

# **TRUMBULL PUBLIC SCHOOLS**

**Trumbull, Connecticut**

## **SCIENCE EXPLORATIONS**

**Grades 9-12**

**Special Education Department**

**2019**

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The Trumbull Board of Education will continue to take Affirmative Action to ensure that no persons are discriminated against in any of its programs.

## CORE VALUES AND BELIEFS

The Trumbull School Community engages in an environment conducive to learning which believes that all students will **read** and **write effectively**, therefore communicating in an articulate and coherent manner. All students will participate in activities **that present problem-solving through critical thinking**. Students will use technology as a tool applying it to decision making. We believe that by fostering self-confidence, self-directed and student-centered activities, we will promote **independent thinkers and learners**. We believe **ethical conduct** to be paramount in sustaining the welcoming school climate that we presently enjoy.

Approved 8/26/2011

## INTRODUCTION & PHILOSOPHY

The Trumbull High School Science Department offers a sequence of science courses from freshman through senior year that provide fundamental science content and skills while maintaining appropriate levels of rigor. Science Explorations offers students with intellectual disabilities the opportunity to explore science concepts through an inquiry-based approach tailored to students' interests and ability levels. In this course, students will be challenged to connect and apply their prior knowledge of natural phenomena as they extend their understanding of Earth's systems. Upon successful completion of the course, the student will receive 0.5 Science credit toward graduation.

The most provocative question students can ask is "Why?" – a question that comes naturally to all students. Order and relationships within the natural world are often represented by "The Hierarchy of Life." All components – from subatomic particles to the biosphere – are placed within this hierarchy, which then provides a context for studying life. Students will explore the levels of organization within this hierarchy, employing a hands-on approach to understand relationships, cross-cutting concepts, and where they fit into this scheme.

Science education stimulates a way of thinking that fosters questioning and subsequent problem-solving using logic. These skills are widely applicable, fostering learning beyond the scientific discipline. It is well understood that prior knowledge and experience is essential for learning, and students will primarily rely on this to make sense of the natural world. Guided explorations and focused learning opportunities will help students in Science Explorations explore their prior understanding, reveal and correct misconceptions, build confidence, and increase their overall knowledge of scientific concepts.

Special education students are placed in the course based on the team decision at each student's Planning and Placement Team meeting. These students placed in the course require specialized instruction in order to develop science skills.

When possible, the course will take a unified approach, and include typical peers, who may take the course as a general elective and serve as partners for students in their science investigations. These typical peers serve as role models for the students with disabilities. Their role is not only to learn science but also to share their knowledge and insights with the students with disabilities,

including by leading small groups during activities. Gaining real-world experience in how to adapt to new situations interpersonally by assisting students who present a variety of disabilities, the typical peers gain a rewarding learning experience that may help build their confidence and leadership abilities.

## **COURSE GOALS**

The following course goals derive from the 2013 Next-Generation Science Standards.

NGSS.MS-PS1-1	Develop models to describe the atomic composition of simple molecules and extended structures.
NGSS.MS-PS1-4	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
NGSS.MS-LS1-1	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
NGSS.MS-LS1-2	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
NGSS.MS-LS1-3	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
NGSS.MS-LS1-6	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
NGSS.MS-LS1-7	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
NGSS.MS-LS2-2	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
NGSS.MS-LS2-3	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

## **COURSE ENDURING UNDERSTANDINGS**

Students will understand that . . .

- matter is all around us and is made from different types of atoms, which combine with one another in various ways.
- gases, liquids, and solids are made of molecules or inert atoms that are moving about at different rates relative to each other, and that physical state is affected by temperature and pressure.
- atoms are reorganized by living things to create energy and other essential structures.
- all living things are made of cells, and that the structures within cells perform functions essential for life.
- in humans and other multicellular organisms, cells interact to form tissues and organs that carry out essential functions.
- all species depend on other organisms and certain environmental conditions to survive. Complex ecosystems provide conditions and essential nutrients, thus supporting biological diversity.

## **COURSE ESSENTIAL QUESTIONS**

- What is the role of matter in the structure and function of life on Earth?
- What does it mean to be a living thing, and what is required to support life?
- How do abiotic and biotic environmental conditions affect matter, organisms, and ecosystems?

## **COURSE KNOWLEDGE & SKILLS**

Students will know . . .

