

Topic 3 FAQs

1. Who are the Snowbirds and what can they do? The Canadian Forces 431 Air Demonstration Squadron – better known as The Snowbirds – is a world-famous military aerobatic demonstration team. The Snowbirds team consists of nine CT-114 Tutor aircraft and a personnel staff of only 24.

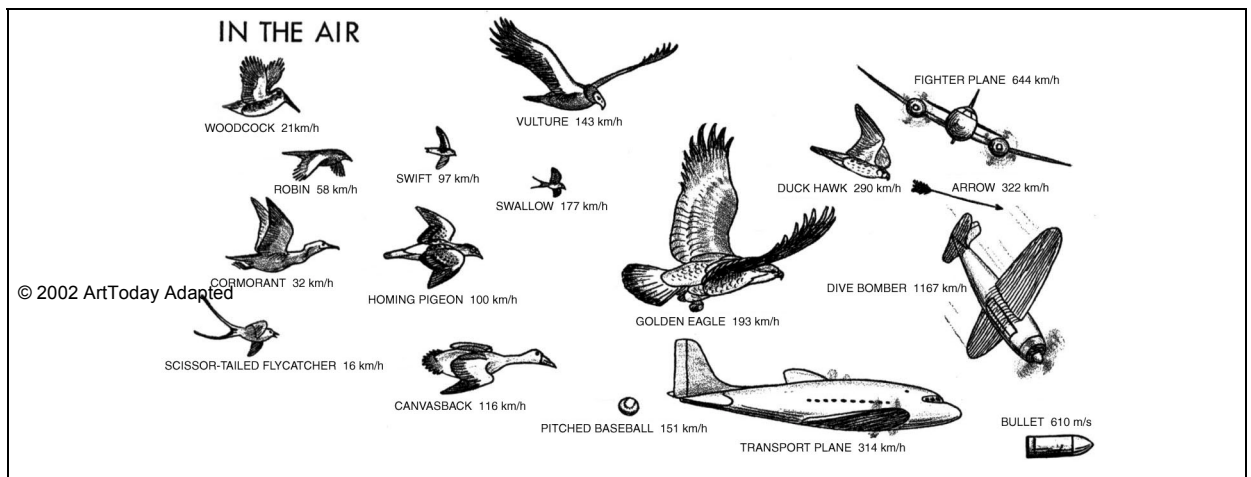
The Snowbirds are capable of many high-speed and often high-risk maneuvers and formations. Many of the Snowbirds “tricks” involve flying inverted, high-speed passes at close range, and formations that include nine aircraft.

Throughout the course of a show, the speed at which The Snowbirds travel varies quite substantially; however, it is not uncommon for the jets to reach speeds of 600 km/hr.

2. What produces thrust on satellites? Tiny rocket engines called attitude thrusters are used on satellites as they don't need much thrust. One common satellite engine uses no “fuel” at all. These engines are called pressurized nitrogen thrusters, which simply blow nitrogen gas from a tank through a nozzle. Thrusters like these kept Skylab in orbit, and are also used on the shuttle's manned maneuvering system.
3. When did the USA decide to develop a reusable space shuttle? In 1972, NASA announced their plans to use a reusable shuttle design consisting of an orbiter attached to solid rocket boosters and an external fuel tank.
4. Meteors burn up when they hit the Earth's atmosphere. Why doesn't the space shuttle? The shuttle orbiter uses a special design. It is covered with many insulating ceramic tiles that absorb the heat of re-entry without harming the astronauts.
5. When was the first shuttle flown and who were the astronauts? The first shuttle was called Columbia. It was piloted first by John Young and Robert Crippen in 1980. Later shuttles were called Discovery, Atlantis, and Challenger.
6. Which shuttle was destroyed in flight? In 1986, the shuttle, Challenger, was destroyed in flight when a flame from a leaky joint on one of the solid rocket boosters ignited fuel in the external fuel tank. The Challenger exploded and the entire crew was lost. The Challenger was later replaced by the Endeavor.
7. How can a rocket fly without wings? A rocket can fly without wings because it has so much force applied to it that gravity can't keep it down. A baseball flies without wings because of the force with which it is hit. It takes a while before the gravity pulls it to the ground.
8. If you are flying 150 km/h into a 50-km/h head wind, what is your ground speed? In order to determine how fast a plane is moving over the ground, wind speed must be considered. First, subtract the speed of the head wind from the air speed if the airplane is flying into a head wind. So if you were flying 150 km/h into a head wind of 50 km/h, your ground speed would be 100 km/h. If you are flying with a tail wind, you add the speed of the tail wind to your air speed.

9. What does it take to lift a jumbo jet? An airliner, like a jumbo jet, may produce an average pressure difference of about 70 grams per square centimetre. That may not seem like much, but over the entire wing, it adds up. The wings of a Boeing 747 have enough surface area to lift 4,000,000 kilograms into the air.
10. What was the first craft powered by a human called and when did it fly? In 1977, the Gossamer Condor successfully demonstrated sustained, maneuverable, manpowered flight. The flight took off from California, USA, piloted by Bryan Allen. The Gossamer Condor flew nearly 2 km.
11. How does a pilot make a level turn? Maintaining a constant altitude through a turn requires extra lift. In level flight, the opposing forces of lift and weight are equal, but as an airplane banks into a turn, the balance shifts. Lift, which acts perpendicular to the wings, is no longer acting directly upward and, therefore, is not fully supporting the weight of the airplane. Unless the pilot compensates for this imbalance, the airplane will lose altitude and spiral downward, so the pilot increases the wing's angle of attack, which increases lift but also decreases drag. The pilot can compensate for the added drag by increasing thrust.
12. Do birds fly the same way airplanes do? Yes, basically, birds and airplanes fly for the same reasons. If you look at the shape of a bird's wing, you would see they are curved the same way airfoils are on an airplane wing. When a bird glides during level flight, it stays in the air just like airplanes do—its wings provide lift. However, birds flap their wings up and down to go higher in the sky while airplanes must use a combination of control surfaces and powerful engines. Birds have strong wing muscles that give them the power to fly

How Fast Do They Travel?



13. What does it feel like when you take off in an airplane? Right before takeoff, you can feel your back being pushed against your seat as the airplane builds up its speed before leaving the ground. As the airplane races down the runway, it's waiting until the wings create enough lift to lift the craft off the ground. During the flight, if you are sitting by a window near a wing, you will see the flaps at the back of each wing (ailerons) move up or down when the airplane banks or turns.

14. What does it feel like when you are going to land? When the airplane you are flying in gets ready for landing, you will be able to hear the sound of the landing gear being lowered below you. Just before touchdown, if you are by a window by a wing, you will notice the large wing flaps in their down position. The pilot lowers these flaps so he or she can more easily control the airplane at such a slow speed. After landing, look at how the spoilers (big rectangular sections in the middle of the wing) pop up to create more drag to slow down the airplane even more.
15. Why do airplane cabins have to be pressurized? The atmosphere is 80 km (50 miles) deep. At sea level it exerts 101 kPa (14.7 pounds per square inch). Our bodies think this is completely normal. An airplane flies at 10 000 metres (30 000 feet). Air pressure is significantly lower at that height. High-pressure air is used to “pump up” the cab in much the same way that a tire is pumped up. The high-pressure air on most planes comes from the compression stage of the jet engines.