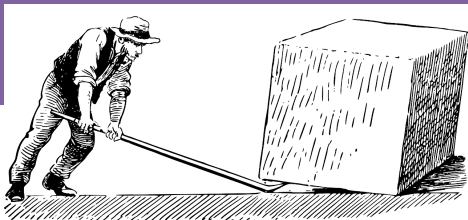


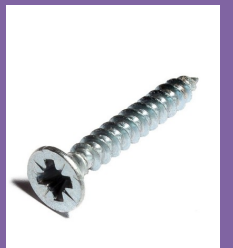
Simple Machines

Middle 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



TWF

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 = $F \times d$ - 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 - Simple machines are outdated and not used in modern technology: Simple machines are fundamental components of many modern devices and machines.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
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.	
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	

Elaborate Phase There are two options for the elaborate phase. '<i>Rube Goldberg Simple Machine Project</i>.' or '<i>Rube Goldberg STEM Project – Middle School</i>'	Duration: 2-3 hours Teacher Role – Facilitate learning and keep students focused
These activities will allow your students to go beyond what they've done in the classroom and demonstrate their understanding in a different way.	Goal ☐ Students use their newly obtained knowledge to propose solutions and extend their learning to new situations
Teacher Notes: - Students will work individually or in small groups - Students will need one device per group	
Evaluate Phase Have your students complete – <i>Evaluate – Simple Machines</i> .	Duration: 45 mins Teacher Role – Distribute and collect.
The test includes multiple choice, true and false, and short answer questions. Answer key is included.	Goal ☐ Students are given the opportunity to demonstrate their understanding and evaluate their own progress

Each phase is clearly described

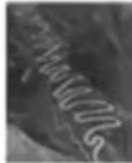
Complete Lessons

TWF

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



Simple Machines Lab Station Activity

This graphic features a blue background with white text and several small images illustrating simple machines: a pulley, a pair of scissors, a person on a bicycle, a person using a lever, and a key. The text includes 'Station 1 Get Hands-On - Create your own lever. Review the attached instructions and observations in' and '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
of their seats and engaged

Rube Goldberg Simple Machine Project

This graphic shows a Rube Goldberg-style contraption made of cardboard, wood, and string, with red arrows indicating the path of a ball. A domino is also shown falling, suggesting a chain reaction. The TWF logo is partially visible on the right.

RUBE GOLDBERG MACHINE ENGINEERING CHALLENGE

MIDDLE SCHOOL

This graphic features a blue background with white text and a small image of a Rube Goldberg-style contraption. The text includes 'STEM CHALLENGE' and the TWF logo.

Simple Machines

Scientific Reading Comprehension Article and Extension Activity – Grades 5-7

This graphic shows a sample of the scientific reading comprehension article and extension activity. It includes a diagram of a simple machine (a pulley) and a photograph of a person using a simple machine. The text includes 'Improve your students Literacy and Analysis Skills, use as an Emergency Substitute Plan or create Applicability in your classroom'.

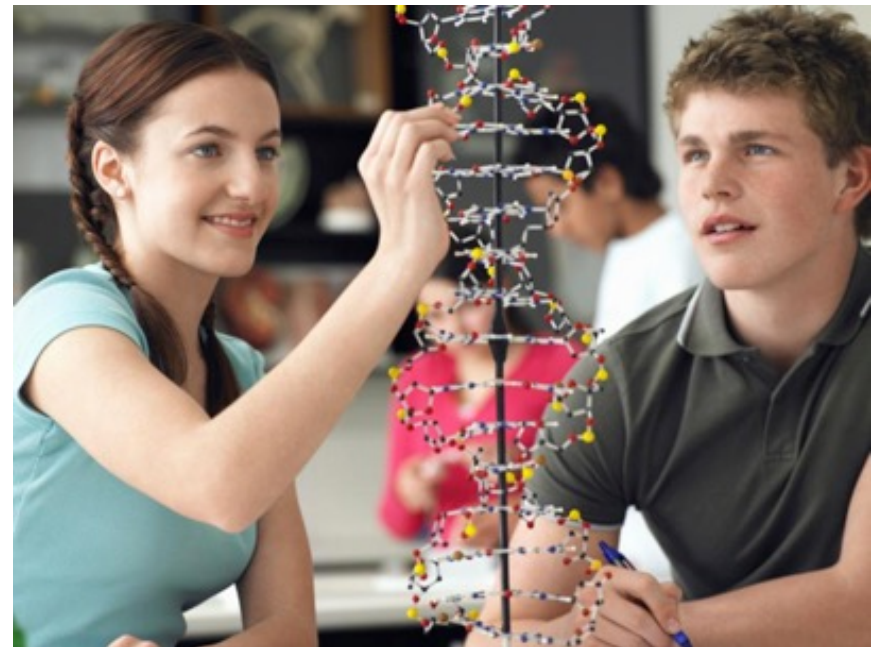
Get away from tired practices and unengaged students



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Provide a Scientifically-Proven means of instruction

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Incorporate Technology and Increase Collaboration



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