

Flying Start Challenge

Stability and Control Mark Scheme

An introduction to how planes fly and how pilots fly them

by

Atkins



Member of the SNC-Lavalin Group



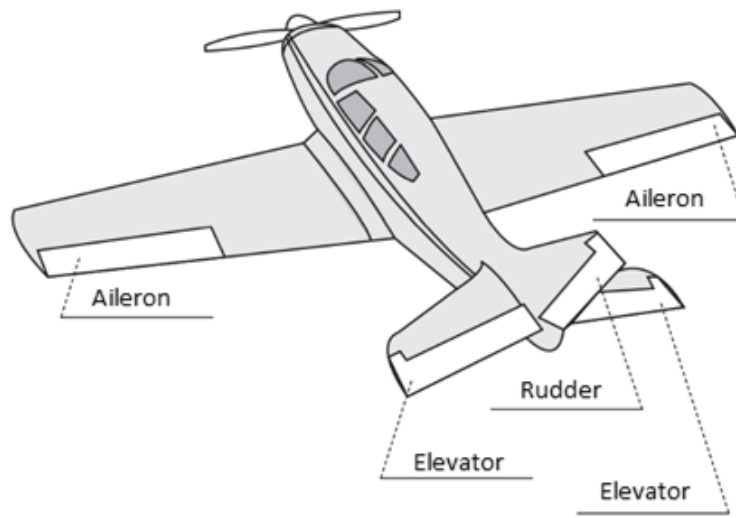
Mark Scheme

Q1: A combined elevator and aileron (like that used on Concorde and your paper plane) has a special name. Which of the following do you think it is?

Answer: B - Elevons

Q2: Using what you have learnt above, can you correctly fill in the labels on this control surface diagram.

Answer:



Challenge Q1: Below are the names of three secondary control surfaces and the description of what they do. See if you can match the control surface to its description (Hint: Use the diagram below to help you)

Answer:

Flaps	These are used to increase the lift created by the wing. They are often deployed on take-off or landing to create more lift at low speeds. They are found on the leading edge (front) of the wing
Slats	These are used to increase the drag over the wing. They are typically deployed on landing to help slow the aircraft down. They are found on the top of the wing.
Spoilers	These are used to increase the lift created by the wing. They are often deployed on take-off or landing to create more lift at low speeds. They are found on the trailing edge (back) of the wing

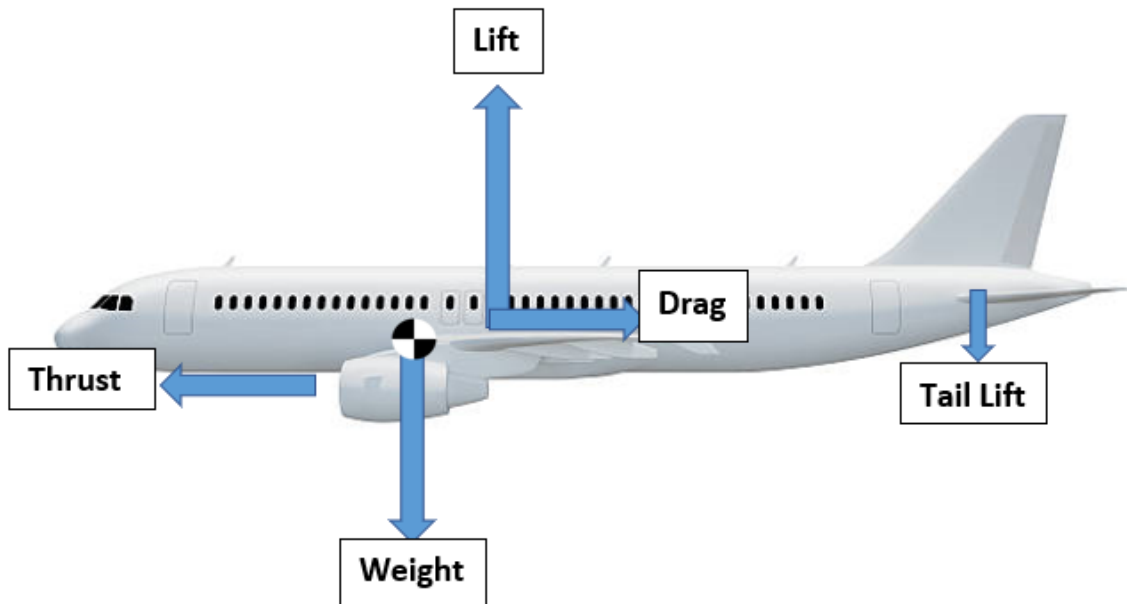
Stability and Control

Q3: Can you think of an example of when negative static stability might be useful and why?

Answer: Fighter aircraft usually have **negative static stability** as this allows them to change direction more quickly, making them more manoeuvrable during dogfights. When a fighter pilot wants to stay in steady, level flight they are helped by an onboard flight control computer which automatically adjusts the **control surfaces**.

Q4: Match up the forces to the correct blue arrow.

Answer:



Q5: Can you remember the equation for Moments?

Answer: Moment = Force x Distance ($M = F \times d$)

Challenge Q2: Can you work out which images show: positive, neutral and negative dynamic stability?

Answer:

