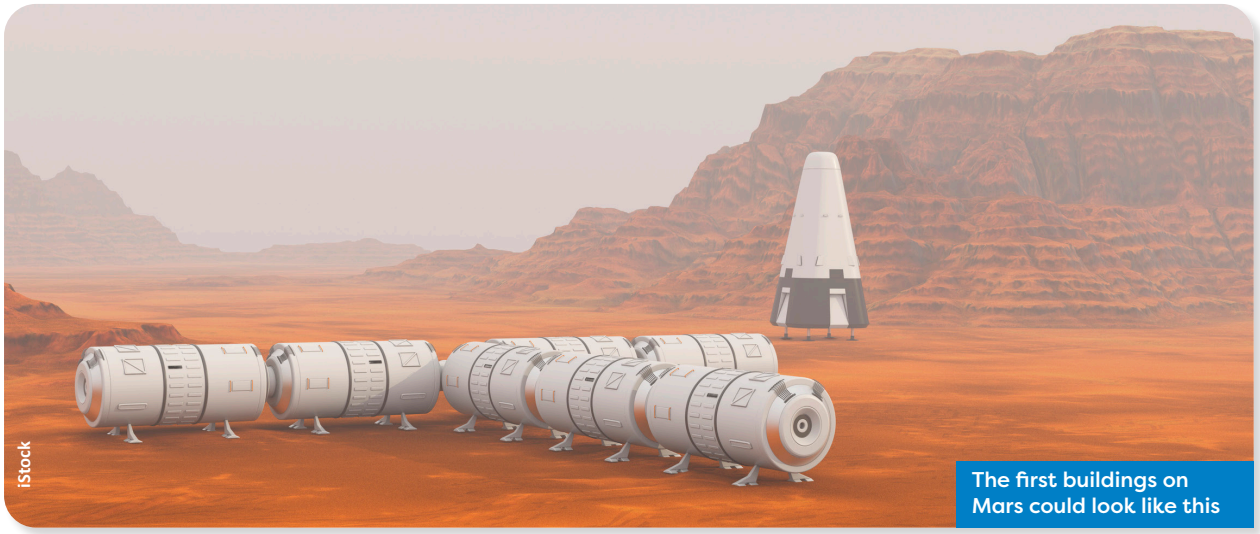
SHOULD HUMANS SET UP HOME ON MARS?



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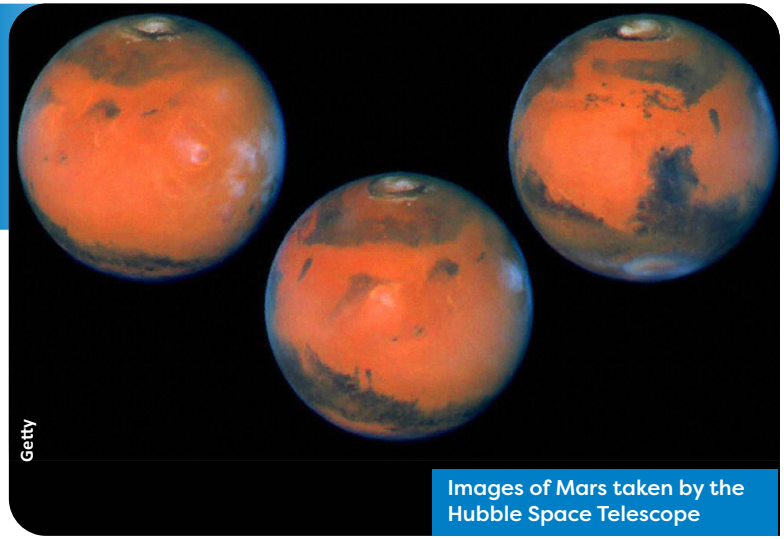
The first buildings on Mars could look like this



Getty

Images of Mars taken by the Hubble Space Telescope

THE DILEMMA

With the COVID-19 pandemic dominating the news headlines, a story from beyond Earth caught our attention. While millions of people around the world are forced to work from home during their countries' lockdowns, most people aren't piloting a robot on the surface of Mars from their living room. But that's exactly what workers at NASA's Jet Propulsion Laboratory are doing.

They're controlling the Curiosity rover as it wanders the Red Planet, picking up vital data for scientists on Earth to examine. From the comfort of their own homes, NASA scientists commanded Curiosity to drill into a rock sample.

