

Dynamics of Flight

Discussion Questions:



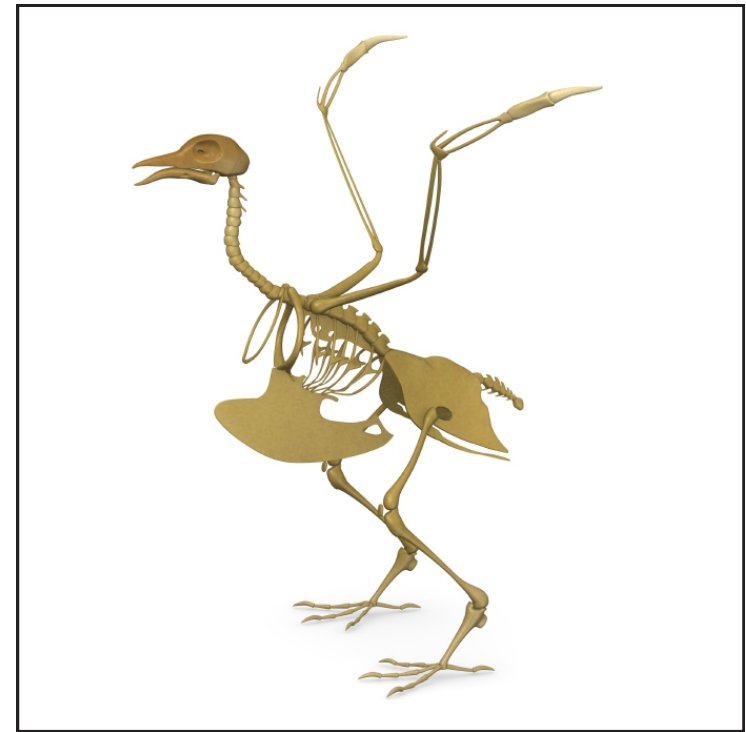
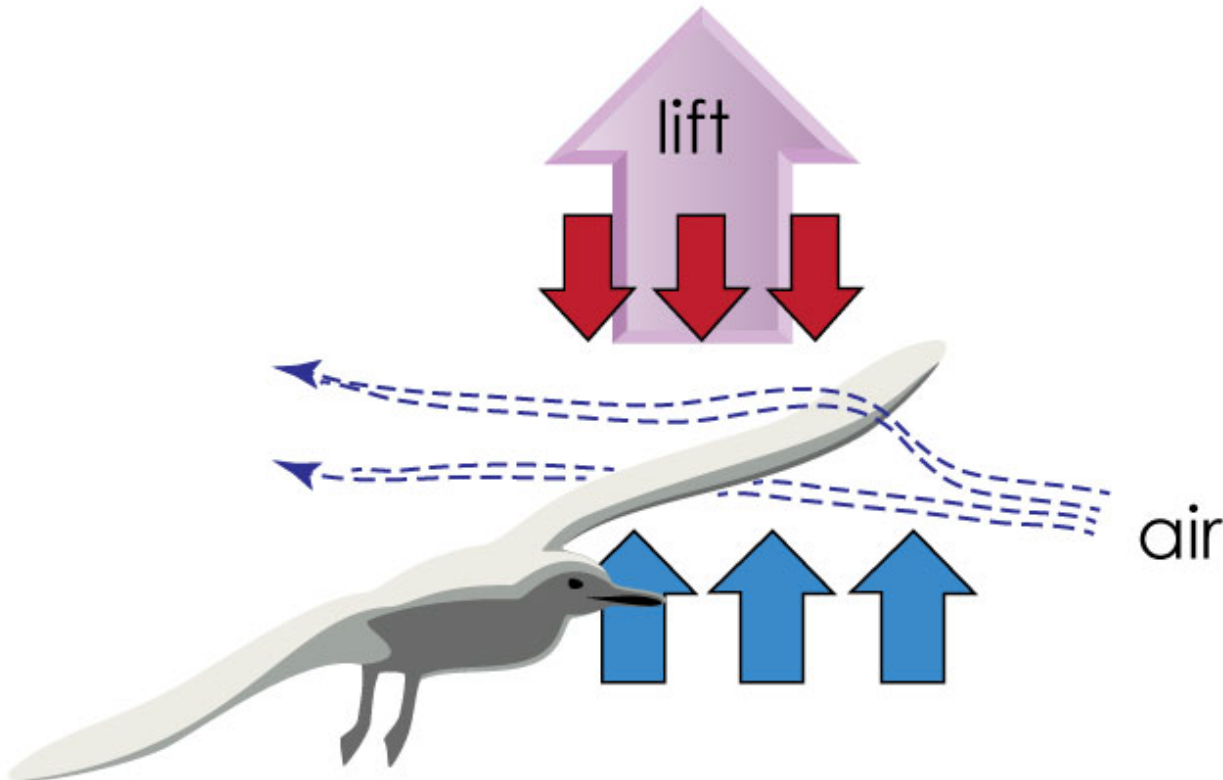
- 1) How do birds fly?
- 2) How does a heavy aircraft fly?
- 3) What forces are involved in flight?

