AVIATION BASIC

INSTRUCTOR NOTES

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TRAINING DIRECTORATE
ENCHANCE THE EXPERIENCE

AVIATION BASIC (AVB)

13 Periods

AVB 1 **Present and Future of Aviation** **AL: B** **Period(s): 1**

a. List current aviation roles
b. Outline the areas of the aviation industry

AVB 2 **Build an Aircraft and Identify Components** **AL: A** **Period(s): 2**

a. Construct a model aeroplane
b. Identify major components of an aeroplane
    1. Tailplane
    2. Horizontal stabiliser
    3. Vertical stabiliser
    4. Fuselage
    5. Wings
    6. Cockpit
    7. Engine
c. Identify the basic control surfaces on an aeroplane
d. Link basic control surfaces to aircraft movement
    1. Aileron causes Roll
    2. Rudder causes Yaw
    3. Elevator causes Pitch

AVB 3 **Physics of Flight: The Four Forces** **AL: A** **Period(s): 2**

a. Define Force
b. Identify the four basic forces acting on an aeroplane in flight
c. Label an aircraft diagram showing force application points
d. Define centre of pressure and centre of gravity
e. Define thrust line and drag line
f. Draw and describe the effect of balanced flight

AVB 4 **Aerofoil and Production of Lift** **AL: B** **Period(s): 2**

a. Describe lift as a force
b. Describe how pressure differentials create lift
c. Build an aerofoil

AVB 5 **Take Off and Climb Away** **AL: B** **Period(s): 2**

a. Define thrust as a force
b. Name ways of producing thrust in an aeroplane
c. Describe and demonstrate how Newton's Third Law of motion relates to aircraft engine
d. Draw and describe the four forces acting on an aircraft during take off and climbing

AVB 6 **Aeroplane on Descent** **AL: B** **Period(s): 1**

a. Describe parasitic and induced drag
b. List methods of drag minimisation
c. Draw and describe the four forces acting on an aircraft during descent and landing
d. Describe the effect of running out of fuel in an aeroplane

AVB 7 **Airfield Safety and Hazards** **AL: A** **Period(s): 1**

a. Identify markings on an airfield and an airfield diagram
b. Identify features and structures on an airfield
c. Orientate runways to magnetic North

d. Recognise hazard areas and sources of hazards applicable to an operating airfield
e. Describe safety precautions when moving around an airfield

AVB 8 **Review**

AVB 9 **Examination**

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AVIATION BASIC

AVB 1 – PRESENT AND FUTURE OF AVIATION

1 PERIOD

AVB 1	**Present and Future of Aviation**	**AL: B**	**Period(s): 1**

a. List current aviation roles
b. Outline the areas of the aviation industry

1001. The Wright brothers first flew in December 1903 and travelled 37 metres, over 100 years later there are over 90,000 commercial flights per day flying 1000's of kilometres, what does the next 100 years hold?

1002. The AVB course will provide an introduction into the aeroplane, explain some of the principles of flight and will introduce the airfield and basic navigation

1003. Every person involved in Aviation has a starting point in the industry, whether that is flying a Glider, helping out at the local airfield or joining the AAFC

1004. In the Royal Australian Air Force there are less than 500 pilots however the establishment is approx. 14500 personnel

1005. There are a number of areas of aviation, each with its own specialties

- General Aviation
- Commercial Aviation
- Military Aviation
- Aerospace

1006. Often there are people who do not want to fly or they may have a medical reason, fortunately there are a number of aviation jobs available such as (but not limited too);

- Pilot
- Air Traffic Control
- Aircraft Design
- Airfield Construction
- Airport Management
- Ground Handling
- Licenced Aircraft Maintenance Engineers
- Regulators (CASA, ATSB)

1007. What is the future of aviation, will space travel be regularly available to the public? Will there be pilots in all aircraft? Will they have different designs and powered by non conventional fuels?

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AVIATION BASIC

AVB 2 – BUILD AN AIRCRAFT AND IDENTIFY COMPONENTS

2 PERIODS

AVB 2 Build an Aircraft and Identify Components AL: A Period(s): 2

a. Construct a model aeroplane
b. Identify major components of an aeroplane
    1. Tailplane
    2. Horizontal stabiliser
    3. Vertical stabiliser
    4. Fuselage
    5. Wings
    6. Cockpit
    7. Engine
c. Identify the basic control surfaces on an aeroplane
d. Link basic control surfaces to aircraft movement
    1. Aileron causes Roll
    2. Rudder causes Yaw
    3. Elevator causes Pitch

