ConcepTest on the Octet Rule and Ions

Students should first be introduced to the Octet Rule as applied to the chlorine and sodium atoms. Then can then be tested on the oxygen and magnesium atoms in the following questions.

The electron dot symbol for the oxygen atom is $\cdot\ddot{\underset{\cdot}{\mathrm{O}}}\cdot$
It can attain an octet in its valence shell by forming the oxide ion. How is this done?

1. Gain 8 electrons.
2. Lose 8 electrons.
3. Gain 2 electrons.
4. Lose 2 electrons.

Correct Answer: **3. Gain 2 electron.**

In the previous question, we see that the oxygen has to gain 2 electrons to attain the octet. In so doing what charge does it incur?

1. 2+
2. 2–
3. neutral
4. none of the above.

Correct Answer: **2. 2–**
Comment to Instructor: Choice #1 is sometimes selected because students tend to think when you gain 2 electrons, it must be +2.

The electron dot symbol for the magnesium atom is ·Mg·
What does the magnesium atom have to do to obey the Octet Rule?

1. Gain 6 electrons to become $:\ddot{\underset{\ddot{}}{\mathrm{Mg}}}:$
2. Lose 2 electrons to become Mg^{2+}
3. Combine with another magnesium to become Mg: :Mg
4. Change into a Ne atom.

Correct Answer: **3. Lose 2 electron to become Mg^{2+}**
Remind students that by losing 2 electron, its inner shell becomes the outershell, and it has 8 electrons.