How Do Birds Fly?

Birds skeletons are very light. Their bones have a honeycomb-like structure inside them to make them strong.

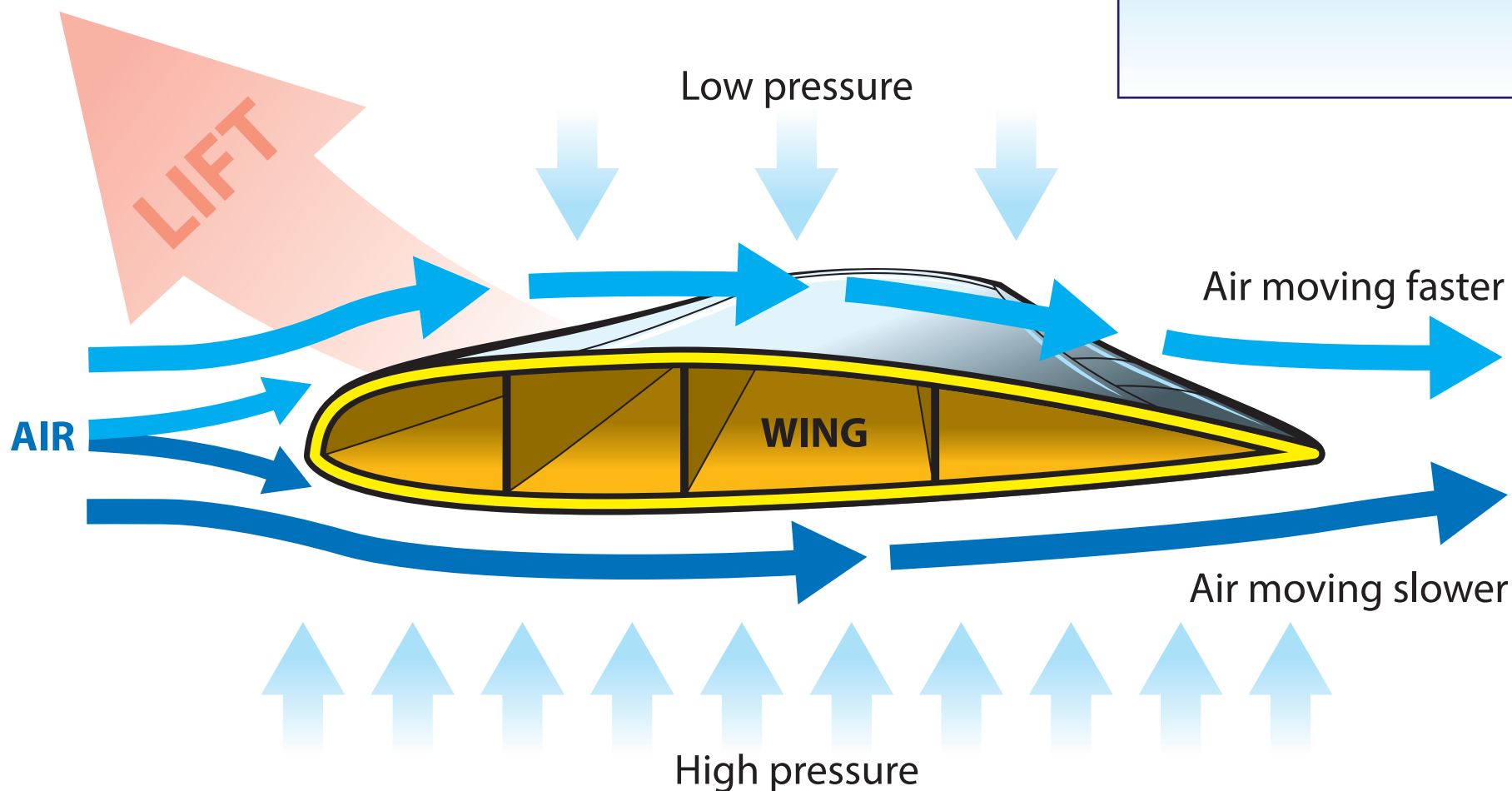
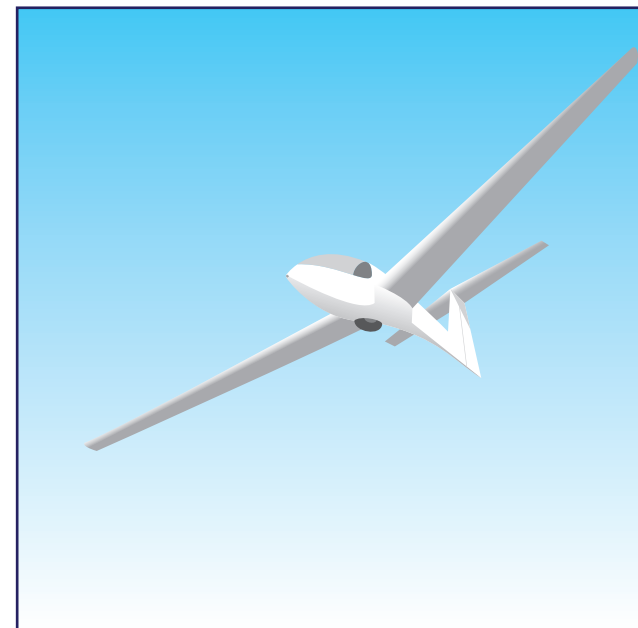
Air needs to be moving over and under the wing for a bird to fly. Birds flap their wings to get the air moving.

Air travelling over the top of the curved wing speeds up because there is a greater distance for the air to travel. This lowers the air pressure above the wing. Because the air pressure under the wing is greater than the air pressure above the wing, lift occurs and the bird rises in the air.



How Do Gliders Fly?

The wings of an aircraft are curved like a bird's wings. Air flows more quickly over the curved edge, lowering the air pressure above the wing. Because the air pressure under the wing is greater than the air pressure above the wing, lift occurs. This is how a glider stays in the air.



How does a plane get into the air?



A bird flaps its wings to get into the air.

A plane has fixed wings so how does it manage to get into the air?

Getting into the air...



Air must be moving over the wings of a plane in order to create lift. You can't flap a plane's wings to get air moving over them! The best way to achieve this is to move the whole plane!

Planes have engines that move them forward on wheels (or on floats in the case of sea planes.) Some engines rely on propellers and some have jet engines.

Once the plane reaches a speed that is great enough to lower air pressure above the wing and overcome its weight, lift will occur and the plane will take off.



Forces Involved in Flight

The right amount of each of the following four forces need to be in place for a plane to be able to fly:

Lift

Lift is the force that moves a plane upwards. Difference in air pressure creates lift.



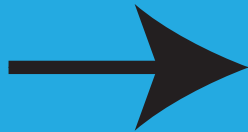
Weight

Weight is the force that pulls the plane towards the ground.



Thrust

Thrust is the force that moves a plane forward. Engines give a plane thrust.



Drag

Drag is the force that slows a plane down. The shape of a plane's wings reduces drag.