Major Components of an Aeroplane

2001. Fuselage: The main body of the aeroplane

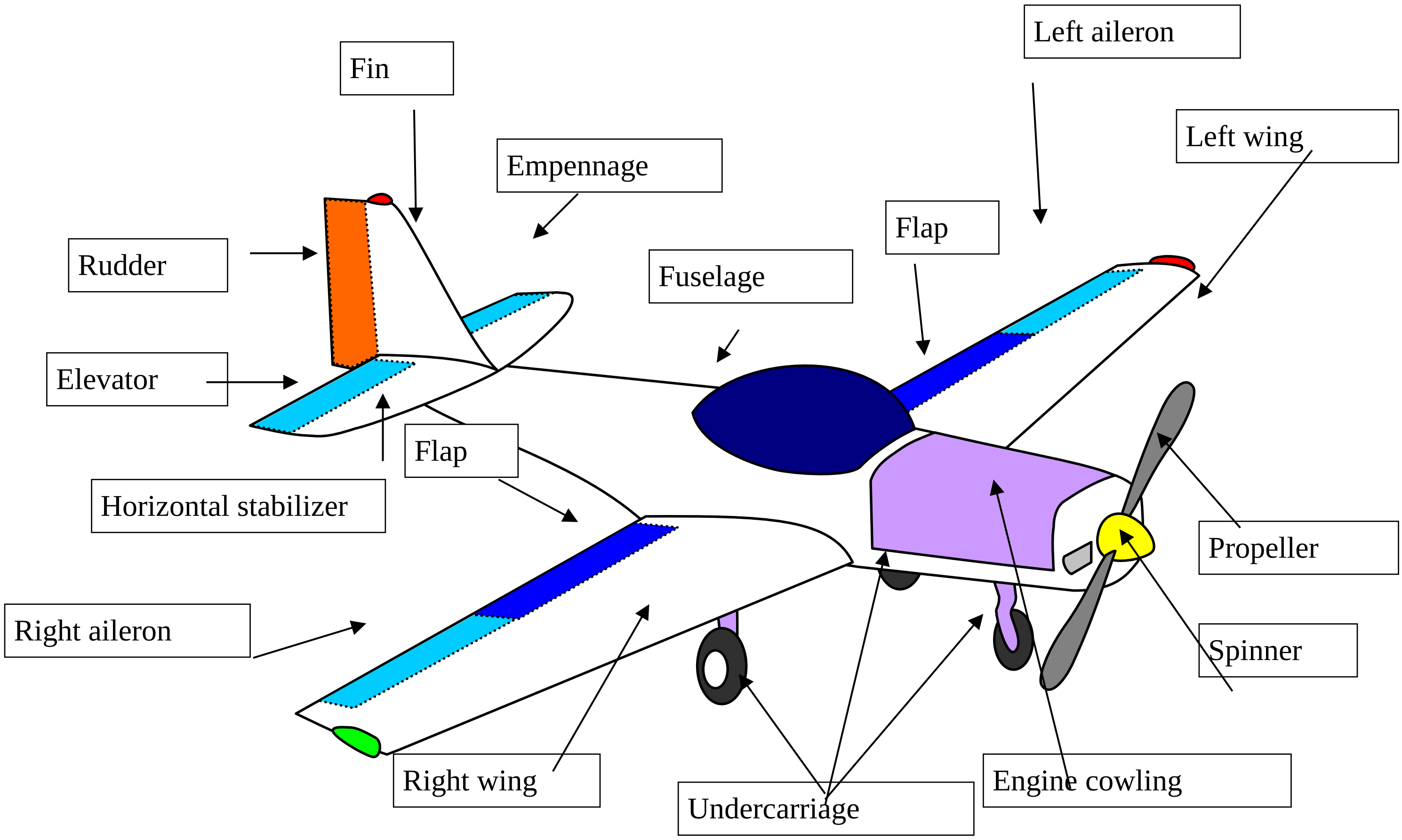
2002. Wings: The main structure providing lift. They also usually hold most of the fuel tanks, and may house the engines.

2003. Undercarriage: The wheels and associated struts, axles etc. In small aeroplanes, these may be fixed in place. Larger aeroplanes usually have a retractable undercarriage to make them more streamlined. Current aeroplanes usually have three sets of wheels

2004. Empennage: The tail section of an aeroplane, usually consisting of the vertical stabiliser (fin) and the horizontal stabilizer.

2005. Engines: Small aeroplanes usually only have one engine, and this is mounted on the nose. If there are two engines, they are usually mounted one on each wing as it is important that they are balanced.

2006. Propellers: The engine may drive a propeller to produce thrust. However, jet engines do not have propellers, and there are also other forms of engine.



