

States of Matter

Planning and Treatment

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EDET 703 Spring 2023

Instructional Strategy

Explanation of model/steps/components:

For this web based e-learning module, the instructional designer will be utilizing the Gagne's Nine Events of Instruction model. Gagne's model includes nine events to improve teacher and learner instruction, which are as follows: gain attention, inform learners of objectives, stimulate recall of prior learning, present stimulus, provide learner guidance, elicit performance, provide feedback, assess performance, and enhance retention and transfer. Gagne believes by utilizing the nine events it would, "facilitate student engagement and thereby enhance student learning, thus improving overall understanding of course concepts" (Miner, et al., 2016.)

Event 1 of Gagne's Nine Events is - Gain Attention. In this event, the teacher is utilizing an introduction activity to engage the learners. Event 2 is - Inform Learners of Objectives. This is where the teacher will present the objectives to the learners. Event 3, Stimulate Recall of Prior Learning, has the teacher activate prior knowledge in learners memory. Present Stimulus is Event 4, in which the learner is given the new content. This then flows into Event 5, Provide Learner Guidance, in which examples are provided to better comprehend the content. Event 6, Elicit Performance, allows the learner to practice the new content through simulations or pictures. The next event is Provide Feedback in which the learner should be given immediate and specific feedback on the practice activities. Event 8 is Assess Performance and in this event the learner is provided with a post assessment opportunity. Lastly, Event 9, Enhance Retention and Transfer, in which the learner is provided extra resources and opportunities to enhance their learner about the content.

Rationale for using this model:

The instructional designer decided the Gagne's Nine Events instructional model was best fit for this e-learning module. It is shown that, "during lectures held in large groups, students can get distracted and engage in day-dreaming, searching the internet, or private discussions, making them

less likely to engage in their learning” (Miner, et al., 2016.) This e-learning module will allow all class sizes to still learn the content and be at the learners pace. The Gagne’s Nine Events instructional model will also allow learners to get immediate feedback on their knowledge of the content.

Lesson structure of model:

Gain Attention: Youtube video about states of matter to introduce topic and engage learners

Inform Learners of objectives: objectives presented to show what knowledge will be gained

Stimulate recall of prior learning: Ask students to think about what solids are in the room.

Present Stimulus: Present new content about the states of matter

Provide learner guidance: students are given examples / images of each state of matter

Elicit performance: Learner given knowledge checks throughout the module about the states of matter.

Provide feedback: Immediate, specific feedback provided on knowledge checks

Assess performance: True / False question provided at end access learning to show master of the states of matter.

Enhance retention and transfer: Extra videos and information about states of matter provided at the end of the module for extra learning

Treatment Report

This module will be created through Articulate 360. The module is designed for students in a 3rd grade classroom. The module should include colors and fonts from the style guide and content/pictures from the storyboard included below. The content of the module "States of Matter" begins with basic understanding of the definition of matter. The student will watch a short video and explore the module's learning objectives. The module proceeds to chunk solids, liquids and gases into their own instructional sections. Each section includes a definition of the state of matter, real life examples, a picture corresponding to the molecules, and a list of the characteristics of the state of matter.

The module should include knowledge checks for the student. The three knowledge checks include a matching activity, a sorting activity and a true/false compare and contrast activity - refer to the storyboard for instructions on the content of these check in's.

The e-learner will interact with this module through a school provided technology device. A teacher will be in the classroom to ensure any questions asked are answered and technological support is provided. The pages include a title screen introducing the module and listing the breakdown of the module. Once the learner enters the lesson, the page is designed with linear navigation to minimize distractions and provide a simplistic module presentation. Due to the age demographic of the module, students will track their progress by monitoring the scroll bar on the page.

Style Guide



COLOUR PALETTE



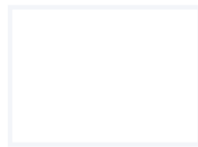
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R 49 G 53 B 55
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R 216 G 71 B 56
#D84738

BRAND FONTS

MONTSERRAT CLASSIC - HEADINGS

Montserrat Regular - Body

Site Map

STATES OF MATTER

Site Map



Digital Storyboard

Objective 1

Students will be able to differentiate the states of matter given the definitions.

Objective 2

Students will be able to categorize different states of matter given examples of solids, liquids and gases.

Objective 3

Students will be able to compare and contrast characteristics of solids, liquids and gas

Content

Everything in our world is made up of either a solid, liquid, or gas. This is known as the states of matter.

What is matter?

Anything you can touch, see or feel is **matter**. This can include the smoke you see from a fire to the water bottle on you may have on your desk.

All of these items are some form of states of matter which can be weighed to find out how much matter is in them. This would be the objects **mass**. To then see how much space the object takes up in their form would be the **volume**.

What is a **solid**?

Look around the room you are currently in. Almost everything you are looking at is a solid.

Examples: Desk, Chair, Pencil, Computer, So how do these items all relate?

Molecules. Solids have invisible molecules that are tightly packed together.

This allows solids to:

- keep their shape
- keeps their volume - doesn't change shape when placed in another object
- can be cut / broken apart
- when melted - turns into a liquid

Other examples of solids:

- Money
- Dirt
- Chocolate

What is a **liquid**?

A form of matter that occurs before a solid changes into a gas.

Liquids are made up of loosely packed molecules. The molecules can move around and change shape.

This allows liquids to:

- do not keep shape
- take shape of the container they are in - have a fixed volume
- when heated - turns to gas

Examples of liquids:

- Honey
- Water

What is a **gas**?

Gas is another form of matter. Most gases cannot be seen but are in the air around us.

Molecules in gas are super small and spread out and constantly moving.

Gases can:

- be weighed
- do not have a fixed shape or volume - fill container they are in.
- can be squeezed
- can be compressed

Examples of Gases:

- Helium
- Carbon Dioxide

Assessment Item 1 matching activity

Solid:

- Firm and stable in shape
- Maintains a fixed volume and shape

Liquid:

- Fluid in shape
- Adapts to the shape of its container

Gas:

- Expands to fill the volume of its container
- Adapts to the shape of its container

Assessment Item 2 Words and picture examples sorting activity

Examples of Solids:

- Ice
- Chair/desk
- Smart board

Examples of Liquids:

- Water
- Milk
- Juice

Examples of Gases:

- Oxygen
- Helium
- Water vapor

Assessment Item 3 compare characteristics

Solids:

- Solids will keep their shape
- Solid objects can be cut/broken apart
- The molecules in solids are close together

Liquids:

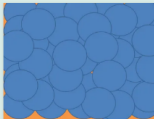
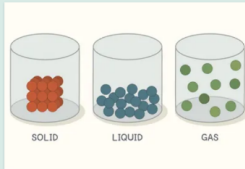
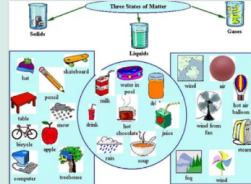
- Liquids do not keep their shape
- Liquids will take the shape of the container they are placed in
- The molecules in liquids are loosely packed

Gases:

- Gases will take the volume of the container they are placed in
- Gases will take the shape of the container they are placed in
- The molecules in gases are very loosely packed

Possible Pictures to Include

States of Matter	Can be Weighed	Occupies Space	Fixed Shape	Fixed Volume	Can be Compressed
Solid	✓	✓	✓	✓	✗
Liquid	✓	✓	✗	✓	✗
Gas	✓	✓	✗	✗	✓

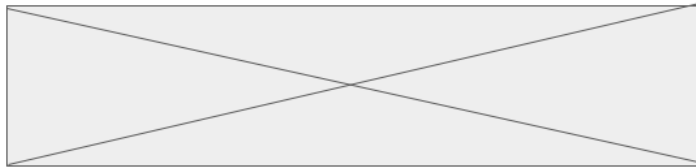
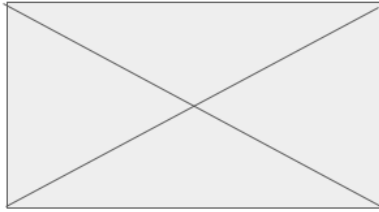


Sorting Images

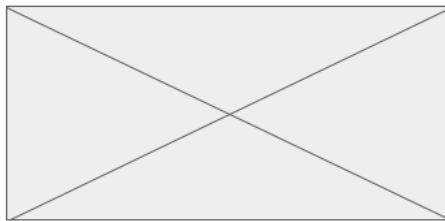


Wireframes

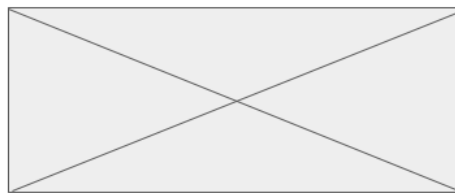
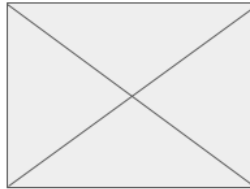
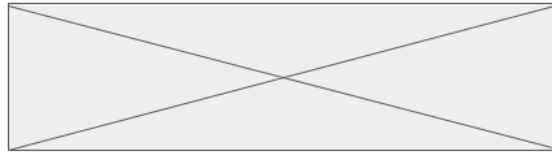
Title Screen



Beginning of lesson



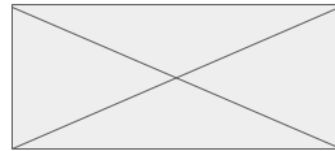
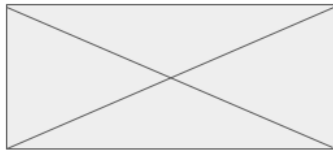
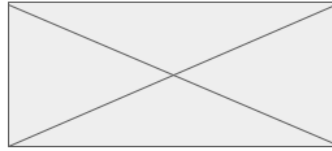
Solid, Liquid, Gas



Knowledge Check 1



Knowledge check 2



Knowledge check 3 X5



Resources

Miner, Amy, et al. "Using Gagne's 9 Events of Instruction to Enhance Student Performance and Course Evaluations in Undergraduate Nursing Course." *Nurse Educator*, U.S. National Library of Medicine, 1 May 2016,
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4598645/#:~:text=Gagne%20suggested%209%20events%20of,and%20enhance%20retention%20and%20transfer.>