

LIFT AND DRAG

What is Lift?

Lift is a mechanical force generated by a solid object moving through a fluid.

Thrust

Weight

- 0. LIFT AND DRAG Story Preface
- 1. WILBUR AND ORVILLE WRIGHT
- 2. AIRCRAFT CONTROL

3. LIFT AND DRAG

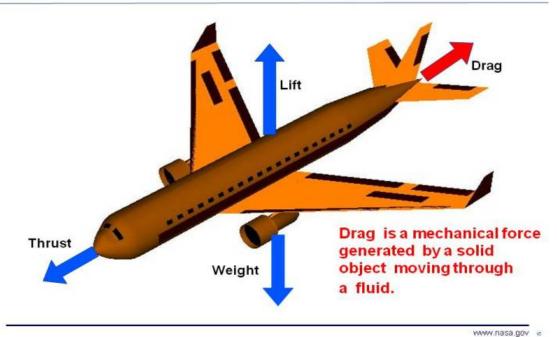
- 4. KITTY HAWK
- 5. THE FIRST FLIGHT
- 6. FLYER 3 and OTHER FAMOUS FLIGHTS
- 7. THE FIRST ROCKETS
- 8. EXPERIMENTAL PLANES
- 9. THE SOUND BARRIER
- 10. THE SPACE RACE
- 11. THE FIRST MAN & WOMAN IN SPACE
- 12. ALAN SHEPARD'S FLIGHT
- 13. JOHN GLENN'S ORBIT
- 14. DEATH IN THE COMMAND MODULE
- 15. TO THE MOON
- 16. APOLLO 11
- 17. APOLLO 13
- 18. THE SHUTTLE'S DESIGN FLAW

For the next two years, Will and Orville used their $\underline{\text{bike shop}}$ as an invention center. Using a bike as their first testing device, they performed $\underline{\text{airfoil experiments}}$.

Pedaling <u>their contraption</u> as fast as they could was exhausting, so the brothers invented a <u>wind tunnel</u> into which they placed two homemade <u>devices</u> - one to test <u>lift</u> and the other to test <u>drag</u>. The blower fan, which was driven by an overhead belt, created winds up to 35 miles per hour.

What is Drag?





Writing down all their <u>observations</u> on strips of wallpaper, they ultimately compiled <u>their findings</u> into a notebook. Among other important conclusions, the brothers <u>determined</u> the commonly accepted coefficient of lift was too high. They also found a wing produced more lift if it had the shape of a <u>parabola</u>.

Using the data from all their experiments, the <u>brothers built</u> a reworked glider in 1902. It was the <u>first aircraft</u> that solved the fundamental <u>problems</u> of flight: <u>lift</u> and <u>three-axis</u> control (referred to as <u>pitch</u>, <u>roll</u>, and <u>yaw</u>).

See Alignments to State and Common Core standards for this story online at:

http://www.awesomestories.com/asset/AcademicAlignment/LIFT-AND-DRAG-History-of-Flight

See Learning Tasks for this story online at:

http://www.awesomestories.com/asset/AcademicActivities/LIFT-AND-DRAG-History-of-Flight

Media Stream



Wright Brother's Bike Shop

Image online, courtesy wright-brothers.org website.

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What is Drag

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Cycle Used to Test Air Foils

Image online, courtesy the NASA website.

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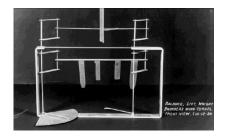


Wright Brother's Wind Tunnel

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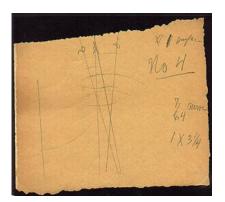


Wright Brother's Machine - Lift Testing

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Wright Brother's Original Notes

Image online, courtesy the U.S. Library of Congress.

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Wright Brother's Notes and Findings

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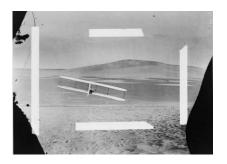


Wright Brother's Reworked Glider

Image online, courtesy wright-brothers.org website.

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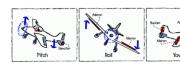


First Aircraft with Control Features

Image online, courtesy the wright-brothers.org website.

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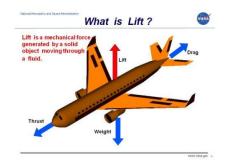


Three-Axis of Aircraft Control

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