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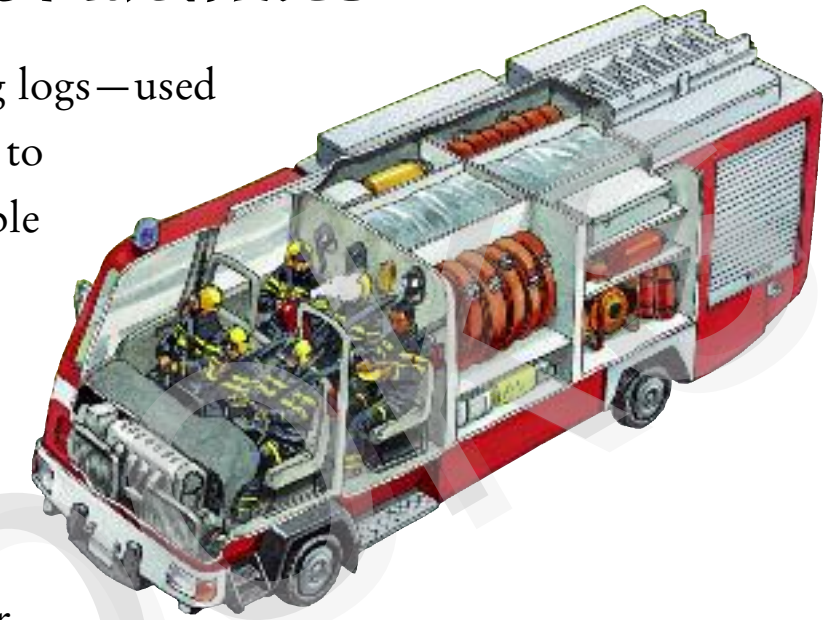
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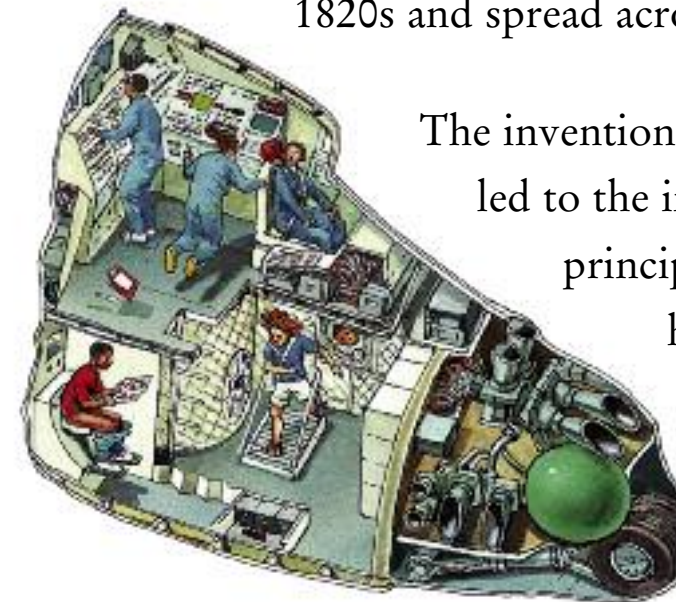


## Transport machines

The first vehicles must have been floating logs—used by people tens of thousands of years ago to cross short stretches of water. Later, people tied the logs together to build rafts or hollowed them out to make canoes. Reeds or animals skins could be also used for boatbuilding. All these early craft were propelled by poles or paddles, until sails were used to harness the power of wind.



The invention of the steam engine in the late 18th century changed transport for ever. In boats and ships, steam engines turned paddle wheels and propellers. Huge iron ships carrying thousands of passengers and vast amounts of cargo, were now built. On land, before the invention of steam engines, people rode horses or used vehicles pulled by animals. Now steam locomotives could pull trucks and carriages along railway tracks. They first appeared in the 1820s and spread across the world.



The invention of lightweight, petrol-driven engines in the 1880s led to the introduction of the motor car and—once the principles of controlled flight had been perfected—heavier-than-air aircraft in 1903. Throughout the 20th century, vehicles could travel on water, roads, rails, and in the air faster and faster. The arrival of jet engines in the 1940s and rocket engines in the 1950s allowed people to travel around the globe

## HOW DOES IT FLY?

An aeroplane relies on its engines to drive it forward and its wings to provide lift, the force that moves something upwards. Because of the curved shape of the wing, air flowing over it moves faster than air flowing under it. Faster-moving air creates less pressure, so the higher pressure on the lower side produces lift.

There are four engines on an Airbus A380, two on each wing

Engine cowling

Communications aerial

Upper deck portholes

Lower deck portholes

Surface of wing

Headlamp

Emergency exit

Wing slat

Engine cowling

## LOADING THE PLANE

Luggage checked in at the airport terminal is carried by moving belt to the bag room. Here it is placed in containers and taken to the aircraft for loading by baggage handlers. The containers are loaded aboard using a loading platform that can be raised up to the level of the hold.

Baggage loading

Loading platform

Inspecting aircraft's landing gear

Airport bus

## READY FOR TAKE-OFF

Before an airliner takes off, the ground crew gets to work. The aircraft is refuelled from a tanker, while firefighters stand by. Baggage handlers load luggage on to the aircraft, and various vehicles arrive to replenish food, drinks and water supplies. Lavatories are refilled with water and disinfectant. Following last-minute checks to the airliner's instruments and controls, it is ready for take-off.

