Disclaimer - For assistance accessing this document or additional information, please contact radiation.questions@epa.gov.

Vocabulary Materials

Radiation Vocabulary from RadTown, the Environmental Protection Agency's Radiation Education Website

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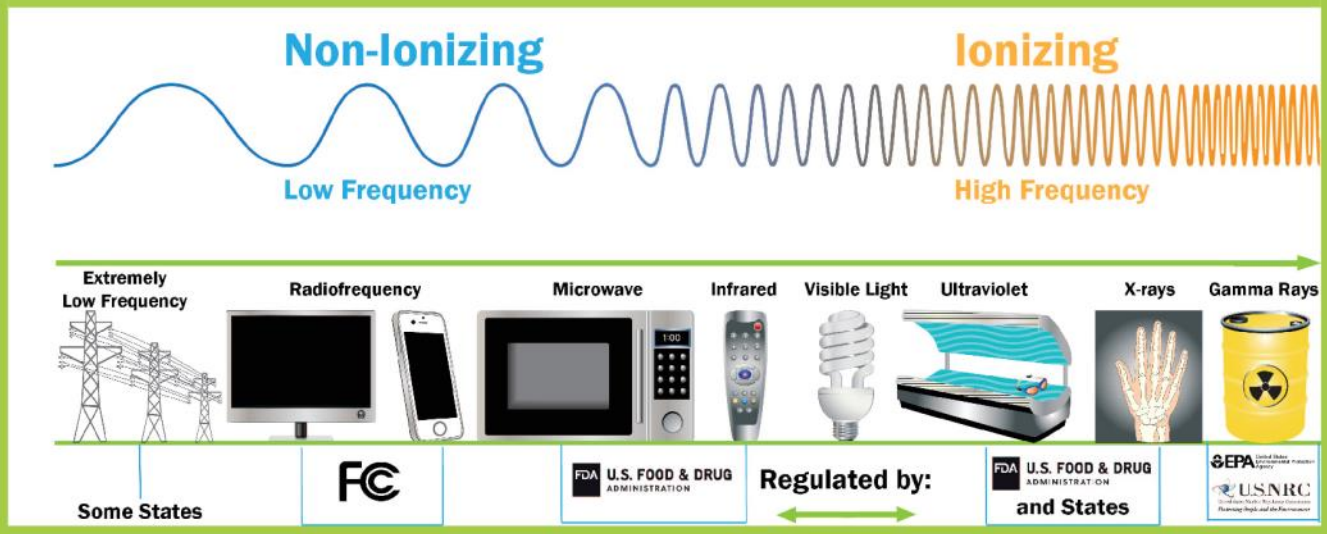
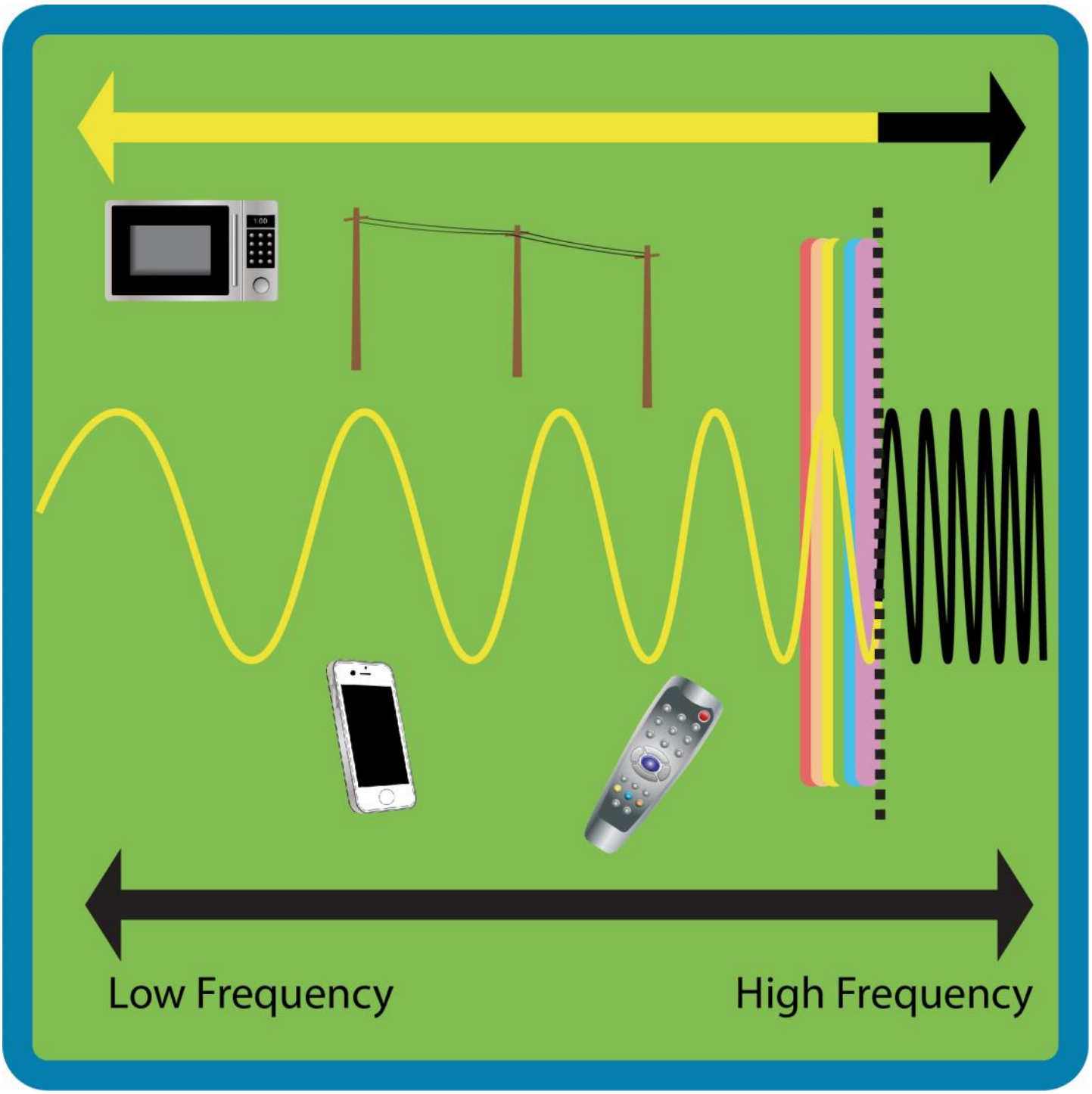
Electromagnetic Spectrum

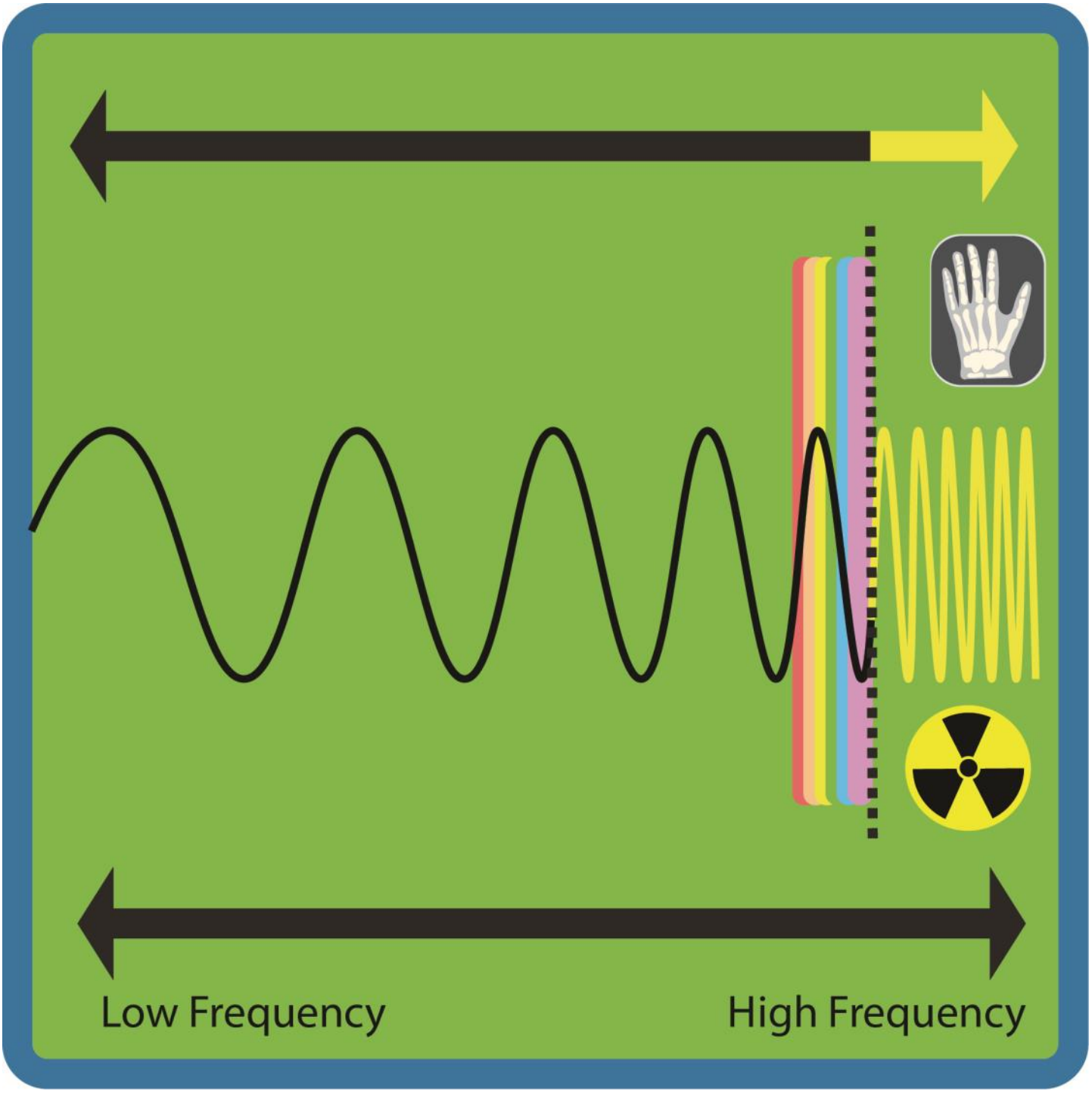
Radiation


Non-Ionizing
Ionizing
Low Frequency
High Frequency
Extremely Low Frequency
Radiofrequency
Microwave
Infrared
Visible Light
Ultraviolet
X-rays
Gamma Rays
Some States
FC
FDA U.S. FOOD & DRUG ADMINISTRATION
Regulated by:
FDA U.S. FOOD & DRUG ADMINISTRATION
and States
EPA
U.S.NRC

