

# Real World Science - Matter: Solids, Liquids, and Gases

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## *Congratulations!*

You have chosen a learning program that will actively motivate your students AND provide you with easily accessible and easily manageable instructional guidelines designed to make your teaching role efficient and rewarding.

The AIMS Teaching Module provides you with a video program keyed to your classroom curriculum, instructions and guidelines for use, plus a comprehensive teaching program containing a wide range of activities and ideas for interaction between all content areas. Our authors, educators, and consultants have written and reviewed the AIMS Teaching Modules to align with the Educate America Act: Goals 2000.

This ATM, with its clear definition of manageability, both in the classroom and beyond, allows you to tailor specific activities to meet all of your classroom needs.

## **RATIONALE**

In today's classrooms, educational pedagogy is often founded on Benjamin S. Bloom's "Six Levels of Cognitive Complexity." The practical application of Bloom's Taxonomy is to evaluate students' thinking skills on these levels, from the simple to the complex: Knowledge (rote memory skills), Comprehension (the ability to relate or retell), Application (the ability to apply knowledge outside its origin), Analysis (relating and differentiating parts of a whole), Synthesis (relating parts to a whole), and Evaluation (making a judgment or formulating an opinion).

The AIMS Teaching Module is designed to facilitate these intellectual capabilities, AND to integrate classroom experiences and assimilation of learning with the students' life experiences, realities, and expectations. AIMS' learner verification studies prove that our AIMS Teaching Modules help students to absorb, retain, and to demonstrate ability to use new knowledge in their world. Our educational materials are written and designed for today's classroom, which incorporates a wide range of intellectual, cultural, physical, and emotional diversities.

# **ORGANIZATION AND MANAGEMENT**

To facilitate ease in classroom manageability, the AIMS Teaching Module is organized in four sections. You are reading Section 1, Introduction to the Aims Teaching Module (ATM).

## ***SECTION 2,***

### **INTRODUCING THIS ATM**

will give you the specific information you need to integrate the program into your classroom curriculum.

## ***SECTION 3,***

### **PREPARATION FOR VIEWING**

provides suggestions and strategies for motivation, language preparedness, readiness, and focus prior to viewing the program with your students.

## ***SECTION 4,***

### **AFTER VIEWING THE PROGRAM**

provides suggestions for additional activities plus an assortment of consumable assessment and extended activities, designed to broaden comprehension of the topic and to make connections to other curriculum content areas.

# FEATURES

## INTRODUCING EACH ATM

### *SECTION 2*

Your AIMS Teaching Module is designed to accompany a video program written and produced by some of the world's most credible and creative writers and producers of educational programming. To facilitate diversity and flexibility in your classroom, your AIMS Teaching Module features these components:

#### **Themes**

The Major Theme tells how this AIMS Teaching Module is keyed into the curriculum. Related Themes offer suggestions for interaction with other curriculum content areas, enabling teachers to use the teaching module to incorporate the topic into a variety of learning areas.

#### **Overview**

The Overview provides a synopsis of content covered in the video program. Its purpose is to give you a summary of the subject matter and to enhance your introductory preparation.

#### **Objectives**

The ATM learning objectives provide guidelines for teachers to assess what learners can be expected to gain from each program. After completion of the AIMS Teaching Module, your students will be able to demonstrate dynamic and applied comprehension of the topic.

## **PREPARATION FOR VIEWING**

### **SECTION 3**

In preparation for viewing the video program, the AIMS Teaching Module offers activity and/or discussion ideas that you may use in any order or combination.

#### **Introduction To The Program**

Introduction to the Program is designed to enable students to recall or relate prior knowledge about the topic and to prepare them for what they are about to learn.

#### **Introduction To Vocabulary**

Introduction to Vocabulary is a review of language used in the program: words, phrases, usage. This vocabulary introduction is designed to ensure that all learners, including limited English proficiency learners, will have full understanding of the language usage in the content of the program.

## **Discussion Ideas**

Discussion Ideas are designed to help you assess students' prior knowledge about the topic and to give students a preview of what they will learn. Active discussion stimulates interest in a subject and can motivate even the most reluctant learner. Listening, as well as speaking, is active participation. Encourage your students to participate at the rate they feel comfortable. Model sharing personal experiences when applicable, and model listening to students' ideas and opinions.

#### **Focus**

Help learners set a purpose for watching the program with Focus, designed to give students a focal point for comprehension continuity.

#### **Jump Right In**

Jump Right In provides abbreviated instructions for quick management of the program.

## **AFTER VIEWING THE PROGRAM**

### **SECTION 4**

After your students have viewed the program, you may introduce any or all of these activities to interact with other curriculum content areas, provide reinforcement, assess comprehension skills, or provide hands-on and in-depth extended study of the topic.

