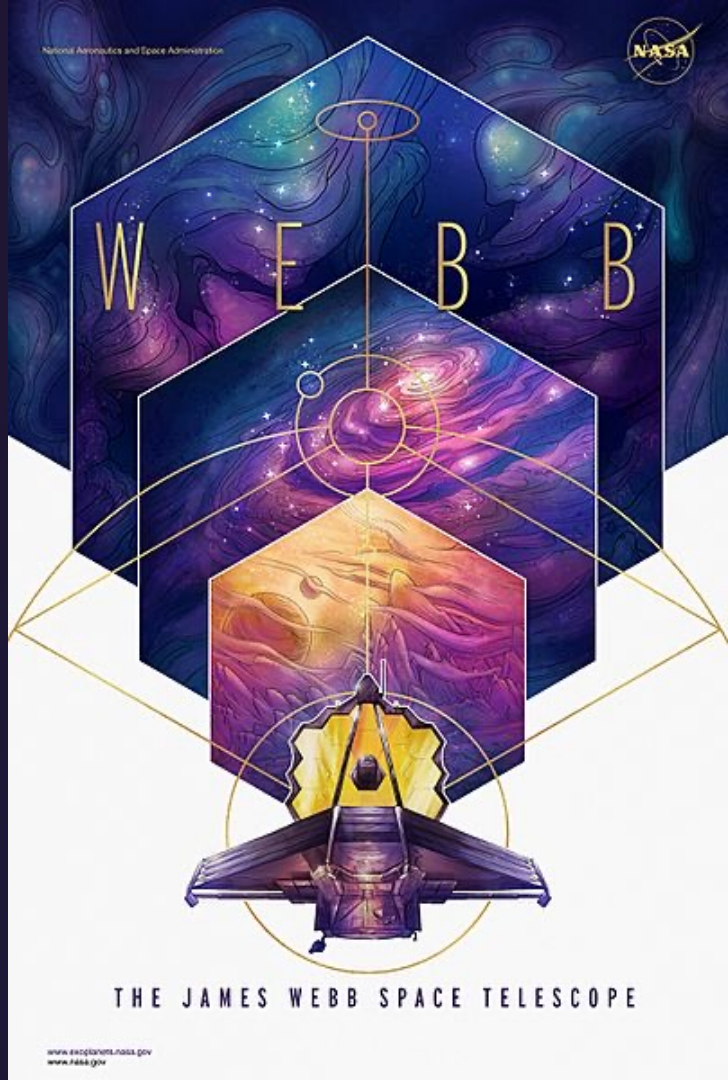
The James Webb Telescope

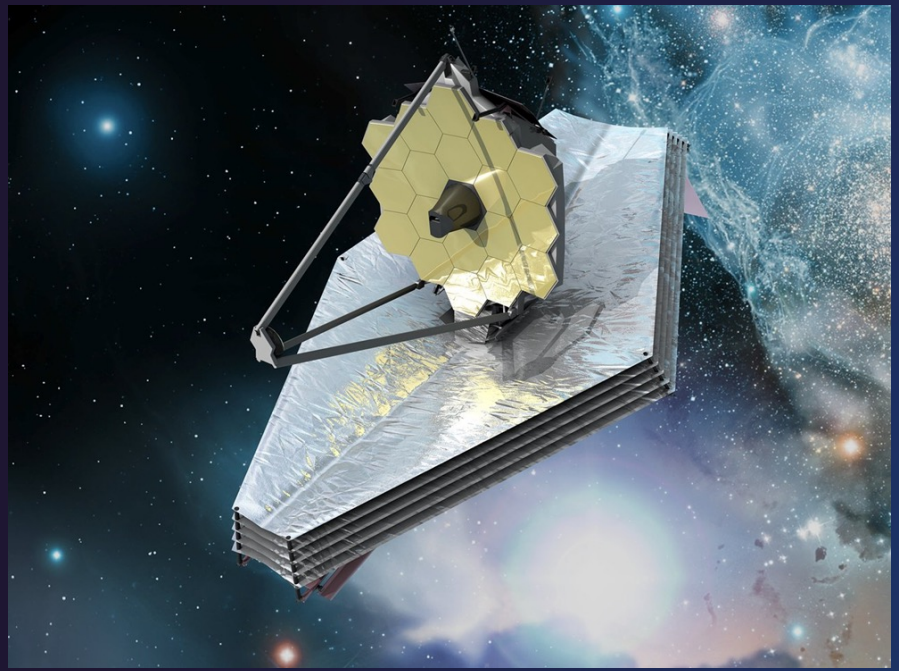
What is the James Webb Telescope?