- what makes up the world around them, differentiating between characteristics of states of matter and the conditions that cause changes in states of matter.
- how atoms can be reorganized to create new substances that can be modeled in many ways.
- the processes essential for life and how organisms reorganize atoms to facilitate life.
- how abiotic and biotic factors interact to support life and influence ecosystems.

Students will be able to . . .

- conduct scientific investigations using standard scientific tools and methods.
- determine major scientific themes and concepts presented in course readings.
- work collaboratively with others using digital tools to broaden perspective, gain understanding of scientific issue, and share knowledge.
- create models, including drawings, flowcharts, and mechanical simulations, to illustrate scientific concepts.
- collaborate with others to follow laboratory procedures, analyze and evaluate data, and explain findings.
- develop an informed response or summarize key factors regarding a science-related question, citing or incorporating supporting data.

# COURSE SYLLABUS

**Course Name**

Science Explorations

**Level**

Non-leveled

**Prerequisites**

Recommendation of the PPT

**Materials Required**

None

**General Description of the Course**

Science Explorations will provide students with intellectual disabilities the opportunity to explore science topics through an inquiry-based approach tailored to students' interests and ability levels. Students will explore high-interest topics related to chemistry, earth science, and biology. When possible, the course will take a unified approach, and include typical peers, who may take the course as a general elective and serve as partners for students in their science investigations.

**Assured Assessments**

Formative Assessments:

- ongoing Science Explorations Notebook (Units 1, 2, 3, 4)
- Matching pictures, words, and phrases in relation to scientific concepts studied (Units 1, 2)
- Answering questions based on scientific concepts studied (Unit 1)
- Guided worksheet based on common living things (Unit 3)
- Research based on various organisms (Unit 4)

Summative Assessments:

- Poster board with images and text related to temperature (Unit 1)
- Modeling kit activity based on molecules (Unit 2)
- Photosynthesis poster activity (Unit 3)
- Answering questions related to relationships among organisms (Unit 4)

**Core Texts**

short excerpts of selected non-fiction texts appropriate for students' diverse needs

# UNIT 1

## Matter Is All Around Us

### Unit Goals

At the completion of this unit, students will:

- |               |   |
|---------------|---|
| NGSS.MS-PS1-4 | Explain what matter is and provide examples.  |
| NGSS.MS-PS1-4 | Use evidence from their investigations and models, and relevant scientific language, to explain how changes in energy affect the state of matter. |

### Unit Essential Questions

- What makes up the world around us?
- How does energy affect the state of matter?

### Scope and Sequence

1. Defining matter
  - a. Mass and volume
  - b. Consists of tiny particles called atoms
2. Three states of matter
  - a. Matter can exist as a solid, liquid, or gas
  - b. Similarities and differences between solids and liquids, focusing on motion of particles (atoms) and energy
    - i. Examples of everyday solids and liquids
  - c. Similarities and differences between solids, liquids, and gases, focusing on motion of particles (atoms) and energy
    - i. Examples of everyday gases
3. Energy changes cause changes in the state of matter.
  - a. Energy change is measured by change in temperature.
  - b. Increase in energy: melting and evaporation
    - i. Examples of melting and evaporation in everyday life
  - c. Decrease in energy: freezing and condensation
    - i. Examples of freezing and condensation in everyday life

### Assured Assessments

Formative Assessment:

- ongoing Science Explorations Notebook
- Students demonstrate their knowledge of states of matter by matching pictures, words, and phrases to the appropriate state of matter.
- Students answer questions involving the path of a water molecule, showing their knowledge of states of matter and how environmental temperatures affect water and the weather we experience.

**Summative Assessment:**

- Using poster board and pictures and phrases about energy and states of matter, students rearrange the images and text based on the correct temperature on the large thermometer.

**Resources**

Core

- short excerpts of selected non-fiction texts appropriate for students' diverse needs
- science laboratory materials
- relevant technology to support student inquiry

**Time Allotment**

- Approximately five weeks

## UNIT 2

### Building with Atoms

#### Unit Goals

At the completion of this unit, students will:

- |               |   |
|---------------|---|
| NGSS.MS-PS1-1 | Explain that different types of atoms exist, that each type is referred to as an element, and that each element has a unique set of properties which makes it different from other elements.  |
| NGSS.MS-PS1-1 | Understand that elements are organized on the periodic table and abbreviated with a one- or two-letter symbol, and identify certain elements on the periodic table by their chemical symbols. |
| NGSS.MS-PS1-1 | Demonstrate, using images and 3-D model kits, that atoms can bond together and form compounds.  |

#### Unit Essential Questions

- How do we represent the building blocks of matter in a useful way?
- What makes one element different from another?
- How do atoms interact with one another to form new substances, and how can we model this?

