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Atoms – Level 1

Reviewed 2025

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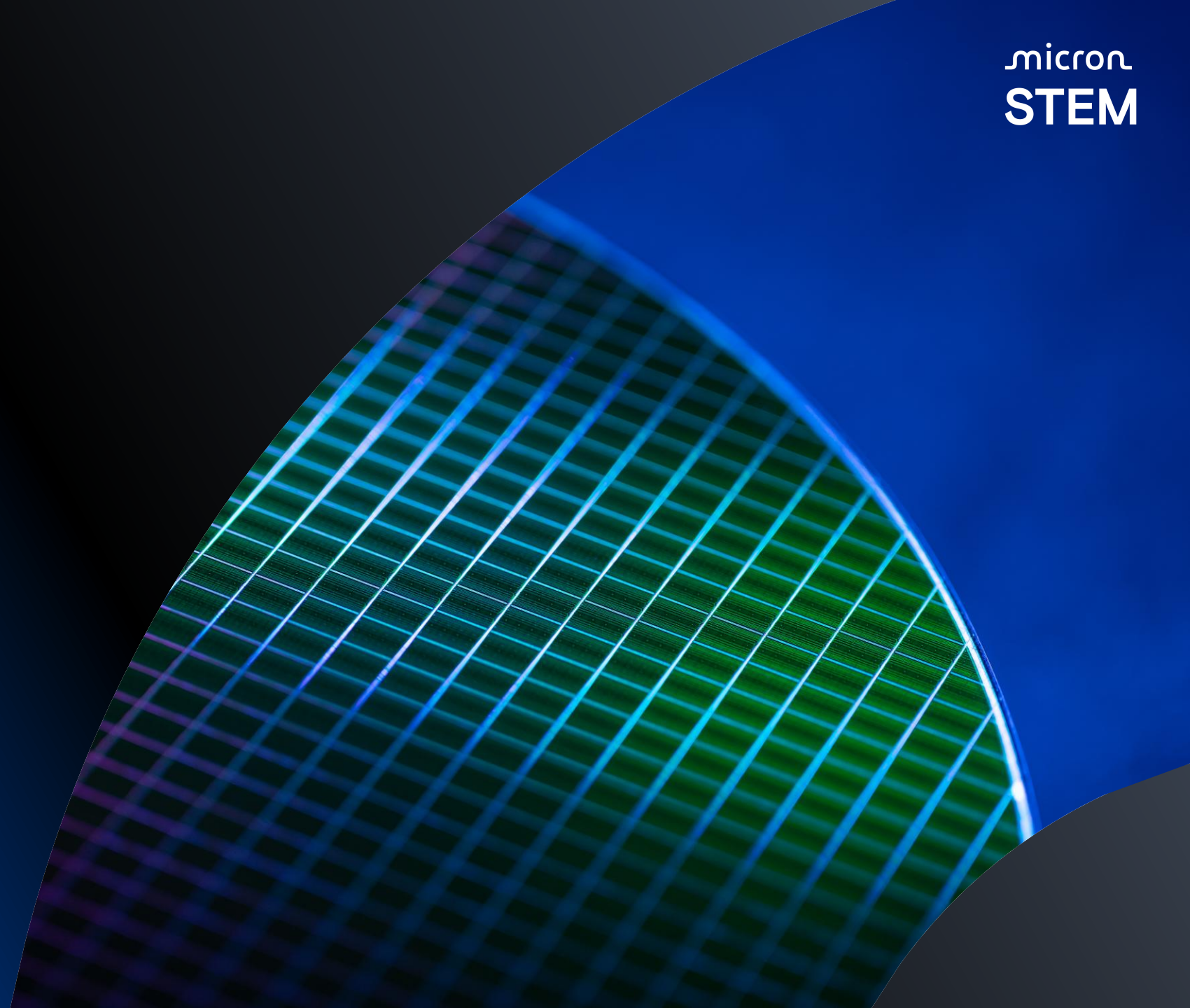
Atoms

K-12 Semiconductor Topics
Level 1



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Hi, I’m Mike Rawn, and I will be your learning guide through this module!

Sand, the sea, rocks, toys

Gases

What is everything made of?

