NASA Says Goodbye to a Space Telescope Called Swift

After nearly 22 years studying powerful space explosions, Swift burned up in Earth's atmosphere this week.



A small satellite burns like a shooting star as it re-enters Earth's atmosphere above the planet's curved horizon.

NASA's Neil Gehrels Swift Observatory ended its mission this week after nearly 22 years in space. According to NASA's Astronomy Picture of the Day, the **satellite** re-entered Earth's **atmosphere** on November 4 at 7:39 EST over the North Sumatra region of Indonesia. Re-entry means a **spacecraft** comes back into the blanket of gases around Earth. Swift burned up like a shooting star, which is the bright streak people see when an object heats up while falling through the atmosphere.

Swift mattered because it helped scientists study some of the fastest and most energetic explosions in the universe. The observatory was not a **telescope** on a mountaintop. It was a satellite, meaning a human-made object sent to travel in a path around Earth. From there, it could observe kinds of light that are hard or impossible to study well from the ground.

Swift carried several instruments that worked together. One was an Ultraviolet/Optical Telescope, which studied visible light and ultraviolet light, a type of light with more **energy** than the light human eyes can see. Swift also had an X-ray telescope and a gamma-ray telescope. X-rays and gamma rays are high-energy forms of light. Doctors use X-rays for images of bones, but in space, X-rays and gamma rays can also come from extreme events.

NASA says Swift's instruments let people study these explosions in unprecedented detail. Unprecedented means something had not been done that well before. That is a reminder that science is not only about having a big question. It is also about building tools that can collect better **evidence** than earlier tools could.

The spacecraft's end came because its **orbit**, or path around Earth, had been getting lower. NASA says the most recent solar maximum sped up the decay of Swift's orbit. A solar maximum is a time when the Sun is especially active. That activity can affect the upper atmosphere around Earth, which can make low-orbiting satellites slow down and sink faster. NASA also says an innovative rescue mission tried to boost Swift into a higher orbit, but it did not succeed.

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That part of the story is important for engineering. A spacecraft can be designed well and still face limits. It can run into problems caused by the space environment, the Sun, fuel, distance, and time. Engineers often have to decide whether a rescue attempt is worth the risk and effort. In Swift's case, the attempt did not save the satellite, but it shows that space missions are not simply launched and forgotten.

NASA's picture for the day showed a mosaic made in 2018 from the first one million images taken by Swift's Ultraviolet/Optical Telescope. A mosaic is one large picture made from many smaller ones. That image is a visual reminder of how much information one mission can gather. Even though the satellite is gone, the data it collected remains. Scientists can keep studying that data, asking new questions, and comparing it with future observations.

For a middle school science class, Swift connects to topics that may already feel familiar: light, energy, **gravity**, the Sun, Earth's atmosphere, and how technology helps people observe what they cannot visit. It also shows how scientific knowledge can be cumulative, which means it builds over time. A satellite can stop working, but the evidence it gathered can continue helping people understand the universe.

Written from reporting by NASA.

THINK IT THROUGH

1. **When a space mission is near the end of its life, how should scientists and engineers decide whether to spend resources trying to save it?**

   A strong answer: A strong answer should weigh the value of the mission's data against cost, risk, safety, and the chance that a rescue will work.

2. **Swift is gone, but its data remains. In what ways can stored scientific data be as valuable as a working machine?**

   A strong answer: A strong answer should discuss how old data can be reanalyzed, compared with new observations, and used to answer questions people may not have asked yet.

3. **What does Swift's ending show about the relationship between Earth, the Sun, and human technology in space?**

   A strong answer: A strong answer should connect solar activity, Earth's atmosphere, satellite orbits, and the limits of engineering.

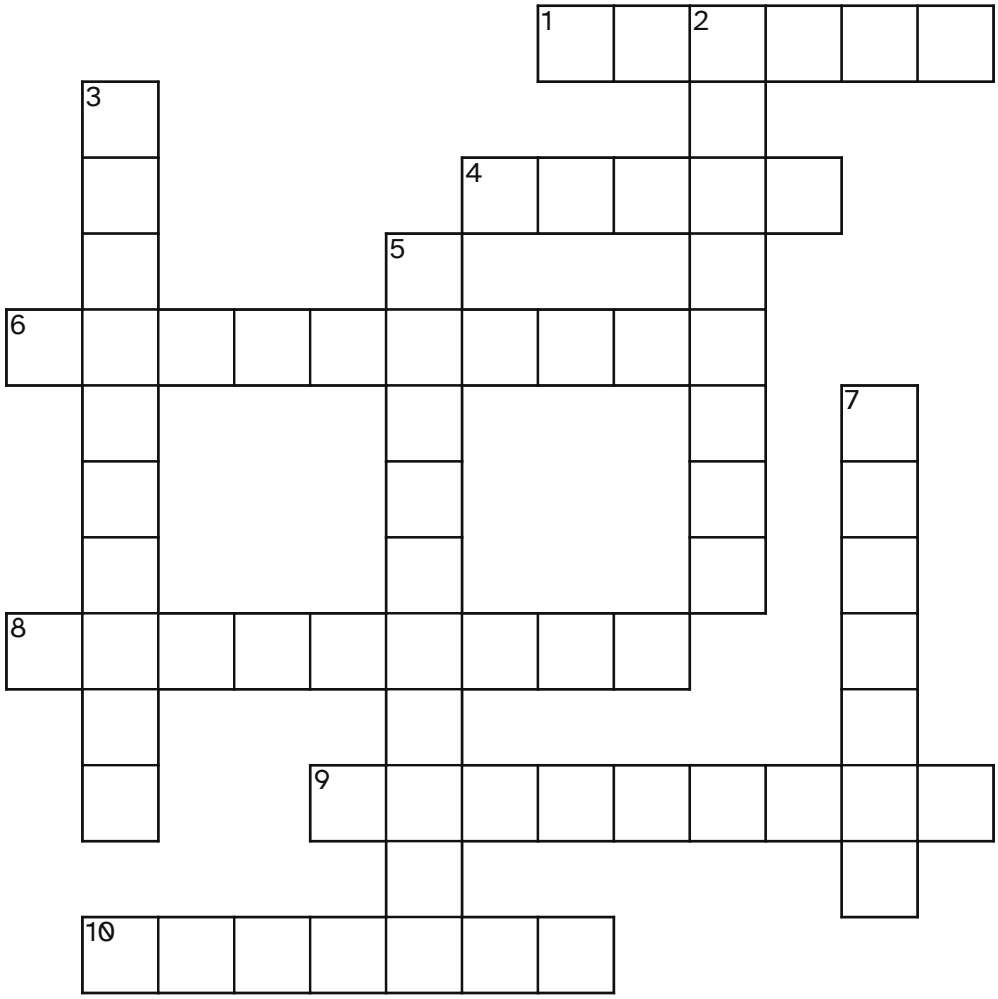
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ATMOSPHERE ENERGY EVIDENCE GRAVITY INSTRUMENT
ORBIT REENTRY SATELLITE SPACECRAFT TELESCOPE

