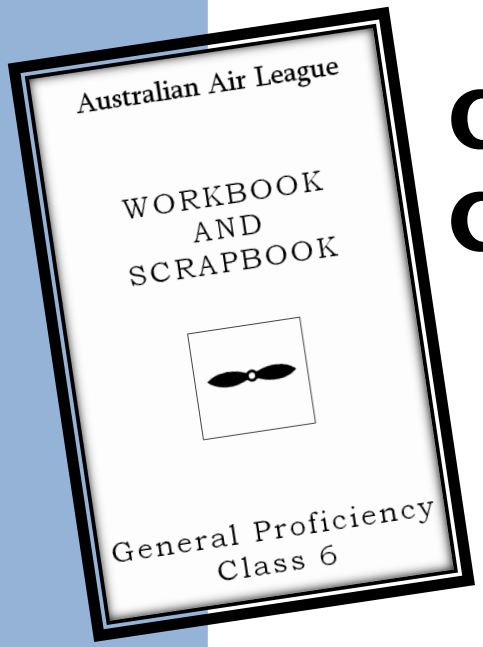
GP6



General Proficiency Class 6

EDUCATION SLIDES

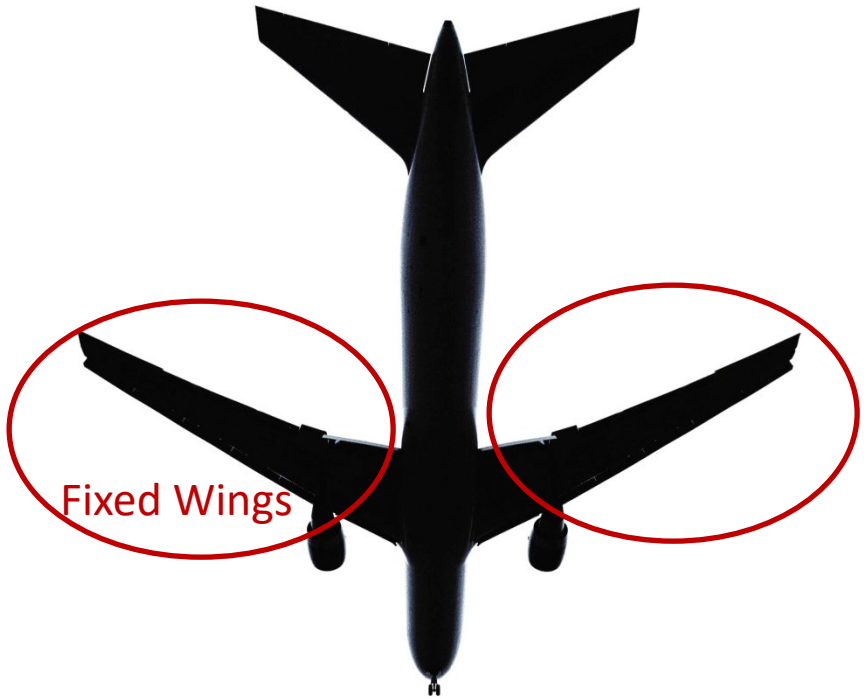
GP6

Section 1 - Types of Aircraft

Aeroplane

What is an Aeroplane?

An Aeroplane is an aircraft that is supported in flight by its fixed wings



GP6

Section 1 - Types of Aircraft

From the collage in your book label the type of:

Aeroplane that can/be used for training and recreational flying

Click for answer

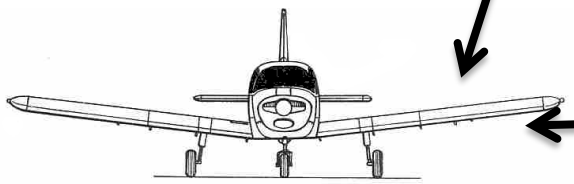
GP6

Section 1 - Types of Aircraft

Monoplanes

They can be…

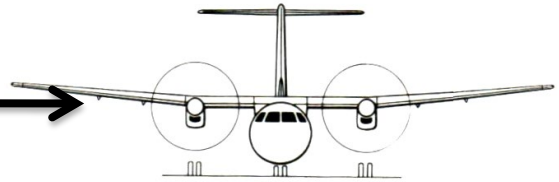
Monoplanes - one set of wings



Low Wing
one set of wings

Mid Wing

High Wing

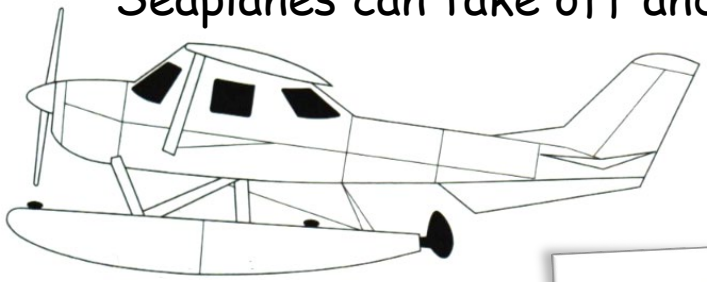


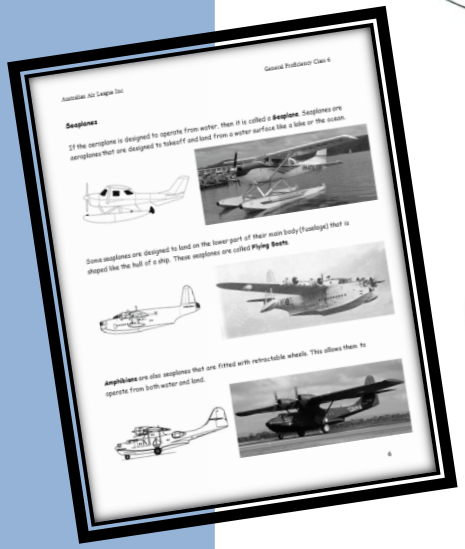
GP6

Section 1 - Types of Aircraft

Seaplanes

Seaplanes can take off and land in water



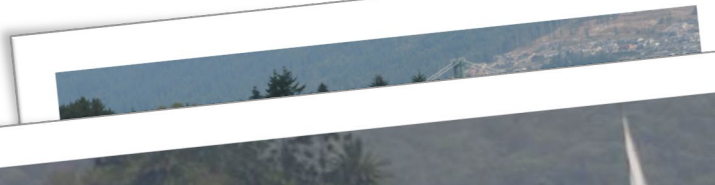

Seaplanes

If the aeroplane is designed to operate from water, then it is called a **Seaplane**. Seaplanes are aeroplanes that are designed to takeoff and land from a water surface like a lake or the ocean.

Some seaplanes are designed to land on the lower part of their main body (fuselage) that is shaped like the hull of a ship. These seaplanes are called **Flying Boats**.

Amphibians are also seaplanes that are fitted with retractable wheels. This allows them to operate from both water and land.

Examples…



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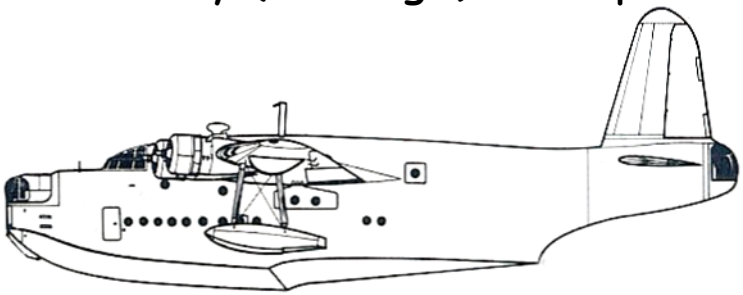
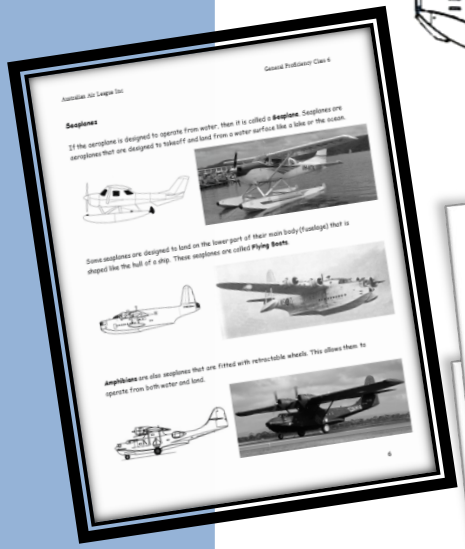
Section 1 - Types of Aircraft

Flying Boats

Body (fuselage) is shaped like hull of a ship





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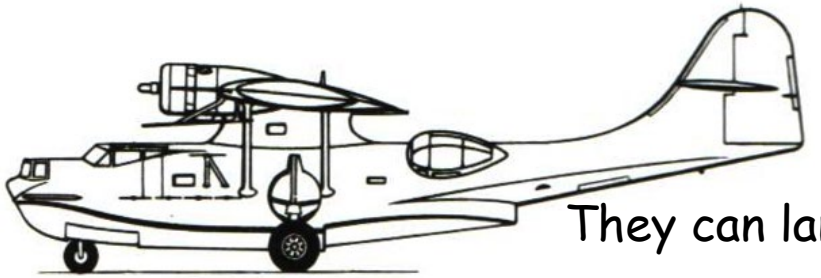
Examples…

GP6

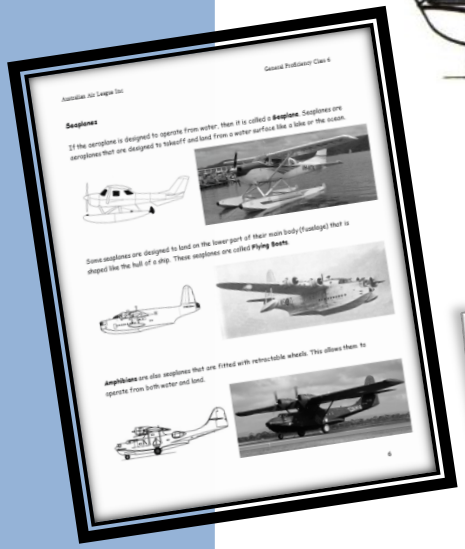
Section 1 - Types of Aircraft

Amphibians

Have retractable wheels.



They can land on both water and land



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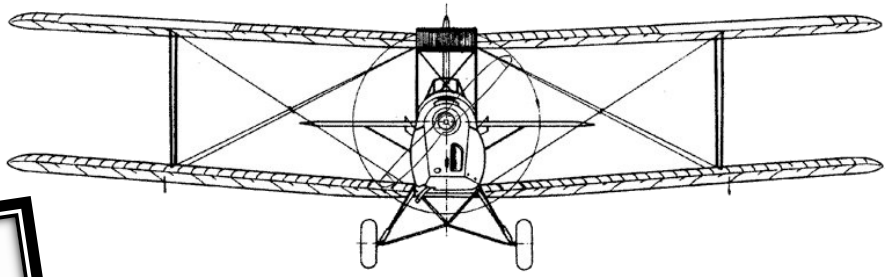
6

Examples...

GP6

Section 1 - Types of Aircraft

Biplanes



Have 2 sets of wings

Biplanes

Biplanes are aeroplanes that have two sets of wings. One set is placed above the other. Another rare type of aeroplane is the **Triplane** with three sets of wings. Triplanes are usually only seen on vintage or replica aeroplanes.

Sailplanes

Sailplanes are aircraft that usually do not have an engine. They are supported in flight with the use of air currents. Sailplanes are commonly referred to as Gliders.

Rotary Wing Aircraft

Rotary Wing Aircraft are aircraft that are supported in flight by the use of a rotating set of wings above the fuselage. The most common Rotary Wing Aircraft are called **Helicopters**.

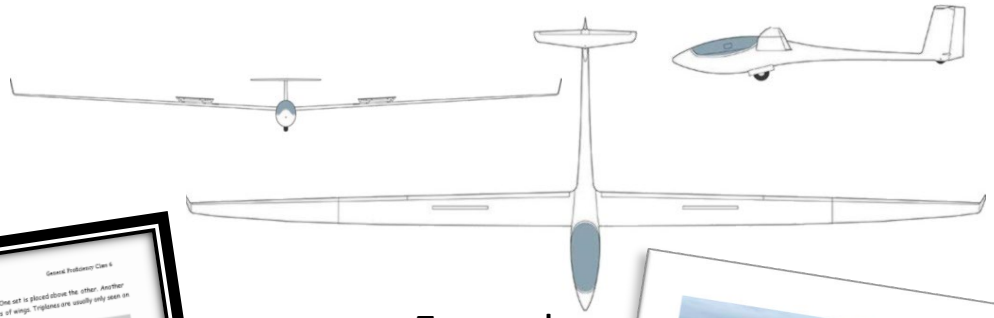
Examples…

GP6

Section 1 - Types of Aircraft

Sailplanes

Do not have an engine



Also called "Gliders"

Examples…

GP6

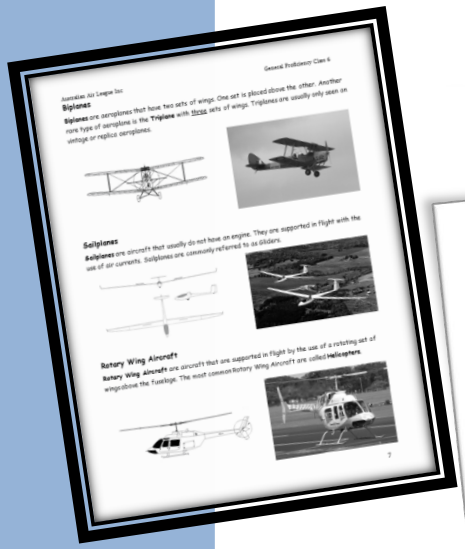
Section 1 - Types of Aircraft

Rotary Wing Aircraft

Have rotating wings above the fuselage

Also called "Helicopters"

Examples…



General Proficiency Class 6

Australian Air League Inc

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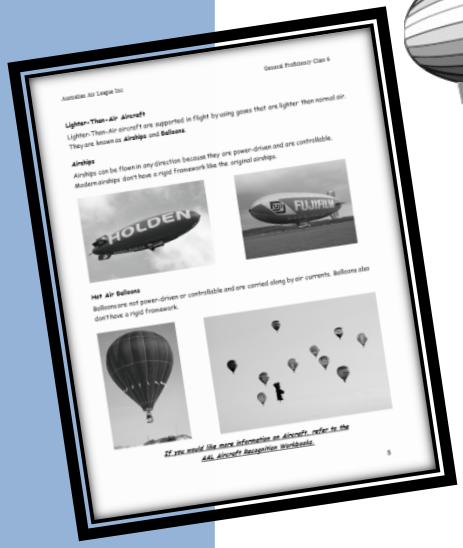
GP6

Section 1 - Types of Aircraft

Lighter-Than-Air Aircraft

Airship

Use power-driven and are controllable

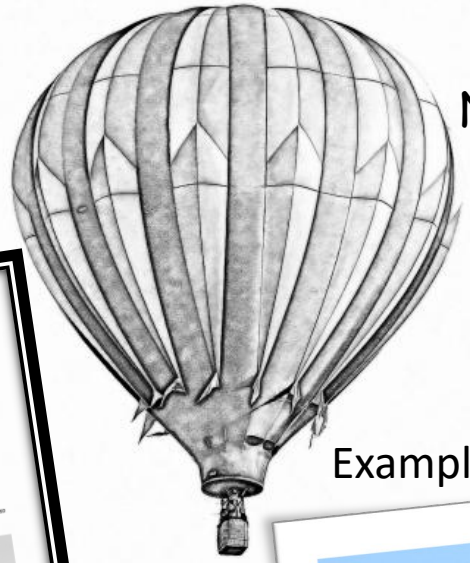


Examples…

GP6

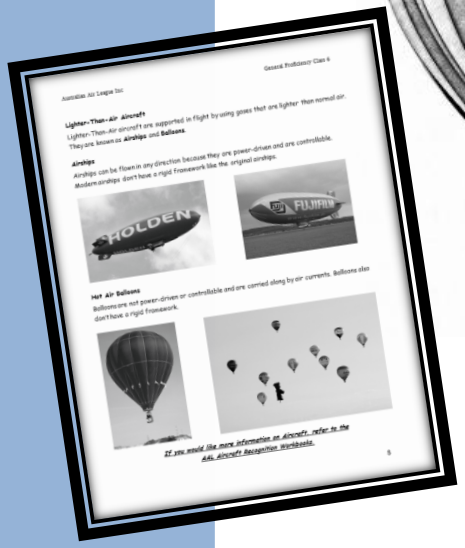
Section 1 - Types of Aircraft

Hot Air Balloon



Not controllable

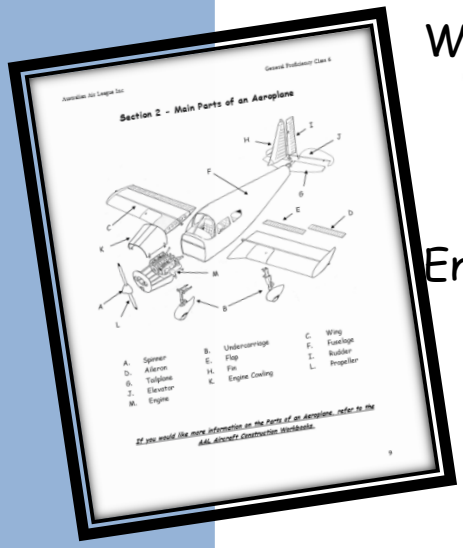
Carried along by air currents



Examples...

