I have no doubt that we will be successful in harnessing the sun's energy. If sunbeams were weapons of war, we would have had solar energy centuries ago.

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SES 194

Energy in Everyday Life

Binding Energies

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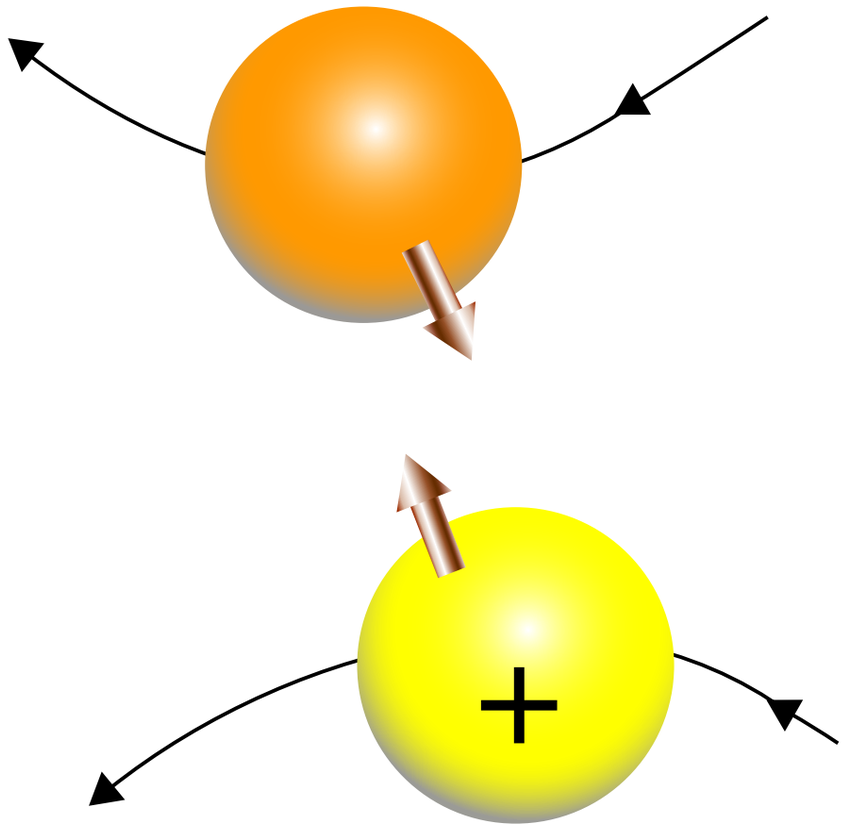
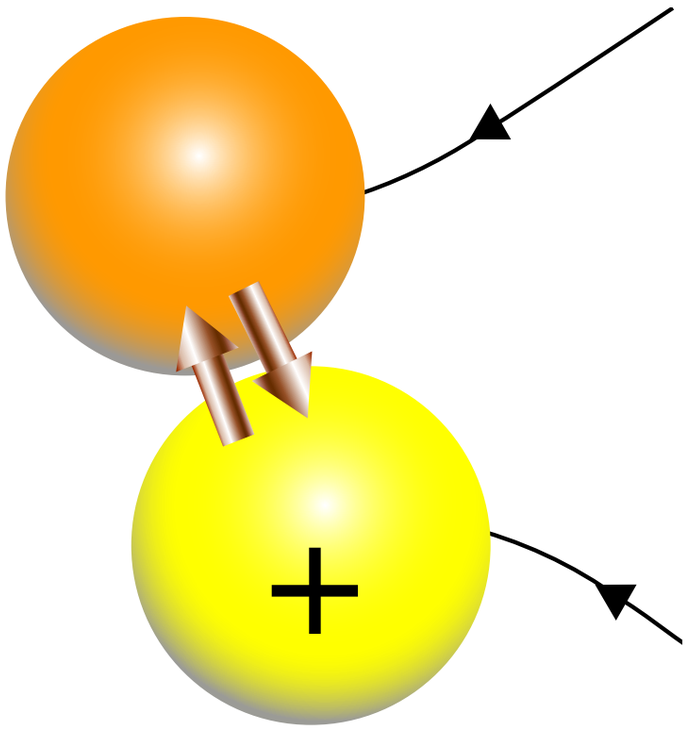
When two neutrons or protons interact, they generally bounce off one another because of their electrical repulsion or hard surfaces.

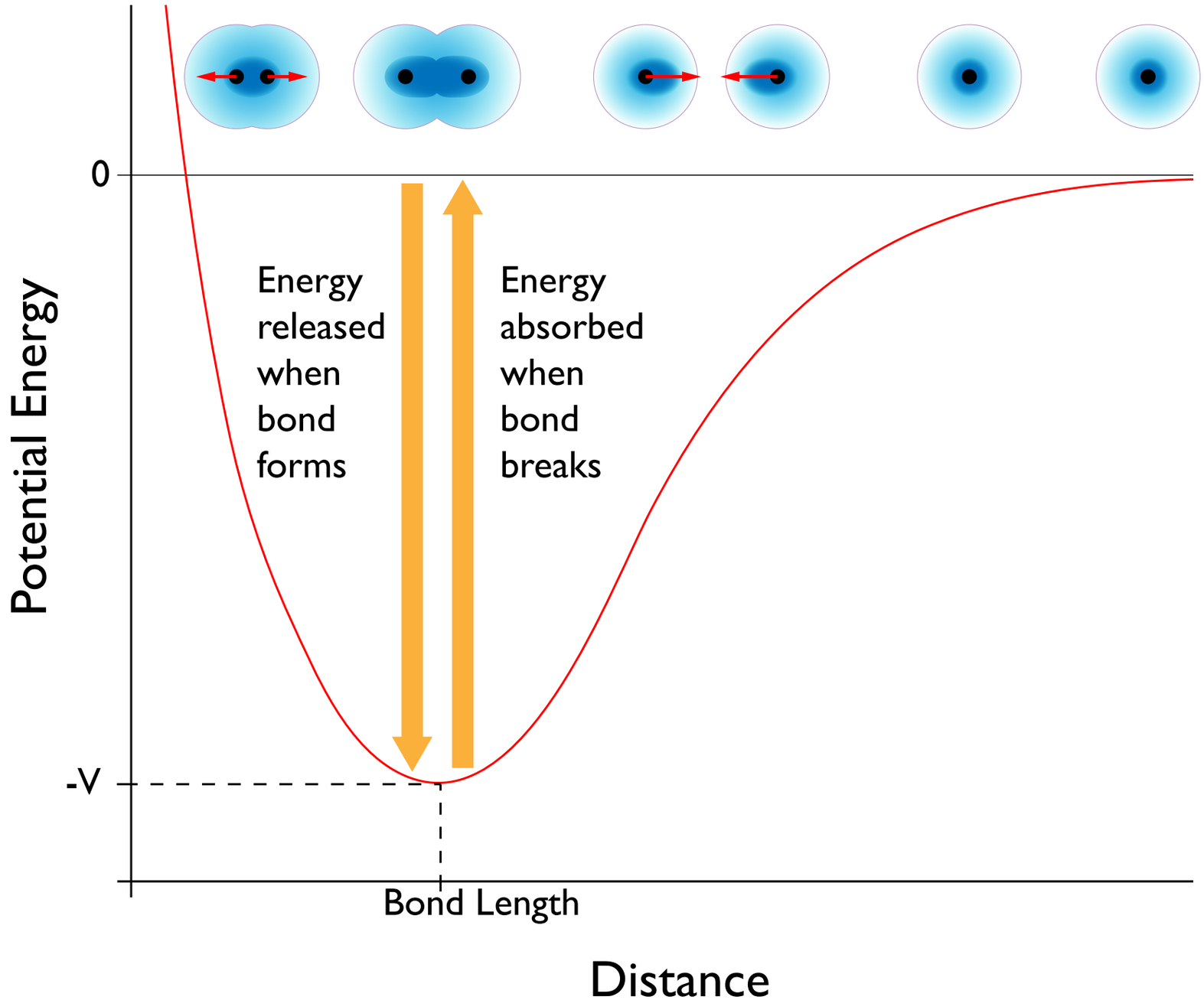


When they get close together, however, they can be attracted to each other by the strong force (velcro stips!)



By emitting some energy as light (gamma-rays) they can form bonds and remain together.