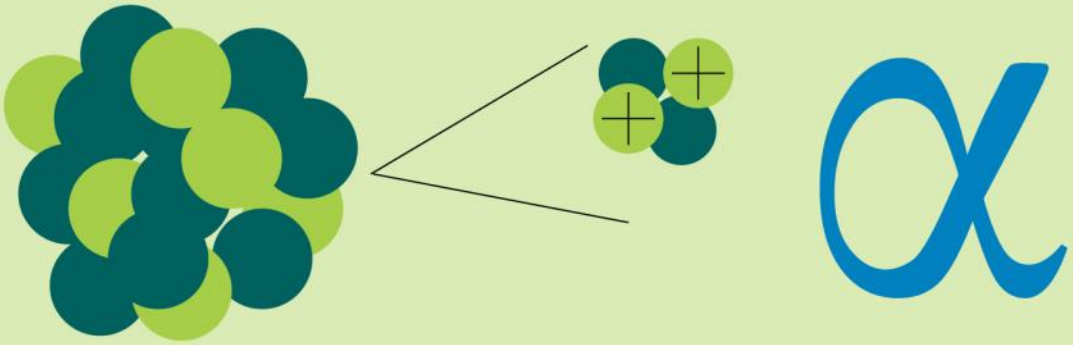
Non-Ionizing Radiation


Low Frequency
High Frequency

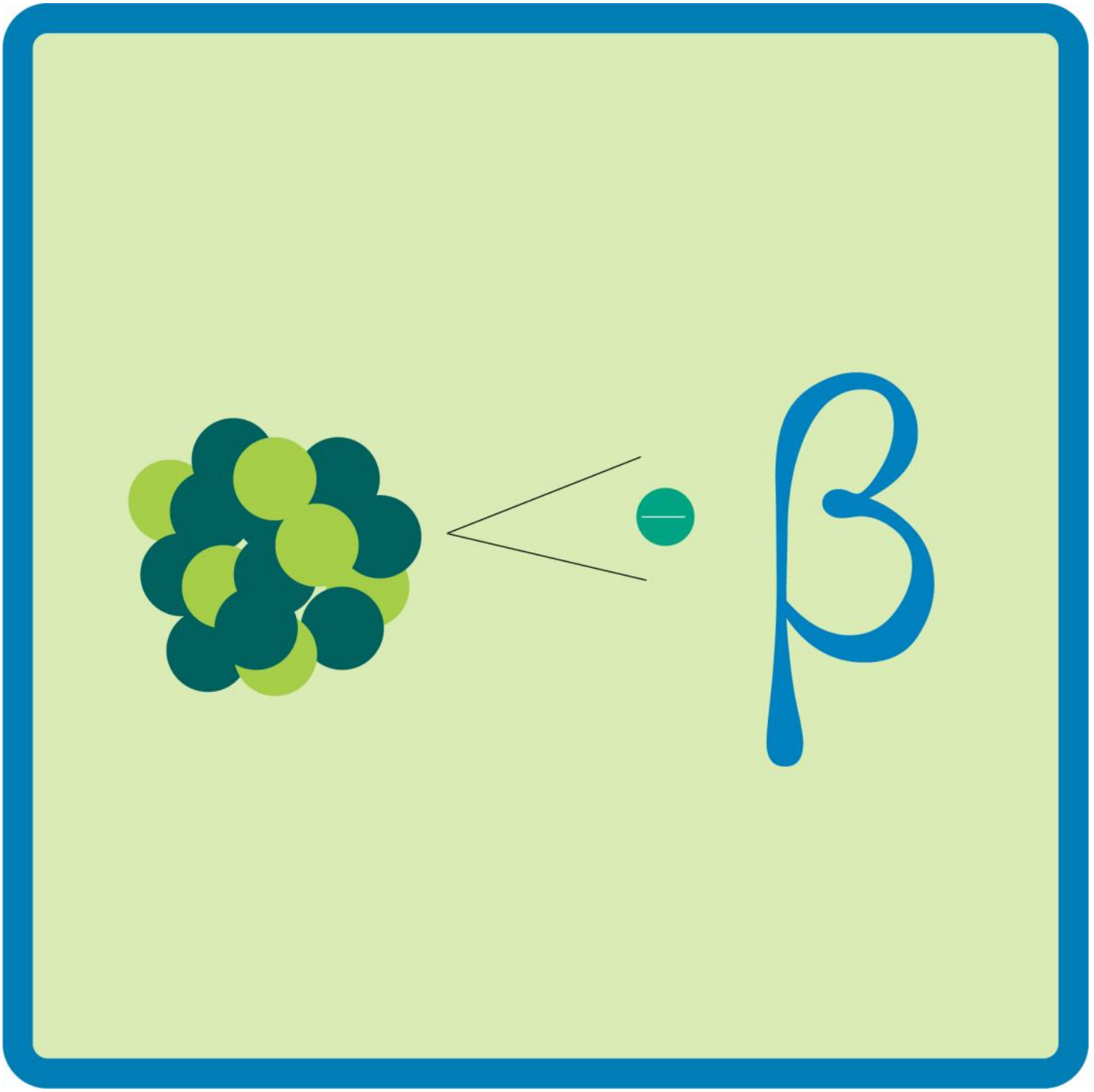
Ionizing Radiation


Low Frequency
High Frequency

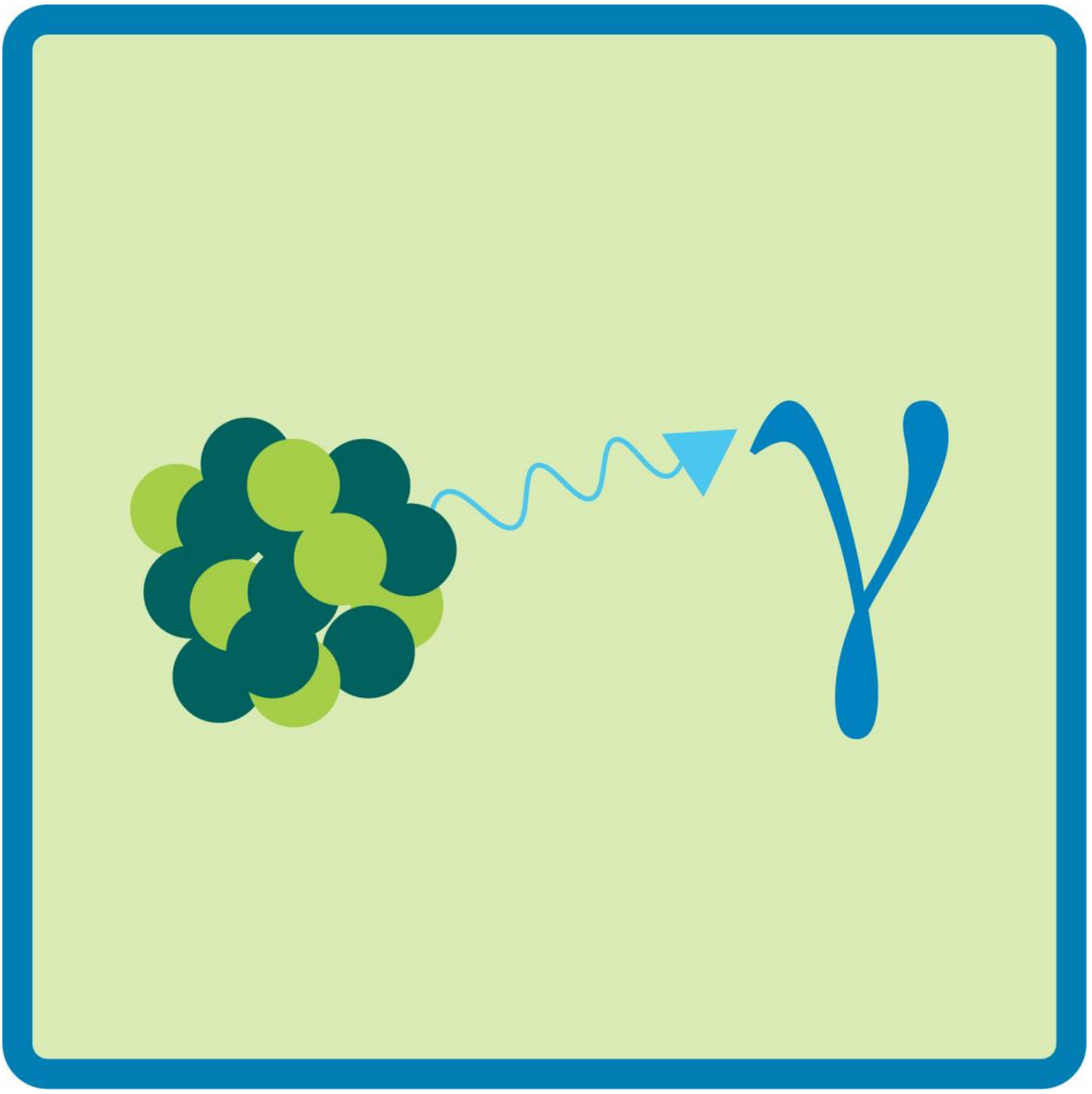
Alpha Particle



Beta Particle



Gamma Rays



X-rays

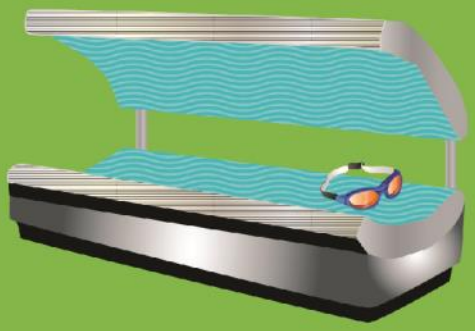
DNA (Deoxyribonucleic Acid)

