# Who should go to Mars?

*Here’s what it takes to survive the mission*

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Elon Musk[laid out his plan to colonize Mars](http://www.theverge.com/2016/9/27/13058990/mars-mission-spaceship-announced-elon-musk-spacex) at a conference on Tuesday, but it was during the Q&A session that a woman asked one of the key questions: who will be chosen to embark on a risky trip to colonize a harsh planet?

“If normal people want to travel to Mars, do we need some specific requirements?” she asked. “Can normal people go?"

The SpaceX CEO had two answers to this line of questioning. "We're trying to make it such that anyone can go,” he said, with "maybe a few days of training.” However, the trip will be dangerous. “The risk of fatality will be really high. There’s no way around it,” he later said. "It would be basically, are you prepared to die? If that okay, then you’re a candidate for going."

But choosing a candidate for a mission to Mars might require a bit more than that, and sending “anyone” to space sounds like a recipe for disaster. Astronauts who go into low Earth orbit have to pass a strict vetting process. Living in space, in a confined environment under high-stress situations, takes both physical and mental tolls. So, we’re left wondering: how much training do you really need? What personality traits should these SpaceX-sponsored Mars colonists have? Should the crews be all-male or all-female? The Verge spoke to experts to try to fill in the holes in Musk’s plan and figure out who would be the perfect candidates for this mission.

**First off, is it true that “anyone with a few days of training” can undertake a trip through deep space?**

Let’s break this down. On a purely physical level, it’s true that you don’t need to be a world-class athlete to be selected. A reasonably fit person without health complications could be cleared, according to [Sheryl Bishop](https://nursing.utmb.edu/faculty-and-staff/faculty-biographies/sheryl-l-bishop.aspx), a researcher who has worked at the [Mars Desert Research Station](http://mdrs.marssociety.org/), which simulates life on Mars for scientific purposes.

SELECT PEOPLE WHO ARE EXCITED AND CAN LIVE WITH OTHERS WITHOUT GETTING INTO FIGHTS

NASA [requires astronaut hopefuls to pass a “space physical”](http://www.nasa.gov/audience/forstudents/postsecondary/features/F_Astronaut_Requirements.html)that is basically a [military physical](http://todaysmilitary.com/videos/meps-physical-exam). It also requires good vision, good blood pressure, and a certain height range. None of this is out of the realm of possibility for most people. NASA doesn’t require extraordinary strength or speed.

Physical fitness, however, is only one part of selection, and it’s arguably the easiest part. For NASA, you also need to have a technical degree (math, engineering, etc.) and at least three years of relevant work experience says Anne Roemer, the agency’s manager for astronaut selection. Technical skills and personality traits will limit who gets chosen, much more so than physical requirements. Since 1959, [only about 338 astronauts have been selected](http://astronauts.nasa.gov/default.htm).

[Barry Wilmore](http://www.jsc.nasa.gov/Bios/htmlbios/wilmore-be.pdf), for example, first applied to be an astronaut in 1992. He wasn’t chosen until 2000, despite having two master's degrees in technical fields and having worked as a Navy pilot. Wilmore says he was challenged by how rigorous and stressful the technical training was — training could have five major systems on the simulation shuttle failing all at once.

**What kind of personality traits are important? Will all Mars colonists have to be gung ho “adventurer” types?**

Not exactly. Of course, all candidates need to be cool under pressure. A lot of NASA astronauts come from the military, and have flying or combat experience. Wilmore, for example — who has spent 178 days in space, mostly on the ISS — flew in [Operation Desert Storm](http://www.ushistory.org/us/60a.asp) during the Gulf War, so it was clear that he could perform well under high-stress situations. “When you are flying, you gotta minimize being within your own mind,” says Wilmore. “You can get flustered and you gotta push that back and be able to clear-minded because your life and that of the crew hangs in the balance.”

Good astronauts have an adventurous spirit, but they also need to be disciplined and able to work well with others. Life on a space station, or a spaceship, can be boring. People live in a tiny confined space and need to figure out things like how to divide up the housework. When it comes to putting together a crew, a mix of technical skills is also important. You need doctors to keep everyone healthy, engineers that really understand how the ship works, and scientists who can conduct research experiments.

ALL-MEN GROUPS AREN’T A GOOD IDEA

This has changed since the early days of spaceflight. The first astronauts we had were stereotypical explorers, the kind of people who want to walk across glaciers and do fieldwork, Bishop says. But those first space trips were short, so it was okay to have “personalities that don’t play well with people over prolonged periods of time,” Bishop says.

Going to Mars, however, will take months, so it’ll be important to select people who are excited and can live with others without getting into fights.

**Do any past expeditions resemble what a trip to Mars would be like and what can we learn from them?**

Mars trips resemble expeditions to Antarctica. These explorers have the drive to survive a punishing environment, but can still collaborate with a few people in a remote area for a long time. They might make some of the best possible recruits for a mission to Mars.

Life in the South Pole, for example, can be highly regimented, says Lauren Wise, a laboratory specialist who investigates the contaminated areas of Antarctica. She gets up around 6:15AM every day. There are set meal times, she had to write on a board when she was leaving station limits, and pay very close attention to instructions.

Life can also be physically and mentally challenging, says Wise. She’s a small person and “sometimes walking in the stronger winds can be quite difficult,” she says. She misses activities back home (like yoga and swimming) and the lack of fresh fruit is a challenge. Sharing the small, remote research station with different types of people also requires her to be tolerant — and prepared for anything.

“The ever-changing conditions mean that sometimes what you have planned doesn’t always occur or happen in the way which you would like it to,” she says. “You also have to be able to think a little outside the box as you can’t just pop down to the hardware store or shop if you need something.”

**So, SpaceX wants to send 100 people on the first trip. What kind of group is ideal? All one gender? Coed?**

All-men groups aren’t a good idea. Women typically are more supportive than men in their interactions with other group members, and all-male groups can be more competitive, says [Namni Goel](http://www.med.upenn.edu/apps/faculty/index.php/g275/p8143819), a researcher at the University of Pennsylvania who has written about [sex and gender in space adaptation](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4235984/#B40). Other studies show that mixed-gender crews do better than all men because adding women to an all-male crew can [make men less territorial and rude](https://www.ncbi.nlm.nih.gov/pubmed/15267070).

There’s less research on all-female groups, and studies from space and other isolated and confined environments often use small sample sizes. It is also important to consider individual differences when thinking about group composition for space missions, adds Goel. According to Bishop, it’s possible that all-female groups aren’t as good as mixed-gender groups because women tend to focus very much on building interpersonal relationships, and having men around might make them focus more on the specific task at hand.

There should be a range of ages too because younger people tend to be more flexible in their thinking, while older ones have more experience and perspective, according to Bishop. Skillset diversity is also important, though large groups of more than 30 people tend to break off into small groups, she adds. This creates an “us and them” mentality — for example, “us scientists versus everyone else” or “us engineers versus everyone else.” Leaders will need to be wary of this situation and make sure people feel a strong sense of common purpose.

**What about the psychological challenges?**

Space is beautiful, but it is also lonely. When you’re stuck on a spaceship, you can’t just go visit friends and family. Wise, the scientist working in Antarctica, has some experience with homesickness. Her grandmother died while she was stationed, and that was a hard time for her, she says. But she could call her family at least once a week and keep in touch by email.

SPACEFLIGHT IS “FAR MORE THAN YOU CAN IMAGINE”

During a trip to Mars, communication with Earth would probably have a 20- to 40-minute delay. Not only does this mean no more immediate communication with mission control in emergency situations, weekly calls to loved ones are also out. The people who go will need to be extra resilient to loneliness.

There’s a lot we still don’t know in terms of the psychological challenges of a mission to Mars. On the International Space Station, for example, astronauts can gaze out the window and look at the Earth. On a trip to Mars, there’ll be a time when our planet will look like a tiny star. No one knows how people might react to that.

But flying in space can also be a positive experience, of course. Astronauts who have viewed the Earth from space have reported deep psychological changes, which is often called the “[overview](https://go.redirectingat.com/?id=66960X1514734&xs=1&url=https%3A%2F%2Fvimeo.com%2F55073825&referrer=theverge.com&sref=https%3A%2F%2Fwww.theverge.com%2F2016%2F9%2F30%2F13099134%2Fspace-x-elon-musk-mars-mission-colonists-personality-fitness-health-requirements)effect.” It’s been described as a sense of mental clarity and a feeling of a new kind of perspective and self-awareness. “Looking out at the Earth over the course of a year and seeing the impacts that our presence has on the environment, especially on some parts of Asia, you know makes me feel like there’s more that everyone can do, including myself, to make Earth a better place for the future inhabitants,” says [Scott Kelly, who spent 340 days on the ISS](http://www.theverge.com/2016/8/1/12322266/nasa-astronaut-scott-kelly-interview-deep-space-travel-psychological-effects)— the longest any American has lived in space.

Wilmore, another NASA astronaut, says that spaceflight is “far more than you can imagine.” Think about leaving the planet and circling the entire globe in 90 minutes: “You see how it changes and it’s just amazing,” he says. “There’s a weightless feeling — you feel like Superman because you can fly and move heavy objects. It’s truly thrilling.”