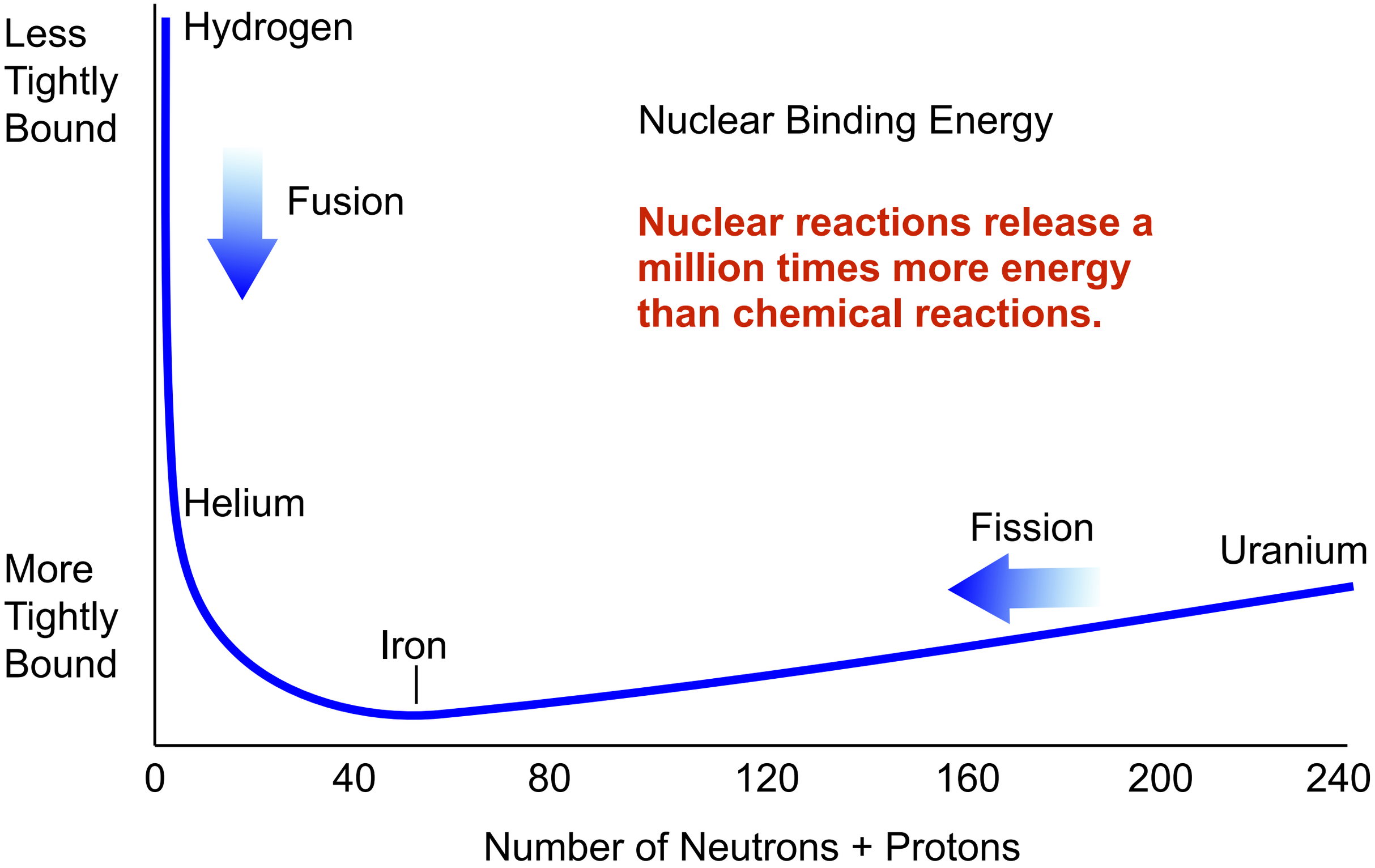
The situation is analogous to the making of chemical bonds.



Also as an analogy, the first pool ball falls the deepest in a pocket, while later balls do not fall as far in the pocket.

Similarly, the first neutrons or protons give up more energy to bind than later ones, but the later ones increase the total binding energy (like more balls in the pocket).

For all the elements in the periodic chart, the picture is this:



Nuclear Binding Energy

Nuclear reactions release a million times more energy than chemical reactions.