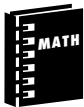
## SUGGESTED ACTIVITIES

The Suggested Activities offer ideas for activities you can direct in the classroom or have your students complete independently, in pairs, or in small work groups after they have viewed the program. To accommodate your range of classroom needs, the activities are organized into skills categories. Their labels will tell you how to identify each activity and help you correlate it into your classroom curriculum. To help you schedule your classroom lesson time, the AIMS hourglass gives you an estimate of the time each activity should require. Some of the activities fall into these categories:



### Meeting Individual Needs

These activities are designed to aid in classroom continuity. Reluctant learners and learners acquiring English will benefit from these activities geared to enhance comprehension of language in order to fully grasp content meaning.



### Curriculum Connections

Many of the suggested activities are intended to integrate the content of the ATM program into other content areas of the classroom curriculum. These cross-connections turn the classroom teaching experience into a whole learning experience.



### Critical Thinking

Critical Thinking activities are designed to stimulate learners' own opinions and ideas. These activities require students to use the thinking process to discern fact from opinion, consider their own problems and formulate possible solutions, draw conclusions, discuss cause and effect, or combine what they already know with what they have learned to make inferences.



### Cultural Diversity

Each AIMS Teaching Module has an activity called Cultural Awareness, Cultural Diversity, or Cultural Exchange that encourages students to share their backgrounds, cultures, heritage, or knowledge of other countries, customs, and language.



### Hands On

These are experimental or tactile activities that relate directly to the material taught in the program. Your students will have opportunities to make discoveries and formulate ideas on their own, based on what they learn in this unit.



### Writing

Every AIMS Teaching Module will contain an activity designed for students to use the writing process to express their ideas about what they have learned. The writing activity may also help them to make the connection between what they are learning in this unit and how it applies to other content areas.



### In The Newsroom

Each AIMS Teaching Module contains a newsroom activity designed to help students make the relationship between what they learn in the classroom and how it applies in their world. The purpose of In The Newsroom is to actively involve each class member in a whole learning experience. Each student will have an opportunity to perform all of the tasks involved in production: writing, researching, producing, directing, and interviewing as they create their own classroom news program.



### Extended Activities

These activities provide opportunities for students to work separately or together to conduct further research, explore answers to their own questions, or apply what they have learned to other media or content areas.



### Link to the World

These activities offer ideas for connecting learners' classroom activities to their community and the rest of the world.



### Culminating Activity

To wrap up the unit, AIMS Teaching Modules offer suggestions for ways to reinforce what students have learned and how they can use their new knowledge to enhance their world view.



## **VOCABULARY**

Every ATM contains an activity that reinforces the meaning and usage of the vocabulary words introduced in the program content. Students will either read or find the definition of each vocabulary word, then use the word in a written sentence.

## **CHECKING COMPREHENSION**

Checking Comprehension is designed to help you evaluate how well your students understand, retain, and recall the information presented in the AIMS Teaching Module. Depending on your students' needs, you may direct this activity to the whole group yourself, or you may want to have students work on the activity page independently, in pairs, or in small groups. Students can verify their written answers through discussion or by viewing the video a second time. If you choose, you can reproduce the answers from your Answer Key or write the answer choices in a Word Bank for students to use. Students can use this completed activity as a study guide to prepare for the test.

## **CONSUMABLE ACTIVITIES**

The AIMS Teaching Module provides a selection of consumable activities, designed to specifically reinforce the content of this learning unit. Whenever applicable, they are arranged in order from low to high difficulty level, to allow a seamless facilitation of the learning process. You may choose to have students take these activities home or to work on them in the classroom independently, in pairs or in small groups.

## **CHECKING VOCABULARY**

The Checking Vocabulary activity provides the opportunity for students to assess their knowledge of new vocabulary with this word game or puzzle. The format of this vocabulary activity allows students to use the related words and phrases in a different context.

## **TEST**

The AIMS Teaching Module Test permits you to assess students' understanding of what they have learned. The test is formatted in one of several standard test formats to give your students a range of experiences in test-taking techniques. Be sure to read, or remind students to read, the directions carefully and to read each answer choice before making a selection. Use the Answer Key to check their answers.

## **ADDITIONAL AIMS MULTIMEDIA PROGRAMS**

After you have completed this AIMS Teaching Module you may be interested in more of the programs that AIMS offers. This list includes several related AIMS programs.

## **ADDITIONAL READING SUGGESTIONS**

AIMS offers a carefully researched list of other resources that you and your students may find rewarding.

## **ANSWER KEY**

Reproduces tests and work pages with answers marked.

# Real World Science: Matter

## THEMES

*Real World Science: Matter* explores the various properties of matter in its three basic states: solid, liquid and gas. It explains how matter changes states with changes in temperature. In addition, it discusses the various ways to measure mass and observe its properties.

## OVERVIEW

The world is comprised of millions of different materials. Though different in shape, texture and weight, all of these materials are made of matter. Matter is anything which takes up space and has mass. Matter can exist as a solid, a liquid or a gas. If a change in temperature occurs, matter can change states. By understanding the nature of different types of matter, we come to understand the building blocks of the universe.

