



HOW MOLECULES ARE MADE AND THE BIG NEW IDEA

ATOMS AND MOLECULES

- Previously we learned about **atoms**!
 - What they are made of
 - How big they are
 - How they are different from each other.

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MOLECULES AND THEIR **BONDS**

- **An atomic bond** is when **two or more atoms stick together.**



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HOW DO BONDS WORK?

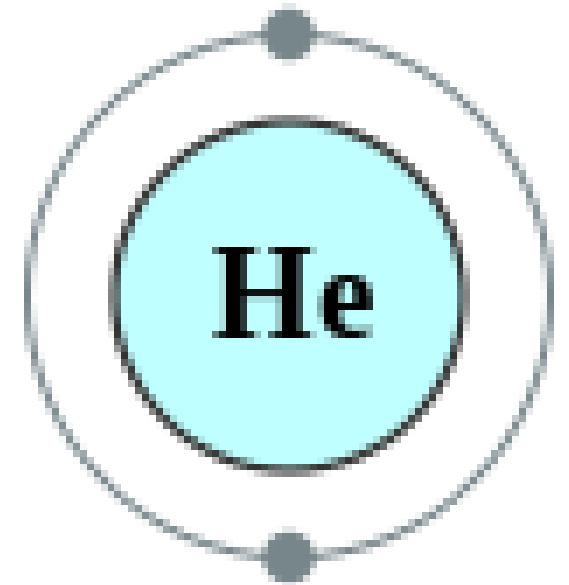
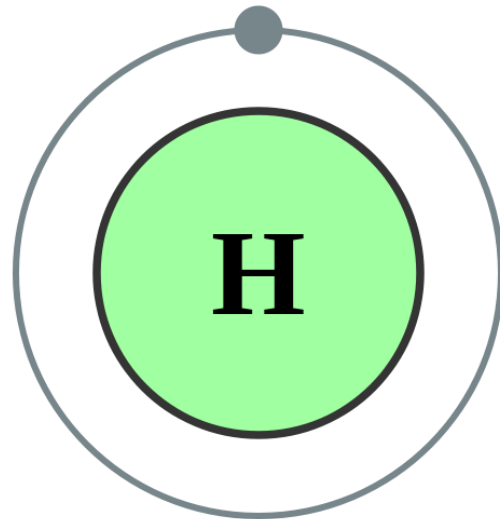
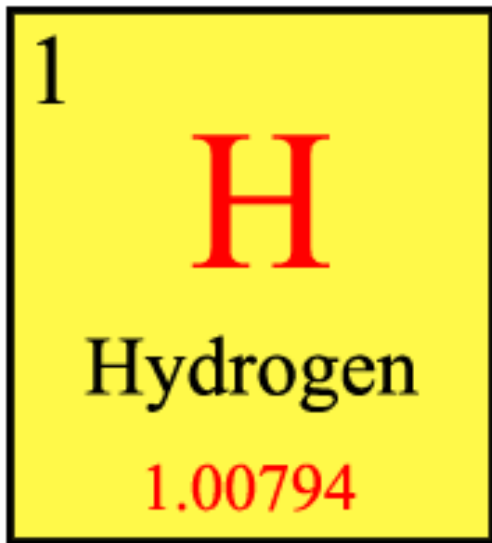


ATOMS AND THEIR ELECTRONS

- Each atom has electrons.
- These **electrons** are in '**electron shells**' around the **nucleus**.
 - **Electrons** are **only** allowed to be in these shells.
 - **Each shell** can have a certain **number of electrons**.