Major Control Surfaces of an Aeroplane

2007. There are hinged pieces on the rear edge of the wings, fin and horizontal stabiliser. These are the control surfaces, and are moved by the pilot to steer and to move the aeroplane up, down and around.

2008. Rudder: The fin is the vertical part of the empennage. The back part of it is hinged and is the rudder. The rudder can be moved from side to side by the pilot to direct the nose left or right to change direction. The pilot moves the rudder with pedals at his feet.

2009. Elevators: The horizontal stabilizer is something like a small pair of wings on the empennage. The rear hinged part of the horizontal stabilizer is the elevator. The pilot uses the elevator to move the nose up or down. The pilot moves the elevator with the control column (or joystick) by pushing forward or pulling back.

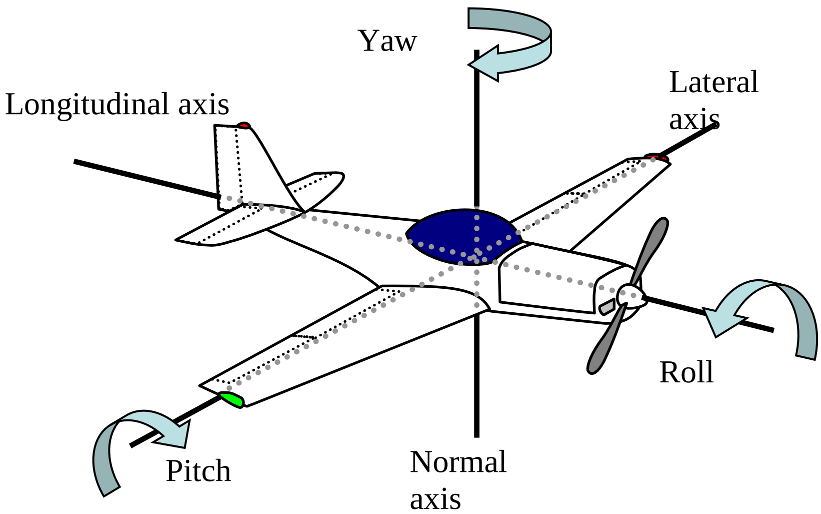
2010. Wing control surfaces: There are at least two sets of hinged control surfaces on the rear edge of the wings of an aeroplane. These are the ailerons and the flaps.

2011. Ailerons: The ailerons are the hinged control surfaces on the outer ends of the wings. They can go up or down. If the pilot moves one up, the other one goes down, and vice versa. The ailerons are used to roll and turn the aeroplane. The pilot moves the ailerons with the control column (or joystick) by pushing left or right.

2012. Flaps: The flaps are the control surfaces on the wings closes to the fuselage. They always move together and can only move downwards or back to level. They are used to allow the aeroplane to fly at slower speeds and are mainly useful for takeoff and landing. The pilot moves the flaps with a switch or lever that is only for the flaps.

How the Control Surfaces of an Aeroplane Work

2013. The aeroplane can be manoeuvred around three dimensions (or axis). These axis are called, the 'normal' axis, the 'lateral' axis and the 'longitudinal' axis.



2014. The elevators are used to 'pitch' the aeroplane around the lateral axis. That means raise or lower the nose

2015. The rudder is used to 'yaw' the aeroplane around the normal axis. That means move the tail left or right.

2016. The ailerons are used to roll the aeroplane around the longitudinal axis. That means roll to left with left wing down and right wing up or vice versa.

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AVIATION BASIC

AVB 3 – PHYSICS OF FLIGHT: THE FOUR FORCES

2 PERIODS

AVB 3 **Physics of Flight: The Four Forces** **AL: A** **Period(s): 2**

a. Define Force
b. Identify the four basic forces acting on an aeroplane in flight
c. Label an aircraft diagram showing force application points
d. Define centre of pressure and centre of gravity
e. Define thrust line and drag line
f. Draw and describe the effect of balanced flight

Definition of a Force

With flying, we have real world objects operating in a real world, and the behaviours need to be understood.

3001. An object that is sitting still can only move from its current position if a force of some kind is applied to it.

3002. A force can be a push, a pull or a twist.

3003. A force is generated by taking something that has mass (is made of matter having some weight) and accelerating it (making it move at a different speed or direction)

3004. This is shown in a mathematical way as Force = mass * acceleration (F=ma) *This is Sir Isaac Newton 2nd Law of Physics*

If you have a consistent force such as how hard you can kick a ball, then you will be able to kick a small ball (small mass) with a greater acceleration than you can kick a heavy ball (big mass).