## OBJECTIVES

- ▶ To identify solids, liquids and gases in the environment
- ▶ To explain how matter changes state
- ▶ To describe the processes of vaporization, evaporation and condensation
- ▶ To calculate the volume and mass of various forms of matter
- ▶ To list the properties of various forms of matter

Use this page for your individual notes about planning and/or effective ways to manage this  
AIMS Teaching Module in your classroom.

Our AIMS Multimedia Educational Department welcomes your observations and comments.  
Please feel free to address your correspondence to:

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## INTRODUCTION TO THE PROGRAM

Matter is all around us. Everything in Earth is made of matter. Learning about the different properties of matter allows us to better understand the changing world we live in. The study of matter has led to many of humankind's greatest discoveries. By investigating different substances and how those substances act and change, scientists have developed energy sources, life-saving drugs and fuels for space travel. By understanding matter, we can make new and exciting discoveries about our world.

## INTRODUCTION TO VOCABULARY

Before starting the program, write the following words on the board. Ask the class to discuss the meaning of each word, and review the terms that are unfamiliar to students.

**matter** - substance that makes up everything in the universe

**mass** - amount of matter in an object

**molecule** - smallest part of matter that still has the properties of matter

## FOCUS

Tell students to think about the world around them. Why is it important to study matter? What benefits can we gain from better understanding the building blocks of the universe? Ask the class to keep these questions in mind as they begin the program.

## DISCUSSION IDEAS

Ask students to take a good look at their surroundings. Of the things they can see, which are in a solid state? Which are in a gaseous or liquid state? What sort of changes could cause the things around them to change states? Encourage students to name specific examples.

# JUMP RIGHT IN

## HOW TO USE THE *REAL WORLD SCIENCE: MATTER* AIMS TEACHING MODULE

### Preparation

- ▶ Read *Real World Science: Matter Themes, Overview, and Objectives* to become familiar with program content and expectations.
- ▶ Use **Preparation for Viewing** suggestions to introduce the topic to students.

### Viewing *REAL WORLD SCIENCE: MATTER*

- ▶ Set up viewing monitor so that all students have a clear view.
- ▶ Depending on your classroom size and learning range, you may choose to have students view *Real World Science: Matter* together or in small groups.

Some students may benefit from

- ▶ viewing the video more than one time.

### After Viewing *REAL WORLD SCIENCE: MATTER*

- ▶ Select **Suggested Activities** that integrate into your classroom curriculum. If applicable, gather materials or resources.
- ▶ Choose the best way for students to work on each activity. Some activities work best for the whole group. Other activities are designed for students to work independently, in pairs, or in small groups. Whenever possible, encourage students to share their work with the rest of the group.
- ▶ Duplicate the appropriate number of **Vocabulary, Checking Comprehension**, and consumable activity pages for your students.
- ▶ You may choose to have students take consumable activities home, or complete them in the classroom, independently, or in groups.
- ▶ Administer the Test to assess students' comprehension of what they have learned, and to provide them with practice in test-taking procedures.
- ▶ Use the **Culminating Activity** as a forum for students to display, summarize, extend, or share what they have learned with each other, the rest of the school, or a local community organization.

## SUGGESTED ACTIVITIES

### Writing

Many scientists have contributed their ideas to our modern understanding of matter. Ask students to choose a person from the list below. Have each student write a one-page summary of their chosen person's contributions to science. Encourage students to use library books and encyclopedia articles to learn more about their chosen topics.

Dmitri Mendeleev  
Ernest Rutherford  
Niels Bohr  
Antoine Lavoisier  
Albert Einstein  
Robert Boyle

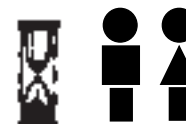


60 Minutes

### Meeting Individual Needs

Ask students to make sentences using the following words. Encourage them to use a dictionary if they are unsure of the meanings. Make sure that their sentences display an understanding of the words as they relate to the program.

- solid - state in which a substance has a definite volume and shape
- gas - state in which a substance can expand indefinitely and completely fill its container
- liquid - state in which a substance is flowing or capable of flowing



20 Minutes

### Critical Thinking

In the video, we learned that liquids pour and take on the shape of the container they are placed in. However, sand can also be poured. In addition, when wet sand is placed into a bucket, it takes on the shape of the bucket. It can even be removed from the bucket, keeping the same shape. Does this mean that sand is a type of liquid? What other substances have similar properties?

(Sand is a solid, not a liquid. It contains many tiny grains, each one a solid with its own shape. The grains can be poured because they move freely past each other, much like the molecules of a liquid. Wet sand can be molded into the shape of a container because water helps to hold the grains of sand together. Other substances with similar properties include flour, sugar and talcum powder.)



10 Minutes

## Link to the World

Ask each student to look through a magazine and locate a photograph with several components. Food, buildings, automobiles, plants and household supplies are good examples. Next, ask students to categorize each substance found in their pictures as a solid, liquid or gas. Which types of matter could easily change states? What environmental changes might cause these changes of state to take place? (Examples can include changes in light intensity, temperature, and exposure to rain or other elements.)



