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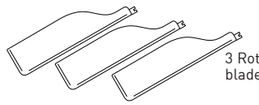
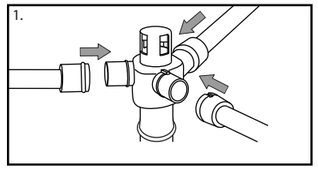
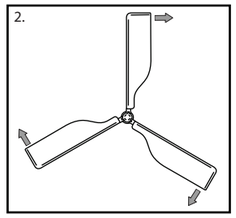

3 Rotor blades

Balloon 'copter Assembly

Instructions

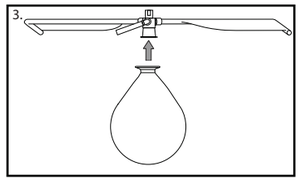
Rotor Blades





Slide the three rotor blades onto the centre section. (see image 1). Ensure that the cutaway hole faces up and engages fully with the plastic section.
This should ensure that all of the blades face the same way. (see image 2).

Attaching the Balloon



Fully inflate the balloon and pinch the neck to ensure that no air is lost. Insert the centre section of the 'copter fully into the neck of the balloon. Ensure that the balloon is as secure as possible.

The neck of the balloon must be pinched at all times to prevent air loss.

Launching the Balloon copter

Read all Instructions carefully before use. Ensure the Balloon copter has been set up properly as detailed above.

To launch, release the balloon and place both hands under the balloon body. As the air starts to escape through the rotor blades they will start to rotate.
During this rotation process gently push the underside of the balloon copter and watch it take off!
When using outdoors, operate in a location clear of obstacles in all directions and launch away from any people or animals. Ensure that the environment is not excessivley windy.

Important Advice:
Ensure that all three air vented blades are not blocked and that the blade edges are not bent or damaged. Also see warning information below.

- Always place the balloon fully onto the copter body.
- Keep eyes and other parts of the body away from the spinning propellor.
- Do not attempt to catch the balloon during flight.
- Avoid launching near objects which could damage the Balloon copter's blades. Do not use if the propellor or other parts of the product are damaged.
- Operate in an open area. Do not use in a crowded place, and keep away from other people when flying the product.

! WARNING:

NOT SUITABLE FOR CHILDREN UNDER 3 YEARS DUE TO SMALL PARTS WHICH MAY REPRESENT A CHOKING HAZARD.

CHILDREN UNDER 8 YEARS CAN CHOKE OR SUFFOCATE ON UNINFLATED OR BROKEN BALLOONS. ADULT SUPERVISION REQUIRED. KEEP UNINFLATED BALLOONS AWAY FROM CHILDREN. DISCARD BROKEN BALLOONS AT ONCE.
BALLOONS MADE OF NATURAL LATEX.

RECOMMENDED FOR CHILDREN OVER 5 YEARS.

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Made in China

Balloon 'copter

science museum uk

What does it do?
This model helicopter can fly up to 20m in the air, powered by nothing more than air stored in a balloon. When you inflate the balloon you are effectively storing pressurised air. The resistance you feel as you blow up the balloon is the elasticity of the balloon's skin. If you release the open end of the balloon, the skin tries to shrink back to its original size by forcing out the air. The Balloon 'copter channels this air along the rotor blades and out at the tip of each blade. This in turn drives the rotor blades around, and the shape of the blades means that the spinning action generates lift – the 'copter rises by forcing the air around it downwards.

How does it work?
Aeroplane wings and helicopter rotor blades have the same function – when they move through still air they generate an upwards force that lifts the aircraft. The shape of a wing creates a difference in the air pressure above and below the wing. Below the wing, air pressure rises as the moving wing strikes stationary air and compresses it slightly (this surface being slightly angled). Above the wing, the curved shape forces the air in a curved path, creating a slight vacuum as the wing moves away from the airflow. The result of this pressure difference is an upwards force.

Did you know?
Propellers make use of the third law of motion discovered by Isaac Newton in the 17th century: "for every action on an object there is an equal, but opposite, reaction". In other words, any force is balanced by another one in the opposite direction. For example, when you kick a football you apply a force to it that makes it move. At the same time it applies a force to your foot which you feel as the impact. If this didn't happen, when you kicked the ball your foot would just pass through it as if it wasn't there. In the case of a propeller, the force comes from the motion of the propeller blade against the air. The reaction is the pressure that the air places on the blade. Each propeller blade is angled so that this pressure is pointing in the direction you want the propeller to go. (downwards in the case of a helicopter).

Fact files
Orville Wright was the first person to make a powered, sustained and controlled flight, in Kitty Hawk North Carolina on 17th December 1903. A century later the largest passenger aircraft, the Airbus A380, capable of carrying over 550 passenger was being developed. In a little over a single human lifetime, air travel had gone from a novelty to being commonplace.

National Curriculum coverage
This product is suitable for exploring science at KS2 and KS3 of the National Curriculum. Use it to discover more about Forces and Motion (physical processes).

In the Science Museum
The Science Museum's Flight gallery contains real and replica aircraft from throughout the history of human aviation. Highlights include a replica of the Wright brothers' Flyer. Orville Wright had presented the original, in which he made the first powered human flight, to the Science Museum in 1928. Following an improvement in his relations with the US government it returned to its native country to go on display in the Smithsonian Institute, and an exact replica was given in exchange.