

### Radioactive Decay - particles or energy (naturally)

Alpha Particle $\alpha$	He nucleus / Alpha Decay ${}^4_2\text{He}$	${}^{226}_{88}\text{Ra} \rightarrow {}^4_2\text{He} + {}^{222}_{86}\text{Rn}$ At# ↓ 2, At mass ↓ 4
Beta Particle $\beta^-$	e- electron ${}^0_{-1}\text{e}$	${}^{131}_{53}\text{I} \rightarrow {}^0_{-1}\text{e} + {}^{131}_{54}\text{Xe}$ At# ↑ 1, No Δ At. mass
Positron Particle $\beta^+$	Positron ${}^0_{+1}\text{e}$	${}^{11}_6\text{C} \rightarrow {}^0_{+1}\text{e} + {}^{11}_5\text{B}$ At# ↓ 1, No Δ at. mass
Gamma Radiation $\gamma$	Pure energy X-Ray ${}^0_0\gamma$	$\rightarrow + {}^0_0\gamma$

Proton 'H or' p

Apr 20-7:43 AM

## Car!

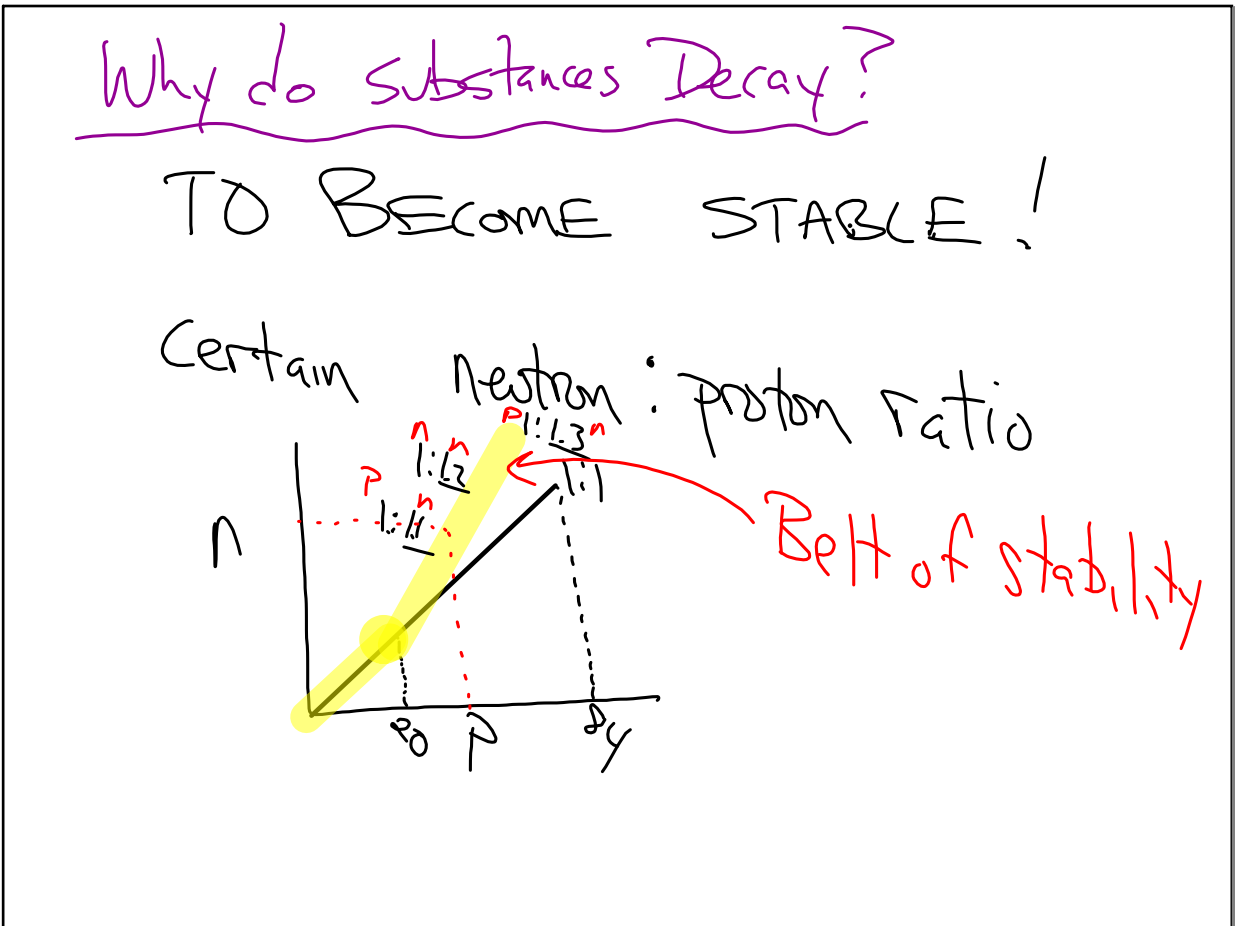
### Sources of Radiation

- ① X-Ray / CAT scan
- ② Microwave
- ③ Cellphones
- ④ Solar → UV (Auntie stuff)
- ⑤ Soil - Rn  
↳ Brick

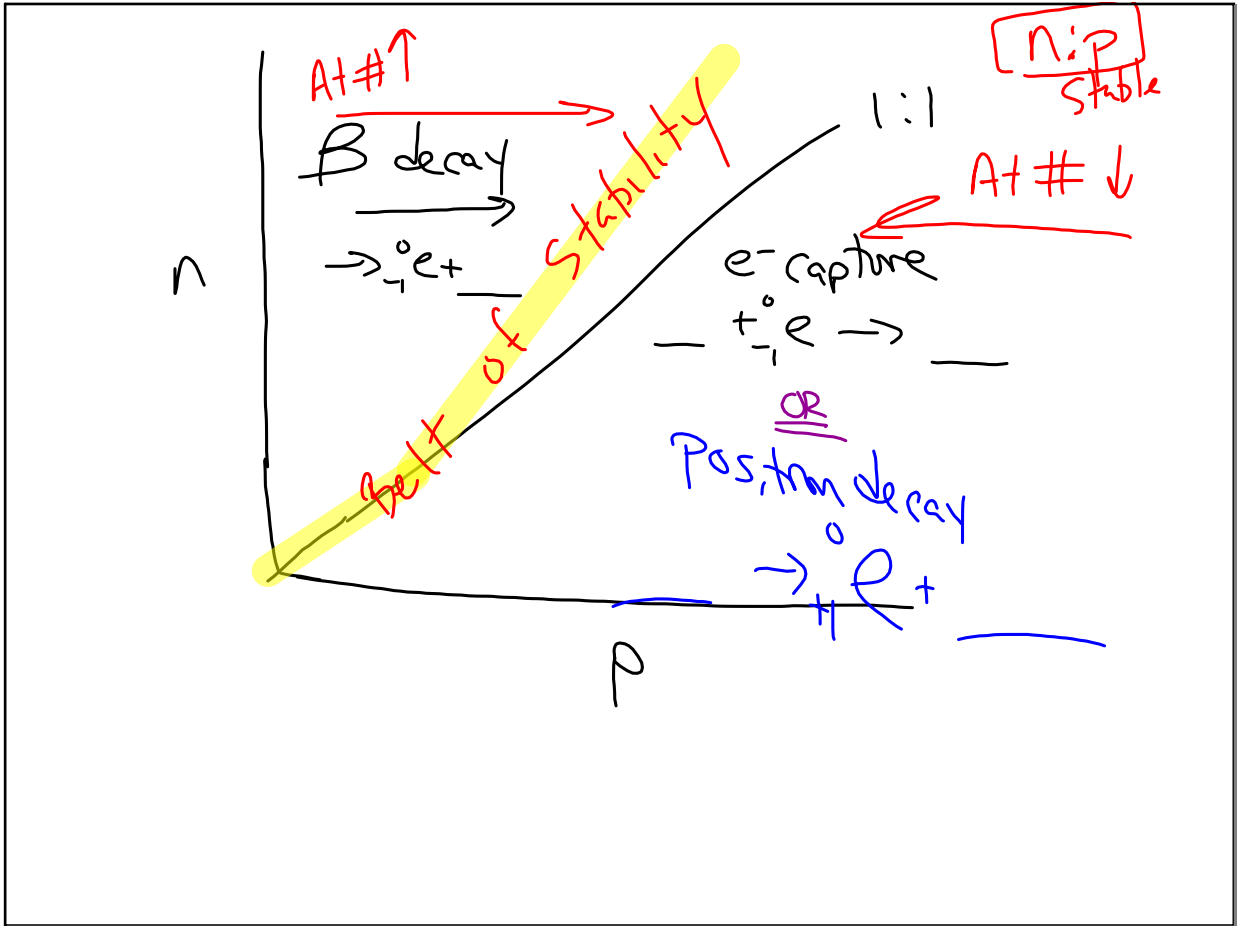
Apr 20-8:00 AM

proton	${}^1_1\text{H}$	hydrogen
Deuteron	${}^2_1\text{H}$	Deuterium
Triton	${}^3_1\text{H}$	Tritium

Apr 20-8:10 AM



Apr 20-8:23 AM



Apr 20-8:39 AM

Exceptions to belt of stability #'s

Items that ARE Stable

Even though they may not fall in the belt.