Weight as a force

3005. WEIGHT: the force that is generated by the mass of an aircraft being attracted to the earth. This is the same thing as saying the force of gravity.

3006. Now gravity acts with a constant acceleration. That is to say, gravity will pull all objects toward the centre of the earth with the same acceleration. So if an object has a big mass such as an Airbus A380, the force of WEIGHT will be big. If the object has a small mass, such as a Cessna 152 then its force of WEIGHT is small.

If you lift a pen to level with your eye, and then drop it, it will accelerate towards the ground. The pen has mass, so a force acted on it. This force is gravity. The same force acts on anything with mass, including all aircraft. So how do we stop everything falling out of the sky?

The Four Forces Relevant to Flight

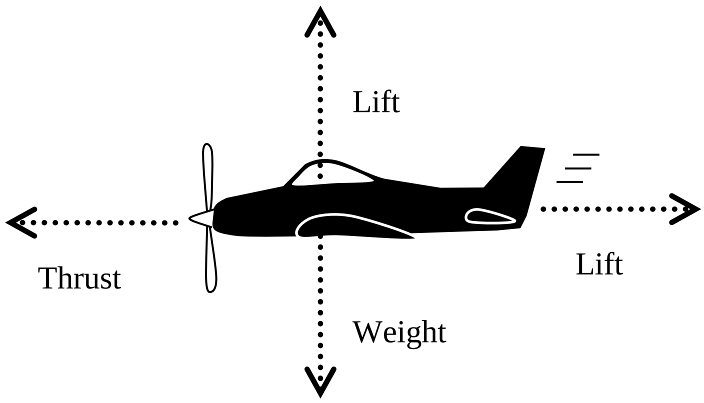
3007. WEIGHT: The force of gravity on the aeroplane

3008. LIFT: The force that holds aeroplanes up in the sky against gravity is called LIFT. Lift is a force that acts in the opposite direction to Weight. Lift is created by the movement of the aeroplane wing through the air.

3009. THRUST: The wing is attached to the aeroplane, so to move it through the air it must be moved forward by another force. This force is called THRUST. The thrust is created by the aeroplane’s engines.

3010. DRAG: As the aeroplane moves forward through the air and producing lift, it experiences resistance in the air and this force is called DRAG.

3011. The forces that are relevant to flight are thus WEIGHT, LIFT, THRUST and DRAG.



Net Force

3012. Net force is the sum of different forces when objects accelerate, it can be caused by a number of different forces. This supplies a NET FORCE on the object.

Balancing forces

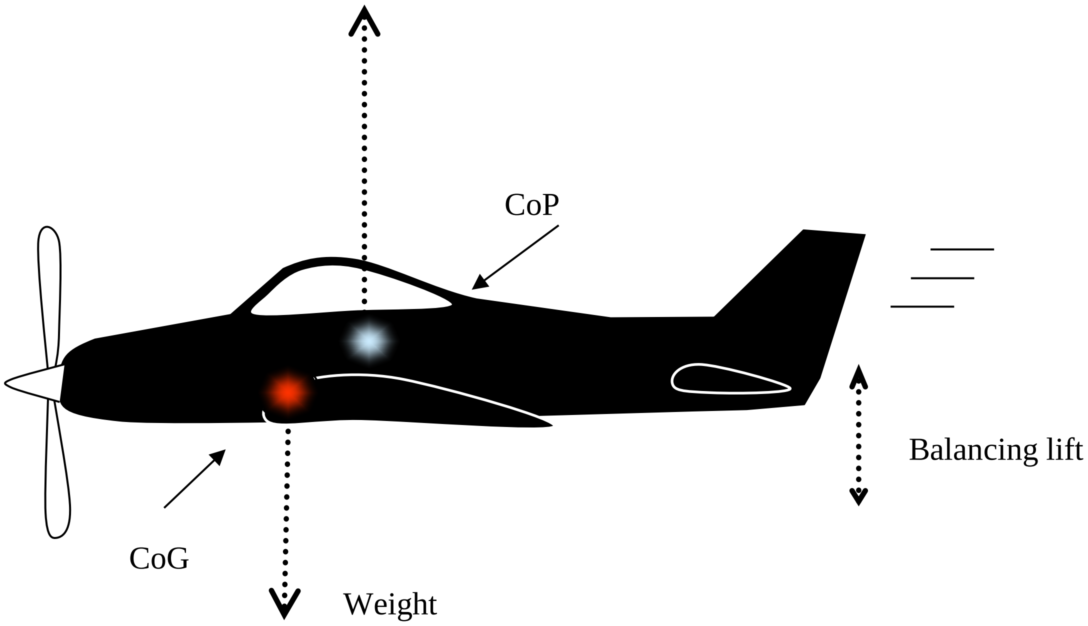
3013. In order for an aeroplane to be able to fly, the four basic forces must be balanced. Lift must balance weight and thrust must balance drag

3014. To assist aeroplane designers in balancing these forces we must first work out the point on the aircraft where these forces act.

