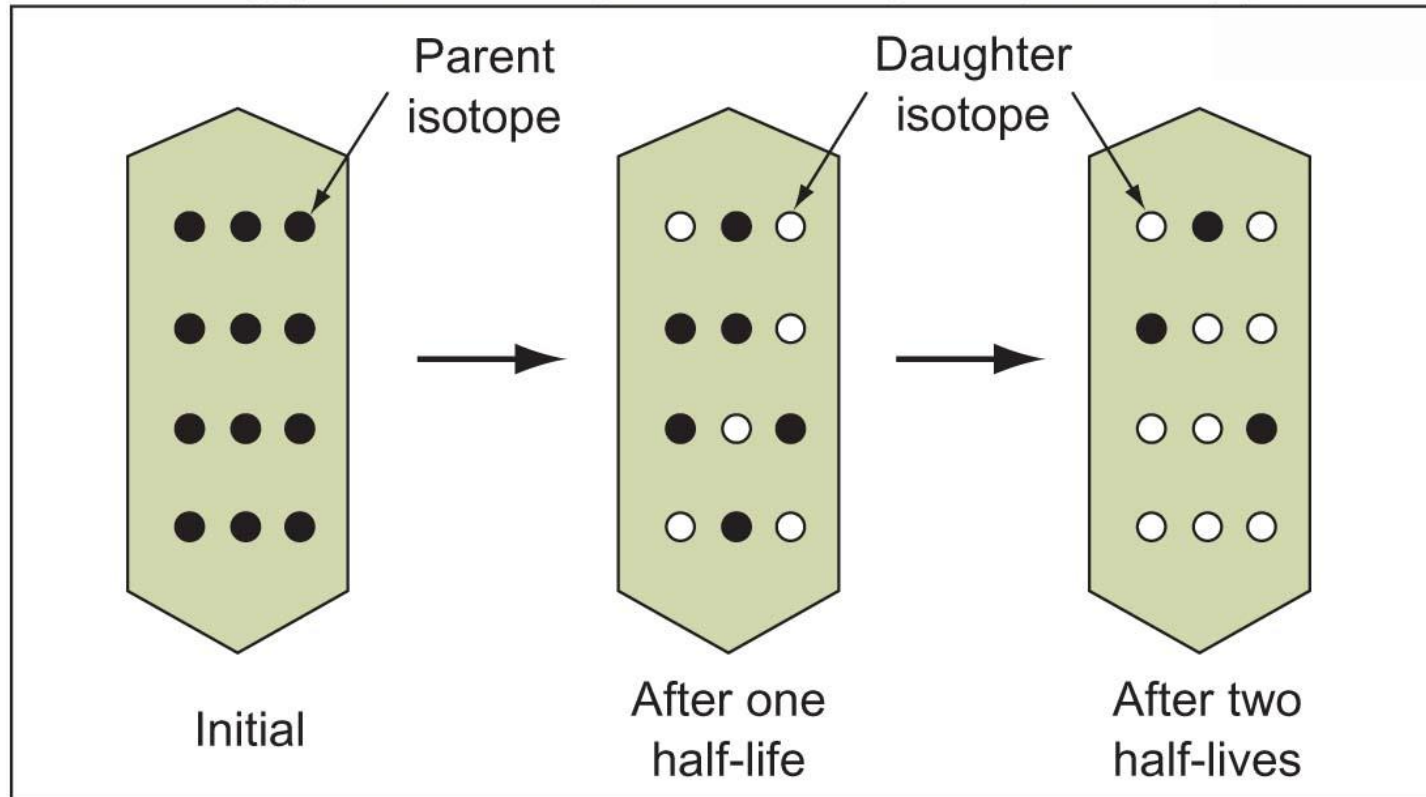




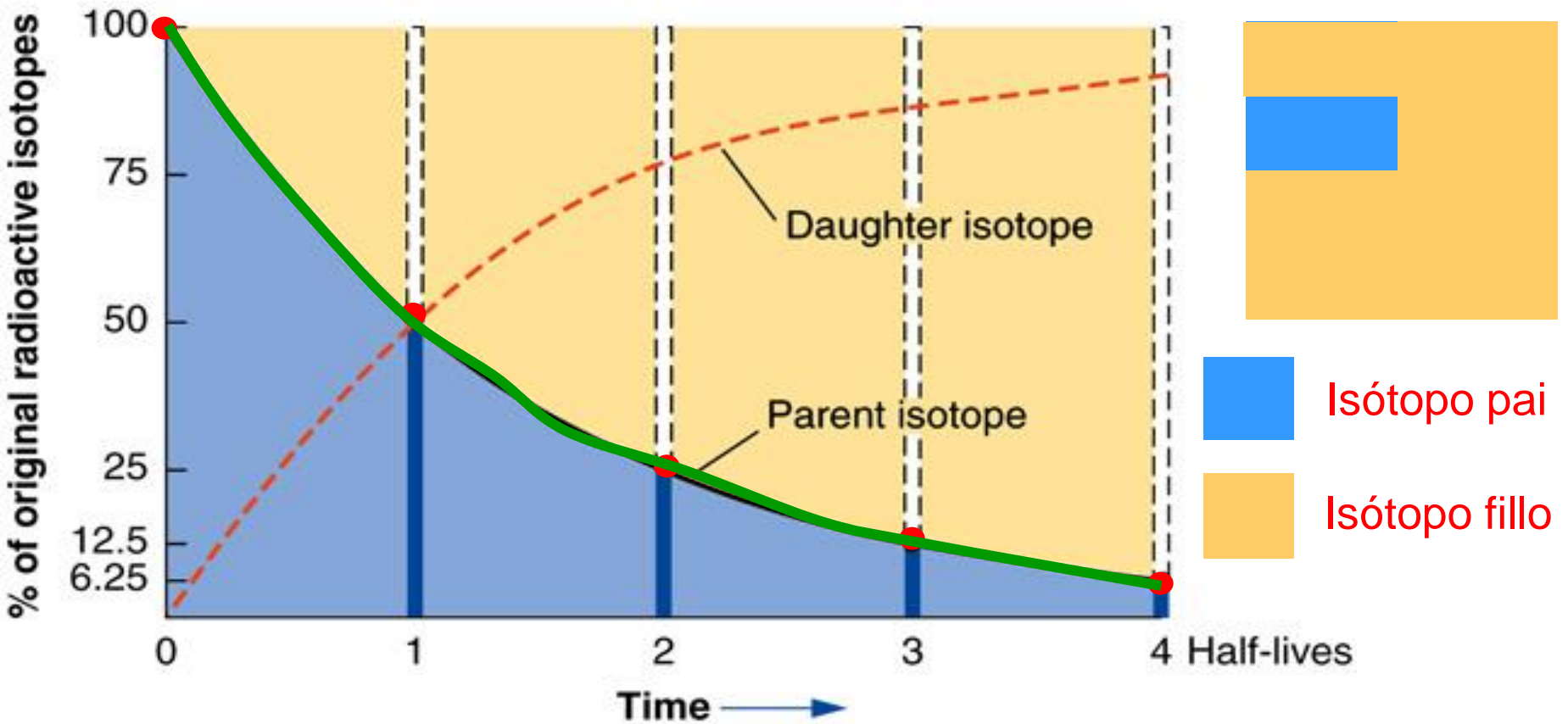
Atomic number

# PERIODO DE SEMIDESINTEGRACIÓN

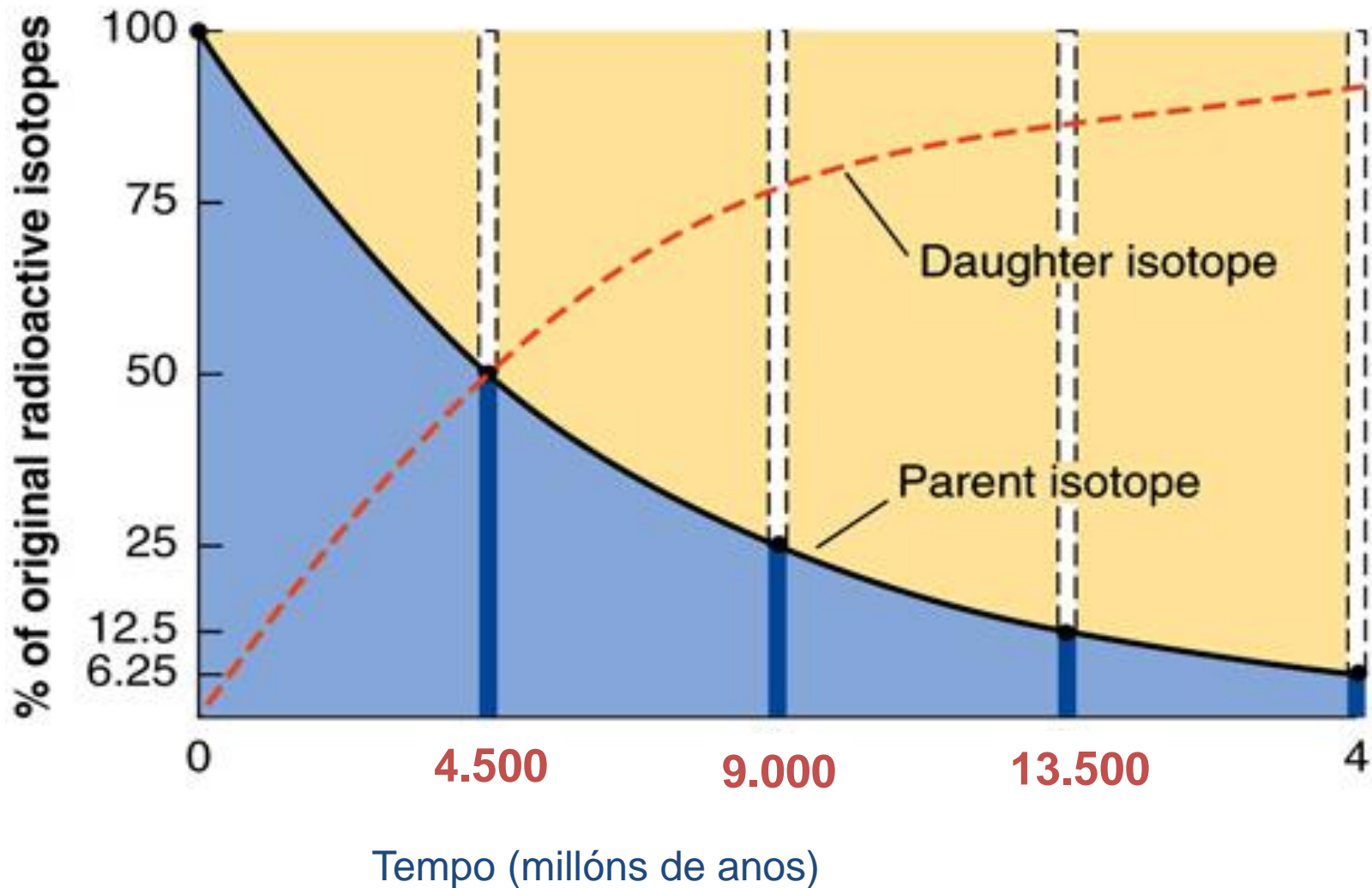
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Tempo ( $t_{1/2}$ )	0	1	2	3	4
% isótopo pai	100 %	50 %	25 %	12,5 %	6,25 %



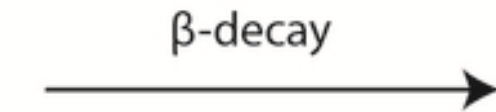
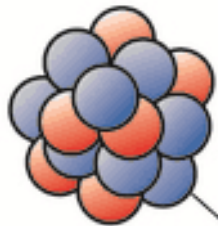
**EXEMPLO :  $^{238}\text{U}$  /  $^{206}\text{Pb}$ ;  $t_{1/2} = 4.500$  m.a.**



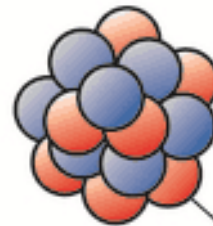