Curiosity's findings will be used to help plan the first ever human mission to Mars, which NASA thinks will take place in the 2030s. Working alongside American companies and other countries, NASA wants to establish a permanent human base on the Moon, which will provide an opportunity to test new tools and equipment that could be used on Mars, including human habitats and life support systems.

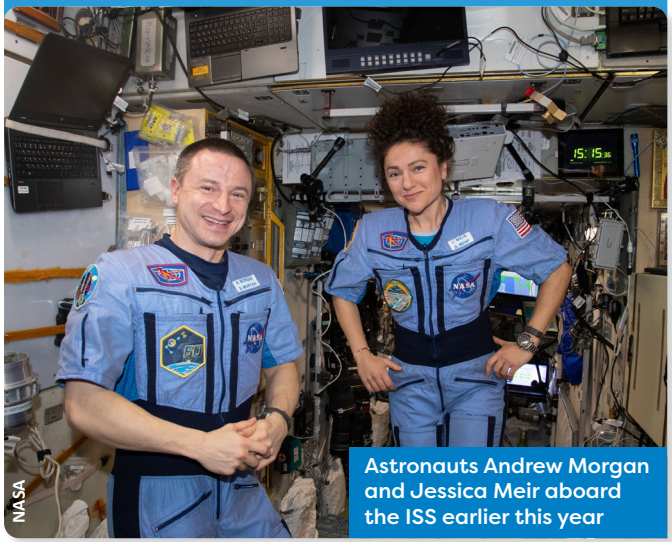
It isn't just the Americans who want to go to Mars in the next 20 years or so. The European Space Agency (ESA) thinks that humans could visit Mars by the 2030s too. If humans do decide to set up a permanent home on the Red Planet, your generation will likely be the first people to go there.

It would be an extraordinary achievement for humans to live on another planet for the first time ever. With problems of overcrowding, food shortages, increasing air pollution, a climate crisis and the worst global pandemic in 100 years, is it time we considered setting up a new, sustainable, safe home on Mars?

Or should we steer clear of 'invading' another planet? Might we do more harm than good, bringing pollution, litter and human diseases to another world? And will the whole project be far too expensive, with the money being better spent on solving problems here on Earth, such as the COVID-19 pandemic, poverty and hunger?

DID YOU KNOW?

Research for a human trip to Mars has been going on for years on the International Space Station (ISS). The scientists on the ISS are helping develop many of the technologies and communications systems needed for long-range missions into space.



NASA

Astronauts Andrew Morgan and Jessica Meir aboard the ISS earlier this year

OPINION

"Engineers and scientists around the country are working hard to develop the technologies astronauts will use to one day live and work on Mars, and safely return home from the next giant leap for humanity."

– NASA statement

FACTS & FIGURES

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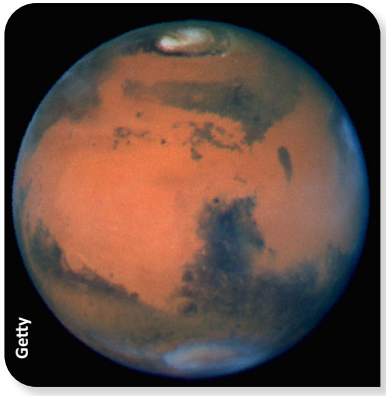
The solar system

Mars is the 4th planet from the sun, and the 2nd closest to Earth (Venus is the closest).

One Mars year is equivalent to **687 Earth days**. This is because Mars is further from the sun, so it takes longer to orbit around it than Earth does.

It took NASA's Mars Curiosity rover **8.5 months** to reach Mars.

The journey to transport humans to Mars will take somewhere between **six and nine months**.



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The distance between Earth and Mars changes constantly as both planets are revolving around the sun.

The average distance between Earth and Mars is **225 million kilometres**.

Getty

The Martian landscape as photographed by the Viking 1 Lander in 1976, the day after it landed

Robotic explorers have been studying Mars for more than **40 years**.

7.8 billion people are currently alive on Earth.