GP6

Section 2 – Main Parts of an Aeroplane



Wing

Fuselage

Fin

Rudder

Elevator

Tail Plane

Engine Cowling

Flap

Aileron

Engine

Spinner

Propeller

Undercarriage

Click for next slide

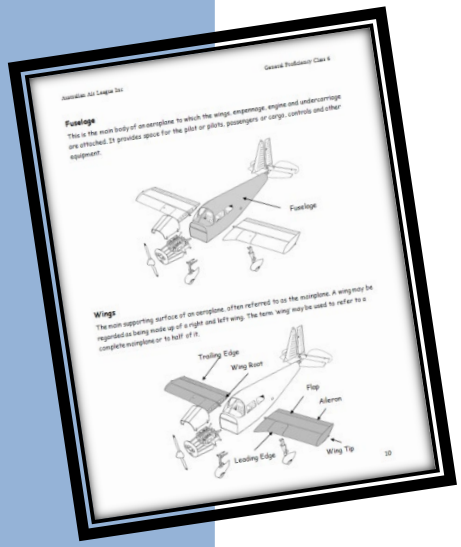
GP6

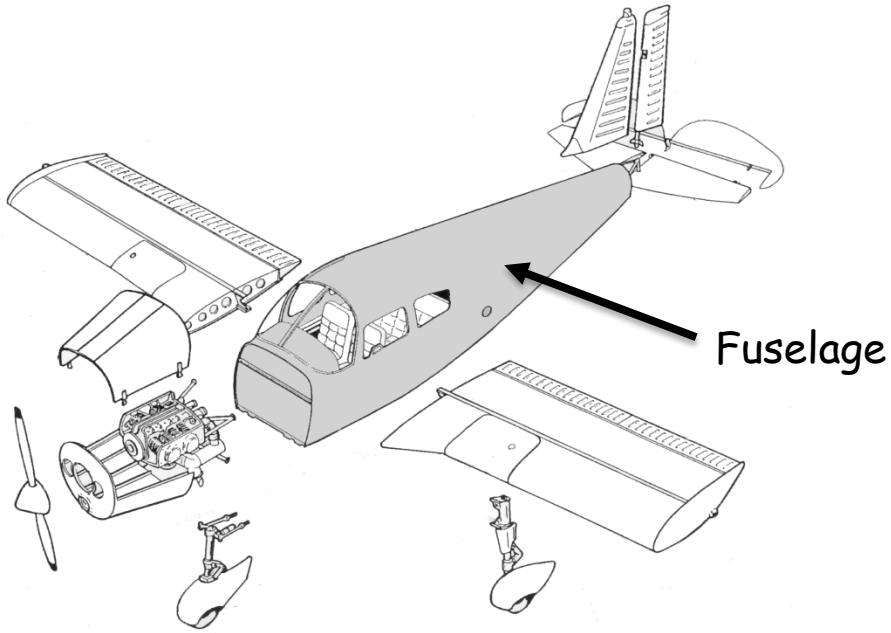
Section 2 – Main Parts of an Aeroplane

Fuselage

Main body of an aeroplane

It provides space for the pilots





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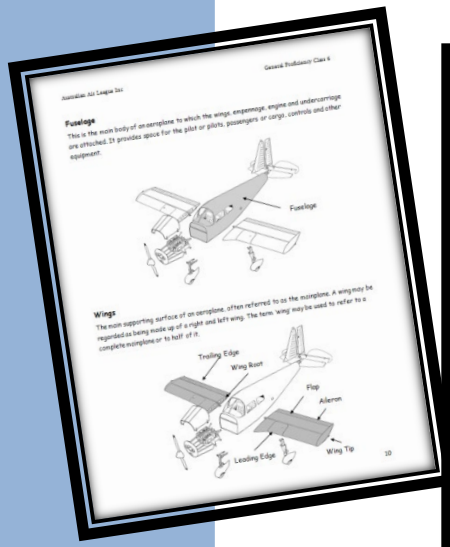
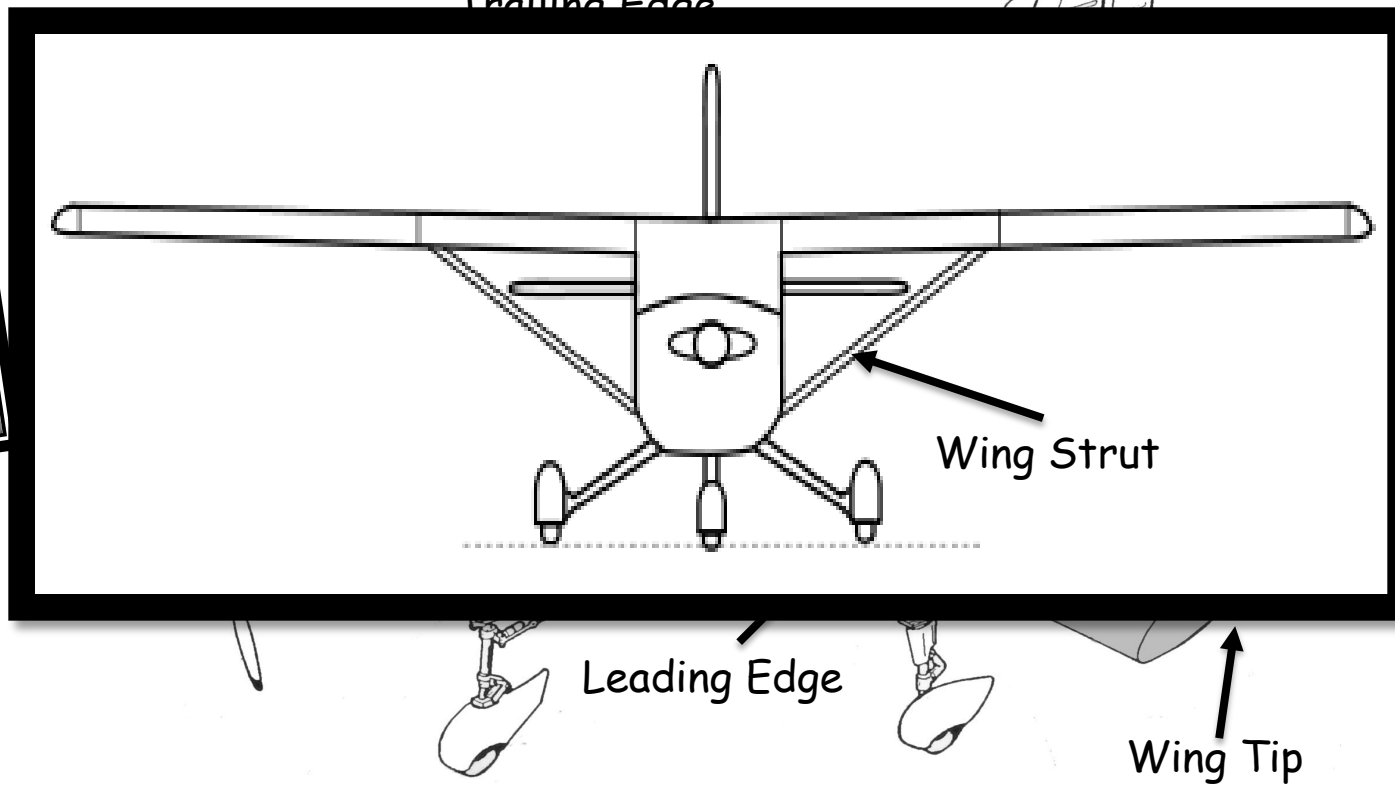
Section 2 – Main Parts of an Aeroplane

Wings

Main supporting surface of an aeroplane

Often called "Mainplane"





GP6

Section 2 – Main Parts of an Aeroplane

Empennage

Complete tail assembly of an Aeroplane

Wing Parts

Aileron:
Hinged, moveable control surfaces attached to the trailing edge of a wing, used to control the angle of bank.

Flap:
Hinged, moveable control surfaces attached to the trailing edge of a wing, which can be lowered to increase the lift and drag of the wing.

Leading Edge:
The front edge of the wing.

Trailing edge:
The rear edge of the wing.

Wing Root:
The end of the wing that is attached to the fuselage.

Wing Tip:
The extreme outer end of the wing.

Wing Struts:
A support connecting the wing and the fuselage.
These are found on most High Wing Aircraft.

Wing Strut

Empennage
This is the complete tail assembly of an aeroplane. It consists of the **Fin**, **Rudder**, **Tailplane** and **Elevator**. The rudder and elevator are moveable control surfaces.

Fin
Rudder
Elevator
Tailplane

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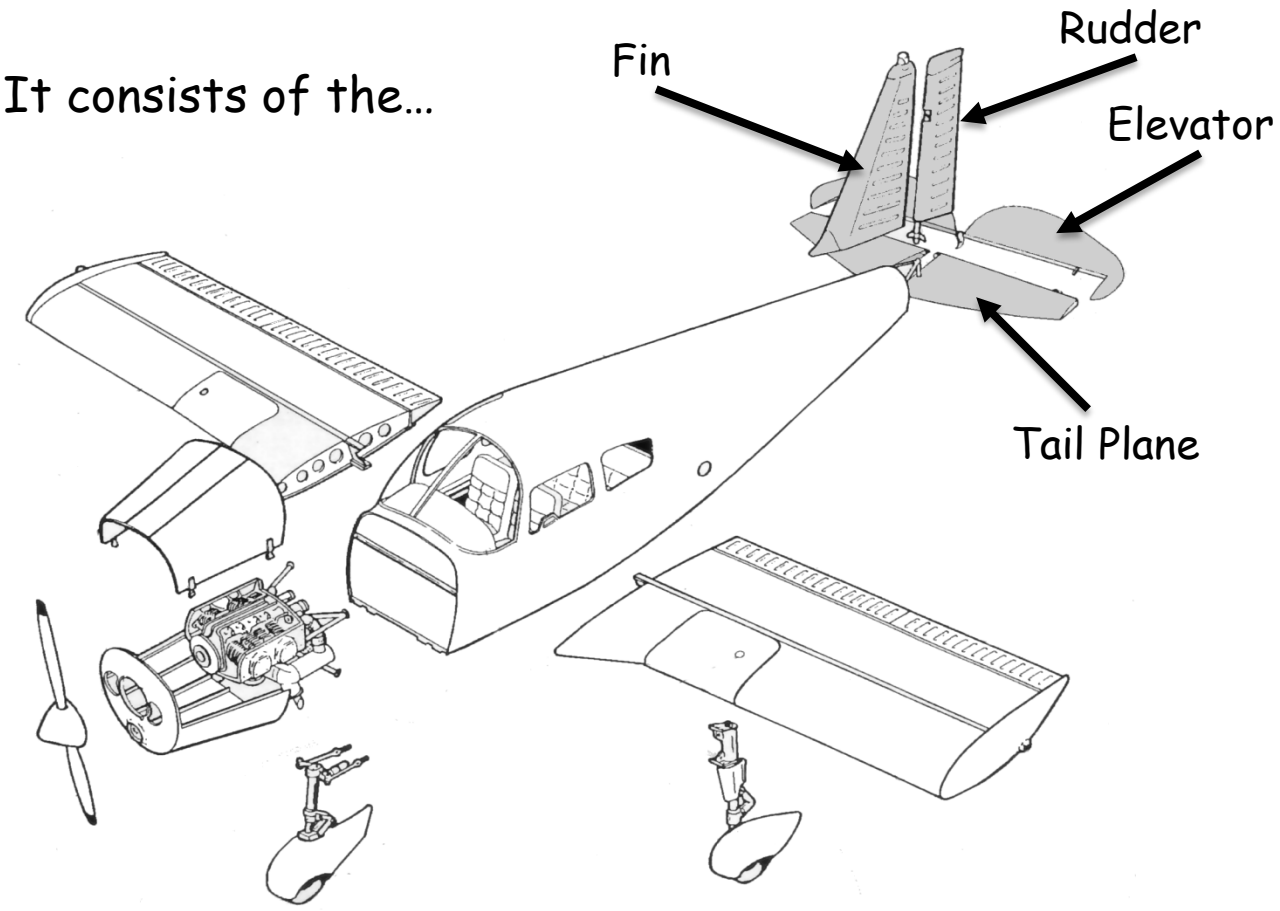
It consists of the…



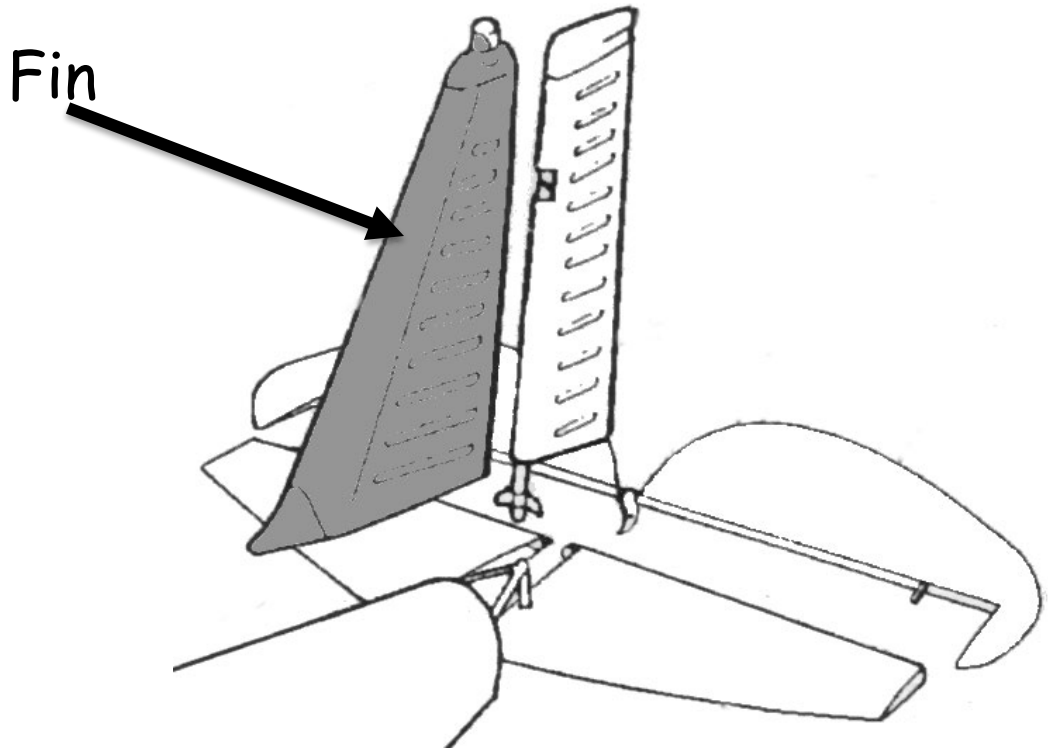
GP6

Section 2 – Main Parts of an Aeroplane

Fin

A fixed vertical surface to which the rudder is attached.

The Fin does not move



GP6

Section 2 – Main Parts of an Aeroplane

Rudder

Moveable control surface attached to the rear of the fin

Used to control turning of the aeroplane

Fin

A fixed vertical surface to which the rudder is attached.

Rudder

A hinged, moveable control surface attached to the rear of the fin.
It is used to control turning of the aeroplane.

Tailplane

A fixed horizontal surface to which the elevator is attached.

Elevator

A hinged, moveable control surface attached to the rear of the tailplane.
It is used to control the climb and descent of an aeroplane.