# OUTROS

ISÓTOPO PAI	ISÓTOPO FILLO	$t_{1/2}$
$^{238}\text{U}$	$^{206}\text{Pb}$	4.500 ma
$^{40}\text{K}$	$^{40}\text{Ar}$	1.300 ma
$^{14}\text{C}$	$^{14}\text{N}$	5.700 anos

carbon-14  
nucleus



nitrogen-14  
nucleus



electron

+



+

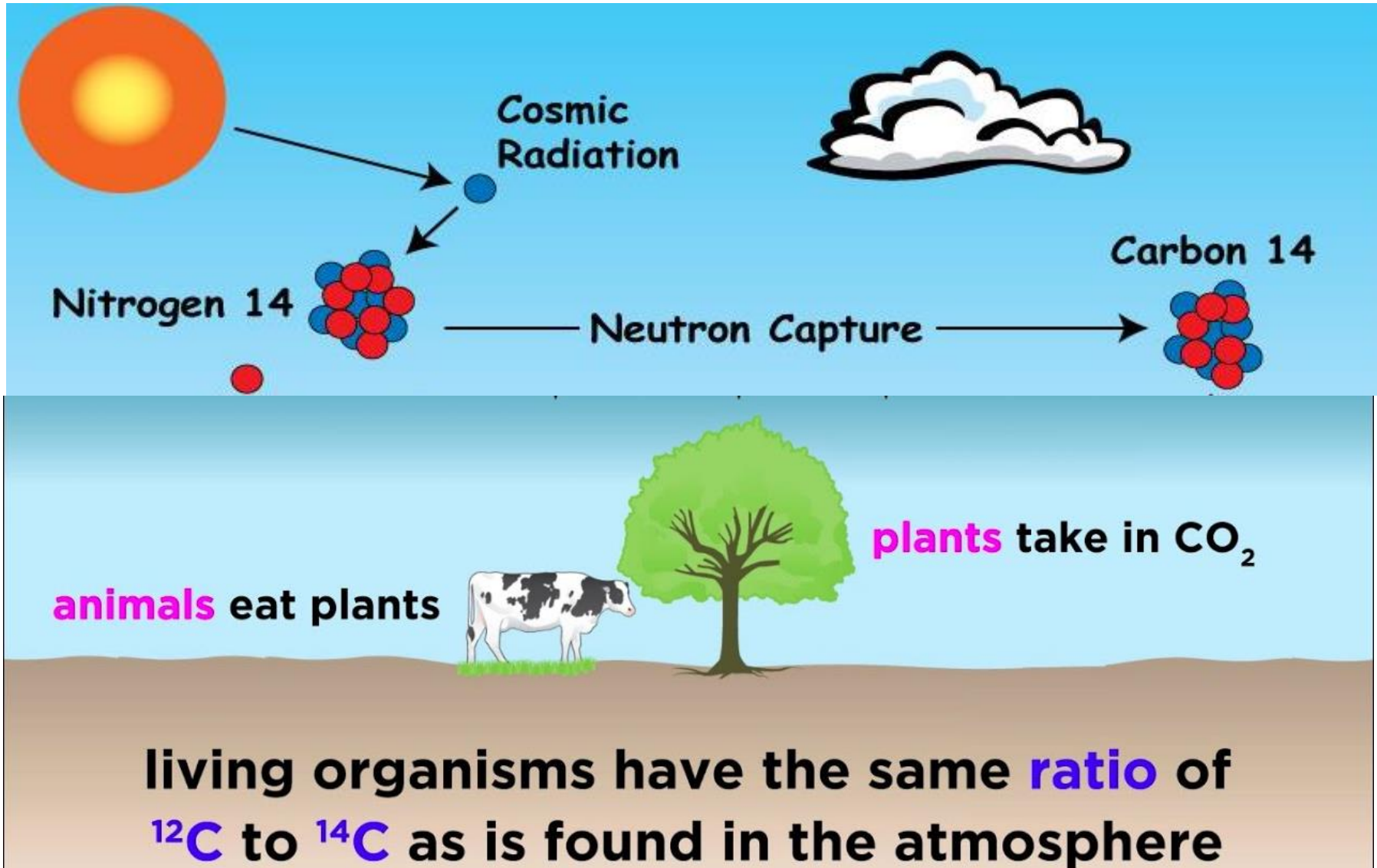
antineutrino



neutron

proton

# $^{14}\text{C}$ – materia orgánica



$^{14}\text{C}$  is produced in the atmosphere.

