

Forming Ions

I've got my ion you . . .

Ions

- * A neutral atom has the same number of protons and electrons.
- * Atoms that lose or gain an electron are called ions.

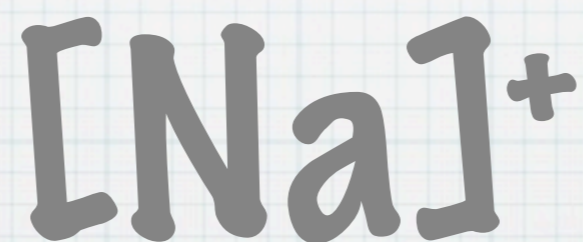
*** The octet rule: atoms are most stable when their valence shell is full, like that of Noble Gases, so all atoms want to have a full valence shell.**

- * **Cations: positively charged ions, have lost electrons.**
- * **Anions: negatively charged ions, have gained electrons.**

- * They achieve this by gaining or losing electrons, depending on how many they have
- * If they have less than 4 e^- they will lose them
- * If they have more than 4 e^- they will gain them.

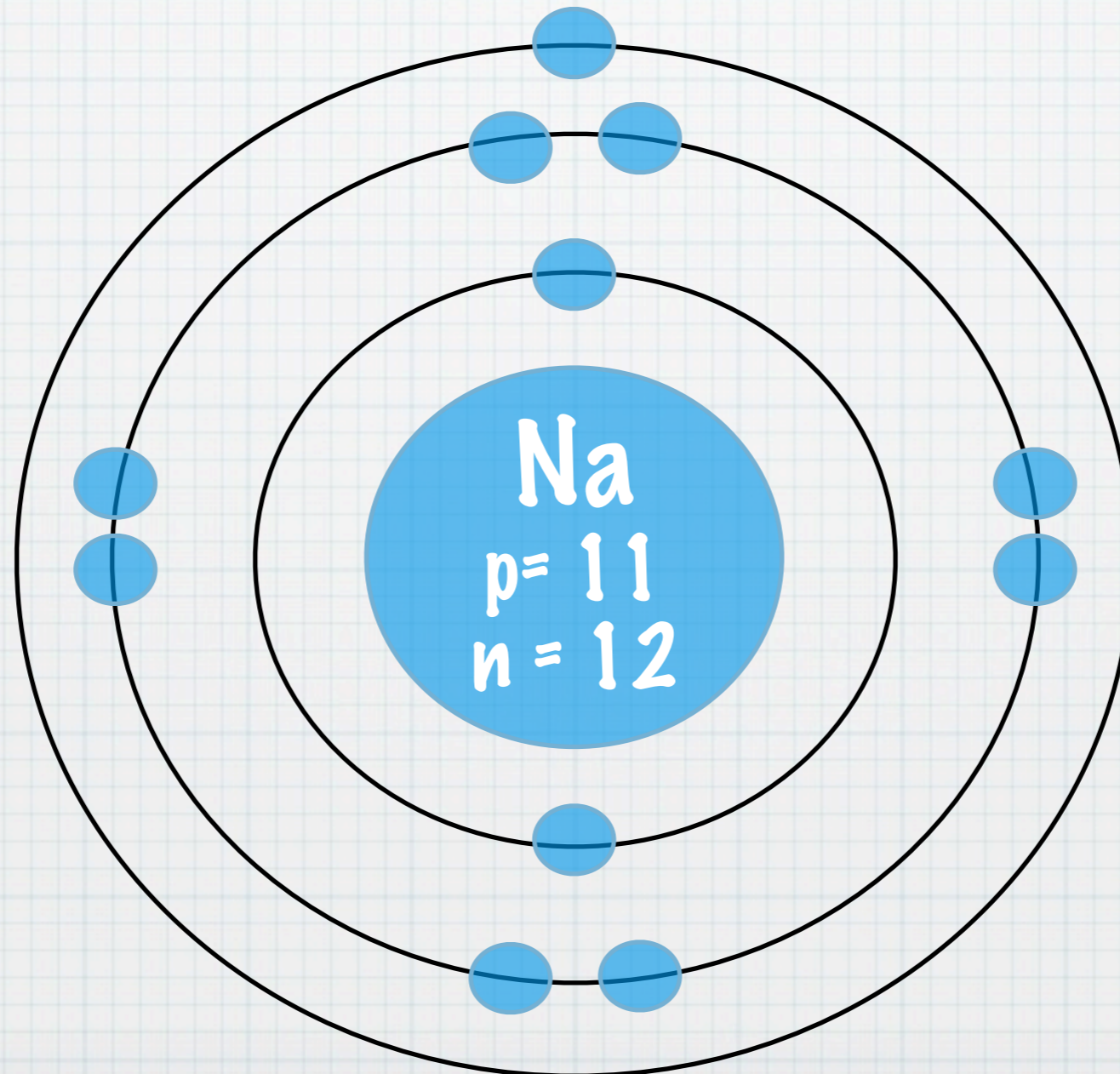
Ions

- * Ions can also be represented by Lewis symbols: the Lewis symbol is enclosed in square brackets, the charge of the ion is placed outside the brackets.



Example

* Let's look at a sodium atom:

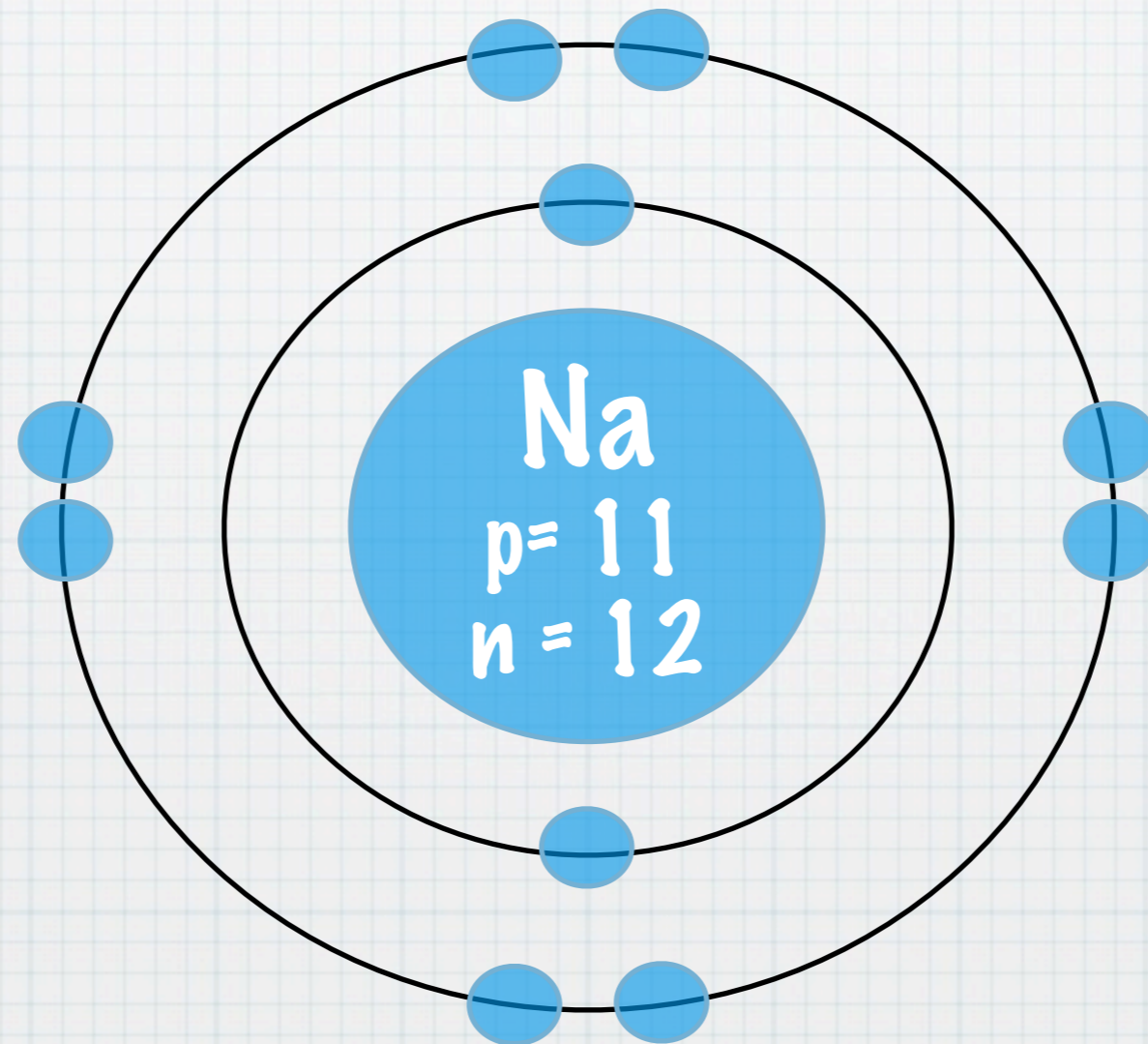


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- * Is it easier to lose one or gain seven?