$\Rightarrow$  n:p ratio ... a bit off  $\rightarrow$  but still stable

MAGIC #'s  $Z \Rightarrow 2, 8, 20, 28, 50, 82$  (P)

$N \Rightarrow 2, 8, 20, 28, 50, 82, 126$  (N)

Apr 20-8:42 AM

$${}_{92}^{238}\text{U} \rightarrow {}_{90}^{234}\text{Th} + {}_2^4\text{He} \quad P^{900}$$

Natural decay

$${}_{92}^{238}\text{U} \xrightarrow{\alpha} {}_{90}^{234}\text{Th}$$

$${}_{90}^{234}\text{Th} \rightarrow {}_{91}^{234}\text{Pa} + {}_{-1}^0\text{e}$$

$${}_{91}^{234}\text{Pa} \rightarrow {}_{92}^{234}\text{U} + {}_{-1}^0\text{e}$$

$${}_{90}^{234}\text{Th} \xrightarrow{\beta} {}_{91}^{234}\text{Pa}$$

$${}_{91}^{234}\text{Pa} \xrightarrow{\beta} {}_{92}^{234}\text{U}$$

Apr 20-8:59 AM

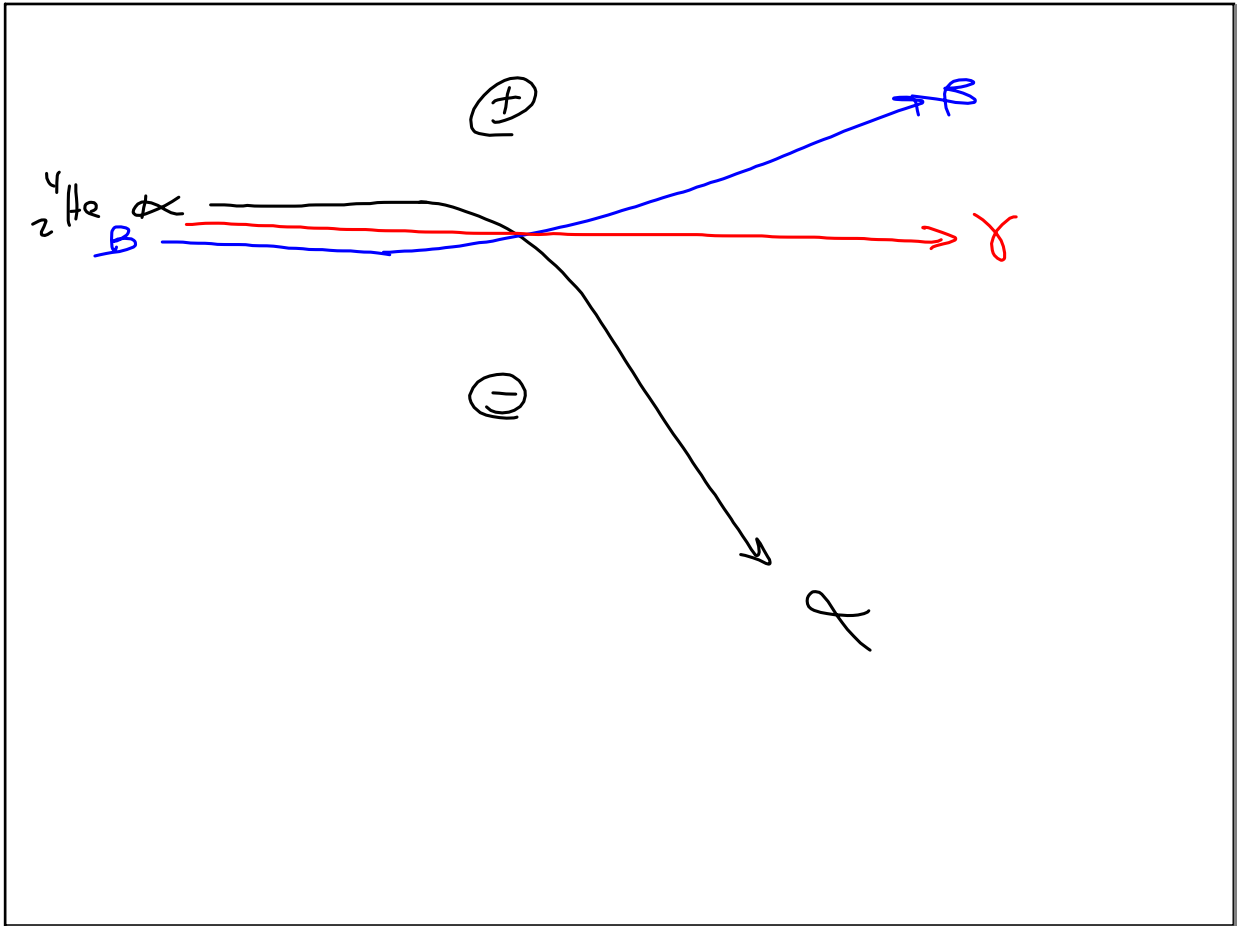
## Artificial Decay

Blast the target with a particle to force decay

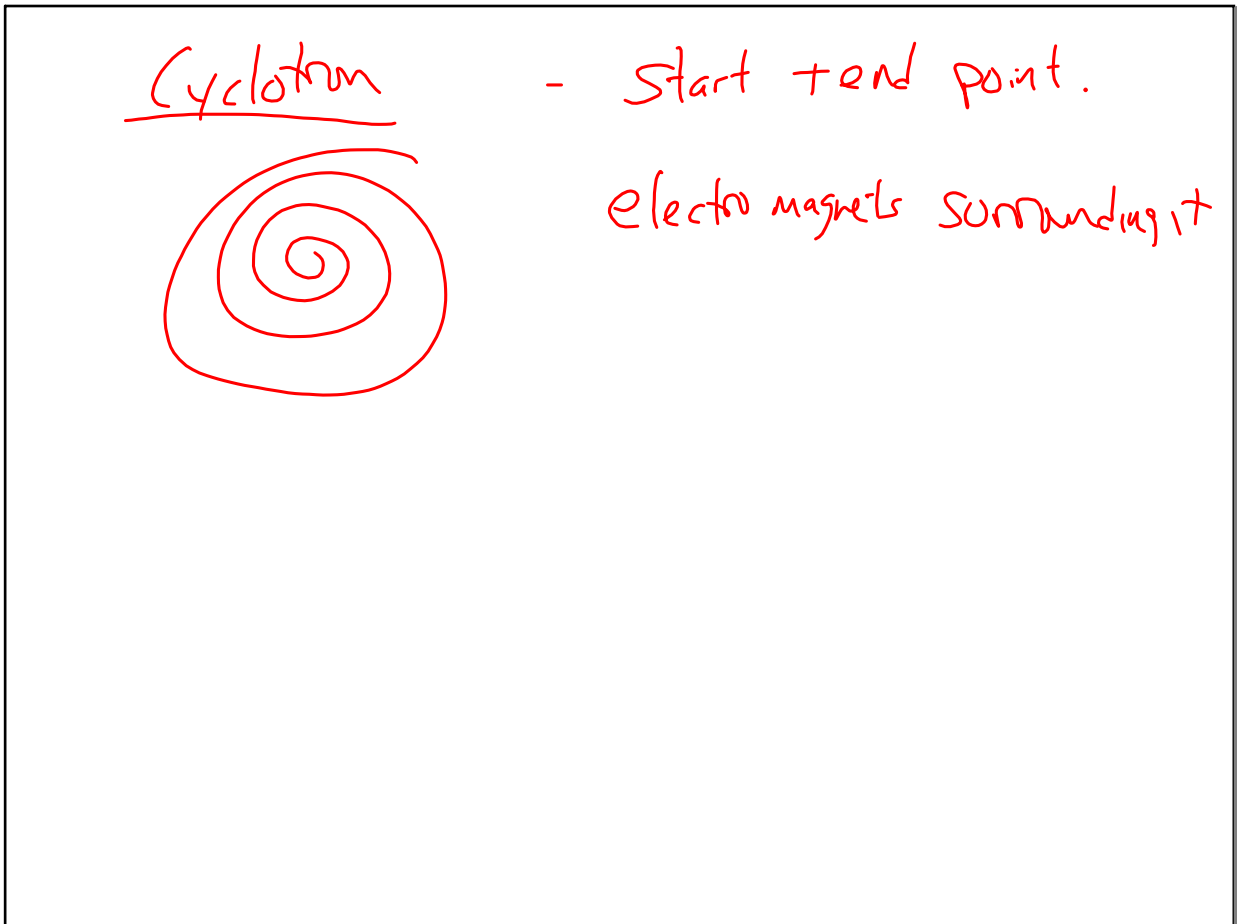
① Linear Accelerator

The diagram illustrates a linear accelerator. Two parallel horizontal lines represent the accelerating electrodes, with alternating positive (+) and negative (-) charges. A dashed line with a central dot represents the particle beam. The beam is directed towards a stick figure labeled 'Target'. A red arrow labeled 'Aim' points to the target. The word 'Electromagnets' is written below the electrodes.