ATOMS AND THEIR ELECTRONS

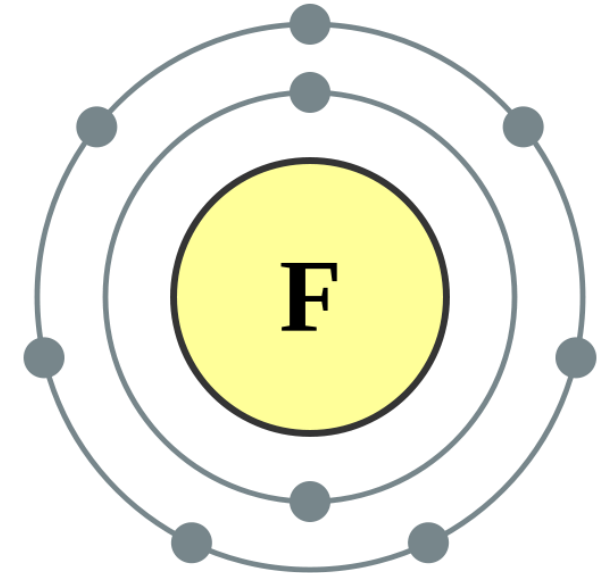
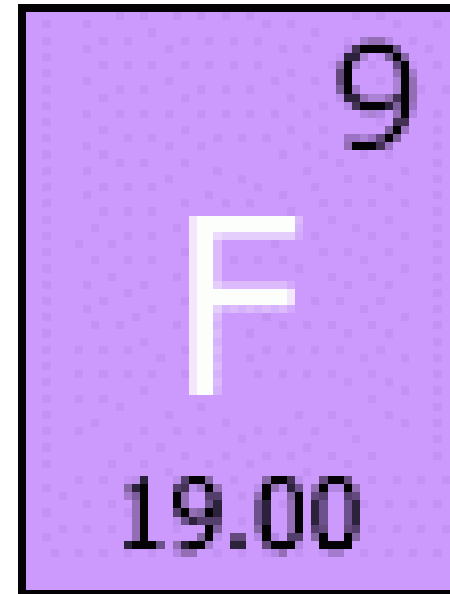
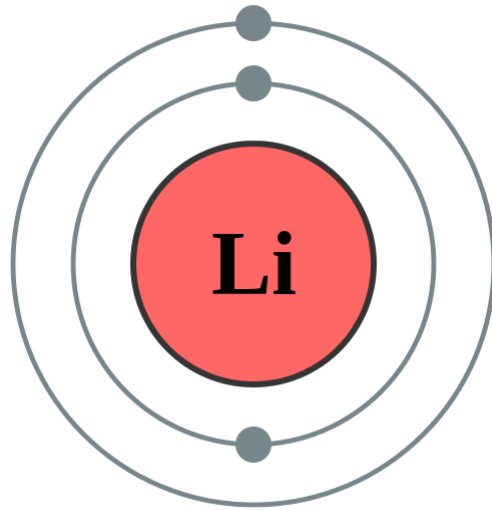
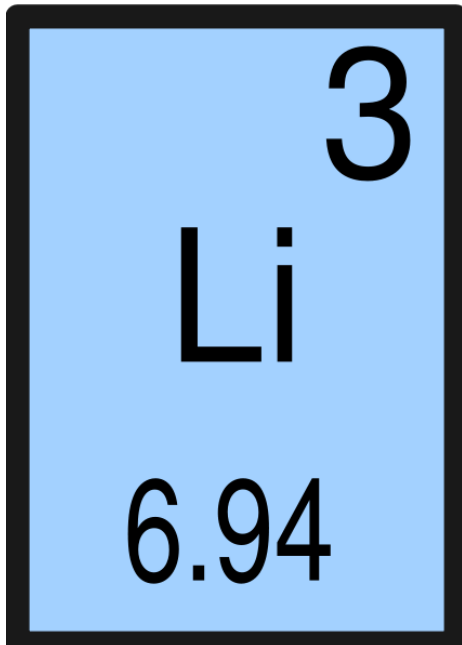
Some examples of **neutral atoms**:



Neutral Atoms have no charge
Number of Protons=Number of Electrons

ATOMS AND THEIR ELECTRONS

Some examples of **neutral atoms**:



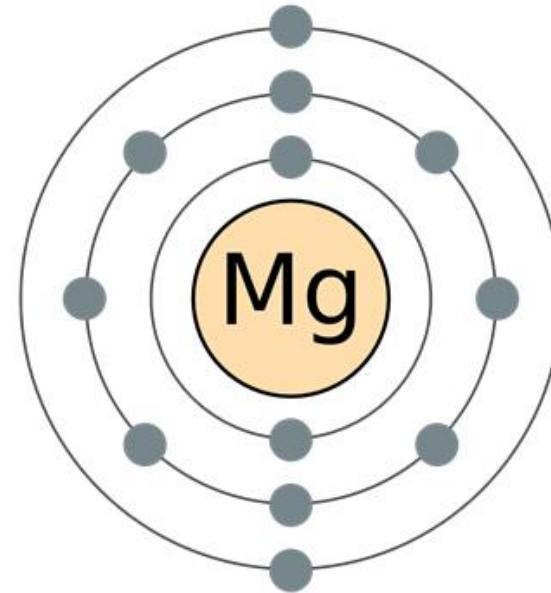
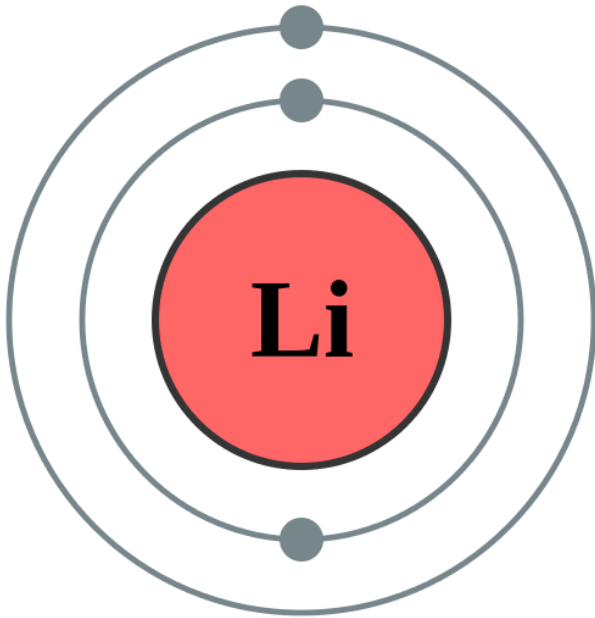


ATOMS AND THEIR ELECTRONS

- The **outermost shell** is called the **Valence Shell**.
- **This shell is where bonds between atoms happen.**
- An **atom** is '**happy**' when it **has filled shells**.
 - 1st shell is filled by 2 electrons
 - 2nd shell onwards is filled by 8 electrons

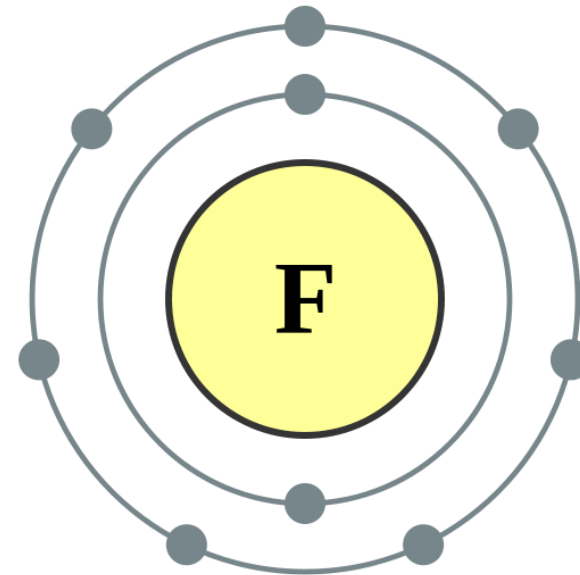
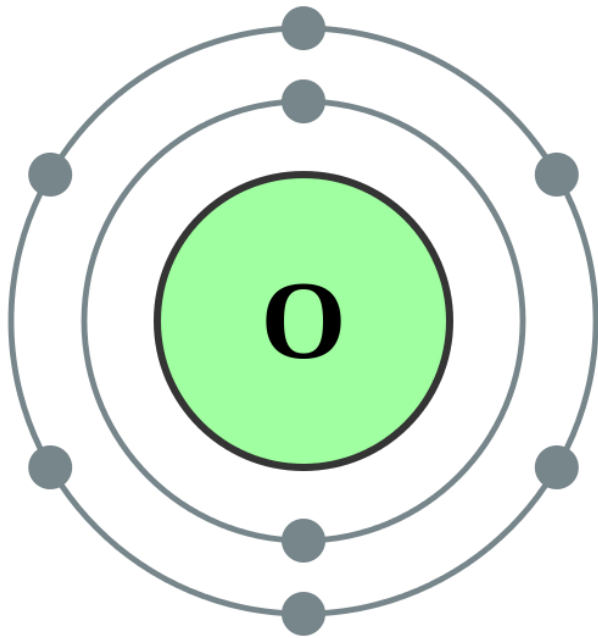
ATOMS AND THEIR ELECTRONS

- Some atoms **have too many electrons** and **want to give them away**.



ATOMS AND THEIR ELECTRONS

- Some atoms **Don't have enough electrons** and **want to take electrons**.