Food

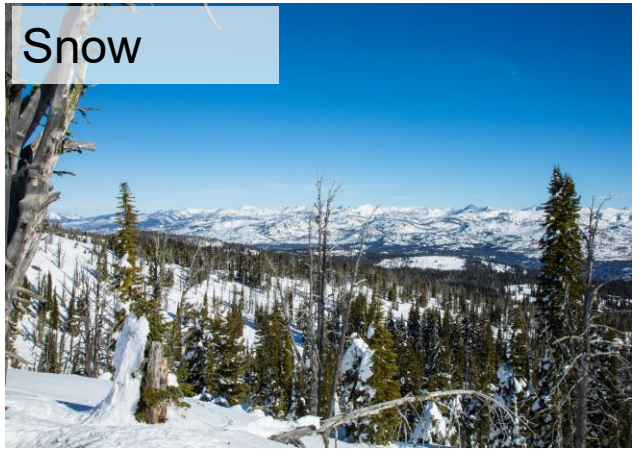
This girl and the bubbles

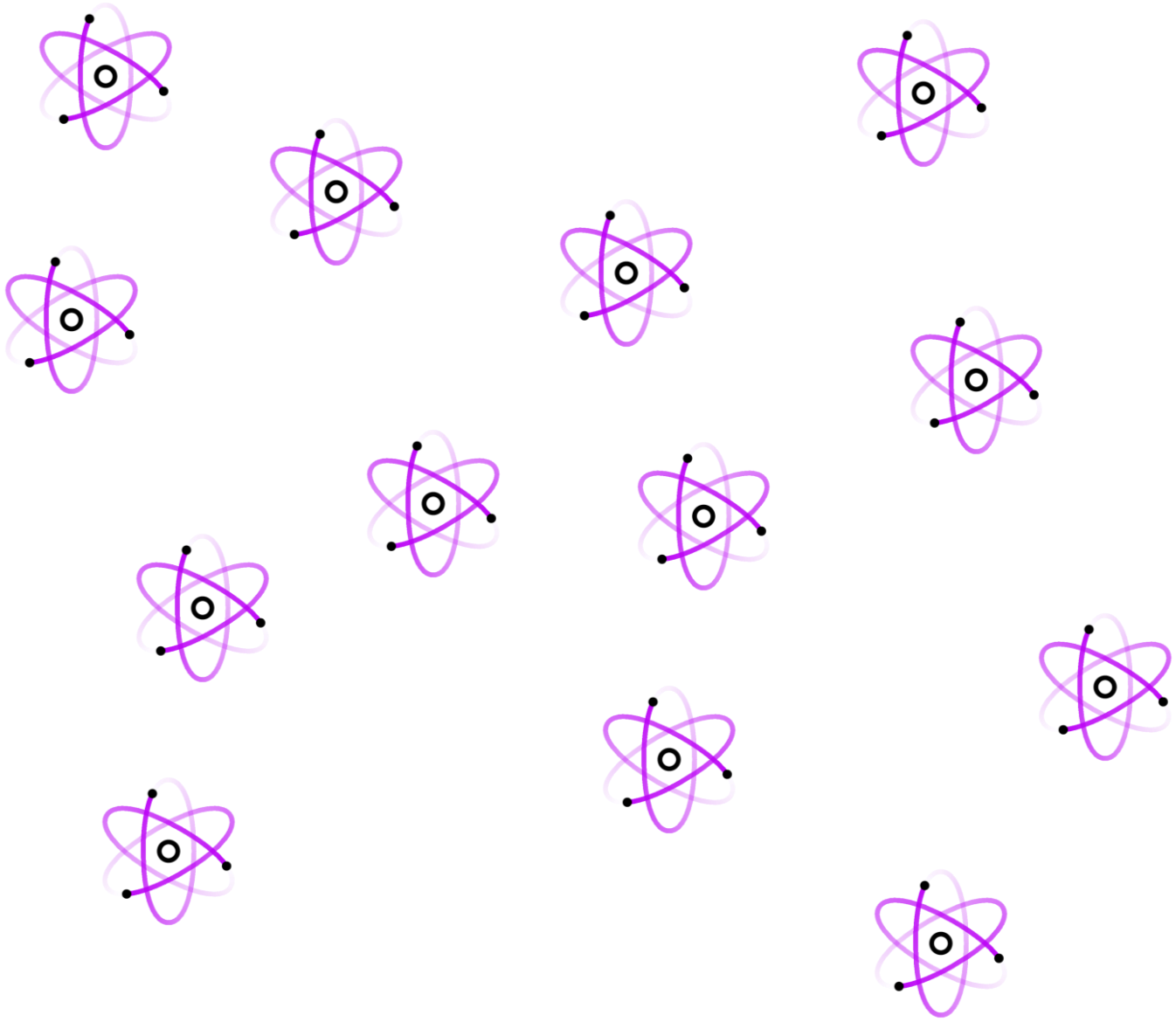
Our friends, the classroom

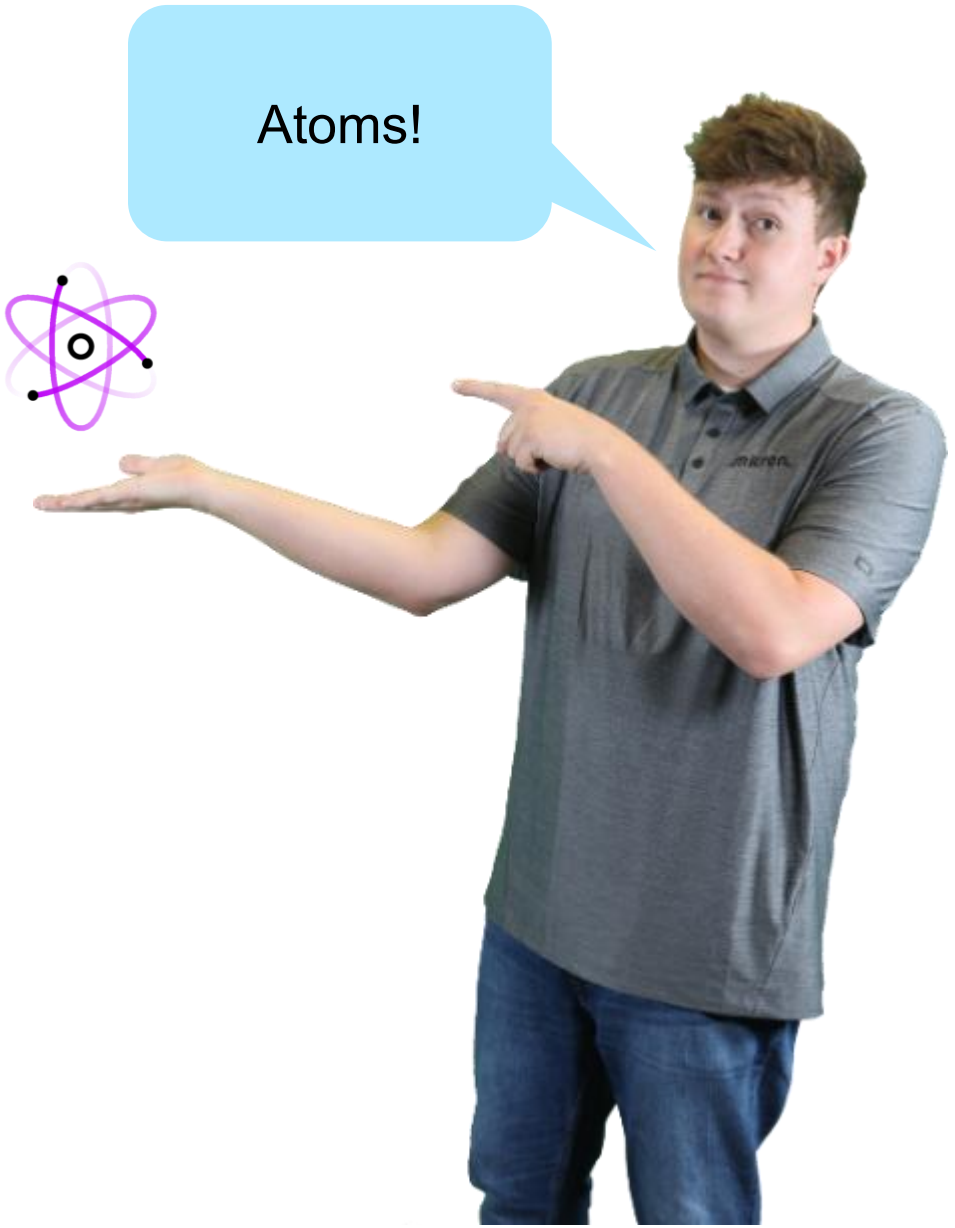
Trees, people, buildings

This lion

Snow






Atoms!

Brief History Lesson: Meet Democritus

Greek philosopher – lived 460-370B.C.