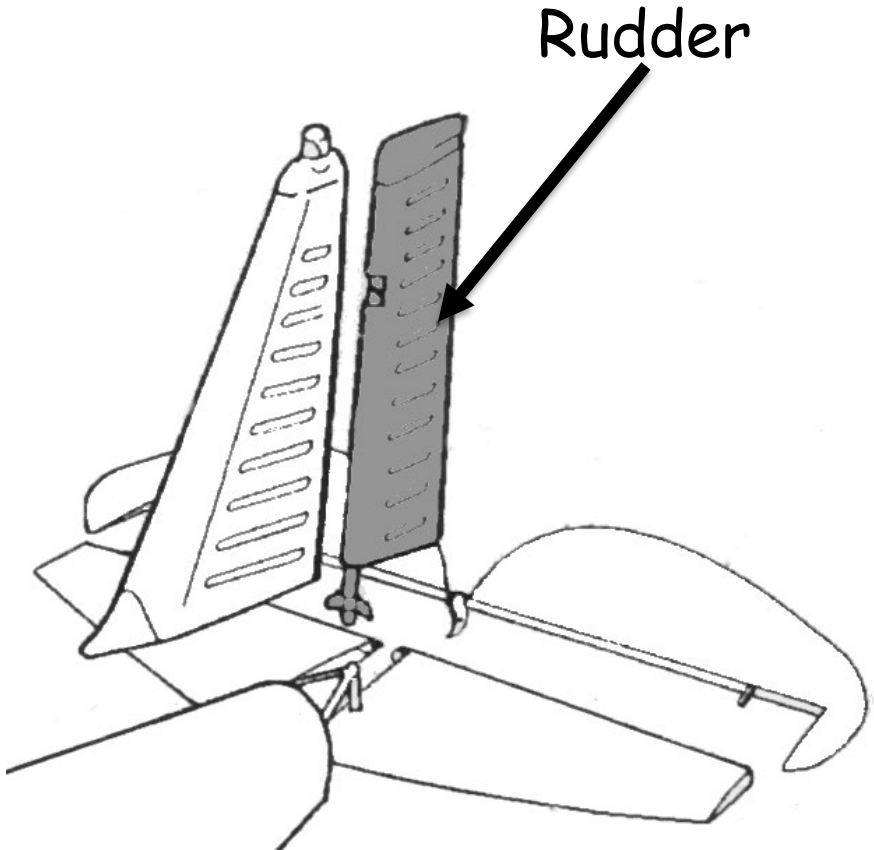
Undercarriage

This assembly supports the aircraft during take-off and landing, and while it is at rest or moving on the ground or water.

Types of Undercarriage

Tricycle Wheel Undercarriage:

For landing on hard surface such as runways, soil, etc.



GP6

Section 2 – Main Parts of an Aeroplane

Tailplane

A fixed horizontal surface to which the elevator is attached.

The Tailplane does not move

Fin

A fixed vertical surface to which the rudder is attached.

Rudder

A hinged, moveable control surface attached to the rear of the fin. It is used to control turning of the aeroplane.

Tailplane

A fixed horizontal surface to which the elevator is attached.

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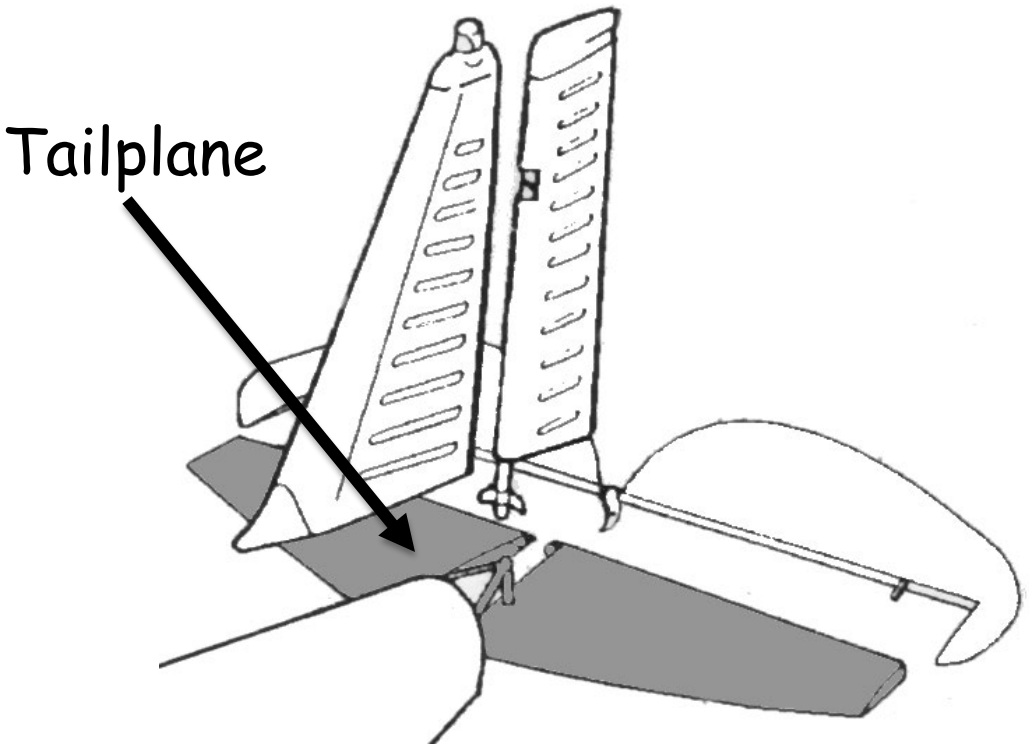

GP6

Section 2 – Main Parts of an Aeroplane

Elevator

Moveable control surface attached to the rear of the tailplane

Used to control the climb and descent of an aeroplane

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A fixed vertical surface to which the rudder is attached.

Rudder

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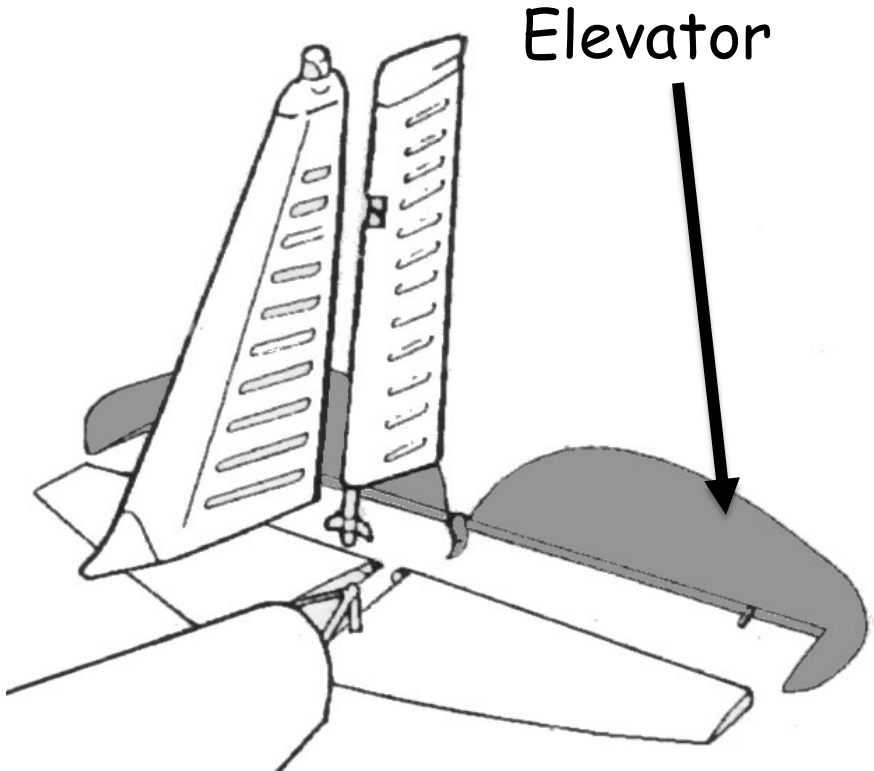

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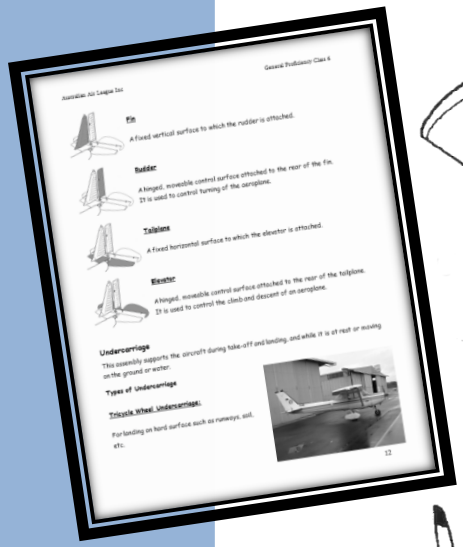
Section 2 – Main Parts of an Aeroplane

Undercarriage

Supports the aircraft during take-off and landing

and while it is at rest or moving on the ground or water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Types of Undercarriage

Tricycle Wheel Undercarriage:

For landing on hard surface such as runways, soil, etc.

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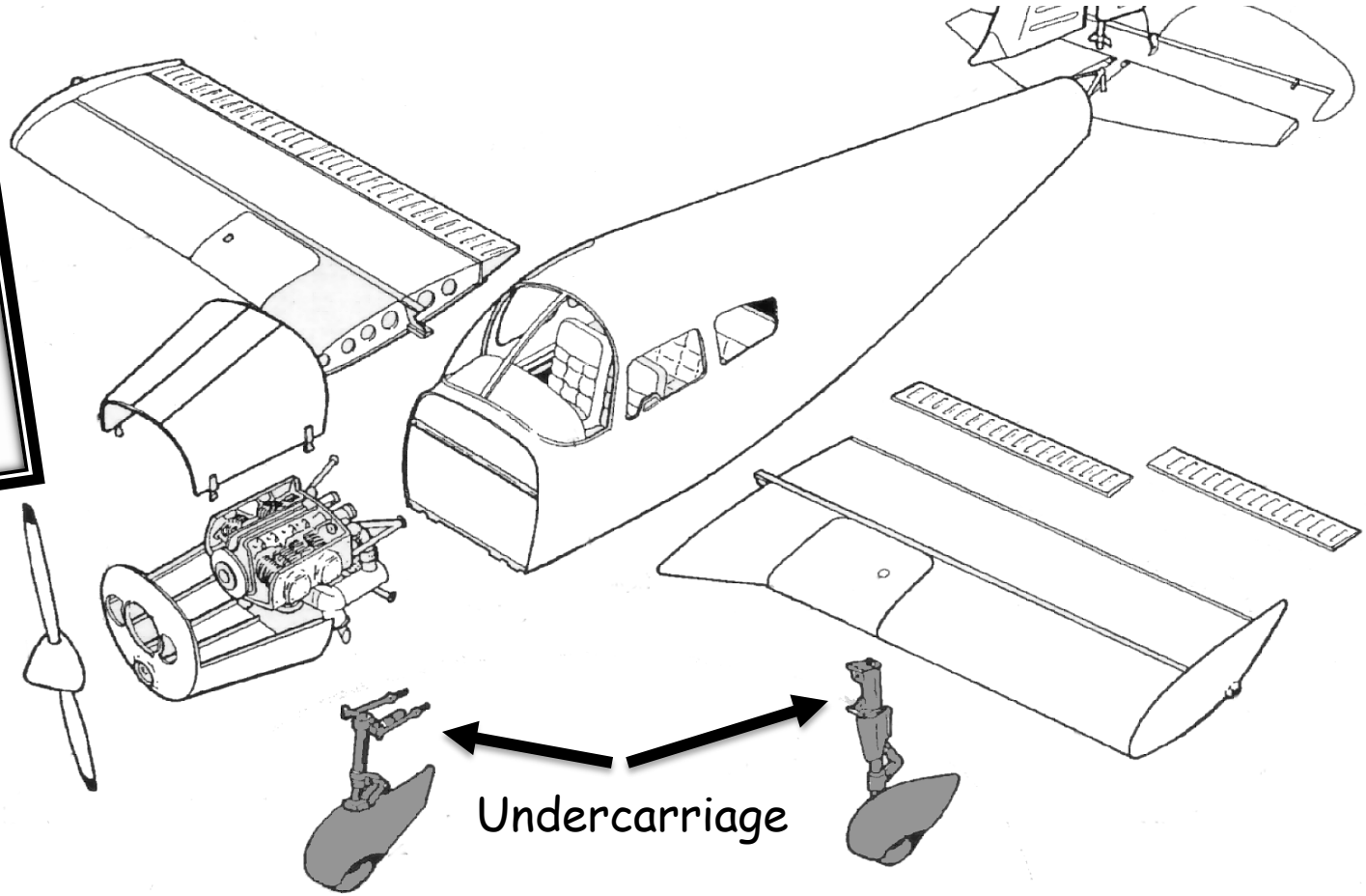

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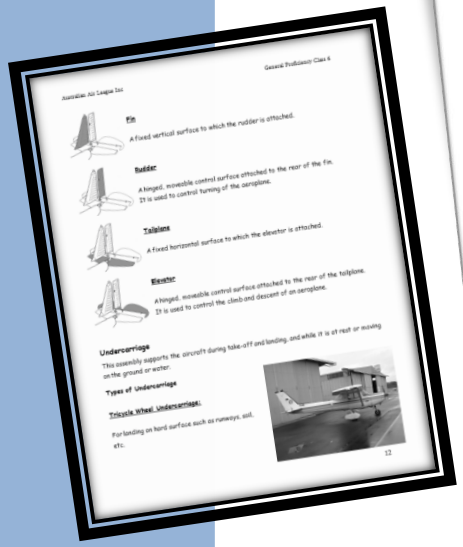
Section 2 – Main Parts of an Aeroplane

Tricycle Wheel Undercarriage

For landing on hard surface such as runways, soil, etc.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Types of Undercarriage
Tricycle Wheel Undercarriage:
For landing on hard surface such as runways, soil, etc.
12

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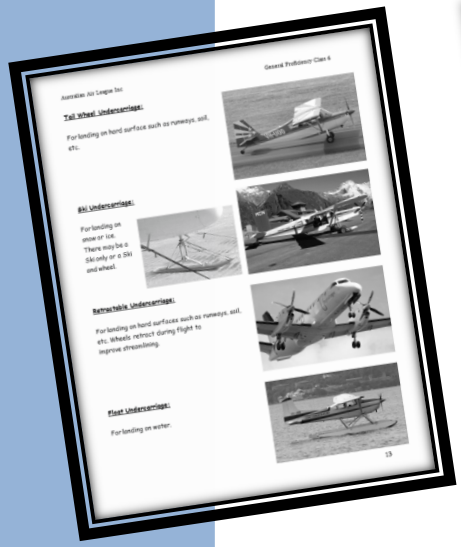
Section 2 – Main Parts of an Aeroplane

Tail Wheel Undercarriage

For landing on hard surface such as runways, soil, etc.



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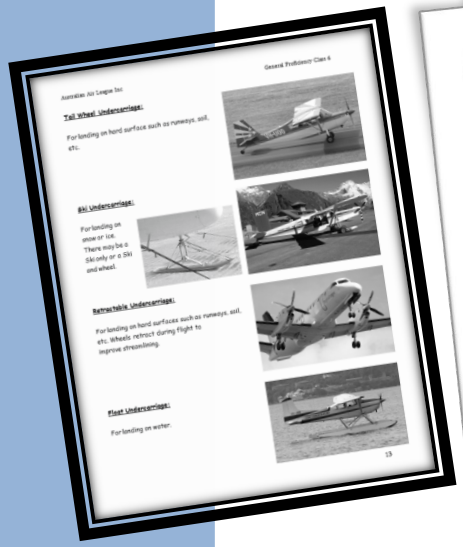
Section 2 – Main Parts of an Aeroplane

Ski Undercarriage

For landing on snow or ice



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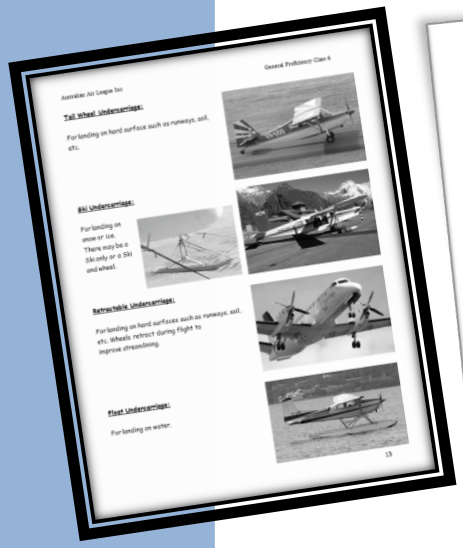
Section 2 – Main Parts of an Aeroplane

Retractable Undercarriage

For landing on hard surfaces such as runways, soil, etc.

Wheels retract during flight to improve streamlining.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Tail Wheel Undercarriage:

For landing on hard surface such as runways, soil, etc.

Ski Undercarriage:

For landing on snow or ice. There may be a Ski only or a Ski and wheel.