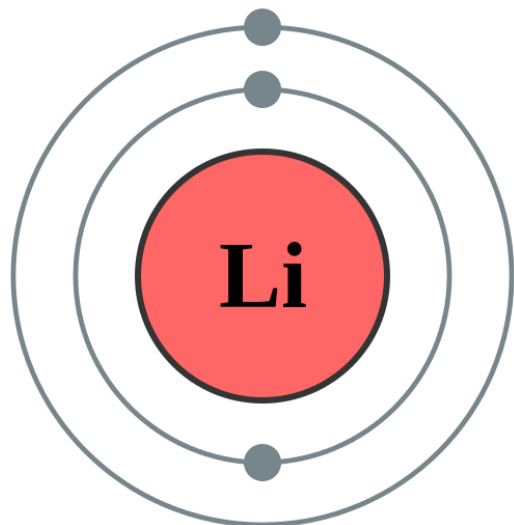
ATOMS AND THEIR ELECTRONS

- **Electronegativity** is a measure of **how much** an atom **'wants'** electrons.

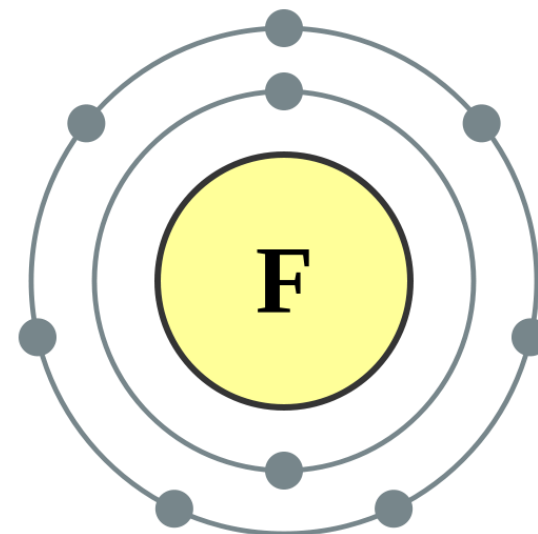
ATOMS AND THEIR ELECTRONS

- **Electronegativity** is a measure of **how much** an atom **'wants'** electrons.

Li has a low
Electronegativity (1.0)



F has a high
electronegativity
(4.0)





ATOMS AND THEIR ELECTRONS

- **Electronegativity** is a measure of **how much** an atom **'wants'** electrons.
- The **difference in electronegativity** also **tells us** the **kind of bond** that forms.



THE KINDS OF BONDS



THE KINDS OF BONDS

- **Ionic Bonds**



THE KINDS OF BONDS

- **Ionic Bonds**
- **Covalent Bonds**



THE KINDS OF BONDS

- **Ionic Bonds**
- **Covalent Bonds**
- **Metallic Bonds**



THE KINDS OF BONDS

- **Ionic Bonds**
- **Covalent Bonds**
- **Metallic Bonds**
- **I will only explain Ionic and Covalent Bonds**



IONIC BONDING

- One **atom gives** its **electron(s)** to the **other atom**.
- This **bond happens** when there is a **large difference** between the **atoms electronegativity**.