Origin of the word ‘atom’ - Greek word meaning “uncuttable”

Scientists that study atoms are chemists and physicists

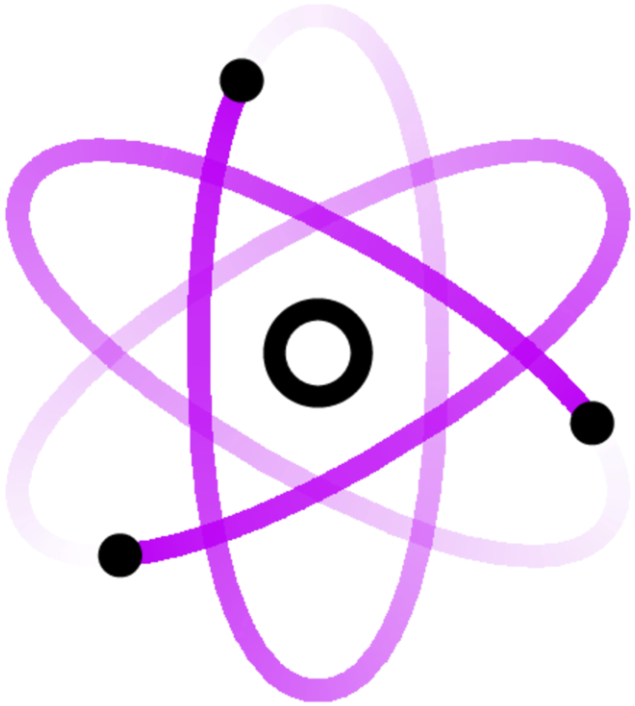
For thousands of years, scientists believed atoms were the smallest pure substances, until the early 20th century when it was discovered that atoms are made up of sub-atomic particles

Never trust an atom…

They make up everything!

Atomic Structure

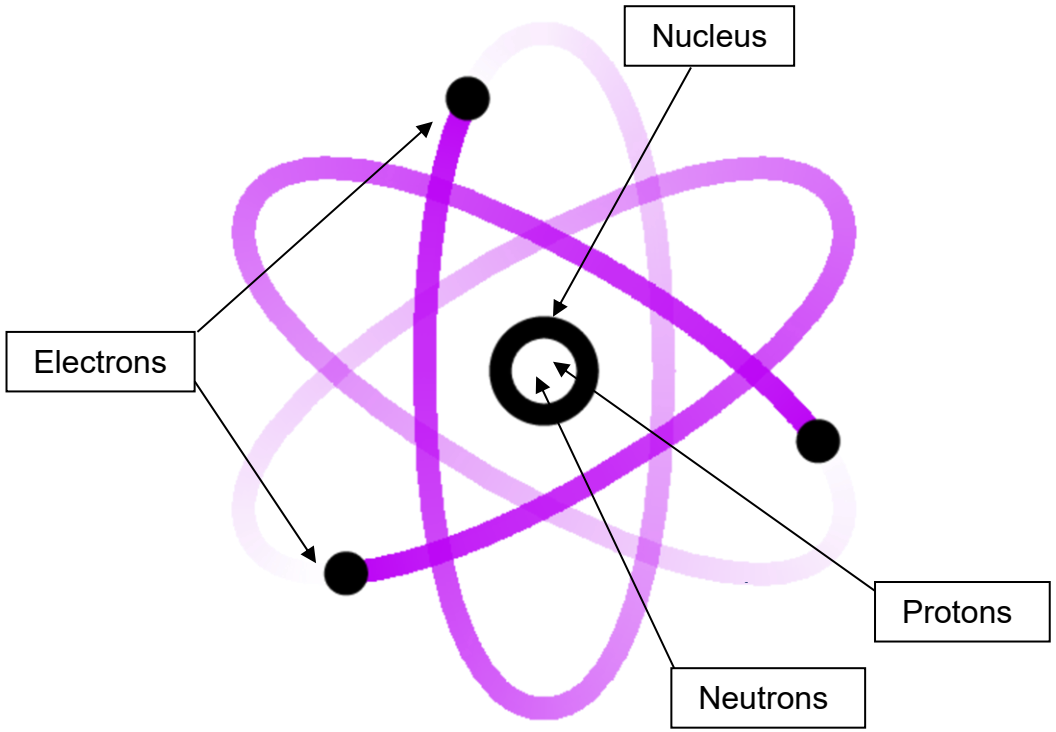
Parts of an atom (sub-atomic particles)



Atomic Structure

Parts of an atom (sub-atomic particles)

Different combinations of the sub-atomic particles combine to make all the unique elements (atoms)



- Nucleus
- Proton
- Neutron
- Electron

Atomic Structure

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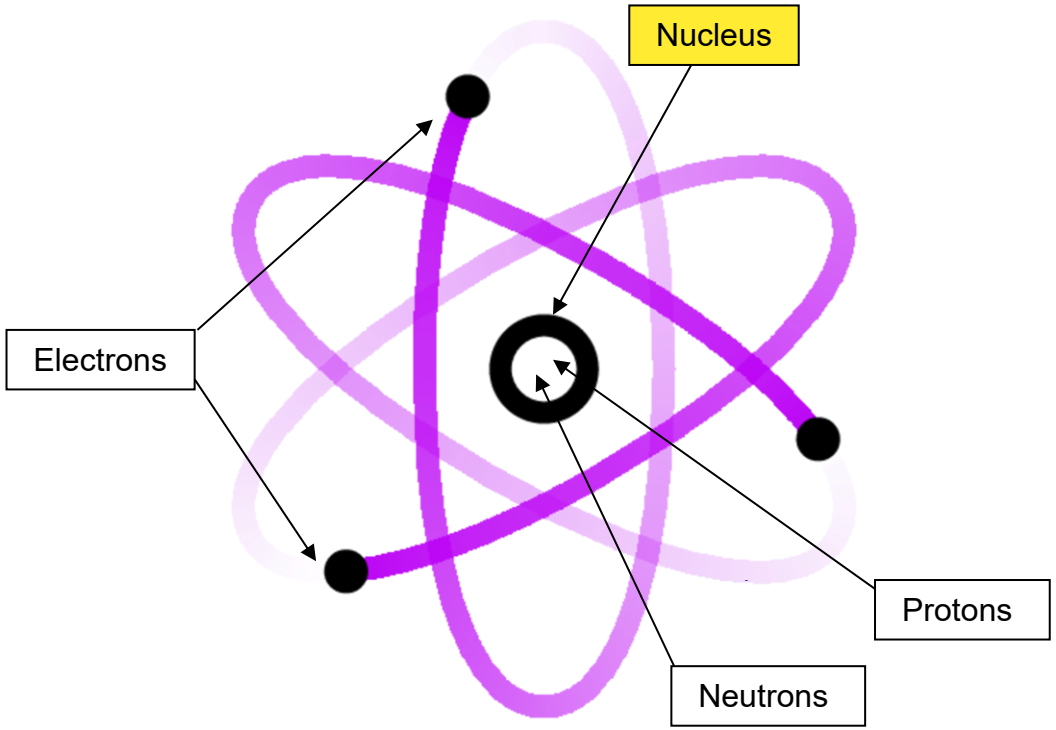