Retractable Undercarriage:

For landing on hard surfaces such as runways, soil, etc. Wheels retract during flight to improve streamlining.

Float Undercarriage:

For landing on water.

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GP6

Section 2 – Main Parts of an Aeroplane

Float Undercarriage

For landing on water.

GP6

Section 2 – Main Parts of an Aeroplane

Float Undercarriage with Wheels

For landing on water and hard surfaces

Also called an Amphibian

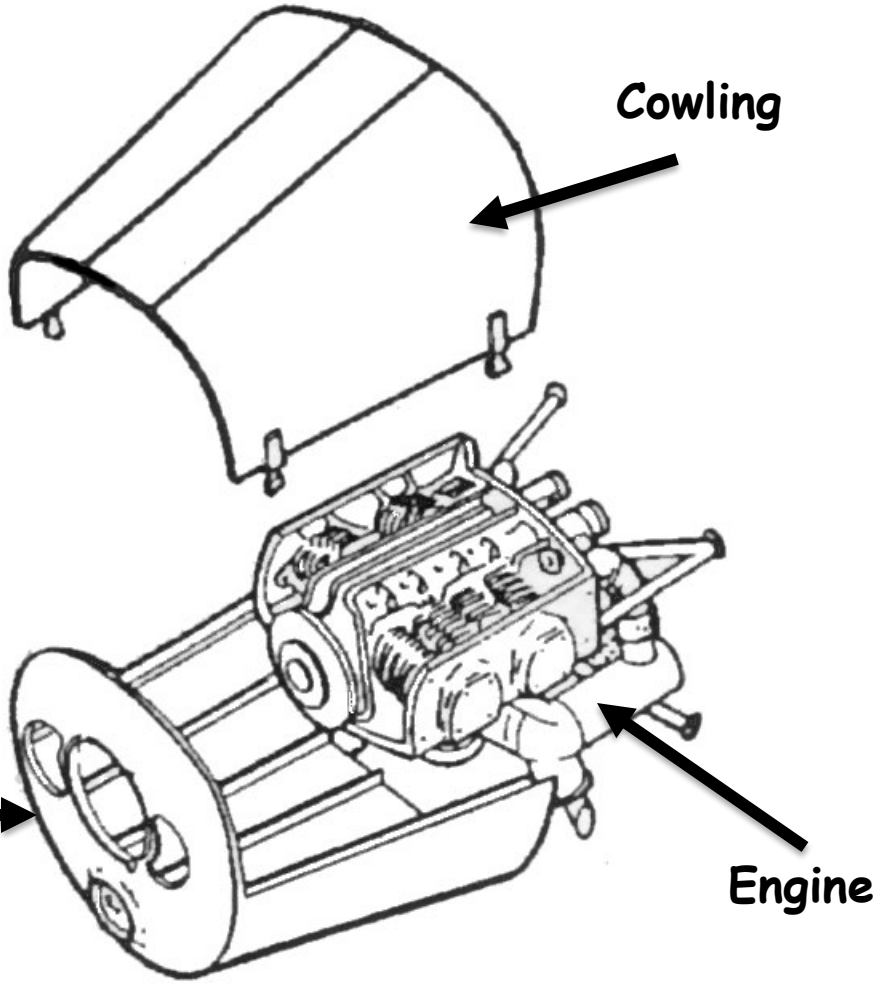
GP6

Section 2 – Main Parts of an Aeroplane

Engine

Provides the power to drive a propeller

Piston engine is used on most light aircraft



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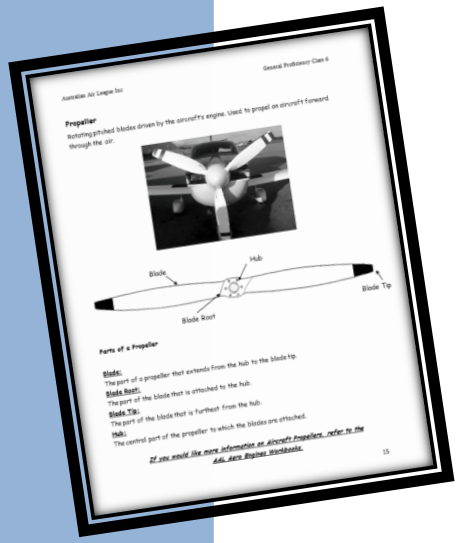
Section 2 – Main Parts of an Aeroplane

Propeller

Rotating blades driven by the engine

It propels the aircraft forward through the air



Propeller

Rotating pitched blades driven by the aircraft's engine. Used to propel an aircraft forward through the air.

Parts of a Propeller

Blade:
The part of a propeller that extends from the hub to the blade tip.

Blade Root:
The part of the blade that is attached to the hub.

Blade Tip:
The part of the blade that is furthest from the hub.

Hub:
The central part of the propeller to which the blades are attached.

If you would like more information on Aircraft Propellers, refer to the AAL Aero Engines Workbook.

GP6

Section 2 – Main Parts of an Aeroplane

Parts of a Propeller

The Propeller is made up of the following parts:

Blade:

The part of a propeller that extends from the hub to the blade tip.

Blade Root:

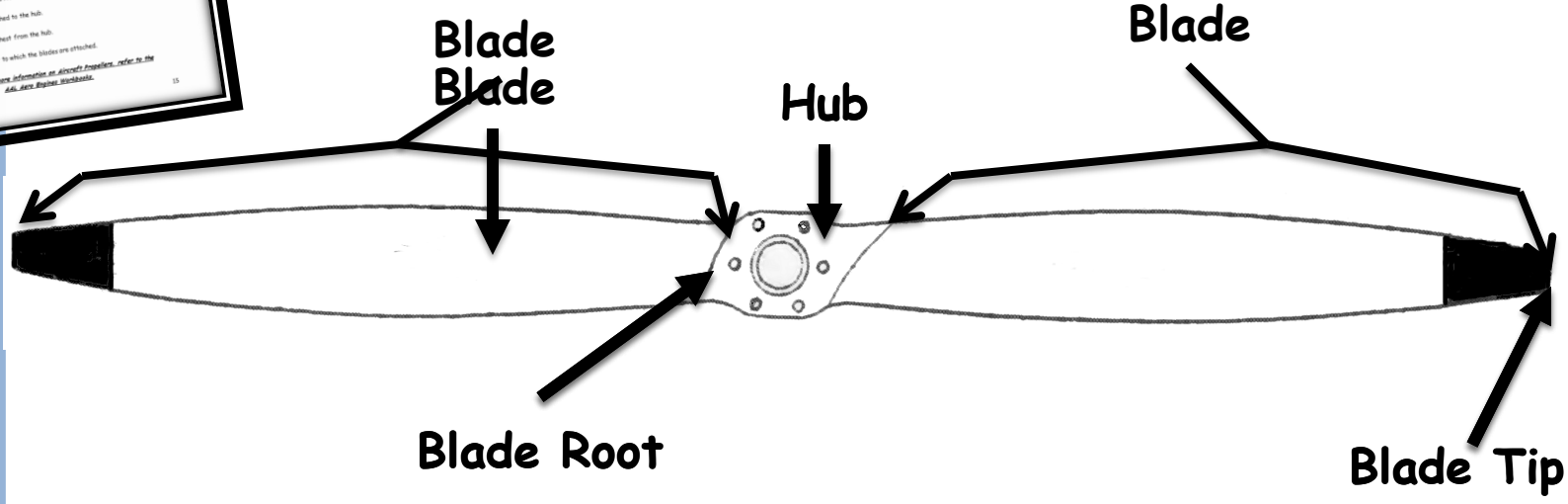
The part of the blade that is attached to the hub.

Blade Tip:

The part of the blade that is furthest from the hub.

Hub:

The central part of the propeller to which the blades are attached.



GP6

Section 3 – Aeroplanes in Australia

Boeing 737

The 737-800 series can carry from 160 to 180 passengers

With full tanks of fuel they can fly over 5,000km

GP6

Section 3 – Aeroplanes in Australia

Airbus A320

It is built by Airbus Industries in Europe

GP6

Section 3 – Aeroplanes in Australia

Differences between the Boeing 737 and the Airbus A320

Try and find the difference between these two Aircraft

Wing Tips

Engines

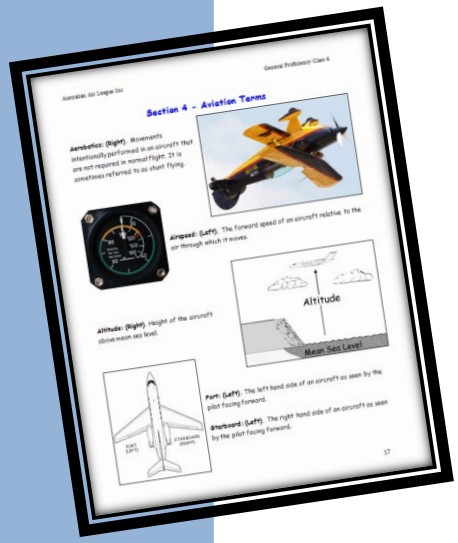
GP6

Section 4 – Aviation Terms

Aerobatics

Movements intentionally performed in an aircraft that are not required in normal flight.

It is sometimes referred to as stunt flying.



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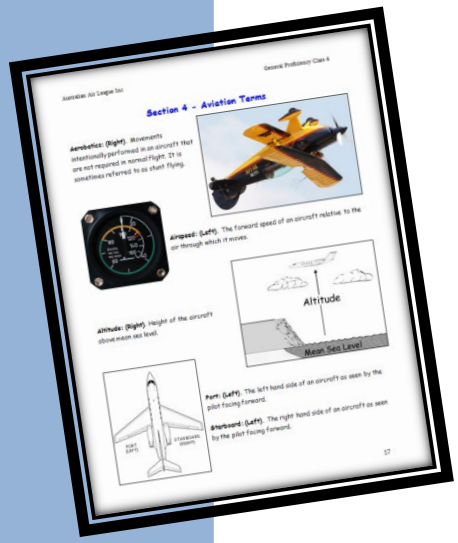
Section 4 – Aviation Terms

Airspeed

The forward speed of an aircraft relative to the air through which it moves.



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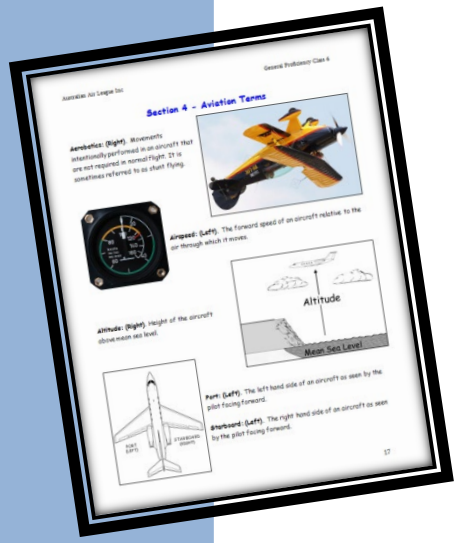
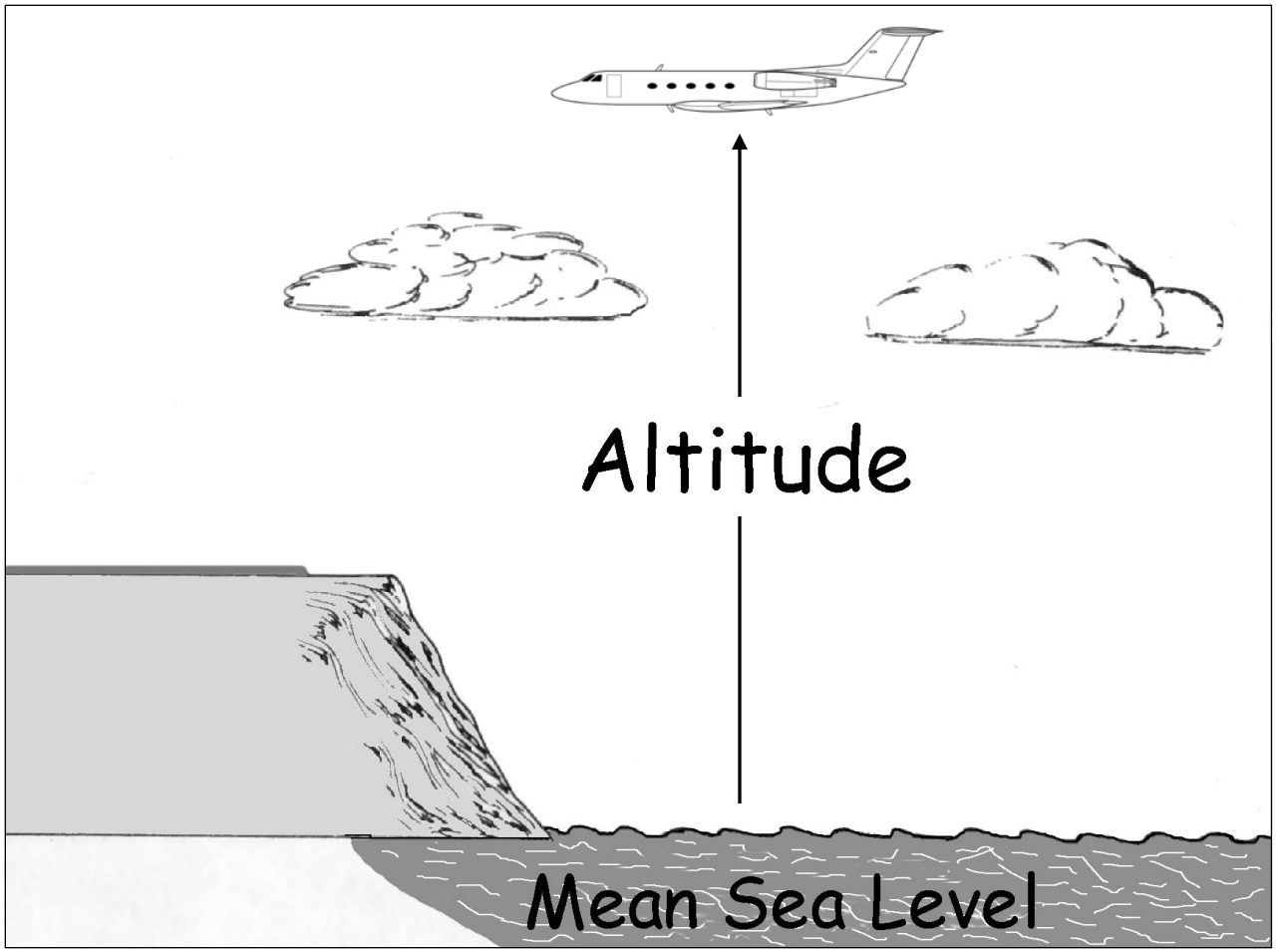
Section 4 – Aviation Terms

Altitude

Height of the aircraft above mean sea level.