#### Scope and Sequence

1. The Periodic Table
  - a. Unique properties of elements
  - b. Symbols
  - c. Everyday examples and uses of some common elements
2. Atoms can bond to form compounds.
  - a. Using models to represent individual atoms and molecules
  - b. H<sub>2</sub>O, CO<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>, sugar (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>)
3. Different compounds have different properties.

#### Assured Assessments

Formative Assessment:

- ongoing Science Explorations Notebook
- Students demonstrate their knowledge of molecules being made of certain elements found on the Periodic Table by matching states of matter by matching pictures, words, and phrases involving common biological molecules.

**Summative Assessment:**

- Using modeling kits based on how atoms and molecules look in real life, students combine elements to make very common molecules, then draw and count the number of each element needed to make the molecule.

**Resources**

Core

- short excerpts of selected non-fiction texts appropriate for students' diverse needs
- science laboratory materials
- relevant technology to support student inquiry

**Time Allotment**

- Approximately five weeks

## **UNIT 3**

### **Molecules to Organisms**

#### **Unit Goals**

At the completion of this unit, students will:

NGSS.MS-LS1-1	Use evidence collected from microscopy and other resources to provide evidence that living things are made of cells.
NGSS.MS-LS1-1	Use a model to describe the various activities that occur within a cell.
NGSS.MS-LS1-3	Explain how cells in the body combine to form systems.
NGSS.MS-LS1-6	Use evidence collected to explain how plants use sunlight, water, and CO <sub>2</sub> to grow.
NGSS.MS-LS1-7	Use human digestion and circulation as a model in order to explain how food is rearranged into new molecules that support growth and/or release matter and/or energy into the environment.

#### **Unit Essential Questions**

- How and why do organisms make molecules from atoms?
- How do cells enable organisms to carry out functions essential for life?
- In what ways do systems interact to support life?

#### **Scope and Sequence**

1. Characteristics of living things
2. Cells
  - a. Structure
    - i. Microscopic investigation of plant and animal cells
  - b. Function
  - c. Requirements
3. Systems: How do living things get what they need?
  - a. Animals
    - i. Role of human digestive system
    - ii. Role of human circulatory system
  - b. Plants
    - i. Comparison and contrast with humans
    - ii. Photosynthesis

## **Assured Assessments**

### Formative Assessment:

- ongoing Science Explorations Notebook
- Students complete a guided worksheet to explain how common living things (plants and animals) get what they need to survive and grow.

### Summative Assessment:

- Students complete a photosynthesis poster activity: using a picture of a tree as the focal point, the students use text and pictures to show how biological molecules enter and exit the plant.

## **Resources**

### Core

- short excerpts of selected non-fiction texts appropriate for students' diverse needs
- science laboratory materials
- relevant technology to support student inquiry

## **Time Allotment**

- Approximately five weeks

## **UNIT 4**

### **Exploring Ecology**

#### **Unit Goals**

At the completion of this unit, students will:

NGSS.MS-LS1-6	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
NGSS.MS-LS1-7	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
NGSS.MS-LS2-2	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
NGSS.MS-LS2-3	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

#### **Unit Essential Questions**

- How does an organism acquire the atoms that it needs in order to grow and carry out activities of life?
- What are the roles of producers, consumers, and decomposers in the environment?
- Where do humans fit into food webs?

#### **Scope and Sequence**

1. Identification of ways in which organisms acquire atoms
  - a. Producers vs. consumers – similarities and differences
  - b. Food chains
  - c. Food webs
2. Populations
  - a. Factors that cause populations to rise and fall
    - i. Abiotic
    - ii. Biotic
  - b. Consequences of increasing and decreasing populations

#### **Assured Assessments**

Formative Assessment:

- ongoing Science Explorations Notebook
- Students conduct research on producers, consumers, and decomposers, learning that there are different types of organisms, each of which has unique needs.