Natural Radiation

Cosmic Radiation

Terrestrial Radiation

Man-Made Radiation




1:00

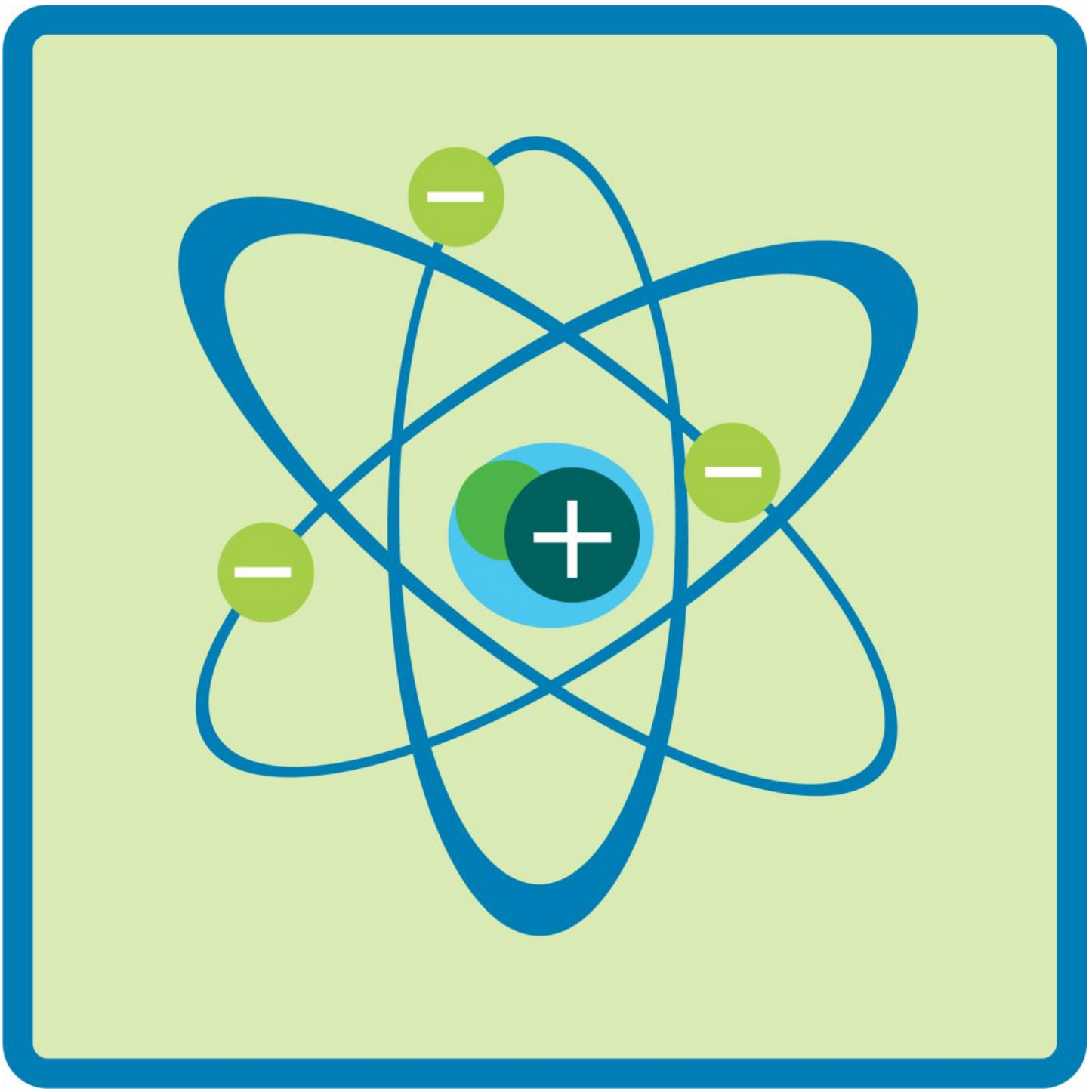
Nuclear Energy

Atom

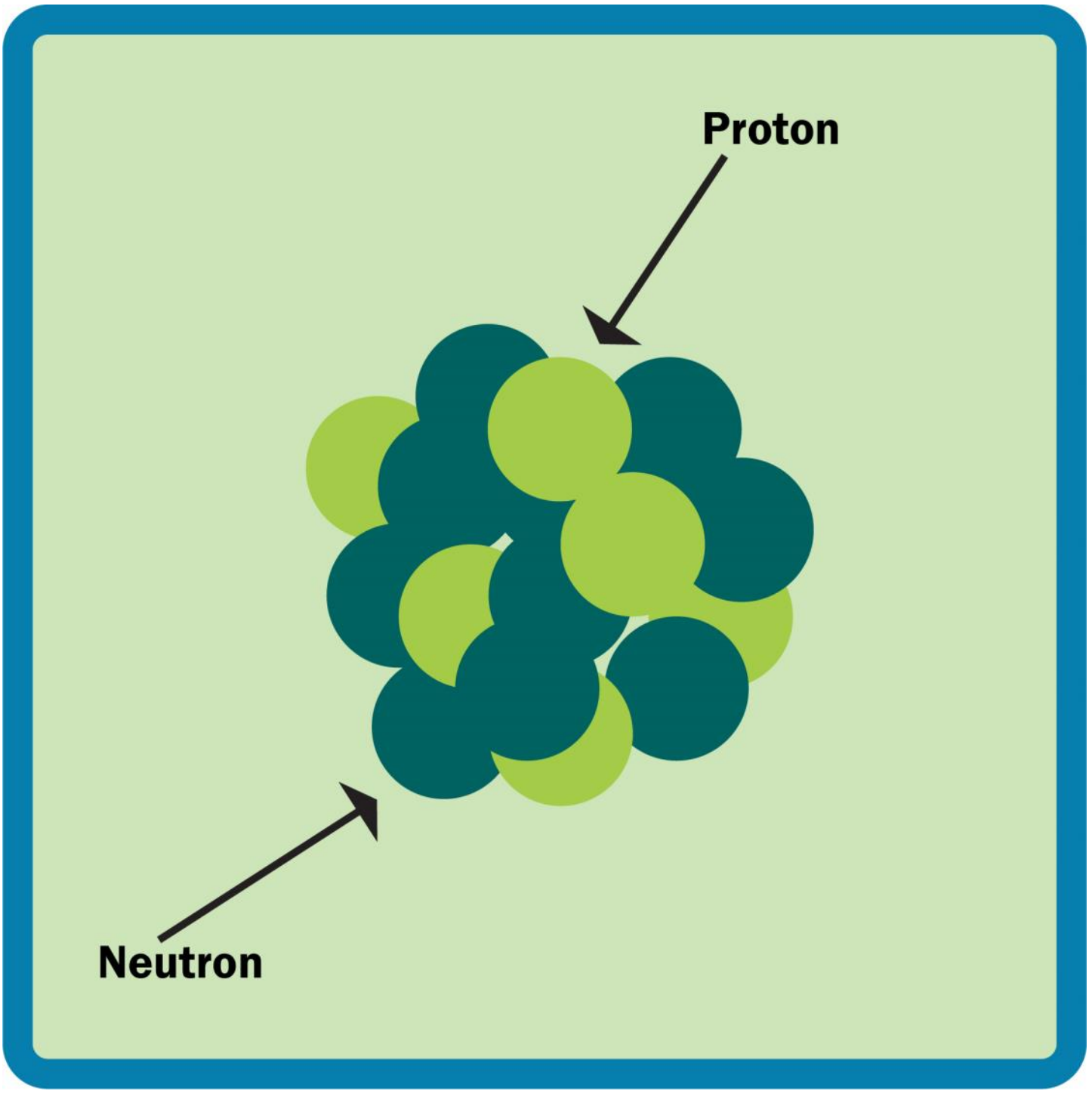
Neutron

Proton

Electron

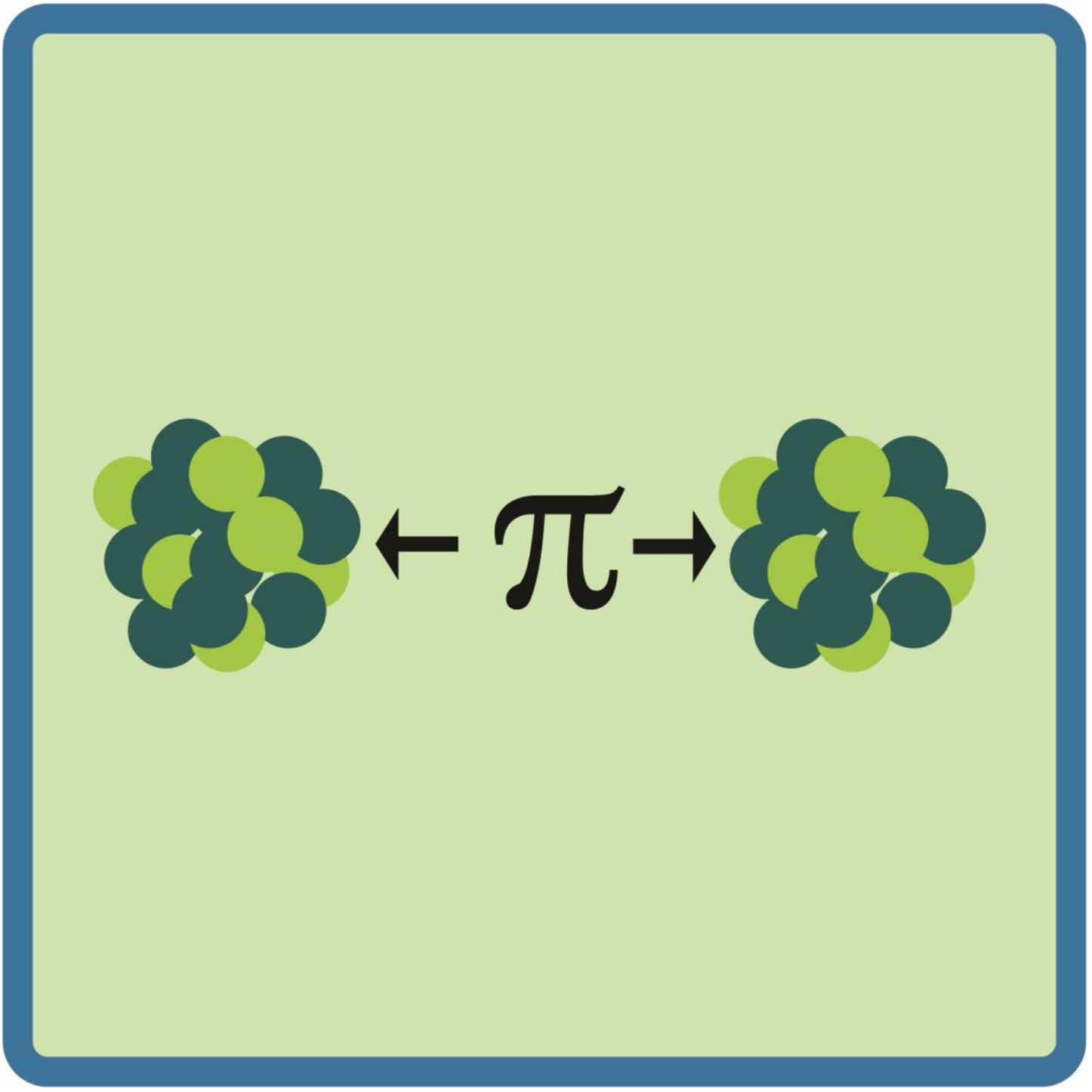


Nucleus


Proton
Neutron

Meson

Strong Nuclear Forces

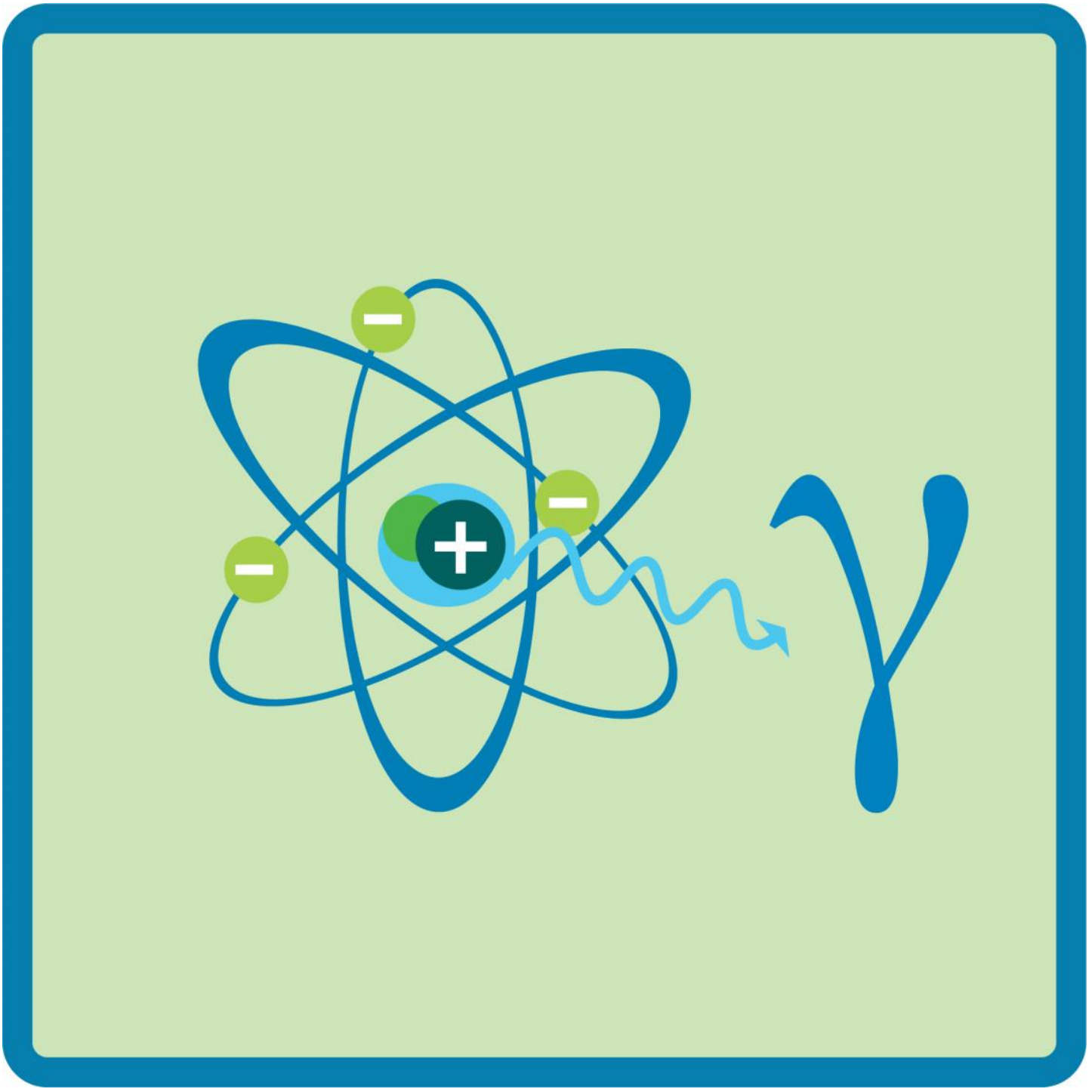

π

Radioactive Atom

Radioactive Decay

Radioactivity

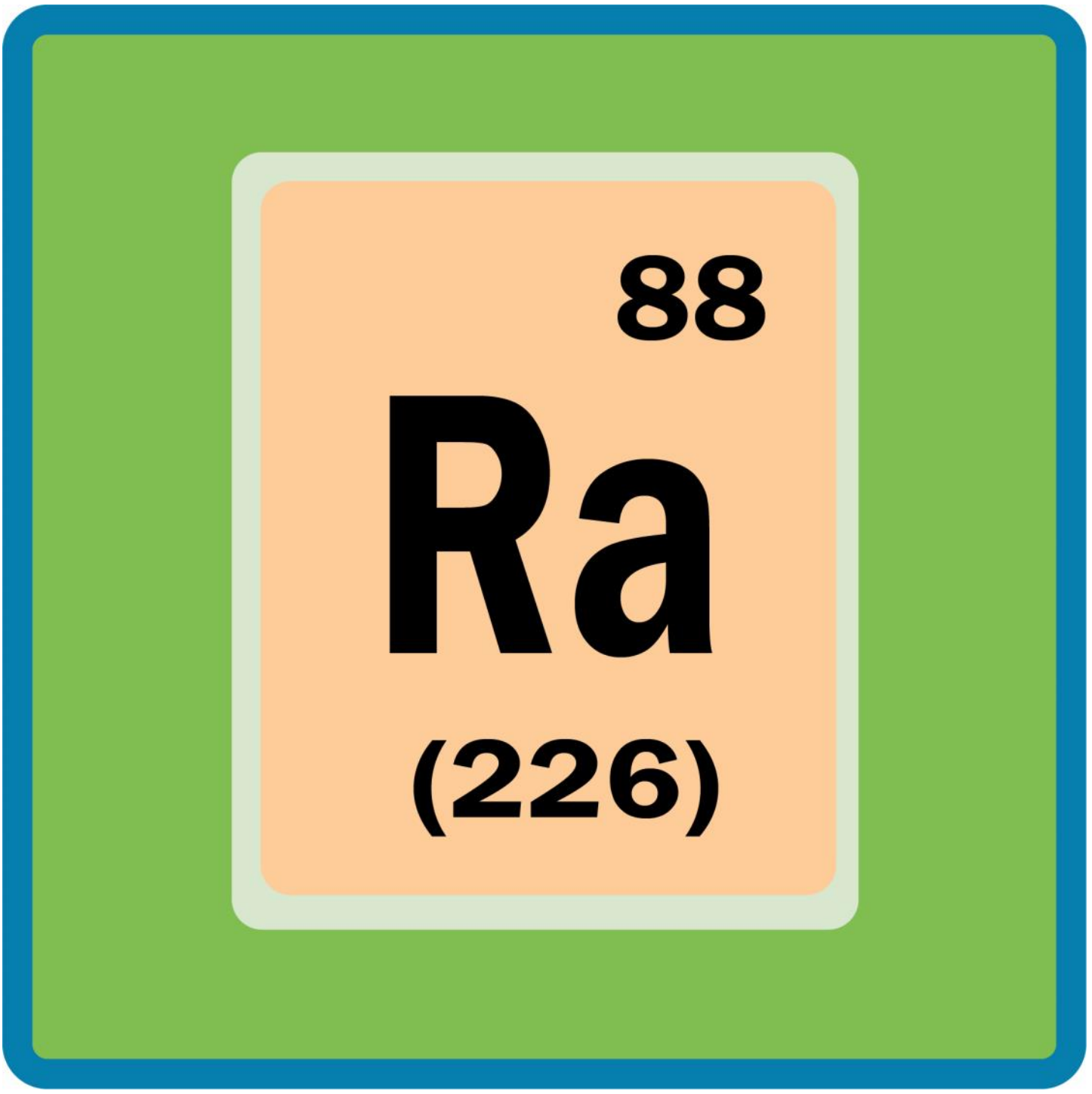
Unstable Nucleus



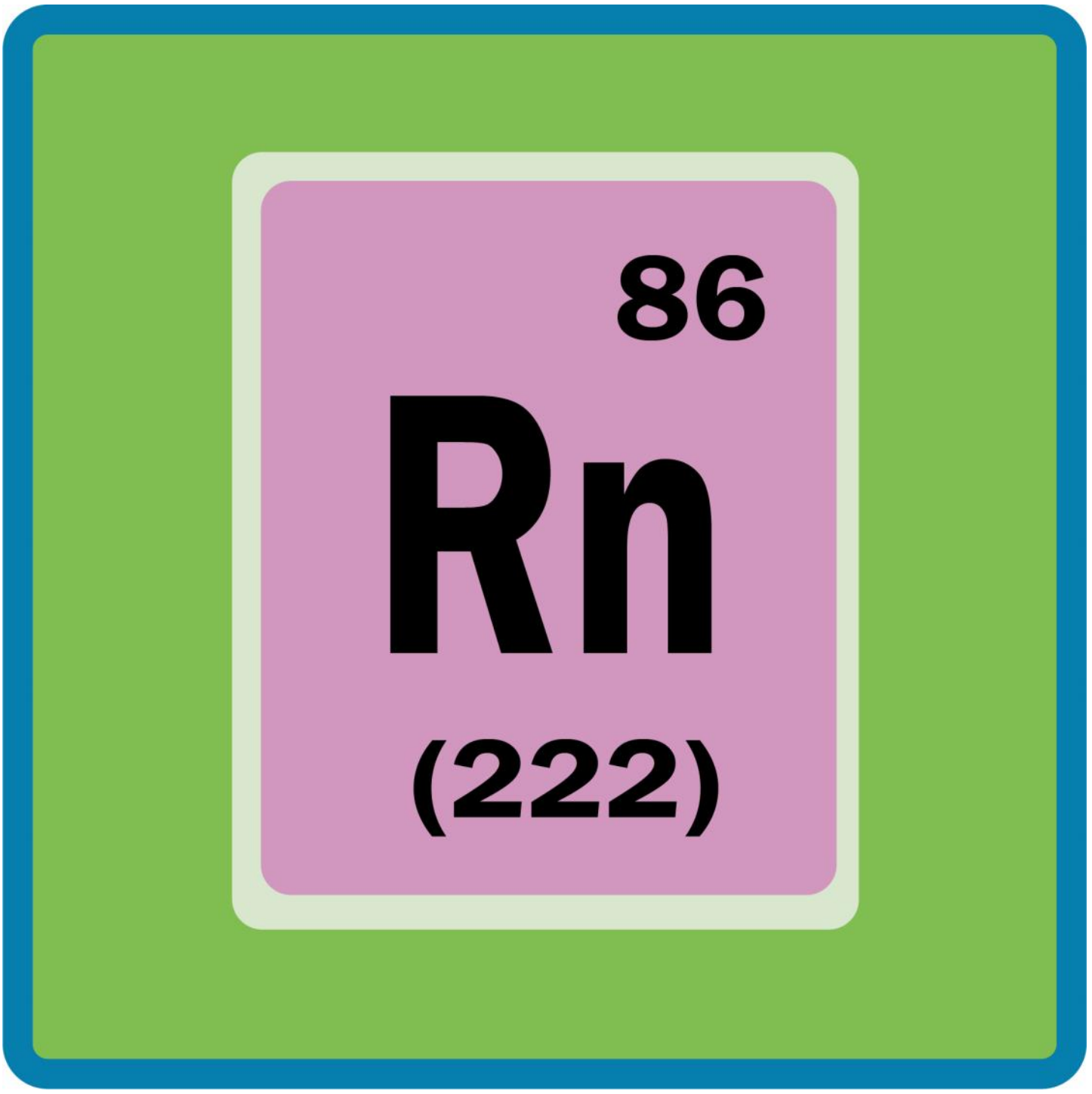
Americium


95
Am
(243)

Radium


88
Ra
(226)

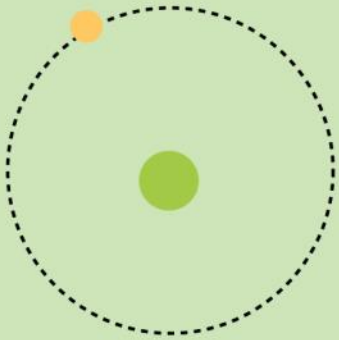
Radon


86
Rn
(222)

Tritium

Hydrogen-1 (1P+0N)