- * The last shell wants to contain eight electrons.
- * Is it easier to lose one or gain seven?
- * ANSWER: Lose one

Examples

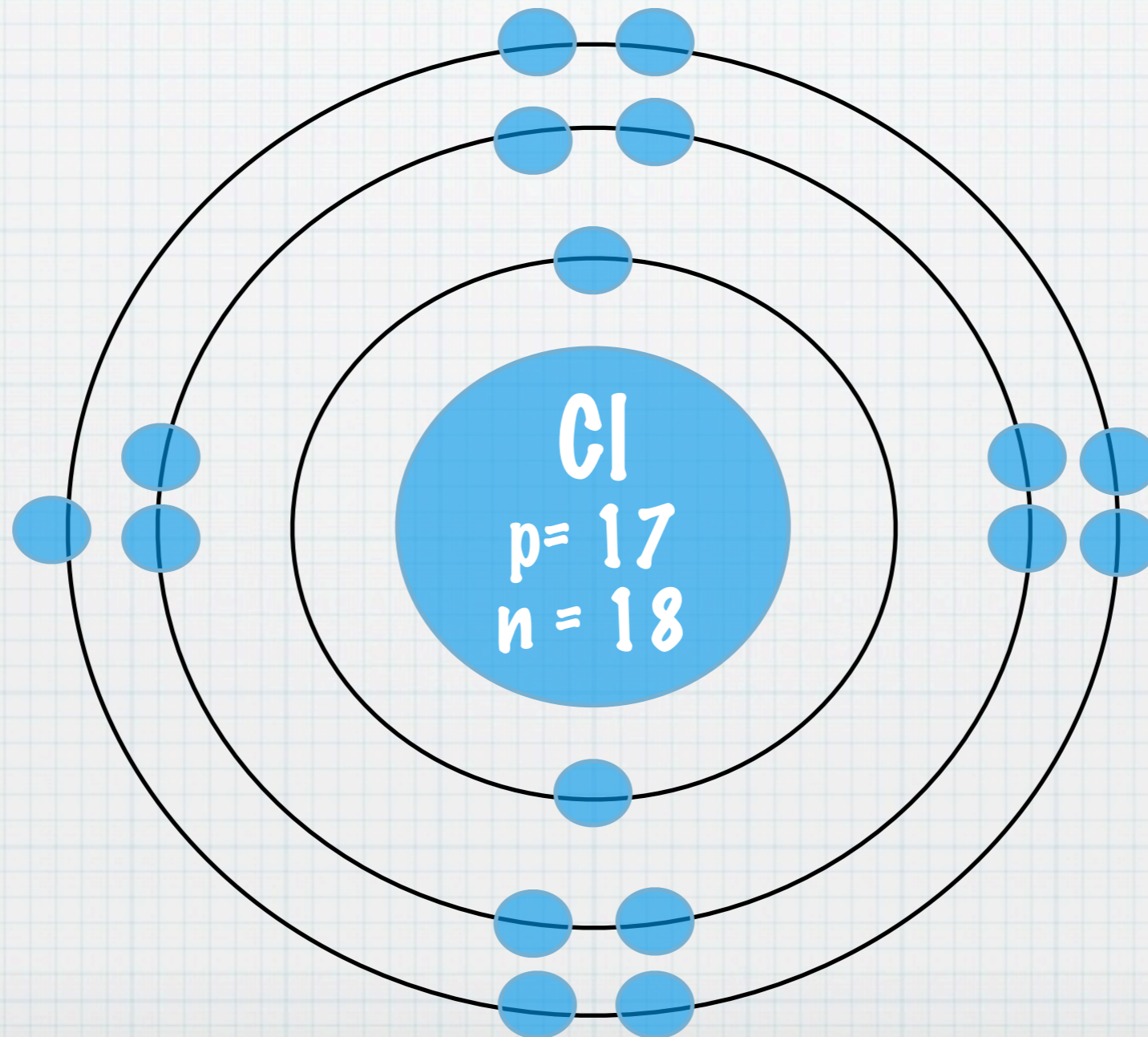
* So the sodium ion would look like this:



- * Since the sodium ion now has eleven protons (+) and only ten electrons(-1), it will have an overall charge of +1.
- * You can write this Na^+

Example

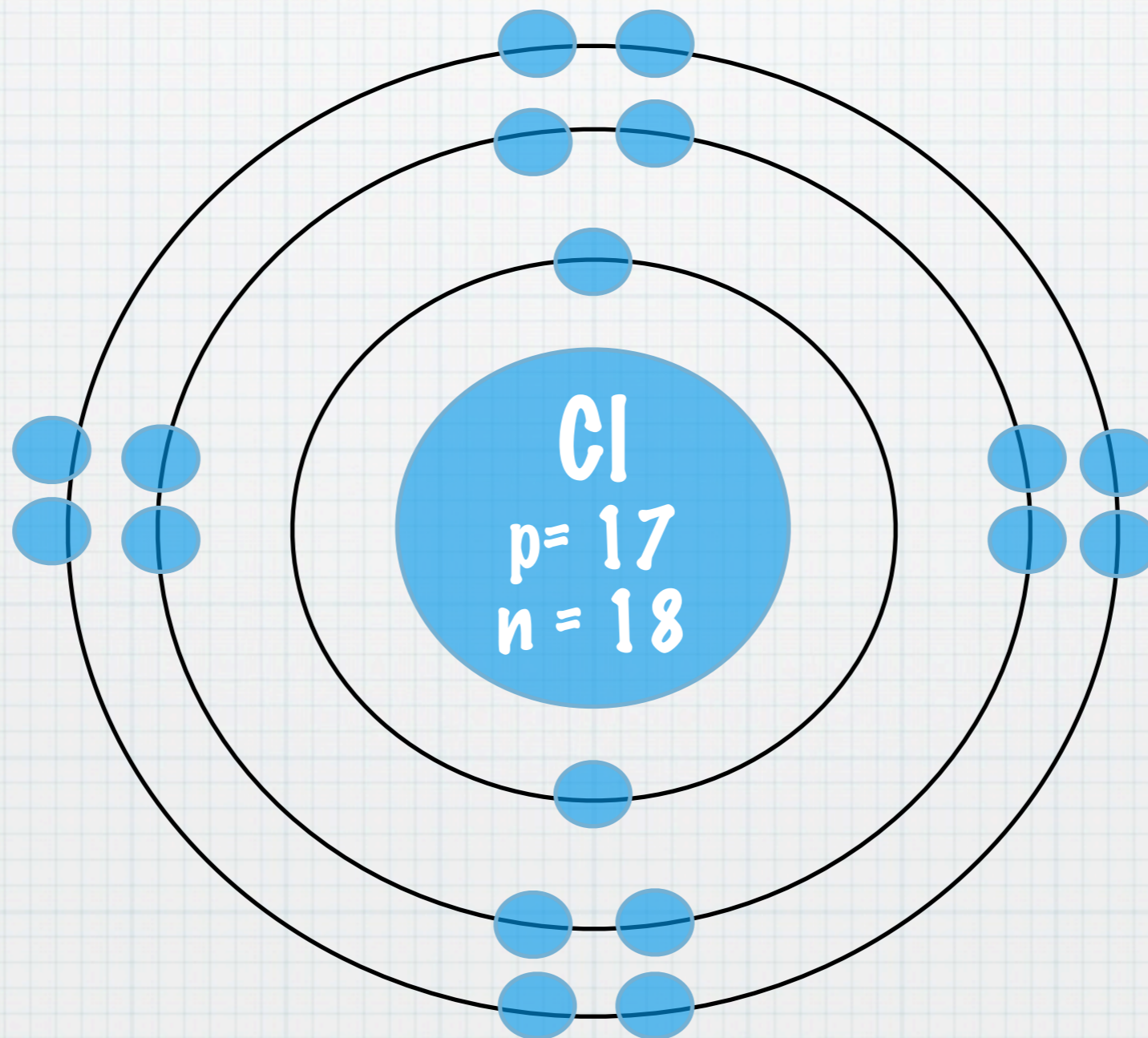
* Let's look at chlorine.



*** To be full chlorine can lose seven or gain one.**

- * To be full chlorine can lose seven or gain one.
- * It is easier for chlorine to gain one.

* Chlorine gains one giving it a charge of negative one.



* RULE:

- * Metals lose electrons and have a positive charge equal to the group number.
- * Non-metals gains electrons, and have a negative charge of eight minus the group number.