**Summative Assessment:**

- Students answer questions involving food chains and food webs, demonstrating an understanding of the relationships between different types of organisms, and how they interact with each other in order to acquire energy to live.

**Resources**

Core

- short excerpts of selected non-fiction texts appropriate for students' diverse needs
- science laboratory materials
- relevant technology to support student inquiry

**Time Allotment**

- Approximately five weeks

## **COURSE CREDIT**

One-half credit per semester  
One class period daily for a semester; may be repeated for credit

## **PREREQUISITES**

Recommendation of the PPT.

## **ASSURED STUDENT PERFORMANCE RUBRICS**

- Trumbull High School School-Wide Writing Rubric (attached)
- Trumbull High School School-Wide Problem-Solving Rubric (attached)
- Trumbull High School School-Wide Independent Learning and Thinking Rubric (attached)
- Ongoing Science Explorations Notebook: Unit 1 (attached)
- “Unit 1: Atoms and Energy” Poster Board Summative Assessment (attached)
- Unit 2: “Using Biological Molecules – Modeling Kits” Summative Assessment (attached)

## Trumbull High School School-Wide Writing Rubric

Category/ Weight	Exemplary 4 Student work:	Goal 3 Student work:	Working Toward Goal 2 Student work:	Needs Support 1-0 Student work:
Purpose X_____	<ul style="list-style-type: none"> <li>• Establishes and maintains a clear purpose</li> <li>• Demonstrates an insightful understanding of audience and task</li> </ul>	<ul style="list-style-type: none"> <li>• Establishes and maintains a purpose</li> <li>• Demonstrates an accurate awareness of audience and task</li> </ul>	<ul style="list-style-type: none"> <li>• Establishes a purpose</li> <li>• Demonstrates an awareness of audience and task</li> </ul>	<ul style="list-style-type: none"> <li>• Does not establish a clear purpose</li> <li>• Demonstrates limited/no awareness of audience and task</li> </ul>
Organization X_____	<ul style="list-style-type: none"> <li>• Reflects sophisticated organization throughout</li> <li>• Demonstrates logical progression of ideas</li> <li>• Maintains a clear focus</li> <li>• Utilizes effective transitions</li> </ul>	<ul style="list-style-type: none"> <li>• Reflects organization throughout</li> <li>• Demonstrates logical progression of ideas</li> <li>• Maintains a focus</li> <li>• Utilizes transitions</li> </ul>	<ul style="list-style-type: none"> <li>• Reflects some organization throughout</li> <li>• Demonstrates logical progression of ideas at times</li> <li>• Maintains a vague focus</li> <li>• May utilize some ineffective transitions</li> </ul>	<ul style="list-style-type: none"> <li>• Reflects little/no organization</li> <li>• Lacks logical progression of ideas</li> <li>• Maintains little/no focus</li> <li>• Utilizes ineffective or no transitions</li> </ul>
Content X_____	<ul style="list-style-type: none"> <li>• Is accurate, explicit, and vivid</li> <li>• Exhibits ideas that are highly developed and enhanced by specific details and examples</li> </ul>	<ul style="list-style-type: none"> <li>• Is accurate and relevant</li> <li>• Exhibits ideas that are developed and supported by details and examples</li> </ul>	<ul style="list-style-type: none"> <li>• May contain some inaccuracies</li> <li>• Exhibits ideas that are partially supported by details and examples</li> </ul>	<ul style="list-style-type: none"> <li>• Is inaccurate and unclear</li> <li>• Exhibits limited/no ideas supported by specific details and examples</li> </ul>
Use of Language X_____	<ul style="list-style-type: none"> <li>• Demonstrates excellent use of language</li> <li>• Demonstrates a highly effective use of standard writing that enhances communication</li> <li>• Contains few or no errors. Errors do not detract from meaning</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates competent use of language</li> <li>• Demonstrates effective use of standard writing conventions</li> <li>• Contains few errors Most errors do not detract from meaning</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates use of language</li> <li>• Demonstrates use of standard writing conventions</li> <li>• Contains errors that detract from meaning</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates limited competency in use of language</li> <li>• Demonstrates limited use of standard writing conventions</li> <li>• Contains errors that make it difficult to determine meaning</li> </ul>