- James Webb Space Telescope (JWST) is a telescope that was launched into space on 25 December 2021.
- It is a replacement for the Hubble Space Telescope which was launched in 1990.
- The telescope is named after James E. Webb, who was one of the bosses at NASA and created the Apollo program that put astronauts on the moon.



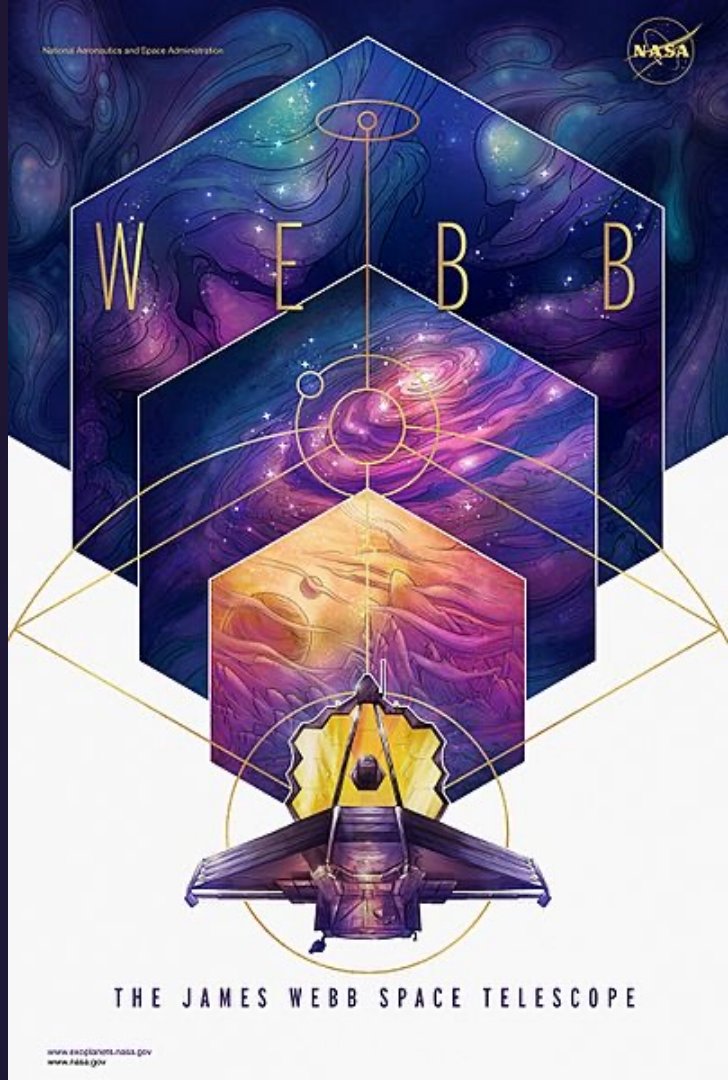
Spot the Difference



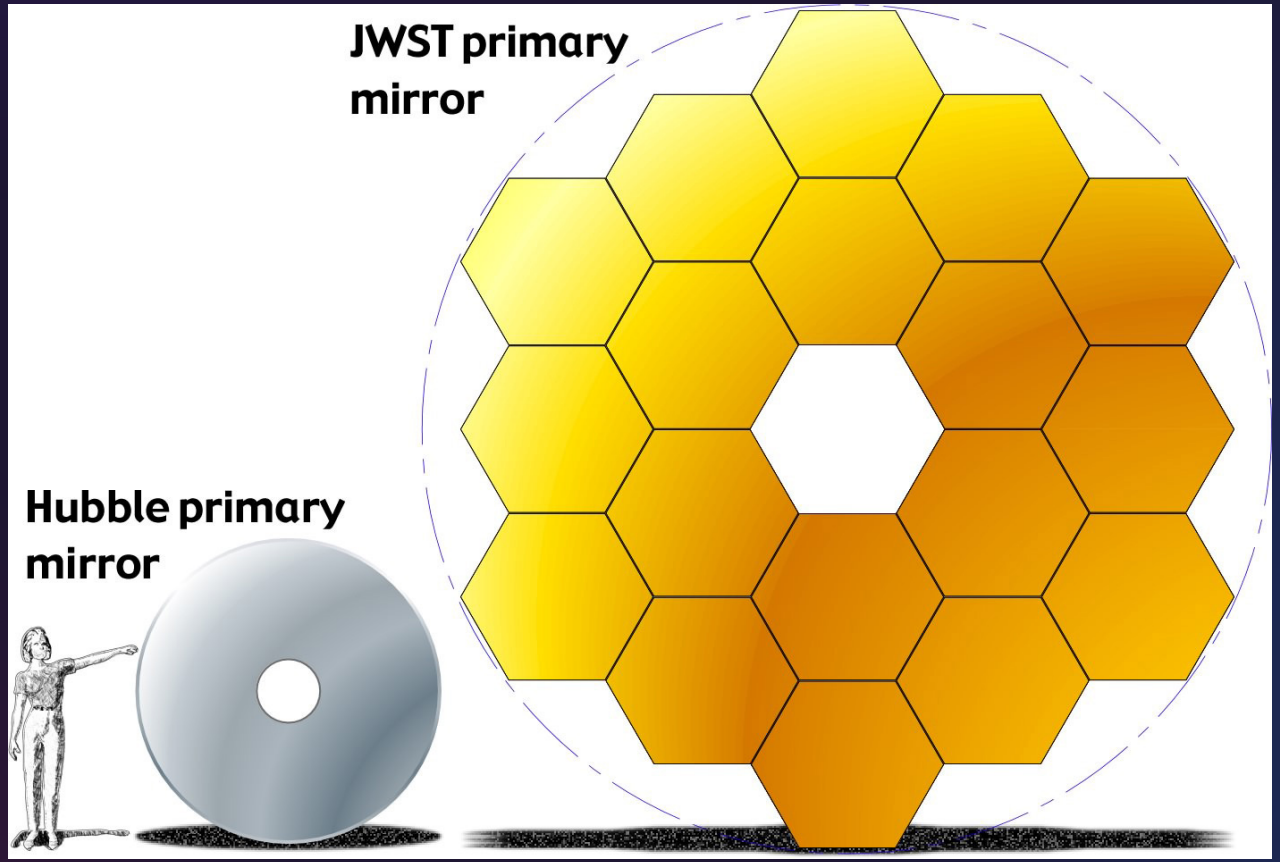


What is the James Webb Telescope?

- NASA's James Webb Space Telescope is AMAZING.
- It is the largest and most complicated space telescope **ever built.**
- It will be able to gather light that has been traveling for 13.5 **billion** years, almost since the beginning of the universe.
- In effect, Webb is a **time machine,** allowing us to peer at the first galaxies to form after the Big Bang.

