| Group | 1 | 2 |  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Period |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 | $\begin{gathered} 1 \\ \mathrm{H} \end{gathered}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $\begin{gathered} 2 \\ \mathrm{He} \end{gathered}$ |
| 2 | $\begin{gathered} 3 \\ \mathrm{Li} \end{gathered}$ | $4^{4}$ |  |  |  |  |  |  |  |  |  |  |  | $\begin{aligned} & 5 \\ & \text { B } \end{aligned}$ | $\begin{aligned} & 6 \\ & C \end{aligned}$ | $\begin{aligned} & 7 \\ & \mathrm{~N} \end{aligned}$ | $\begin{aligned} & 8 \\ & 0 \end{aligned}$ | $\begin{aligned} & 9 \\ & F \end{aligned}$ | $\begin{aligned} & 10 \\ & \mathrm{Ne} \end{aligned}$ |
| 3 | $\begin{aligned} & 11 \\ & \mathrm{Na} \end{aligned}$ | $\begin{gathered} 12 \\ \mathrm{Mg} \end{gathered}$ |  |  |  |  |  |  |  |  |  |  |  | $\begin{aligned} & 13 \\ & \text { Al } \end{aligned}$ | $\begin{aligned} & 14 \\ & \mathrm{Si} \end{aligned}$ | $\begin{gathered} 15 \\ \mathrm{P} \end{gathered}$ | $\begin{aligned} & 16 \\ & \mathrm{~S} \end{aligned}$ | $\begin{aligned} & 17 \\ & \mathrm{Cl} \end{aligned}$ | $\begin{gathered} 18 \\ \mathrm{Ar} \end{gathered}$ |
| 4 | $\begin{aligned} & 19 \\ & \text { K } \end{aligned}$ | $\begin{aligned} & 20 \\ & \mathrm{Ca} \end{aligned}$ |  | $\begin{aligned} & 21 \\ & \mathrm{Sc} \end{aligned}$ | $\begin{aligned} & 22 \\ & T i \end{aligned}$ | $\begin{aligned} & 23 \\ & \mathrm{~V} \end{aligned}$ | $\begin{aligned} & 24 \\ & \mathrm{Cr} \end{aligned}$ | $\begin{gathered} 25 \\ \mathrm{Mn} \end{gathered}$ | $\begin{aligned} & 26 \\ & \mathrm{Fe} \end{aligned}$ | $\begin{aligned} & 27 \\ & \mathrm{Co} \end{aligned}$ | $\begin{aligned} & 28 \\ & \mathrm{Ni} \end{aligned}$ | $\begin{aligned} & 29 \\ & \mathrm{Cu} \end{aligned}$ | $\begin{aligned} & 30 \\ & \mathrm{Zn} \end{aligned}$ | $\begin{gathered} 31 \\ \mathrm{Ga} \end{gathered}$ | $\begin{gathered} 32 \\ \mathrm{Ge} \end{gathered}$ | $\begin{gathered} 33 \\ \text { As } \end{gathered}$ | $\begin{aligned} & 34 \\ & \mathrm{Se} \end{aligned}$ | $\begin{aligned} & 35 \\ & \mathrm{Br} \end{aligned}$ | $\begin{aligned} & 36 \\ & \mathrm{Kr} \end{aligned}$ |
| 5 | $\begin{gathered} 37 \\ \mathrm{Rb} \end{gathered}$ | $\begin{aligned} & 38 \\ & \mathrm{Sr} \end{aligned}$ |  | $\begin{aligned} & 39 \\ & Y \end{aligned}$ | $\begin{aligned} & 40 \\ & \mathrm{Zr} \end{aligned}$ | $\begin{gathered} 41 \\ \mathrm{Nb} \end{gathered}$ | $\begin{gathered} 42 \\ \text { Mo } \end{gathered}$ | $\begin{aligned} & 43 \\ & \mathrm{Tc} \end{aligned}$ | $\begin{gathered} 44 \\ \mathrm{Ru} \end{gathered}$ | $\begin{aligned} & 45 \\ & \mathrm{Rh} \end{aligned}$ | $\begin{aligned} & 46 \\ & \text { Pd } \end{aligned}$ | $\begin{aligned} & 47 \\ & \mathrm{Ag} \end{aligned}$ | $\begin{aligned} & 48 \\ & \mathrm{Cd} \end{aligned}$ | $\begin{aligned} & 49 \\ & \text { In } \end{aligned}$ | $\begin{aligned} & 50 \\ & \mathrm{Sn} \end{aligned}$ | $\begin{aligned} & 51 \\ & \mathrm{Sb} \end{aligned}$ | $\begin{aligned} & 52 \\ & \mathrm{Te} \end{aligned}$ | $\begin{gathered} 53 \\ \mathrm{I} \end{gathered}$ | $\begin{aligned} & 54 \\ & \mathrm{Xe} \end{aligned}$ |
| 6 | $\begin{aligned} & 55 \\ & \mathrm{Cs} \end{aligned}$ | $\begin{gathered} 56 \\ \mathrm{Ba} \end{gathered}$ |  | $\begin{aligned} & 71 \\ & \mathrm{Lu} \end{aligned}$ | $\begin{aligned} & 72 \\ & \mathrm{Hf} \end{aligned}$ | $\begin{aligned} & 73 \\ & \mathrm{Ta} \end{aligned}$ | $\begin{aligned} & 74 \\ & \mathrm{~W} \end{aligned}$ | $\begin{aligned} & 75 \\ & \mathrm{Re} \end{aligned}$ | $\begin{aligned} & 76 \\ & \text { Os } \end{aligned}$ | $\begin{aligned} & 77 \\ & \mathrm{Ir} \end{aligned}$ | $\begin{aligned} & 78 \\ & \mathrm{Pt} \end{aligned}$ | $\begin{aligned} & 79 \\ & \mathrm{Au} \end{aligned}$ | $\begin{gathered} 80 \\ \mathrm{Hg} \end{gathered}$ | $\begin{aligned} & 81 \\ & 71 \end{aligned}$ | $\begin{aligned} & 82 \\ & \mathrm{~Pb} \end{aligned}$ | $\begin{aligned} & 83 \\ & \mathrm{Bi} \end{aligned}$ | $\begin{aligned} & 84 \\ & \text { Po } \end{aligned}$ | $\begin{aligned} & 85 \\ & \text { At } \end{aligned}$ | $\begin{aligned} & 86 \\ & \mathrm{Rn} \end{aligned}$ |
| 7 | $\begin{aligned} & 87 \\ & \mathrm{Fr} \end{aligned}$ | $\begin{aligned} & 88 \\ & \mathrm{Ra} \end{aligned}$ |  | $\begin{aligned} & 103 \\ & \mathrm{Lr} \end{aligned}$ | $\begin{aligned} & 104 \\ & \mathrm{Rf} \end{aligned}$ | $\begin{aligned} & 105 \\ & \mathrm{Db} \end{aligned}$ | $\begin{aligned} & 106 \\ & \mathrm{Sg} \end{aligned}$ | $\begin{aligned} & 107 \\ & \mathrm{Bh} \end{aligned}$ | $\begin{aligned} & 108 \\ & \mathrm{Hs} \end{aligned}$ | $\begin{aligned} & 109 \\ & \text { Mt } \end{aligned}$ | $\begin{aligned} & 110 \\ & \text { Ds } \end{aligned}$ | $\begin{aligned} & 111 \\ & \mathrm{Rg} \end{aligned}$ | $\begin{aligned} & 112 \\ & C p \end{aligned}$ | 113 <br> Uut | $114$ <br> Uuq | $115$ <br> Uup | $116$ <br> Uuh | Uus | $\begin{aligned} & 118 \\ & \text { Uuo } \end{aligned}$ |


