

SAMPLING MARS

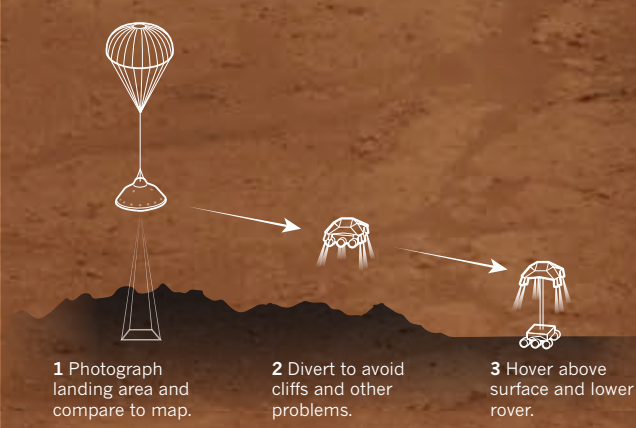
THE AUDACIOUS PLAN TO COLLECT RED-PLANET ROCKS.

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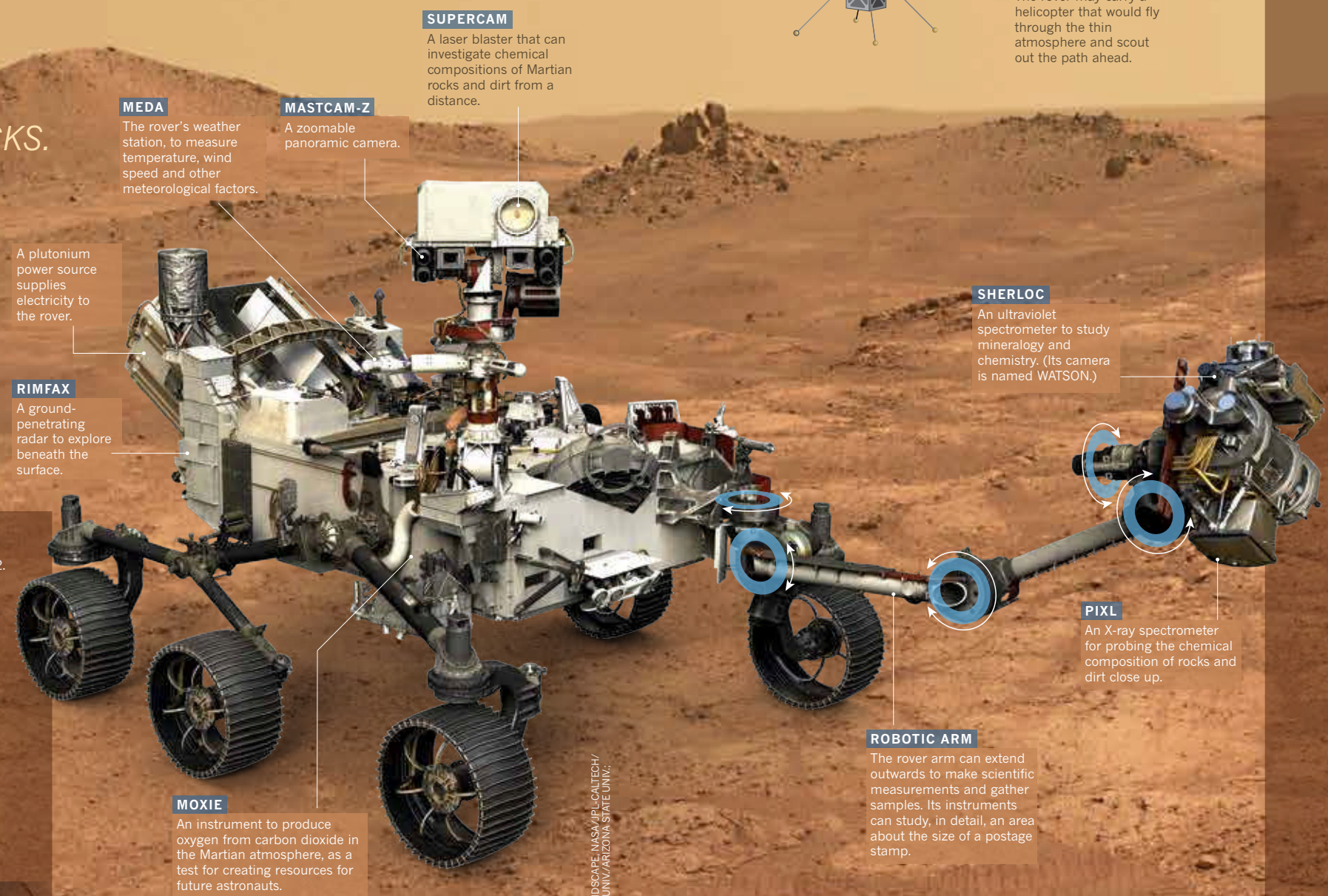
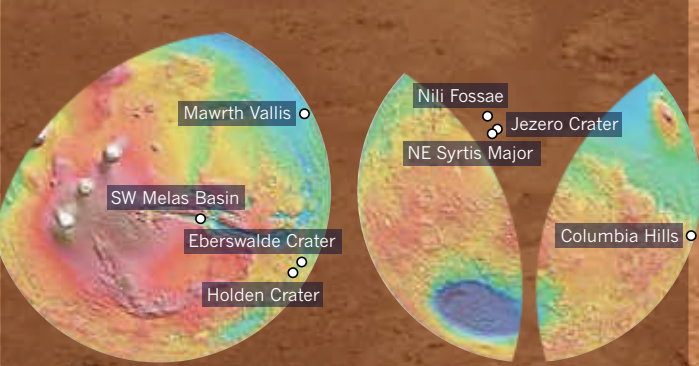
In 2020, NASA plans to send a rover to Mars to collect and store tubes of rock and dirt. If it succeeds, it will be the first step in bringing carefully documented Martian samples back to Earth for study. Engineers are now designing the robotic system to gather the samples — and they have to make it excruciatingly clean, so as not to contaminate any possible traces of Martian life.