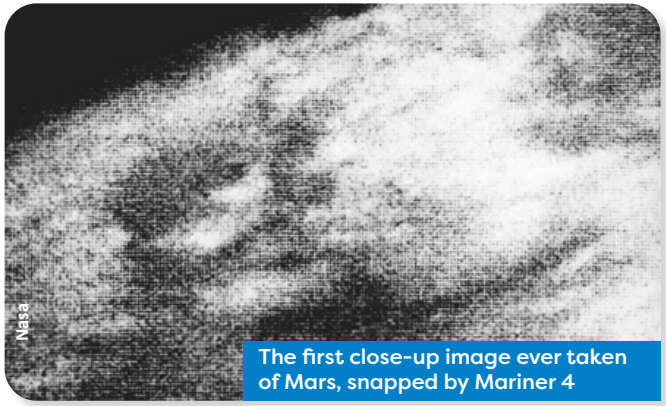
820 million people on Earth do not have enough to eat – a number that is increasing every year.

MAN & MARS: A TIMELINE

1960 – The Soviet Union attempts to send two spacecraft, Marsnik 1 and Marsnik 2, to fly by Mars. Both missions fail at launch.

1962 – Two Soviet flyby missions fail.

1964 – NASA's first attempt to fly past Mars fails.



Nasa

The first close-up image ever taken of Mars, snapped by Mariner 4

1965 – NASA's Mariner 4 flies past Mars and sends back 21 photos to Earth. Mariners 6 and 7 in 1969 also send back pictures.

1971 – The Soviet Union's Mars 3 craft lands on the planet, but fails after a few minutes.

Getty

A photo of Mars taken during the Viking mission

1976 – On 20 July, the first Mars rover, NASA's Viking 1, lands on the Red Planet. Viking 1 and Viking 2 landers provide the first proper exploration of Mars, spending years on the Red Planet and sending back detailed information to Earth.

NASA

Phobos, one of the Martian moons

1988 – The Soviet Union launches two missions to reach one of the two moons of Mars: both missions fail.

1997 – The Mars Global Surveyor arrives on the Red Planet and maps the whole planet from pole to pole. It reveals ancient evidence of water having existed on Mars.

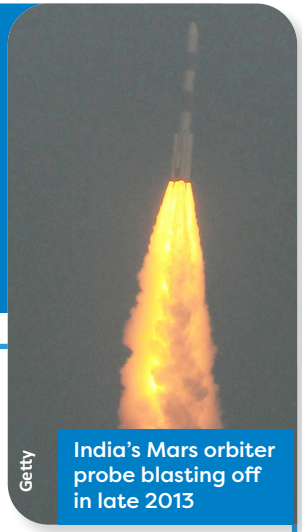
2001 – Mars Odyssey launches in March and arrives in October. It has returned more than 300,000 images of the Red Planet to Earth.

An illustration of the Opportunity rover

2004 – Two more NASA rovers, Spirit and Opportunity, make it to Mars. Opportunity continues to send back data to this day.

2012 – NASA's Curiosity rover arrives, and goes on to make some important discoveries: it finds areas that were once filled with water and traces of methane on the planet's surface.

2014 – India enters the 'Mars race' by successfully putting a craft into the Red Planet's orbit. Several pictures are sent back to Earth.



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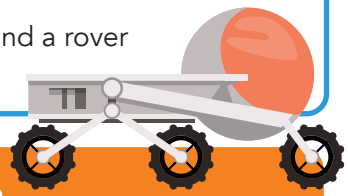
India's Mars orbiter probe blasting off in late 2013

2020 – NASA's new Mars Perseverance rover is scheduled to leave Earth in July.

Around the same time, the European Space Agency's Rosalind Franklin robot is scheduled to leave for Mars. It was built in the UK.

China also intends to send a rover to Mars this summer.



2021 – Perseverance is due to land on the Red Planet.

CURIOSITY

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The Curiosity rover

Eight years ago, NASA launched its latest Mars rover, called Curiosity. This robot, about the size of a small car, has been on the Red Planet since August 2012. It is sending back very detailed photos and data from Mars, helping scientists understand the planet's climate and rocks, the history of water there and overall conditions on the planet.

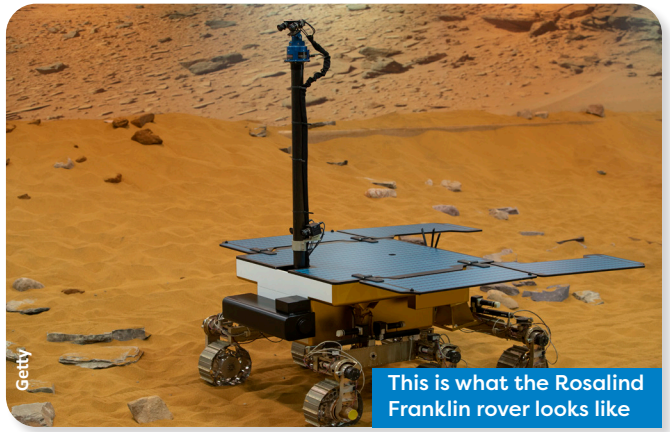
PERSEVERANCE

NASA's new 2020 rover will look for signs of ancient microbe life on Mars. It will do this by drilling for rock and soil samples, placing these in metal capsules, sealing them and leaving them at various sites on the planet's surface. In the future, these tubes could be collected and returned to Earth to be studied with laboratory equipment that is too large to take to Mars. The design of the Mars 2020 rover is similar to Curiosity, but it has higher-resolution colour cameras, an extra computer "brain" for processing images and making maps and better navigation software.

The new 2020 rover with its capsules alongside it

ROSALIND FRANKLIN

Named after a British scientist, the ESA's Rosalind Franklin rover is due to leave Earth for Mars this summer. It will drill two metres below the Martian surface, where scientists think there may be evidence of past and maybe present life on Mars. This drill will be able to go deeper than the Mars 2020 Perseverance rover. However, there have been



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This is what the Rosalind Franklin rover looks like

some technical problems recently, and the ESA project manager says: "it is going to be very tight getting the probe ready. I think we have only a 50-50 chance that we will be able to go ahead as scheduled."

WHY GO TO MARS?

What business have we exploring Mars? Some people say that it is human nature to explore and discover. Just as hundreds of years ago people went out on ships to discover countries they never knew existed, today our imagination is fired by space and, in particular, our nearest rocky planet. When humans first went to the moon in 1969, it was an extraordinary achievement. But going to Mars, and setting up human colonies on the planet, would be one of humanity's greatest achievements ever.


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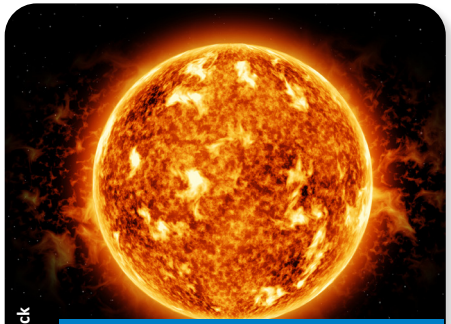
What a human colony on Mars might look like

Sending humans to another planet for the first time will probably lead to many scientific advancements and discoveries that could benefit all of us. For example, a mission to Mars would probably lead to big advancements in how we use renewable energy and in how we provide nutritious, cheap food without having access to fresh products (a journey to Mars means astronauts will have no access to fresh food for a very long time!) That technology, in turn, could help solve hunger on Earth.

CAN WE GET THERE?

It sounds like a great idea, but is moving people to Mars doomed to fail? These are some of the things that could cause serious problems to the first humans to arrive on Mars…

Radiation - During the long journey to Mars, astronauts will be exposed to several types of radiation that the Earth's atmosphere shields us from. This can damage a person's genes, leading to a risk of developing deadly diseases such as cancer.


iStock
Radiation from the sun could expose Mars travellers to danger

Low gravity – Gravity on Mars is just 40% of that on Earth. Our muscles and bones suffer in low-gravity environments, which could lead to serious health complications after long periods of time spent on the Red Planet. NASA says that: "without gravity working on your body, your bones lose minerals, with density dropping at over 1% per month. By comparison, the rate of bone loss for elderly men and women on Earth is from 1% to 1.5% per year."


Getty
Space food isn't so tasty

Food supplies – There's no soil or flowing water on Mars, so humans who colonise (set up home on) the planet would have to rely on freeze-dried food or insects brought from Earth, or lab-grown meat. That could quickly get very boring! It may be possible to build greenhouses in order to grow things, but that would take time. NASA says "a lack of fresh food and mean variety, or deficiency in nutrition" may well cause physical problems.