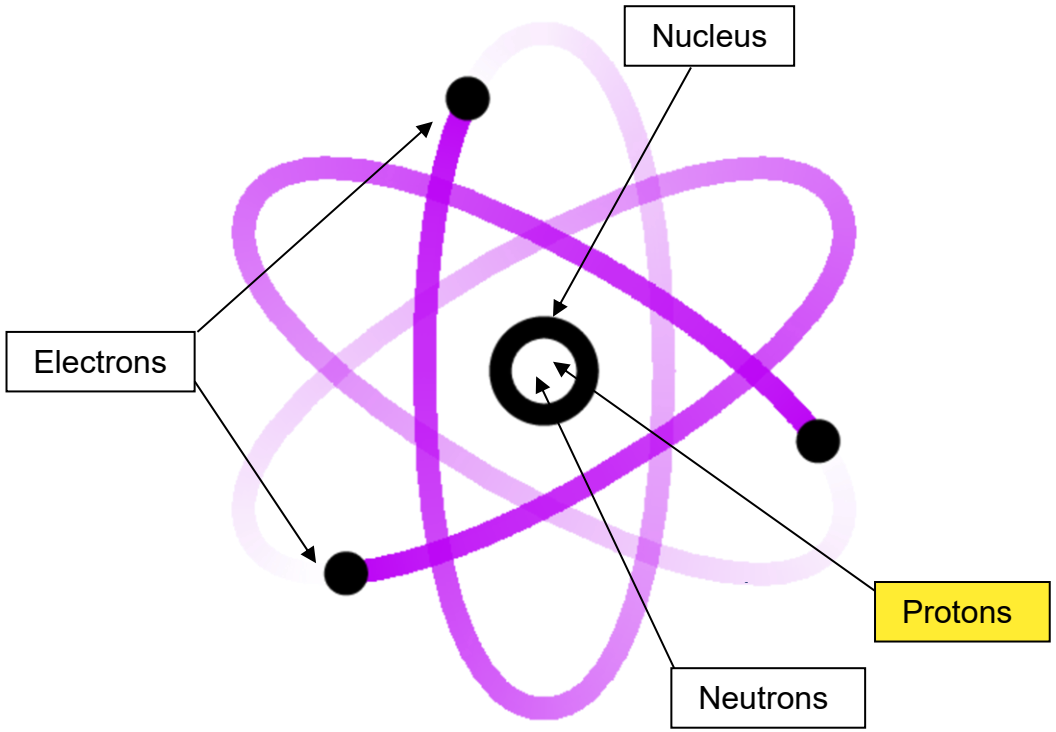
Nucleus

- Positive charge - from Proton(s)
- Center of the Atom
- Houses Protons and Neutrons

Atomic Structure

Parts of an atom (sub-atomic particles)

Different combinations of the sub-atomic particles combine to make all the unique elements (atoms)



Proton

- Positive charge (+)
- Number of protons is unique to every atom
- Greek word: “First”

Atomic Structure

Parts of an atom (sub-atomic particles)

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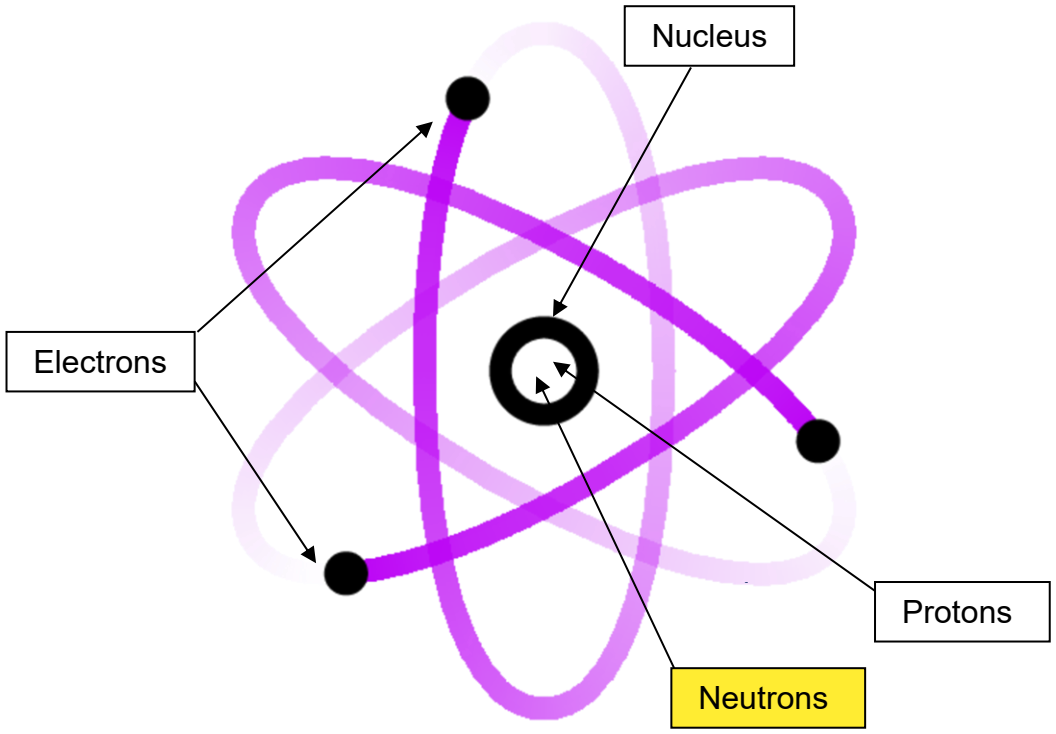