IONIC BONDING

- Ionic Bonding Example:
- **Salt!**

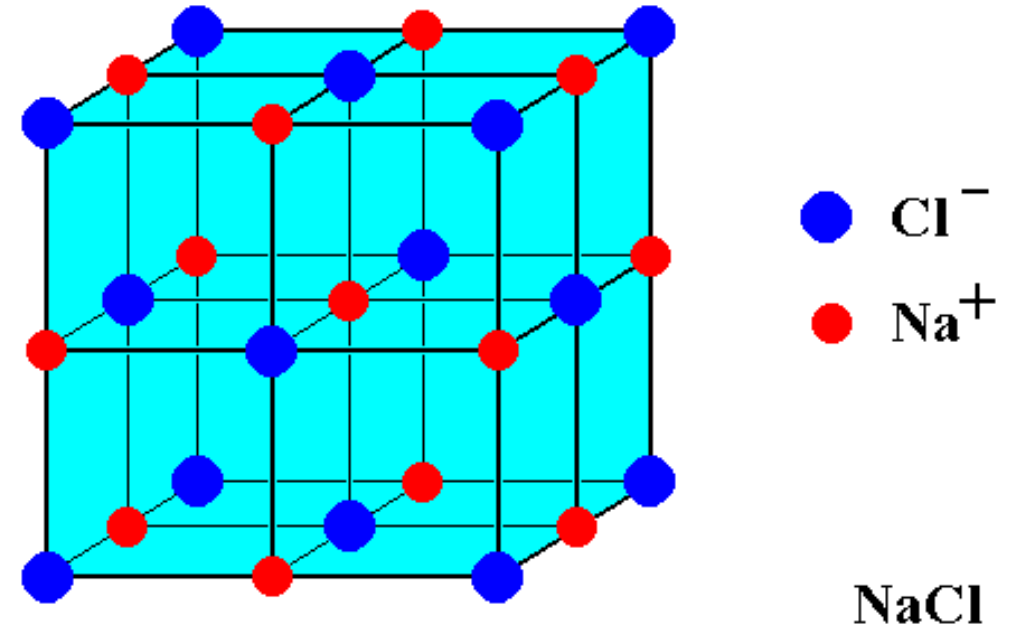
IONIC BONDING

See Blackboard time!
Molecules Worksheet

- Ionic Bonding Examples:

- Salt!

IONIC COMPOUNDS MAKE CRYSTALS





Now You Try It!



COVALENT BONDING

- **Atoms share electrons.**
- This **bond happens** when there is a **small difference** between the **atoms electronegativity**.



COVALENT BONDING

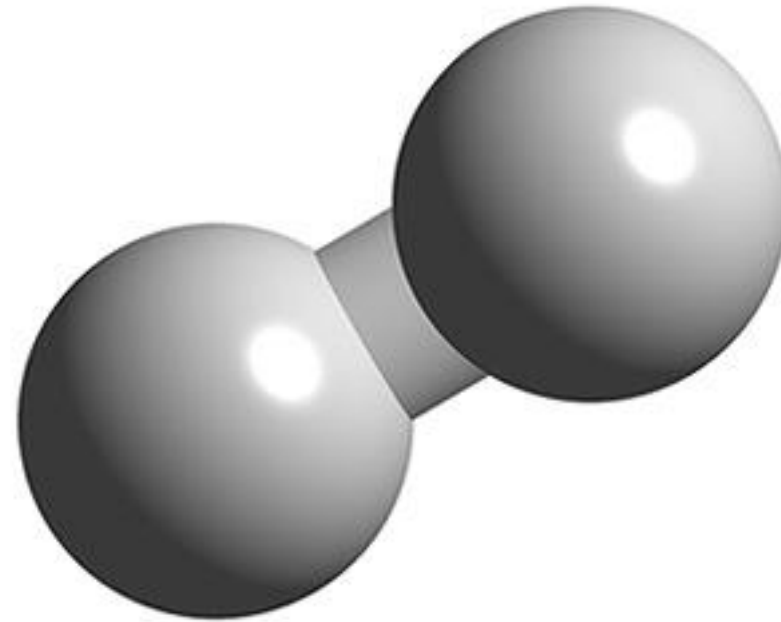
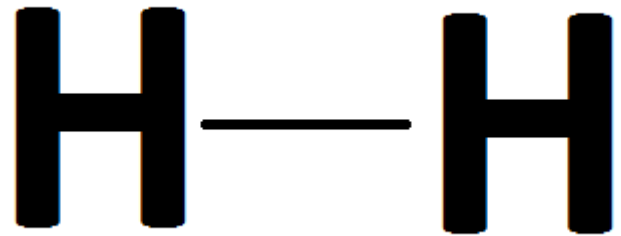
- Covalent Bonding Example:
- Hydrogen!

COVALENT BONDING

- Covalent Bonding Example:
- Hydrogen!

Blackboard time!