30 Minutes

## In the Newsroom

To help the class understand the universal presence of matter, ask each student to choose a science-related article from a magazine or newspaper. Most articles will mention various types of matter, often in various states. Ask students to consider this as they read their articles. What types of matter are mentioned in the articles? What "changes of state" are mentioned, such as vaporization, evaporation, melting, or solidifying?



60 Minutes

Have students present a summary of their articles to the class, along with information about the types of matter mentioned.

## Extended Activity

In the video, one gram was illustrated in this way:

- two paper clips = 1 gram
- a nickel = 5 grams
- a baseball = 150 grams



15 Minutes

To help students become more familiar with the concept of mass measured in grams, ask them to use the information above to estimate the weight of the following objects:

- an orange = approximately 100 grams
- a hardback textbook (175 pages) = approximately 500 grams
- a wooden chair = approximately 1,400 grams
- a small car = 10,000 grams

The gram is a metric unit. Metric units make it easy to convert measurements into other units. For instance, 100 grams = 1 kilogram, and 1000 grams = 1 metric ton. How can these conversions make it easier to record the mass of the objects above? How do they make calculations easier? (Smaller numbers are easier to record and calculate.)



## Hands On

Ask students if they have ever wondered why the oceans don't freeze in winter. Do they have any theories or guesses? Tell them that a simple experiment can explain the answer. They can perform the experiment at home. They should place a paper cup filled with water in the freezer. At the same time, they should also place another paper cup filled with water and a tablespoon of salt mixed together. Ask them to check on both cups every twenty minutes for two hours. What happens?



10 Minutes

The salt water takes longer to freeze. That's because salt lowers the freezing point of water. The more salt in the water, the longer it will take to freeze. How does this knowledge help us clear the streets of ice when it gets cold? (Salt is poured on the ice to help it melt more quickly. This is a good example of science making the world a better place.)

## Connection to Science

All matter has two main types of properties: physical and chemical.

The physical properties of matter are things that we recognize by sight, smell, touch, hearing or taste. These properties include color, size, shape, odor, sound and texture. Other physical properties include solubility, or the ability of one kind of matter to dissolve in another, and conductivity, or the ability of matter to conduct heat or electricity.



45 Minutes

Chemical properties of matter are ways in which a substance acts when it undergoes chemical change. For instance, when iron combines with oxygen and water vapor, it forms iron oxide, or rust.

Ask each student to locate three types of matter in the classroom. For each type of matter, have them list all the physical properties they can. Encourage them to consider each type of matter using each of the five senses. In addition, students can investigate the physical properties of each matter type using library resources. For example, how easily does the matter burn? What happens if it is combined with other substances, such as water?

## Culminating Activity

Using what they have learned in the unit, ask each student to write a question related to the program. Collect the questions and use them to write a review quiz. After giving the quiz, ask students if they enjoyed designing the test. How would they feel about designing more tests in the future?



60 Minutes

**VOCABULARY**

The following terms are from *Real World Science: Matter*. Fill in the number of each term next to its closest definition.

- |             |                  |
|-------------|------------------|
| 1. matter   | 6. volume        |
| 2. molecule | 7. mass          |
| 3. solid    | 8. vapor         |
| 4. liquid   | 9. evaporation   |
| 5. gas      | 10. condensation |

- \_\_\_ type of matter that takes the shape of the container that holds it
- \_\_\_ vaporization that takes place on the surface of a liquid
- \_\_\_ amount of material or matter in an object
- \_\_\_ type of matter that holds its shape unless something is done to change it
- \_\_\_ liquid in a gaseous state
- \_\_\_ process by which a gas turns into a liquid
- \_\_\_ amount of space matter takes up
- \_\_\_ substance that makes up everything on Earth and in the universe
- \_\_\_ smallest part of matter that still has the properties of matter
- \_\_\_ type of matter that completely fills any closed container

**CHECKING COMPREHENSION**

Read the following sentences and circle the letter of the word that best fills each blank.

Everything in the universe is made up of \_\_\_1\_\_\_. Solids, liquids and gases are all made up of tiny particles called \_\_\_2\_\_\_. All forms of matter have \_\_\_3\_\_\_. The amount of space an object takes up is known as \_\_\_4\_\_\_. In liquids, this is often measured in \_\_\_5\_\_\_. Liquids take the \_\_\_6\_\_\_ of the container that holds them. The molecules of a solid are \_\_\_7\_\_\_. Gases mix together easily, a process that often creates \_\_\_8\_\_\_. The process of a liquid becoming a gas is known as \_\_\_9\_\_\_. When this happens, the molecules of the liquid \_\_\_10\_\_\_.

