

BALLOON TERMINOLOGY

ACROPHOBIA: The fear of heights.

AERONAUT: One who operates or travels in a balloon.

AEROSTAT: The balloon itself.

ALTIMETER: An instrument to register changes in atmospheric pressure resulting from a change in altitude. It is calibrated to indicate height above mean sea level.

APEX: The uppermost point or crown of the balloon envelope where gore ends and load tapes meet.

BALLOONMEISTER: The person responsible for the various balloon activities at a balloon meet.

BAROGRAPH: A recording barometer which senses changes in the atmospheric pressure. It records altitude and time.

BASKET: Cockpit of the balloon designed to hold passengers, fuel tanks and the operational control systems. Sometimes it is referred to as the gondola.

BLAST VALVE: A high pressure fuel valve used to put heat into the envelope.

BTU: British Thermal Unit. The amount of heat required to raise the temperatures of one pound of water by one degree Fahrenheit. Burners on balloons are rated by their BTU output.

BUOYANCY: The tendency of a balloon to float in the air.

BURNER: The fuel burning device consisting of superheating coils, propane jets and pilot light.

CEILING: The height of the lowest layer of clouds above the ground.

CHASE CREW: The crew members who follow the balloon in a vehicle to retrieve it after landing.

CROWN LINE: A handling line some 100' long attached to the apex of the balloon. Used to steady the balloon during inflation and deflation.

DEFLATION PORT: The rip panel of the envelope that separates from it to allow hot air to escape quickly.

ENVELOPE: The fabric portion of the balloon that holds the hot air.

EQUATOR: Where the circumference of the balloon is the greatest.

EQUILIBRIUM: The state of balance when the balloon's lift equals its weight and becomes buoyant.

FAHRENHEIT: One of two common temperature scales; the other being Centigrade or Celsius. On a Fahrenheit scale 32° is the freezing point of water under standard atmospheric pressure.

FALSE LIFT: The venturi effect of the wind that causes the balloon to lift off before equilibrium is reached.

GORE: The lengthy pieces of balloon fabric which taper at each end to form the vertical sections of the envelope.

HANDLING LINE: A 50' rope attached near the equator. Used to maintain stability of the balloon during inflation or deflation.

HEATER: See burner.

INFLATION: The process by which air is forced into the envelope and then heated.

KEVLAR: A non conducting material used to replace stainless steel suspension cables.

KNOT: A unit of speed in nautical miles per hour.

LAPSE RATE: The decreases in atmospheric temperature with altitude.

LOAD TAPE: A flat vertical or horizontal webbed nylon strap that takes most of the envelope stress.

MANEUVERING VENT: A closeable flap operated by a control line which permits hot air to be vented

Ballooning Timeline

- 1709** A Brazilian priest, Bartolomeu de Gusmao, demonstrated a model hot-air balloon to Johan V of Portugal. No records exists to suggest that any passenger carrying balloon was then built.
- 1776** Henry Cavendish discovers hydrogen, which was found to be seven times lighter than air. In these early days, hydrogen was made by mixing sulfuric acid and iron. The race to fly was on.
- 1783 June** - The Montgolfier brothers, Joseph and Ettienne J. began experimenting with small-scaled hot-air balloons built out of paper or light fabric.
- August** - Jacques A. C. Charles launched an unmanned hydrogen balloon, *The Globe*, which travelled 15 miles (24 km) and reached an altitude of 3000 feet (915m). At the landing in Gonesse, the local peasants were so frightened that they attacked the balloon with pitchforks and scythes, thus destroying it.
- September** - The Montgolfier brothers launched an unmanned hot-air balloon from Versailles. Louis XVI had decreed that the first flight should be flown with animals. A duck, a sheep, and a rooster became the first air travellers. If it wasn't this flight, then it was had to be another one within the following 2 months.
- November** - For the first time in recorded human history, we leave the confines of the Earth's surface and take flight among the birds. Over 400,000 Parisians, including Louis XVI and Marie Antoinette, witnessed as the Marquis François d'Arlandes and Jean-François Pilâtre de Rozier flew in the very first flight in a Montgolfier built hot-air balloon. This flight lasted 25 minutes and covered 7 miles (11 km).
- December** - Just 10 days after the Montgolfier flight, J.A.C. Charles piloted the first gas balloon flight. Also launched in Paris, this flight lasted 2 1/2 hours and covered a distance of 27 miles (43 km). The first recorded change out of a passenger occurred on this flight when Charles landed and dropped off his passenger Professor Robert, then took off again. Charles then flew to height of 9000 ft (2750 m).
- 1784 January** - Joseph Montgolfier made his only recorded flight in *Le Fleusselles*. This balloon is believed to have had a passenger carrying capacity of more than 30 and the envelope must have been over 700,000 cf (20,000 cubic meters)! This was the largest hot-air balloon ever built until very recently! The flight originated in Lyon, France.
- September** - Vincenzo Lunardi, a minor Italian diplomat, piloted the first balloon flight outside of France. A crowd of 100,000, including the Prince of Wales, watched as Lunardi launched his 18,200cf (515 cubic meters) hydrogen balloon from Moorfields, England. He ultimately touched down near Ware.
- November** - Frenchman Jean-Pierre Blanchard and American John Jeffries make their first flight. This flight was from Rheidium Garden, London to the banks of the Thames.
- 1785 January** - Blanchard and Jeffries make the first crossing of the English Channel by balloon. This flight included the very first airmail letter!
- July** - Jean-François Pilâtre de Rozier attempted an English Channel crossing in a hybrid gas/hot-air balloon. This flight ended in disaster as a fire caused the hydrogen to explode. de Rozier and his passenger Romain were killed. This was the first aviation accident. Jean-Pierre Blanchard became the first skydiver as he parachuted out of a gas balloon.
- 1793 January** - After moving to America, Jean-Pierre Blanchard piloted the first known balloon flight in North America in Philadelphia, PA. George Washington witnessed this flight.