## Trumbull High School School-Wide Problem-Solving Rubric

Category/ Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Understanding X_____	<ul style="list-style-type: none"> <li>Student demonstrates clear understanding of the problem and the complexities of the task</li> </ul>	<ul style="list-style-type: none"> <li>Student demonstrates sufficient understanding of the problem and most of the complexities of the task</li> </ul>	<ul style="list-style-type: none"> <li>Student demonstrates some understanding of the problem but requires assistance to complete the task</li> </ul>	<ul style="list-style-type: none"> <li>Student demonstrates limited or no understanding of the fundamental problem after assistance with the task</li> </ul>
Research X_____	<ul style="list-style-type: none"> <li>Student gathers compelling information from multiple sources including digital, print, and interpersonal</li> </ul>	<ul style="list-style-type: none"> <li>Student gathers sufficient information from multiple sources including digital, print, and interpersonal</li> </ul>	<ul style="list-style-type: none"> <li>Student gathers some information from few sources including digital, print, and interpersonal</li> </ul>	<ul style="list-style-type: none"> <li>Student gathers limited or no information</li> </ul>
Reasoning and Strategies X_____	<ul style="list-style-type: none"> <li>Student demonstrates strong critical thinking skills to develop a comprehensive plan integrating multiple strategies</li> </ul>	<ul style="list-style-type: none"> <li>Student demonstrates sufficient critical thinking skills to develop a cohesive plan integrating strategies</li> </ul>	<ul style="list-style-type: none"> <li>Student demonstrates some critical thinking skills to develop a plan integrating some strategies</li> </ul>	<ul style="list-style-type: none"> <li>Student demonstrates limited or no critical thinking skills and no plan</li> </ul>
Final Product and/or Presentation X_____	<ul style="list-style-type: none"> <li>Solution shows deep understanding of the problem and its components</li> <li>Solution shows extensive use of 21<sup>st</sup>-century technology skills</li> </ul>	<ul style="list-style-type: none"> <li>Solution shows sufficient understanding of the problem and its components</li> <li>Solution shows sufficient use of 21<sup>st</sup>-century technology skills</li> </ul>	<ul style="list-style-type: none"> <li>Solution shows some understanding of the problem and its components</li> <li>Solution shows some use of 21<sup>st</sup>-century technology skills</li> </ul>	<ul style="list-style-type: none"> <li>Solution shows limited or no understanding of the problem and its components</li> <li>Solution shows limited or no use of 21<sup>st</sup>-century technology skills</li> </ul>

## Trumbull High School School-Wide Independent Learning and Thinking Rubric

Category/ Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Proposal X_____	<ul style="list-style-type: none"> <li>• Student demonstrates a strong sense of initiative by generating compelling questions, creating uniquely original projects/work</li> </ul>	<ul style="list-style-type: none"> <li>• Student demonstrates initiative by generating appropriate questions, creating original projects/work</li> </ul>	<ul style="list-style-type: none"> <li>• Student demonstrates some initiative by generating questions, creating appropriate projects/work</li> </ul>	<ul style="list-style-type: none"> <li>• Student demonstrates limited or no initiative by generating few questions and creating projects/work</li> </ul>
Independent Research & Development X_____	<ul style="list-style-type: none"> <li>• Student is analytical, insightful, and works independently to reach a solution</li> </ul>	<ul style="list-style-type: none"> <li>• Student is analytical, and works productively to reach a solution</li> </ul>	<ul style="list-style-type: none"> <li>• Student reaches a solution with direction</li> </ul>	<ul style="list-style-type: none"> <li>• Student is unable to reach a solution without consistent assistance</li> </ul>
Presentation of Final Product X_____	<ul style="list-style-type: none"> <li>• Presentation shows compelling evidence of an independent learner and thinker</li> <li>• Solution shows deep understanding of the problem and its components</li> <li>• Solution shows extensive and appropriate application of 21<sup>st</sup>-century skills</li> </ul>	<ul style="list-style-type: none"> <li>• Presentation shows clear evidence of an independent learner and thinker</li> <li>• Solution shows adequate understanding of the problem and its components</li> <li>• Solution shows adequate application of 21<sup>st</sup>-century skills</li> </ul>	<ul style="list-style-type: none"> <li>• Presentation shows some evidence of an independent learner and thinker</li> <li>• Solution shows some understanding of the problem and its components</li> <li>• Solution shows some application of 21<sup>st</sup>-century skills</li> </ul>	<ul style="list-style-type: none"> <li>• Presentation shows limited or no evidence of an independent learner and thinker</li> <li>• Solution shows limited or no understanding of the problem and its components</li> <li>• Solution shows limited or no application of 21<sup>st</sup>-century skills</li> </ul>

# Unit 1 – Matter Is All Around Us

## Atoms and Energy

- Atoms make up the world around us.
- Energy affects the state of matter of these atoms.