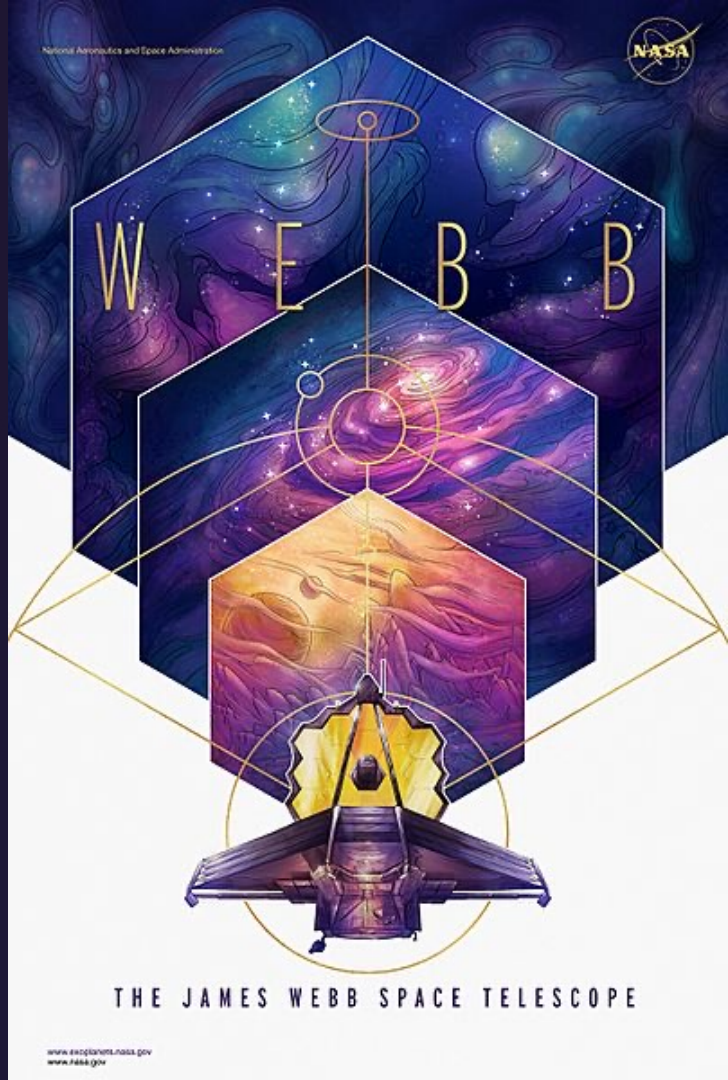


Compare These Mirrors



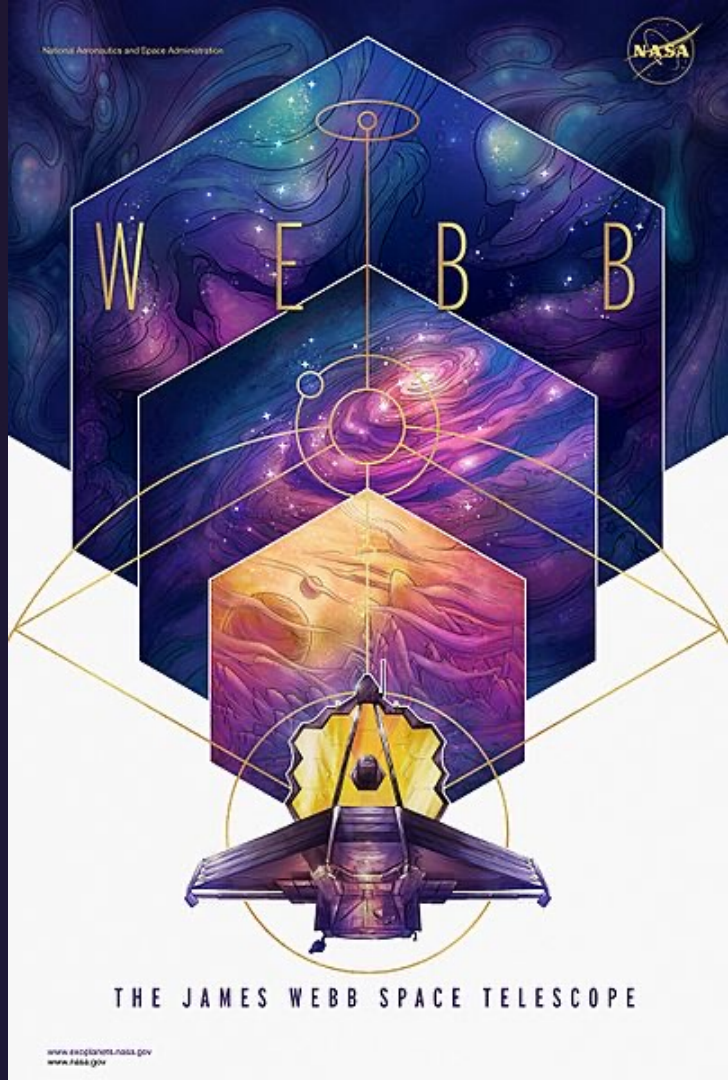
What is the James Webb Telescope?

- It will have a main mirror that is 6.5 metres (21 feet) wide.
- It is so large it is made in 18 pieces that fold together during the launch, so that it can fit into a rocket.
- It will be able to see things that the Hubble Space Telescope cannot.



What is the James Webb Telescope?

- Webb will help us understand how galaxies grow over billions of years into big spirals, like our own Milky Way,
- It will search for signs of life on distant planets
- And it will look into the hearts of dusty star nurseries!



Mirror Sections

What shape is this mirror?

What do you think it's made from? Why?



