

DEEP TIME ACTIVITY #15 CUTOUTS

**All Known Original Radioisotopes With Half-Lives of 1 Million Years or More
Sequenced According to Half-Lives (“yes”= found in nature; “no”= not found in nature)**

For faster activity, provide the left column intact, and cut apart only the right hand nuclides for student sorting.

Vanadium	V-50	6.0×10^{15}	yes
Neodymium	Nd-144	2.4×10^{15}	yes
Hafnium	Hf-174	2.0×10^{15}	yes
Platinum	Pt-192	$\sim 1.0 \times 10^{15}$	yes
Indium	In-115	4.4×10^{14}	yes
Gadolinium	Gd-152	1.08×10^{14}	yes
Tellurium	Te-123	1.2×10^{13}	yes
Platinum	Pt-190	6.9×10^{11}	yes
Lanthanum	La-138	1.12×10^{11}	yes
Samarium	Sm-147	1.06×10^{11}	yes
Rubidium	Rb-87	4.75×10^{10}	yes
Rhenium	Re-187	4.3×10^{10}	yes
Lutetium	Lu-176	3.5×10^{10}	yes
Thorium	Th-232	1.40×10^{10}	yes
Uranium	U-238	4.47×10^9	yes
Postassium	K-40	1.25×10^9	yes
Uranium	U-235	7.04×10^8	yes

Plutonium	Pu-244	8.2×10^7	yes
Samarium	Sm-146	7.0×10^7	no
Lead	Pb-205	3.0×10^7	no
Curium	Cm-24	1.6×10^7	no
Hafnium	Hf-182	9×10^6	no
Palladium	Pd-107	$\sim 7 \times 10^6$	no
Cesium	Cs-135	3.0×10^6	no
Technetium	Tc-97	2.6×10^6	no
Gadolinium	Gd-150	2.1×10^6	no
Zircon	Zr-93	1.5×10^6	no
Technetium	Tc-98	1.5×10^6	no
Dysprosium	Dy-153	$\sim 1.0 \times 10^6$	no