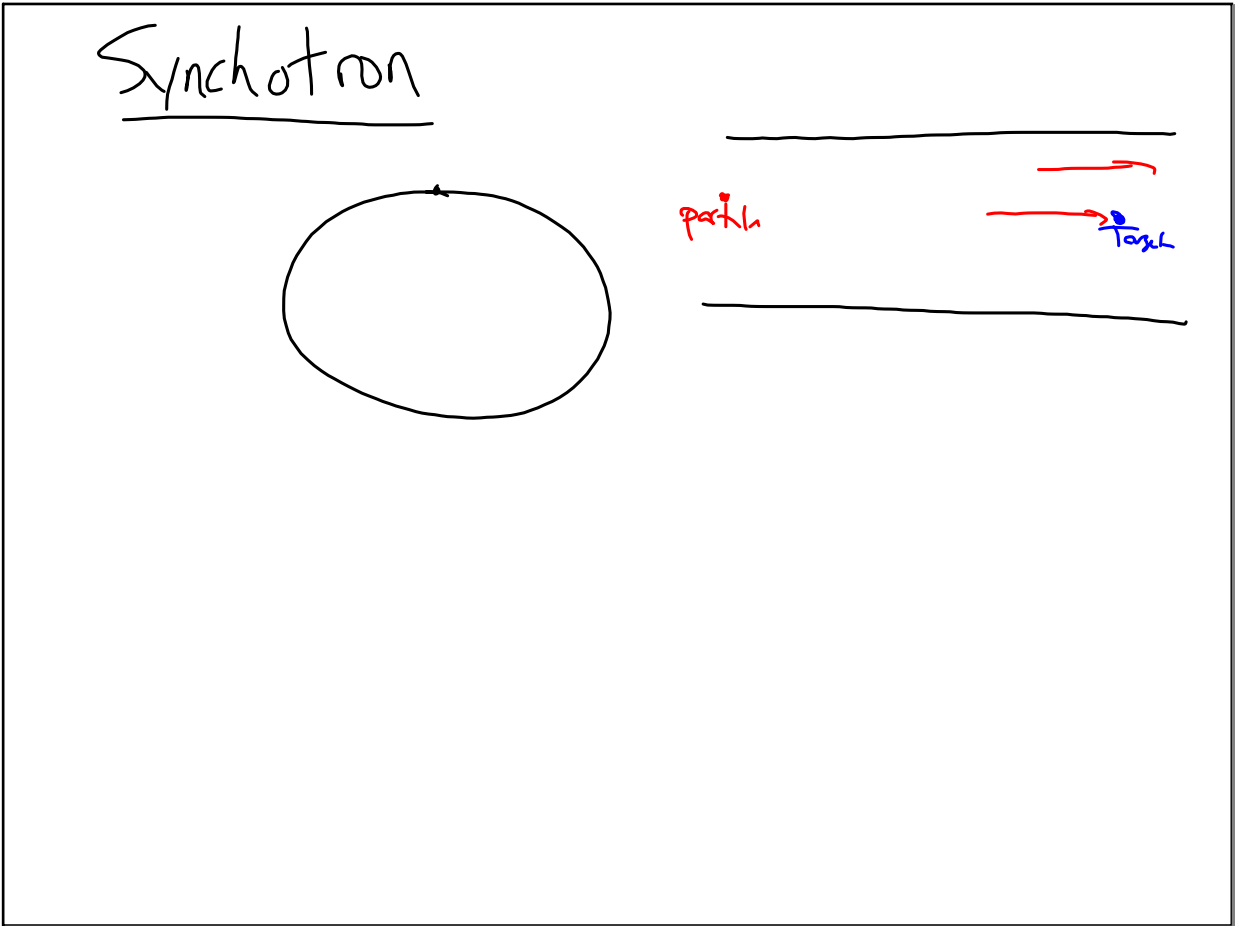
Apr 20-9:02 AM



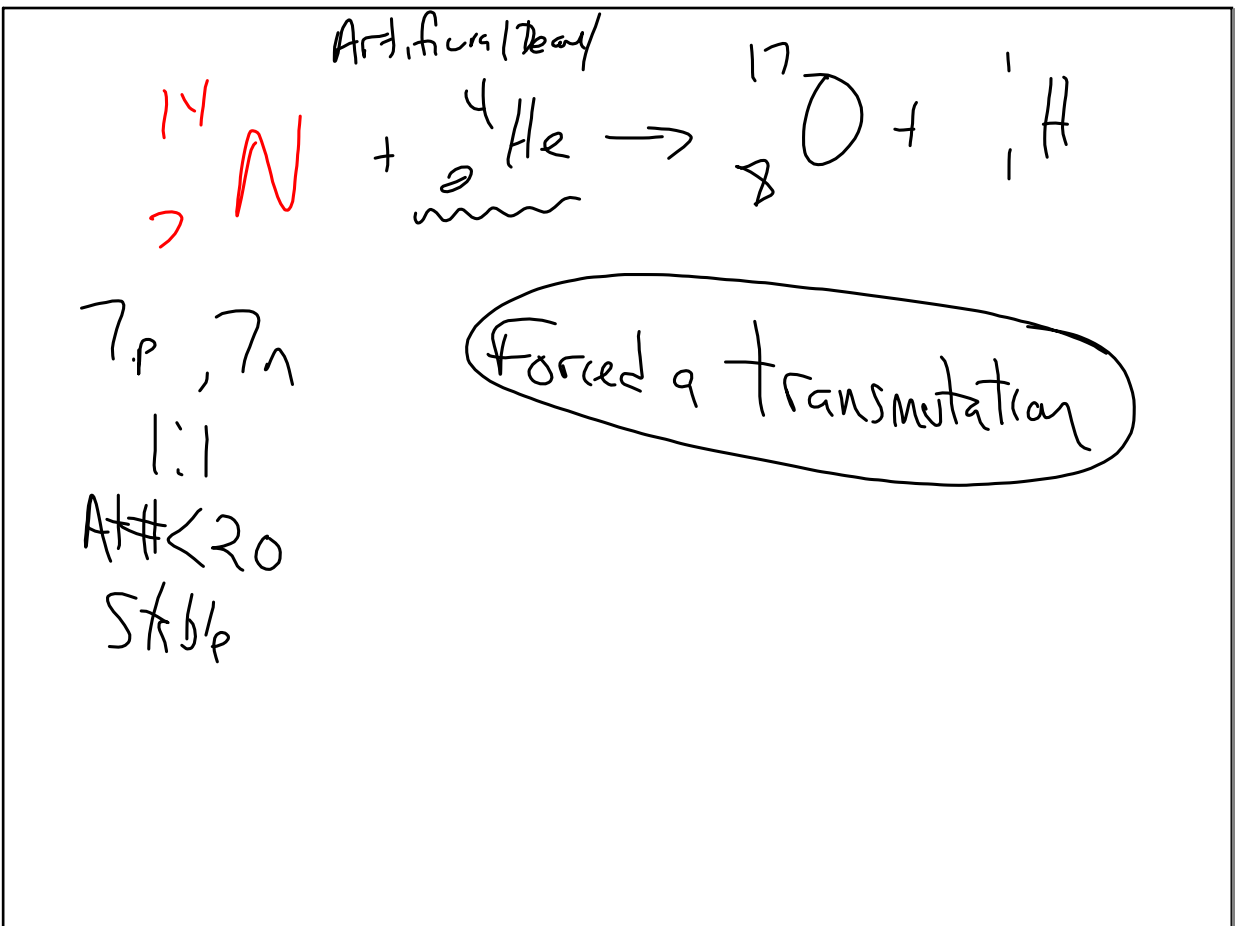
Apr 20-9:08 AM



Apr 20-9:10 AM



Apr 20-9:11 AM



Apr 20-9:13 AM

21 / 12, 18, 28, 30

Apr 20-9:17 AM