| *Lanthanoids |  | $\begin{aligned} & 57 \\ & \mathrm{La} \end{aligned}$ | $\begin{aligned} & 58 \\ & \mathrm{Ce} \end{aligned}$ | $\begin{aligned} & 59 \\ & \mathrm{Pr} \end{aligned}$ | $\begin{gathered} 60 \\ \mathrm{Nd} \end{gathered}$ | $\begin{array}{r} 61 \\ \mathrm{Pm} \end{array}$ | $\begin{gathered} 62 \\ \mathrm{Sm} \end{gathered}$ | $\begin{aligned} & 63 \\ & \mathrm{Eu} \end{aligned}$ | $\begin{aligned} & 64 \\ & \text { Gd } \end{aligned}$ | $\begin{aligned} & 65 \\ & \mathrm{~Tb} \end{aligned}$ | $\begin{aligned} & 66 \\ & \text { Dy } \end{aligned}$ | $\begin{aligned} & 67 \\ & \mathrm{Ho} \end{aligned}$ | $\begin{aligned} & 68 \\ & \mathrm{Er} \end{aligned}$ | $\begin{gathered} 69 \\ \mathrm{Tm} \end{gathered}$ | $\begin{aligned} & 70 \\ & \mathrm{Yb} \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| **Actinoids | ** | $\begin{aligned} & 89 \\ & \text { AC } \end{aligned}$ | $\begin{aligned} & 90 \\ & \text { Th } \end{aligned}$ | $\begin{aligned} & 91 \\ & \mathrm{~Pa} \end{aligned}$ | $\begin{aligned} & 92 \\ & \mathrm{U} \end{aligned}$ | $\begin{aligned} & 93 \\ & \mathrm{~Np} \end{aligned}$ | $\begin{aligned} & 94 \\ & \mathrm{Pu} \end{aligned}$ | $\begin{gathered} 95 \\ \text { Am } \end{gathered}$ | $\mathrm{Cm}$ | $\begin{aligned} & 97 \\ & \text { Bk } \end{aligned}$ | Cf | Es | 100 | 101 | 102 |

Where did all of these elements come from?

$$
\mathrm{T}=13.7 \mathrm{Gyr}
$$