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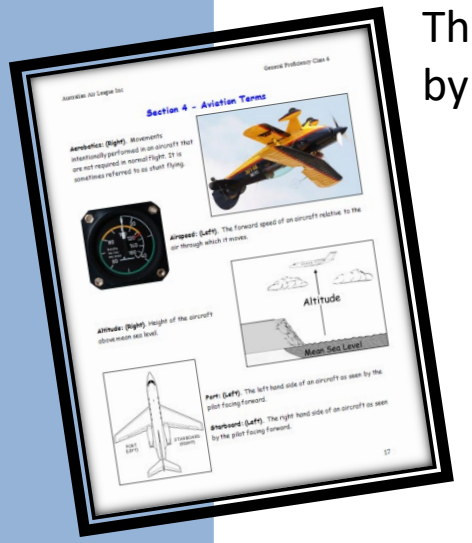
Section 4 – Aviation Terms

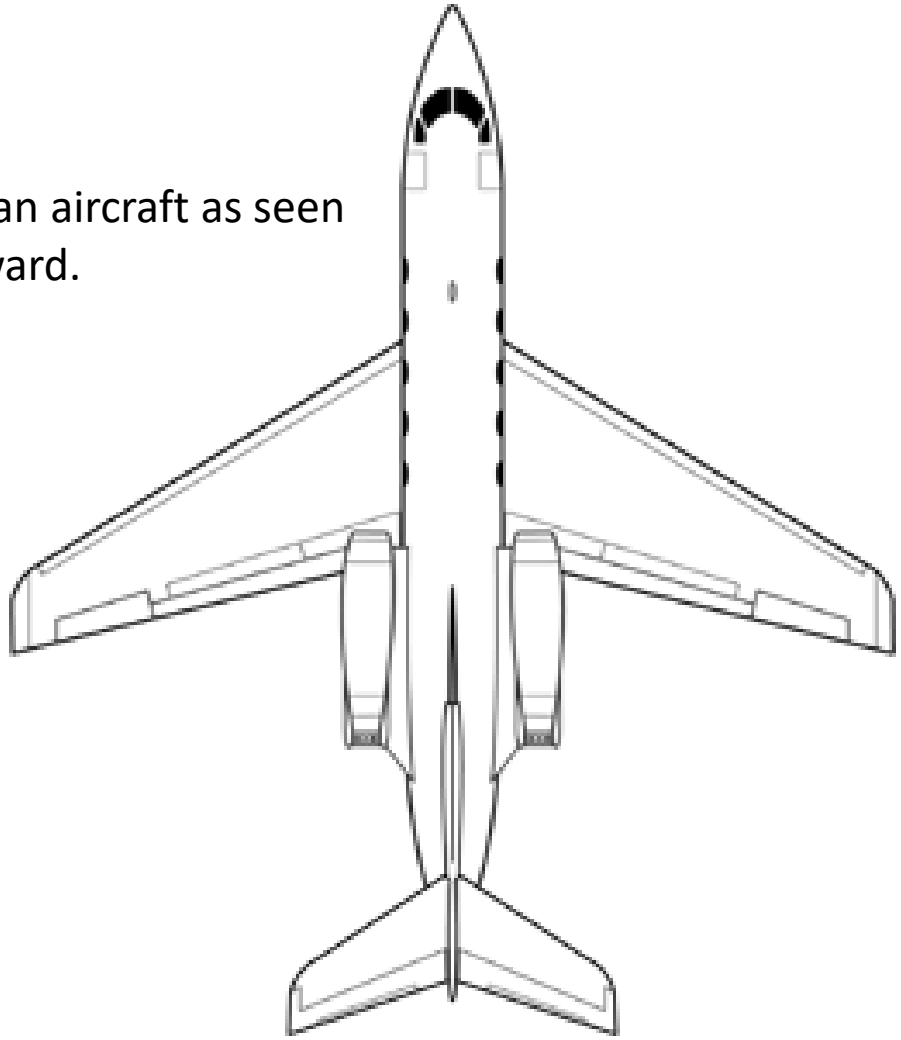
Port

The left hand side of an aircraft as seen by the pilot facing forward.

Starboard

The right hand side of an aircraft as seen by the pilot facing forward.





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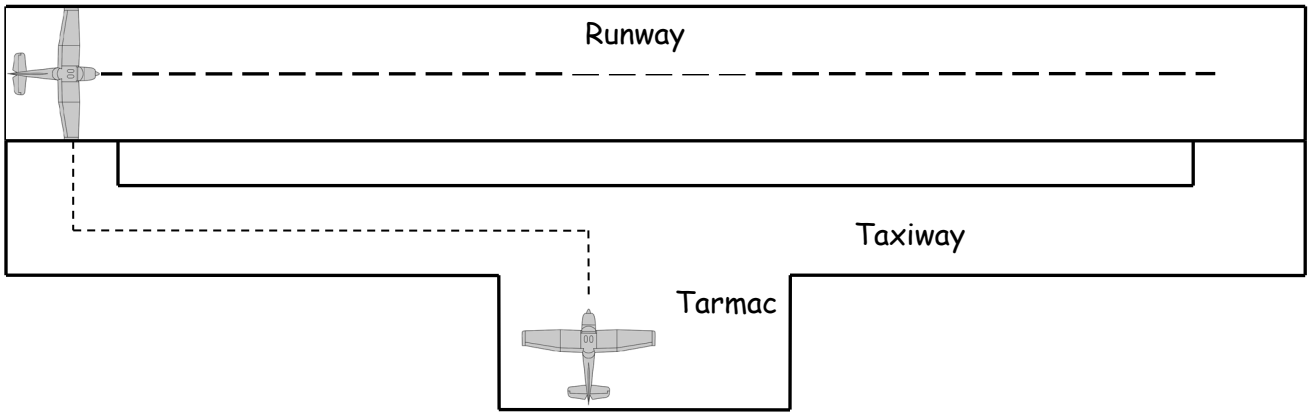
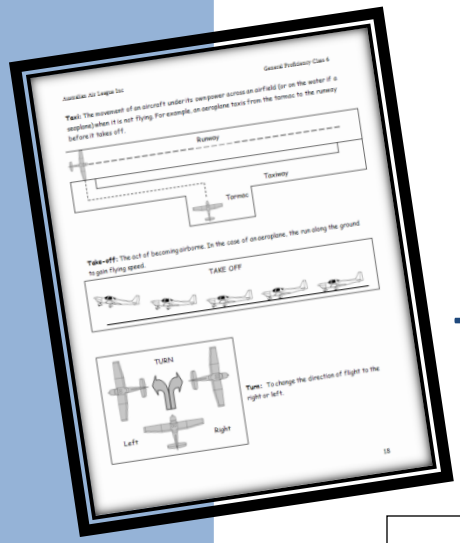
Section 4 – Aviation Terms

Taxi

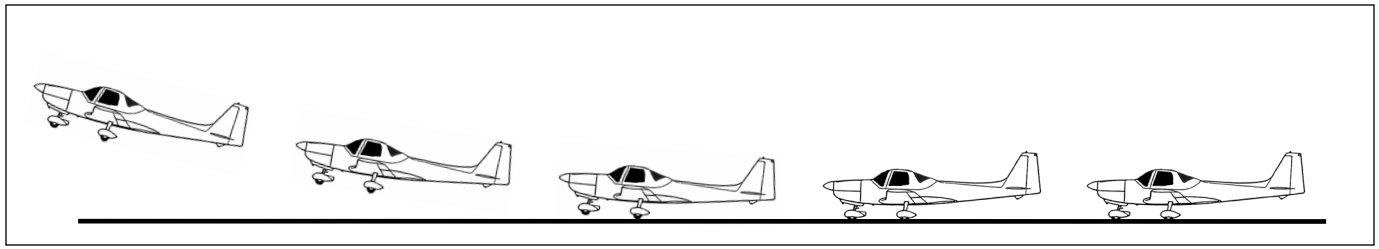
The movement of an aircraft under its own power across an airfield.





Take-off

The act of becoming airborne



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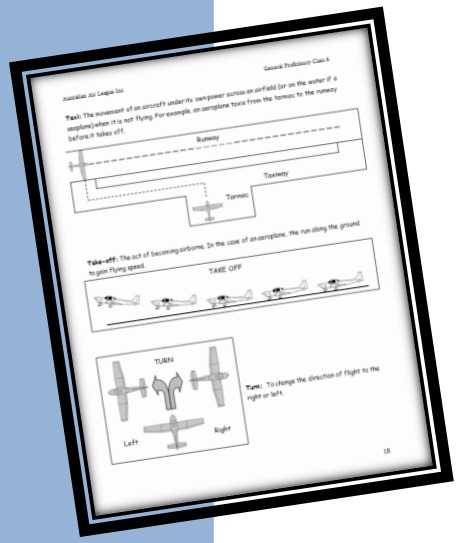
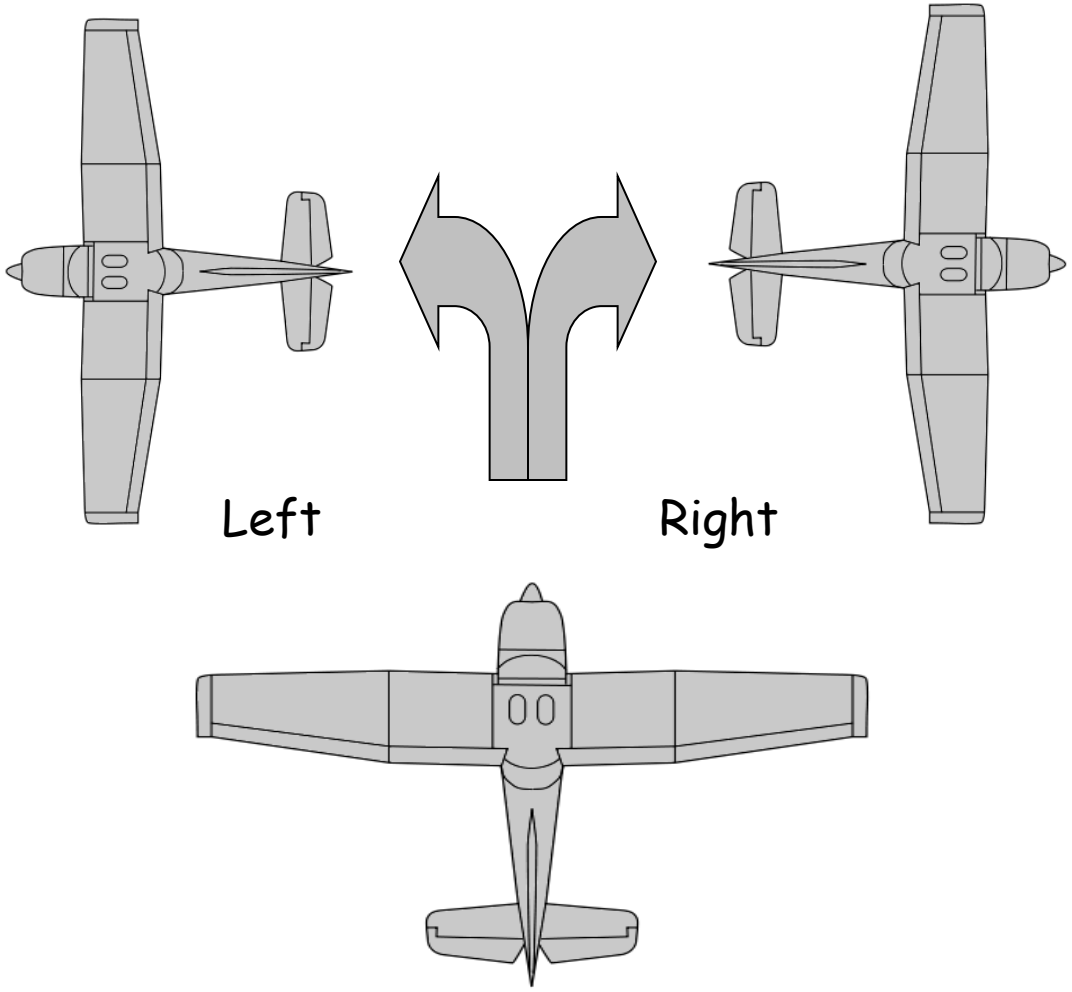
Section 4 – Aviation Terms

Turn

To change the direction of flight to the right or left.





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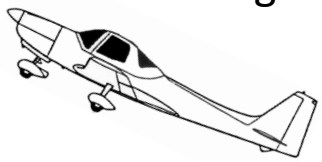
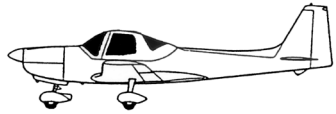
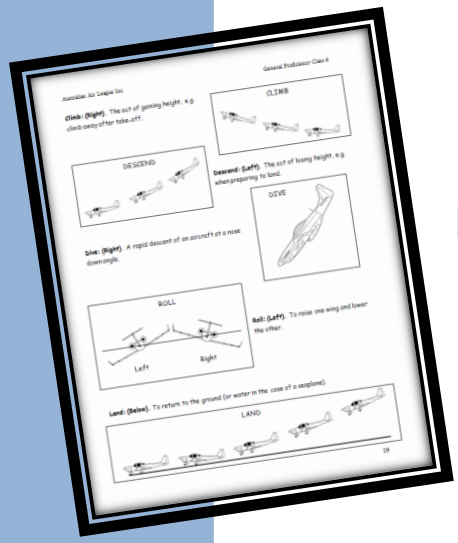
Section 4 – Aviation Terms

Climb

The act of gaining height

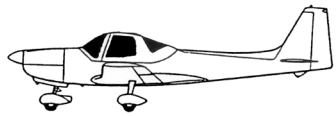


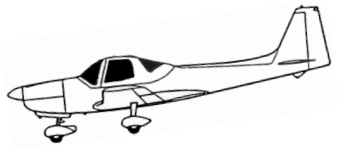




Descend

The act of losing height





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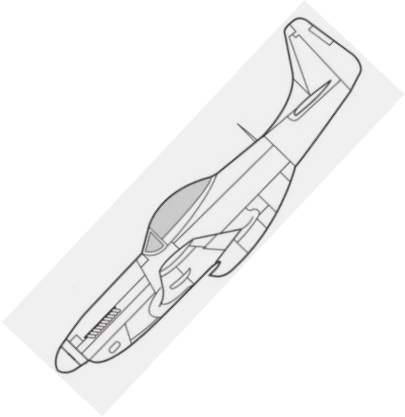
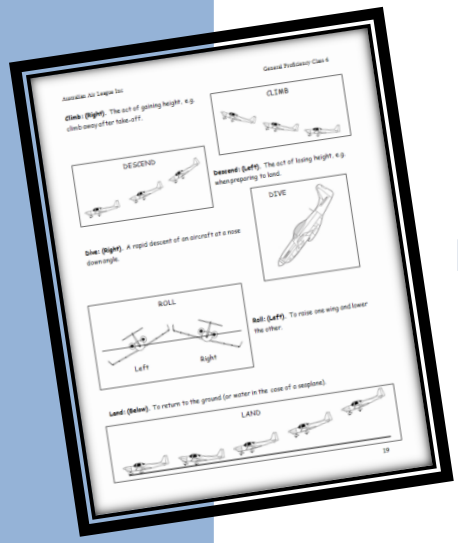
Section 4 – Aviation Terms

Dive

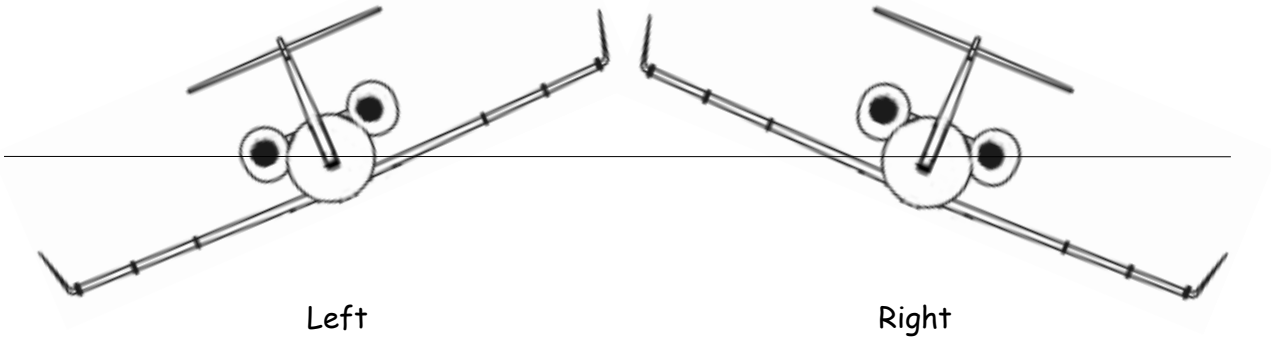
A rapid descent of an aircraft at a nose down angle





Roll

To raise one wing and lower the other



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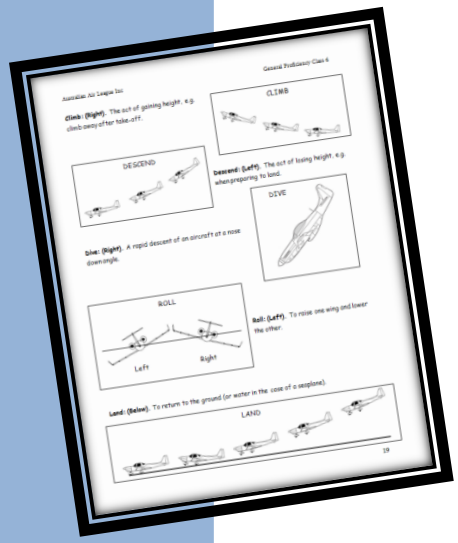
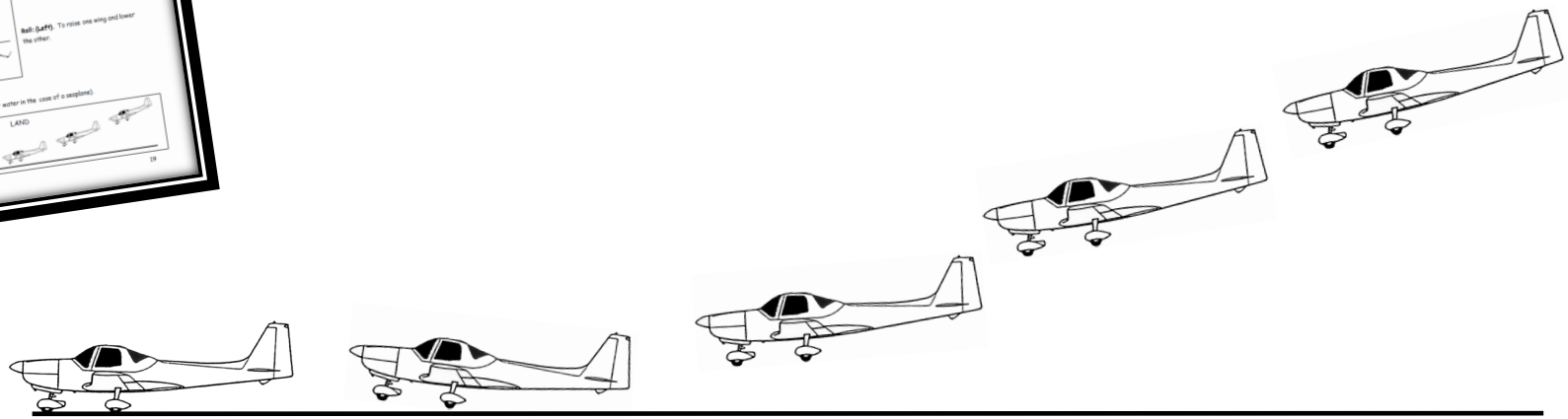
Section 4 – Aviation Terms

Land

To return to the ground (or water in the case of a seaplane)





GP6

Section 4 – Aviation Terms

Flight Attendant

One whose job it is to attend to passengers on an aircraft, serving meals, giving information, etc.