$^{14}\text{C}$  is oxidized and forms carbon dioxide.

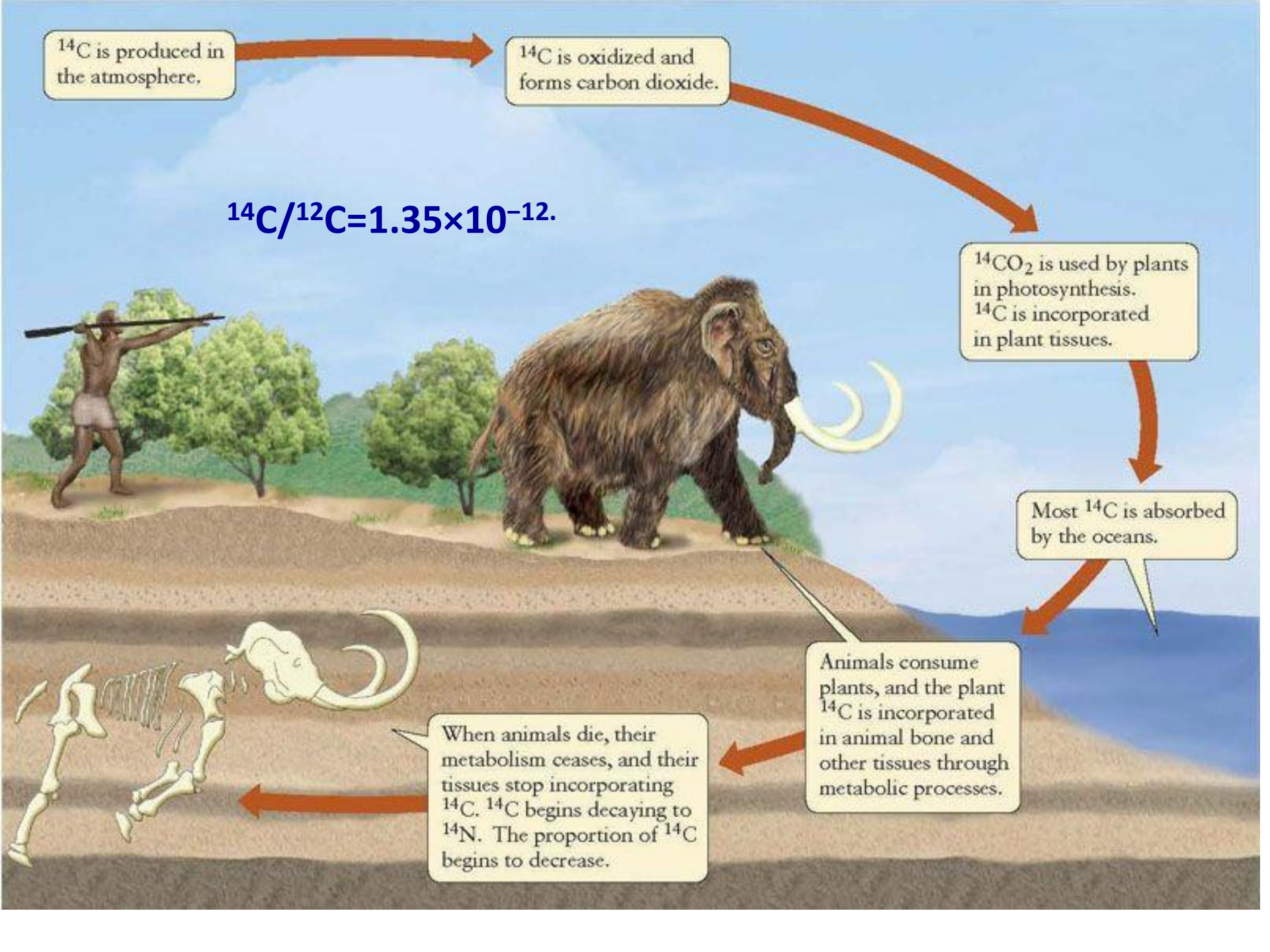
$$^{14}\text{C}/^{12}\text{C} = 1.35 \times 10^{-12}.$$

$^{14}\text{CO}_2$  is used by plants in photosynthesis.  $^{14}\text{C}$  is incorporated in plant tissues.

Most  $^{14}\text{C}$  is absorbed by the oceans.

Animals consume plants, and the plant  $^{14}\text{C}$  is incorporated in animal bone and other tissues through metabolic processes.

When animals die, their metabolism ceases, and their tissues stop incorporating  $^{14}\text{C}$ .  $^{14}\text{C}$  begins decaying to  $^{14}\text{N}$ . The proportion of  $^{14}\text{C}$  begins to decrease.



# CARBÓN COÍDO DE BARREIROS



# Resultado da datación



Radiocarbon Dating Results

Submit New Sample Set

English

Oscar Pazos



Click to see the datasheet submitted



Open/Save Photos



Download data as spreadsheet



Download PDF report by clicking the Beta or Submitter No.



Click the link to download the two sigma calibration file



Download quality assurance report

SUBMITTER No.

Search...



Total Records: 1

<input type="checkbox"/>	SUBMITTER FORM	PHOTOS	EXPORT	BETA No.	RECEIVED	SUBMITTER No.	SERVICES	MATERIAL / PRETREATMENT	CONVENTIONAL AGE	2 SIGMA CALIBRATION	2 SIGMA CALIBRATION PDF	STABLE ISOTOPES & CN	REPORT COMPLETED	QA REPORT
<input type="checkbox"/>				440557	Thursday, June 30, 2016	ESTA1-1	RadiometricPLUS-Standard delivery	(Charred Material): Acid/Alkali/Acid	> 43500 BP			δ13C (‰) -25.5	Friday, July 15, 2016	39712

Download Selected Files

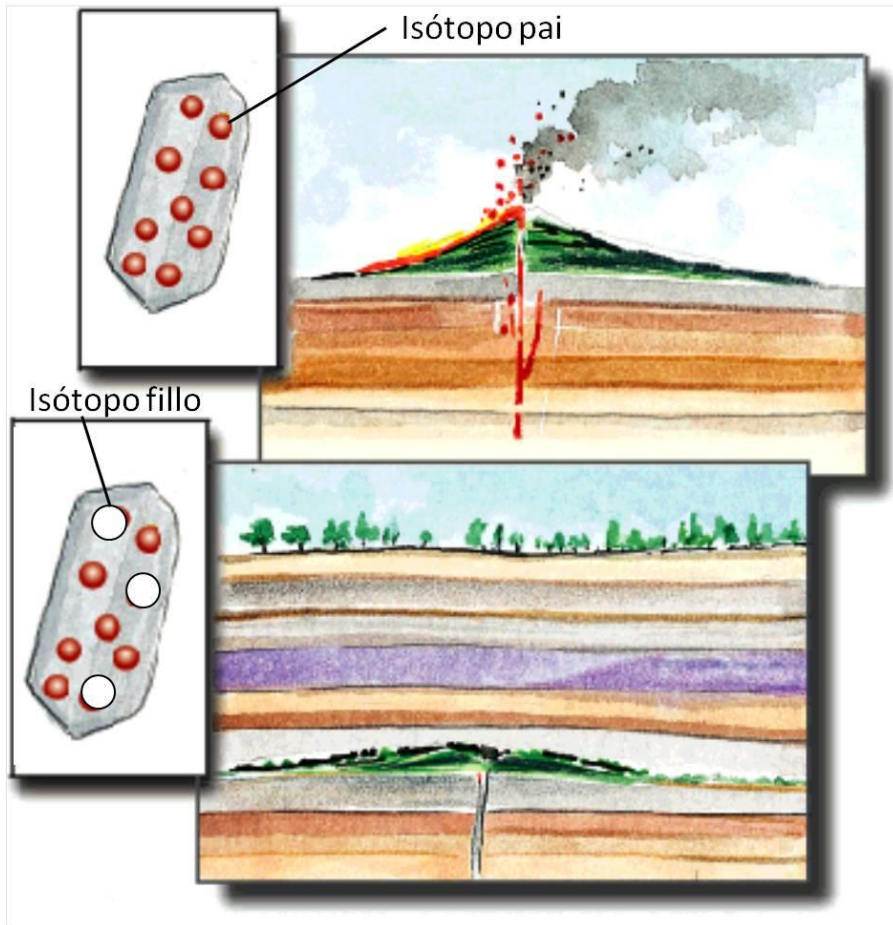
Export Results CSV

CONVENTIONAL  
AGE

> 43500 BP

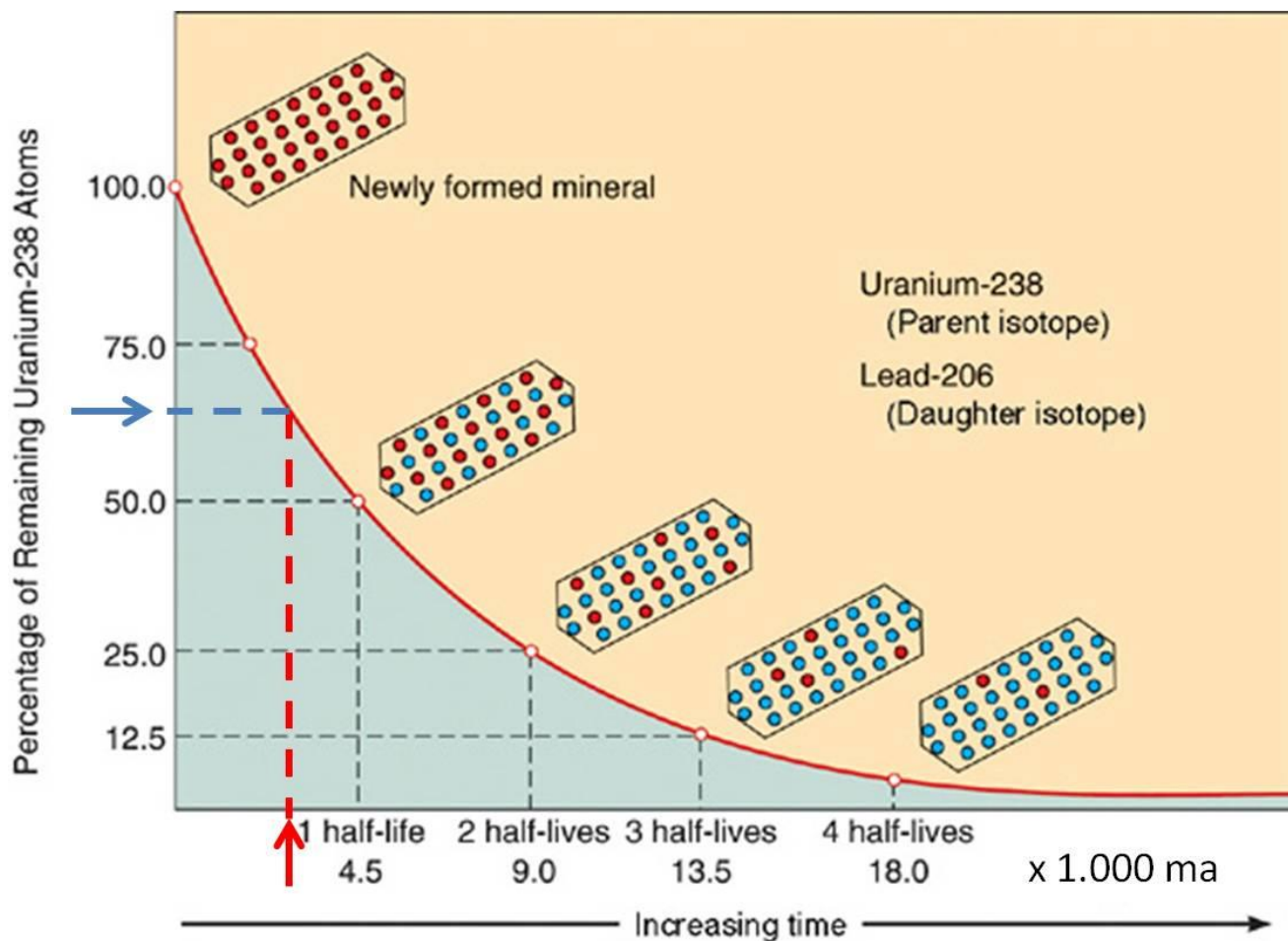
Offline - Chat not available

# EXEMPLO

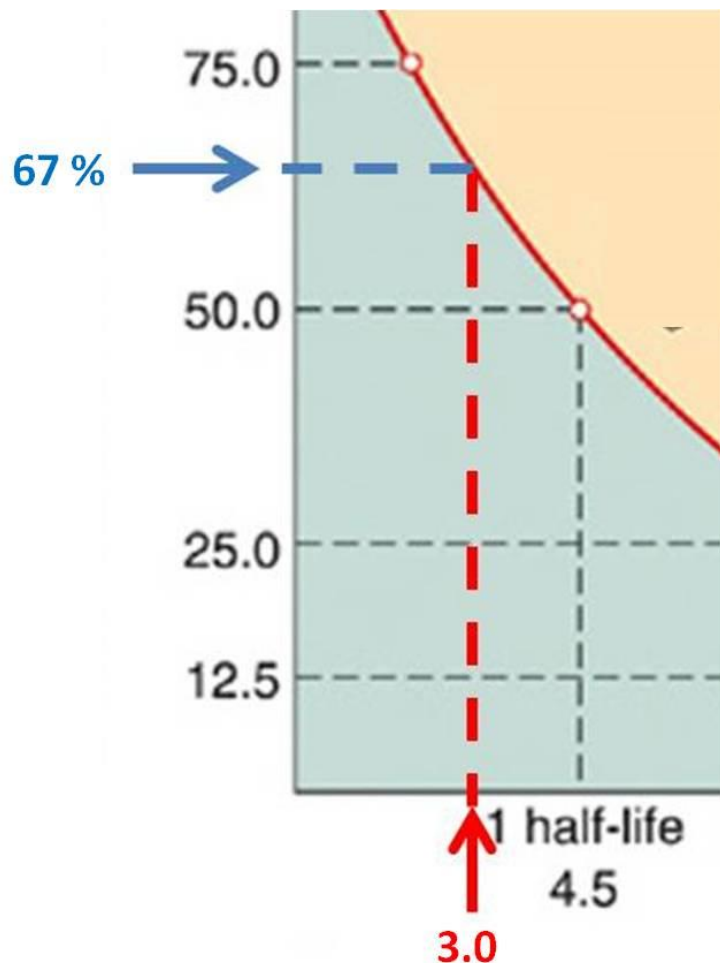


a) Usando un espectrómetro de masas determinan a cantidade de isótopo pai e fillo contido na mostra que como podes ver son 6 de uranio e 3 de chunbo. Cunha sinxela regra de tres calculamos que a porcentaxe de uranio sobre o total de pai e fillo é, redondeando, de 67 %.

b) Utilizando a gráfica da figura inferior situamos o valor anterior no eixo das Y que corresponde á porcentaxe de isótopo pai que queda.



c) Levamos o valor á curva e o baixamos ao eixo das X que representa o tempo, neste caso xa utilizando o periodo de semidesintegración do uranio-238 que é de 4.500 millóns de anos.



d) Como vemos é aproximadamente de 2/3 dese periodo o que nos da unha idade aproximada de 3.000 millóns de anos.

**3.000 ± 50 m a**  
3.000 – 50 = 2.950  
3.000 + 50 = 3.050  
Idade comprendida entre 2.950 e 3.050

## INVESTIGACIÓN

# A Coruña buscará una solución para la máquina del millón de euros

El vicerrector de Profesorado dice que la falta de recursos impide crear plazas para los científicos Parga Pondal

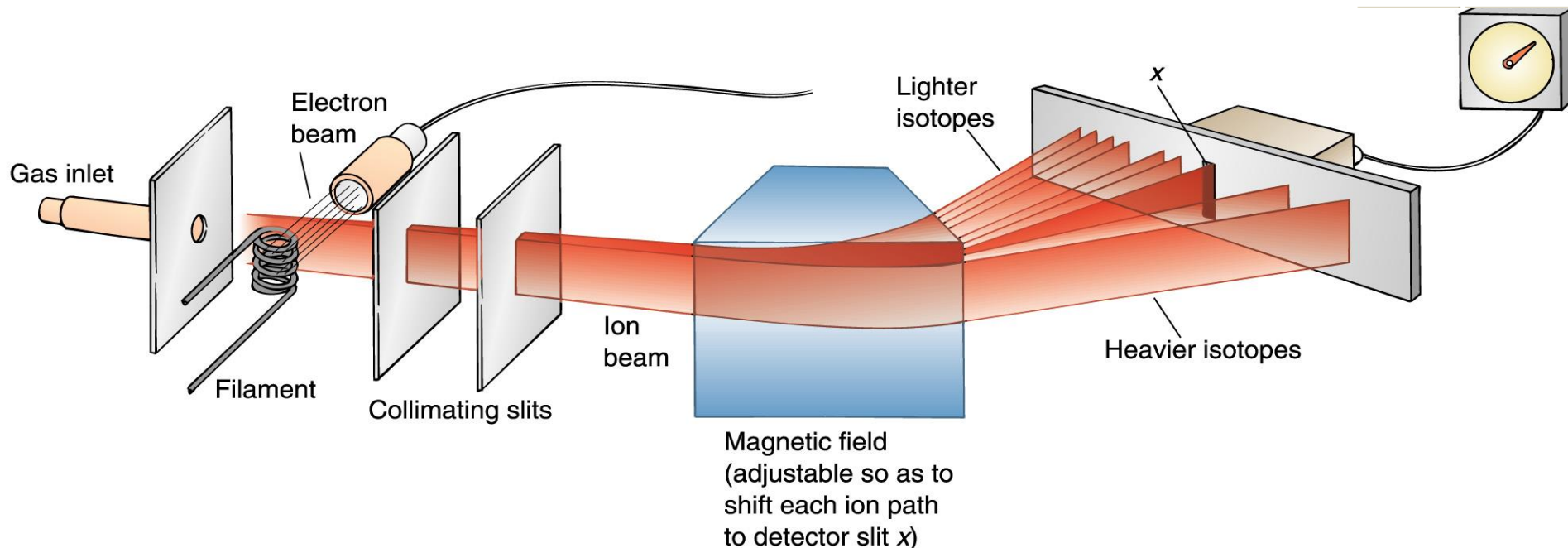
Raúl Romar | 3/11/2009

Valoración  (20 votos)

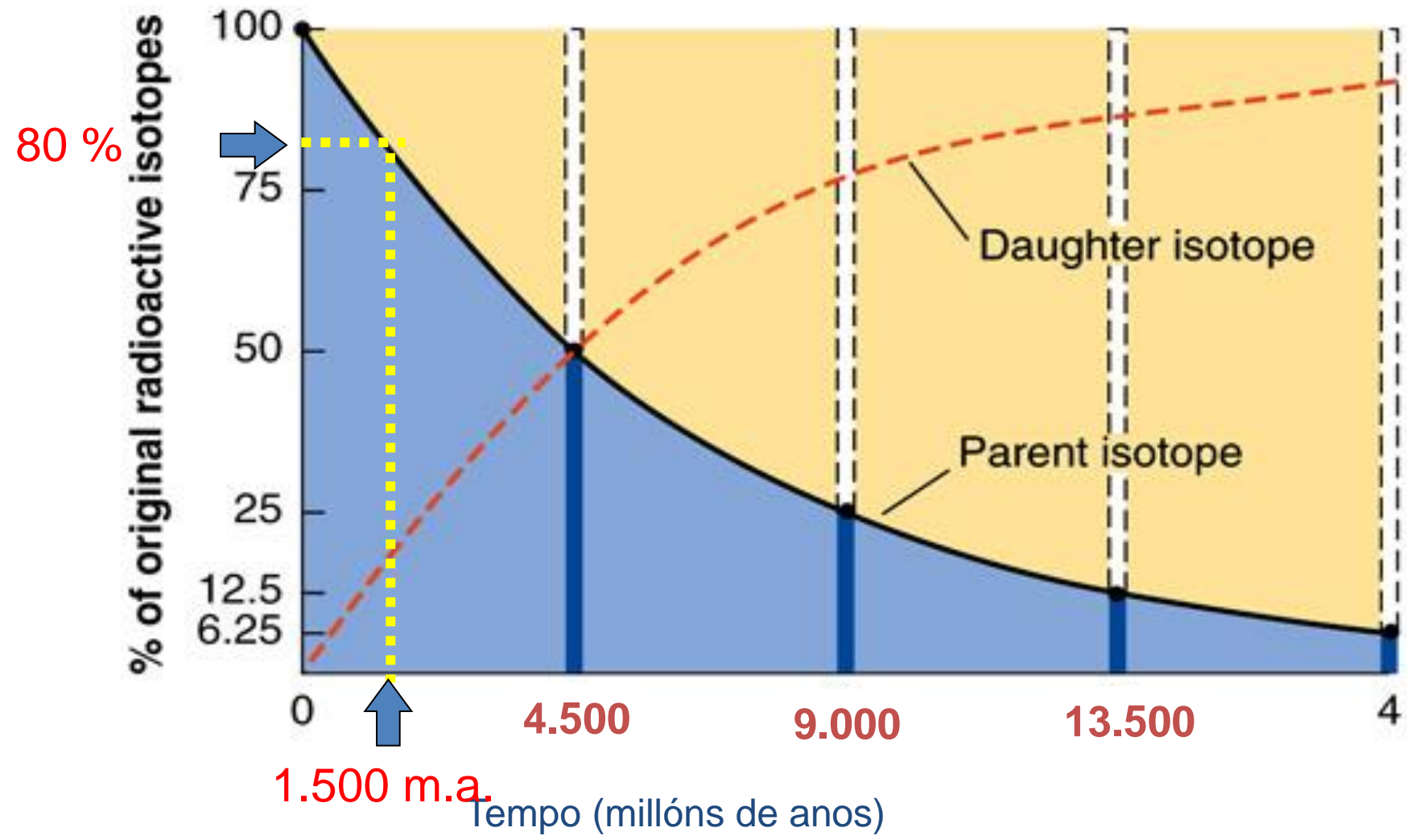


Daniel Fernández trabajando en el laboratorio con el costoso espectrómetro de masas de gases nobles

| CÉSAR QUIJANO



Analizamos uns circóns e atopamos que conteñen unha proporción de uranio con respecto ó total de uranio + plomo do 80 %





circón, zircón

Mineral compuesto de silicato de circonio, más o menos transparente, de color gris, verde, rojo o incoloro, con brillo diamantino y de gran dureza y peso, es apreciada en joyería como piedra preciosa.



