Granddad was superstitious about books.
He thought that if you had enough of them around, education leaked out, like radioactivity.

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SES 194

Energy in Everyday Life

Radioactive Decay

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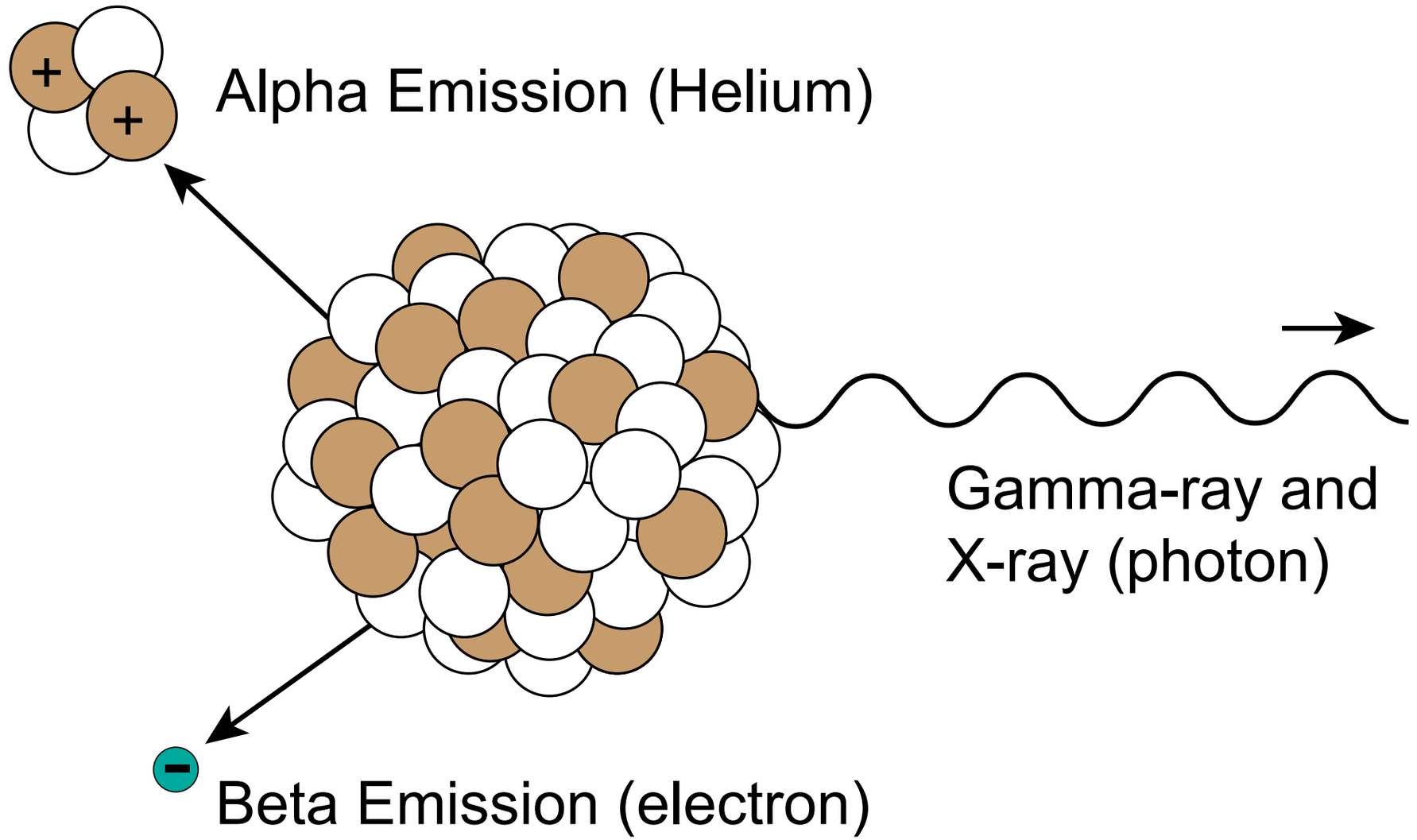
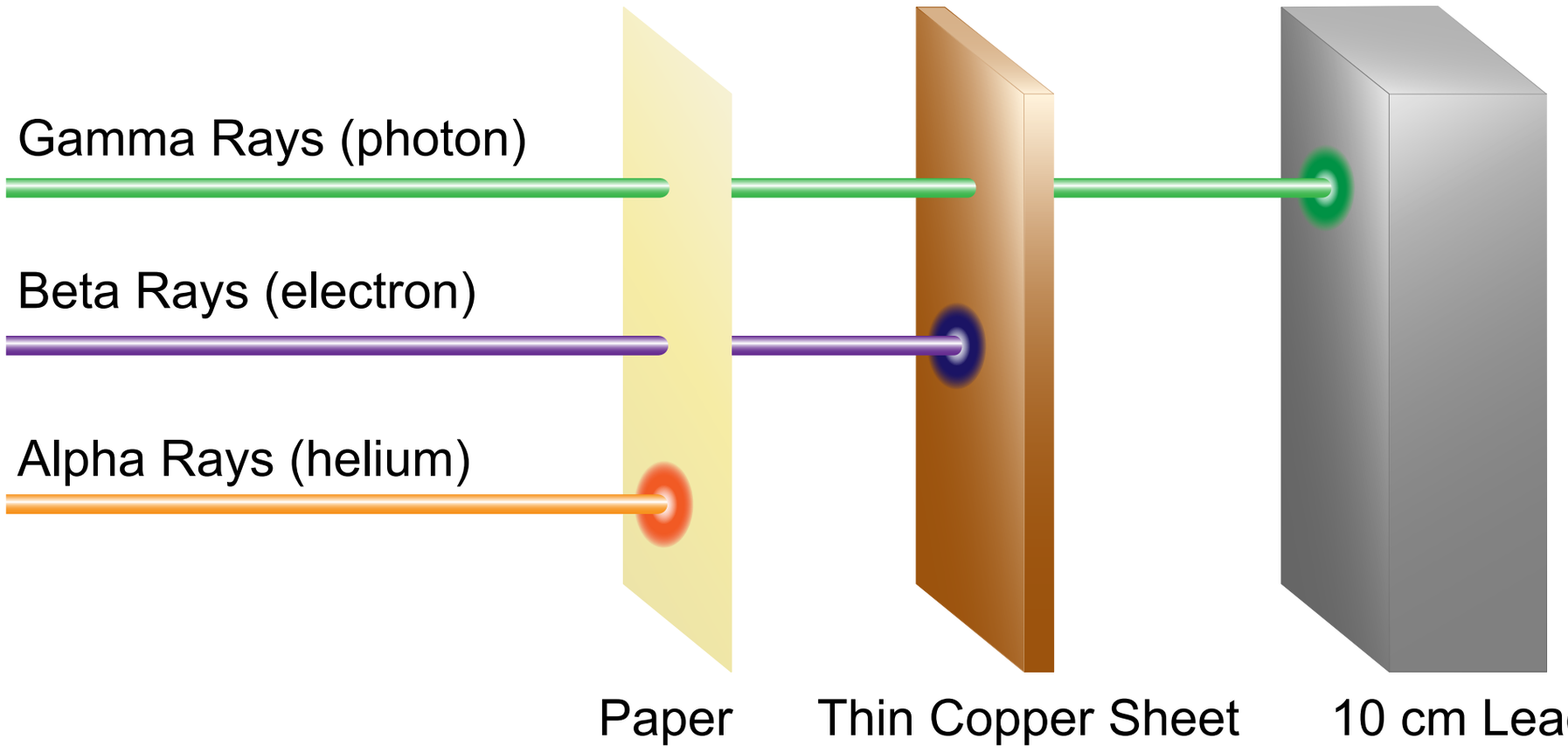
Fission is just one way to change an atom into another type of atom.

