**Don’t overcomplicate Periodic Trends…**

**Be VERY careful with your phrasing!**

Believe it or not, when justifying periodic trends, there is no reason to mention shielding or Zeff at all.

It isn’t “wrong” to use these terms, but you need to be careful to use them correctly, and to not just “vocab bomb” an answer. They want to read an EXPLANATION not a list of vocab words.

*Remember…AP Chem LOVES “columbic attraction” explanations!*

**Two elements in the same period?**

Discuss the fact that…

* Each element has valence electrons that are located in the same energy level.
* One atom has a greater number of protons (greater nuclear charge).
* More protons results in a stronger attraction between the nucleus and the valence electrons.
* Stronger columbic attraction between nucleus and valence e‑s results in a smaller atomic radius.
* That is what “Greater Effective Nuclear Charge” is trying to explain!

**Two elements in the same group?**

Discuss the fact that…

* The valence e-s are not located in the same energy levels.
* Valence e-s for one element are in a higher energy level than the valence e-s of the other element.
* The electrons in the higher energy level are (on average) located farther away from the nucleus.
* Being further away from the nucleus results in a weaker attraction between the nucleus and valence e-s
* Weaker columbic attraction between nucleus and valence e-s results in a lager atomic radius.
* Increased e-s also results in more repulsions between electrons resulting in a larger atomic radius
* That is what “Increased Shielding” is trying to explain!

*Increased Zeff*

*Increased Shielding*

**Everything Comes Down to…**

* ***Attractions***
* ***Repulsions***
* ***Energy***

**=**

**↑ Distance   
between nucleus and valence electrons**

**↓ Columbic Attraction between nucleus and valence electrons**