1. A. volume  
B. matter  
C. gases  
D. fluid molecules
2. A. grams  
B. cells  
C. molecules  
D. electrons
3. A. a smell  
B. color  
C. a certain shape  
D. mass
4. A. volume  
B. weight  
C. state  
D. property
5. A. meters  
B. liters  
C. grams  
D. molecules
6. A. weight  
B. mass  
C. shape  
D. state
7. A. tightly packed  
B. loosely packed  
C. flying off into space  
D. flowing
8. A. colors  
B. smells  
C. vaporization  
D. fluids
9. A. condensation  
B. melting  
C. fluidity  
D. vaporization
10. A. pack together  
B. fly off into space  
C. lose energy  
D. move close together

### MATTER MATCH-UP

Match each term on the left with the best example on the right.

- |                 |   |
|-----------------|---|
| 1. melting      | steam hits cold metal and forms water droplets                                  |
| 2. solidifying  | the temperature of liquid juice is lowered until it becomes a solid             |
| 3. evaporation  | liquid molecules are moved to another container, where they take on a new shape |
| 4. condensation | hot, melted chocolate is returned to room temperature and becomes hard          |
| 5. boiling      | cheese is heated on a stove until it becomes a liquid                           |
| 6. freezing     | water from the ocean is heated by the sun and becomes water vapor               |
| 7. pouring      | liquid soup is heated in a microwave until it releases bubbles of water vapor   |

**TRUE OR FALSE**

Place a T next to statements that are true and an F next to statements that are false.

1. \_\_\_ A molecule is the smallest part of matter that still has the properties of matter.
2. \_\_\_ All solids hold their shape unless something is done to change them.
3. \_\_\_ It is difficult to change the volume of a gas.
4. \_\_\_ When liquids are mixed together, it is usually difficult to separate them.
5. \_\_\_ Vaporization is the process of a liquid turning into a gas.
6. \_\_\_ Heating a liquid causes its molecules to move closer together.
7. \_\_\_ Liquid in a gaseous state is known as vapor.
8. \_\_\_ Solids take the shape of the container they are placed in.
9. \_\_\_ The amount of matter in an object is known as volume.
10. \_\_\_ The molecules of a solid are packed tightly together.

**REVERSE ALPHABET**

Use the code below to uncover the words in bold and complete each sentence.

A = Z, B = Y, C = X, D = W, E = V, F = U, G = T, H = S, I = R, J = Q, K = P, L = O, M = N,  
N = M, O = L, P = K, Q = J, R = I, S = H, T = G, U = F, V = E, W = D, X = C, Y = B, Z = A

1. Each type of matter has certain properties that make it **fmrijfv**.

\_\_\_\_\_

2. All matter has mass and takes up **hkzxv**.

\_\_\_\_\_

3. All gases will completely fill any closed **xlmgzrmvi**.

\_\_\_\_\_

4. Although liquids have no shape of their own, their **elofnv** can be measured.

\_\_\_\_\_

5. Changes in temperature can cause "changes of **hgzgv**" in matter.

\_\_\_\_\_

6. **Ezkirazgrlm** is the process of a liquid becoming a gas.

\_\_\_\_\_

7. When a solid is heated, its molecules become energized and move **zkzig**.

\_\_\_\_\_

8. **Nlovxfvh** make it possible for matter to change states.

\_\_\_\_\_

### SOLID, LIQUID OR GAS?

Each property describes either a solid, liquid or gas. Write an "S" if the property describes a solid, an "L" if it describes a liquid or a "G" if it describes a gas.

1. Holds its shape unless changed by pressure or temperature

\_\_\_\_\_

2. Takes the shape of the container it is placed in

\_\_\_\_\_

3. Molecules are tightly packed together and held by strong bonds

\_\_\_\_\_

4. Completely fills any closed container

\_\_\_\_\_

5. Molecules are close together, but they are able to move around freely

\_\_\_\_\_

6. Molecules move in all directions at very high speeds

\_\_\_\_\_

7. Easy to separate when mixed together

\_\_\_\_\_

**WORD SEARCH**

The following words can be found in the maze below. The letters may be arranged horizontally, vertically, diagonally or backward.

**matter**  
**molecule**  
**property**  
**volume**  
**mass**  
**fluid**  
**solidify**  
**vaporization**  
**condensation**

B	C	L	C	V	O	L	U	M	E	E	V
M	O	L	E	C	U	L	E	H	S	N	A
L	N	C	B	G	H	A	Z	T	O	B	P
A	D	G	N	P	C	D	N	M	L	X	O
D	E	A	K	R	N	E	H	A	I	C	R
K	N	E	D	O	L	O	J	H	D	R	I
L	S	O	N	P	A	M	R	E	I	D	Z
M	A	T	T	E	R	R	A	H	F	M	A
B	T	G	C	R	L	G	R	S	Y	G	T
C	I	K	B	T	A	D	S	L	S	H	I
L	O	L	Z	Y	B	Q	P	C	M	A	O
E	N	F	L	U	I	D	Q	G	L	C	N



**TEST**

Circle the phrase which best answers each question.