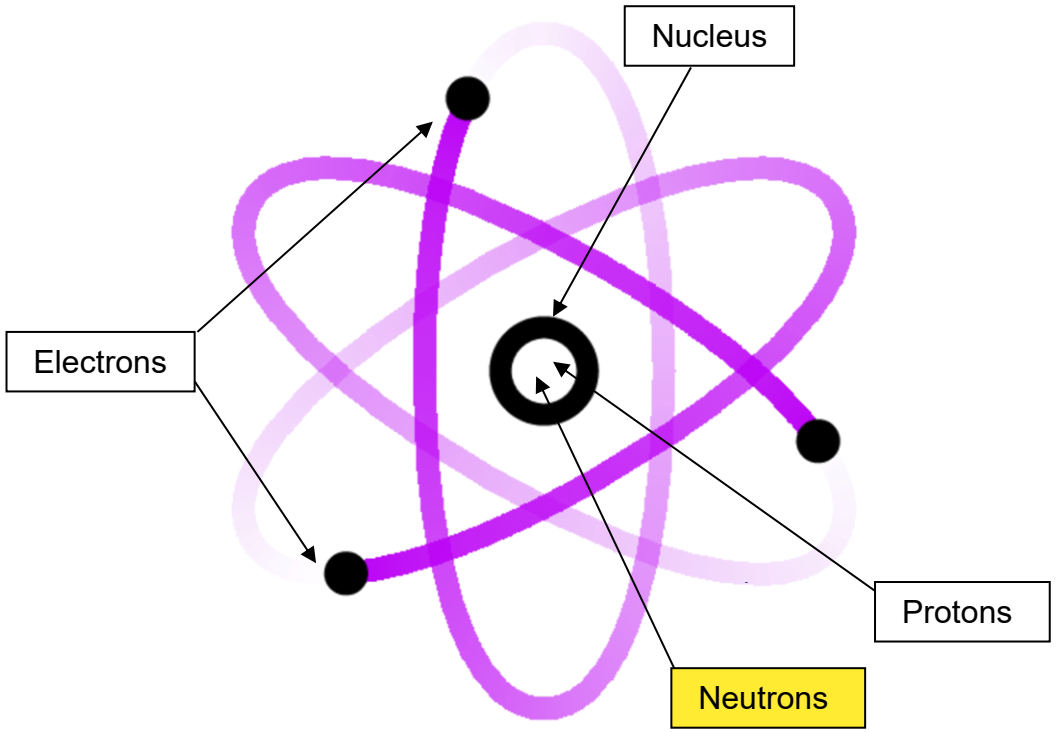
Neutron

- No charge
- Defines the mass of the atom
- Latin word: “Neutral”

Atomic Structure

Parts of an atom (sub-atomic particles)

Different combinations of the sub-atomic particles combine to make all the unique elements (atoms)



A neutron walks into a restaurant. The waitress says, “For you, no charge!”

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Neutron

- No charge
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Atomic Structure

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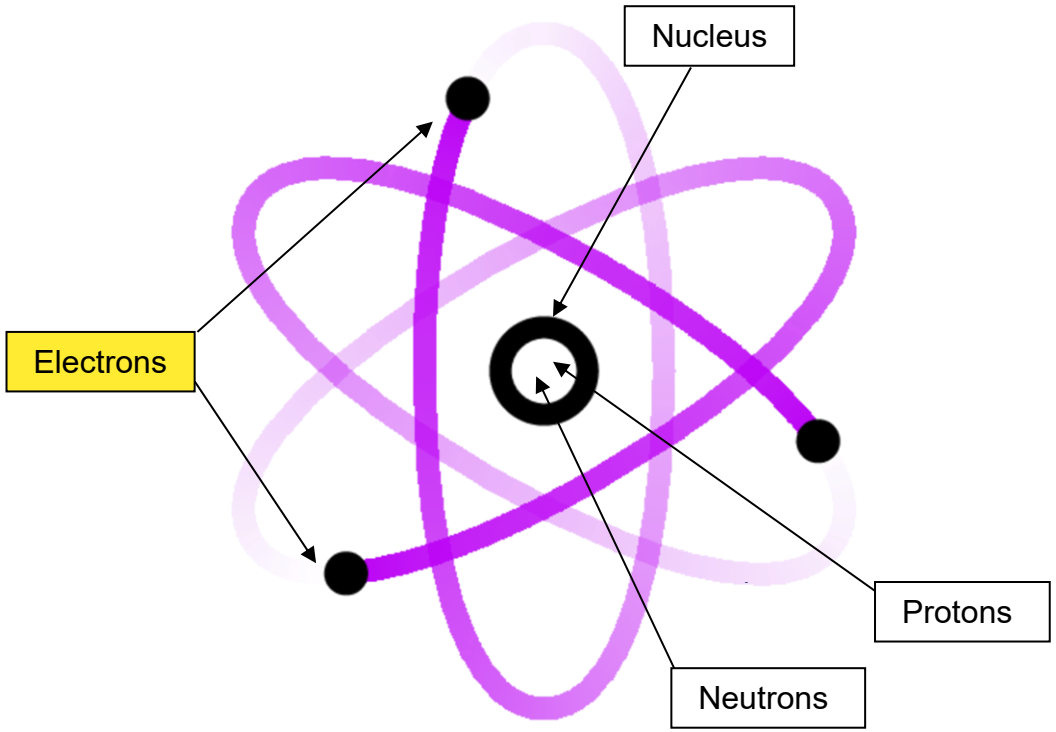

Electron

- Negative charge (-)
- Almost 2000 times smaller than a proton or neutron
- Not part of the nucleus
- Can be shared between atoms
- Certain atoms can lose or gain electrons