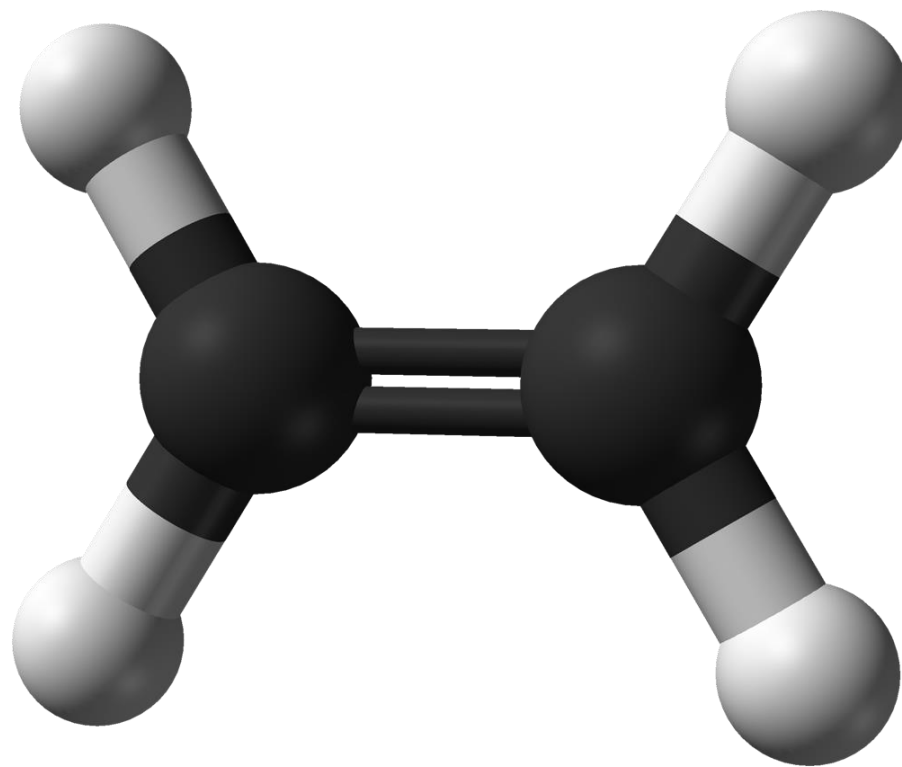
COVALENT BONDING MAKES MOLECULES



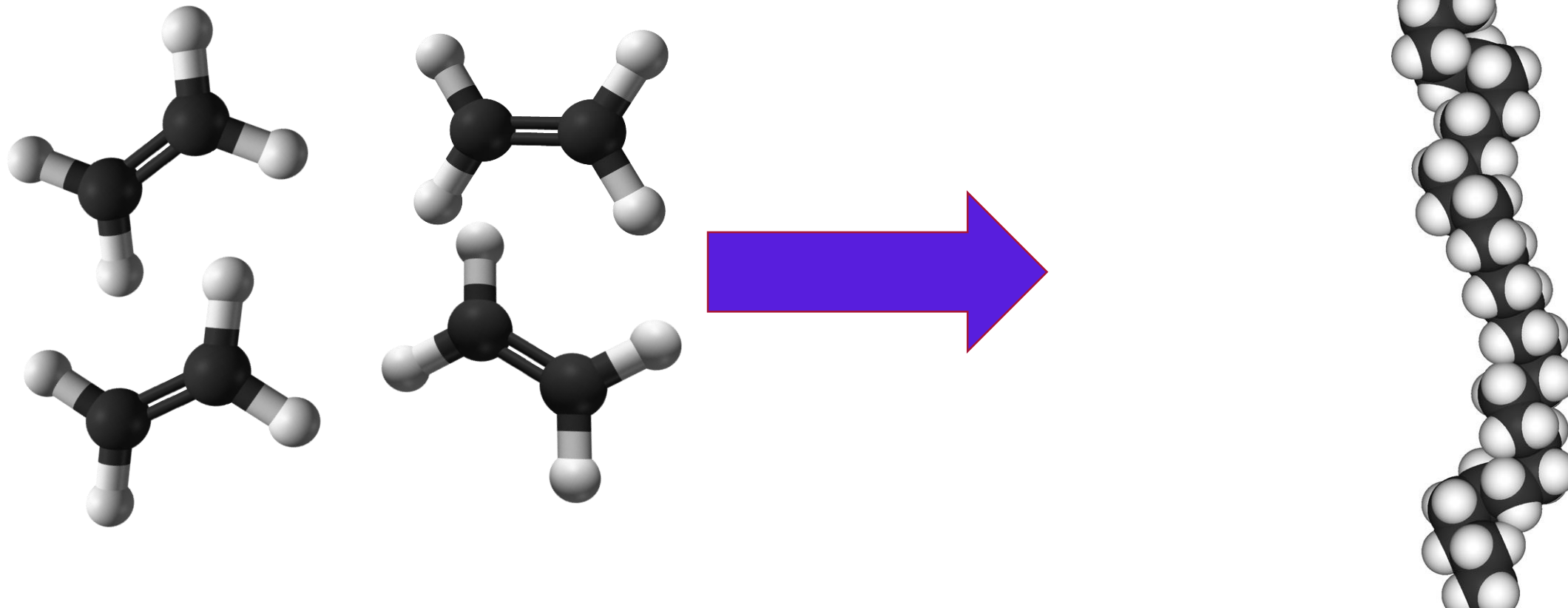


Now You Try It!
Make Some Molecules!

ETHENE



POLYTHENE



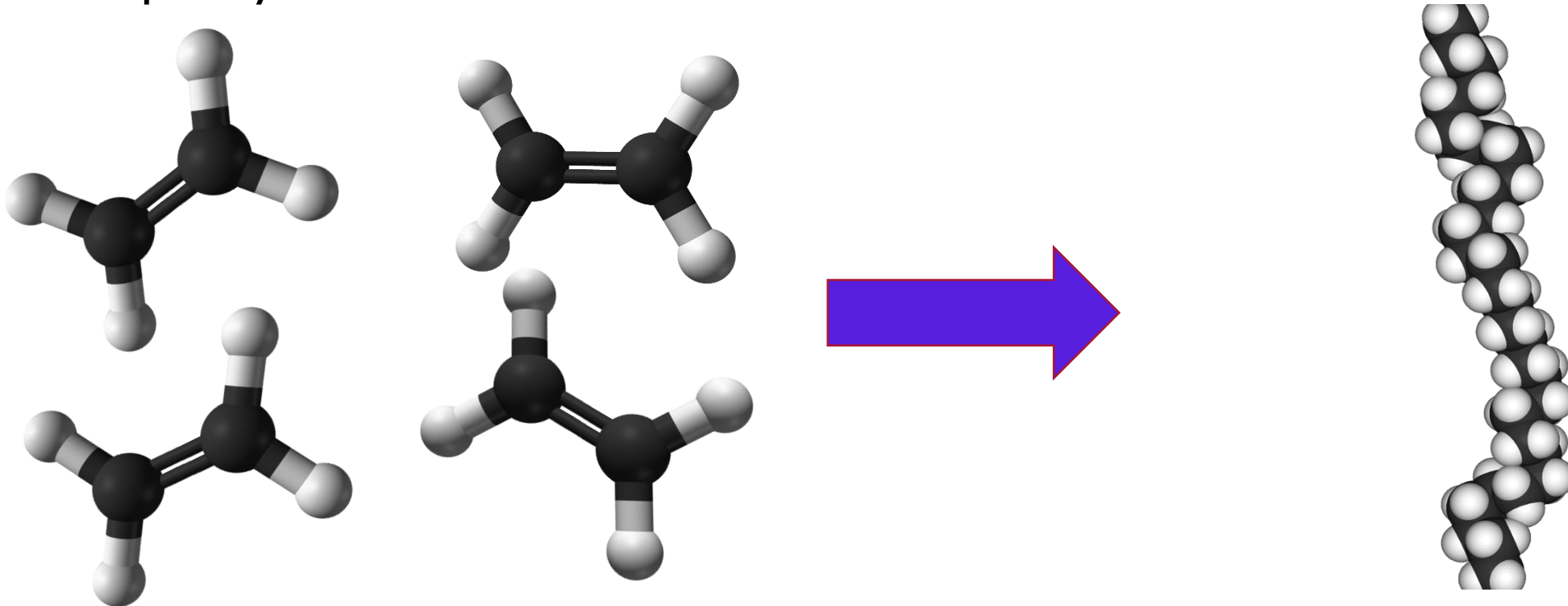


POLYTHENE THE POLYMER

- **Polythene** is a **polymer**.
- A **polymer** is a **molecule** that is made up of **long chains of repeating links**. Each **link** in the chain is a **smaller molecule**.
- **Monomers** are these **smaller molecules**.

POLYMERISATION

- The process where monomers join together to make a polymer.



REFERENCES

- GCSE Science Foundation textbook, pgs. 142-143, Oxford university press. 2011
- W.P. Wagner Science. Victor Wong (teacher). Edmonton Public Schools.
<https://sites.google.com/a/share.epsb.ca/mr-wong-s-share-site/chemistry-20/unit-a-the-diversity-of-matter-and-chemical-bonding> (accessed: 2016/09/20)