3015. The weight of the aircraft will act through the centre of gravity (CoG). This is same principle as a see-saw. You can have a light weight a long distance from the centre being balanced by a heavy weight close to the centre.

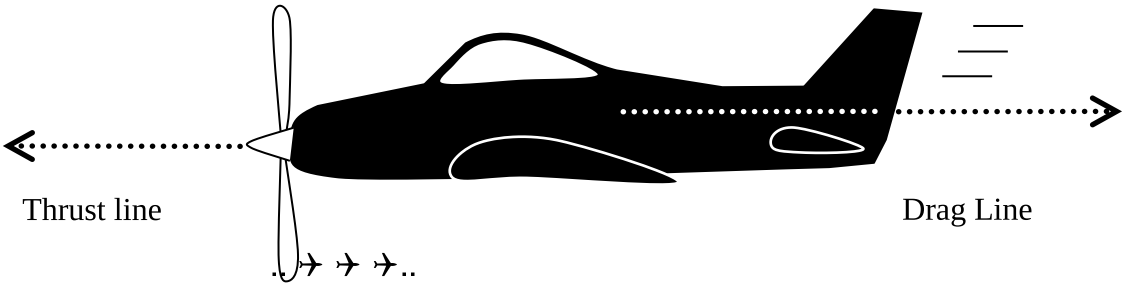
3016. It is important that the CoG is calculated correctly for an aeroplane to fly and this is why airlines ensure people are all sitting in the correct seats for take off. Otherwise if all people moved to the front (or back) the CoG would be in the wrong spot.

3017. The lift acts on the aeroplane through the centre of pressure (CoP). Usually the CoG and the CoP are not aligned. This can cause the aeroplane to pitch up or down around the CoG, so a small balancing force is needed. The tail plane produces lift like the wing but it is designed to be a small force to balance out the pitching effect. Depending on aircraft design, this balance force can be up or down.



3018. Thrust and drag must also be balanced. Thrust is typically aligned with the centre of the engine on the aircraft. The THRUST force acts on the aircraft along this line. This is called the THRUST line.

3019. Drag comes from the shape of the aeroplane and the wing when it is producing lift. All of this drag is added up to produce a total drag. The DRAG force acts on the aircraft against forward movement along a line. This is called the DRAG line.



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AVB 4 – AEROFOIL & PRODUCTION OF LIFT

2 PERIODS

AVB 4 Aerofoil and Production of Lift AL: B Period(s): 2

a. Describe lift as a force
b. Describe how pressure differentials create lift
c. Build an aerofoil

Straight and level flight is the main part of a journey on an aeroplane.

Lift and aerofoil shape

4001. In order for an aeroplane to fly it must produce a force that is opposite to weight. This force is LIFT.

4002. LIFT is produced by movement of the aeroplane's wing through the air. When studying the production of LIFT, the wing is viewed from side-on and is called an aerofoil.

4003. Aerofoil shapes are designed by the aerodynamic engineers to give the best performance for how they plan the aircraft to fly. A typical aerofoil shape for a low speed aircraft will have a curved upper surface and a relatively flat bottom. A fighter jet will have a thin aerofoil to reduce drag at high speed.

Low speed high lift

High speed low drag

Production of lift

4004. The production of LIFT is a result of several complex factors occurring with no one simple explanation of the phenomenon.

4005. It is known that the movement of the aerofoil through the air forces some of the air to flow over the top and some underneath. This displaces the air from its original state.

4006. This displacement gives known and measurable results. Specifically, we can observe and measure changes in speed, pressure and direction of the air stream.

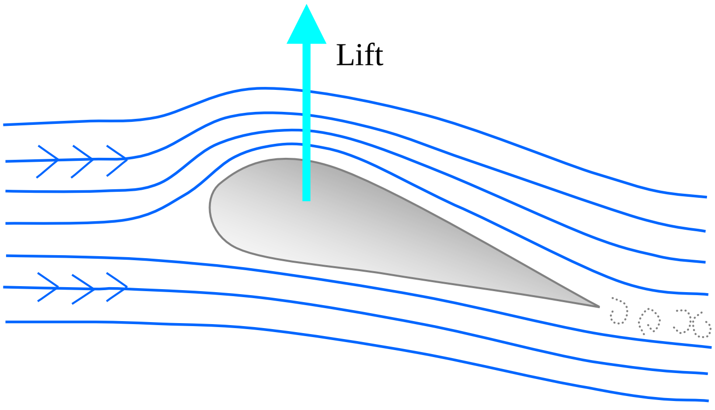
4007. *Speed* – the air stream over the top of the aerofoil is accelerated. The air on top travels much faster than the air underneath in relation to the aerofoil.