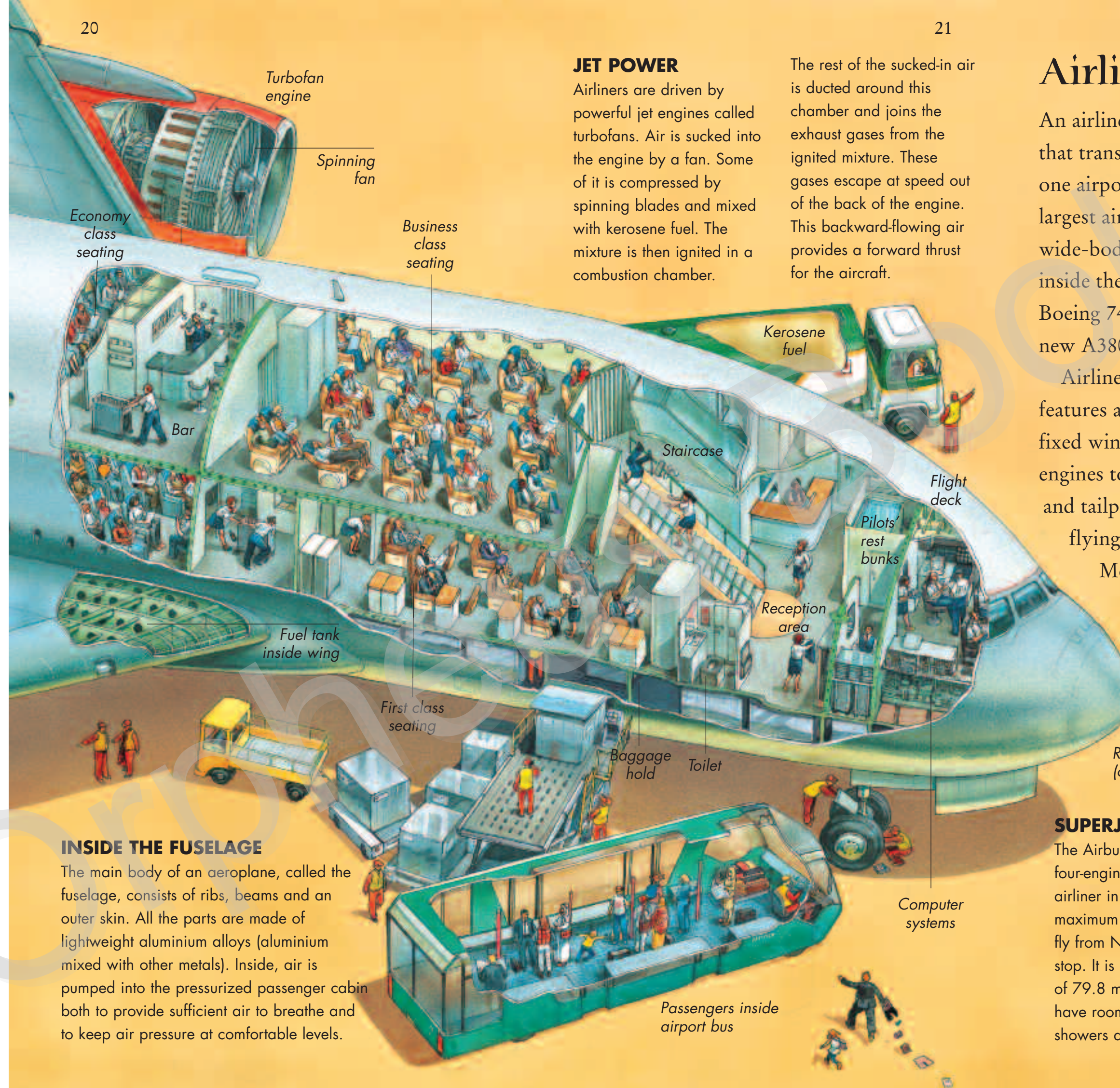
Fuel tanker

## AIR TRAVEL

The development of the jet airliner in the 1950s made it possible for everyone to fly to destinations all over the world. Nowadays, about 2 billion people travel by airliner every year.

Emergency exit





## JET POWER

Airliners are driven by powerful jet engines called turbofans. Air is sucked into the engine by a fan. Some of it is compressed by spinning blades and mixed with kerosene fuel. The mixture is then ignited in a combustion chamber.

The rest of the sucked-in air is ducted around this chamber and joins the exhaust gases from the ignited mixture. These gases escape at speed out of the back of the engine. This backward-flowing air provides a forward thrust for the aircraft.

## Airliner

An airliner is a large aeroplane that transports passengers from one airport to another. The largest airliners, known as wide-bodies, have two aisles inside the passenger cabin. The Boeing 747 Jumbo Jet and the new A380 are wide-bodies.

Airliners have the same features as all other aeroplanes: fixed wings that provide lift, engines to give thrust, and a fin and tailplane to keep the plane flying straight and level.

Moving hinged parts of the wings and fin allow the pilot to steer the aircraft through the air.

## SUPERJUMBO

The Airbus A380, a double-decked, four-engine airliner, is the largest airliner in the world. It seats up to a maximum of 853 passengers and can fly from New York to Hong Kong non-stop. It is 73 m long with a wingspan of 79.8 m. Some versions of the A380 have room for beauty salons, casinos, showers and even a gymnasium!

## INSIDE THE FUSELAGE

The main body of an aeroplane, called the fuselage, consists of ribs, beams and an outer skin. All the parts are made of lightweight aluminium alloys (aluminium mixed with other metals). Inside, air is pumped into the pressurized passenger cabin both to provide sufficient air to breathe and to keep air pressure at comfortable levels.