

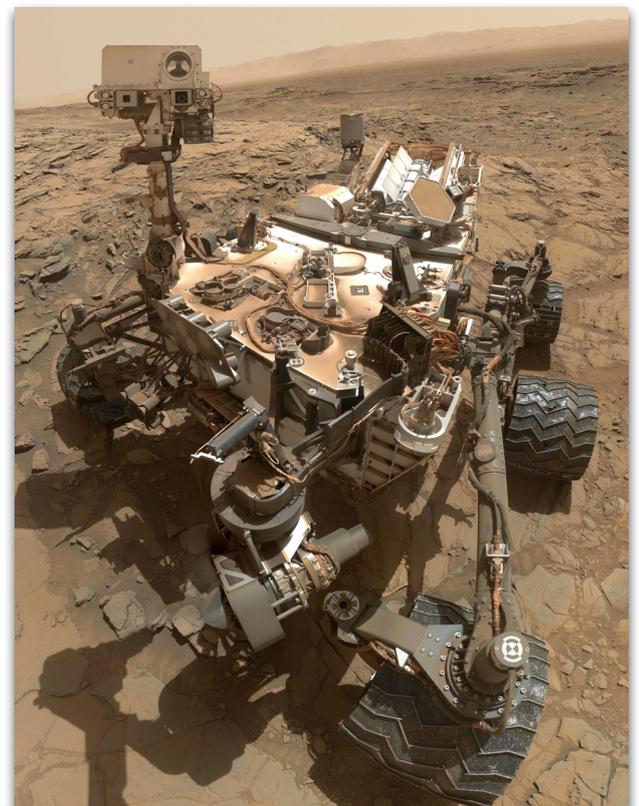
Curiosity Rover

What is it?

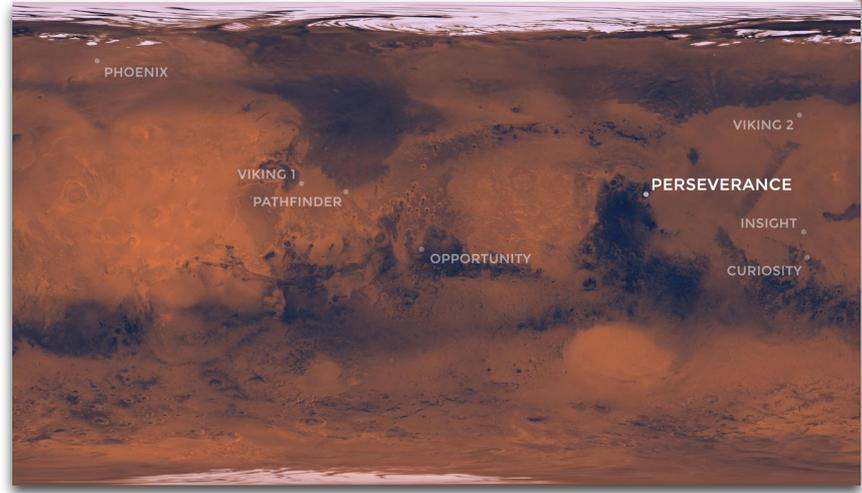
Curiosity is a robot about the size of a car that can drive around on the surface of Mars. Because it can move around, we call it a rover. It was launched on top of a rocket towards Mars on the 26th November 2011. It took 9 months to reach it's final destination!

Curiosity is covered in scientific equipment for taking measurements and samples, including a laser to vaporise rocks, 17 cameras, an x-ray diffraction instrument to see what those rocks are made of and a drill to get to rock underneath the Martian surface. The rover won't ever return to the Earth, so it sends its results back to the Earth as a signal we can detect.

Its huge robotic arm is used to collect samples and doubles up as a selfie stick! Curiosity still takes lots of selfies and you can find some of them [here](#).



A selfie taken by Curiosity in 2015



This map of the surface of Mars shows the landing sites of NASA's Mars landings, including Curiosity on the right

Where is it?

After a 560million km journey, Curiosity landed inside Gale Crater on Mars on the 6th of August 2012. Gale Crater is 154km across and has a mountain within it, called Mount Sharp, which rises 5.5km above the bottom of the crater.

Scientists think Gale Crater used to be an ancient Lake filled with liquid water, an essential component of life as we know it!

It hasn't just sat still for 10 years though; Curiosity has been travelling across the Gale crater, stopping to take samples on its way. It's only travelled about 27km since it landed in 2012!

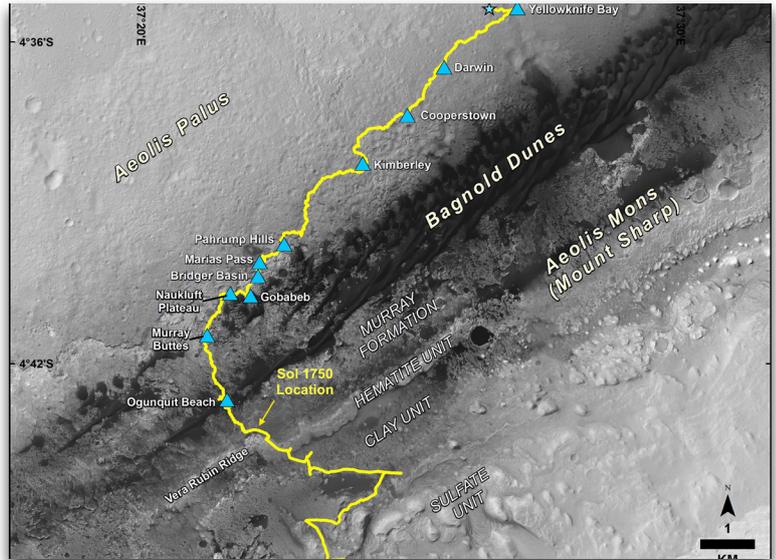
It moves very slowly to protect the instruments it's got on board and disturb as little of the surface as possible!



What is it doing?

Curiosity is surveying Gale Crater on Mars. It's taking samples from the rock, soil and air, analysing them and then sending the results back to Earth.

It's looking for any signs that life might have existed on Mars. It's looking for evidence that there used to be any liquid water on Mars (the **average temperature** now is around -60°C!), or any evidence of organic materials (organic means involving living things and usually means compounds that contain Carbon, which life on Earth is based on)



The yellow line shows Curiosity's route from landing between 2012-2017. The Blue star is where it landed, and the blue triangles are sites where it stopped to collect data

What have we learned from it?

From the samples taken inside Gale Crater, scientists now think that the crater was formed by a meteor impact and then over time was filled and emptied with water, leaving layers of sediment. It found evidence of **liquid water** existing for over a million years!

The chemistry of ancient Mars could have supported microbes! The soil contains carbon, sulphur, nitrogen, phosphorus and oxygen, which are necessary for life as we know it.

Martian rocks contain organic carbon, which is one of the key building blocks for life! Though this doesn't definitely mean there is or was life on Mars, it shows that the ingredients for life were there.



An image of Gale Crater created using data from three Mars orbiters.

Methane was detected in Mars' atmosphere, and methane can be made by living organisms, or by rocks reacting with water.

Mars used to have a thicker atmosphere and **a lot more water**. This atmosphere was lost to space over time and can give us clues about what Mars used to look like.

Lastly, and very importantly for future human missions there, Mars has high levels of radiation that would put astronauts at risk if they weren't properly shielded. This information will help NASA to design radiation protections for any future human explorers!