This video shows how each segment is prepared

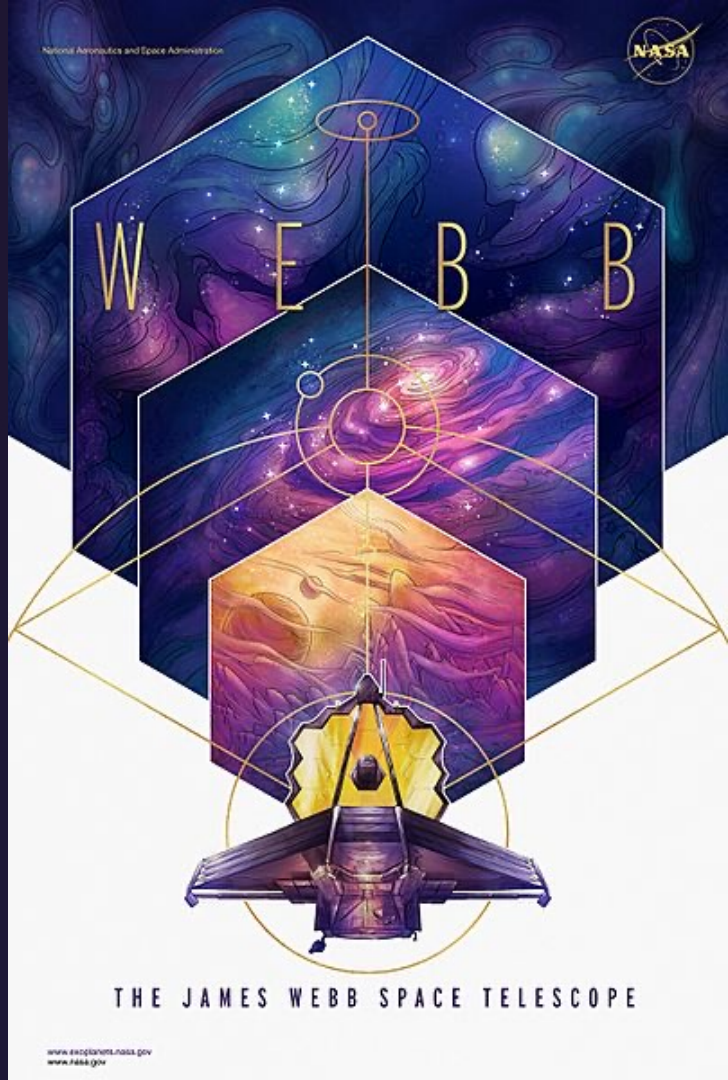
Mirror Sections

The mirror is made up of 18 hexagons because this makes the mirror really big without being too heavy. It also means they can fold the mirror up to fit inside the rocket to be launched into space.



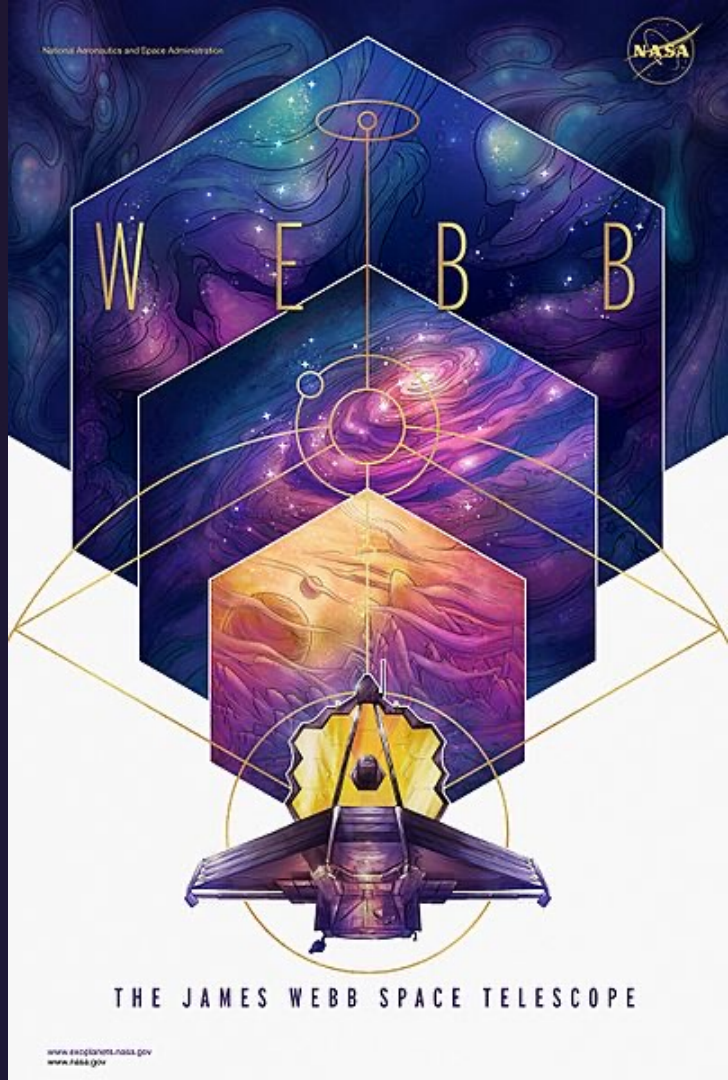
Today you will make ‘catchers’ to catch some balls

What do you think the mirrors on the Webb Telescope are catching?