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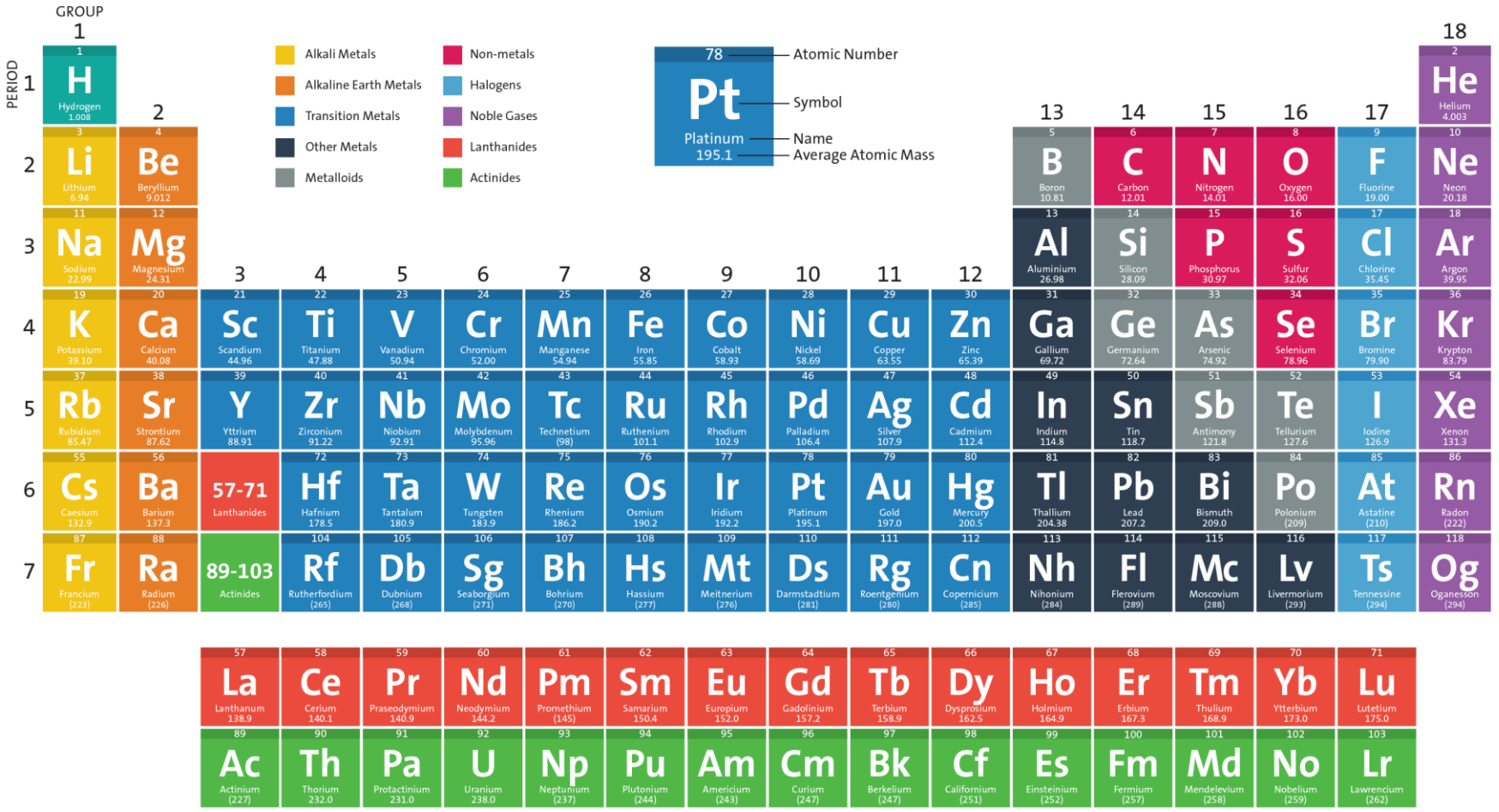
PERIODIC TABLE OF ELEMENTS



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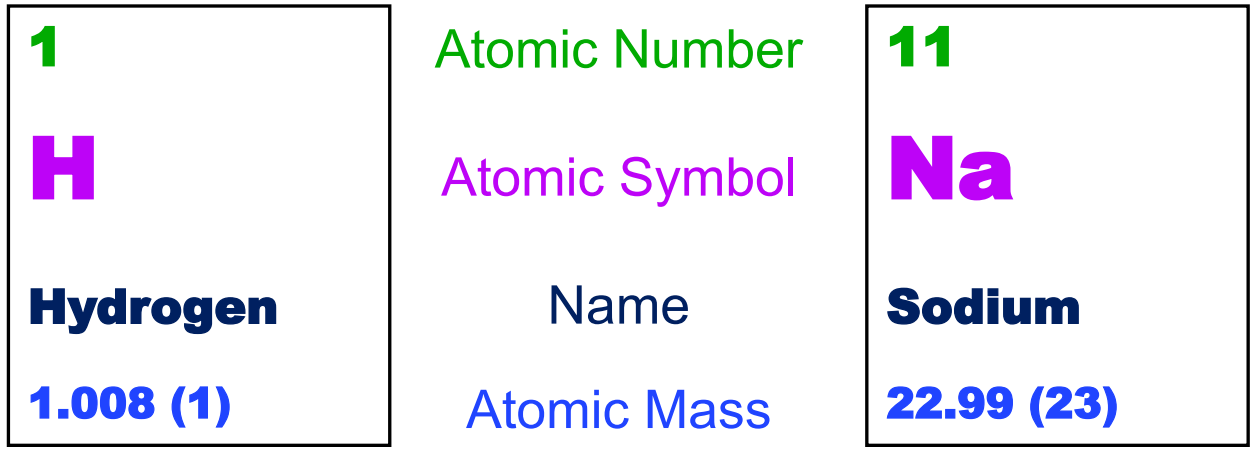
Periodic Table of the Elements

Elements is another term for atoms

- Table initially designed in 1869 by scientist Dmitri Mendeleyev.
- Elements are identified by their symbols (example: O for oxygen)
- Each element has their own cell with the following information:
  - Atomic Number
  - Atomic Symbol
  - Name
  - Atomic Mass



