



MSL



Mars 2020

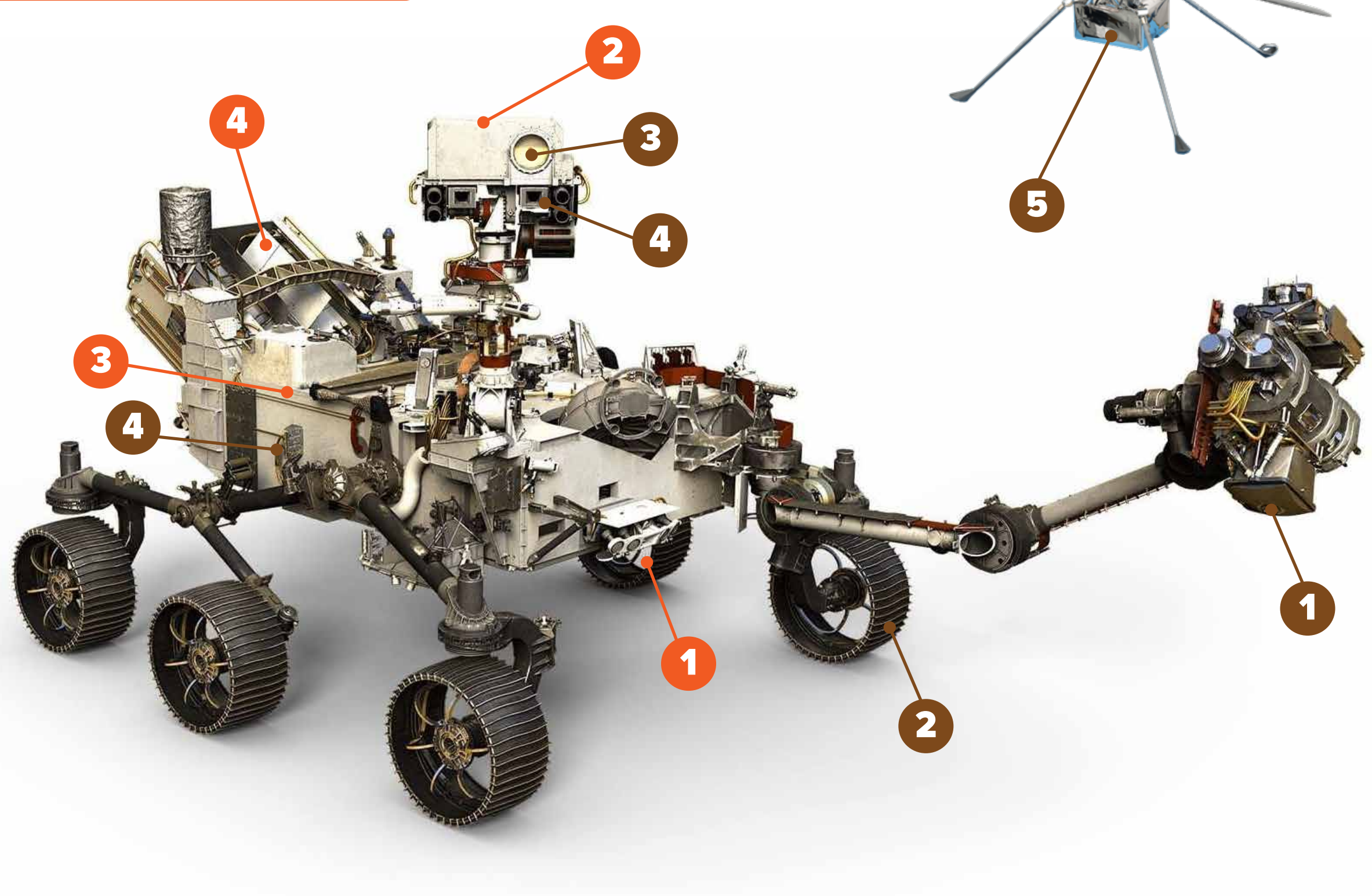
ENGINEERING OF MARS ROVERS

Perseverance

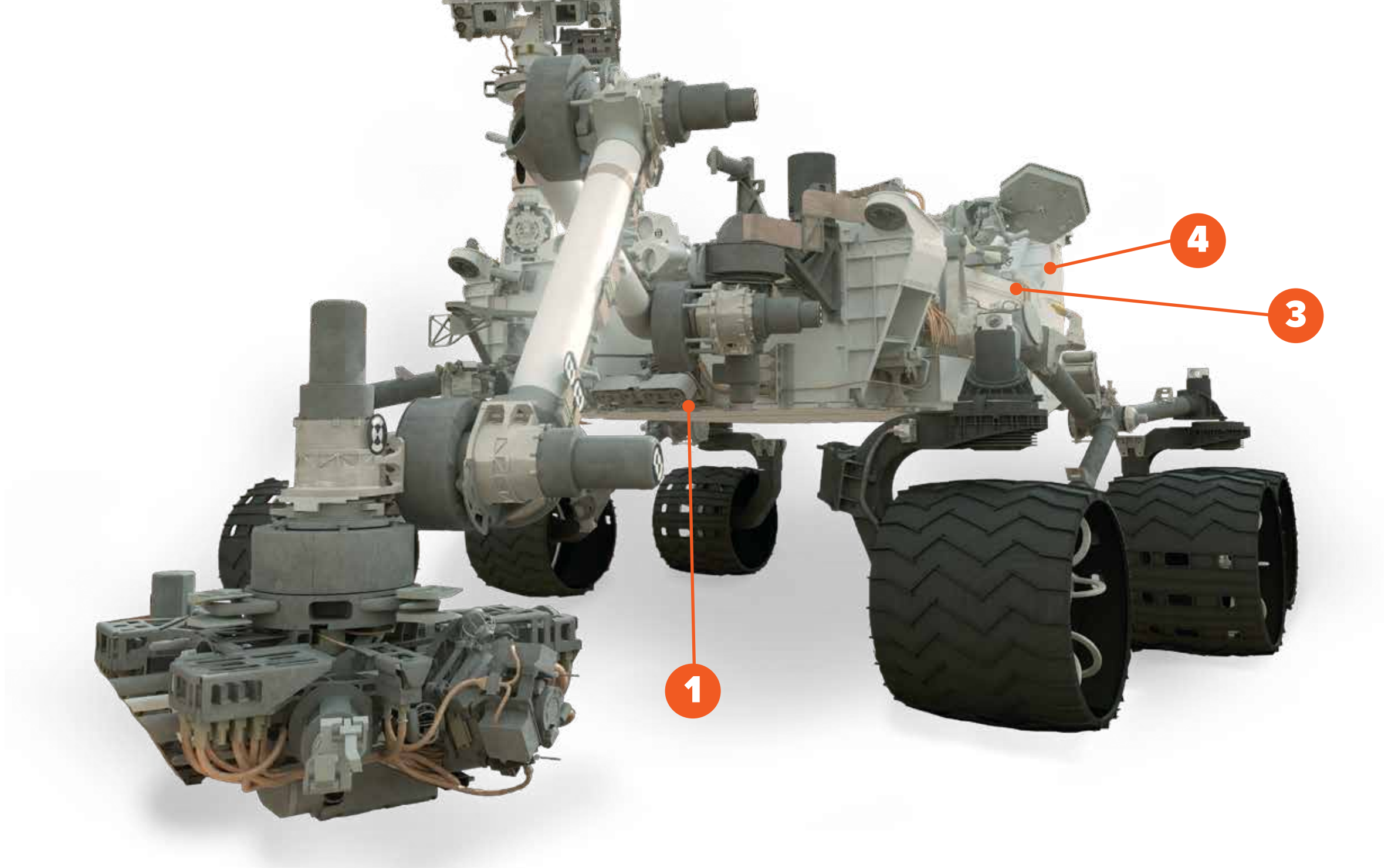
VS. Curiosity

In February 2021, the Perseverance rover joined its predecessor Curiosity on the Martian surface. Both rovers built by engineers and scientists at NASA's Jet Propulsion Laboratory, share many similarities in engineering features but play different roles in the ongoing exploration of Mars. While Curiosity studied samples collected onsite, Perseverance will collect rock core samples and save them for possible future study by scientists. Engineers at NASA applied the lessons learned from Curiosity, which has been on the Red Planet since August 2012, and made some significant design changes to Perseverance. Here are five ways the two rovers are similar and different in their features.

