Note: Image used in the background of the article title — A hook-and-loop Velcro fastener. Credits: Kamran Iftikhar, Wikimedia Commons. URL: https://en.wikipedia.org/wiki/File:Hook_and_loop_fastener_-_macro_photograph_of_%22hooks%22.jpg. License: CC-BY-SA.

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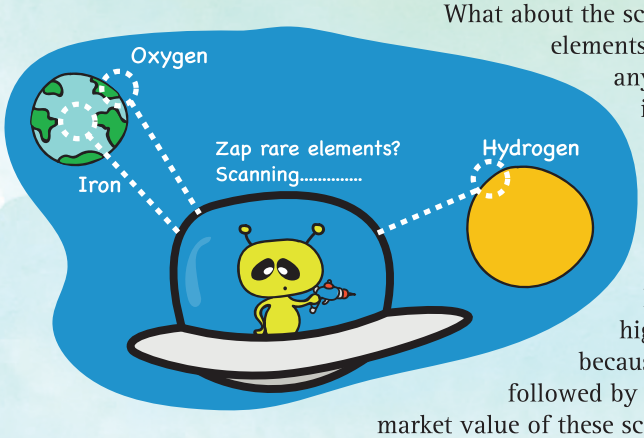
SNIPPETS

ABUNDANT AND RARE ELEMENTS

What are the most abundant elements on earth? Surprisingly, the answer to this question can vary. The most abundant elements in the earth's crust are oxygen (did you get that right?), silicon, aluminium, iron, calcium, sodium, potassium and magnesium (in that order). Seen as a whole, however, the earth is made up of 32.1% iron, 30.1% oxygen, and 15.1% silicon etc. This variation is caused because the distribution of elements at the core of the earth is different from that at its crust.



What about the scarcest element on earth? Among the naturally occurring elements, this would be astatine (At) — a radioactive halogen. At any given time, only as much as one ounce (28.35 g) of At is present on earth. This is a very tiny amount indeed! Many other radioactive elements, like francium, technetium, polonium, radium, actinium and protactinium are also found in scarce amounts. This may be because of the radioactive decay of their original stocks to today's negligible levels. We also know that some 'precious metals' are very rare — their high costs are not only due to their high demand, but also because of their scarcity. The rarest of these is iridium; followed by gold, rhodium, palladium, platinum and silver. The market value of these scarce metals is also determined by the costs of their extraction. Thus, the more difficult to extract platinum is more expensive than the less abundant gold.

We often assume that a discussion on abundant and rare elements refers only to the elements found on earth. What about the solar system? Today, we know the most abundant element in the solar system is hydrogen (70.5%), followed by helium (27.5%), and carbon (~0.6%). Much of this hydrogen and helium are concentrated in the sun. Hydrogen is also the most abundant element in the universe, making up ~73.9% of its mass. This is followed by helium (~24%), oxygen (~0.1%), and carbon (~0.046%). All other elements are estimated to be present at trace levels. Do keep in mind that these distributions do not take into account dark matter and dark energy; they are only true of the visible matter of the universe.

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