

1. What force is responsible for holding the nucleus together? What particles does it act on? Does it work over long or short distances?
2. What force acts on protons that are on opposite sides of the nucleus? Is it an attractive or a repulsive force?

The following questions refer to the “Band of Stability” diagram (see handout).

3. What does each black dot represent?
4. What is the most stable neutron/proton ratio for lighter elements?
5. What is the most stable neutron/proton ratio ( $n^0/p^+$ ) for heavier elements?
6. In the region above the band of stability, are there too many protons or neutrons?
7. In the region below the band of stability, are there too many protons or neutrons?
8. What two particles does a neutron decay into (one +, one -)? Write the decay equation that represents this. In what region does this decay occur?
9. What two particles does a proton decay into (one +, one neutral)? Write the decay equation that represents this. In what region does this decay occur?
10. What is the primary decay mode for atoms with  $Z > 83$ ? What particle(s) are there too many of?