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WELCOME TO PILOT ACADEMY!

Congratulations! You have now joined Pilot Academy, where you will learn about the skills and knowledge you need to be a pilot.

Every year, airline pilots carry billions of passengers around the globe, helicopter pilots carry workers to oil rigs at sea, rescue people from mountains and even fly air ambulances, and jet pilots patrol the skies to keep their country safe. All of these tasks are possible thanks to the skill and knowledge of pilots who fly high in the sky, often at incredible speeds.

Trainee pilots have a lot to learn when they enter the amazing world of flight. As you complete the tasks in this book you will discover what the different types of pilot need to be able to do. This includes:

- Understanding how their aircraft works.
- Keeping passengers and crew safe.
- Flying at top speeds.
- Responding to emergencies.
- Landing safely.



Your first task is to fill in the Trainee Pilot card.







You will also find out about the different aircraft and skills and qualities a pilot needs, such as excellent fitness, good coordination, fast reactions and team-working skills.

As you go through the course, you will graduate as a Helicopter Pilot, a Jet Pilot and an Airline Pilot.

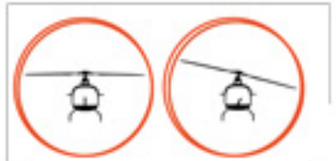
Good luck!



HELICOPTER PILOT

HELICOPTER CONTROLS

Before a trainee helicopter pilot is allowed to fly their aircraft, they must understand how the controls work. There are four main controls – the stick, rudder, throttle and lever.



The **STICK** controls the tilt of the rotor blades. If they tilt left, the helicopter **turns** left; if they tilt right, the helicopter turns right.



Two pedals operate the **RUDDER**. These are used to turn the helicopter around on its own **axis.** They do this by increasing or decreasing the speed of the tail rotor.

Twisting the **THROTTLE** increases and decreases **engine** power.

The **LEVER** moves the swash plates to change the angle of the **blades**. Pointing up brings air rushing in underneath, causing lift.



These are the **swash plates**.

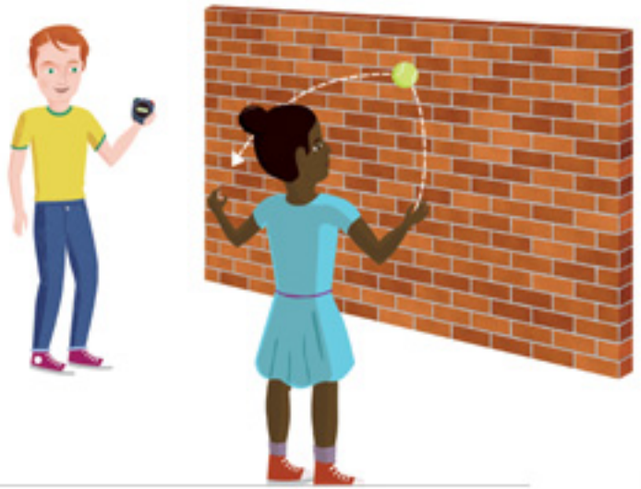
WALL BALL GAME

Operating the controls while watching where the aircraft is heading can be tricky, and a helicopter pilot needs to have excellent hand-eye coordination skills. Practice yours by playing this game.

You will need: high outdoor wall, tennis ball, stopwatch or timer, a friend.



1. Stand about two strides away from a wall. Ask your friend to time you. When they say "Go!," use your right hand to throw the ball at the wall. Then use your left hand to catch it as it bounces back.



2. Next, throw the ball using your left hand and catch it using your right. Repeat this sequence, and see how many catches you can complete in one minute.
3. Try four more times, and see if you can improve your score.

Record your results in the boxes below.

	ATTEMPT 1	ATTEMPT 2	ATTEMPT 3	ATTEMPT 4	ATTEMPT 5
NUMBER OF CATCHES					



When you have finished playing the Wall Ball game, place your Task Complete sticker here.

PLACE STICKER HERE

TASK COMPLETE

HELICOPTER PILOT

SEARCH AND RESCUE: NIGHT FLYING

A search and rescue helicopter pilot cannot choose when to fly. For example, mountain hikers may stay out too late and become lost in the darkness. Then, if the search and rescue team is called out, the pilot will need to take off and land in the dark, as well as carry out the search.

The helicopter flies in a pattern over the search area, shining strong lights. Powerful **searchlights** help the crew spot people on the ground.



When flying at night, it is important to be seen. A helicopter could have a white **strobe** light on the end of its tail, as well as green (right) and red (left) **navigation** lights.

