



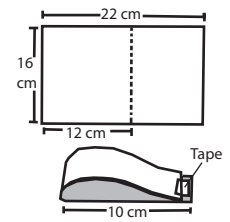
Activity Card

MA-6

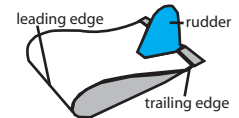
“Aerofoil”

OUTCOME: To demonstrate how the aerofoil separates the air.

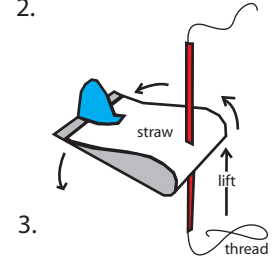
- PROCEDURE:**
1. Make a simple working model of an airplane wing. Cut a piece of paper 22 cm by 16 cm. Measure 12 cm down each edge and make a dotted line. Make a fold on the 12 cm line. Use the sticky tape to fasten the edges together as shown. The top of the wing should be curved and the bottom flat.
 2. Make a small paper rudder and fix it in the centre of the trailing edge.
 3. Fix a drinking straw through the thickest part of the aerofoil. Glue it in place. Cut 60 cm of thread and feed it through the straw. Hold each end of the thread and swing your aerofoil through the air.



1.



2.



3.

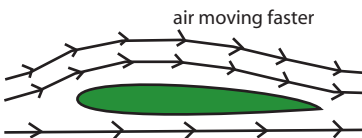
- MATERIALS NEEDED:**
- paper
 - sticky tape
 - scissors
 - glue
 - 60 cm thread



Activity Card

MA-6

Theory:
Aircraft wings are specially designed shapes called aerofoils. The top of the wing is curved while the bottom is flat. Aerofoils are shaped like this:



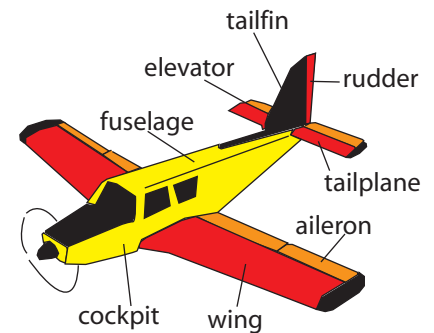
As the wing, or aerofoil, moves through the air, the air separates at the front edge of the wing. Some air passes over the top surface of the wing, and the rest passes along the lower surface. The air moving over the top curved surface has further to go, and therefore, it travels faster. From the Bernoulli Principle we know that the greater the speed of air, the lower its pressure. This means that the air on top of the wing is at a lower pressure than the air below the wing. This

difference in pressure causes the wing to lift.

The angle at which the aircraft's wing meets the oncoming air is also important. The pilot has to ensure that this “angle of attack” gives the best possible lift. If the angle of attack becomes too steep, the air on top of the wing begins to swirl. This swirling is called turbulence, and it destroys lift, causing the aircraft to stall. When an airplane starts to stall, the pilot must act quickly to correct the angle of attack.

An aircraft has three main control surfaces that can be moved to change the direction of flight. These are the rudder, ailerons and elevators.

The rudder is a movable part that is fitted to the vertical tailfin. This rudder flap is used to steer the aircraft.



The ailerons are two movable flaps on the wings. They can be moved up and down so that the aircraft can be tilted from side to side when it is flying. This movement is called banking and helps the plane change direction in the air.

The elevators are flaps fitted to the tailplanes. These are used at take-off and landing to lift and lower the nose of the plane. When the elevators are raised, the plane climbs. When they are lowered, the plane dives.