Name_____

Hot Air Balloon Exam

Match the words with their definition.

- | | |
|--------------------------|---|
| 1. _____Basket | A. Deflects the wind around the burner flame. |
| 2. _____Burner | B. A huge air bag made of fabric. |
| 3. _____Burner Supports | C. The load-carrying part of a balloon. |
| 4. _____Crown | D. Keep the basket stiff and hold up the load frame and burner. |
| 5. _____Envelope | E. Panels of fabric cut at angles to form shape of the balloon. |
| 6. _____Gores | F. Connect the basket to the balloon. |
| 7. _____Load Tapes | G. The top of the balloon. |
| 8. _____Skirt | H. Heats the balloon to allow it to fly. |
| 9. _____Suspension Cable | I. Distribute the payload evenly to the fabric itself. |
| 10. _____Aeronaut | J. Used for cold inflation. |
| 11. _____Inflator fan | K. The open end of the envelope. |
| 12. _____Mouth | L. A balloon pilot |

Write a short answer for each question.

How does a pilot steer a balloon?

What is a chase crew?

How old can you be to first fly a balloon?

What makes a balloon fly?

Name_____

Test Review

Define the following terms.

1. Basket
2. Burner
3. Burner Supports
4. Crown
5. Envelope
6. Gores
7. Load Tapes
8. Skirt-
9. Suspension Cable
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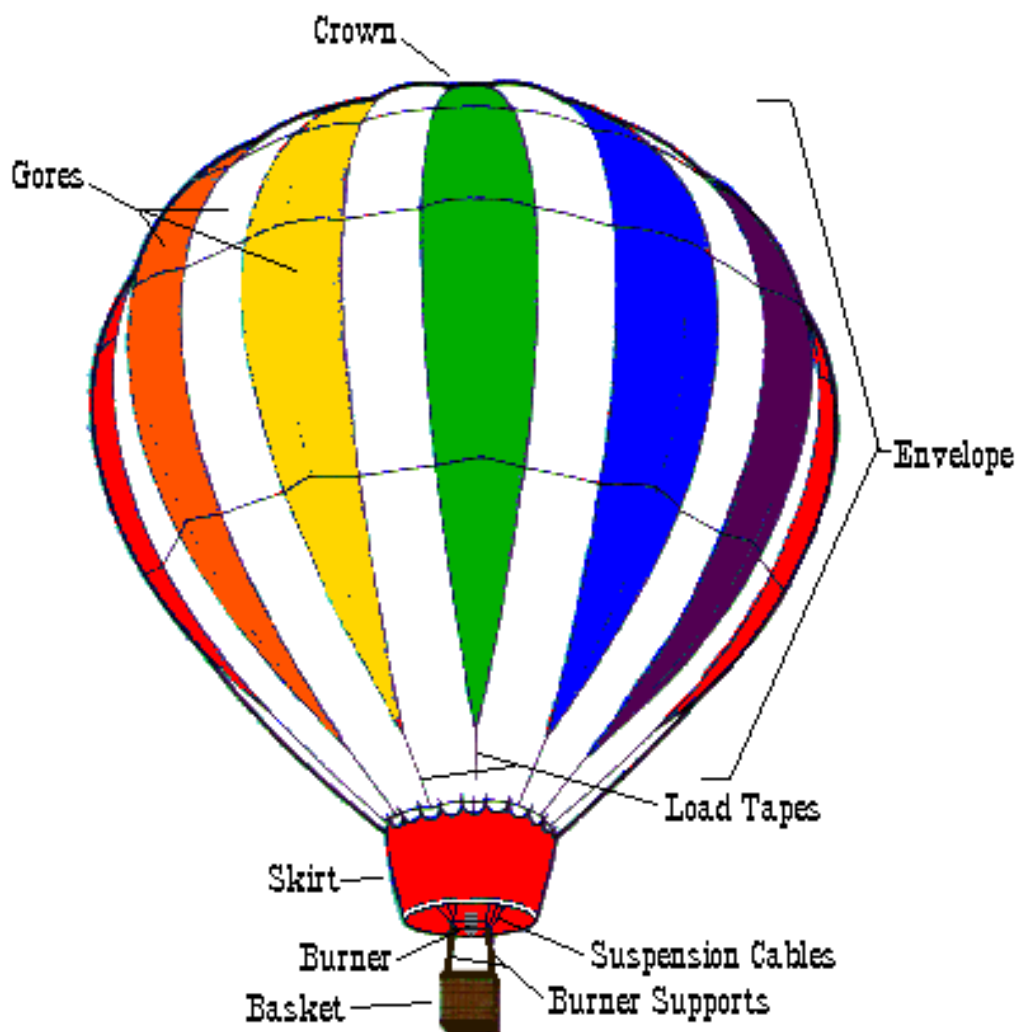
How old can you be to first fly a balloon?

What makes a balloon fly?

Name _____

Date _____

PARTS OF A BALLOON



Basket

Crown

Load Tapes

Burner

Envelope

Skirt

Burner Supports

Gores

Suspension Cables