MATERIAIS MÁIS  
ANTIGOS DATADOS :  
CIRCONS DE JACK  
HILLS (AUSTRALIA)

**4.404 ± 8 m.a.**



Utilizando o  
método

**$^{238}\text{U}$  /  $^{206}\text{Pb}$**

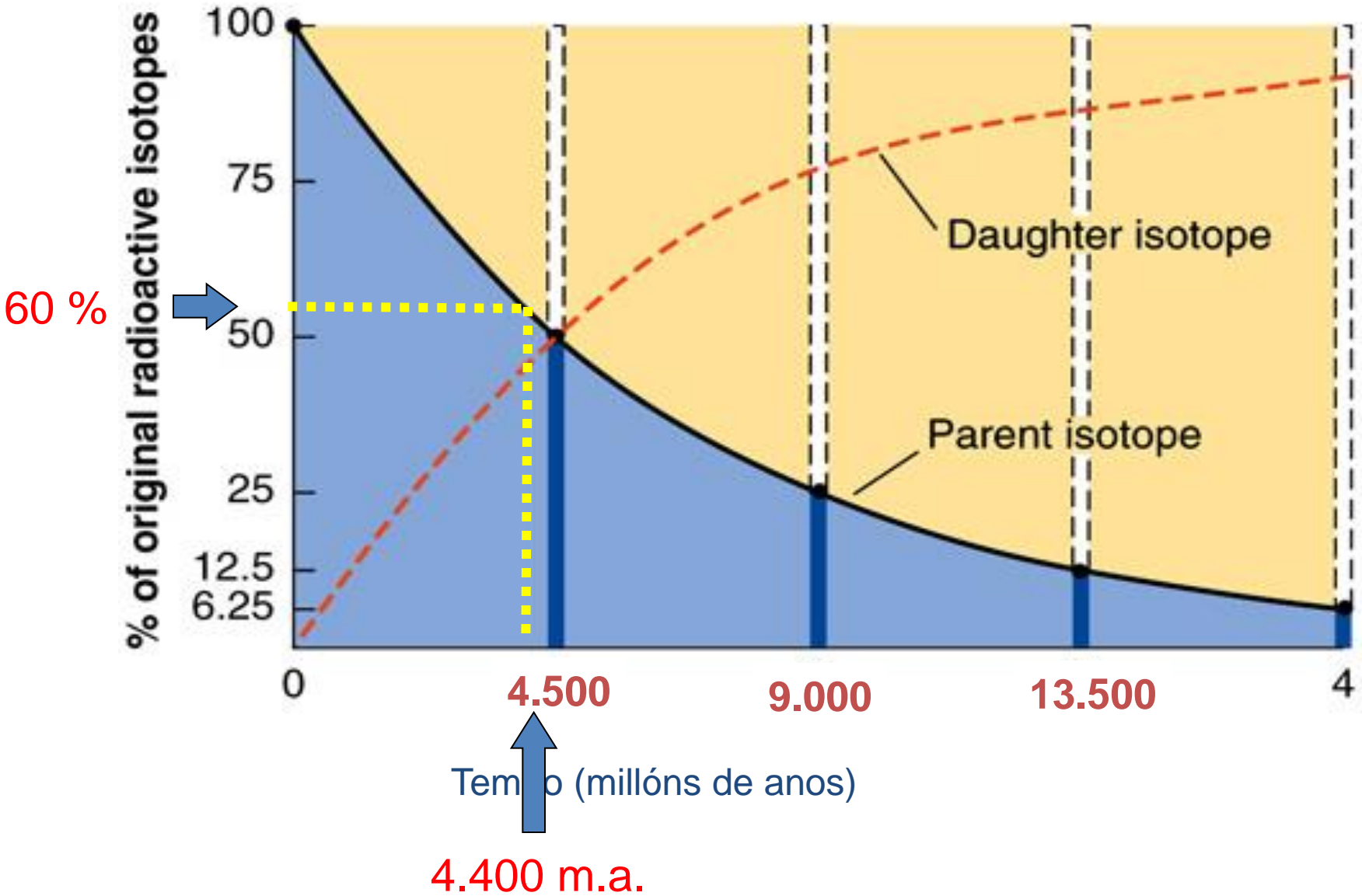
Consider **ZIRCON** –  $\text{ZrSiO}_4$

Nesosilicate – sites are compatible with  $\text{U}^{4+}$ , but not  $\text{Pb}^{2+}$ .

When Zircon forms, it can contain substantial U but no Pb.

All Pb in Zircon is due to decay and is relative to absolute age.

Zircons are very durable – can survive several cycles of erosion/depositions: **“Zircons are Forever”!!!!**

