



## Newton's Laws of Motion Project



Sir Isaac Newton lived during the 1600s. Like all scientists, he made observations about the world around him. Some of his observations were about motion. His observations have been supported by more data over time; and we now call these Newton's Laws of Motion. His laws of motion explain rest, constant motion, accelerated motion, and describe how balanced and unbalanced forces act to cause these states of motion.

Review the three laws of motion:

- ⊗ Newton's first law of motion says that an object in motion will stay in motion and an object at rest will stay at rest unless acted on by an unbalanced force.
  - An object will not change its motion unless a force acts on it.
  - An object that is not moving remains at rest until something pushes or pulls it.
  - An object that is moving remains moving until something pushes or pulls it.
  - All objects resist having their motion changed.
  - This tendency to resist a change in motion is called inertia.
  - The more mass an object has, the greater its inertia.
  
- ⊗ The second law of motion states that the force of an object is equal to its mass times its acceleration.
  - A change in motion occurs only if a net force is exerted on an object.
  - A net force changes the velocity of the object, and causes it to accelerate.
  - If an object is acted upon by a net force, the change in velocity will be in the direction of the net force.
  - The acceleration of an object depends on its mass.
  - The more mass an object has or the more inertia it has, the harder it is to accelerate.
  - More mass means less acceleration if the force acting on the objects is the same.
  
- ⊗ Newton's third law of motion states that for every action there is an equal and opposite reaction.
  - When one object exerts a force on a second object, the second object exerts an equal force in the opposite direction on the first object.
  - The force exerted by the first object is the action force.
  - The force exerted by the second object is the reaction force.

## Newton's Law Project (option A)

Where can you find Newton's three Laws? This project allows you find it in magazines and real life. Your task is to make a book of the Newton's laws using, at the smallest, 8.5 by 11 inch paper (notebook size) which you will fold in half to make a "book" out of.

### Procedure:

1. First, you will need to state each law as it is written in your textbook or other source.
2. Then find at least two pictures that illustrate each law. Pictures can be from magazines, real photographs, and newspapers, and must be printed and cut out if from the internet. The pictures from the internet must be photographs not diagrams or illustrations and cannot already be labeled with forces. The pictures must be in color.
3. Write a paragraph describing how the pictures you choose illustrates the law. The paragraphs must be at least 5 sentences. Please make sure your references are school appropriate.

Page 1.....Cover Page.....Title of Project

Your name/s

Your hour #

Date

Page 2 and 3.....1<sup>st</sup> Law..... State Newton's 1<sup>st</sup> Law

Two pictures illustrating the law

One paragraph for each picture describing how the picture illustrates Newton's 1<sup>st</sup> law.

Page 4 and 5.....2<sup>nd</sup> Law..... State Newton's 2<sup>nd</sup> Law

Two pictures illustrating the law

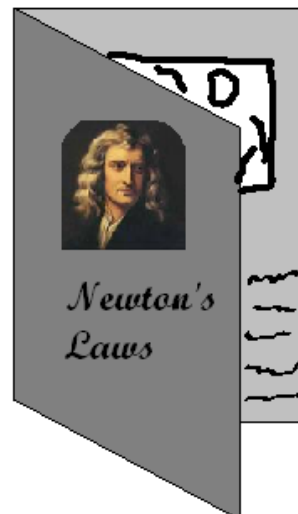
One paragraph for each picture describing how the picture illustrates Newton's 2<sup>nd</sup> law.

Page 6 an 7.....3<sup>rd</sup> Law..... State Newton's 3<sup>rd</sup> Law

Two pictures illustrating the law

Draw arrows on your pictures, indicating action and reaction force pairs on the actual pictures.

One paragraph for each picture describing how the picture illustrates Newton's 3<sup>rd</sup> law.



## Newton's Laws Project (option B)

Your task is to make a PowerPoint presentation of the Newton's laws using Microsoft PowerPoint or an equivalent computer program.

### Procedure:

1. First, you will need to state each law as it is written in your textbook or other source.
2. Then find at least two pictures or video segments that illustrate each law and copy them to a PowerPoint slide; one picture per slide. Pictures or video segments can be from any internet source or digital media that is school appropriate. The pictures must be photographs not diagrams or illustrations and cannot already be labeled with forces. The pictures must be in color. Beware of using video segments or links, some of them may not work on school computers, therefore you may want to try them on school grounds before placing them in your project. If I cannot access them from school your grade will reflect so.
3. Write a paragraph describing how each picture you chose illustrates the law. The paragraphs must be at least 5 sentences and be on the same slide as the picture. Please make sure your references are school appropriate.

Slide 1.....Cover Page.....Title of Project

Your name

Your hour #

Date

Slide 2 and 3.....1<sup>st</sup> Law..... State Newton's 1<sup>st</sup> Law

Two pictures illustrating the law

One paragraph for each picture describing how the picture illustrates Newton's 1<sup>st</sup> law.

Slide 4 and 5.....2<sup>nd</sup> Law..... State Newton's 2<sup>nd</sup> Law

Two pictures illustrating the law

One paragraph for each picture describing how the picture illustrates Newton's 2<sup>nd</sup> law.

Slide 6 and 7.....3<sup>rd</sup> Law..... State Newton's 3<sup>rd</sup> Law

Two pictures illustrating the law

Draw arrows on your pictures, indicating action and reaction force pairs on the actual pictures.

One paragraph for each picture describing how the picture illustrates Newton's 3<sup>rd</sup> law.

## Newton's Laws Project (option C)

Your task is to make a Video/Movie presentation of the Newton's laws using a video camera.