Pilots might wear **night vision** goggles to help them see in the dark.

Thermal sensors can locate **body heat** from people on the ground.

When the **helicopter team** spots a missing person, they may call in the ground team, or they may land and pick up the person themselves.

When you have finished your night search practise, place your Task Complete sticker here.

PLACE STICKER HERE

TASK COMPLETE

SEARCH AND RESCUE MISSION

Practise how well you can find things using a searchlight. You can use a darkened room. Play it with a friend, taking turns to be the searcher.

You will need: paper, pencil, torch, a friend.

1. Cut or tear the paper into six small pieces about 3 cm wide. Write the numbers 1 to 6 on them, so each piece has a different number.



2. Give the pieces to your friend and ask them to go into the darkened room while you wait outside. They must put all six pieces in different places on the floor, number side up.
3. Now it's your turn to go into the room. Switch on the torch and search for the pieces. You can only pick them up in number order – so you cannot touch number 2 until you have found number 1, and so on.

AIRLINE PILOT

KNOW YOUR AIRLINER

Before flying their airliner for the first time, the pilot needs to learn as much as possible about it. Large airliners are huge, powerful machines. They may be over 75 metres long, with a wingspan stretching three-quarters the length of a football pitch.

The airliner can weigh **200,000 kg** – that's about the same as the Statue of Liberty. Imagine how much **power** is needed to lift this weight off the ground! Airliners are even heavier with hundreds of **passengers** on board.







MATCH THE AIRCRAFT PARTS

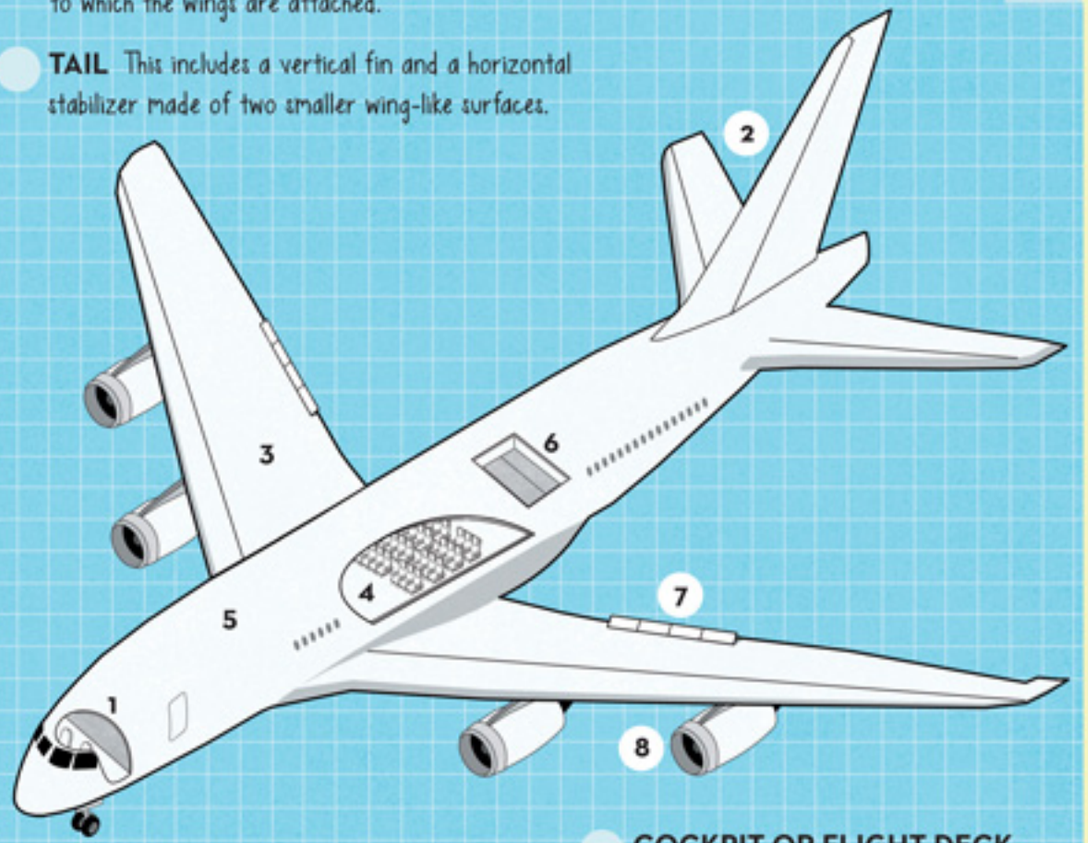
In the picture on the opposite page, different parts of the aircraft are numbered from 1 to 8. Your challenge is to match the parts to their labels.