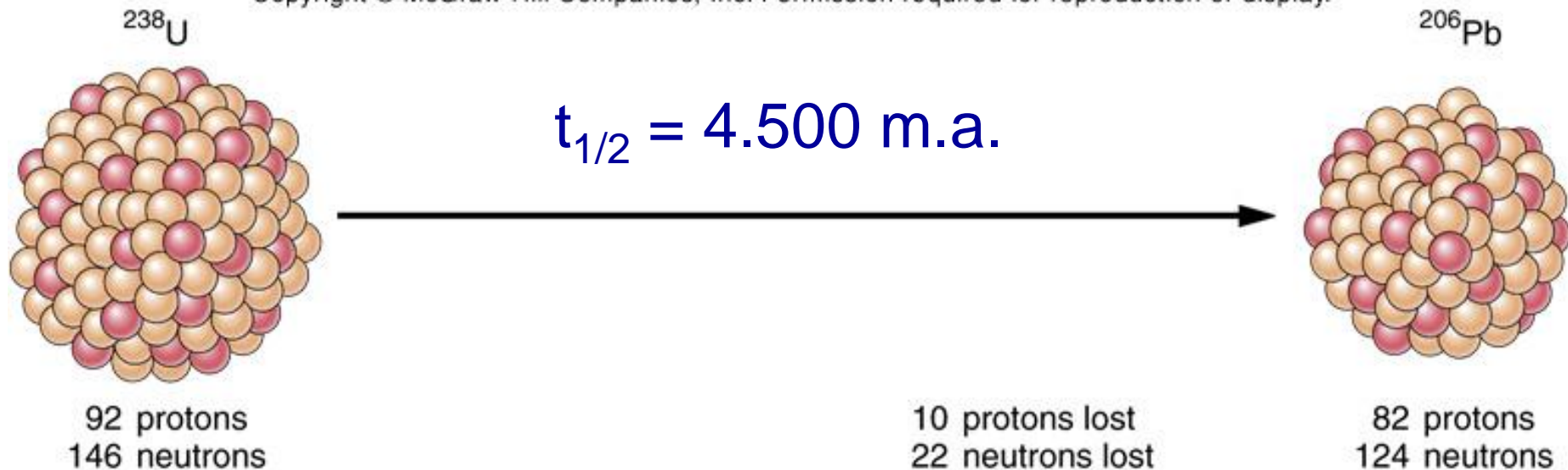


# Exercicio

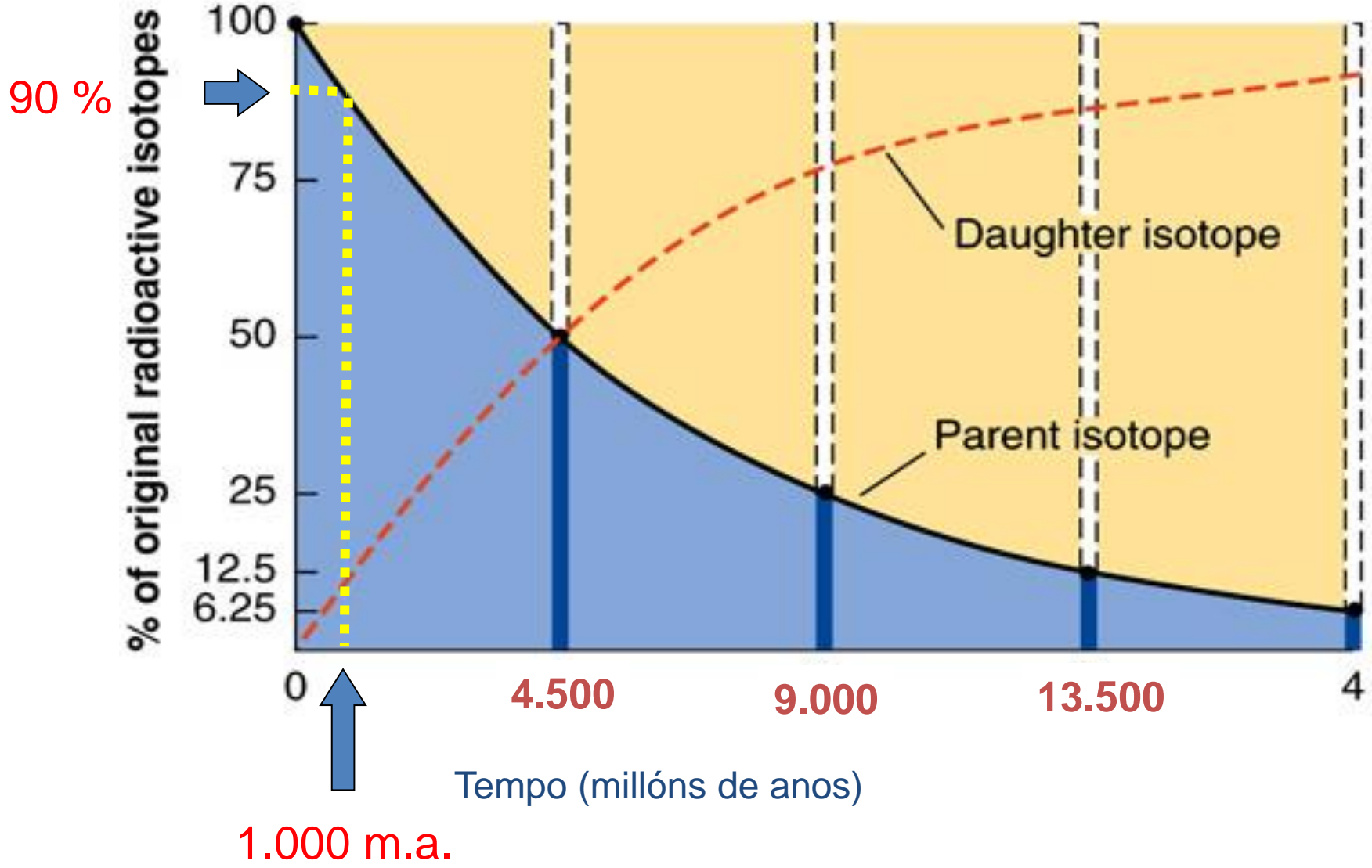
## CIRCÓNS DAS ANFIBOLITAS DE CEDEIRA

1159<sub>±</sub>39 milhões de anos.

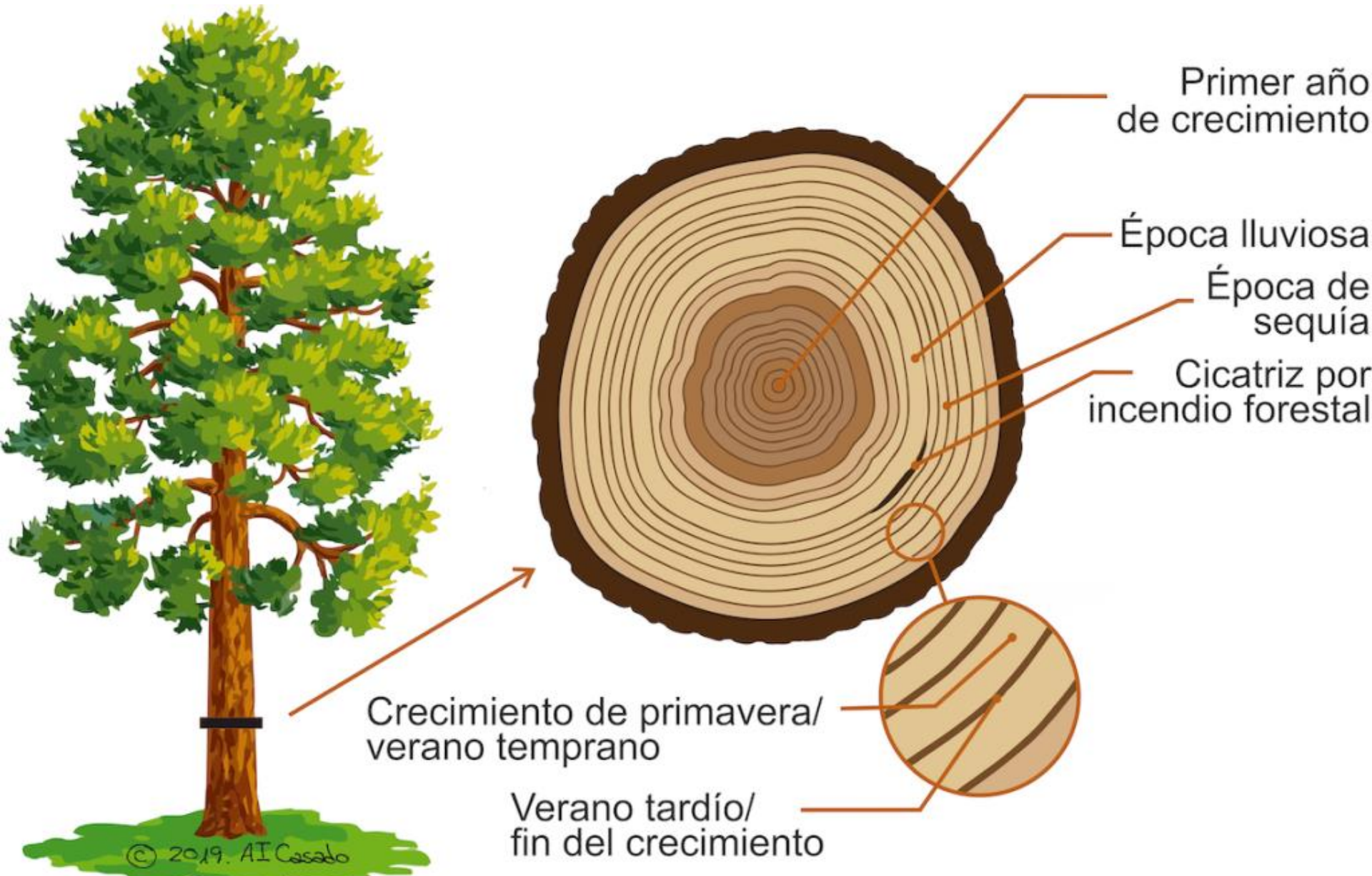
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ANFIBOLITAS DE CEDEIRA:  $1.159 \pm 39$  m.a.

