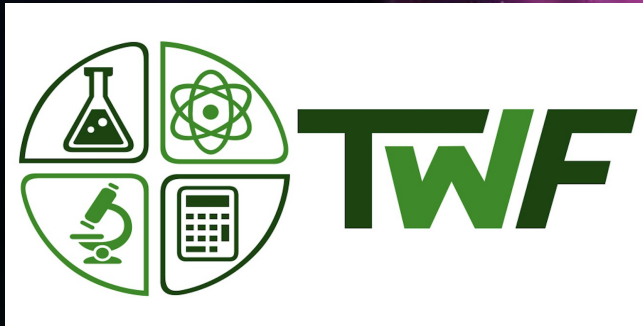


The Particle Theory

5E Lesson

The 5E model is a scientifically proven method to improve student engagement and learning in your classroom

- ✓ Engagement
- ✓ Exploration
- ✓ Explanation
- ✓ Elaborate
- ✓ Evaluate



Complete Teacher Instructions

The Particle Theory 5E Lesson

Grades 7-10	The Particle Theory	Ongoing Lesson (4)
Lesson Objective: Students will learn about: • The 5 particle theory rules • Matter • Pure substances • Mixtures • States of matter • Water • Plasma • Democritus • Atoms		
Possible Student Misconceptions: • When ice melts, its volume increases • Particles change from solid to liquid • When a substance is heated, its particles get bigger • All solids are denser than their liquid counterparts • There is no water in the air (water is visible in all its states)		
Materials: • 1 device (smartphone, Chromebook, laptop, tablet, or computer) per 3 students • A means of projecting a PowerPoint presentation • Internet access • General classroom objects		
Teacher Notes: ➢ All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If it doesn't, right-click on the image and click Edit Hyperlink or something similar. ➢ I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/oCIKIP9SaDQ ➢ I don't believe in long lessons. If you feel your students are losing their focus, stop the PowerPoint and give them a 5-minute break. If you'd like to show a recommended video collection here - http://www.teachwithfergy.com/science are tons of brain-break videos to choose from all grouped by category.		

The Particle Theory – 5E Lesson

Engagement Phase

Your students will watch the video 'Why does ice float in water?' and complete the following:

1. Watch the video and answer the questions.

The video can be found here -

<https://www.youtube.com/watch?v=UukRgqzk-KE>

Teacher Notes:

- The video is about 4 minutes long
- You may need to show the video more than once or pause when an answer is given to one of the questions.

Exploration Phase

Exploration – Lab Station Activity

- In groups of 2-3, have your students complete *Exploration – Lab Station Activity*. Once they're done, they will submit their passport to you.

Teacher Notes:

- The complete instructions for my Lab Station activity can be found in the *START HERE – Instructions* file.

Explanation Phase

PowerPoint Lessons

- The lesson is found in the folder – *Explanation – Particle Theory Lesson*
- This lesson is designed to be completed over one day
- There are multiple embedded videos, a simulation, and plenty of opportunity to engage, interact and check for your students' understanding throughout the lesson
- The lesson covers the following topics:
 - The 5 Particle Theory Rules
 - Matter review
 - Pure substances
 - Elements & Compounds
 - Mixtures
 - Homogeneous & Heterogeneous

Teacher Notes:

- All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, right-click the image and select **Edit Hyperlink** or something similar.
- I've created a video walkthrough if needed. It can be accessed here - <https://youtu.be/oCIKIP9SaDQ>
- I have also enclosed a .PDF version of both the teacher and student versions.

Elaborate Phase

Elaborate – Scavenger Hunt

Your students will complete – *Elaborate – Scavenger Hunt*. This activity will require your students to move beyond what was covered directly in the lesson and allow them to further develop their understanding.

Teacher Notes:

- Students will work individually or in small groups
- Students will need one device per group.

