

## MimioScience Units Feature Key Instructional Information

The design of the MimioScience™ interactive lessons ensures that you know exactly what to expect and how to facilitate the lessons in each unit.

- Each unit aligns with these national and international science standards: the Next Generation Science Standards (NGSS) and the Trends in International Mathematics and Science Study (TIMSS) framework.
- Each unit includes learning objectives and a list of related MimioScience units. If other units are prerequisite, they are listed to let you know the necessary sequence, and to make sure your students have acquired the skills needed to benefit from the current unit.
- Special “Tips for Teachers” icons are offered in each unit to ease navigating through the pages and to help you manage student participation.
- There is always a “Tips for Teachers” page with ideas for encouraging active student participation.

### Unit's Instructional Features

#### Learning Objectives

1. Students will analyze the molecular structure of substances and mixtures from everyday life or the laboratory and:
  - a. Determine the basic structure in terms of isolated atoms and/or molecules.
  - b. Categorize the exemplar as a pure substance or a mixture based on its composition, and explain the rationale for their answer.
2. Students will categorize pure substances (based on either a molecular-level representation or a written description of their compositions) as either an element or a compound, and explain the rationale for their answer.
3. Students will build models of molecules that represent common pure substances and mixtures.

#### Related Units

States of Matter 2  
Physical and Chemical Changes  
Chemical Reactions and Nuclear Processes

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### Alignment with Standards

#### Alignment with Next Generation Science Standards (first public draft)

- **Disciplinary Core Ideas**  
PS1.A: Structure and properties of matter
- **Crosscutting Concepts**  
Patterns  
Structure and function
- **Science and Engineering Practices**  
Developing and using models

#### Alignment with TIMSS Science Framework

- **Content Domains**  
Physical Science (4th grade)  
Classification and Properties of Matter: 3  
Chemistry (8th grade)  
Classification and Composition of Matter: 3, 4  
Properties of Matter: 1
- **Cognitive Domains** (4th and 8th grades)  
Knowing: Recall/Recognize; Define; Describe; Illustrate with Examples  
Applying: Compare/Contrast/Classify; Use Models; Relate; Interpret Information; Find Solutions; Explain  
Reasoning: Analyze; Integrate/Synthesize; Draw Conclusions; Generalize

#### Bloom's Taxonomy Levels

Understand, Apply, Analyze

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### Tips for Teachers: Navigation



**Think:** Students reflect on the question. It is not necessary that they answer the question correctly in this attempt.



**Discuss:** Students discuss the question with a partner or as a group, and agree on the best answer.



**Move:** Students come to the board to move items to their correct places (for example, in drag-and-drop or sorting activities).



**Collaborate:** Students use the Collaborate feature with their MimioPads or tablets to engage in collaborative activities.



**View:** Use MimioView™ or a document camera to project materials on the board.



Use this icon to reveal the correct answer to a question or activity.



Tap this box (or others like it) to reveal the correct answer to a question.



Use this icon to learn more about the material on the page, including details, clarifications, or suggestions for further activities.



Use this icon to see a chart representing the results of a voting activity.



If you need to stop or are running short on time, these breaks are a good stopping point.

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### Tips for Teachers: Encouraging Active Participation

#### Individual Writing

If a question asks for a written response, ask students to write their answers on paper. Encourage them to discuss their answers; provide feedback.

#### Working in Pairs

If a question would benefit from a collaborative response, ask students to work in pairs. Pairs should discuss how they decided on their answers. Then, have them share their answers and reasoning with the class.

#### Voting

If there is a multiple-choice question or an identification or matching activity, ask students to vote.

*If you have the MimioVote™ assessment system or MimioMobile™ application:*

- Ask students to select an answer to multiple-choice questions using their voting devices or tablets. You can view the results and may choose to share them with students.
- Use the QuickVote feature to allow voting for identification or matching activities. For instance, if students are asked to select a certain item from a set, you can choose items one at a time and ask them to vote “yes” if it qualifies and “no” if it does not.

*If you are not using MimioVote assessment or the MimioMobile app:*

- For both multiple-choice questions and identification or matching activities, ask students to write down their answers on a sheet of paper before sharing.

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## How will I know how to teach each lesson?

The MimioScience lessons are self-contained, providing all of the information you need to deliver them successfully, with minimal prep time. Each lesson comes with “Lesson Notes” that provide instructions, assessment tips, correction procedures, and, frequently, further elaboration on the topic. Each lesson page clearly states the student instructions. The careful design and systematic teaching approach prepare students for success as they progress through the steps of each lesson.

**Challenge Yourself**

The molecules in matter can be made of the *same kinds* of atoms, or *different kinds* of atoms, but there are always at least two atoms joined together.

Are these molecules, or not? Tap on each image.

Image A      Image B      Image C

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Lesson Notes pull out here, showing you how to correct possible student errors, and often providing useful background information.

This section provides all the information necessary for students to understand the contents of this page and perform the activity. Teachers may add any further explanation or discussion they feel their students need.

In this sample, the possible answers show correct and incorrect examples of molecules varying in their critical “must-have” and variable “can-have” features.

## How will I know how my students are doing?

Assessment probes are embedded throughout each lesson to test students’ mastery of each of the learning objectives. These frequent checks let you quickly determine whether your students are on the right track. Assessment notes are at hand, and include recommendations for additional practice.

**What Is Inside a Balloon?**

**Assessment**

This page measures student understanding of the difference between elements and compounds. It is recommended that students answer the question(s) on this page individually. For example, students can vote on the question or write the answer on a piece of paper. After students answer the question, do a quick survey of the question to assess understanding. If there are errors, guide students to note whether the object is made of only one type of atom (element) or more than one type of atom (compound).

helium gas filling the balloon

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Assessment probes are designed as part of the “Lesson Notes” pull-out. They also include recommendations on what to do if students make errors.

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