1. All matter is formed from small particles called:

- ions.
- compounds.
- neutrons.
- molecules.

2. No two objects can occupy the same:

- liquid.
- container.
- gas.
- space.

3. The molecules of a liquid are close together and:

- often fly into space.
- are held rigid by strong bonds.
- are free to move past each other.
- cannot be separated.

4. When liquids are mixed, they:

- change to a different state.
- are difficult to separate.
- undergo vaporization.
- evaporate.

5. Evaporation is a kind of vaporization that takes place:

- inside the liquid.
- only at cold temperatures.
- on the surface of the liquid.
- when an object solidifies.

**TEST (CONTINUED)**

6. Gases can change volume:
- only when great amounts of pressure are applied.
  - only during a temperature change.
  - very easily.
  - only if they are turned into liquids.
7. When matter changes from a liquid to a solid, it is known as a "change of:
- molecules."
  - state."
  - boiling point."
  - vaporization."
8. The process of a liquid becoming a gas is known as:
- suspension.
  - melting.
  - vaporization.
  - condensation.
9. The molecules of a gas:
- always move upward.
  - move quickly in every direction.
  - stay locked together.
  - are close together, but free to move around.
10. The mass of an object is measured in:
- ohms.
  - meters.
  - grams.
  - fluid liters.

## **ADDITIONAL AIMS MULTIMEDIA PROGRAMS**

You and your students might also enjoy these other AIMS Multimedia programs:

*2570-EN-VID-NR: "Real World Science: Electricity"*

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*2287-EN-VID-NR: "Real World Science: Rocks and Minerals"*

*2290-EN-VID-NR: "Real World Science: Dinosaurs"*

## ANSWER KEY for page 18

### VOCABULARY

The following terms are from *Real World Science: Matter*. Fill in the number of each term next to its closest definition.

- |             |                  |
|-------------|------------------|
| 1. matter   | 6. volume        |
| 2. molecule | 7. mass          |
| 3. solid    | 8. vapor         |
| 4. liquid   | 9. evaporation   |
| 5. gas      | 10. condensation |

- 4 type of matter that takes the shape of the container that holds it
- 9 vaporization that takes place on the surface of a liquid
- 7 amount of material or matter in an object
- 3 type of matter that holds its shape unless something is done to change it
- 8 liquid in a gaseous state
- 10 process by which a gas turns into a liquid
- 6 amount of space matter takes up
- 1 substance that makes up everything on Earth and in the universe
- 2 smallest part of matter that still has the properties of matter
- 5 type of matter that completely fills any closed container

## ANSWER KEY for page 19

### CHECKING COMPREHENSION

Read the following sentences and circle the letter of the word that best fills each blank.

