

# Guided Lesson Notes

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Ions

**Directions:** Complete this study guide as you move through the lesson. By taking notes, you are more likely to remember what you are learning. The completed study guide can be used for practice activities and to prepare for quizzes and exams. Be sure to save each study guide so you can access it when you need it.

### Essential Vocabulary

As you encounter these scientific terms in the lesson, enter the meaning and an example (or two) for each. You can even draw a picture. If there are other unfamiliar words you find, enter them in the blank spaces provided.

|                          |                   |
|--------------------------|-------------------|
| <i>valence electrons</i> | <i>ionization</i> |
| <i>ions</i>              | <i>cations</i>    |
| <i>anions</i>            | <i>octet rule</i> |

|                      |  |
|----------------------|--|
| <i>monatomic ion</i> |  |
|                      |  |

### **Review Valence Electrons and the Periodic Table**

**What are valence electrons?**

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**How can valence electrons be determined from electron configurations?**

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**How can the periodic table be used to determine the number of valence electrons an element has?**

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## The Octet Rule and Ionic Charge

What happens during the process of ionization?

Which electrons are gained or lost to form ions?

Ions have an unequal number of \_\_\_\_\_ and electrons.

Fill in the following table to show the difference between cations and anions.

| Type of ion | Charge | How is it formed? | Are there more protons or electrons? |
|-------------|--------|-------------------|--------------------------------------|
| Cation      |        |                   |                                      |
| Anion       |        |                   |                                      |

**When are elements most stable?**

**How many valence electrons does an atom have if it has a full valence shell?**

**What is the octet rule?**

**What are the two exceptions to the octet rule?**

**Which group of elements has a full valence shell?**

Metals tend to \_\_\_\_\_ their valence electrons to form \_\_\_\_\_ ions.  
Nonmetals tend to \_\_\_\_\_ electrons to form \_\_\_\_\_ ions. They will  
\_\_\_\_\_ enough electrons to get up to \_\_\_\_\_ electrons in their valence shell.

Why is the charge for groups 13 and 14 not included?

### Tutorial Ions

Explain why a magnesium ion has a charge of +2.

How is an ion written?

How is the charge written on an ion if the charge is a +1 or a -1?

### Determining the Number of Subatomic Particles in Ions

Fill in the table to identify each part of the nuclear notation for this ion.

|                 |  |
|-----------------|--|
| Chemical symbol |  |
|-----------------|--|



|                      |  |
|----------------------|--|
| <b>Mass number</b>   |  |
| <b>Charge</b>        |  |
| <b>Atomic Number</b> |  |

**Describe how to calculate the number of electrons in an ion.**

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### Practice Naming Ions

**Use the word bank to identify each of the following ion naming rules:**

| s-block cations  | non-s-block cations | anions |
|--|---------------------|--------|
| Uses Roman numerals in parenthesis to show the charge of the ion |                     |        |
| The element name followed by the word ion                        |                     |        |
| The end of the element name is dropped and replaced with “-ide”  |                     |        |