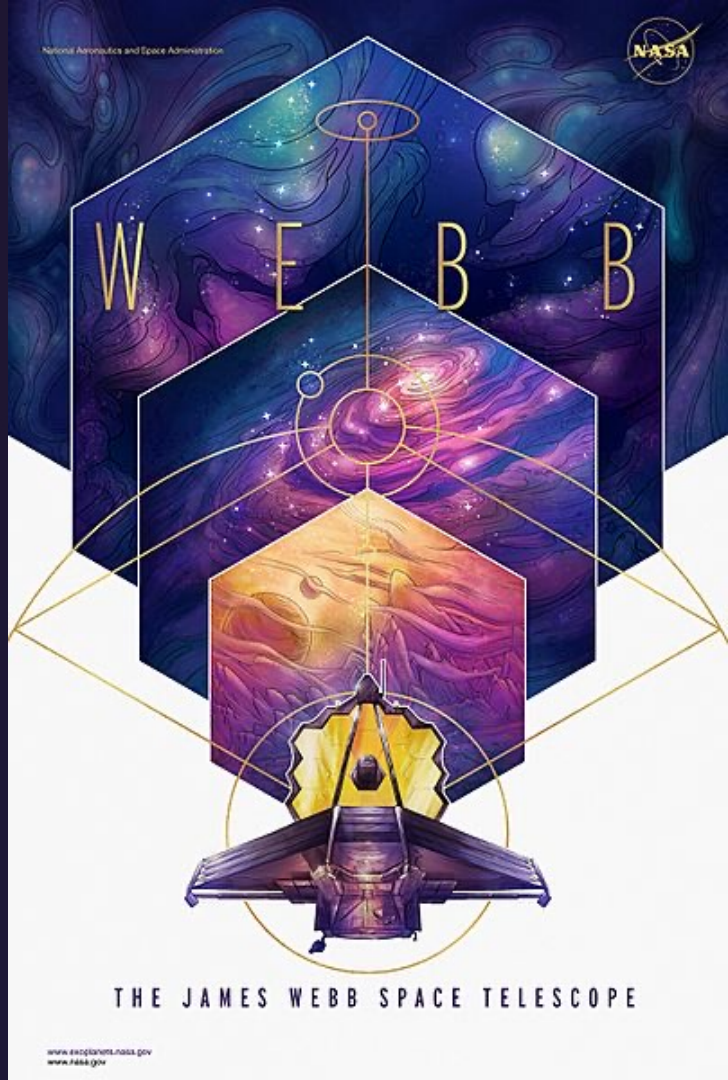
Today you will make ‘catchers’ to catch some balls

What shape would make a good catcher?



Today you will make ‘catchers’ to catch some balls

How will you work together to make sure you test your catchers fairly?



It is cold in space!



How cold do you think it might be in space?

It is cold in space!



It is -270 degrees in space. On earth, the coldest it has ever been is -67 degrees. Your freezer at home is -18 degrees.

What would a creature look like if it lived on the mirrors of the Webb Telescope?



We can look at some creatures on Earth to give us some inspiration because animals grow and adapt so that they can survive in cold places.





These hardy flightless birds spend the mating season in Antarctica, where temperatures routinely drop to -40. The colony survives such life-threatening cold by gathering together in a huge group to share warmth and minimize individual exposure to the elements. At regular intervals, the penguins at the outer fringes of the huddle are brought into the middle so every member is given the opportunity to warm up.



When temperatures grow chilly, the wood frog adapts by letting itself freeze, remaining in this unique form of suspended animation until the spring thaw. It can survive being frozen by accumulating sugar in its tissues (muscles and skin).



With it’s stunning white winter coat the Arctic fox is extremely well equipped to handle freezing conditions.
It’s thick coat provides insulation and their black noses absorb warmth from the sun.
The hair on the pads of their feet stops them from slipping on the ice.
They can curl their thick bushy tails around their nose and face to keep them warm.