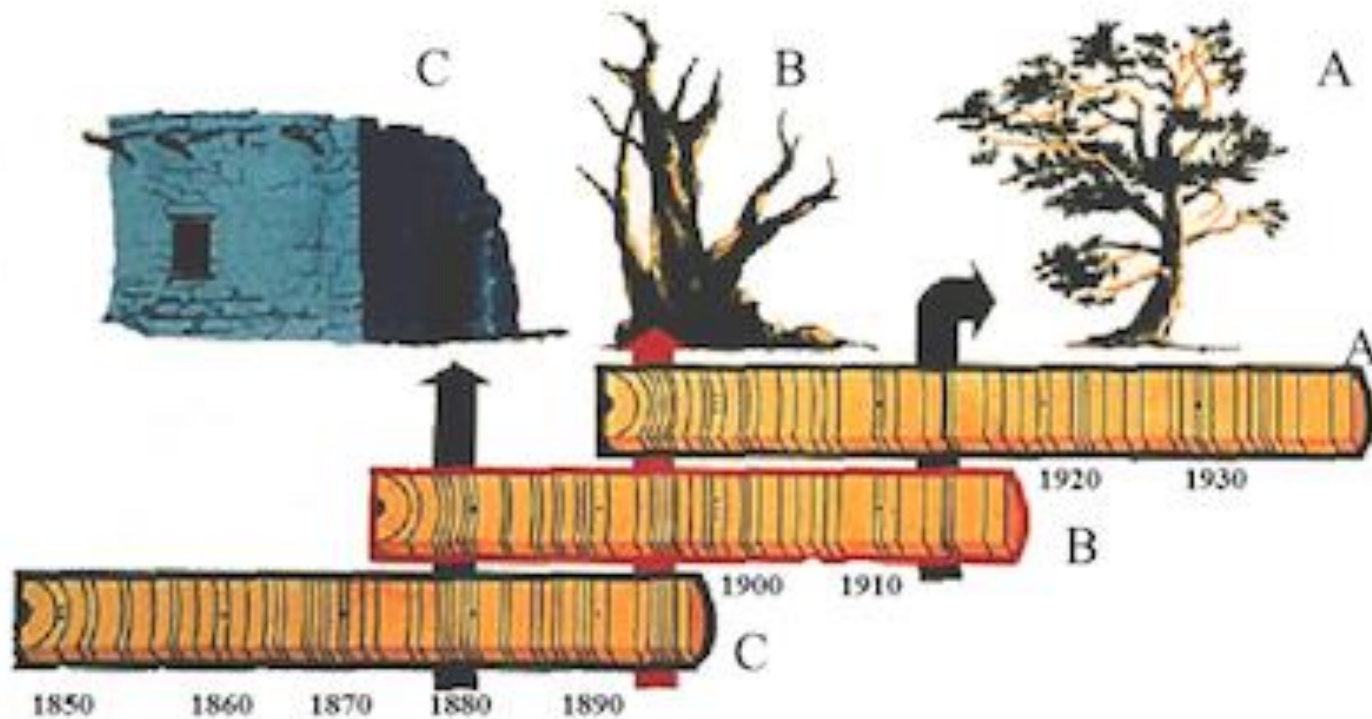


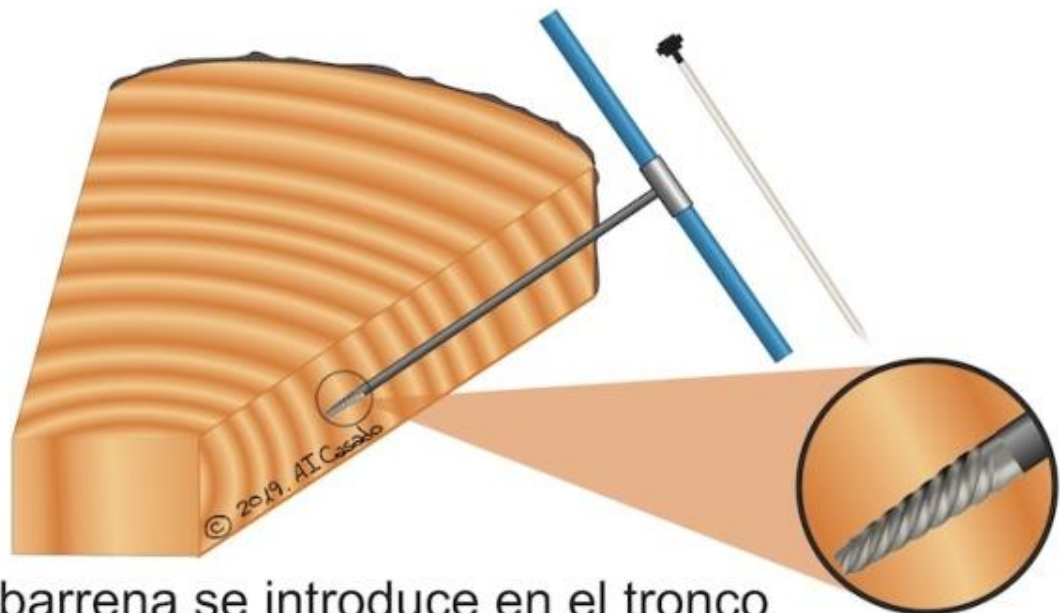
# Dendrocronología



# VARIOS MILES DE ANOS

Crossdating: The Basic Principle of Dendrochronology





La barrena se introduce en el tronco girando, gracias a la rosca afilada de su extremo



Con la varilla metálica se recupera el testigo cilíndrico del interior de la barrena

**Barrena Pressler**

**Coring a tree  
with increment borer**

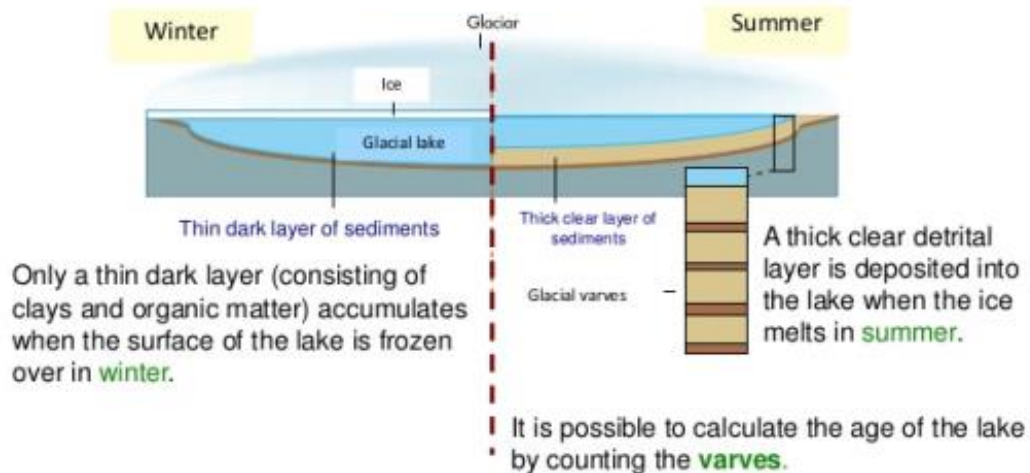
**Tree core**



**Increment borer tip**

# VARVAS GLACIARES

## Sedimentos rítmicos en lagos glaciares



# Varios miles de años 50.000 excepcionalmente

