

Bell Ringer #21:

Socratic Room Name:
LEVEL70WARRIOR

Periodic Table

<http://drmoad.weebly.com/>

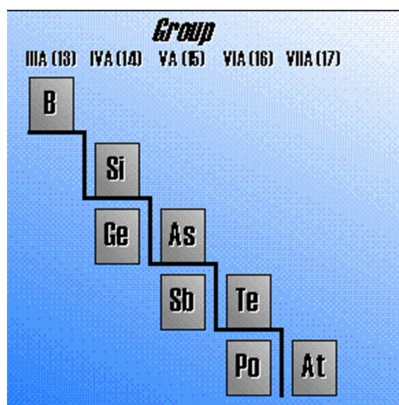
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Agenda

- Bell Ringer
- Atomic Radii Instruction
- Coloring Activity
- Whiteboard Questions
- Metal Demo
- Discuss Element Quiz
- Element Family Matching Worksheet
- Exit Ticket

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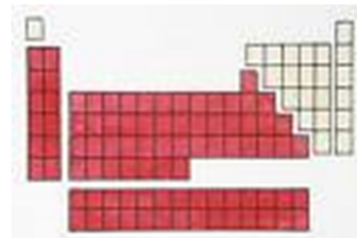
Metalloids



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Metals

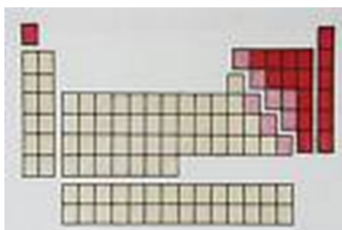
- Left side of the periodic table
- Conduct heat and electricity
- Form cations
- Malleable
- Ductile
- Luster



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Non-Metals

- Right side of the periodic table
- Do not conduct heat and electricity
- Forms anions (except noble gases)



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Lanthanide Metals

- Found in the first row of the f-block

A periodic table with the lanthanide metals highlighted in yellow. The lanthanide series is shown as a separate row below the main table, starting with Ce and ending with Lu.

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Actinide Metals

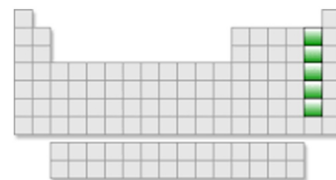
- Second row in the f-block

A periodic table with the actinide series highlighted in purple. The actinides are the 14 elements in the second row of the f-block, from Actinium (Ac) to Lawrencium (Lr).

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Halogens

- Second to last column
- Forms anions with -1 charge



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Noble Gases

- Last column in the periodic table



A periodic table with the noble gas group highlighted in red. The noble gases are the elements in the last column, from Helium (He) to Oganesson (Og).

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Atomic Radii

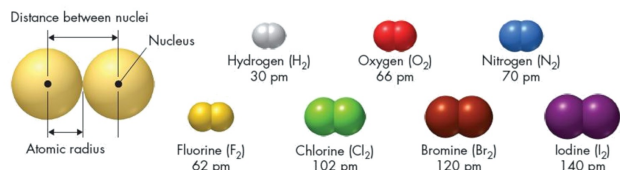
What are the trends among the elements for atomic size?

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Atomic Radii

One way to think about atomic size is to look at the units that form when atoms of the same element are joined to one another.

- These units are called molecules.
- Because the atoms in each molecule shown below are identical, the distance between the nuclei of these atoms can be used to estimate the size of the atoms.

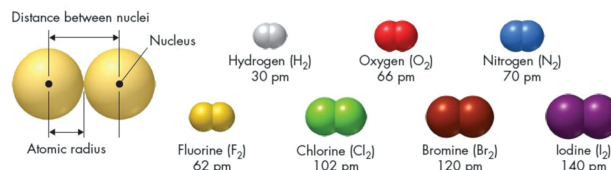


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Atomic Radii

This size is expressed as an atomic radius.

- The **atomic radius** is one-half of the distance between the nuclei of two atoms of the same element when the atoms are joined.