4008. *Pressure* - the accelerated air on top has a significantly lower pressure than the air underneath.

4009. *Direction* – the air stream is bent downwards from its original path as the trailing edge of the aerofoil moves onwards.

4010. The air has been an accelerated by having its direction and/or speed changed. The air also has mass. Physics tells us that if a mass is accelerated there is a force; F=ma

4011. The air stream has experienced a resultant force from the passage of the aerofoil. This force is LIFT.



4012. LIFT is also produced if the aerofoil is not moving but the air is being blown over it, such as with a headwind or in a wind tunnel experiment. The displacement effect on the airstream by the aerofoil will be the same.

4013. When we look at the LIFT as a force, acting on an aerofoil, we show that force as acting through (or coming from) a single point. This point is called 'the centre of pressure' (CoP). The LIFT force acts at 90 degrees (perpendicular) to the original path of the air stream.

4014. The total LIFT force on an aeroplane is calculated from all LIFT that is being generated. The aeroplane CoP is calculated using total LIFT and acts through a single point at 90 degrees to the original path of the air stream.

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AVIATION BASIC

AVB 5 – TAKE OFF AND CLIMB AWAY

2 PERIODS

AVB 5	**Take Off and Climb Away**	**AL: B**	**Period(s): 2**

a. Define thrust as a force
b. Name ways of producing thrust in an aeroplane
c. Describe and demonstrate how Newton's Third Law of motion relates to aircraft engine
d. Draw and describe the four forces acting on an aircraft during take off and climbing

Take off and climb out is the first part of the airborne journey on an aeroplane.

Thrust

5001. An aeroplane sitting on the start of a runway with no speed and no thrust is not going to fly.

5002. For any aircraft on the ground, force is needed for it to get into the air. That force is normally provided by an aircraft's engines as THRUST.

5003. It is possible that THRUST alone can be used to overcome the forces of WEIGHT and DRAG to take an aircraft off and climb. This is the case in rockets, such as the Saturn V used for the moon landings.

5004. For aeroplanes though to take off and climb, LIFT and THRUST are required. To produce lift, an aeroplane must have its wings move through the air. THRUST accelerates the aeroplane for takeoff to produce this lift.

5005. A typical small aeroplane generates thrust through a propeller. Fuel is burnt in the engine to turn the propeller. The propeller accelerates air backwards. Because a mass of air is being accelerated, a FORCE is being produced. This is the propeller force.

5006. As a result of this FORCE from the propeller, anything attached to the engine (the aeroplane) will move forward. We know this movement as the THRUST. It is an opposite reaction to the propeller force.

Newton's Third Law of Motion

5007. This resultant FORCE and forward movement is defined by Newton's Third Law of Motion: For every action (air being pushed backwards) there is an equal and opposite reaction (aeroplane moving forwards).

Types of engine

5008. The type and purpose of the aircraft will determine what sort of engine is used to generate thrust.

5009. A modern high speed / high altitude airliner will use a jet engine.

5010. A low speed / low altitude aeroplane will use a propeller.

5011. A rocket or missile will use solid fuel rocket engines, or advanced ram jets/scramjets.

Aviation fuels

5012. Small propeller aeroplanes usually get their energy from a form of petrol, similar to that used in a car.

5013. Jet aircraft usually use kerosene. It has much more energy for the same mass.

5014. Rockets often use solid fuels that can generate huge amounts of energy in a very short time so that they have maximum thrust while close to the ground.

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AVIATION BASIC

AVB 6 – AEROPLANE ON DESCENT

1 PERIOD

AVB 6 **Aeroplane on Descent** **AL: B** **Period(s): 1**

a. Describe parasitic and induced drag
b. List methods of drag minimisation
c. Draw and describe the four forces acting on an aircraft during descent and landing
d. Describe the effect of running out of fuel in an aeroplane

At the end of a journey on an aeroplane there must be descent and landing.

Drag

6001. Drag is the force that the aeroplane experiences as resistance to move through the air. It acts along the drag line of the aircraft and in the opposite direction to thrust.

