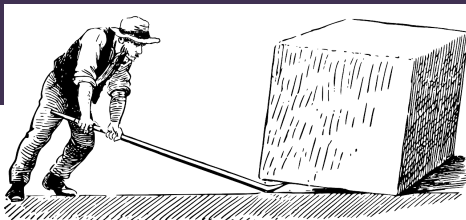


Simple Machines

High School 5E Lesson

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



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



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Complete Teacher Instructions



Simple Machines - 5E Lesson

Simple Machines	Ongoing Lesson (6-7)
Lesson Objective: Students will learn about the following: - What are Simple Machines? - Work = F X d - Lever - Inclined Plane - Wheel and Axle - Pulley - Screw - Wedge - Compound Machines	
Possible Student Misconceptions: - Simple machines can create energy: Simple machines do not create energy; they only transform it from one form to another or transfer it from one location to another. - Simple machines reduce the amount of work needed to do a task: The work output remains the same; simple machines make work easier by changing the direction or magnitude of force applied. - Pulleys are only used for lifting objects: Pulleys can also be used to apply forces sideways to transmit power over a distance. - Simple machines are outdated and not used in modern technology: Simple machines are fundamental components of many modern devices and machines. - Simple machines always make a task faster: They make tasks easier, not necessarily faster. Sometimes using a simple machine can take more time due to the increased distance over which the force is applied. - Only ancient tools are considered simple machines: Modern tools and devices also incorporate simple machines in their mechanisms. - A wedge and an inclined plane are unrelated: A wedge is actually a type of inclined plane that moves, whereas an inclined plane is stationary.	
Materials: 1 device (smartphone, Chromebook, laptop, tablet, or computer) per 3 students - A means of projecting a presentation - Internet access - General classroom objects	
Teacher Notes: - The presentations as well as the student notes are in Google and Office format which can easily be used in class or online - All videos can be accessed directly from the presentation. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If it doesn't for some reason, 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, don't force it. Stop the presentation and give them a 5-minute break. If you'd like to show a quick video, I recommend my video collection here - http://www.teachwithfergy.com/science-videos/. There are tons of brain-break videos to choose from all grouped by category.	

Simple Machines - 5E Lesson	
Engagement Phase Your students will complete ' <i>Simple Machines – Digital Science Reading Article</i> .'	Duration: 60 minutes Teacher Role – Facilitate learning and guide student understanding Goals ☐ Connect student's experiences ☐ Create interest ☐ Ask questions ☐ Understand the objectives of the lesson
Teacher Notes: The students will be asked to read a short article and answer questions about it. They will then be asked additional questions which can be answered using information from their web browser.	
Exploration Phase Exploration – Lab Station Activity In groups of 2-3, have your students complete '<i>Simple Machines - Lab Station Activity</i>'. Once they're done, they will submit their passport to you.	Duration: 1 hour Teacher Role – Facilitate learning and guide student understanding Goals ☐ Students receive real experience with the topic ☐ Students use and develop creative thinking skills ☐ Students make
Teacher Notes: The complete instructions for my Lab Station activity can be found in the <i>START HERE – Instructions</i> file.	
Explanation Phase Lesson - Complete the lesson '<i>Simple Machines Lesson</i>.' - In the lesson, there are multiple embedded videos and plenty of opportunity to engage, interact and check for your students' understanding throughout the lesson.	Duration: 2-3 hours 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
Teacher Notes: - All videos can be accessed directly from the presentation. 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	Evaluate Phase Have your students complete – <i>Evaluate – Simple Machines</i> . The test includes multiple choice, true and false, and short answer questions. Answer key is included.
	Duration: 45 mins Teacher Role – Distribute and collect. Goal ☐ Students are given the opportunity to demonstrate their understanding and evaluate their own progress

Each phase is clearly described

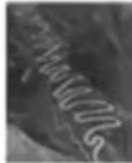
Complete Lessons

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Teacher Version

Inclined Plane

Examples of inclined planes include switchback roads/
trails, boat ramps, stairs, and
wheelchair ramps.



Student Version

Student version contains
blanks to be filled in



Inclined Plane

Examples of inclined planes
include _____



Videos Embedded Right Into Your PowerPoint



Wheel and Axle



- The part of the wheel touching the ground is small
- This means the force of friction is similarly small
- Lastly, instead of sliding along on the ground, the wheel rolls, so friction is acting over a short amount of time



Interactive and Engaging Activities

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Simple Machines Lab Station Activity



Station 1
Get Hands-On – Create your own lever. Review the attached instructions and observations in

Station 5
Applicability Reading – Read the following information article and answer the associated questions found below in the Applicability Reading section of your passport.

7 Lab Station Activities to get students out of their seats and engaged

Rube Goldberg Simple Machine Project



RUBE GOLDBERG MACHINE ENGINEERING CHALLENGE

HIGH SCHOOL



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Simple Machines

Scientific Reading Comprehension Article and Extension Activity



Improve your students' **Literacy** and **Analysis Skills**, use as an **Emergency Substitute Plan**, or create **Applicability** in your classroom

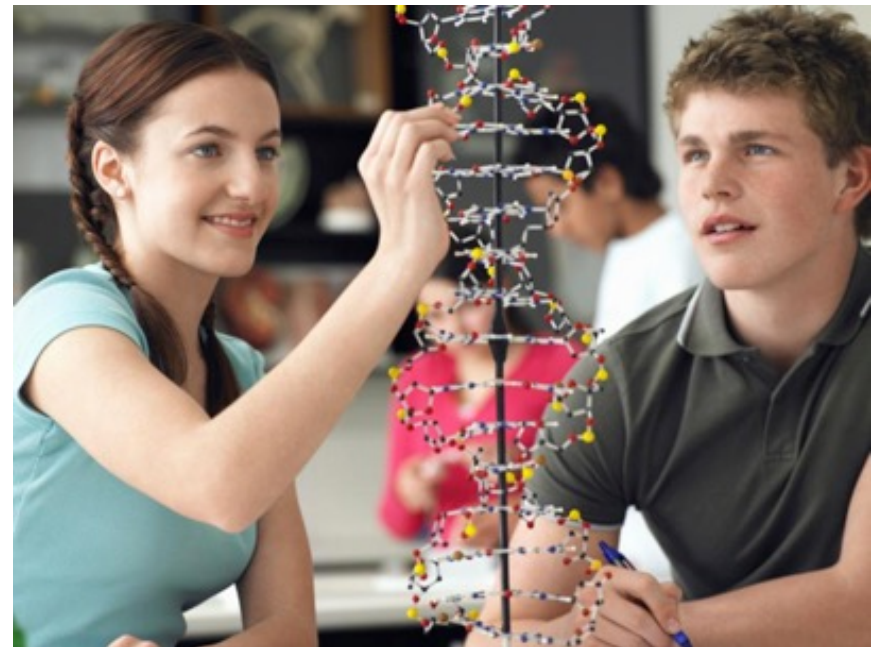
Get away from tired practices and unengaged students



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Provide a Scientifically-Proven means of instruction

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Incorporate Technology and Increase Collaboration



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**click here
to START**