GP6

Section 4 – Aviation Terms

Pilots

Captain: A qualified pilot who is in charge of an aircraft.
Co-pilot: A qualified pilot who assists the captain of the aircraft

GP6

Section 4 – Aviation Terms

Flight Engineer

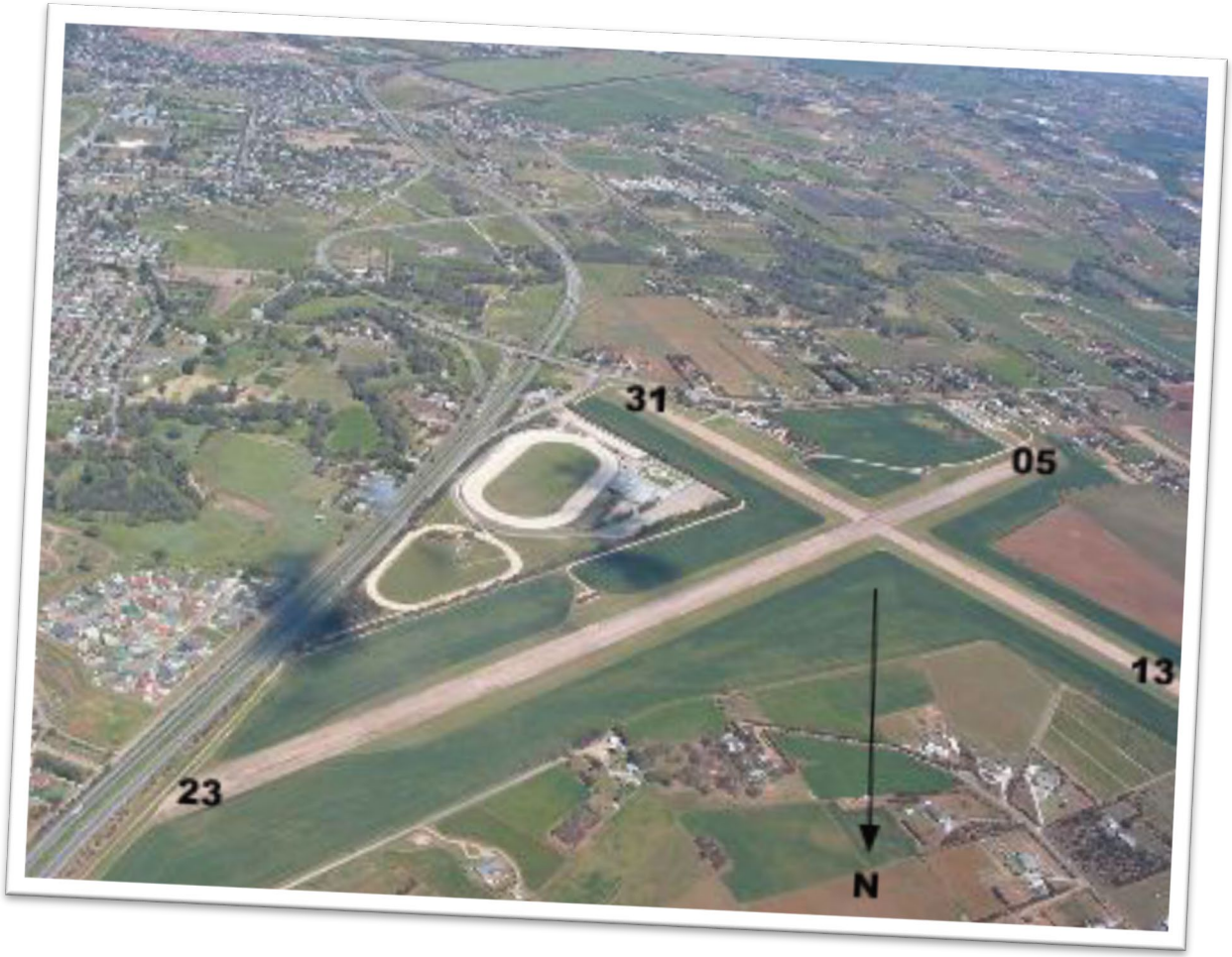
A member of the flight crew responsible for the operation of the aircraft's systems and engines during flight

GP6

Section 5 – Airfields

Airfield

Any reasonable level area where an aircraft may take-off and land.



GP6

Section 5 – Airfields

Aerodrome

A landing field for aircraft at which refuelling, maintenance and other facilities are available

GP6

Section 5 – Airfields

Airport

An aerodrome at which provision is made for handling passenger traffic.

Section 5 – Airfields

Airfield (Right): Any reasonable level area where an aircraft may take-off and land.

Aerodrome (Left): A landing field for aircraft at which refuelling, maintenance and other facilities are available.

Airport (Right): An aerodrome at which provision is made for handling passenger traffic.

Terminal (Left): A building at an airport to where passengers go when waiting to board an aircraft or after just having left an aircraft. It contains areas such as waiting lounges, ticket counters, baggage handling areas, cafeterias, etc.

GP6

Section 5 – Airfields

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A building at an airport to where passengers go when waiting to board an aircraft or after just having left an aircraft.

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GP6

Section 5 – Airfields

Control Tower

The building on an aerodrome from which all aircraft movements are controlled, both in the air and on the ground.

GP6

Section 5 – Airfields

Hanger

A building on an aerodrome that is used to house aircraft and in which maintenance work may be done.

GP6

Section 5 – Airfields

Tarmac

A prepared hard surface area in front of the hanger or hangers that is used for the parking of aircraft.

GP6

Section 5 – Airfields

Taxiway

These run from the tarmac to the runways and are areas along which aircraft taxi to the take-off position or on which they return after landing.

GP6

Section 5 – Airfields

Runway

The actual area on which the take-off and landings are performed.

GP6

Section 6 – Aviation History

1783 – Dreams Come True

- Joseph, and Étienne Montgolfier
- In June 1783, they launched a giant balloon filled with hot air
- They launched another balloon carrying a rooster, a duck and a sheep to prove that living beings could survive in the air
- In November 1783, two volunteers became the first people to be carried in a free balloon

Section 6 – Aviation History

People have always dreamed of flying. The dream of flight did not begin to come true until the end of the 18th century (1700-1799).

1783 - Dreams Come True

Joseph, and Étienne Montgolfier (two French brothers) became inspired by experiments they had made holding paper bags over their kitchen fire. In June 1783, they launched a giant balloon filled with hot air in front of a vast crowd. Later that year, in front of the King and Queen of France, they launched another balloon carrying a rooster, a duck and a sheep to prove that living beings could survive in the air. In November 1783, two volunteers became the first people to be carried in a free balloon.

1890 - Gliding Begins

Otto Lilienthal, Known as the Father of Gliding was a German Engineer who began gliding experiments in 1890. He realised that there must be some method of controlling his aircraft and devised a method of tilting the wings with his arms. That he was able to make several hundred flights of over 100 metres.

1892 - Australians Get Involved

Lawrence Hargrave is known as Australia's pioneer of aviation. An English born Australian, he experimented at Stanwell Tops, south of Sydney, with Box-Kites with curved surfaces. Of simple structure, they provided good lift and stability and formed the basis of early aeroplane designs.

1903 - Powered Flight

Wilbur and Orville Wright were the first men to leave the ground in a powered heavier-than-air aeroplane in a controlled manner. This they achieved at Kitty Hawk, U.S.A. on the 17th December 1903. Their aircraft was a biplane with elevators ahead of the wings and rudders behind it. The pilot and the engine were located in the open space between the wings.

23

How did Joseph and Étienne Montgolfier become inspired?

They became inspired by experiments they had made holding paper bags over their kitchen fire

GP6

Section 6 – Aviation History

1890 – Gliding Begins

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GP6

Section 6 – Aviation History

1892 – Australians Get Involved

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- He found they provided good lift and stability
- These Box-kites formed the basis of early aeroplane designs

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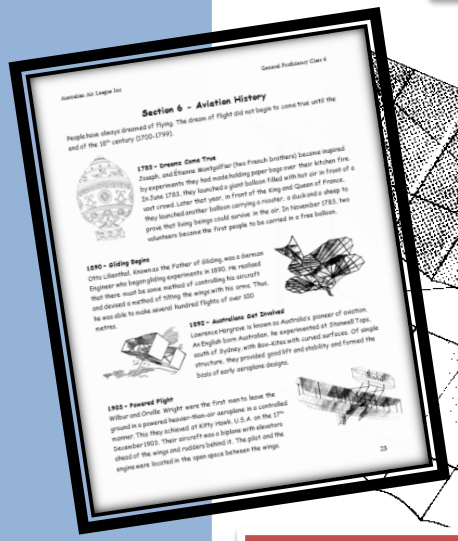

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What was the right brothers aircraft and where were the elevators?

Their aircraft was a biplane with elevators ahead of the wings and rudders behind it.

GP6

Section 6 – Aviation History

1928 – The Long Hop

- An aircraft named the "Southern Cross"
- Was piloted by Sir Charles Kingsford-Smith
- It flew from California to Brisbane via Honolulu and Fiji
- The basis of today's long-distance flight routes was formed.

1928 - The Long Hop

Aircraft developed quickly during World War 1 and immediately after. Flight distance records were being broken almost as quickly as they were made. One goal was to fly an aircraft across the Pacific Ocean.

In 1928, a Fokker Trimotor aircraft named the "Southern Cross" piloted by Sir Charles Kingsford-Smith flew from California to Brisbane via Honolulu and Fiji. The basis of today's long-distance flight routes was formed.

1939 - Jet Age Launched

Propellers can only do so much. Just before and during World War 2, two engineers independently developed jet engines. Dr. Hans von Ohain in Germany and Sir Frank Whittle in the United Kingdom are both recognized as being the co-inventors of the jet engine. Each worked separately and knew nothing of the other's work.

1957 - Free From The Bonds Of The Earth

History changed on October 4, 1957, when the Soviet Union successfully launched Sputnik 1. The world's first artificial satellite was about the size of a beach ball (58 cm in diameter), weighed only 83.6 kg and took about 98 minutes to orbit the Earth on its elliptical path. That launch ushered in new political, military, technological, and scientific developments. While the Sputnik launch was a single event, it marked the start of the space age and the U.S.-U.S.S.R space race.

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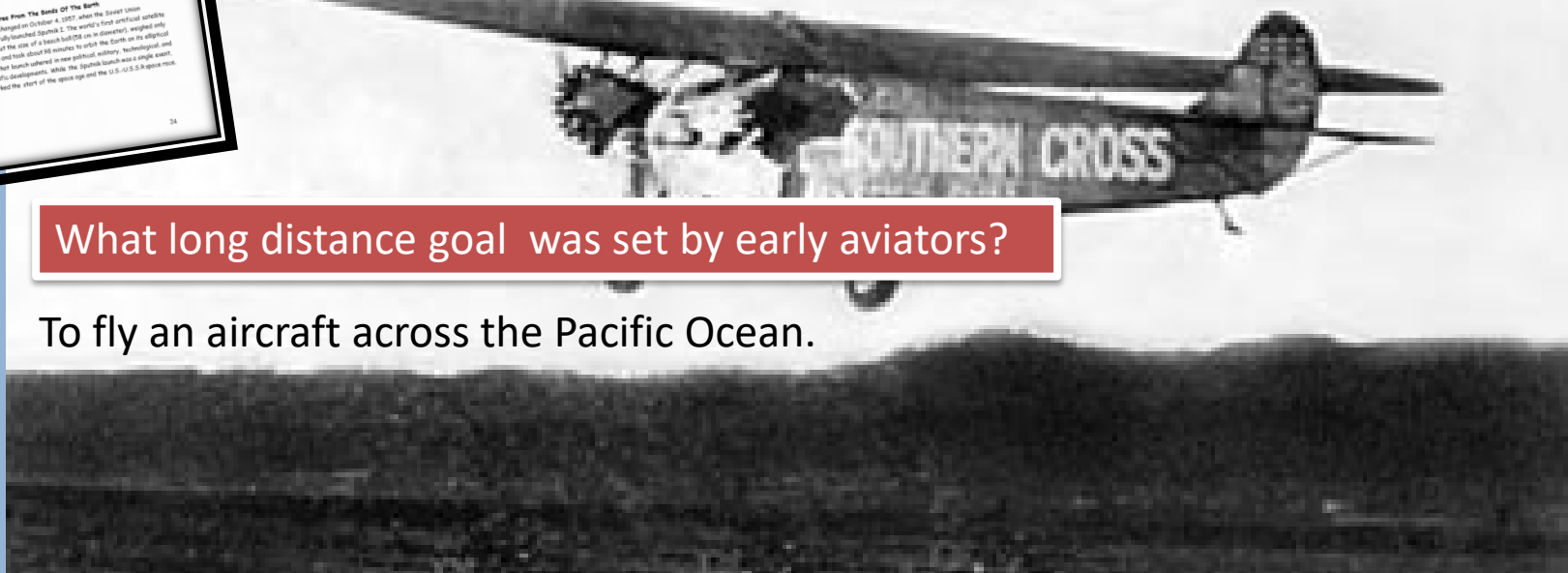

What long distance goal was set by early aviators?

To fly an aircraft across the Pacific Ocean.

GP6

Section 6 – Aviation History

1939 – Jet Age Launched

- Just before and during World War 2
- Dr. Hans von Ohain in Germany and Sir Frank Whittle in the United Kingdom co-invented the jet engine.
- Each worked separately and knew nothing of the other's work.

Name an aircraft that uses a jet engine

Boeing 747

GP6

Section 6 – Aviation History

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How long did it take the Sputnik 1 to orbit the earth?

About 98 minutes .

GP6

Section 7 – Your AAL Squadron

History of the Australian Air League

- George Robey was an Australian soldier who had earned a Distinguished Conduct Medal on 25th April 1915 at the Gallipoli landing

- In 1927 he went to Canberra to assist in the Ceremonial Opening of Parliament House

- George Robey and other concerned adults formed the "Air Mindedness Development League" and on 18 July 1934 Keith was enrolled as the first Cadet member. Not long after that the name was changed to the "Australian Air League"

Section 7 - Your Australian Air League Squadron

History of the AAL

The Beginning

George Robey was an Australian soldier who distinguished himself as an original ANZAC earning a Distinguished Conduct Medal on 25 April 1915 at the Gallipoli landing. Mr. Robey was still a soldier, in the Militia when in 1927 he went to Canberra to assist in the Ceremonial Opening of Parliament House.

He brought back a toy wooden aeroplane for his son Keith that sparked an interest in aviation and inspired his son to learn about aviation. The gift of the toy wooden aeroplane also sparked off the "Australian Air League" when five years later Keith complained of the lack of a youth organisation specialising in aviation.

His Father George Robey and other concerned adults formed the "Air Mindedness Development League" and on 18 July 1934 Keith was enrolled as the first Cadet member. Not long after that the name was changed to the "Australian Air League".

The First Squadron

The First Training Squadron opened at Manly, New South Wales on 17 January 1935 with 30 Cadets aged between 14 and 23 years (including, of course, Keith Robey) beginning their course of training. In March 1935, Manly Branch had around 90 members.

