

Mass, Volume, Density, and Buoyancy

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

Mass, Volume, Density, and Buoyancy 5E Lesson

Grades 7-10	Mass, Volume, Density, and Buoyancy	Ongoing Lesson
Lesson Objective: Students will learn about: • Mass • Mass vs. weight • Area • Volume • Density • Archimedes • Buoyancy • Water • Icebergs		
Possible Student Misconceptions: • Mass and weight are the same thing. • The only way to find area of a given shape is length x width • Volume can be found by determining the area of a single face on a prism and multiplying that number by the total number of faces. • Solid phases of substances are always denser than their liquid phases. • Heavy objects sink and light objects float. • Large objects sink.		
Materials: • 1 device (smartphone, Chromebook, laptop, tablet, or computer) per student • 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, right-click on the image and it will automatically open for you. If you need to edit a video, 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 see my video collection here - http://www.teachwithfergy.com There are tons of brain-break videos to choose from all grouped by category.		

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Engagement Phase	Duration: 10 min
Your students will watch the videos 'The Mass Vs Weight Song' and 'The Volume Song' and complete the questions found in the file – Engagement - Songs . The videos can be found here - https://www.youtube.com/watch?v=1whMAIGNg7E https://www.youtube.com/watch?v=GEwheYZX1-s	Teacher Role – Facilitate learning and keep students focused
Teacher Notes: - Each video is about three minutes long - You may need to pause a few times so students can write down their answers. - You may stop the video when all the answers have been given; they're pretty repetitive.	Teacher Role – Facilitate learning and keep students focused
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 Role – Facilitate learning and keep students focused
Teacher Notes: • The complete instructions for my Lab Station activity can be found in the START HERE – Instructions file.	Teacher Role – Facilitate learning and keep students focused
Explanation Phase PowerPoint Lesson • The lesson is found in the folder – Explanation – Lesson • This lesson is designed to be completed over three days • There are multiple embedded videos and plenty of opportunity to engage, interact and check for your students' understanding throughout the lesson • The lesson covers the following topics: ➢ Mass ➢ Mass vs weight ➢ Volume ➢ Density ➢ Archimedes ➢ Buoyancy ➢ Water	Teacher Role – Facilitate learning and keep students focused
Teacher Notes: • All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode	Teacher Role – Facilitate learning and keep students focused

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. • I have created two versions of the lesson: one for upper middle school to high school students, and a simpler version for middle schoolers or older students with lower developed learning levels. Choose the version you think best fits your students.	Teacher Role – Facilitate learning and keep students focused
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.	Duration: 1 hour Teacher Role – Facilitate learning and keep students focused
Teacher Notes: - Students will work individually or in small groups - Students will need one device per group	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 – Mass, Volume, Density, and Buoyancy Quiz	Duration: 30 min Teacher Role – Distribute and collect evaluation
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	Goal ☐ Students are given the opportunity to demonstrate their understanding and evaluate their own progress

Each phase is clearly described

A Complete Lesson

Mass vs. Weight



- Weight depends on location
- Weight – the force of gravity acting on an object
- The units for weight are Newtons (N) or pounds
- Weight = mass x acceleration (due to gravity)

Make sure your students are on track

Student copies with blanks
Videos embedded right into
your slideshow

Mass vs. Weight



- _____
- Weight – the force of gravity acting on an object
- The units for weight are Newtons (N) or pounds
- Weight = mass x acceleration (due to gravity)

Archimedes



The most famous of these favors for the king was that of the gold crown



Crown of Syracuse

Interactive and Engaging Activities

Device-Based Scavenger Hunt Mass, Volume, Density, and Buoyancy



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



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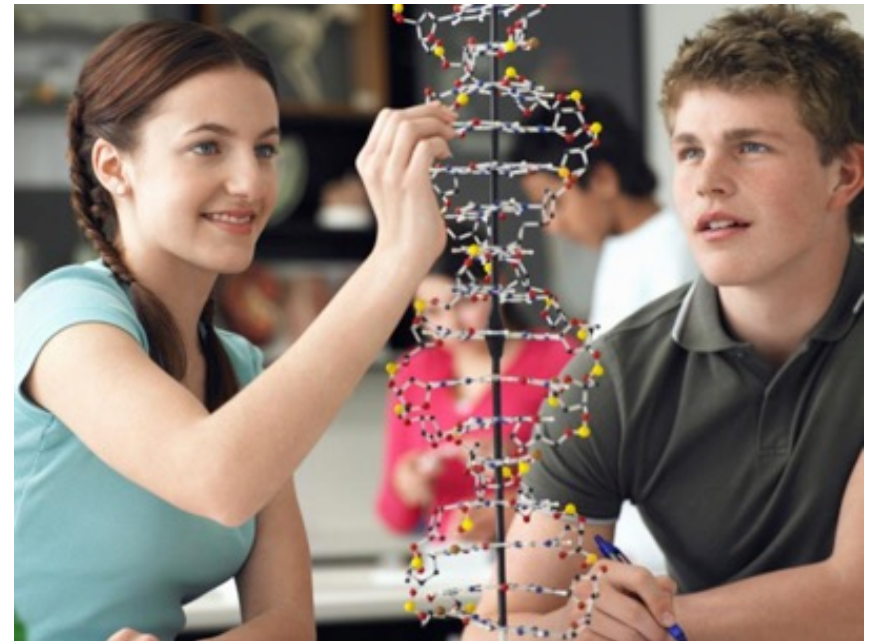


7 Lab Station Activities to get your kids out of their seats and engaged in their learning

Get away from tired practices and unengaged students



Provide a Scientifically-Proven means of instruction



Incorporate Technology and Increase Collaboration