LANDING

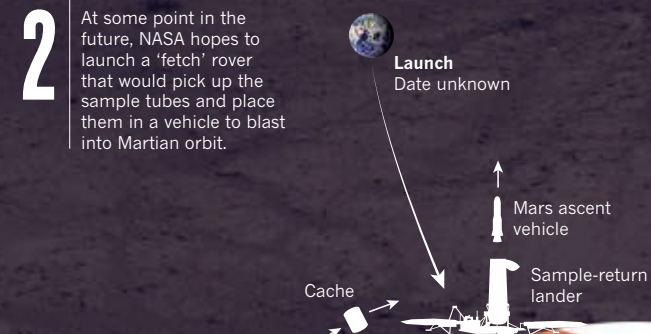
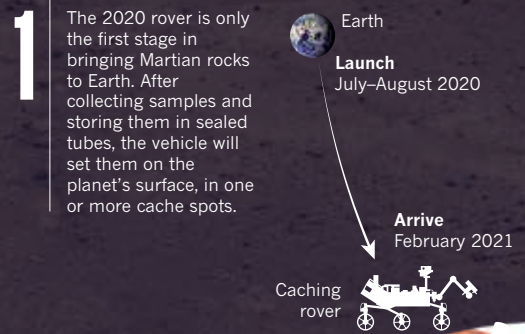
NEW LANDING TECHNIQUE
When it reaches Mars, the mission will use an updated version of the entry, descent and landing sequence used by the Curiosity probe in 2012. The new method, known as 'terrain relative navigation', allows the spacecraft to land closer to its area of interest because it can divert from dangerous situations in the last moments before landing, if necessary.



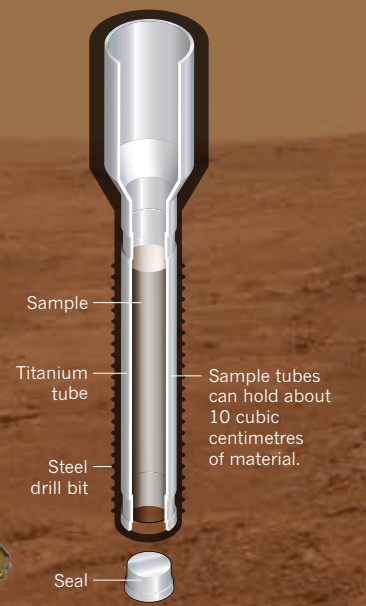
POTENTIAL LANDING SITES
Eight landing sites are being considered for the 2020 rover. Where it goes will dramatically shape the future of Mars science.



RECOVERY IN STEPS



SAMPLING AND CACHING



The sampling system will use steel drill bits, with teeth made of tungsten carbide, to drill into rocks. It can drill in a percussive mode, like a jackhammer, or in a rotary mode. Once collected, the 15-gram sample will slide into a 14-centimetre-long titanium tube and be hermetically sealed to keep it pristine. The robotic arm will then swing back to the rover's body and deposit the sample tube in a carousel.



43 sample tubes carried aboard the rover

37 filled with rock/dirt sample, or atmospheric contamination as a 'witness tube'

Witness tubes

6 spares