With membership climbing fast, the Air League Council decided to expand the organisation into other states and as a result, in early 1939 a Melbourne office was opened. The First squadron opened at Glenhuntly in March, and the response in the southern state was as enthusiastic as it had been in NSW. In May 1939, the Air League established itself in Queensland.

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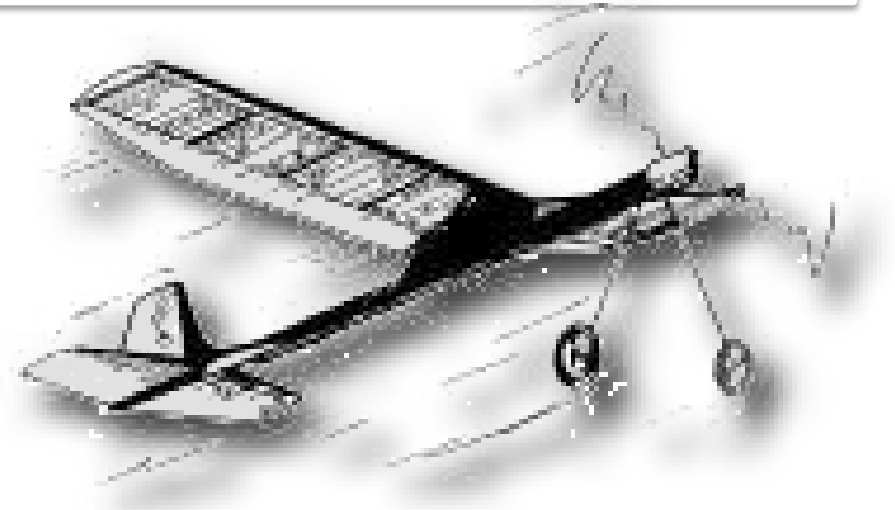

GP6

Section 7 – Your AAL Squadron

The First Squadron

- The first Squadron opened at Manly, New South Wales on 17th January 1935 with 30 cadets.
- In March 1935, Manly had 90 members.
- Due to its popularity the Air League expanded to other states. In early 1939 a Melbourne office was opened.

Section 7 – Your Australian Air League Squadron

History of the AAL

The Beginning

George Robey was an Australian soldier who distinguished himself as an original ANZAC earning a Distinguished Conduct Medal on 25 April 1915 at the Gallipoli landing. Mr. Robey was still a soldier, in the Militia when in 1927 he went to Canberra to assist in the Ceremonial Opening of Parliament House.

He brought back a toy wooden aeroplane for his son Keith that sparked an interest in aviation and inspired his son to learn about aviation. The gift of the toy wooden aeroplane also sparked off the "Australian Air League" when five years later Keith complained of the lack of a youth organisation specialising in aviation.

His Father George Robey and other concerned adults formed the "Air Mindedness Development League" and on 16 July 1934 Keith was enrolled as the first Cadet member. Not long after that the name was changed to the "Australian Air League".

The First Squadron

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When did the Air League establish in QLD.

1939

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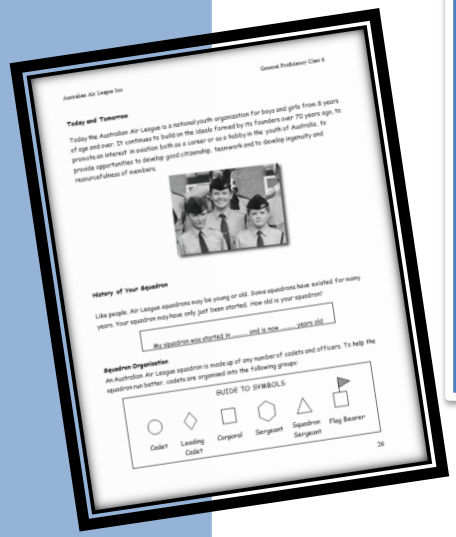
Section 7 – Your AAL Squadron

Today and Tomorrow

• Today the Australian Air League is a national youth organization for boys and girls from 8 years of age and over



Today and Tomorrow

Today the Australian Air League is a national youth organization for boys and girls from 8 years of age and over. It continues to build on the ideals formed by its founders over 70 years ago, to promote an interest in aviation both as a career or as a hobby in the youth of Australia, to provide opportunities to develop good citizenship, teamwork and to develop ingenuity and resourcefulness of members.

History of Your Squadron

Like people, Air League squadrons may be young or old. Some squadrons have existed for many years. Your squadron may have only just been started. How old is your squadron?

My squadron was started in ____ and is now ____ years old.

Squadron Organisation

An Australian Air League squadron is made up of any number of cadets and officers. To help the squadron run better, cadets are organised into the following groups:

GUIDE TO SYMBOLS

Cadet | Leading Cadet | Corporal | Sergeant | Squadron Sergeant | Flag Bearer

26

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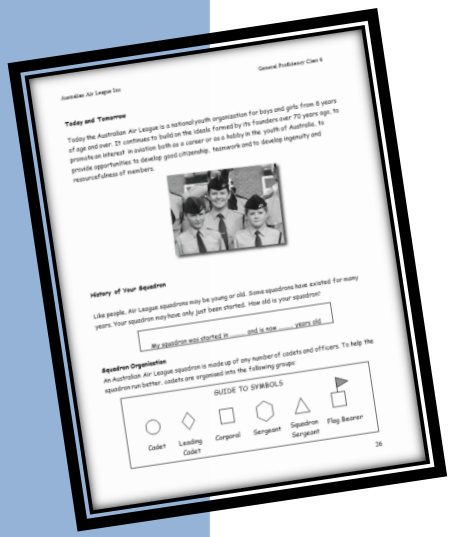
Section 7 – Your AAL Squadron

History of Your Squadron

When did your Squadron start?

How old is it now?



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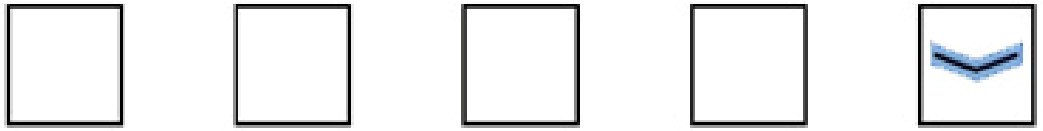
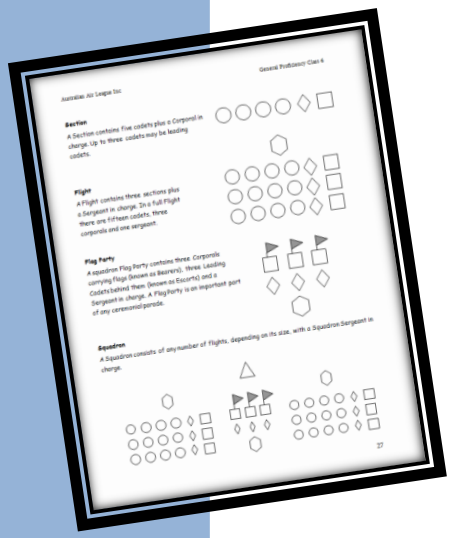
Section 7 – Your AAL Squadron

Squadron Organisation

Section





A section comprises of 6 members, including an NCO in charge.

The NCO in charge should be a Corporal and must not be of higher rank (than a Corporal).

A leading cadet is the 2.I.C (2nd In Command).

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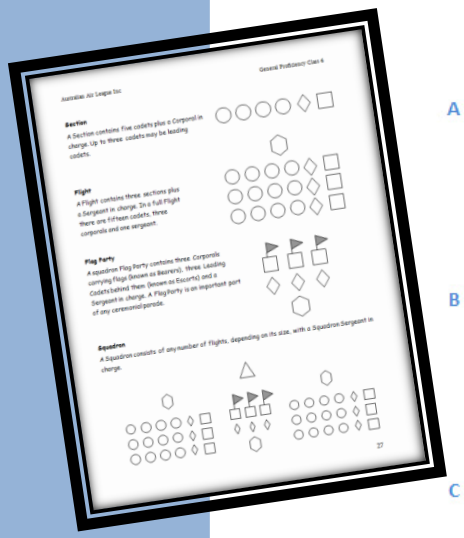
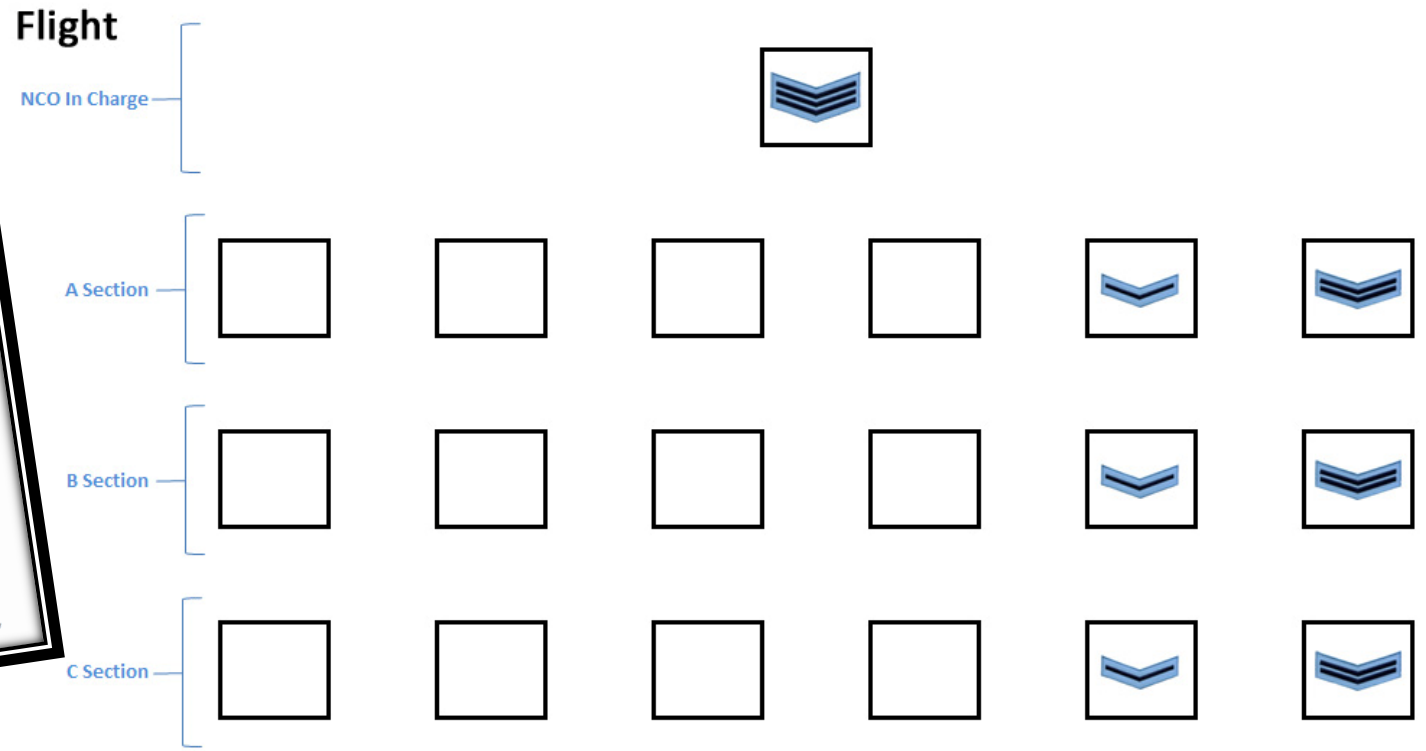
Section 7 – Your AAL Squadron

Squadron Organisation





A flight comprises of 3 sections, including an NCO in charge.

The NCO in charge should be a Sergeant and must not be of higher rank (than a Sergeant, unless there are no sergeants).

A corporal is encouraged to be in a flight as a 2.I.C (2nd In Charge).

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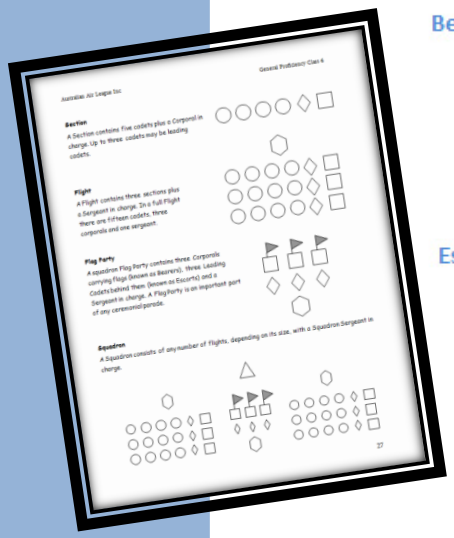
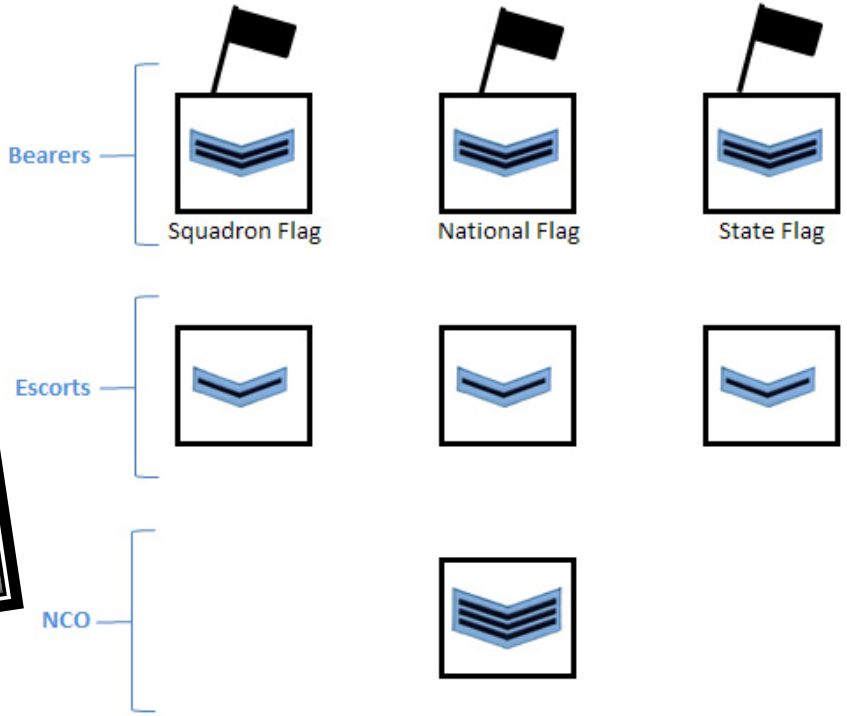
Section 7 – Your AAL Squadron

Squadron Organisation



Flag Party



A flag Party comprises of a maximum of 7 members.

Each rank shown above is the highest rank that position can be.

