Forces in flight and wind testing by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Write down the 4 forces that act on a flying object 🡪

True or False?

1. Air pressure is caused by the rotation of the Earth.
2. The faster air moves, the higher the pressure.
3. Air pressure pushes in all directions.

To make something fly, there must be more \_\_\_\_\_\_\_\_\_\_\_\_ than \_\_\_\_\_\_\_\_\_\_\_\_

And there must be more \_\_\_\_\_\_\_\_\_\_\_\_ than \_\_\_\_\_\_\_\_\_\_\_\_

At low speeds you need more \_\_\_\_\_\_\_\_\_\_\_\_ and a bigger \_\_\_\_\_\_\_\_\_\_\_\_ for a good L/D ratio.
At higher speeds you can have much less because so much air is moving past the wing.



Changes in pressure create lift. On a*symmetric*wing, the changes on the top half match the bottom half so \_\_\_\_\_\_\_\_ results. Because a *cambered*airfoil is not symmetric, the forces on the top and bottom are different \_\_\_\_\_\_\_\_\_\_\_\_\_ is generated.

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If you raise the nose of an airplane it places the wing at an angle. This is the *angle of attack*. Now the forces on the top and bottom of the wing are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and create lift.

The greater the angle of attack, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; but only up to a certain angle. If the angle is too high, the air breaks up and the wing *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*, which means it loses lift.

**Wind Tunnel Experiment:** You must use all materials provided.

Brainstorm: sketch at least 2 possible ideas

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Which is the best idea and why?

First Test results:

How will you redesign?

Second test results:

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