Duration: 1 hour

Teacher Role – Facilitate learning and keep students focused

Goal

- Students use their newly obtained knowledge to propose solutions and extend their learning to new situations

Evaluate Phase

Quiz

Have your students complete - *Evaluate – The Particle Theory Quiz*

Teacher Notes:

- It's sometimes best to have the students peer evaluate
- Placing students in small groups and having them exchange papers to mark will accomplish two things
 - 1) Provide immediate feedback on the questions they just completed
 - 2) Significantly reduce your marking time
- Peer evaluation is not needed, only suggested when appropriate

Duration: 30 min

Teacher Role – Distribute and collect evaluation

Goal

- Students are given the opportunity to demonstrate their understanding and evaluate their own progress

Each phase is clearly described

A Complete Lesson

1. All matter is composed of particles.

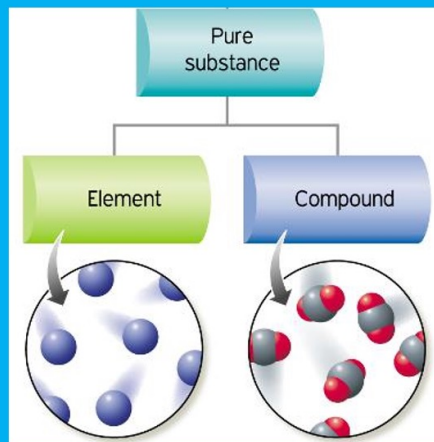
- These particles are the smallest pieces of matter that identify a substance
- If you take a substance and break it into successively smaller pieces, eventually you come to the smallest piece...a particle

← Make sure your students are on track

Student copies with blanks
Videos embedded right into
your slideshow

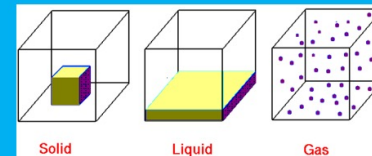
Pure Substance

- _____
- _____



3. There are attractive forces between particles.

- The closer particles are to each other, the stronger the force
- This is why substances like solids, with particles so strongly attracted to each other, are more rigid and typically more dense than liquids or gases



Interactive and Engaging Activities

Device-Based Scavenger Hunt The Particle Theory

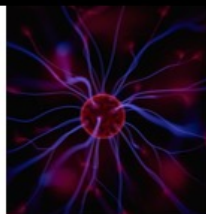
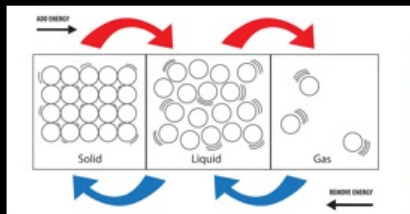


Includes

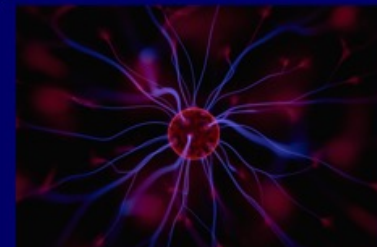
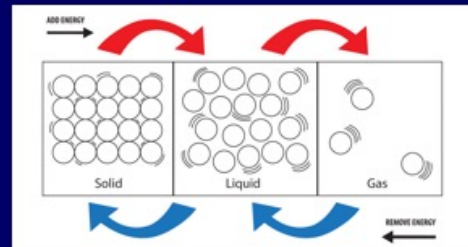
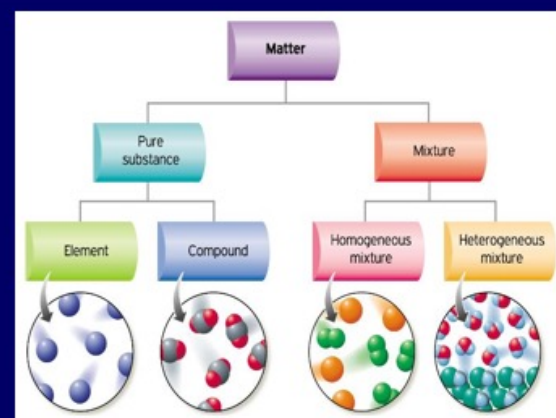
- 5 Unique Locations
- Online form submission
- Answer Key

Works on all smartphones, tablets, Chromebooks, and laptops

- **100% Digital**
- Simulations
- Quizzes
- Videos
- Games
- and more



The Particle Theory Lab Station Activity



7 Lab Station Activities to get your kids out of their seats and engaged in their learning

Get away from tired practices and unengaged students



Provide a Scientifically-Proven means of instruction



Incorporate Technology and Increase Collaboration