Read each name and label carefully, and then write the correct part number in the circle. The first one has been done for you.

5 **FUSELAGE** The main part of the aircraft to which the wings are attached.

TAIL This includes a vertical fin and a horizontal stabilizer made of two smaller wing-like surfaces.

HOLD The luggage compartment.



PASSENGER CABIN The part of the airliner where the passengers sit.

WING FLAP Part of the wing that moves up and down during take off and landing.

JET ENGINE Airliners usually have either two or four of these.

COCKPIT OR FLIGHT DECK The pilots control the plane from here.

WING The wings create the lift that keeps the plane in the air.

When you have matched the labels and numbers, check your answers at the bottom of the page and place your Task Complete sticker here.

PLACE STICKER HERE

TASK COMPLETE

ANSWERS: 1. Cockpit or Flight Deck 2. Tail 3. Wing 4. Passenger Cabin 5. Fuselage 6. Hold 7. Wing Flap 8. Jet Engine

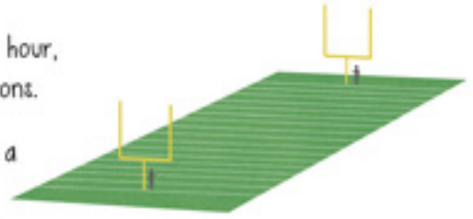
JET PILOT

PILOT REACTIONS

Have you heard of jets being described as 'supersonic'? When something is described this way, it means it can travel faster than the speed of sound.

SUPERSONIC SPEED

Sounds travel at a speed of about **1,225 kilometres** per hour, though this can vary slightly depending upon weather conditions.



Imagine you and a friend were standing at opposite ends of a football pitch. If your friend **called out** your name, you would hear their voice less than one third of a second later!

THE THREE COINS CATCH CHALLENGE

Jets travel at amazing speeds and jet pilots must operate with split-second timing. Practise this three-level challenge to develop the fast reactions need to fly supersonic aircraft.



You will need: three coins, a friend.

Start at Beginner Level. Once you have mastered it, move to Intermediate and then Expert Levels.

BEGINNER LEVEL

1. Place a coin on the back of your hand. Jerk your hand upwards slightly, so the coin flicks up.



2. Now catch the coin in the palm of the same hand.



3. When you can do this, repeat using two coins stacked on top of each other. Then try three coins!

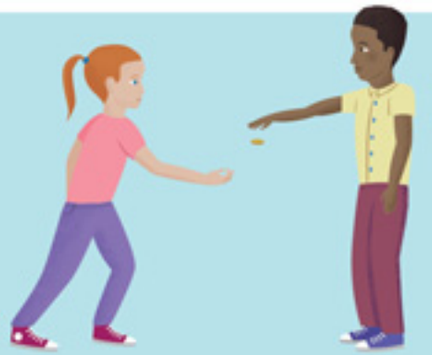


INTERMEDIATE LEVEL

1. Ask a friend to stretch out one arm. Drop a coin into their hand.



2. Stand one pace in front of them with your arms by your sides.



3. When they drop the coin, catch it before it hits the ground.

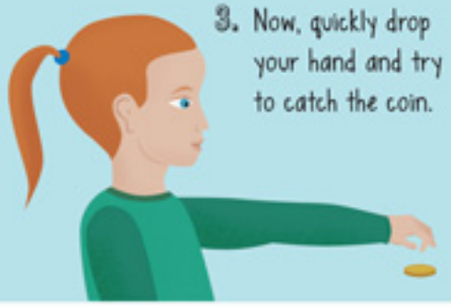
EXPERT LEVEL

1. Bend up one arm, about level with its shoulder.

2. Place a coin on the back of your arm, just above the elbow.



3. Now, quickly drop your hand and try to catch the coin.



MACH NUMBERS

One way of measuring jet speed is by using **Mach numbers.** If a jet is travelling at the speed of sound (1,225 kph), it is travelling at Mach 1.



A lot of jets can fly faster than Mach 2 (2 x 1,225 kph = 2,450 kph). For example, the **F-15 Eagle** can reach Mach 2.5!

When you have done the Three Coins Catch challenge, place your Task Complete sticker here.

PLACE STICKER HERE

TASK COMPLETE

AIRLINE PILOT

LANDING PRACTICE

All airline pilots need to know how to make a smooth landing. There are hundreds of passengers on board, so it needs to be as bump-free as possible. Look at the steps below to learn how it should be done.