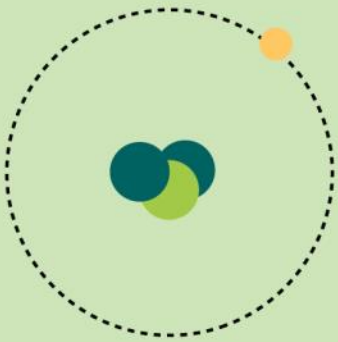
Atomic Weight = 1



1 protons
0 neutrons

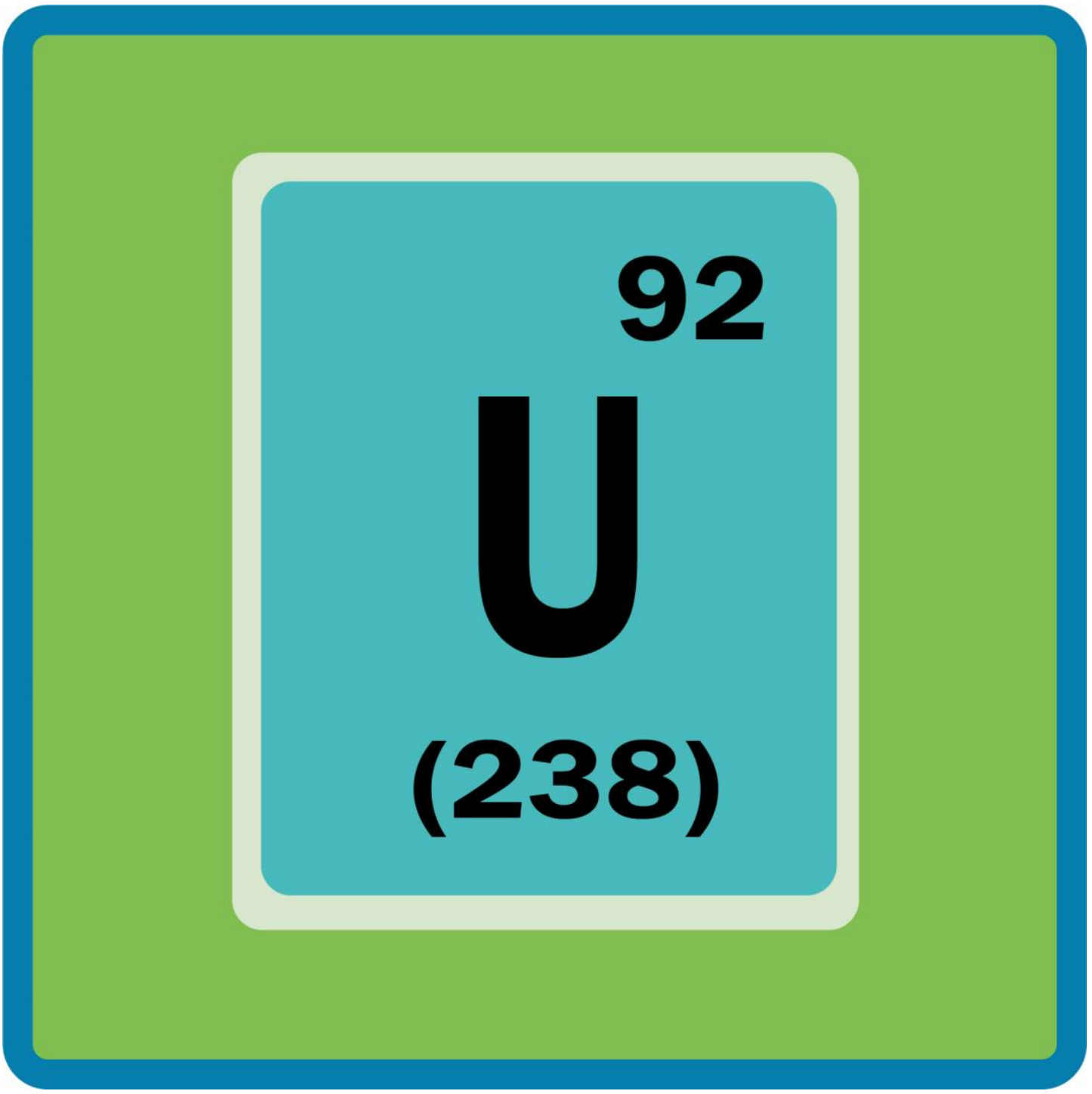
Hydrogen-3 (1P+2N)

Atomic Weight = 3



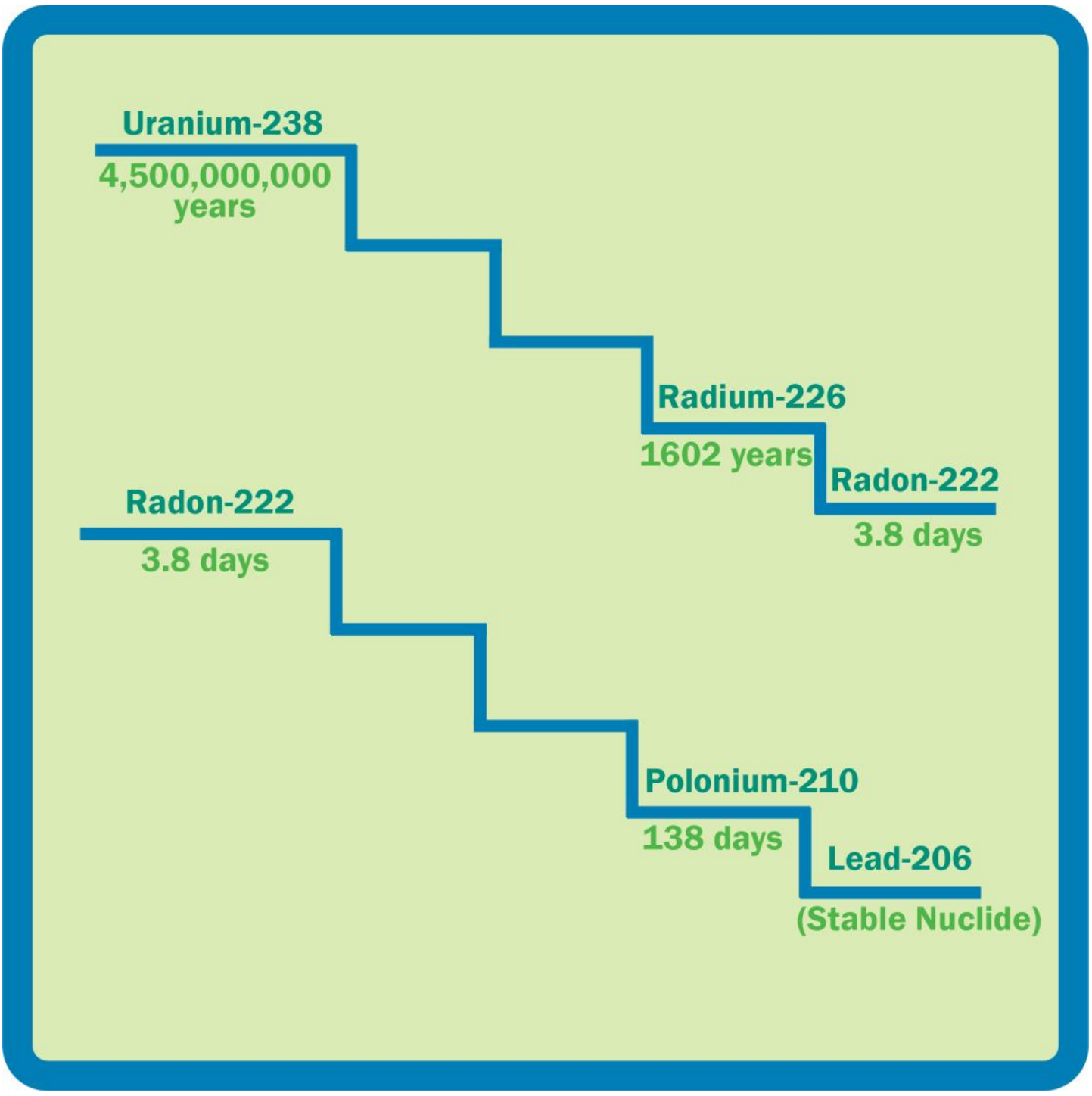
1 protons
2 neutrons

Uranium


92
U
(238)

Decay Chain

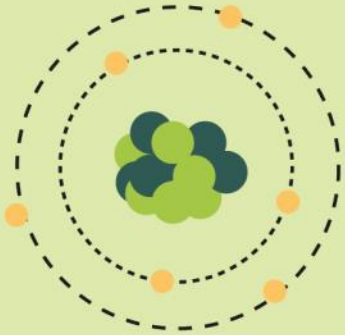
Half-Life


Uranium-238
4,500,000,000 years
Radium-226
1602 years
Radon-222
3.8 days
Radon-222
3.8 days
Polonium-210
138 days
Lead-206
(Stable Nuclide)

Ion

Neutral Atom

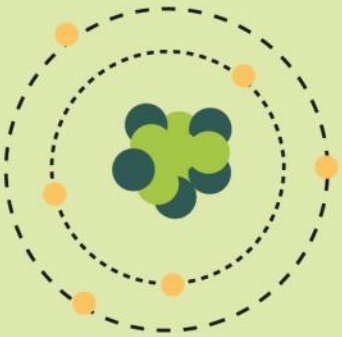
protons (+)
=
electrons (-)



6 protons
6 electrons

Negatively Charged Atom

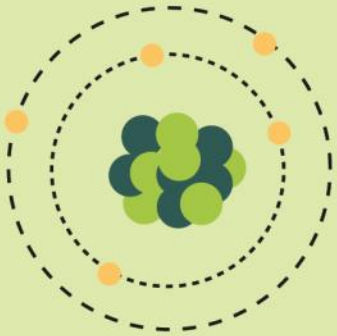
protons (+)
<
electrons (-)



5 protons
6 electrons

Positively Charged Atom

protons (+)
>
electrons (-)

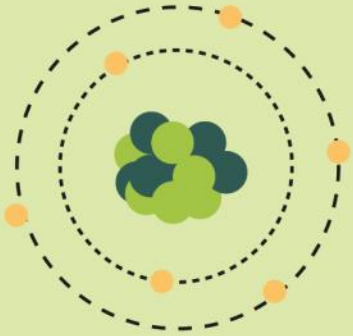


6 protons
5 electrons

Isotope

Carbon-12 (6P+6N)

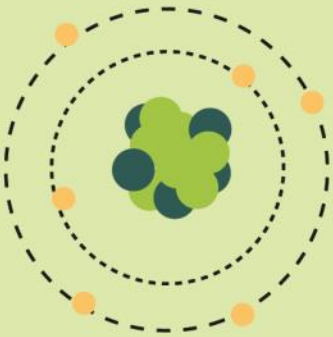
Atomic Weight = 12



6 protons
6 neutrons

Carbon-13 (6P+7N)

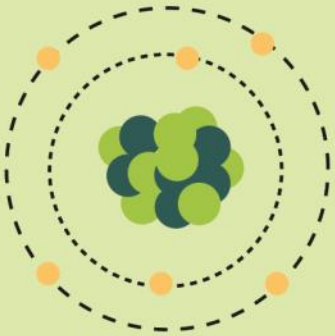
Atomic Weight = 13



6 protons
7 neutrons

Carbon-14 (6P+8N)

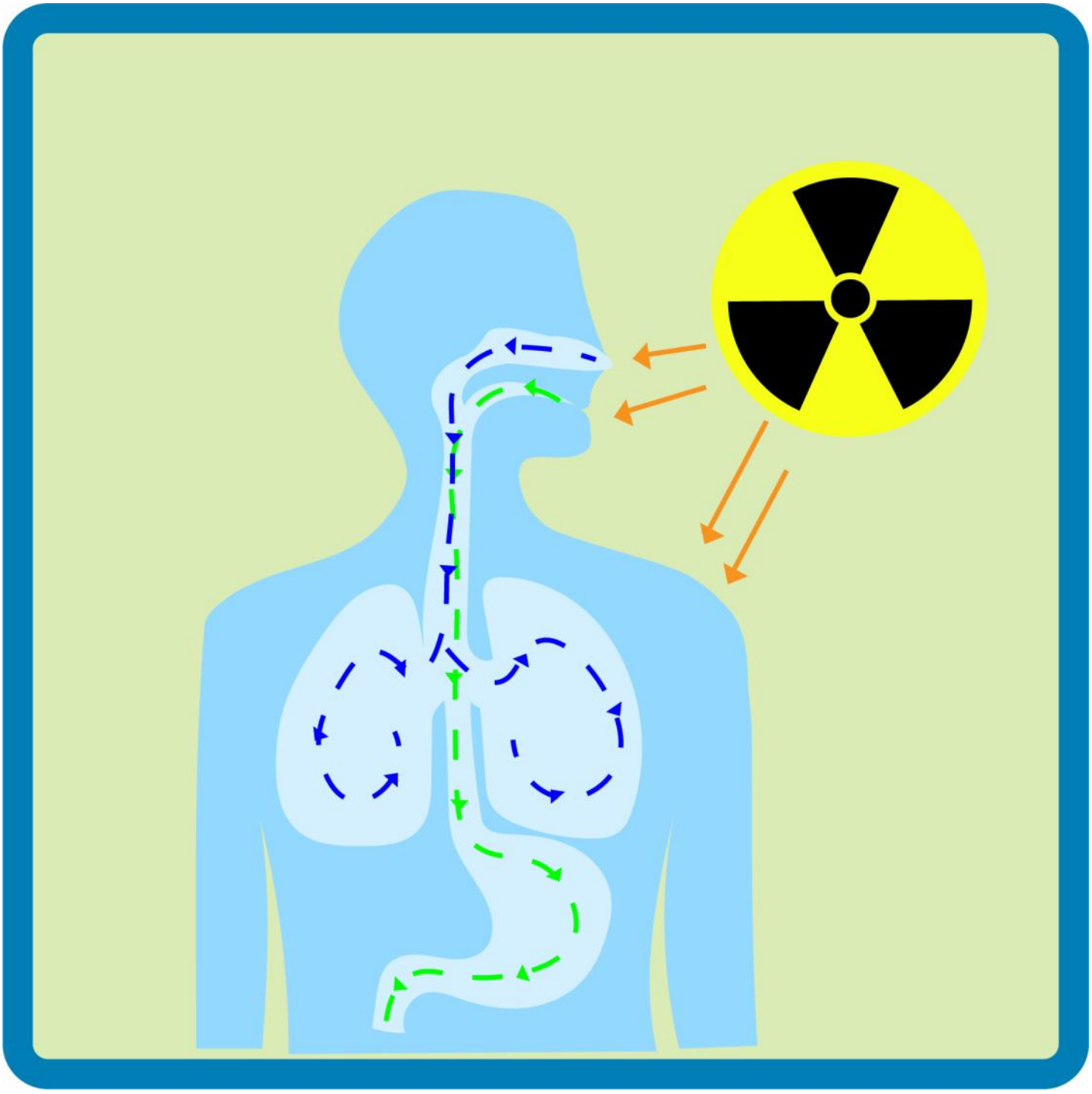
Atomic Weight = 14



6 protons
8 neutrons

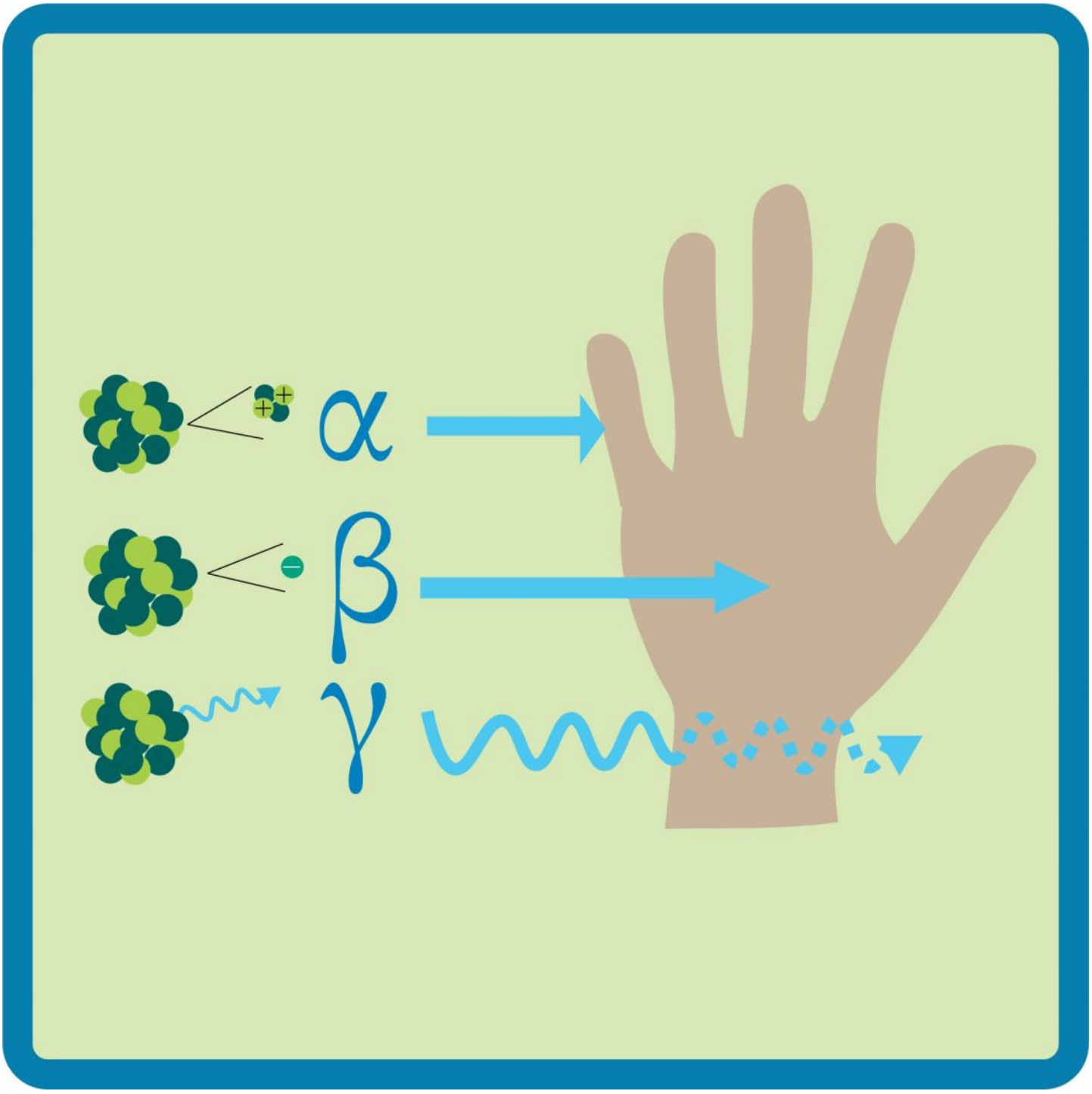
Radioactive Materials

Exposure Pathways

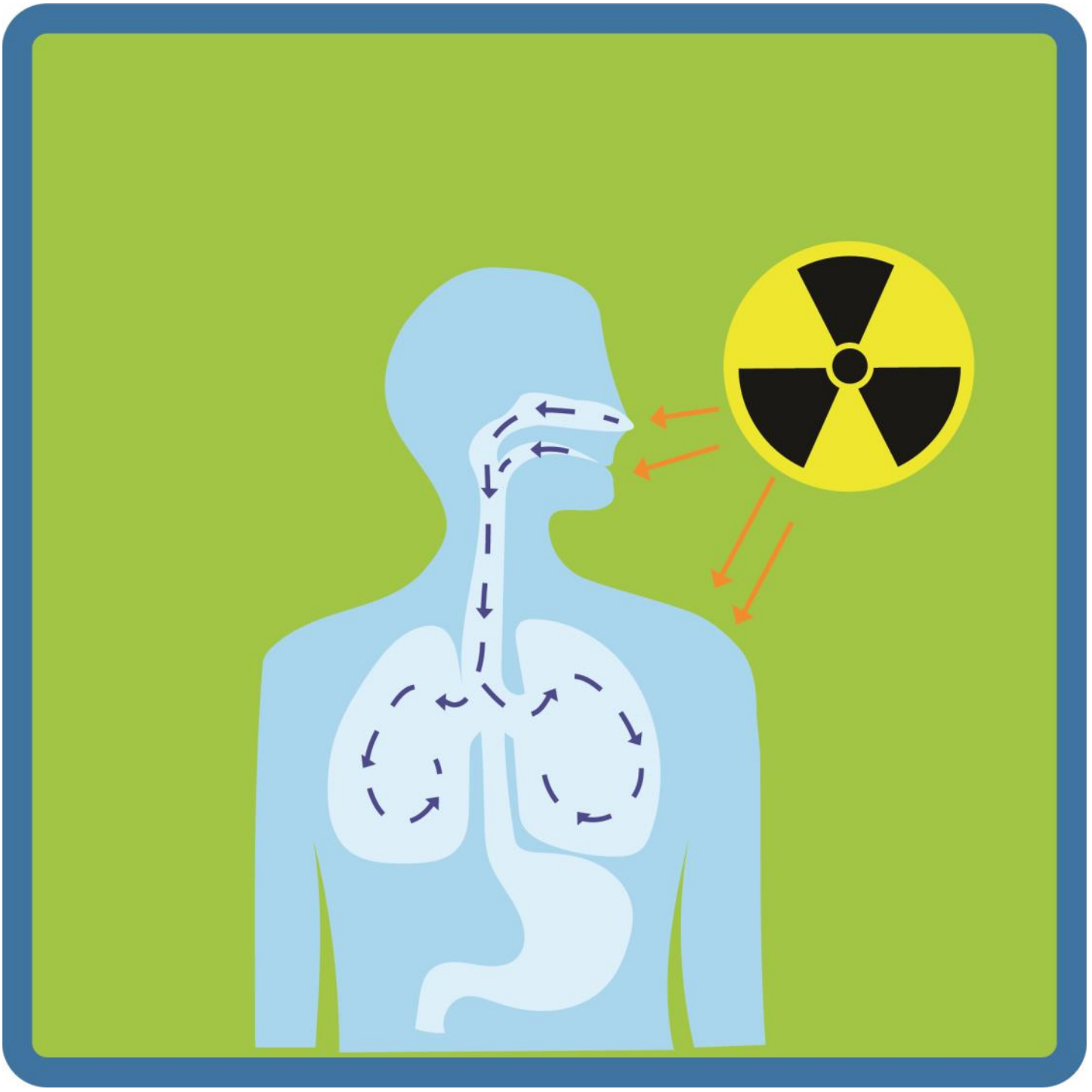


Radiation Exposure

Direct Exposure

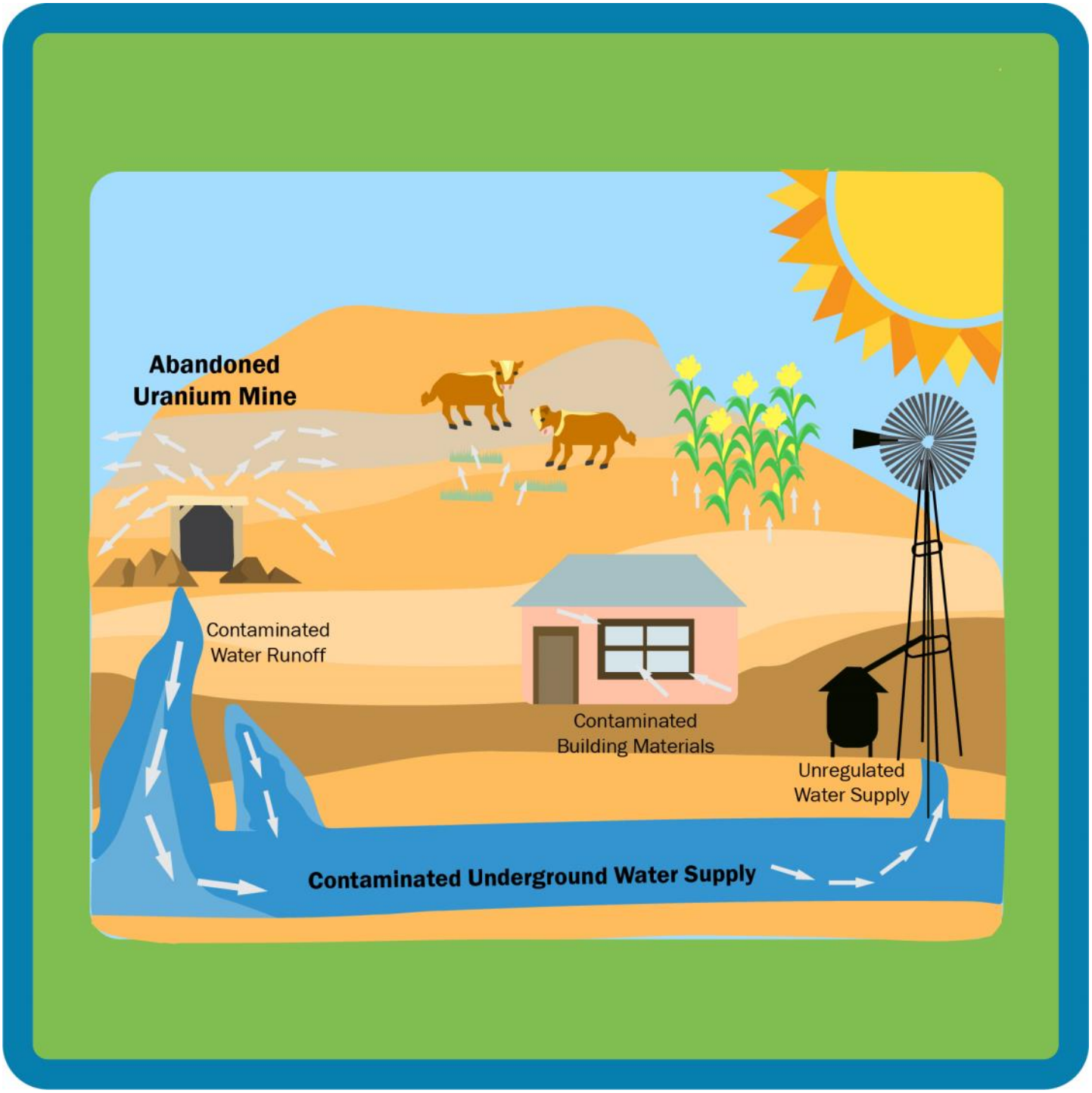

α
β
γ

Inhalation



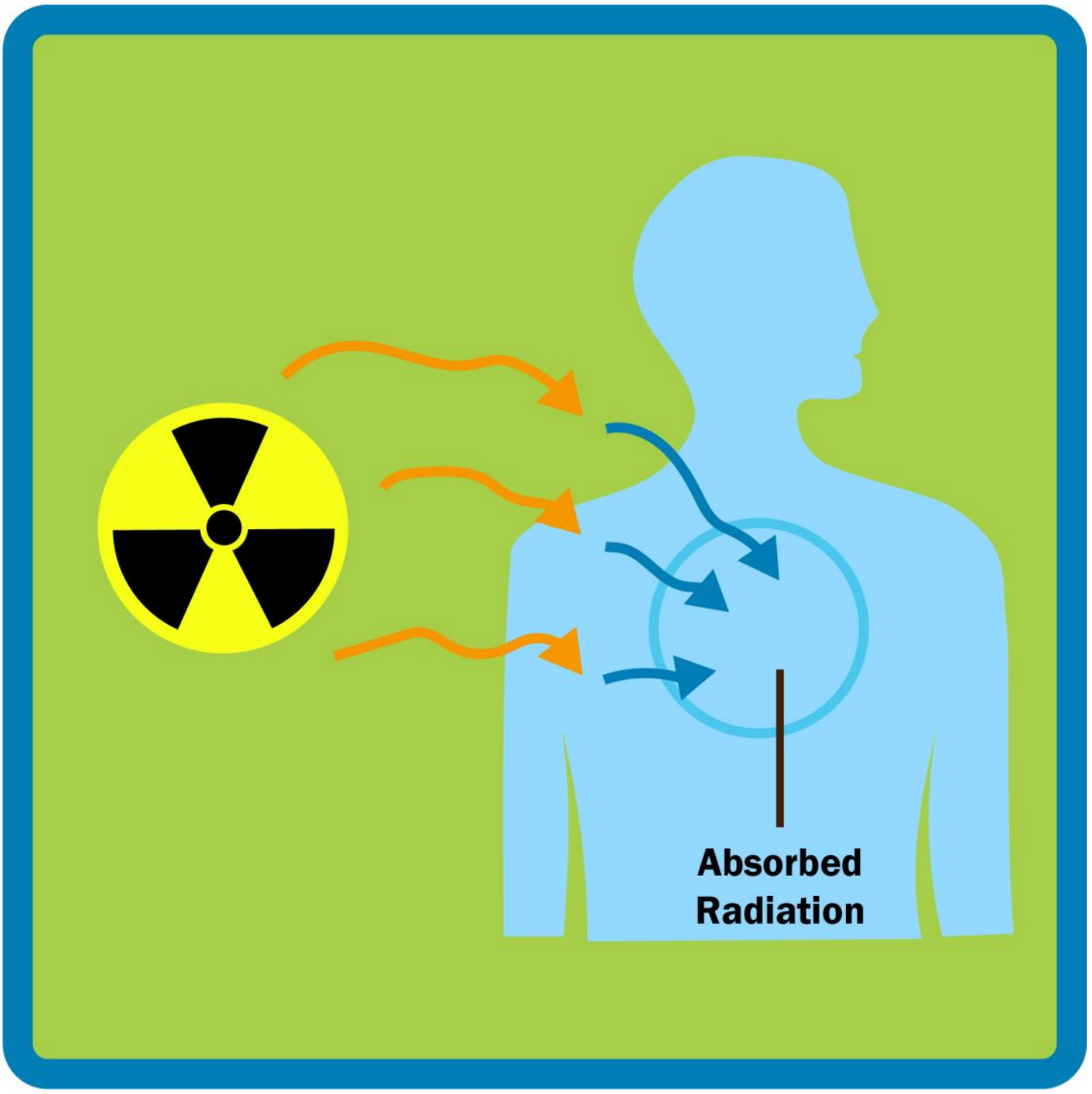
Ingestion

Radioactive Contamination

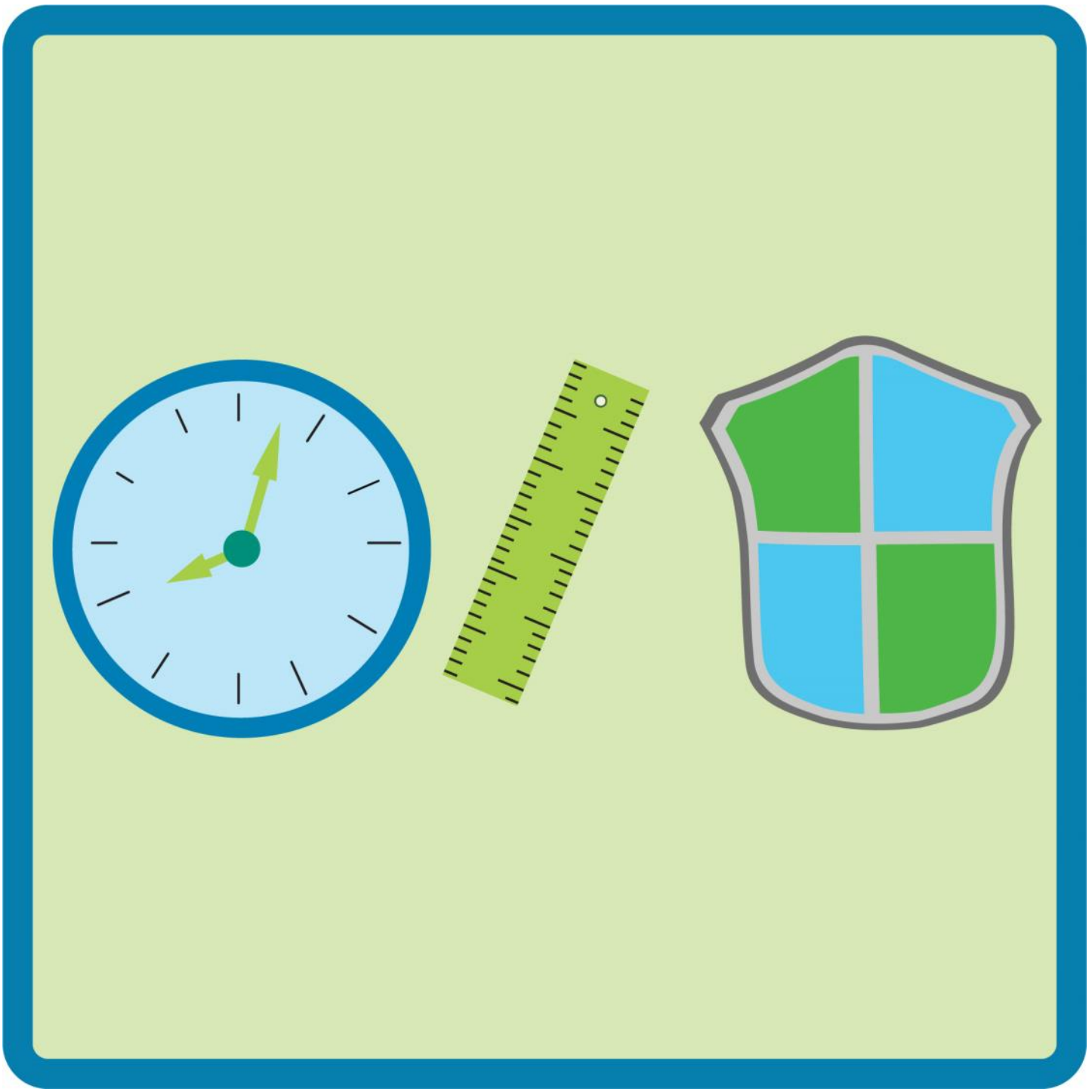

Abandoned
Uranium Mine
Contaminated
Water Runoff
Contaminated
Building Materials
Unregulated
Water Supply
Contaminated Underground Water Supply

Dose

