

1. Mark the parts that confuse you. Make a marginal note to explain how it confuses you. (**Bold, underlined** words in bold must be annotated.)
2. Use what context clues you can to make a guess about what confuses you.
3. Comment on the text by connecting to personal experience or previous knowledge.
4. Write a summary on the back.

## Why SpaceX's New Mission is the Gateway to Colonizing Mars

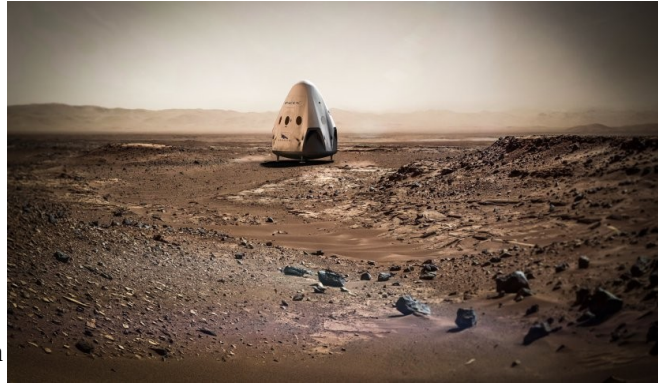
Fortune Magazine

Comprehension

Comments

SpaceX announced last Wednesday that it's planning to send a series of missions to Mars as soon as 2018, using a Falcon Heavy rocket and a landing craft called Red Dragon. Though details are still **scarce**, it's clear these missions will be much different than the way anything has been sent to Mars before.

The Falcon Heavy, still under development, is a larger version of the Falcon 9 rocket that last month hit the milestone of landing safely back on earth after launch. SpaceX has been using Falcon 9 re-entries to refine a



similar landing method in a Mars-like band of the Earth's atmosphere.

Those tests, along with surface tests, are aimed at letting the Red Dragon landing craft use rocket engines to land on the Mars surface, a process known as supersonic **retro-propulsion**. Though you've seen something like that a million times in science fiction movies, it's not remotely how previous Mars missions have worked.

As described in depth at the Verge, NASA's missions to Mars, particularly the landing of the Curiosity rover, involved a complex system of parachutes, heat shields, and a "sky crane," a kind of disposable hovering platform. NASA has continued working along those lines, recently testing a massive inflatable heat shield for atmospheric re-entry.

But even with enhancements, the gymnastic approach limits the payload that can be landed on Mars. The Curiosity Rover weighed slightly less than one ton. SpaceX engineers have written that retro-propulsion could land up to 28 tons of useful payload. The current Falcon 9 could already get about four tons of payload to Mars, and the version of Falcon Heavy currently being developed is specced at about 15 tons.

That heavier lift is crucial to the mission that has been Elon Musk's white whale<sup>1</sup> since before he got mixed up in that whole electric car thing: Colonizing Mars. The amount of equipment needed to get that process rolling has been estimated at between 40 and 80 tons, just a few trips on the Red Dragon.

Musk has said he will reveal more details about SpaceX's game plan for Mars in September, at the International Aeronautical Congress in Guadalajara, Mexico.

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1 This is a reference to Moby Dick, the great white whale of the novel by the same name. Captain Ahab became obsessed with the whale and hunted it even to the risk of his own crew. Someone's "white whale" then is someone's obsession.