PLTW Flight and Space Virtual Learning

8th Grade/Newton's Laws of Motion

April 15, 2020

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Lesson: April 15, 2020

Objective/Learning Target:
Students will learn Newton's 3 Laws of Motion and how they help explain the forces acting on an airplane.

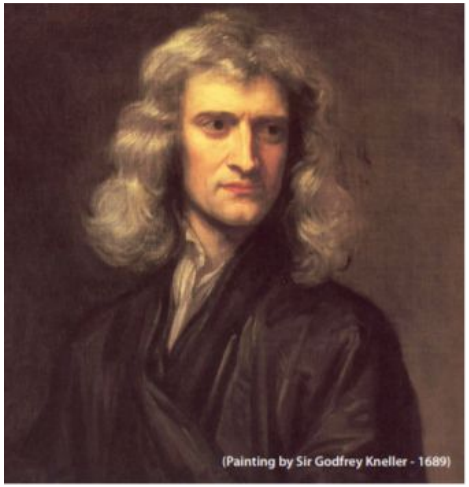
Warm-Ups:

We have learned about how the Bernoulli Principle and Coanda Effect help explain the force of lift on an airplane. Write down a brief definition of each of these and try to explain how they affect the force of lift. You can write on Cornell Notes or notebook paper.

Lift is so complicated that there is more for us to learn!

Lesson Introduction/Background Information:

Another essential that applies to understanding how airplanes fly are the laws of motion described by Sir Isaac Newton. Newton (1642 -1727) was an English physicist, mathematician, astronomer, alchemist, theologian and natural philosopher. He has long been considered one of the most influential men in human history.



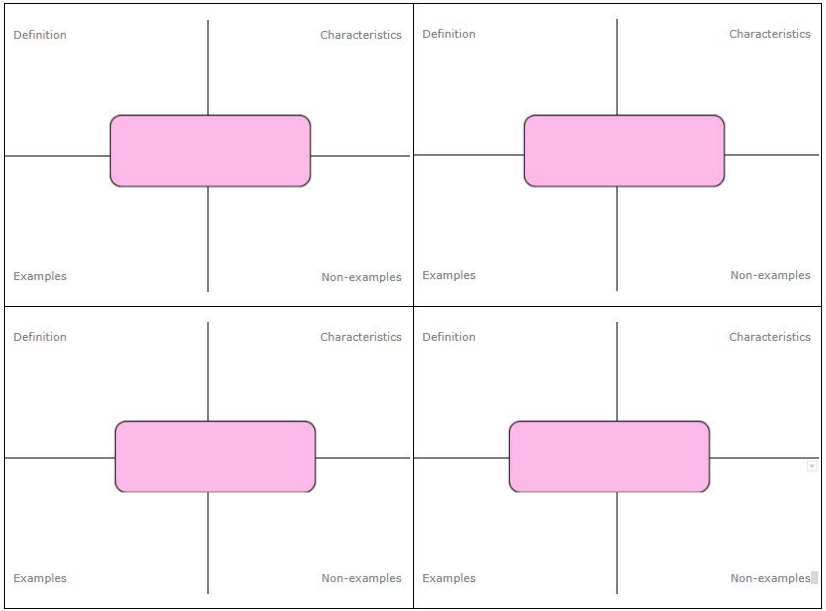
Practice:

Watch this video on Newton's Laws of Motion. Write down the three laws you learn about when the narrator of the video tells you to on your Cornell Notes or notebook paper.

Newton explained the three laws of motion. Newton's first and third laws of motion are especially helpful in explaining the phenomenon of flight. The first law states that an object at rest remains at rest while an object in motion remains in motion, unless acted upon by an external force. Newton's second law states that force is equal to the change in momentum per change in time. For constant mass, force equals mass times acceleration or $F=m \cdot a$. Newton's third law states that for every action, there is an equal and opposite reaction.

Practice:

Use the Frayer Model Vocabulary sheet to explain Newton's 3 Laws of Motion. In the fourth section put the Bernoulli Principle. You can use pictures to help you explain the laws. You may reproduce this sheet on your own notebook paper if it is easier for you.



Self-Assessment:

Write a letter to your teacher that answers the question: How do airplanes fly? You may email your letter to your teacher. Kara Burke

Utilize the word bank below to help with recall and communication

Air pressure	Airstream	Force	Lift
Airflow	Bernoulli Principle	Gravity	Low pressure
Airfoil	Fluid	High pressure	Newton's Laws of Motion

Extend Your Learning/Continued Practice:

Here's a fun video to help you remember Newton's Laws

Here's another music video about Newton's Laws