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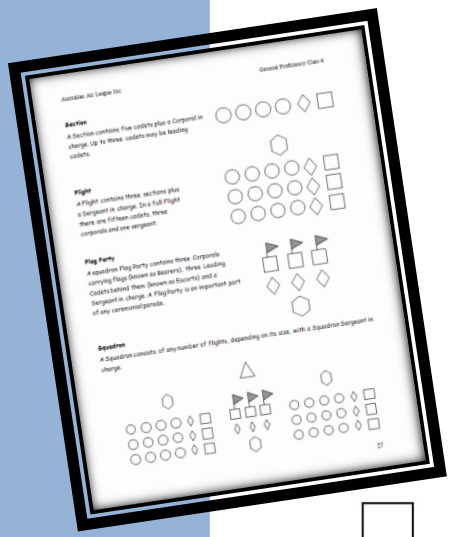
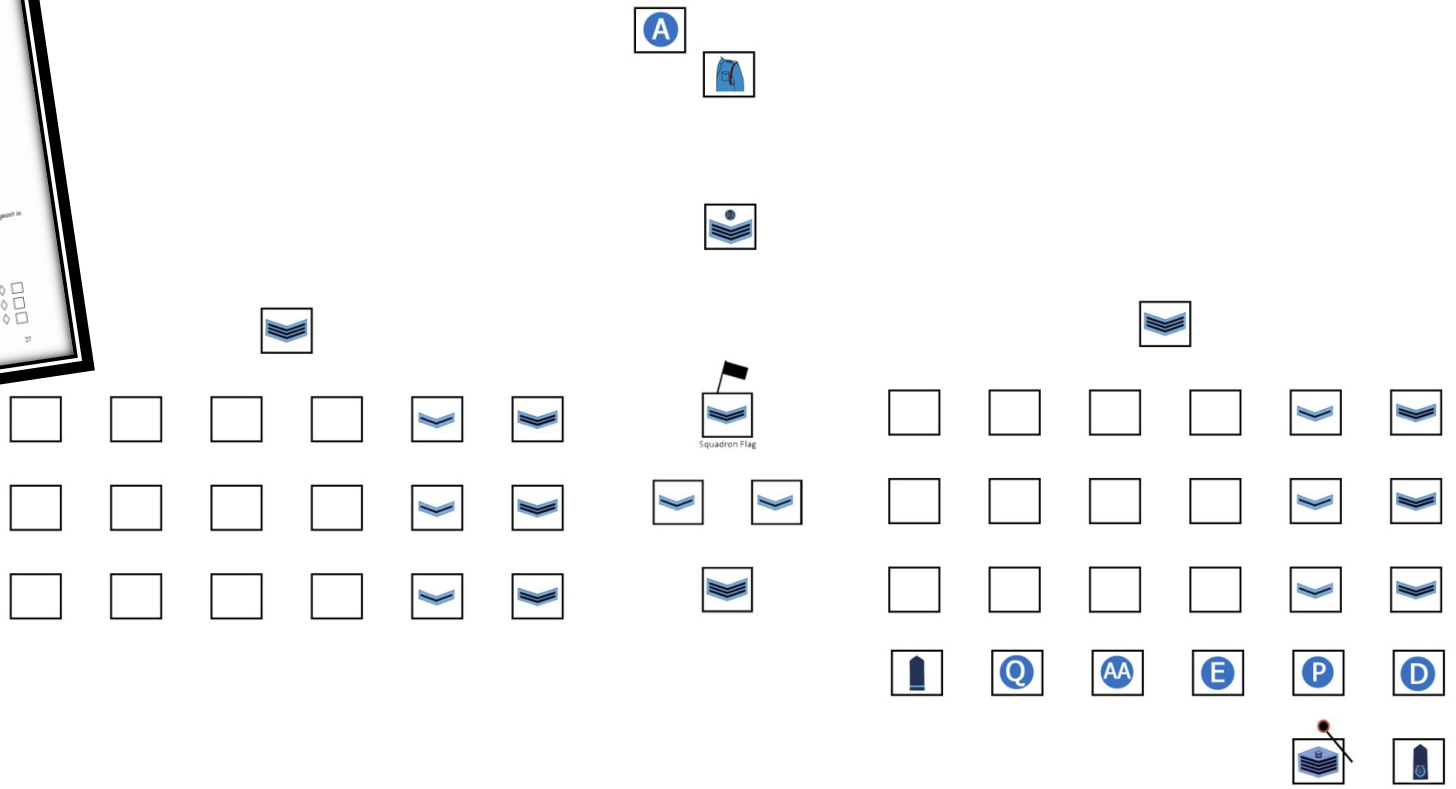
Section 7 – Your AAL Squadron

Squadron Organisation

Squadron

A Squadron consists of any number of flights, depending on its size, with a Squadron Sergeant in charge.





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Section 7 – Your AAL Squadron

Ranks and Appointments

Non Commissioned Officers (NCO's)

Leading Cadet

Second in Charge to a Corporal in a Section, to understudy a Corporal, and may be an escort in a Flag Party

Corporal

In charge of a Section, and may be a bearer in a Flag Party

Sergeant

In charge of a Flight, and may be in charge of a Flag Party

GP6

Section 7 – Your AAL Squadron

Ranks and Appointments

Non Commissioned Officers (NCO's)

Squadron Sergeant

This is the N.C.O. responsible for the routine running of the whole Squadron. The Squadron Sergeant is the most senior N.C.O. rank.

Drum Major

This is the N.C.O. in charge of a Band. When they are not in charge of a band, they are considered equal to a Sergeant in authority

What is a chevron?

The arrow like lines that make up an NCOs rank.

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Section 7 – Your AAL Squadron

Ranks and Appointments

Supernumerary Rank

Warrant Officer

The Warrant Officer insignia in Sky Blue on a Navy Blue barrel type **Epaulette** is worn on each shoulder.

Trainee Officer

Trainee Officer rank insignia consists of a Sky Blue Bar on a Royal Blue **Epaulette** worn on each shoulder.

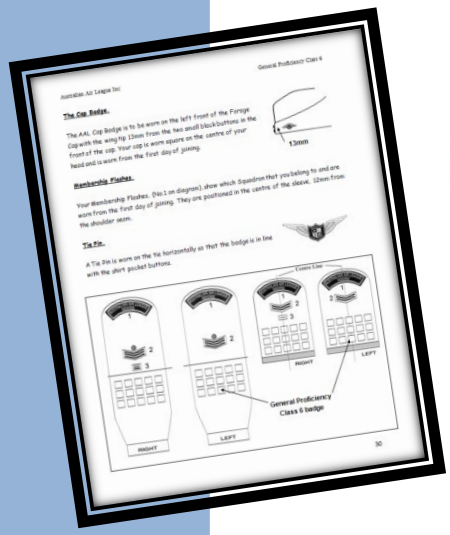
What is a Supernumerary Rank?

A supernumerary Rank is a member of the Squadron Staff that is not attached to a Section or Flight but assists the various Officers to perform their duties

GP6

Section 7 – Your AAL Squadron

Uniform - Styles



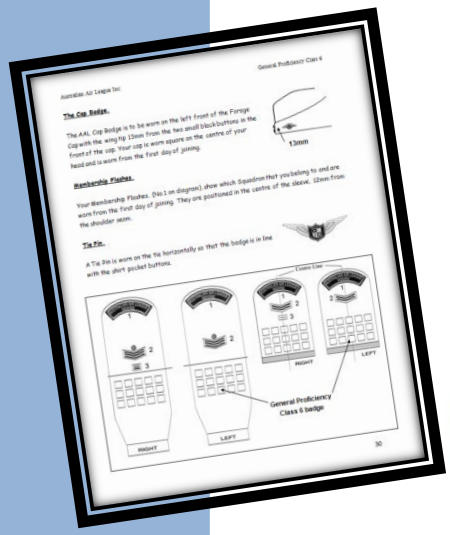
Junior Cadet (8 -12 Yrs)

Hat & Hat Badge
Short Sleeve Shirt
Belt
Shorts
Knee high navy blue Socks
Black Shoes (Not AAL Issued)

GP6

Section 7 – Your AAL Squadron

Uniform - Styles



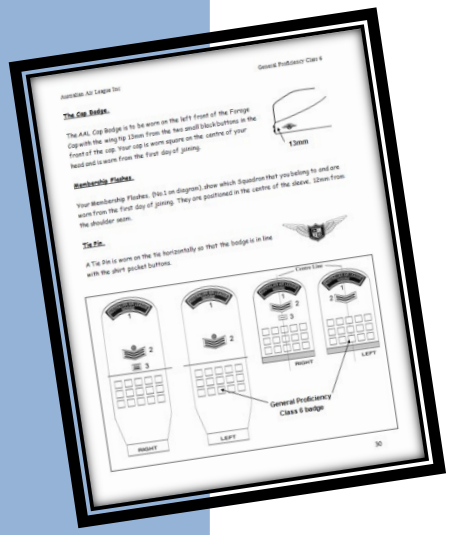
Cadet (12 – 16 Yrs)

Hat & Hat Badge
Long Sleeve Shirt
Tie & Tie Pin
Belt
Trousers
Black Socks (Not AAL Issued)
Black Shoes (Not AAL Issued)

GP6

Section 7 – Your AAL Squadron

Uniform - Styles



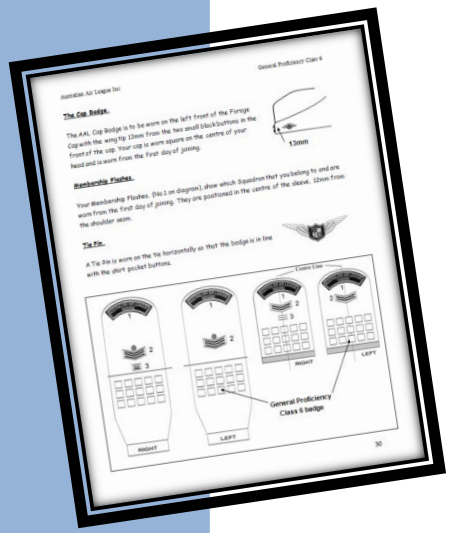
Senior Cadet (16 – 18 Yrs)

Hat & Hat Badge
Dark Blue Snr Epaulets
Long Sleeve Shirt
Tie & Tie Pin
Belt
Trousers
Black Socks (Not AAL Issued)
Black Shoes (Not AAL Issued)

GP6

Section 7 – Your AAL Squadron

Uniform - Styles



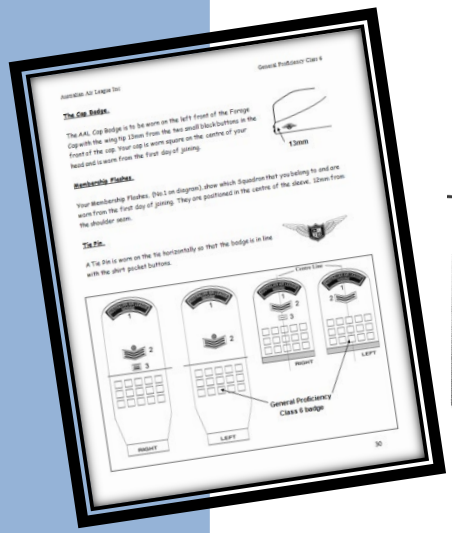
Officer (18 Yrs & Older)

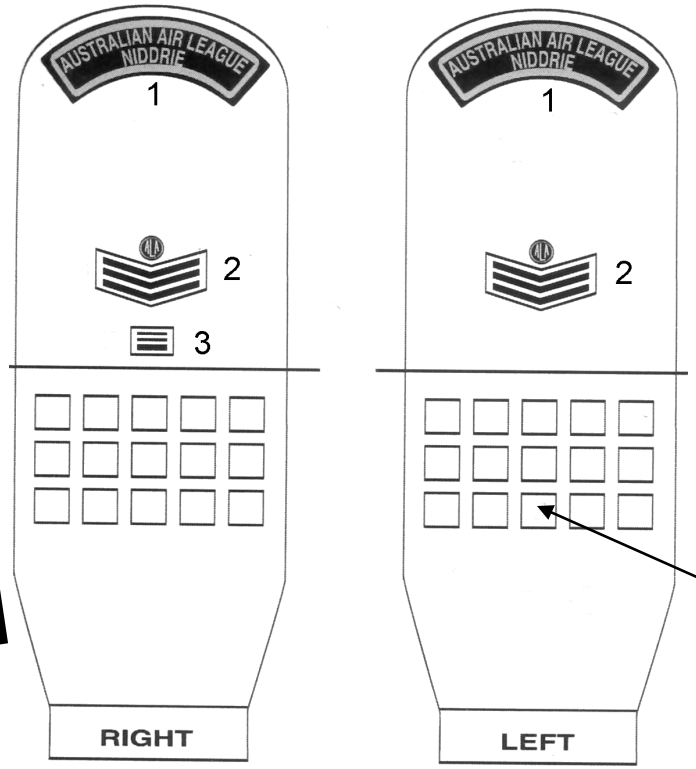
Officer Peak Hat & Officer Hat Badge
Long Sleeve Shirt & Tunic
Tie & Tie Pin
Belt
Trousers
Black Socks (Not AAL Issued)
Black Shoes (Not AAL Issued)

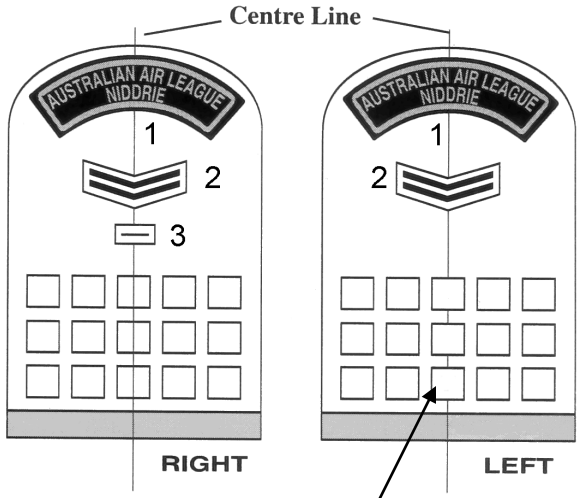
GP6

Section 7 – Your AAL Squadron

Uniform







General Proficiency Class 6 badge

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Section 7 – Your AAL Squadron

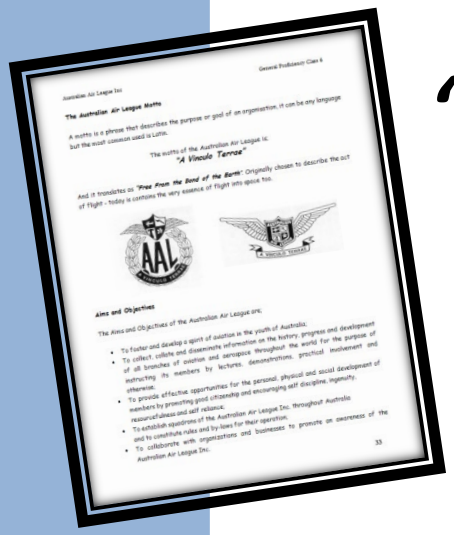
The Australian Air League Motto

The motto of the Australian Air League is;

"A Vinculo Terrae"

And it translates as

"Free From the Bond of the Earth"



The Australian Air League Motto

A motto is a phrase that describes the purpose or goal of an organisation. It can be any language but the most common used is Latin.

The motto of the Australian Air League is;

"A Vinculo Terrae"

And it translates as *"Free From the Bond of the Earth"*. Originally chosen to describe the act of Flight - today is contains the very essence of Flight into space too.

Aims and Objectives

The Aims and Objectives of the Australian Air League are;

- To foster and develop a spirit of aviation in the youth of Australia;
- To collect, collate and disseminate information on the history, progress and development of all branches of aviation and aerospace throughout the world for the purpose of instructing its members by lectures, demonstrations, practical involvement and otherwise.
- To provide effective opportunities for the personal, physical and social development of members by promoting good citizenship and encouraging self discipline, ingenuity, resourcefulness and self reliance.
- To establish squadrons of the Australian Air League Inc. throughout Australia and to constitute rules and by-laws for their operation.
- To collaborate with organizations and businesses to promote an awareness of the Australian Air League Inc.

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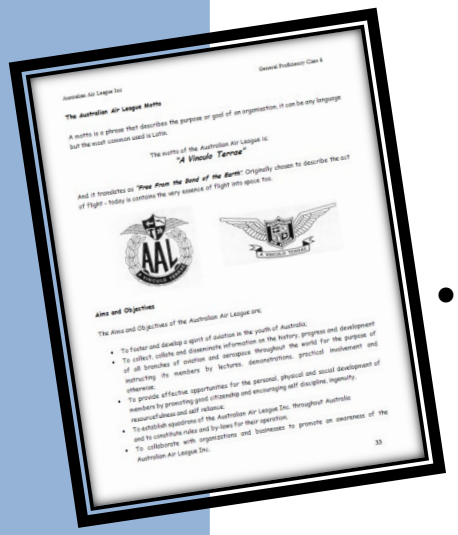
Section 7 – Your AAL Squadron

Aims and Objectives



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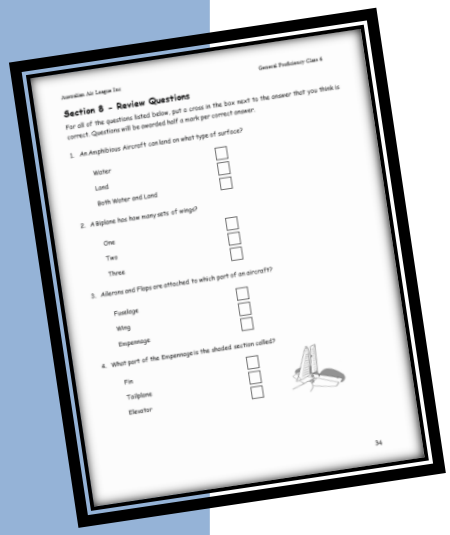
Section 7 – Your AAL Squadron

Questions



Section 8 – Review Questions

For all of the questions listed below, put a cross in the box next to the answer that you think is correct. Questions will be awarded half a mark per correct answer.

1. An Amphibious Aircraft can land on what type of surface?
   - Water
   - Land
   - Both Water and Land
2. A Biplane has how many sets of wings?
   - One
   - Two
   - Three
3. Ailerons and Flaps are attached to which part of an aircraft?
   - Fuselage
   - Wing
   - Empennage
4. What part of the Empennage is the shaded section called?
   - Fin
   - Tailplane
   - Elevator