\*\*\* Anchoring Phenomenon: Melting Glaciers \*\*\*

### Vocabulary (Science Words):

Glacier

Solid

Liquid

Gas

Melting

Freezing

Temperature

Energy

Atoms

Evaporation

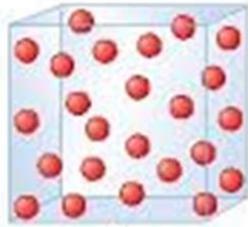
PhET Simulations: <https://phet.colorado.edu/en/simulation/states-of-matter>



**Atoms** are tiny building blocks that make up everything in the world.

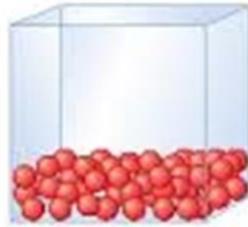


**Figure 5.1** The three states of matter. A gas has no definite shape, and its volume is the volume of the container. A liquid has a definite volume but no definite shape. A solid has a definite shape and a definite volume.



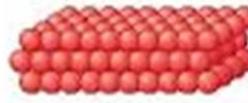
Gas

- Molecules far apart and disordered
- Negligible interactions between molecules



Liquid

- Intermediate situations



Solid

- Molecules close together and ordered
- Strong interactions between molecules

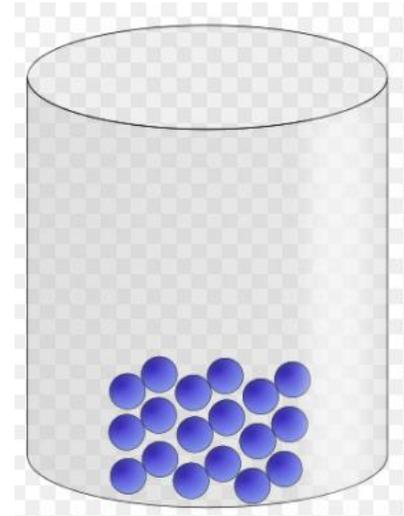
## Solid

Object that has atoms close together.

**Same shape.**

In a solid, molecules are packed together, and it keeps its shape.

Examples: ice, rock, pencil, chair



## Liquid



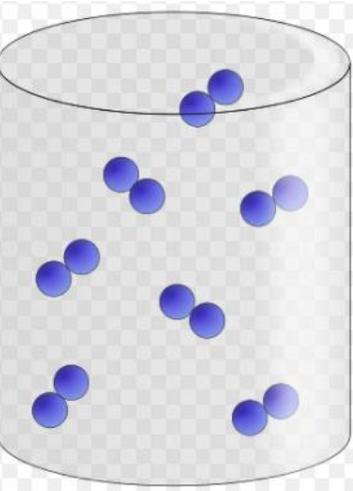
Thing that has **atoms moving**.

Shape **can change**.

Liquids take the shape of the container.

Examples: water, vegetable oil, soda, juice

## Gas



Atoms move **far apart**.

**No shape**.

Gases spread out to fill the container.

Examples: steam, helium in a balloon, air



**Energy**: a source of usable power.

This can be solar energy like light from the sun.

Chemical energy from the food we eat.

Heat energy from an oven or fire.

## Energy and States of Matter

The 3 basic states of matter are: Solid, Liquid, and Gas.

When there is more energy or heat, the atoms will move **FASTER**.

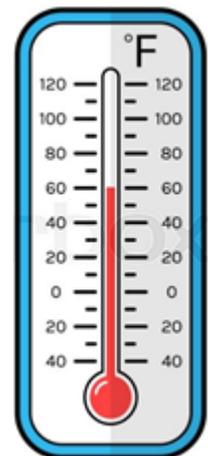


When there is less energy or heat, the atoms will move **SLOWER**.



