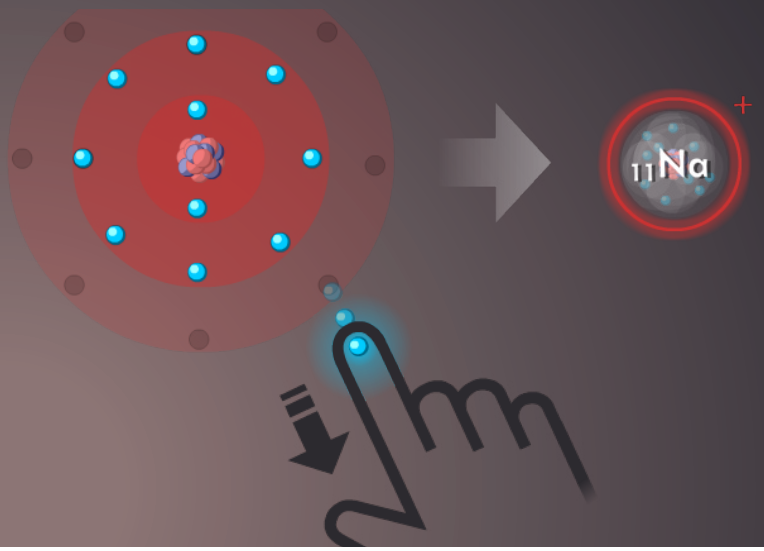
Educator Quick Start Guide

IONS GAME



Integrated chemistry concepts:

- Cation and anion formation
- Octet rule
- Ionic radii
- Ionization energy

Use Collisions® PRE-INSTRUCTIONALLY to engage your students and explore a topic.

Assign your students the first 8 levels of Ions. During gameplay, ask your students to answer the following guided questions:

1. What did you have to do to create a positive ion?
2. What did you have to do to create a negative ion?
3. How did you create an ion with a 2+ charge?
4. How did you create an ion with a 3- charge?
5. Does removing an outer electron release or use energy?
6. What is your goal in the Ions game?

Use Collisions POST-INSTRUCTIONALLY to practice, review, and extend the learning.

After instruction, encourage your students to work through the remaining core game levels. To check for student understanding, here are some additional guided questions to incorporate into your lesson:

1. Explain the rules of the Ions game using some or all of the following keywords: protons, electrons, cation, anion, ionization energy (first, second, third), electron affinity.
2. How much energy is used to remove each individual electron from magnesium when forming an ion? What is a possible explanation for this difference in energy?
3. In Level 6, what are the charges of the ions that you built for the 1st and 2nd targets?
4. Which ion formation takes more energy: K^+ or Li^+? Mg^{2+} and Be^{2+}? Why?

You can also use the Ions Sandbox to highlight a specific concept integrated into gameplay and encourage your students to earn the built-in Achievements.

Additional resources available at www.playmadagames.com

- **Ions Game Guide** - Teacher resource that provides an overview of the game.
- **Ions Student Quest** - Student activity designed to be completed during and after gameplay.
- **Ions Student Activities** (Student Version)

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