NASA
Life on Mars could be pretty lonely at first

Psychology – Being so far away from Earth, and being unable to communicate directly with friends and family back at home, may be extremely stressful for humans who go to live on Mars. It would be unlike anything any human has ever experienced before: this isn't like moving country, where a person is still surrounded by other humans, as well as animals, trees, plants and things you know and love like your favourite food or the seaside. For the early settlers, it may be very difficult to adjust to life on Mars.

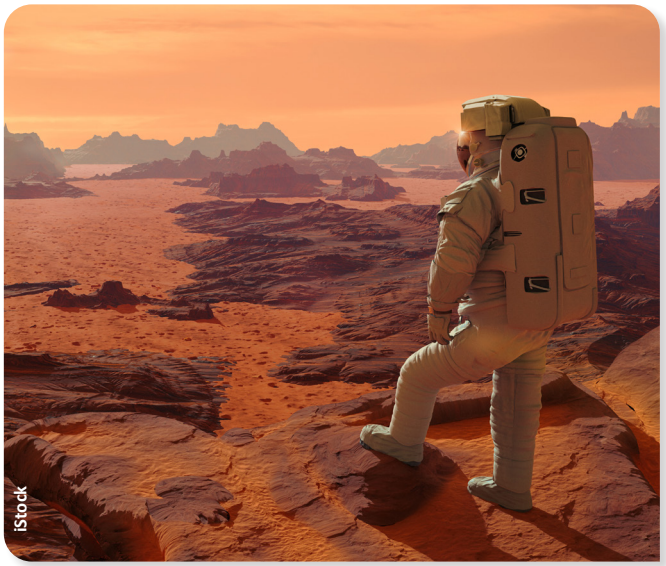
PROTECTING MARS

Climate change, polluted skies and filthy waters – everybody knows that humans have had a negative effect on Earth's environment. So, is it a good idea to set up a colony on Mars? Won't we end up damaging the Red Planet's environment, too?

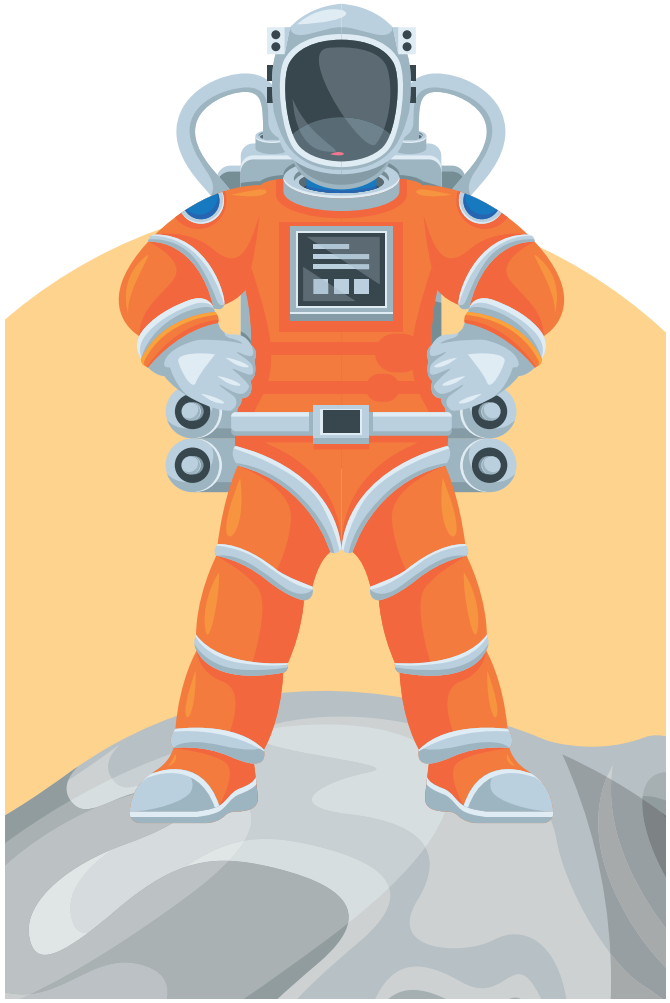
An image of Mars taken by NASA's Curiosity rover

You can't have hundreds or thousands of people in a place without affecting the environment there. We would probably need to build lakes and reservoirs, as well as housing, transport systems and ways of growing food. All of this could have a serious impact on the planet's environment.

A NEW HOPE?