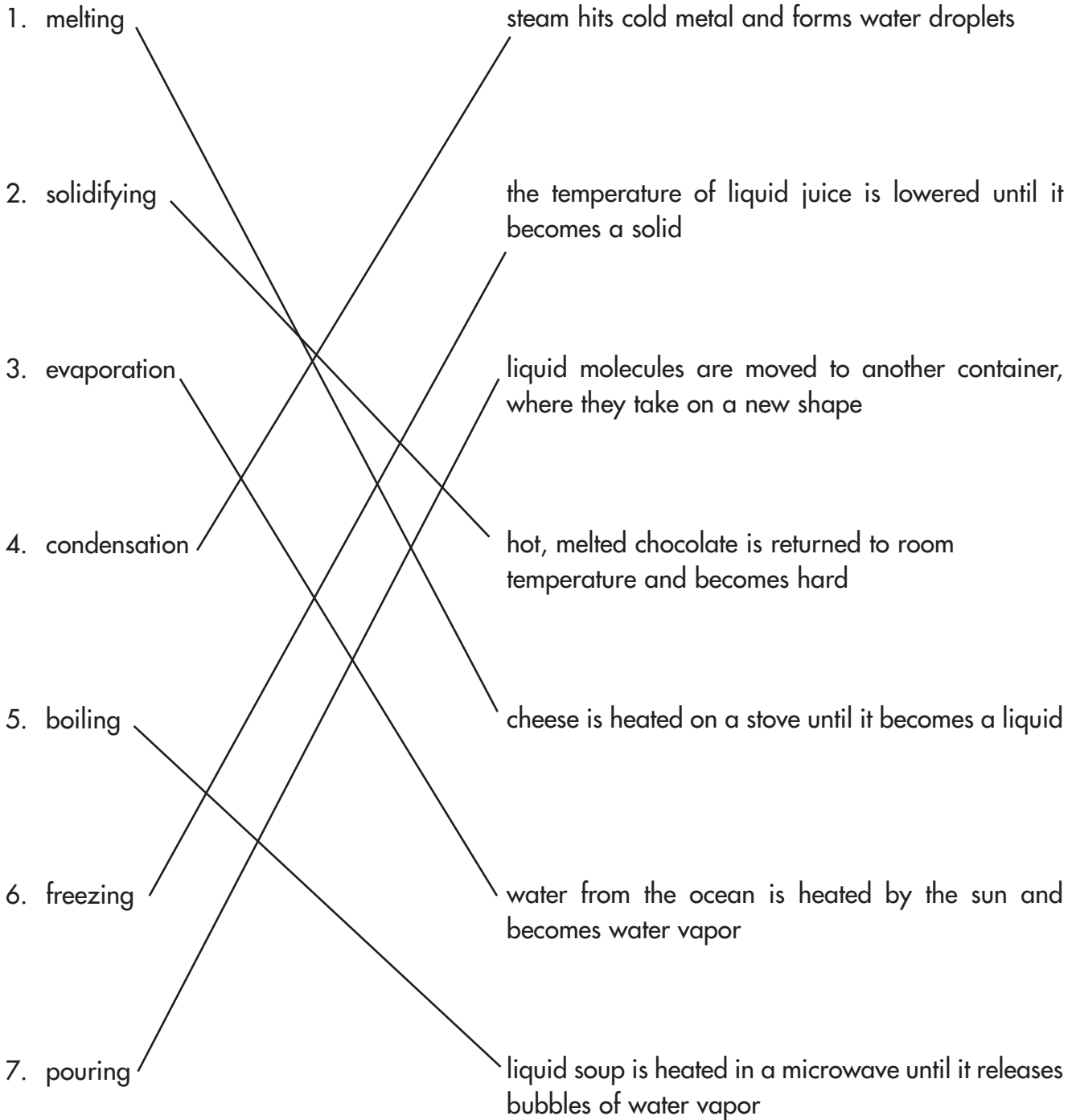
Everything in the universe is made up of \_\_\_1\_\_\_. Solids, liquids and gases are all made up of tiny particles called \_\_\_2\_\_\_. All forms of matter have \_\_\_3\_\_\_. The amount of space an object takes up is known as \_\_\_4\_\_\_. In liquids, this is often measured in \_\_\_5\_\_\_. Liquids take the \_\_\_6\_\_\_ of the container that holds them. The molecules of a solid are \_\_\_7\_\_\_. Gases mix together easily, a process that often creates \_\_\_8\_\_\_. The process of a liquid becoming a gas is known as \_\_\_9\_\_\_. When this happens, the molecules of the liquid \_\_\_10\_\_\_.

1. A. volume  
 B. matter  
C. gases  
D. fluid molecules
2. A. grams  
B. cells  
 C. molecules  
D. electrons
3. A. a smell  
B. color  
C. a certain shape  
 D. mass
4.  A. volume  
B. weight  
C. state  
D. property
5. A. meters  
 B. liters  
C. grams  
D. molecules
6. A. weight  
B. mass  
 C. shape  
D. state
7.  A. tightly packed  
B. loosely packed  
C. flying off into space  
D. flowing
8. A. colors  
 B. smells  
C. vaporization  
D. fluids
9. A. condensation  
B. melting  
C. fluidity  
 D. vaporization
10. A. pack together  
 B. fly off into space  
C. lose energy  
D. move close together

# ANSWER KEY for page 20

## MATTER MATCH-UP

Match each term on the left with the best example on the right.



## ANSWER KEY for page 21

### TRUE OR FALSE

Place a T next to statements that are true and an F next to statements that are false.

1.   **T**   A molecule is the smallest part of matter that still has the properties of matter.
2.   **T**   All solids hold their shape unless something is done to change them.
3.   **F**   It is difficult to change the volume of a gas.
4.   **T**   When liquids are mixed together, it is usually difficult to separate them.
5.   **T**   Vaporization is the process of a liquid turning into a gas.
6.   **F**   Heating a liquid causes its molecules to move closer together.
7.   **T**   Liquid in a gaseous state is known as vapor.
8.   **F**   Solids take the shape of the container they are placed in.
9.   **F**   The amount of matter in an object is known as volume.
10.   **T**   The molecules of a solid are packed tightly together.

## ANSWER KEY for page 22

### REVERSE ALPHABET

Use the code below to uncover the words in bold and complete each sentence.

A = Z, B = Y, C = X, D = W, E = V, F = U, G = T, H = S, I = R, J = Q, K = P, L = O, M = N,  
N = M, O = L, P = K, Q = J, R = I, S = H, T = G, U = F, V = E, W = D, X = C, Y = B, Z = A

1. Each type of matter has certain properties that make it **fmrijfv**.

**unique**

---

2. All matter has mass and takes up **hkzxv**.

**space**

---

3. All gases will completely fill any closed **xlmgzrmvi**.

**container**

---

4. Although liquids have no shape of their own, their **elofnv** can be measured.

**volume**

---

5. Changes in temperature can cause "changes of **hgzgv**" in matter.

**state**

---

6. **Ezklirazgrlm** is the process of a liquid becoming a gas.