In your movie you must follow the following procedure:

1. First, you will need to state each law as it is written in your textbook or other source.
2. Your group must record yourselves accurately demonstrating each of Newton's Laws. You must have two different demonstrations for each of the three laws. Demonstrations must be school appropriate.
3. After each demonstration there must be an explanation on camera, either while the demonstration is occurring, or after the demonstration, of how each illustrates the law. The explanations must be at least 5 sentences for each demonstration. All group members must in some way be in the video. You can recruit other people to assist in demonstrations.

Video Segment 1.....Introduction.....Title of Project  
Your name  
Your hour #  
Date

Video Segments 2 and 3.....1<sup>st</sup> Law..... State Newton's 1<sup>st</sup> Law  
Two demonstrations of the law  
One paragraph for each demo describing how the picture illustrates Newton's 1<sup>st</sup> law.

Video Segment 4 and 5.....2<sup>nd</sup> Law..... State Newton's 2<sup>nd</sup> Law  
Two demonstrations of the law  
One paragraph for each demo describing how the picture illustrates Newton's 2<sup>nd</sup> law.

Video Segment 6 and 7.....3<sup>rd</sup> Law..... State Newton's 3<sup>rd</sup> Law  
Two demonstrations of the law  
Indicate in your demonstrations action and reaction force pairs.  
One paragraph for each demo describing how the picture illustrates Newton's 3<sup>rd</sup> law.

# Newton's Three Laws

Name \_\_\_\_\_

		Points Available				Peer Evaluation	Self Evaluation	Total Points Earned
Book/Video/ Slideshow	Quality of format	<b>10</b> Easy to read, visually pleasing, powerful images, logical sequencing, appropriate for audience, exhibits originality, no technical problems	<b>7</b> Visually organized, all information is presented in professional manner, fulfills expectations	<b>5</b> Missing some information, a little unorganized, little creativity	<b>0</b> Little to no effort, missing key information			
1 <sup>st</sup> Law	Law Stated	<b>4</b> Law is stated Accurately	<b>2</b> Law is stated, but inaccurate		<b>0</b> Law is not stated			
	2 Pictures	<b>8</b> Both pictures present and appropriately illustrate law	<b>6</b> Both pictures present, but 1 or both may not accurately illustrate law	<b>2</b> Only one picture present, but it appropriately illustrates law	<b>0</b> Pictures not present or not appropriately illustrating law			
	Paragraph	<b>8</b> Complete paragraph with no grammatical errors or spelling errors, Accurately describes how <u>both</u> selected pictures relate to 1 <sup>st</sup> Law	<b>6</b> Complete paragraph with no grammatical errors or spelling errors, but accurately describes how <u>only one</u> selected picture relate to 1 <sup>st</sup> Law Or Only minor spelling or grammatical errors	<b>4</b> Minor errors in accuracy Or Major spelling and grammatical errors	<b>2</b> Paragraph present, but does not accurately relate pictures to Newton's law	<b>0</b> Paragraph not present		
2 <sup>nd</sup> Law	Law Stated	<b>4</b> Law is stated Accurately	<b>2</b> Law is stated, but inaccurate		<b>0</b> Law is not stated			
	2 Pictures	<b>8</b> Both pictures present and appropriately illustrate law	<b>6</b> Both pictures present, but 1 or both may not accurately illustrate law	<b>2</b> Only one picture present, but it appropriately illustrates law	<b>0</b> Pictures not present			
	Paragraph	<b>8</b> Complete paragraph with no grammatical errors or spelling errors, Accurately describes how <u>both</u> selected pictures relate to 2 <sup>nd</sup> Law	<b>6</b> Complete paragraph with no grammatical errors or spelling errors, but accurately describes how <u>only one</u> selected picture relate to 2 <sup>nd</sup> Law Or Only minor spelling or grammatical errors	<b>4</b> Minor errors in accuracy Or Major spelling and grammatical errors	<b>2</b> Paragraph present, but does not accurately relate pictures to Newton's law	<b>0</b> Paragraph not present		
3 <sup>rd</sup> Law	Law Stated	<b>4</b> Law is stated Accurately	<b>2</b> Law is stated, but inaccurate		<b>0</b> Law is not stated			
	2 Pictures	<b>8</b> Both pictures present and appropriately illustrate law. <b>Pictures have arrows accurately depicting action &amp; reaction forces</b>	<b>6</b> Both pictures present, but 1 or both may not accurately illustrate law Or Perfect, but arrows missing	<b>2</b> Only one picture present, but it appropriately illustrates law	<b>0</b> Pictures not present			

	Paragraph	<p style="text-align: center;"><b>8</b></p> <p>Complete paragraph with no grammatical errors or spelling errors, Accurately describes how <u>both</u> selected pictures relate to 3<sup>rd</sup> Law</p>	<p style="text-align: center;"><b>6</b></p> <p>Complete paragraph with no grammatical errors or spelling errors, but accurately describes how <u>only one</u> selected picture relate to 3<sup>rd</sup> Law</p> <p style="text-align: center;">Or</p> <p>Only minor spelling or grammatical errors</p>	<p style="text-align: center;"><b>4</b></p> <p>Minor errors in accuracy</p> <p style="text-align: center;">Or</p> <p>Major spelling and grammatical errors</p>	<p style="text-align: center;"><b>2</b></p> <p>Paragraph present, but does not accurately relate pictures to Newton's law</p>	<p style="text-align: center;"><b>0</b></p> <p>Paragraph not present</p>			
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