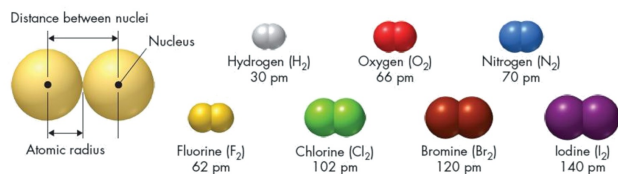


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Atomic Radii

The distances between atoms in a molecule are extremely small.

- The atomic radius is often measured in picometers (pm).
- Recall that there are one trillion, or 10^{12} , picometers in a meter.

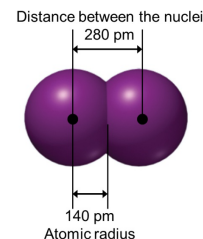


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Atomic Radii

The distance between the nuclei in an iodine molecule is 280 pm.

- Because the atomic radius is one-half the distance between the nuclei, a value of 140 pm ($280/2$) is assigned to the radius of the iodine atom.

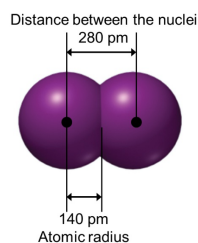


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Atomic Radii

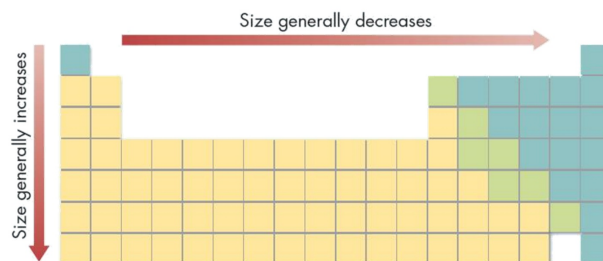
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- The figure below summarizes the group and period trends in atomic size.
- In general, atomic size increases from top to bottom within a group, and decreases from left to right across a period.



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Group Trends in Atomic Size

As the atomic number increases within a group, the charge on the nucleus increases and the number of occupied energy levels increases.

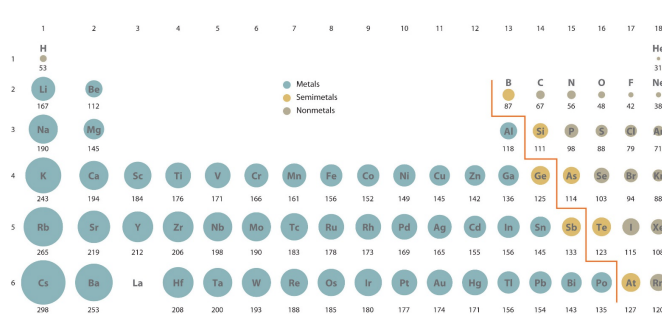
- These variables affect atomic size in opposite ways.

The increase in positive charge draws electrons closer to the nucleus.

- The increase in the number of occupied orbitals shields electrons in the highest occupied energy level from the attraction of protons in the nucleus.
- The shielding effect is greater than the effect of the increase in nuclear charge, so the atomic size increases.

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Atomic Radii Graphic



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Periodic Table Coloring Activity

Try this from memory:

- Color in the periodic table and differentiate the metals, non-metals and metalloids.
- Also, indicate the Alkali, Alkaline, Halogen, Noble Gas, Lanthanide, and Actinide Groups

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Whiteboard Practice Problems

Write the non-metal noble gas that is in the same period as Lithium.

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Whiteboard Practice Problems

Write one alkali metal and one alkaline earth metal.

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Whiteboard Practice Problems

Write one metal with one valence electron.

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Whiteboard Practice Problems

Write one non-metal with 8 valence electrons.

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Whiteboard Practice Problems

Write one metal with 2 valence electrons.

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Metal Demonstrations

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Element Quiz

When: Later this week

- **You will be presented with a list of common elements and will be quizzed on their properties.**

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Element Matching Family Worksheet

<http://drmoad.weebly.com/>

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Exit Ticket #21:

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Atomic Radii

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