6002. The overall or total drag an aeroplane experiences is made up of two parts. Parasitic drag and induced drag.

Parasitic Drag

6003. Parasitic drag comes from the shape of the aeroplane and how sleek or aerodynamic it is in the air. If an aeroplane is quite square with flat surfaces hitting the airflow then it will have high drag. If it is more bullet shaped and smooth it will have less drag.

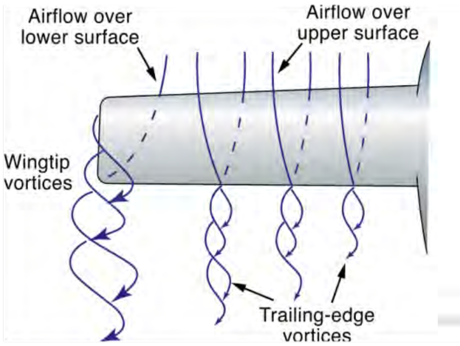
6004. Parasitic drag is directly related to how fast an aeroplane flies. The faster is flies, the more parasitic drag there is.

Induced Drag

6005. Induced drag is also called lift dependant drag. This drag is produced when the wing is making lift.

6006. The high pressure air underneath the wing flows towards the wing tip to try and reach low pressure air on top. The air mixes at the trailing edge and causes a circular, vortex flow.

6007. At the wing tip large amounts of air escape to the top resulting in a large vortex. These vortices cause drag. Pilots call this a wake vortex.



6008. This type of drag is minimised by the designers with things like winglets at the tips of the wings to delay the airflows mixing.

Descent

6009. In a normal descent an aeroplane uses nil or very little thrust. It still needs to produce lift though to balance against weight.

6010. The forces acting on the aeroplane in descent are WEIGHT, LIFT and DRAG.

6011. The aeroplane uses the potential energy of its altitude to convert into kinetic energy. This allows the aeroplane to move forward and produce lift. So the descent is controlled and it doesn't just fall out of the sky.

6012. Pilots will fly the descent at the speed that gives the most lift for the least drag. This gives the optimum glide angle and makes the best use of the potential energy.

6013. If an aeroplane is at height and runs out of fuel it will not fall out of the sky. Instead the pilot will fly the aeroplane like a descent at the best speed for most lift and least drag. The difference now is that no thrust is available to assist with landing.

Effects of weight and drag on descent

6014. For the same aeroplane but at different weights, the designed glide angle will be the same. So the aeroplane will take the same distance to descend if it is light or if it is heavy.

6015. However, a heavy aircraft needs more lift. So it must travel faster to produce this lift. As it goes faster the drag increases. So it will still have the same comparison of best lift to least drag. It will just descend in a shorter time than a light aircraft.

6016. If drag is changed though (for example putting the landing gear down) then this changes the comparison of best lift for least drag of the aeroplane. The result is that for more drag, the aeroplane's descent distance is shorter.

Landing

6017. Ideally the pilot will aim to land an aeroplane as slow as safely possible. This means that less runway is needed and less braking to stop the aeroplane.

6018. The aeroplane must still produce lift as before, but it is now going slower. To do this the pilot must change the shape of the wing.

6019. The pilot will use flaps to alter the wing shape. These flaps increase the curve on top of the wing. This curve on an aerofoil is called the camber. The flap also makes the aerofoil longer. So in effect it is now a different aerofoil and it produces more lift. This means the pilot can now fly slower.

6020. To help stop an aeroplane on the ground, large military transport and jet airliners have reverse thrust as well as wheel brakes. The reverse thrust forces the airflow from the engines forward.

6021. In jet engines special doors open on the side of the engines and the jet exhaust is forced out of them in a forward direction.

6022. On propeller aircraft, the blades are twisted so that they push the air forward instead of the usual backwards.

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AVIATION BASIC

AVB 7 – AEROPLANE ON DESCENT

1 PERIOD

AVB 7 **Airfield Safety and Hazards** **AL: A** **Period(s): 1**

a. Identify markings on an airfield and an airfield diagram
b. Identify features and structures on an airfield
c. Orientate runways to magnetic North
d. Recognise hazard areas and sources of hazards applicable to an operating airfield
e. Describe safety precautions when moving around an airfield

For a safe landing, there are standard features and rules to reduce risk and hazards.

Airfield markings

7001. Where an airfield has sealed taxiways and runways, they are always marked in a specific way.

7002. All runway markings are in white.

- Centreline is a white dashed line
- Sides of runway are a solid white line
- Threshold markings (Piano keys) at each end, as touchdown point
- Runway number at each end

7003. All taxiway markings are in yellow.

- Centreline of taxiway is a solid yellow line
- Sides of taxiway are a solid yellow line

7004. Note that the centreline of taxiways and runways is the route of the aircraft nose wheel – unlike a road where the centreline indicates the line dividing traffic passing in opposite directions.