Rem (Roentgen Equivalent Man)


Absorbed
Radiation

Radiation Protection



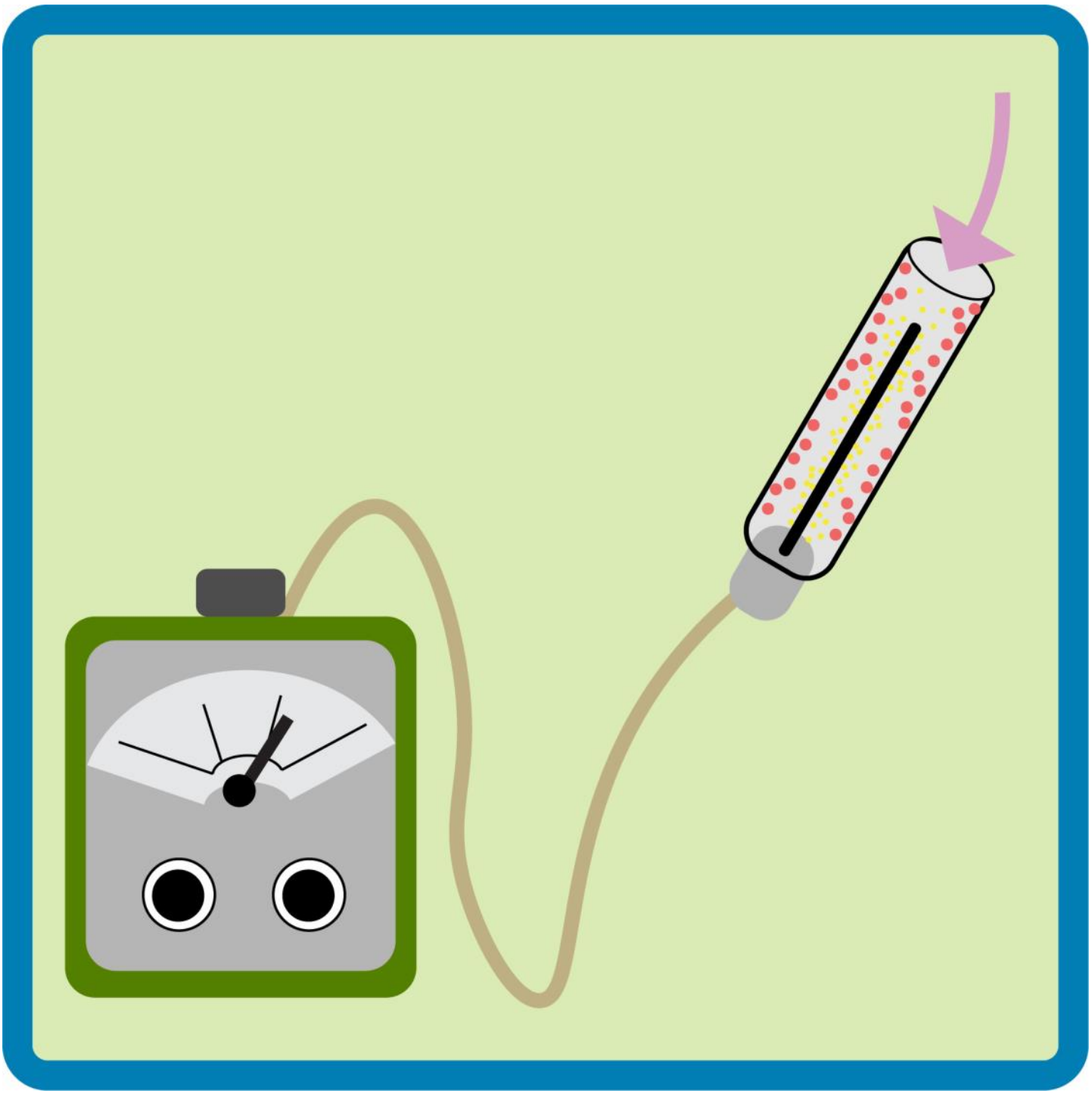
Dosimeter


AA00032634B
Stevenson , K 290501
075-0123 Return Date: 04/2007
Stevenson , K 290501
075-0123 Return Date: 04/2007

Dosimetry

Image Provided by U.S. Department of Energy (DoE), Oak Ridge National Laboratory

Geiger Counter



Health Physics

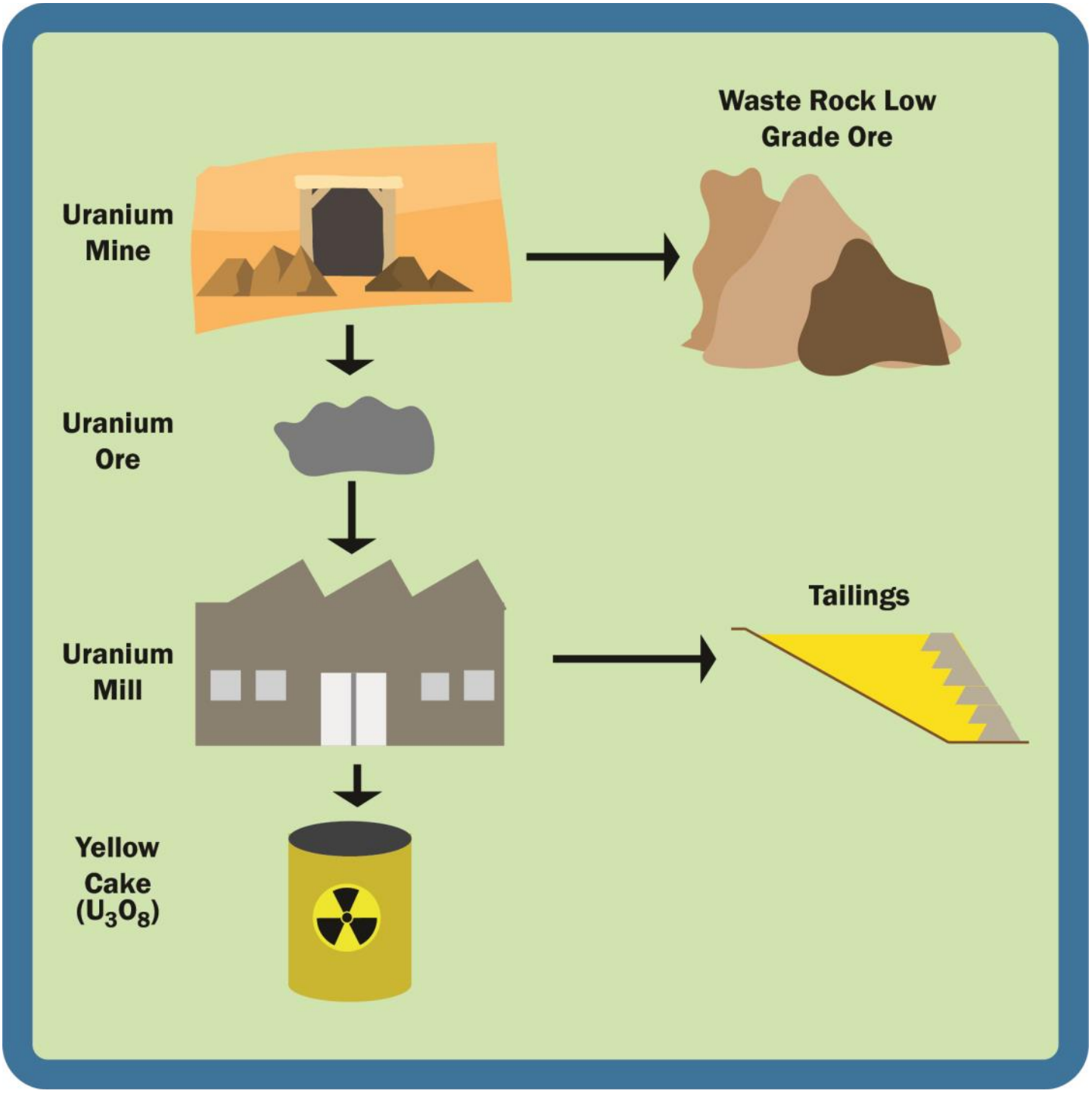
Monitoring

Open-pit Uranium Mining

Underground Uranium Mining

Uranium Milling

Uranium Mine Tailings


Waste Rock Low Grade Ore
Uranium Mine
Uranium Ore
Uranium Mill
Tailings
Yellow Cake (U_3O_8)

Heap Leaching

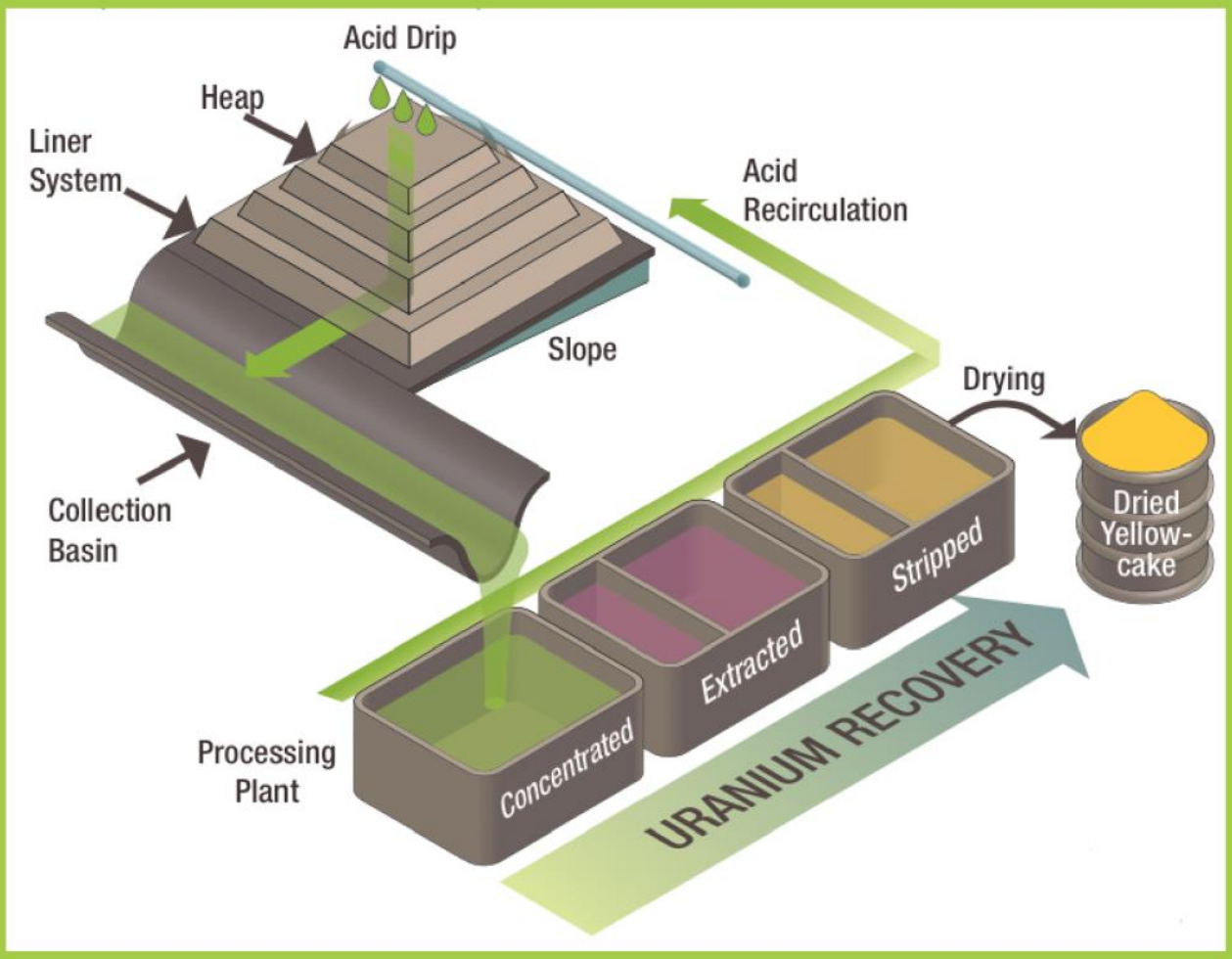


Image Provided by Nuclear Regulatory Commission (NRC)

In-situ Leaching

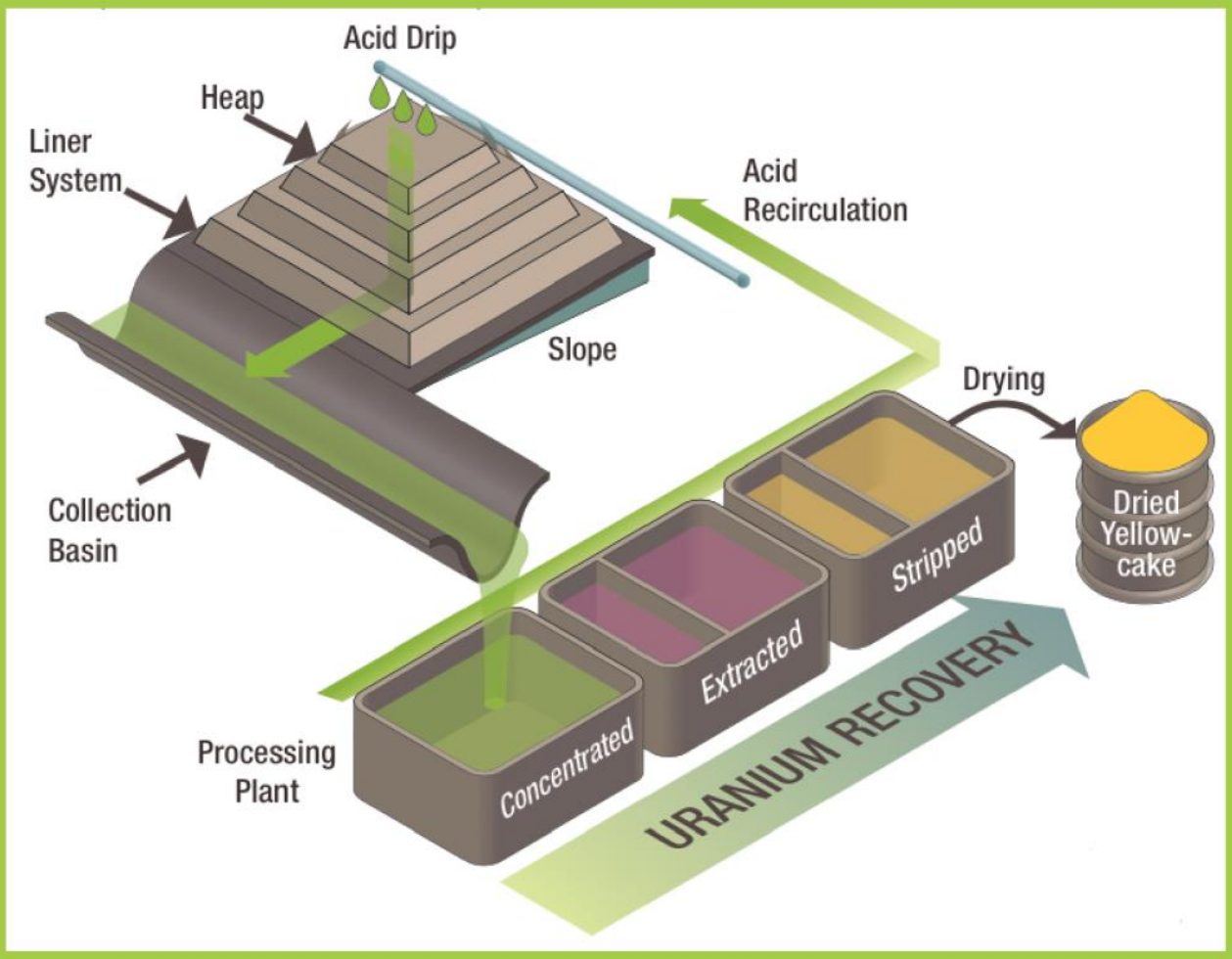
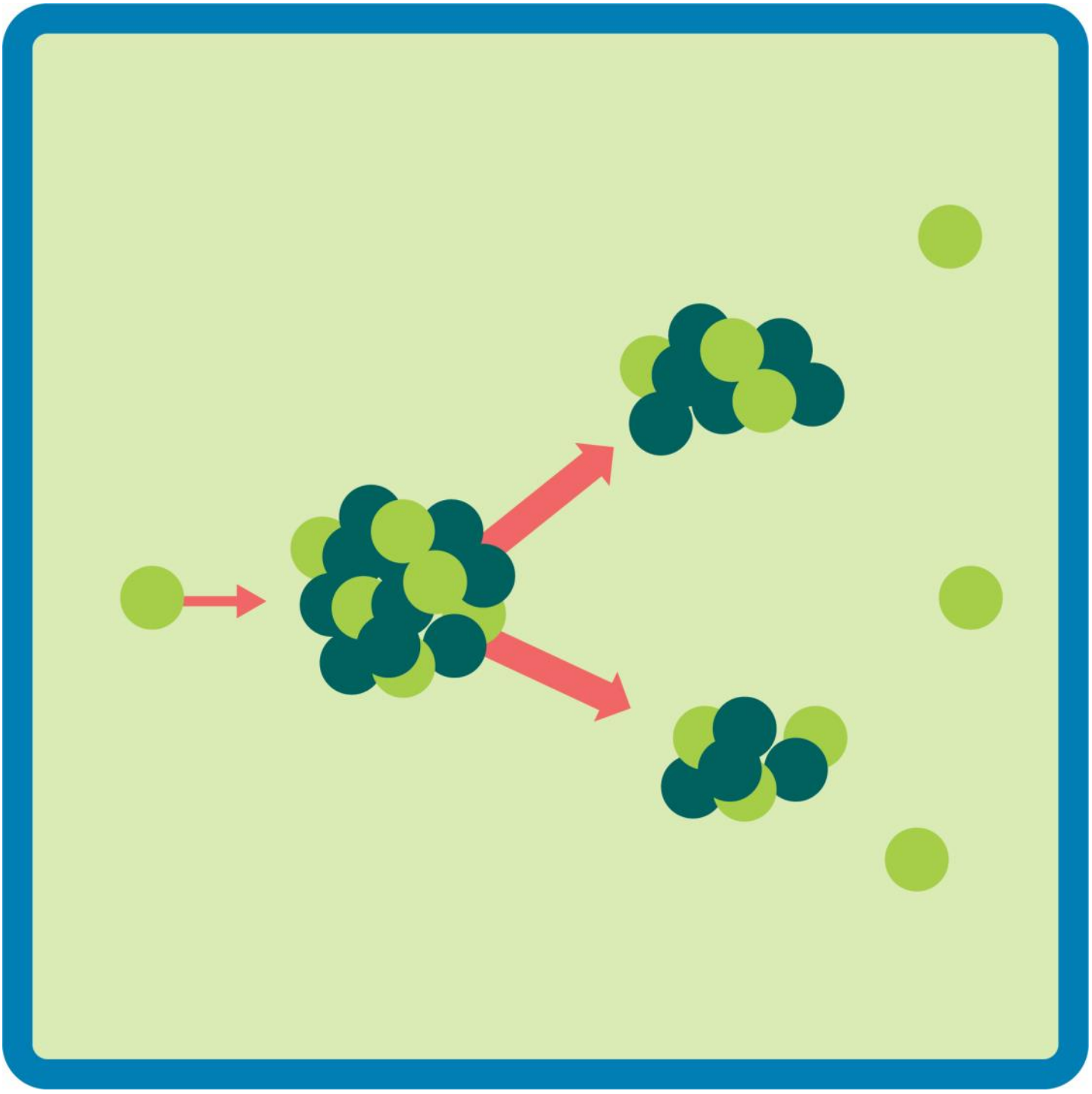
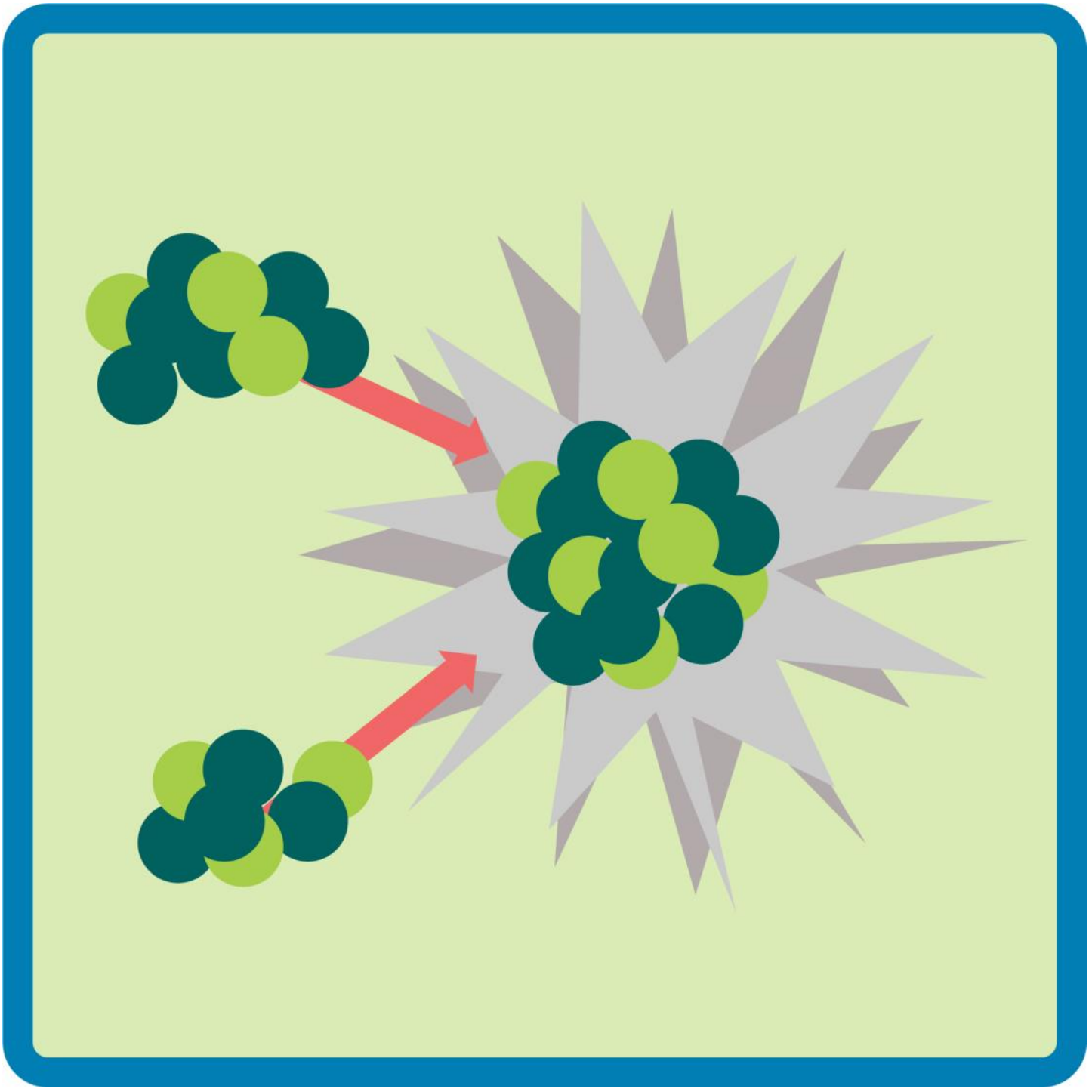


Image Provided by Nuclear Regulatory Commission (NRC)