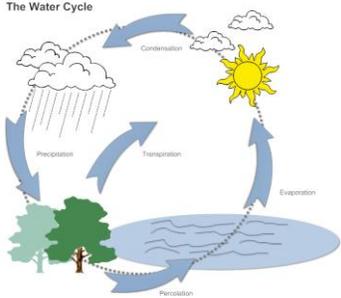
A thermometer helps us measure the temperature.

This is how much energy is in the **AIR** outside and tells us how hot or cold it is.



What does **heat** do to you?



Term	Definition	Picture
<p><b>Water Cycle</b></p>	<p>A process by which <b>water</b> is <b>circulated</b> throughout the earth.</p>	 <p>The diagram, titled 'The Water Cycle', illustrates the continuous movement of water. It shows a sun heating a body of water, causing evaporation. Water vapor rises and condenses into clouds. Precipitation falls as rain or snow. Some water infiltrates the ground (infiltration) or runs off into a stream. From the stream, water evaporates back into the atmosphere. Transpiration is also shown as water vapor rises from trees. The cycle is a continuous loop of these processes.</p>
<p><b>Evaporation</b></p>	<p>Turning from <b>liquid</b> into <b>gas</b>.</p> <p>Needs <b>Heat</b></p> <p><u>Examples:</u> Steam, Mist</p>	 <p>A photograph showing a misty or steamy scene over a body of water, likely a lake or river, with mountains in the background. The mist is a visible example of evaporation.</p>
<p><b>Condensation</b></p>	<p>Water that collects as droplets and changes from a <b>gas</b> to a <b>liquid</b>.</p> <p><u>Examples:</u> Clouds, Drops on window</p>	 <p>A photograph of a glass of water with condensation droplets on the outside, illustrating the process of condensation.</p>

<p><b>Precipitation</b></p>	<p>The falling of rain, snow, or sleet to the ground.</p> <p><u>Examples:</u> Rain, Snow</p>	
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Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Science Explorations**  
Mr. Gabriel

### Unit 1: Atoms and Energy

Understand that energy will change how the atoms behave.

**Directions:** On a piece of poster board you will arrange these words and phrases around a thermometer. Think about how the temperature will affect the motion of the atoms.

Words that have to do with Temperature

hot      cold      warm

cool

ice      water      steam

solid      liquid      gas

Atoms close together

Same shape

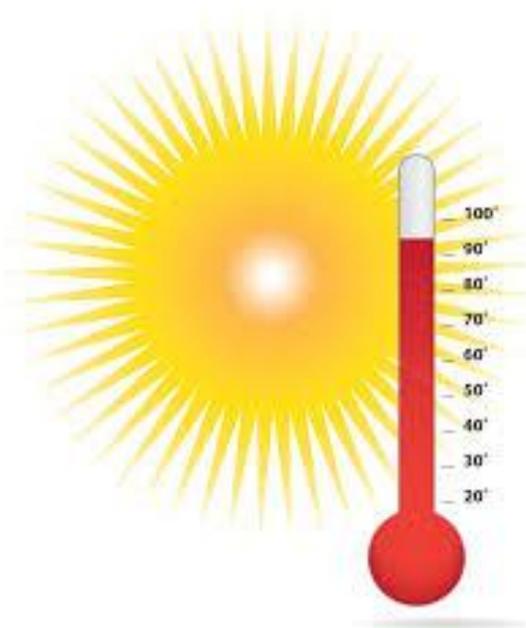
**Atoms are moving (in motion)**

Shape can change.

Atoms **spread** far apart

No shape







melting







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

**Science Explorations**

Mr. Gabriel

**Using Biological Molecules – Modeling Kits**

Hydrogen	<b>H</b> – Yellow
Carbon	<b>C</b> – Black
Oxygen	<b>O</b> – Red

Scientists use **modeling kits** to show how atoms and molecules look in real life.

We are going to combine elements together to **make** some very common molecules.

Name	Formula or symbols	What do we need to make it?	What does it look like?
Water	$H_2O$	<p>_____ H</p> <p>_____ O</p>	
Oxygen	$O_2$	<p>_____ O</p>	
Carbon Dioxide	$CO_2$	<p>_____ C</p> <p>_____ O</p>	

Name	Formula or symbols	What do we need to make it?	What does it look like?
Glucose	$C_6H_{12}O_6$	_____ C _____ H _____ O	