A look at the Sodium atom

Atomic Number **11**

Atomic Symbol **Na**

Name **Sodium**

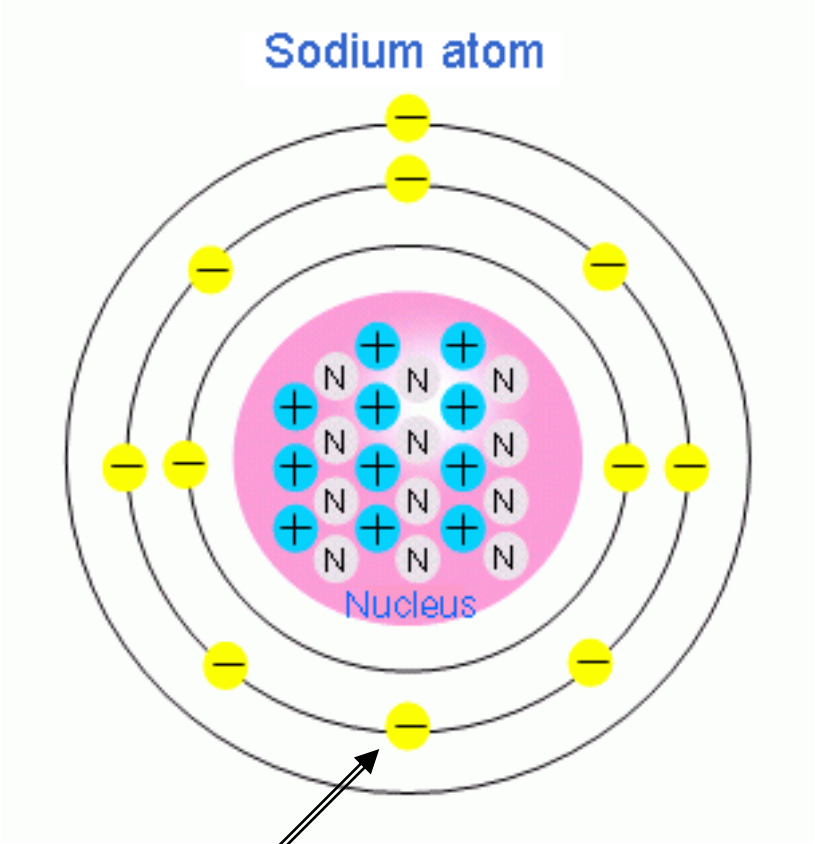
Atomic Mass **22.99 (23)**

Atomic Number = Number of Protons = 11

Atomic Mass - Atomic Number = Number of Neutrons

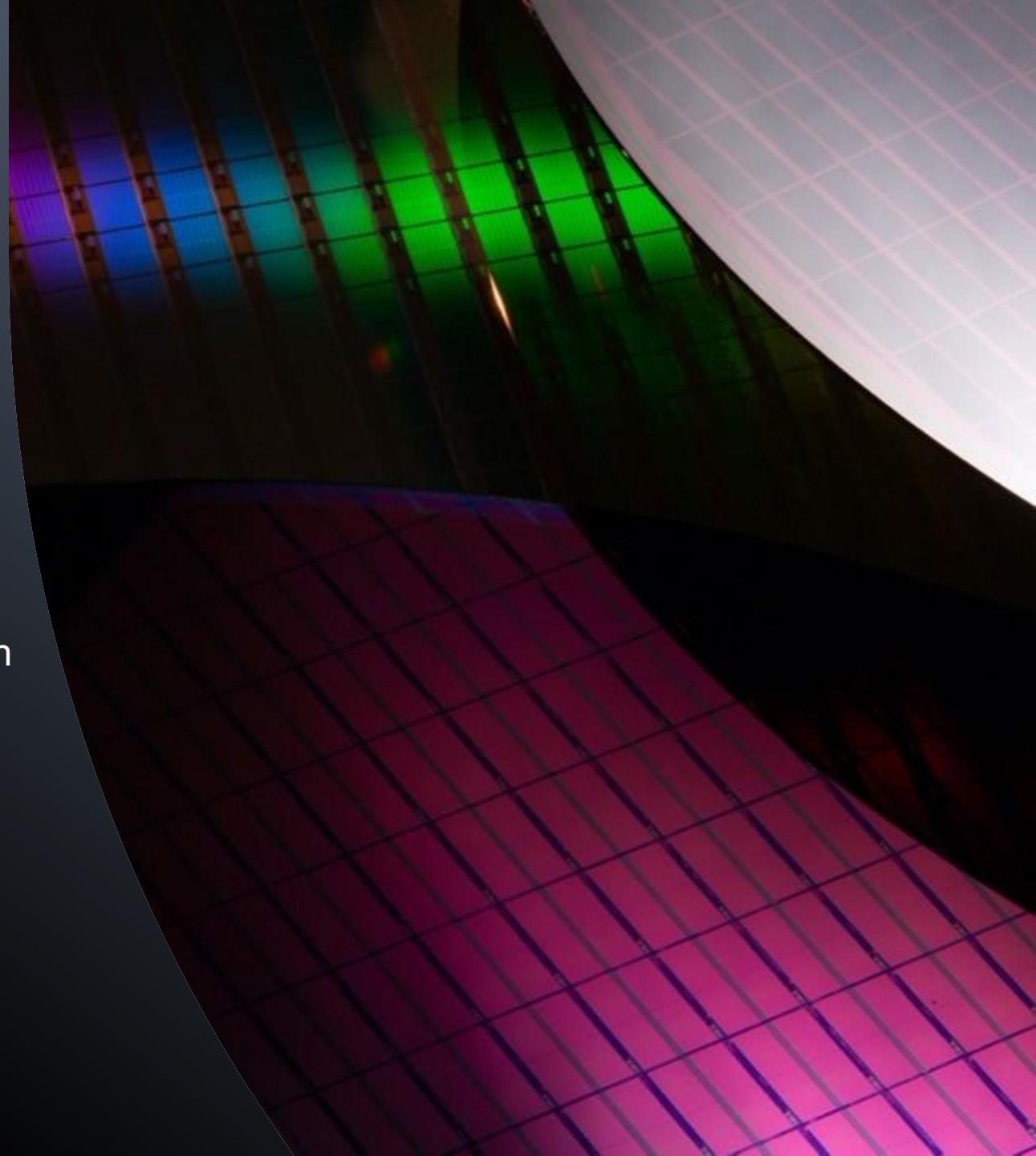
23 - 11 = 12

Number of Protons = Number of Electrons = 11



Chemistry is used to make memory chips

Technology is constantly evolving and advancing, which makes STEM jobs exciting.