Many nuclei exhibit radioactive decay, where there is a spontaneous change of a nucleus into a different nucleus accompanied by the release of other particles and energy.



Alpha rays are heavy, positively charged helium nuclei which do not travel very far in air.

Beta rays are fast moving, negatively charged electrons, shielded by a thin sheet of aluminum.

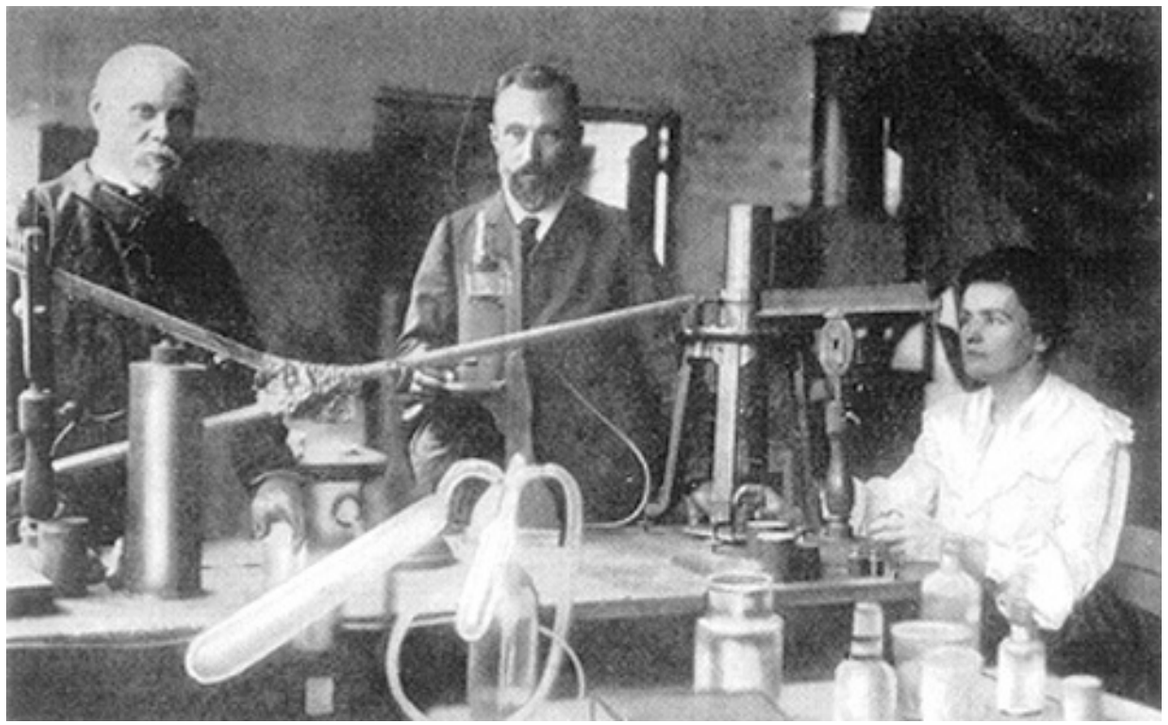


Gamma rays and X-rays are very penetrating photons and require shielding of concrete or lead to stop them.

Radioactivity was discovered about a century ago when Henri Becquerel included potassium and uranium sulfates as part of a photographic emulsion mixture.

He found that all uranium compounds were “light sources”, with an intensity proportional to the amount of U present.

Two years later, Pierre and Marie Curie coined “radioactive” for those elements that emitted such “Becquerel rays.”



A year later, Ernest Rutherford demonstrated that at least three different kinds of radiation are emitted in the decay.

He called these “alpha,” “beta,” and “gamma” rays in increasing order of their ability to penetrate matter.

A few years later Becquerel and Rutherford showed the alpha-rays were helium and beta-rays were electrons.

By 1912 Arthur Compton had shown the gamma-rays were very energetic photons.

Today we know radioactive decay are transitions between different states of nuclei, driven by electroweak interactions.