



PLTW Flight and Space Virtual Learning

8th Grade/Ailerons

May 14, 2020



8th Grade/Flight and Space
Lesson: May 14, 2020
Day 2 of 2

Objective/Learning Target:
Students will learn about the effects of ailerons on flight.

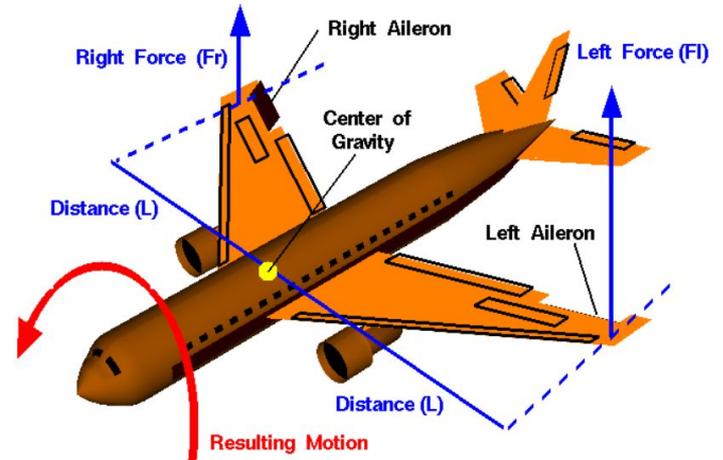
Warm-Ups:

Practice what you have learned with this [Flight and Space Quizlet](#)

Lesson Introduction/Background Information:

In this lesson you will experiment with Ailerons and their effects on airplane movement. You should have the paper airplane built from the last lesson, or you can fold a paper airplane of your own design. You will be modifying the ailerons and testing the flight path based on your changes.

In the diagram, the left aileron is angled down and the right aileron is angled up. This causes a greater lift effect on the left wing rolling the airplane to the right.



Practice:

1. Cut 0.25 inch (6 mm) slits about 1 inch (2.5 cm) from the end of each wing and then fold these areas down. The tabs you have just made are called:_____
2. Looking at your paper airplane from the front, fold the right tab down and the left tab up so that it resembles the diagram on the Aileron Roll Web page. What motion do you predict will result when you fly your airplane? _____
3. Fly your paper airplane. Was the motion the same as your prediction in the question above? If not, describe how it differed. _____
4. The paper airplane should have rolled counterclockwise around its center of gravity if viewed from the front. Where is its center of gravity in terms of the length of the airplane? _____

Practice:

5. Now bend the left tab flat and bend the right flap up. Predict the motion you will see when you fly the paper airplane: _____
6. Fly the plane again. Was your prediction correct? If not, describe how it differed.

7. Is more lift generated on the wing when the tab is bent?
8. Bend the tabs on both wings up and fly your paper airplane. Explain what happened.

9. In what situation would a pilot want to use the ailerons to roll the plane?

10. Where are the ailerons located on a commercial jet? _____

Practice:

11. If the ailerons were used during landing to decrease lift, which way would they be deflected?

12. Where is a spoiler located on a wing of an airliner? _____
13. If a spoiler is deflected on the left wing of an airplane, which way would the airplane roll as viewed from the front? _____
14. If spoilers on both wings were deflected the same amount at the same time, how would the plane's position change? _____
15. Cut and attach small strips of paper to your paper airplane's wings with tape. Fly it. How did your spoilers affect the flight? _____

Self-Assessment:

In your notes reflect on your success in making the paper airplane move in the expected direction. Describe the ailerons positions in order to make the plane go left. Describe the ailerons positions in order to make the plane go right.

Extend Your Learning/Continued Practice:

Learn more about [turning an airplane during flight](#).

See airflow helps [how an airplane turns](#).