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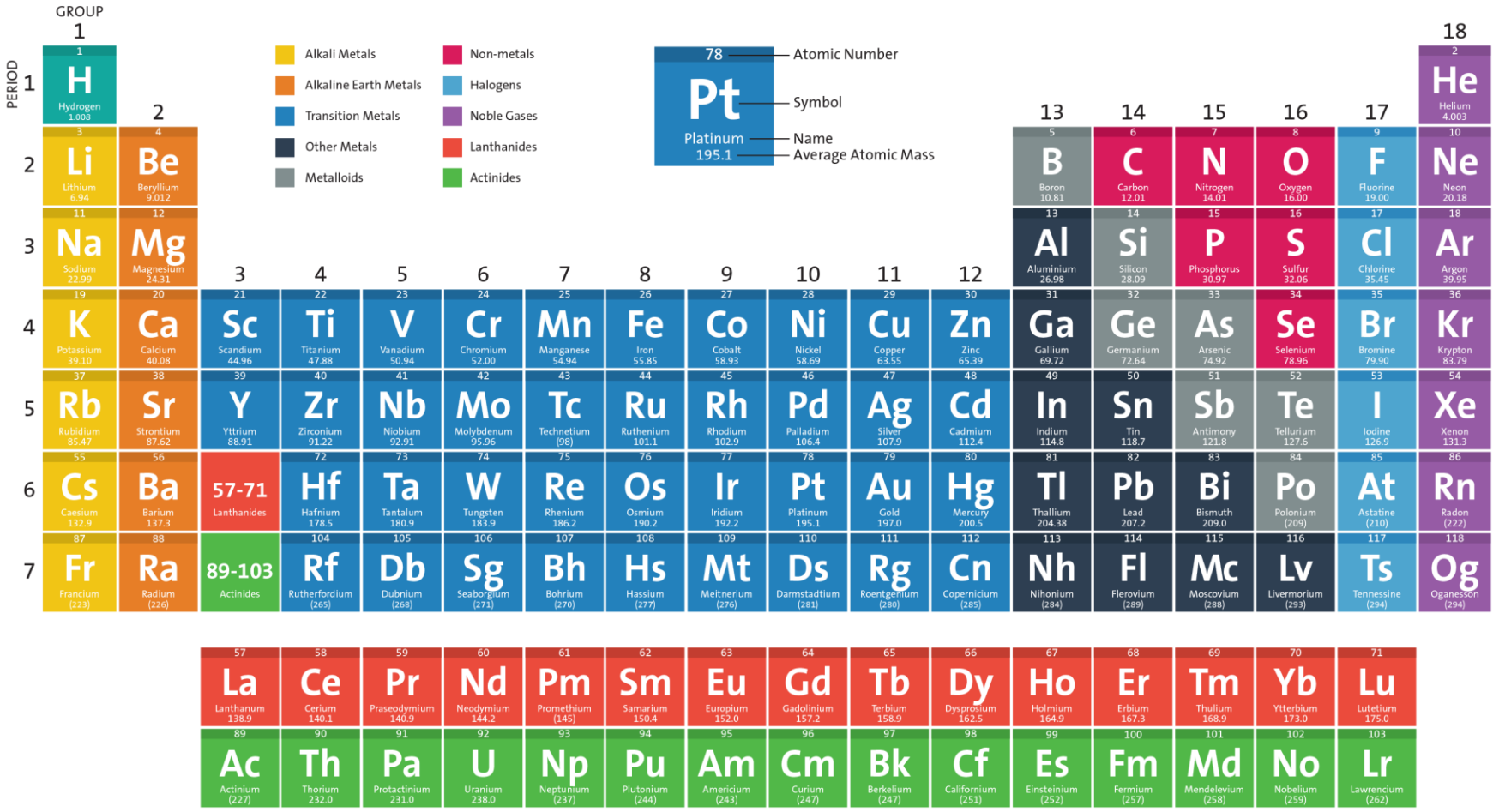

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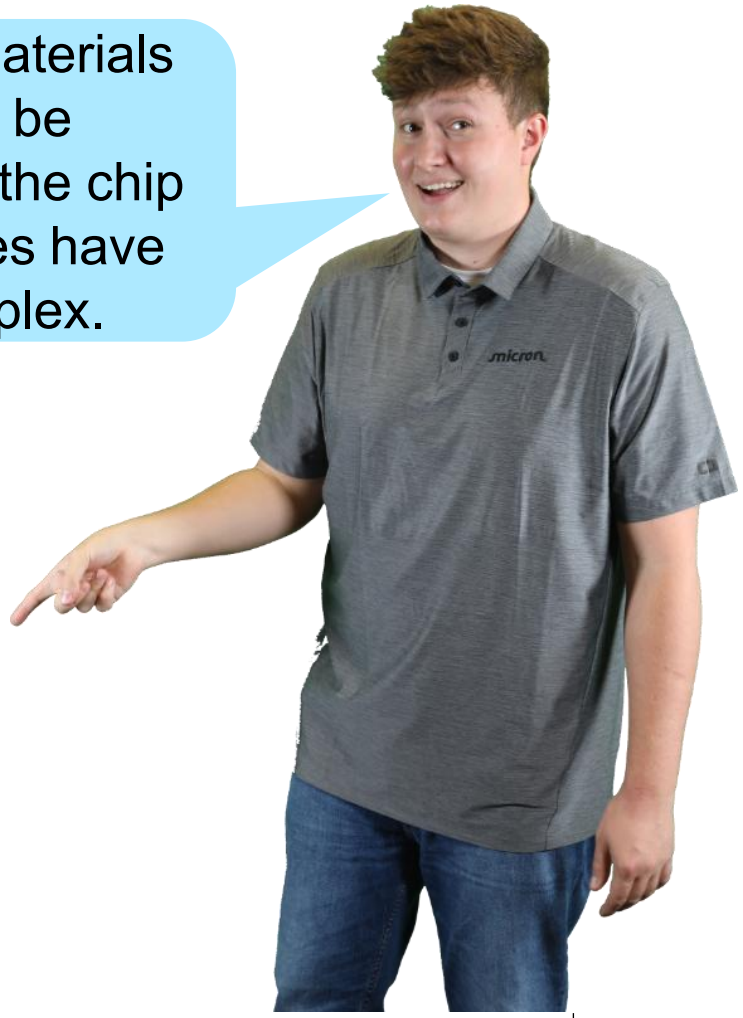
The number of elements used in silicon chip fabrication has grown over the decades

Over the years new materials (elements) had to be incorporated because the chip designs and processes have become more complex.



1980
13 elements

1990
17 elements

2000
64 elements

2010
68 elements

Atoms Activities

Atom Structure (activity paper is on next slide)

Periodic Table Cards (not shown in this slide deck)

ATOMS

Name: _____

Refer to a Periodic Table and the Key below to fill out this table for each element. Start with helium as your first atom to make.

1. Fill out the table below with the correct values.
2. Assemble the nucleus using the proper number of large colored and white marshmallows, sticking them together with toothpicks.
3. Select the proper number of small colored marshmallows (all one color) as your electrons. Attach them one at a time to the nucleus with toothpicks, away from the nucleus.

ATOM	ATOMIC SYMBOL	ATOMIC NUMBER	NUMBER OF PROTONS (see key)	ATOMIC MASS (ROUNDED)	NUMBER OF NEUTRONS (see key)	NUMBER OF ELECTRONS (see key)
Hydrogen	***H***	***1***	***1***	***1.00***	***0***	***1***
Helium						
Lithium						
Beryllium						

Atomic Number **1**

Atomic Symbol **H**

Name **Hydrogen**

Atomic Mass **1.00794**

KEY

Number of Protons = Atomic Number
(Use the large colored marshmallows for protons)

Number of Neutrons = Subtract Atomic Number from Atomic Mass
(Use the large white marshmallows for neutrons)

Number of Electrons = Number of Protons
(Use the small colored marshmallows for electrons)

Congratulations on completing the Atoms – Level 1 module!

Ready for more? Check out other modules at the Micron Educator Hub. See you soon!

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