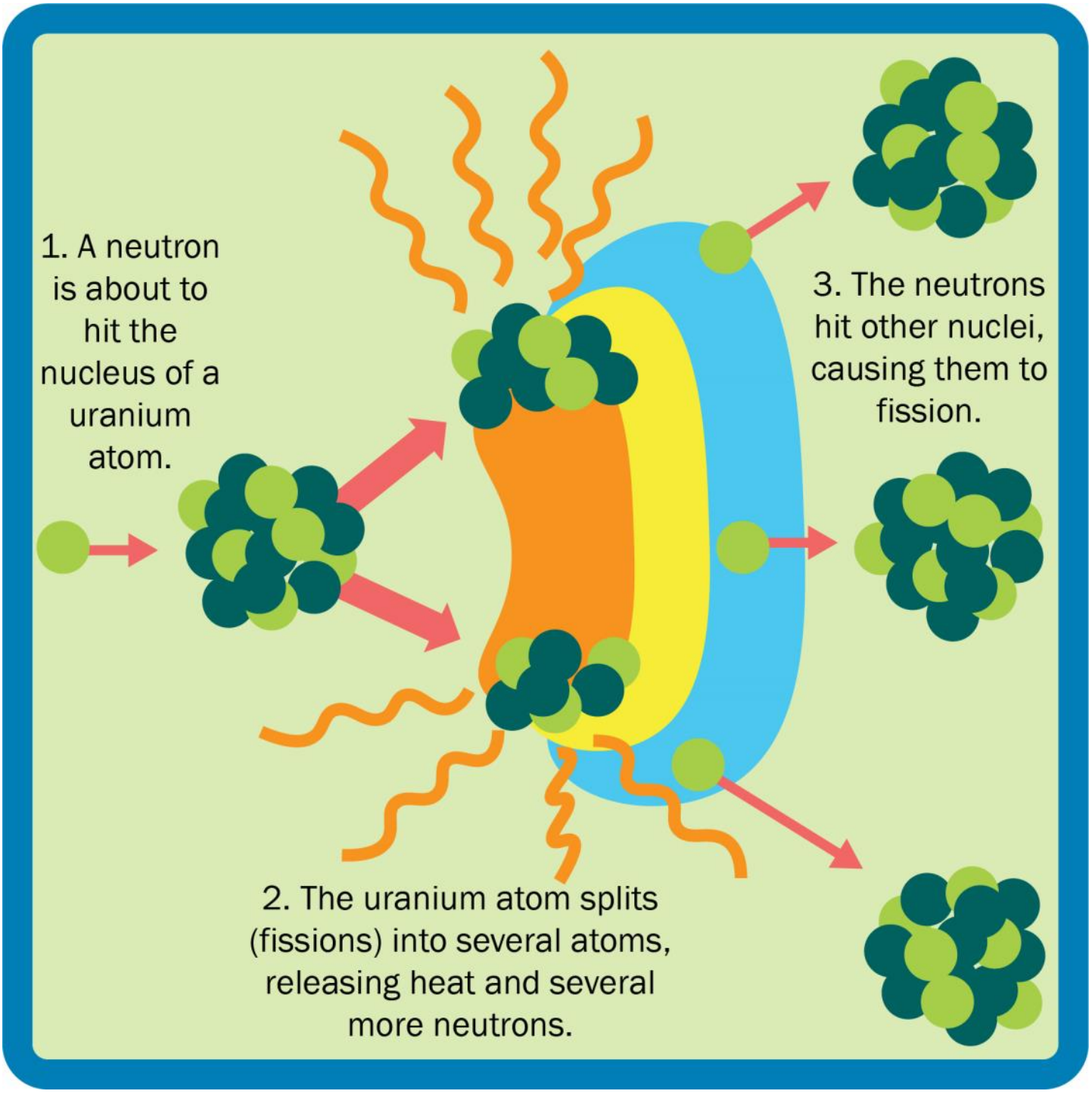
Fission



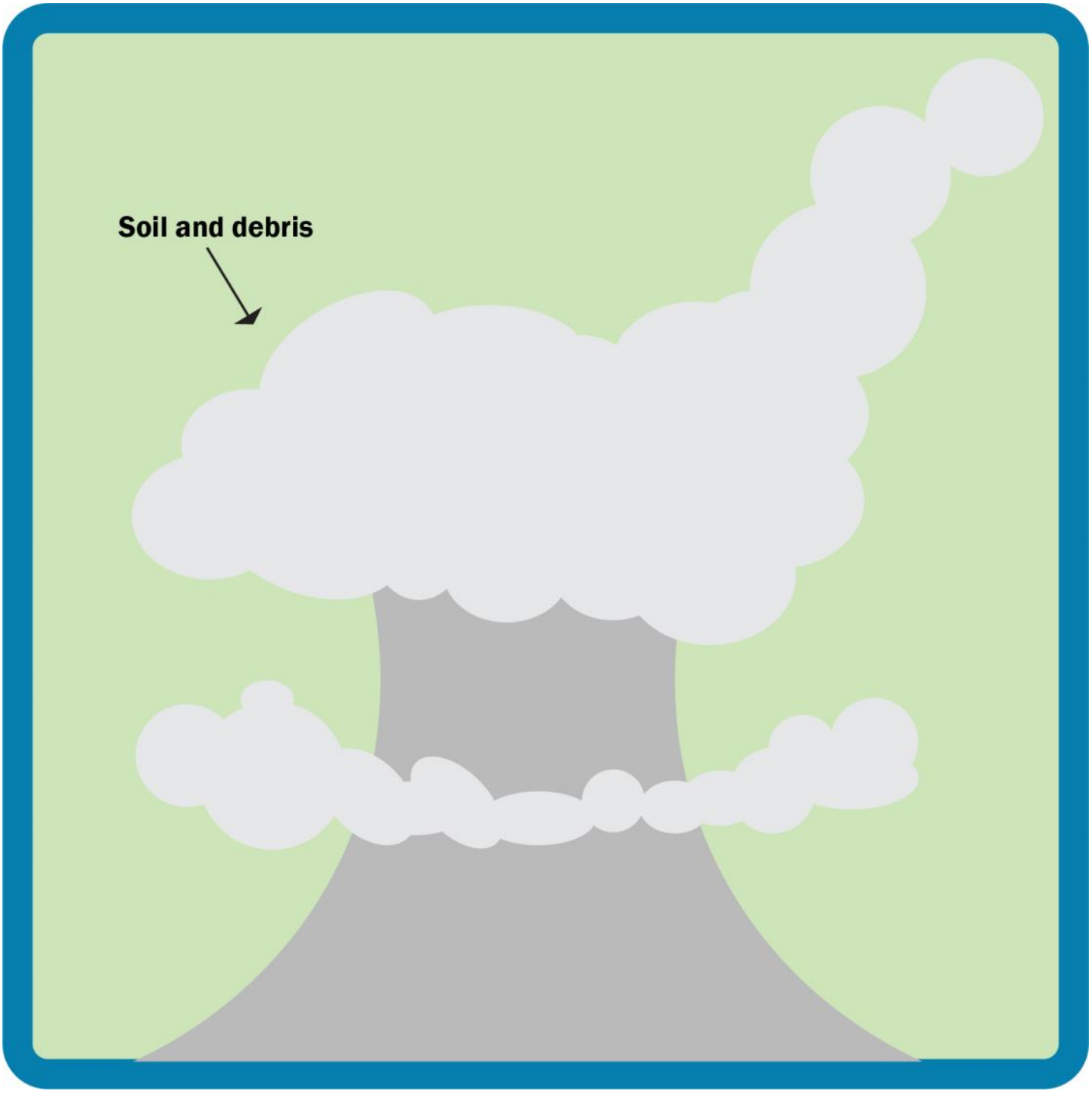
Fusion



Chain Reaction

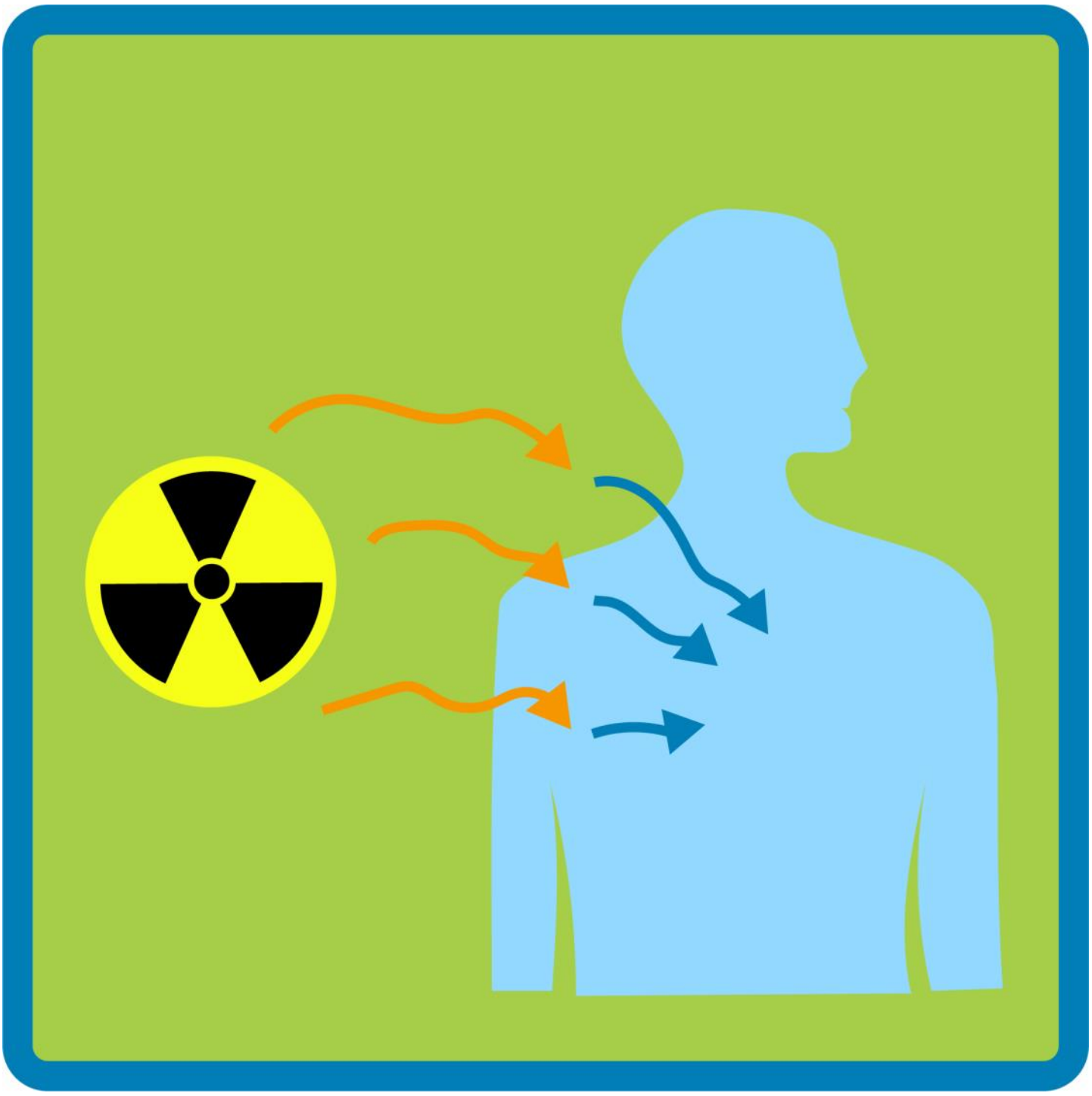

1. A neutron is about to hit the nucleus of a uranium atom.
2. The uranium atom splits (fissions) into several atoms, releasing heat and several more neutrons.
3. The neutrons hit other nuclei, causing them to fission.

Nuclear Fallout

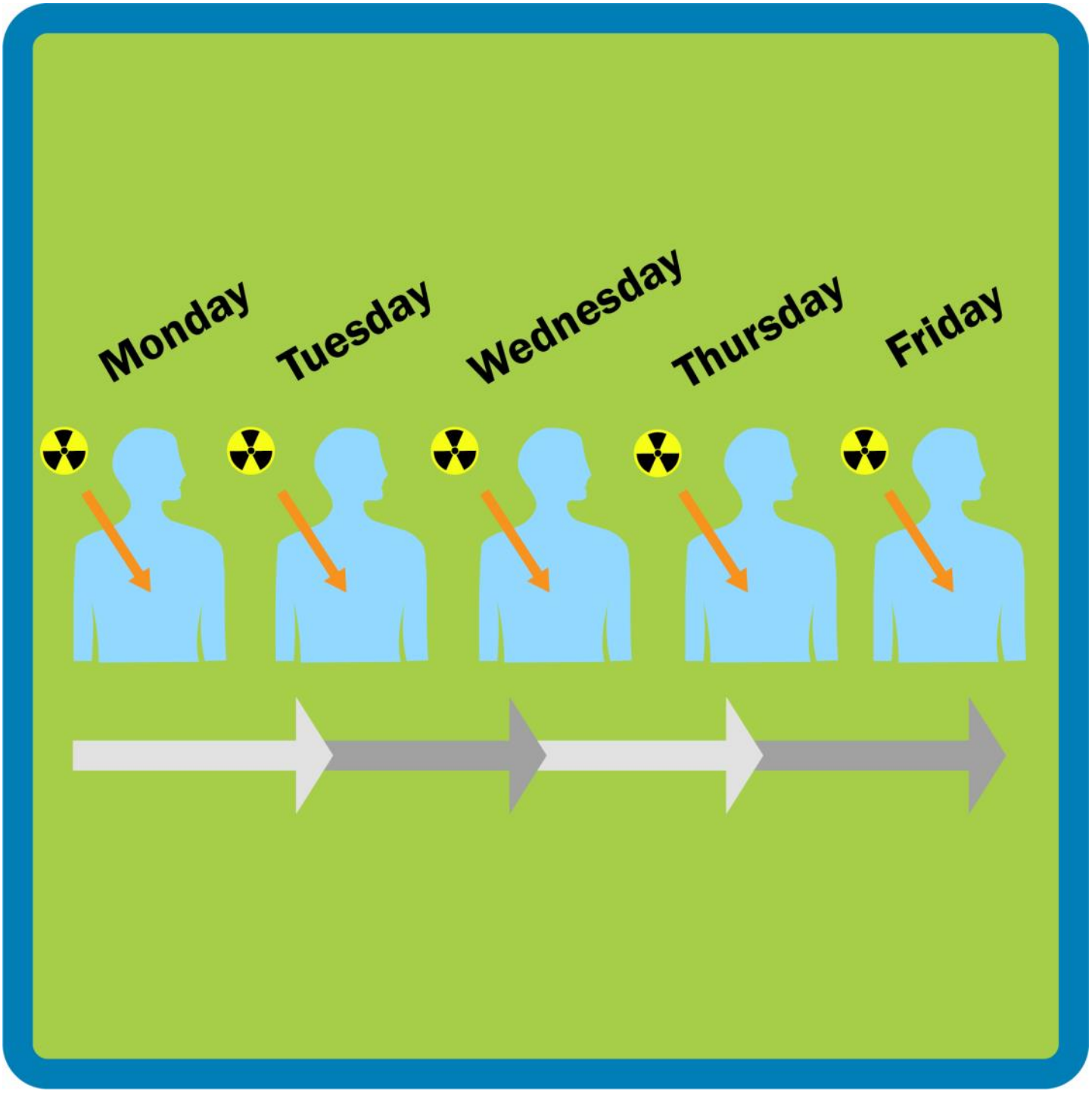

Soil and debris

Shelter in Place

Acute Exposure



Chronic Exposure


Monday
Tuesday
Wednesday
Thursday
Friday