**Vaporization**

---

7. When a solid is heated, its molecules become energized and move **zkzig**.

**apart**

---

8. **Nlovxfvoh** make it possible for matter to change states.

**Molecules**

---



## ANSWER KEY for page 23

### SOLID, LIQUID OR GAS?

Each property describes either a solid, liquid or gas. Write an "S" if the property describes a solid, an "L" if it describes a liquid or a "G" if it describes a gas.

1. Holds its shape unless changed by pressure or temperature

S

2. Takes the shape of the container it is placed in

L

3. Molecules are tightly packed together and held by strong bonds

S

4. Completely fills any closed container

G

5. Molecules are close together, but they are able to move around freely

L

6. Molecules move in all directions at very high speeds

G

7. Easy to separate when mixed together

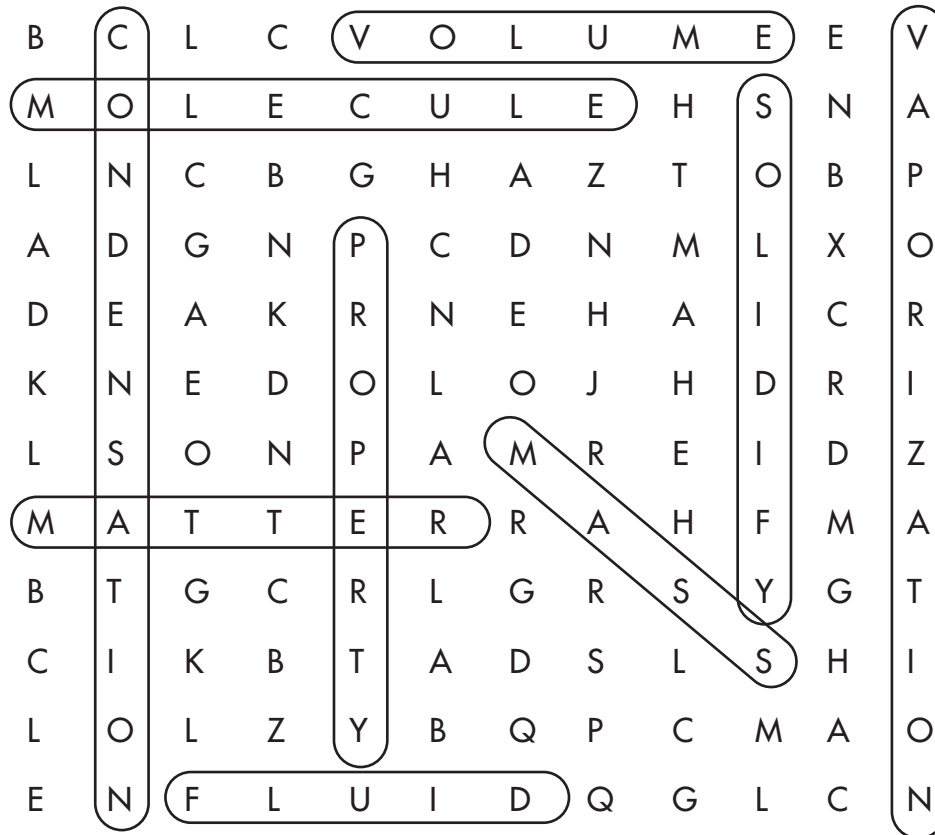
S

# ANSWER KEY for page 24

## WORD SEARCH

The following words can be found in the maze below. The letters may be arranged horizontally, vertically, diagonally or backward.

**matter**  
**molecule**  
**property**  
**volume**  
**mass**  
**fluid**  
**solidify**  
**vaporization**  
**condensation**



## ANSWER KEY for page 25

### TEST

Circle the phrase which best answers each question.

1. All matter is formed from small particles called:

- ions.
- compounds.
- neutrons.
- molecules.

2. No two objects can occupy the same:

- liquid.
- container.
- gas.
- space.

3. The molecules of a liquid are close together and:

- often fly into space.
- are held rigid by strong bonds.
- are free to move past each other.
- cannot be separated.

4. When liquids are mixed, they:

- change to a different state.
- are difficult to separate.
- undergo vaporization.
- evaporate.

5. Evaporation is a kind of vaporization that takes place:

- inside the liquid.
- only at cold temperatures.
- on the surface of the liquid.
- when an object solidifies.

## ANSWER KEY for page 26

### TEST (CONTINUED)

6. Gases can change volume:

- only when great amounts of pressure are applied.
- only during a temperature change.
- very easily.
- only if they are turned into liquids.

7. When matter changes from a liquid to a solid, it is known as a "change of:

- molecules."
- state."
- boiling point."
- vaporization."

8. The process of a liquid becoming a gas is known as:

- suspension.
- melting.
- vaporization.
- condensation.

9. The molecules of a gas:

- always move upward.
- move quickly in every direction.
- stay locked together.
- are close together, but free to move around.

10. The mass of an object is measured in:

- ohms.
- meters.
- grams.
- fluid liters.