

Women in Space: Kalpana Chawla

Kalpana Chawla is often remembered in the context of one of space travel's great tragedies, the Columbia disaster of 2003. During which Chawla and her crew perished on entry due to damage with the internal wing structure that caused the shuttle to break apart. But this isn't her whole story.

She was a pioneer. The first Indian woman to go to space, her groundbreaking work in NASA's research and development team helped to guide space travel through the decades.

Born in Karnal, India, on 17 March 1962, Kalpana grew up with a fascination for flying and airplanes. She joined local flying clubs in Karnal and would watch planes with her father. This fascination for flying encouraged her to get a degree in aeronautical engineering from Punjab Engineering College in India in 1982 and was a passion she followed throughout her career.

In 1982 Chawla followed her love of flying to the United States where she studied for a Master's degree in Aerospace engineering from the University of Texas and went on to receive a PhD from the University of Colorado in the same field.

But it was after achieving her numerous degrees that her love for space travel truly developed.

Chawla's career at NASA began in 1988 when she worked at NASA's Ames Research Centre as a powered-lift computational fluid dynamics researcher. Computational fluid dynamics is used to predict different properties of aircraft, such as drag and lift, and how this will affect the performance of the system. This research is critically important when it comes to launching spacecraft to be able to fully understand how the spacecraft will react in its environment. Chawla's work focused on simulating air flows around the aircraft which was incredibly complicated in 1988 before the modelling software we have today.

During her time at NASA's Ames Research Centre, Chawla also worked on simulations for Short Take-Off and Vertical Landing (STOVL) for aircraft to determine how these manoeuvres would affect the wing of an aircraft in different scenarios. This research is most famous today for being used by the



SpaceX Falcon 9 rocket during its vertical landings, but Chawla was one of the NASA team to utilise this research for space exploration.

Space Shuttle Missions

During her time in research, Chawla became a US citizen which allowed her to apply for NASA's astronaut corps in 1991. In 1994, Chawla was selected for the corps and reported to the Johnson Space Centre in 1995 to begin training. A year later in November 1996 she was assigned her first mission, STS-87, aboard the Space Shuttle Columbia. Chawla would act as mission specialist and prime robotic arm operator. Launching on STS-87 Columbia, Chawla became the first woman of Indian origin to go to space, spending 15 days and 16 hours on the shuttle. During the mission Chawla performed experiments to study the effects of weightlessness and observed the Sun's outer atmosphere with the use of satellites.

It was her second space flight in 2003 that would go down in history, aboard STS-107 Columbia. After being selected for her second mission in 2001, Chawla returned to space in 2003. During the mission the crew performed approximately 80 experiments working for 24 hours a day in two shifts. They studied Earth, space science and astronaut health and safety.

On 1 February 2003, after a further 15 days and 22 hours in space, Chawla and her crew headed back to Earth. However, due to a malfunction during launch, where a piece of foam insulation struck the wing of the shuttle, the shuttle disintegrated during re-entry and Chawla and her crew sadly lost their lives, 16 minutes before the shuttle was due to land.

A Legacy That Lives On

Kalpana Chawla's life was one marked by tragedy, something she is generally remembered by, but she should also be remembered for her determination, pioneering spirit and incredible research. By following her love of flying in the air and in space, she has inspired countless others to follow in her footsteps in space exploration and research. So whilst her death should be remembered, we shouldn't forget to celebrate her extraordinary life.

THE FACT CORNER

Did you know?

SWEAT is odorless, it only smells when combined with **BACTERIA** found on your skin

Did you know?

Positive emotions **ENHANCES** the brain's ability to make good **DECISIONS**

Did you know?

Always **EXHALE** when your left foot hits the ground to **AVOID** cramps while running

Did you know?

The **TONGUE** is the only muscle only attached to **ONE** extremity

BRAIN TEASERS

1 Q. Divide 30 by 1/2 and add 10. What is the answer?

2 Q. A man builds a house rectangular in shape. All sides have southern exposure. A big bear walks by, what color is the bear? Why?

3 Q. If there are 3 apples and you take away 2, how many do you have?

4 Q. How many two cent stamps are there in a dozen?

5 Q. There's one sport in which neither the spectators nor the participants know the score or the leader until the contest ends. What is it?