1. Make sure the **landing gear** is down by pressing down the gear handle. Lights on the flight deck will show the wheels are down.



Wheels drop down from under plane



2. Just before the plane hits the runway, pull back on the **control column**. This raises the nose of the plane slightly, so that it lands on the back wheels, not the front.

3. As soon as you land, activate the **reverse thrust**. This slows the plane, by making the engine exhaust flow forwards instead of backwards.





4. Apply the **wheel brakes** by pressing on the foot pedal. When the plane has stopped, press the parking brake and switch off the engines. Wait for the ground crew to position the steps.

THE LANDING GAME

Practise getting your stopping speed right by making and playing this game with a friend. Remember to ask an adult's permission before chalking on a path or patio.

You will need: paper strip measuring about 10 cm x 4 cm, a pencil or ballpoint pen, scissors, sticky tape, chalk, tape measure, hard outside surface you are allowed to chalk on.

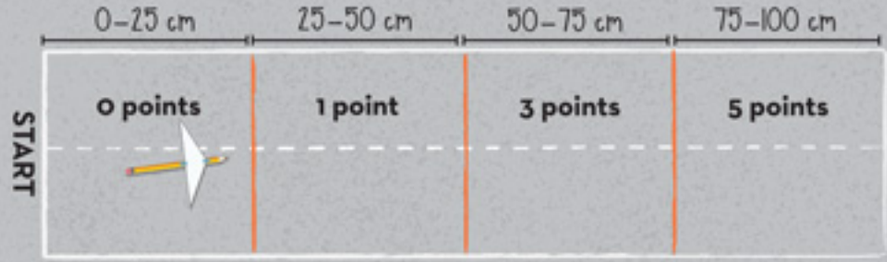






1. Fold the paper strip in half.
2. Use the scissors to cut the folded paper in half diagonally, as the dotted line in the picture shows.
3. Open out the paper, which will be shaped like a plane's wings. Tape this to a pencil or pen to make your plane.
4. Use the chalk and tape measure to draw a runway on the hard surface. Your runway should measure 1 metre long and 30 cm wide. Split it into sections every 25 cm, as shown in the picture below. Finally, draw a dotted line along the centre.

Time to play! Position the plane at the start. Take turns to flick it ONCE to send it along the runway. Check where it lands and note your scores. The winner is the first player to score 20 points.



Lose 10 points if the plane crosses the 100 cm line!

Score 2 bonus points if the plane wings are over the centre line when it stops!

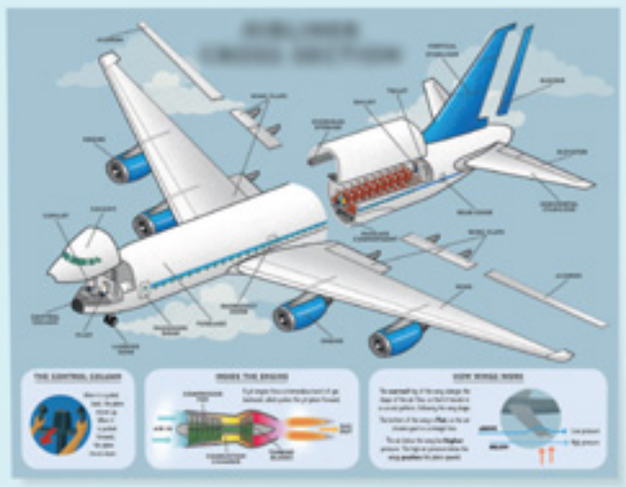
When you have made and played the Landing Game, place your Task Complete sticker here.

PLACE STICKER HERE

TASK COMPLETE

PILOT KIT

- Flight Stats Game Cards
- World Class Pilot Game
- Airliner Cross-section Poster
- Airliner Model
  (on the flaps of the book)
- Stickers





FLIGHT STATS GAME INSTRUCTIONS

FOR 2+ PLAYERS

Shuffle and deal all of the cards. The player to the dealer's left starts by reading out a category value of their choice from the card at the top of their pile (e.g. Size = 5). The next player then reads out the same category value from the card at the top of their pile, and so on until each player has read the chosen category value. The player with the highest category value wins and collects the cards played in that round, then chooses the category value for the next round. If there is a tie, no one takes the cards in the round. The player that collects all of the cards is the winner.

ANSWERS

PLAN THE ROUTE, PAGE 45