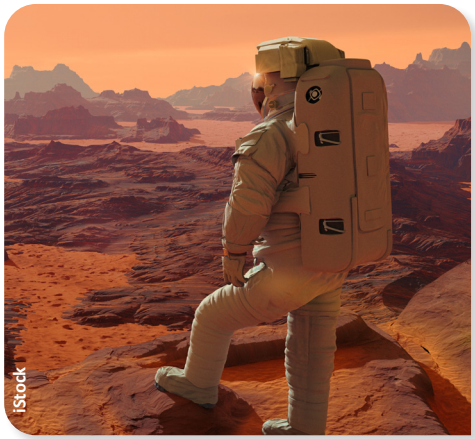


On the other hand, Mars offers us a great chance to start again, and right many of the wrongs on Earth. Perhaps we will have learned from our mistakes on Earth, and the first humans to live on Mars could take steps to protect the environment there. Maybe we will be able to grow meat and other food products in laboratories, rather than creating emissions through livestock. Vehicles could be powered without harmful petrol or diesel. Any artificial lakes, rivers or ponds could be kept clean. Your generation understands the climate crisis better than many grown-ups do, so if you're the first settlers on Mars, you'll want to make sure the mistakes from Earth aren't repeated on the Red Planet.



YES, HUMANS SHOULD SET UP HOME ON MARS

1. HUMANS ARE EXPLORERS



It is in our nature to explore and go on adventures. There is so much space we are unable to explore because it is so far away, but it makes perfect sense to send people to Mars and to make the Red Planet a 'home from home' for humans. We could one day use it as a base to launch further into space.

2. IT COULD HELP PEOPLE ON EARTH

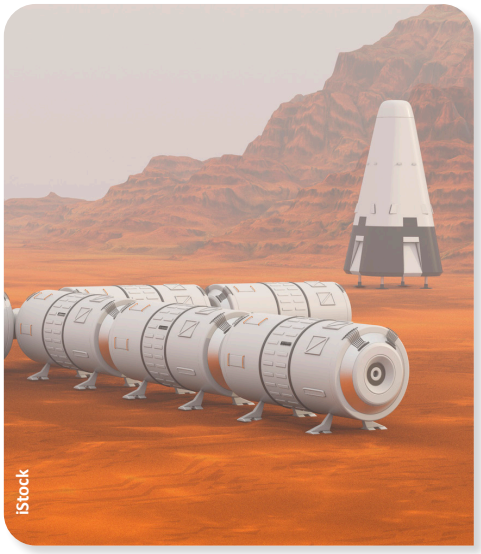
The science that will help send people to Mars can also help people on Earth. It could provide more environmentally friendly energy, and it could help us find clever ways of providing food for the hundreds of millions of people who are currently going hungry. Plus there could be discoveries made on the Martian surface that might help us make big advancements on Earth.

3. EARTH HAS PROBLEMS

There are several problems on Earth, such as the climate crisis, hunger and, right now, a terrible pandemic. While these are problems made worse by humans, Mars offers us a chance to start afresh, learn from our mistakes, and create a safer, more environmentally friendly, prosperous, equal world.