6 Q. What famous North American landmark is constantly moving backward?

7 Q. What fruit has its seeds on the outside?

8 Q. Only four words in Standard English begin with the letters "dw". They are all common. Name two of them.

SOLUTION:
1. 70. 30 divided by 2 would have made 25. But 30 divided by 1/2 equals 60. Plus 10 equals 70.
2. White. Because a house with southern exposure is still 12.
3. You have two, because YOU took away 8. Dwarf, "dweller", "dwindle", and dwindle".
4. 12! A dozen of anything is still 12.
5. Niagara Falls.
6. Boxing.
7. Strawberry.
8. Dwarfs.

English Proverbs and Meanings

* **Knowledge in youth is wisdom in age.**
What you learn when you are young will be invaluable when you grow old.

* **No man can serve two masters.**
It's impossible to follow instructions from two different sources.

* **Once bitten, twice shy.**
After an unpleasant experience, people are careful to avoid something similar.

* **One swallow doesn't make a**

summer.
A single satisfactory event does not mean that all the others will be as good.

* **Penny wise, pound foolish.**
Refers to a person who is careful about spending small amounts of money, but not careful about spending large amounts of money.

* **Pride comes before a fall.**
Don't be too self-confident or proud; something may happen to make you look foolish.

Cheese Pull Apart Bread



1 1/2 cup mozzarella
150 gm cream cheese
2 tablespoon parsley
100 gm butter
Method

To prepare this enticing appetizer, first, preheat the oven at 180 C. Meanwhile, wash bacon under running water. Now, place bacon and parsley over a chopping board and chop them finely. Also, grate cheddar cheese and mozzarella cheese using a grater and crush garlic cloves. Keep aside until needed further.

Next, place baguette over the same board and cut it in a criss-cross pattern. Do not cut the whole bread. In a bowl add butter, garlic and parsley. Mix them well. Baste the bread with the butter mixture. Make sure to baste even on the bread openings.

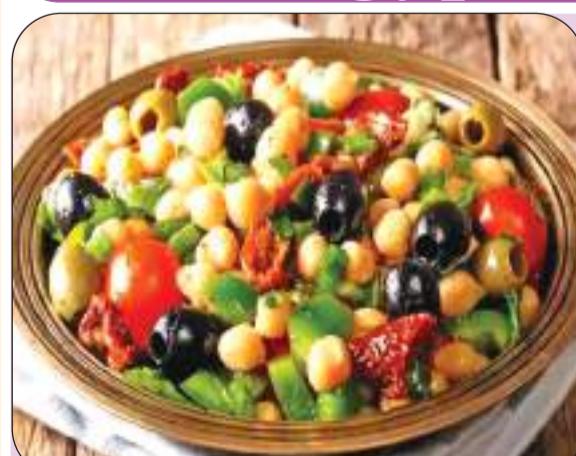
Now, take a bowl and add bacon, cream cheese, cheddar, black pepper and mozzarella into it. Mix them well. Stuff the bread with this mixture. Stuff generously to enjoy the filling to its best.

Now, cover the bread with foil place the bread into the oven. Bake for 15-20 minutes until the cheese melts. Serve hot!

Ingredients:
1 baguette
1 1/2 cup cheese-cheddar
200 gm bacon
6 cloves garlic
salt as required

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Egyptian Salad



Ingredients:
1 tablespoon virgin olive oil
1/4 cup tomato
6 green olives
1/2 teaspoon cumin powder
1/4 cup onion

1/4 cup capsicum (green pepper)
6 pitted black olives
1 cup boiled chickpeas
For Dressing
2 tablespoon extra virgin olive oil
4 tablespoon tahini
1/2 teaspoon black pepper
1/2 teaspoon chilli flakes
1 tablespoon lemon juice

Add olive oil, tahini, chilli flakes, black pepper powder, lemon juice and salt as per taste to a small jar. Close the lid and shake well and your dressing is ready. You can also add these ingredients to a bowl and whisk well to prepare the dressing.

Add 1 tbsp olive oil to a pan and heat it a bit. Add chopped onions, tomatoes, capsicum, green olives and black olives. Mix well and saute for two minutes. Add cumin powder, salt and black pepper powder as per taste. Now add boiled chickpeas to the pan and mix well. Cook for two minutes and turn off the flame. Collect the salad in a bowl.

Your salad dressing on the salad and toss a bit. Your salad is ready to be served.