Name

# Today, we will draw Lewis dot structures<sup>1</sup>.

<sup>1</sup> (Lewis dot structures) also known as Lewis dot diagrams

CFU What are we going to do today? What does structures mean?

Activate (or provide) Prior Knowledge

Valence electrons are an atom's outermost electrons. The number of valence electrons an atom has corresponds to the group (vertical column) the atom lies in on the Periodic Table of the Elements. The valence electrons are largely responsible for the atom's chemical behavior.





On your whiteboards, write the number of valence electrons for the following three elements:

1) Sodium 2) Fluorine 3) Neon

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Students, you already know how to identify the number of valence electrons for elements. Today, we will use valence electrons to draw Lewis dot structures.

### Concept Development

**Lewis dot structures** show valence electrons which are represented<sup>2</sup> as dots placed around the element symbol.

- <u>Unpaired valence electrons</u> represent electrons available for bonding or for linking with other elements.
- *Elements with the <u>same</u> number of valence electrons have the <u>same</u> Lewis dot structures. <sup>2</sup> shown*



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Why is this (point to Lewis dot structure of oxygen) an example of a Lewis dot structure?

How <u>many</u> electrons or dots should be placed around the symbol of nitrogen in a Lewis dot diagram? How do you know?

Why are the Lewis dot structures of beryllium and magnesium the same?

In your own words, what are Lewis dot structures? Lewis dot structures are \_\_\_\_\_\_.



Importance

**Lewis dot structures** show valence electrons which are represented as dots placed around the element symbol.

• <u>Unpaired valence electrons</u> represent electrons available for bonding or for linking with other elements.

It is important to know how to draw Lewis dot structures because they:

- 1. Lewis dot structures help scientists to see which valence electrons are responsible for the chemical behavior of an atom.
  - Oxygen (O)
- 2. Lewis dot structures show the electrons that are available for bonding by quickly seeing the unpaired valence electrons.
- 3. Lewis dot structures are used by scientists to make new compounds. (plastics, metals, packaging materials, etc.)
- 4. knowing Lewis dot structures will help you do well on tests.

Which of the following elements has the same Lewis dot structure as silicon?

- A germanium (Ge)
- **B** aluminum (Al)
- C arsenic (As)
- D gallium (Ga)

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Does anyone have another reason why it is important to draw Lewis dot structures? (pair-share) Why is it important to draw Lewis dot structures? You may give me one of my reasons or your own reason. Which reason means the most to you? Why?

**Lewis dot structures** show valence electrons which are represented as dots placed around the element symbol.

• <u>Unpaired valence electrons</u> represent electrons available for bonding or for linking with other elements.

Draw Lewis dot structures.

Step #1: Find the number of valence electrons.

Step #2: Write down the symbol of the element.

- Step #3: Draw the Lewis dot diagram.
  - a. Place all the electrons clockwise around the element symbol Reminder: no side receives two dots until each side receives one. Exception: Helium.

Step #4: Write down the number of unpaired valence electrons or electrons available for bonding.

Element	Number of valence electrons	Lewis dot structure	# of unpaired valence electrons
1. Lithium			
2. Potassium			
3. Boron			
4. Carbon			

## 5. Which pairs of elements have the same Lewis dot structure? Why is this so?

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Where did I find the symbol for the element? How did I know where to get the number of valence electrons? Where did you find the symbol for the element? How did you know where to get the number of valence electrons? What do the dots represent in the Lewis dot structure?

### Skill Development/Guided Practice (continued)

**Lewis dot structures** show valence electrons which are represented as dots placed around the element symbol.

• <u>Unpaired valence electrons</u> represent electrons available for bonding or for linking with other elements.

### Draw Lewis dot structures.

Step #1: Find the number of valence electrons.

Step #2: Write down the symbol of the element.

- Step #3: Draw the Lewis dot diagram.
  - a. Place all the electrons clockwise around the element symbol Reminder: no side receives two dots until each side receives one. Exception: Helium.

Step #4: Write down the number of unpaired valence electrons or electrons available for bonding.

Element	Number of valence electrons	Lewis dot structure	# of unpaired valence electrons
6. Arsenic			
7. lodine			

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Where did I find the symbol for the element? How did I know where to get the number of valence electrons? Where did you find the symbol for the element? How did you know where to get the number of valence electrons? What do the dots represent in the Lewis dot structure?

Closure

Lewis dot structures show valence electrons which are represented as dots placed around the element symbol.

• <u>Unpaired valence electrons</u> represent electrons available for bonding or for linking with other elements.

1. Draw the Lewis dot structures below.

2. In your own words, what is a Lewis dot diagram?

Step #1: Find the number of valence electrons.

Step #2: Write down the symbol of the element.

Step #3: Draw the Lewis dot diagram.

a. Place all the electrons clockwise around the element symbol. Reminder: no side receives two dots until each side receives one. Exception: Helium.

Step #4: Write down the number of unpaired valence electrons or electrons available for bonding.

Element	Number of valence electrons	Lewis dot structure	# of unpaired valence electrons
1. Beryllium			
2. Fluorine			

What did you learn today about drawing Lewis dot structures? Day 1 \_\_\_\_\_

Day 2 \_

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#### Independent Practice

Name

<u>Lewis dot structures</u> show valence electrons which are represented as dots placed around the element symbol.

• <u>Unpaired valence electrons</u> represent electrons available for bonding or for linking with other elements.

Draw Lewis dot structures.

- Step #1: Find the number of valence electrons.
- Step #2: Write down the symbol of the element.
- Step #3: Draw the Lewis dot diagram.
  - a. Place all the electrons clockwise around the element symbol Reminder: no side receives two dots until each side receives one. Exception: Helium.

Step #4: Write down the number of unpaired valence electrons or electrons available for bonding.

Element	Number of valence electrons	Lewis dot structure	# of unpaired valence electrons
1. Sulfur			
2. Calcium			
3. Oxygen			
4. Magnesium			
5. Neon			
6. Argon			

## 7. Which pairs of elements have the same Lewis dot structure? Why is this so?

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