

**HOW MANY  
PROTONS,  
ELECTRONS, AND  
NEUTRONS ARE IN  
AN ATOM?**

# ELEMENT KEY

## Atomic Number:

Number of protons and it is also the number of electrons in an atom of an element.

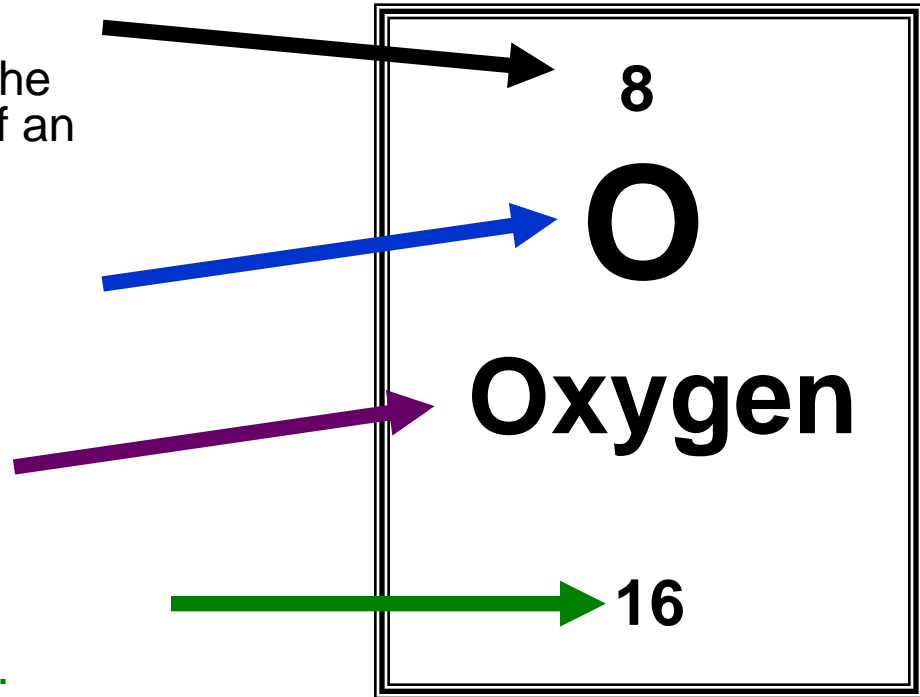
## Element's Symbol:

An abbreviation for the element.

## Elements Name

## Atomic Mass/Weight:

Number of protons + neutrons.



# DO NOW

What are the symbols for the following:

- Nitrogen
- Argon
- Sulfur
- Helium

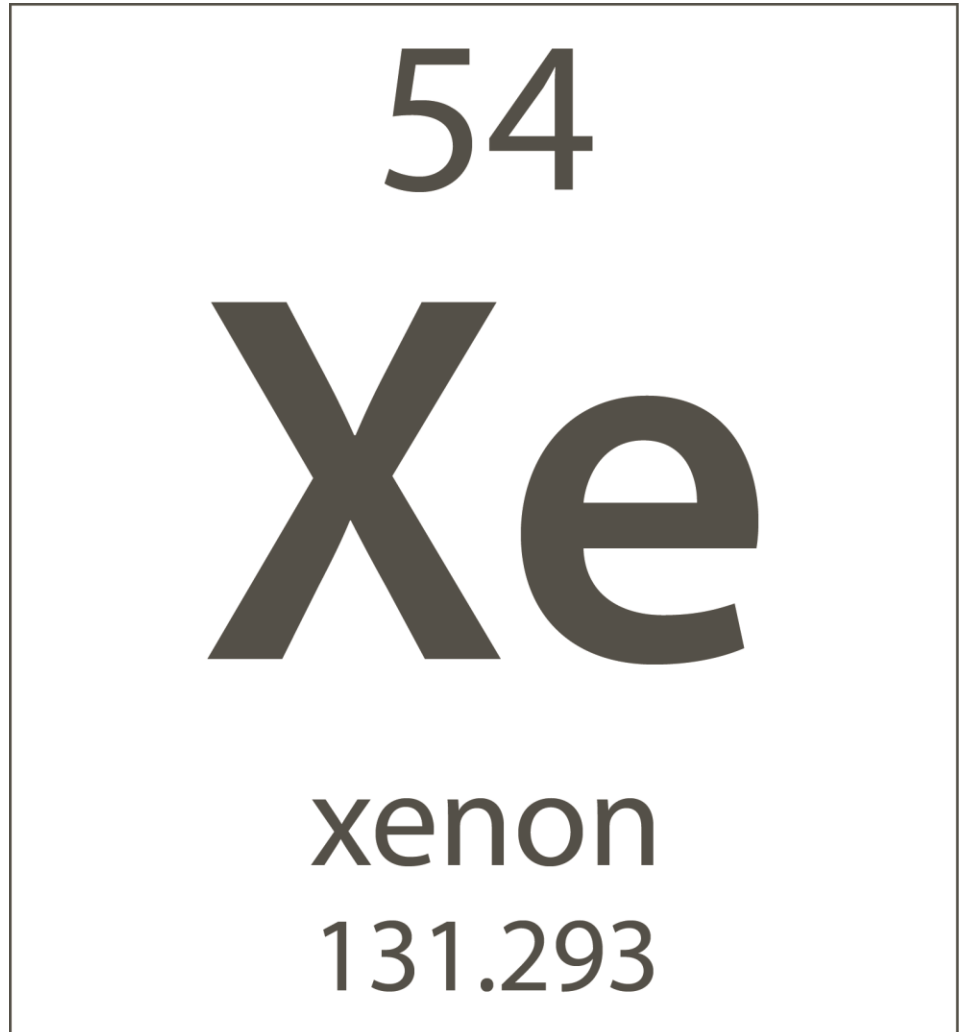
# DO NOW

What are the symbols for the following:

- Nitrogen → N
- Argon → Ar
- Sulfur → S
- Helium → He
  
- Anyone notice a pattern with the letters?

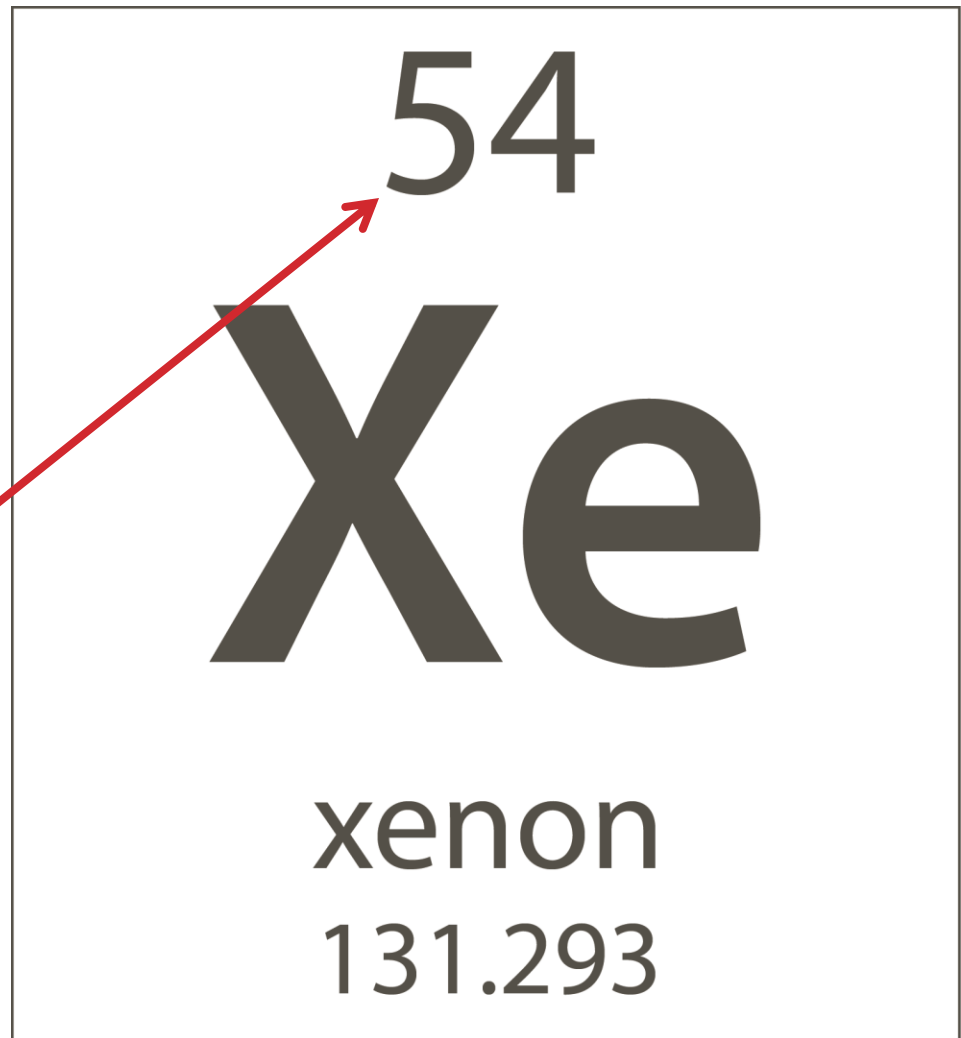
## STEP 1

- Locate the element square on your periodic table of elements
- We are looking for the element Xenon