Perseverance



Curiosity

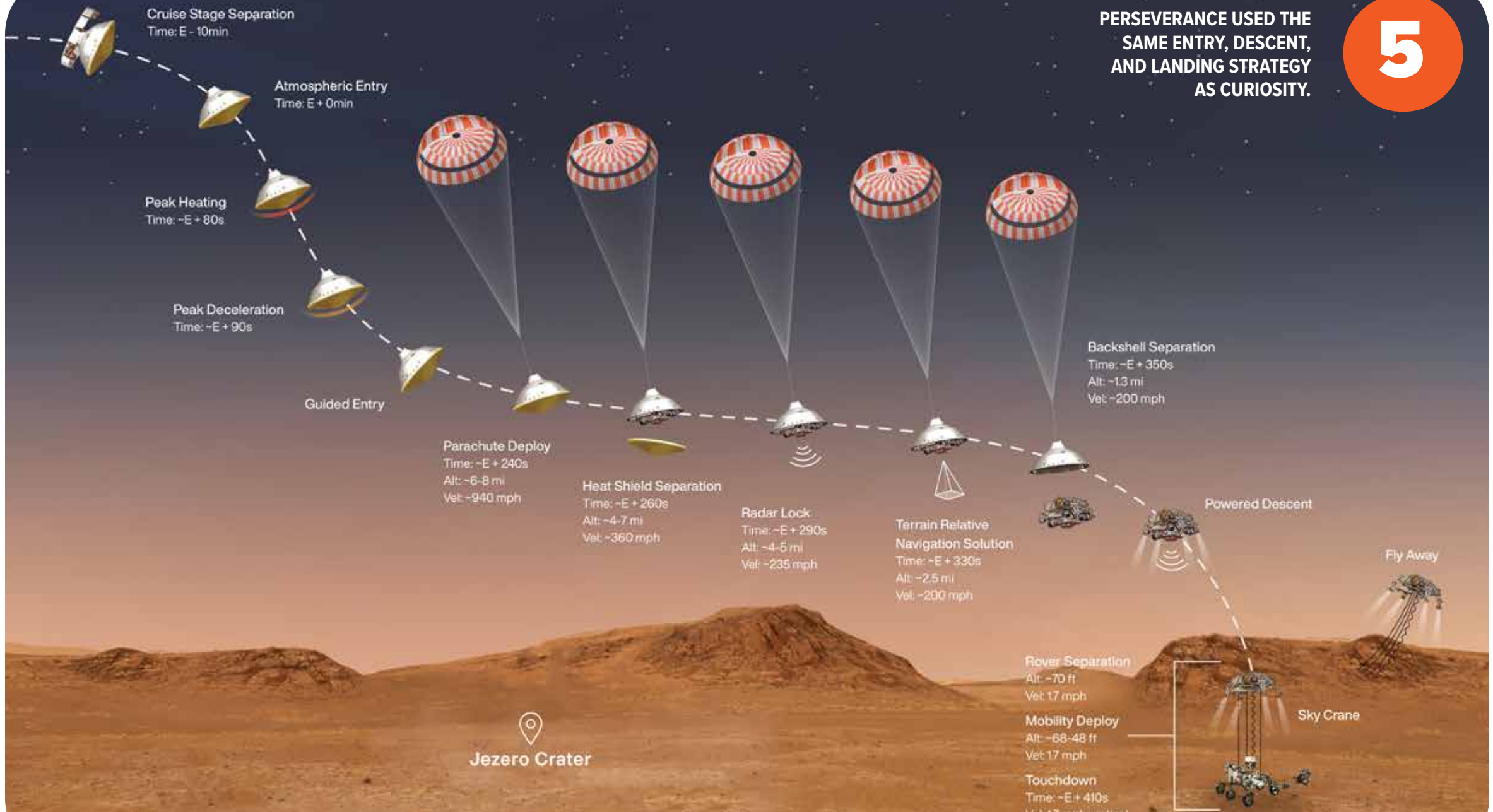


Five Similarities

- 1** The rovers are almost identical in design, both measuring roughly 10-foot long, 9-foot wide, and 7-foot tall.
- 2** A large mast houses the main cameras (SuperCam and MastCam-Z), along with the Mars Environmental Dynamics Analyzer (MEDA) on both rovers.
- 3** The rovers' computer, electronics, and batteries are housed inside the same "WEB" or Warm Electronics Box.
- 4** A Multi-Mission Radioisotope Thermoelectric Generator (MMRTG) powers both rovers with nuclear energy. The MMRTG converts the heat naturally produced by the radioactive decay of plutonium-238 to electricity.
- 5** Perseverance used the same entry, descent, and landing strategy as Curiosity. It was, however, equipped with an autopilot technology that guided the spacecraft through its difficult landing.

Five Differences

- 1** Perseverance accommodates a larger turret at the end of the robot arm. This turret has the coring drill and two science instruments, plus a color camera for close-up surface inspection.
- 2** Engineers redesigned the new rover's wheels to be more robust. Perseverance's wheels are narrower than Curiosity's, but bigger in diameter and made of thicker aluminum.
- 3** Perseverance carries onboard 23 cameras compared to Curiosity's 17. The new higher-resolution cameras offer much better picture quality and will capture full-color images.
- 4** The new rover, unlike its predecessor, has two microphones that will relay the sounds of the Red Planet back to Earth.
- 5** While Curiosity traveled alone, the Perseverance rover carries the Ingenuity Mars Helicopter for attempting the first ever flight in another planet's atmosphere.



Source: NASA <https://mars.nasa.gov/mars2020/>