7005. Holding points: A dashed line across a taxiway is a holding point. No aircraft can pass without permission from Ground Control at a manned airfield. If there is no Ground Control, the pilot is required to stop and ensure the way is clear before proceeding. At the holding point prior to entering a runway, the pilot does a final engine check to ensure full power is available for takeoff.

7006. Holding Bay: At some busy aerodromes, one or more holding bays may be available beside the final holding point to allow smaller aircraft to do their run-up checks without holding up others. Holding bays are semi-circular with entrance and exit because aeroplanes don’t have a reverse gear to drive backwards.

7007. The area where the aircraft park to pickup/unload passengers and cargo is called the apron or ramp.

Features and structures on an airfield

7008. Windsock: The basic requirement for an airfield of any sort is the windsock which displays the current ground level wind direction and (to a rough extent) the speed.

7009. Gable markers: In Australia, the gable markers outline the full runway width of an airstrip (which is wider than the sealed section).

7010. Control Tower: Where the aerodrome has enough traffic to justify its own Air Traffic Control, there may be a control tower. The controllers advise aircraft the order to take off and land and ensure they don’t run into each other.

Runway orientation and naming

7011. Runways are named according to their compass orientation. If you taxi onto a runway and sit near the ‘piano keys’ looking down the length of the runway, that will be the runway direction.

7012. The name of the runway is the first two digits of the runway direction. Thus:

- If the runway direction is 281, then the name is Runway 28
- If the runway direction is 279, then the name is Runway 28
- If the runway direction is 060, then the name is Runway 06
- If the runway direction is 143, then the name is Runway 14

7013. If the Runway name includes a zero (eg Runway 06) then it is spoken as for instance, ‘Runway zero six’.

7014. If you are approaching an aerodrome and intending to land, the name of the runway will clearly indicate which direction it is in relation to the wind direction on the ground. (Pilots try to land facing into the wind).

7015. Each runway has two ends, so there are two names attached to each one. If you went to the opposite end of Runway 28, then you would find it was now Runway 10 because it is 180 degrees around.

7016. Because there are 360 degrees on the compass rose, and we only use the first 2 digits for runway names, then:

- Subtract 18 from the runway name to get the name for the opposing runway. (Thus, if the runway is 26, then 26-18=08, so the opposite runway is Runway 08.
- If the Runway name is less then 18, then add 18 to the Runway name to get the name for the opposing runway. (Eg. if the Runway is 12, then 12+18=30, so the opposing runway is 30.

7017. Some runways are only used in one direction due to particular hazards for takeoff or landing at one end, but they still have two names, which are designated, for instance, as Runway 12/30.

Hazard area and sources of hazards

7018. Propellers: All propellers must be treated as though they may rotate at any time, as the engine, even after being turned off, can retain enough energy to turn it a few more times without warning.

7019. A moving propeller is nearly invisible, and has enough power to slice a person in little slices. This has occurred, so all care near propellers is required.

7020. Prop wash: Propellers are designed to force air backwards. With large propellers, this wash can be enough to blow people off their feet and break limbs or dent heads.

7021. Jet blast: Jets are designed to force a lot of air backwards very fast. This is very dangerous, and can readily kill people who wander into range.

7022. Hinged control surfaces: All aircraft are designed with many moveable control surfaces. These can be operated from inside the aeroplane, and with a force sufficient to shear any body part caught in the gap with the operator being aware of it. So do not idly touch aeroplanes, and in particular, keep fingers etc away from hinges.

7023. Fuel points: Major aerodromes may have piped fuel to the aeroplane parking areas. Others have fuel delivered by tanker, or for light aircraft, they may operate a petrol pump similar to those used for cars. Whatever they are, aviation fuel is high energy and inflammable.

7024. Moving aircraft: Pilots generally have limited vision on the ground. People are relatively small and hard to see – and aeroplanes have a lot of inertia and cannot stop quickly even if they are moving slowly.

Safety precautions on an operational airfield

7025. Always follow instructions and stay within designated pathways (for commercial passenger flights, these re usually marked with orange witch hats and tape).

7026. Do not touch the outside of any aeroplanes until instructed to do so.

7027. Do not use electronic devices around active aircraft – they can ignite fuel vapour or interfere with safety devices.

7028. Foreign Object Damage (FOD): Jet aircraft are particularly susceptible to foreign object damage, but it can also be a problem with propellers too. When people are around aeroplanes, all loose objects should be secured. Remove hats and stow in bags etc. Ensure pocket items are tucked well in, and generally do not let anything flap about.

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