NO, HUMANS SHOULD NOT SET UP HOME ON MARS

1. IT'S NOT OUR PLANET TO COLONISE



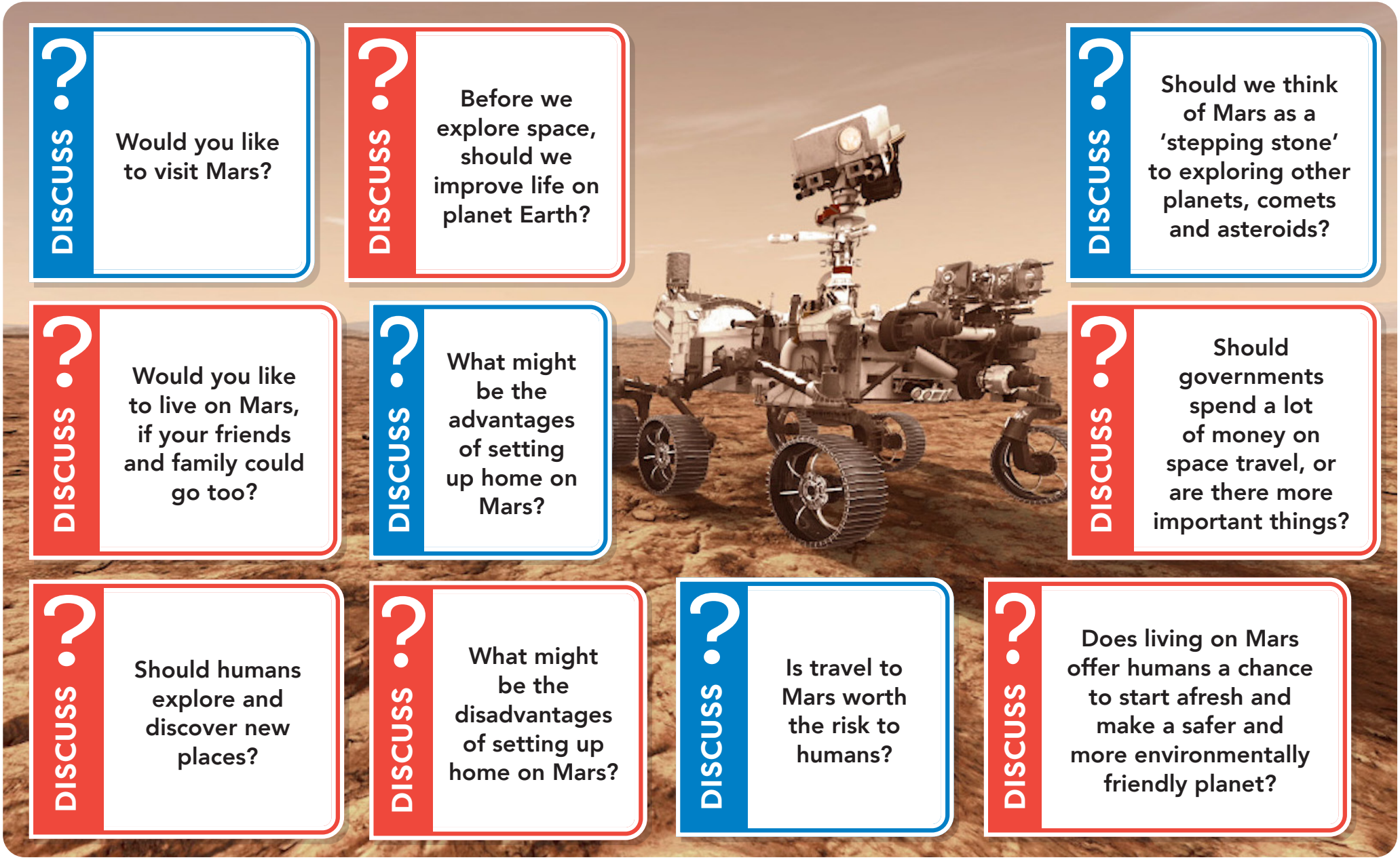
Our home planet is Earth and it really isn't our place to move into other planets in our Solar System. We might change the environment of the planet for the worse. A visit to Mars might be OK, but moving people to live there permanently is unnecessary and wrong.

2. THE EFFECTS ON HUMANS COULD BE AWFUL

A trip to Mars will take up to nine months, according to NASA. Once there, the humans will be very far away from their home planet and their loved ones. The low gravity will cause physical problems. The trip to Mars alone will be very risky. It's simply not worth risking lives like this.

3. WE SHOULD SPEND THE MONEY AT HOME

We have enough problems on Earth that need our scientists' attention and our governments' money, such as providing everybody with food, clean water and getting rid of diseases like COVID-19. Shouldn't we only think about colonising another planet when we have made our own safer and fairer for the billions of people living on it?



DISCUSS ? Would you like to visit Mars?

DISCUSS ? Before we explore space, should we improve life on planet Earth?

DISCUSS ? Should we think of Mars as a 'stepping stone' to exploring other planets, comets and asteroids?

DISCUSS ? Would you like to live on Mars, if your friends and family could go too?

DISCUSS ? What might be the advantages of setting up home on Mars?

DISCUSS ? Should governments spend a lot of money on space travel, or are there more important things?

DISCUSS ? Should humans explore and discover new places?

DISCUSS ? What might be the disadvantages of setting up home on Mars?

DISCUSS ? Is travel to Mars worth the risk to humans?

DISCUSS ? Does living on Mars offer humans a chance to start afresh and make a safer and more environmentally friendly planet?