## STEP 2

- To find the number of protons (+):
  - Locate the atomic number on the periodic table square
- Atomic Number = Number of Protons
- Xenon has an atomic number of 54
  - Atomic Number = 54
  - Number of protons = 54
  - Atomic Number = Number of Protons



# NUMBER OF PROTONS

Find the number of protons in each of the following:

- Hydrogen
- Lithium
- Sodium
- Bromine
- Iron

# NUMBER OF PROTONS

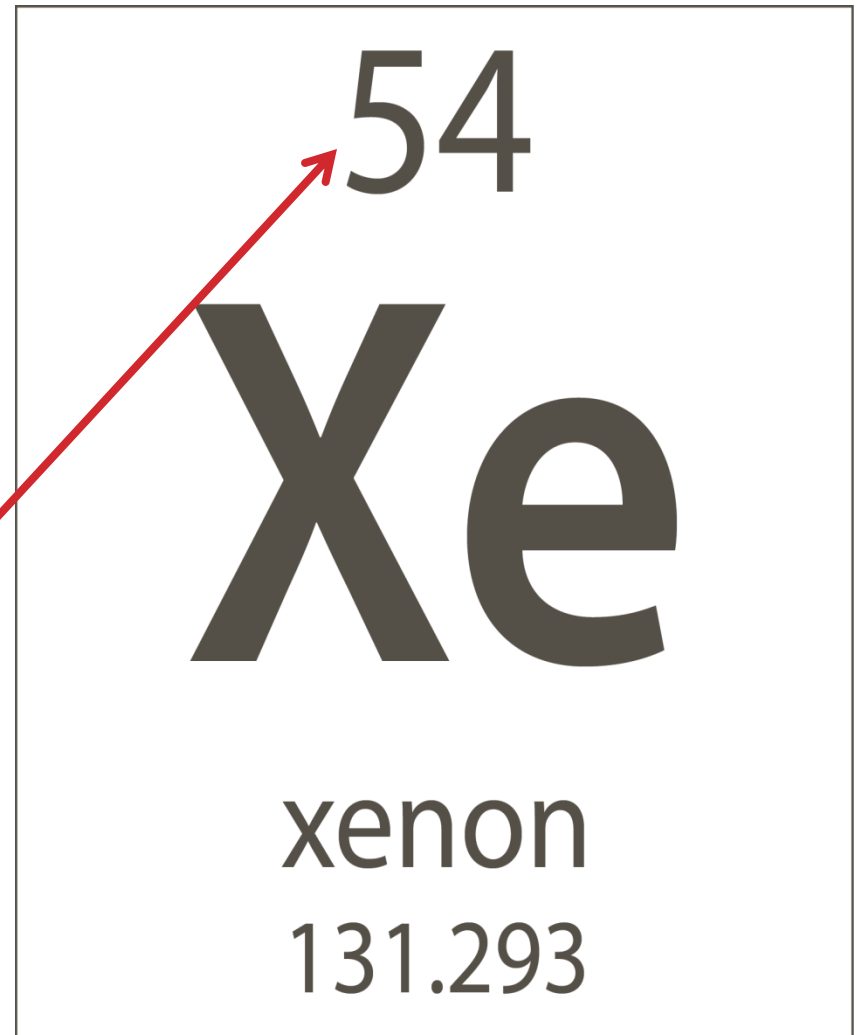
Find the number of protons in each of the following:

- Hydrogen → 1
- Lithium → 3
- Sodium → 11
- Bromine → 35
- Iron → 26



## STEP 3

- **The number of Electrons (-)**
  - Atoms have an overall charge of (0) neutral
- **Number of Protons = Number of Electrons**
- **Xenon has an atomic number of 54, which means it has 54 protons**
  - Number of protons = 54
  - Number of Protons = Number of Electrons
  - Xenon has 54 electrons (-)



# NUMBER OF ELECTRONS

Find the number of electrons (-) in each of the following:

- Hydrogen
- Lithium
- Sodium
- Bromine
- Iron

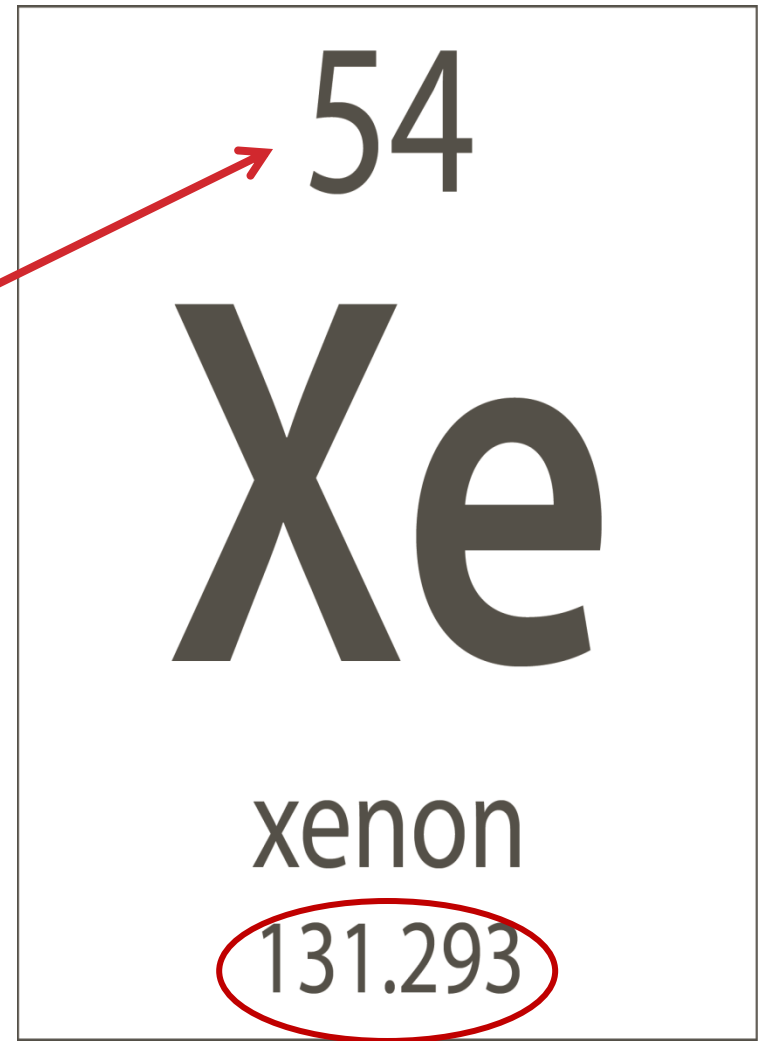
# NUMBER OF ELECTRONS

Find the number of neutrons (-) in each of the following:

- Hydrogen → 1
- Lithium → 3
- Sodium → 11
- Bromine → 35
- Iron → 26

## STEP 4

- The number of Neutrons (no charge)
- Neutrons – Mass # - Protons
- 1. Find Mass #
- 2. Find Protons
- 3. Neutrons = Mass # - Protons
  - Neutrons =  $131 - 54$
  - Neutrons = 77



# NUMBER OF NEUTRONS

Find the number of neutrons in each of the following:

- Hydrogen
- Lithium
- Sodium
- Bromine
- Iron

# NUMBER OF NEUTRONS

Find the number of neutrons in each of the following:

- **Hydrogen → 0**
  - $1 - 1 = 0$
- **Lithium → 4**
  - $7 - 3 = 4$
- **Sodium → 12**
  - $23 - 11 = 12$
- **Bromine → 45**
  - $80 - 35 = 45$
- **Iron → 30**
  - $56 - 26 = 30$

# SUMMARY

Number of Protons = **Atomic Number**

Number of Electrons = **Number of Protons/Atomic Number**

Number of Neutrons = **Mass # - Protons**

# DO NOW

Find the protons, electrons, and neutrons of the following:

- Oxygen
- Neon
- Zirconium



# OXYGEN

Number of Protons = Atomic Number

- Atomic Number  $\rightarrow$  8

- Protons = 8

Number of Electrons = Number of Protons

- Number of Protons  $\rightarrow$  8

- Electrons = 8

Number of Neutrons = Mass # - Protons

- Mass # = 16

- Protons = 8

- Neutrons = 16 - 8  $\rightarrow$  8

# NEON

Number of Protons = Atomic Number

- Atomic Number  $\rightarrow$  10

- Protons = 10

Number of Electrons = Number of Protons

- Number of Protons  $\rightarrow$  10

- Electrons = 10

Number of Neutrons = Mass # - Protons

- Mass # = 20

- Protons = 10

- Neutrons = 20 - 10  $\rightarrow$  10

# ZIRCONIUM

Number of Protons = Atomic Number

- Atomic Number  $\rightarrow$  40

- Protons = 40

Number of Electrons = Number of Protons

- Number of Protons  $\rightarrow$  40

- Electrons = 40

Number of Neutrons = Mass # - Protons

- Mass # = 91

- Protons = 40

- Neutrons = 91 - 40  $\rightarrow$  51