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ACROSS

1 Ability to cause change or do work, including as light

4 Curved route followed around another object in space

6 Blanket of gases around a planet

8 Tool that collects light or signals from faraway objects

9 Human-made object circling a planet in space

10 Return from space into gases around Earth

DOWN

2 Facts or information that support an idea or answer a question

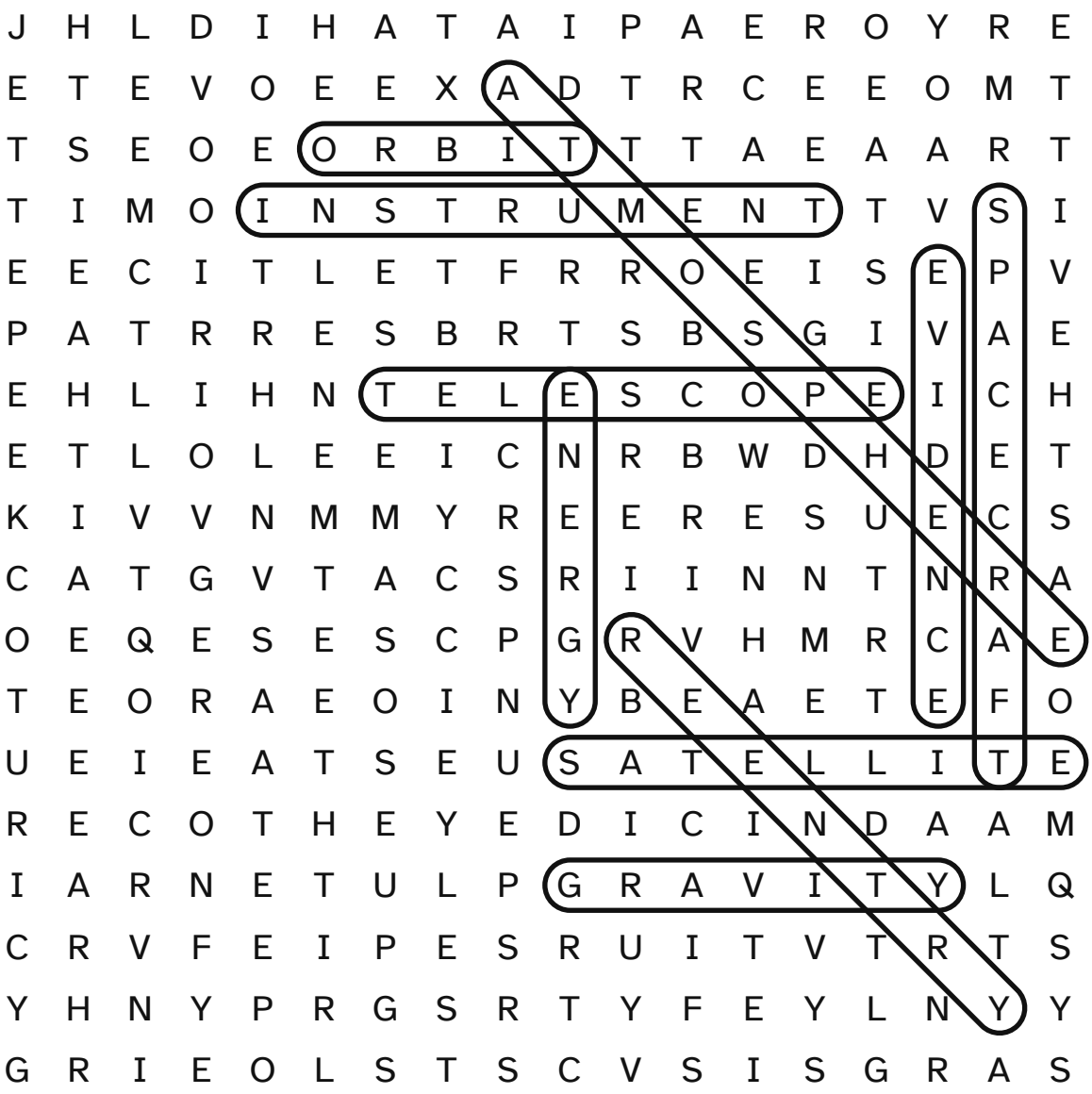
3 Specialized tool for measuring, detecting, or studying something

5 Vehicle built to travel beyond Earth's air layer

7 Force that pulls objects toward each other

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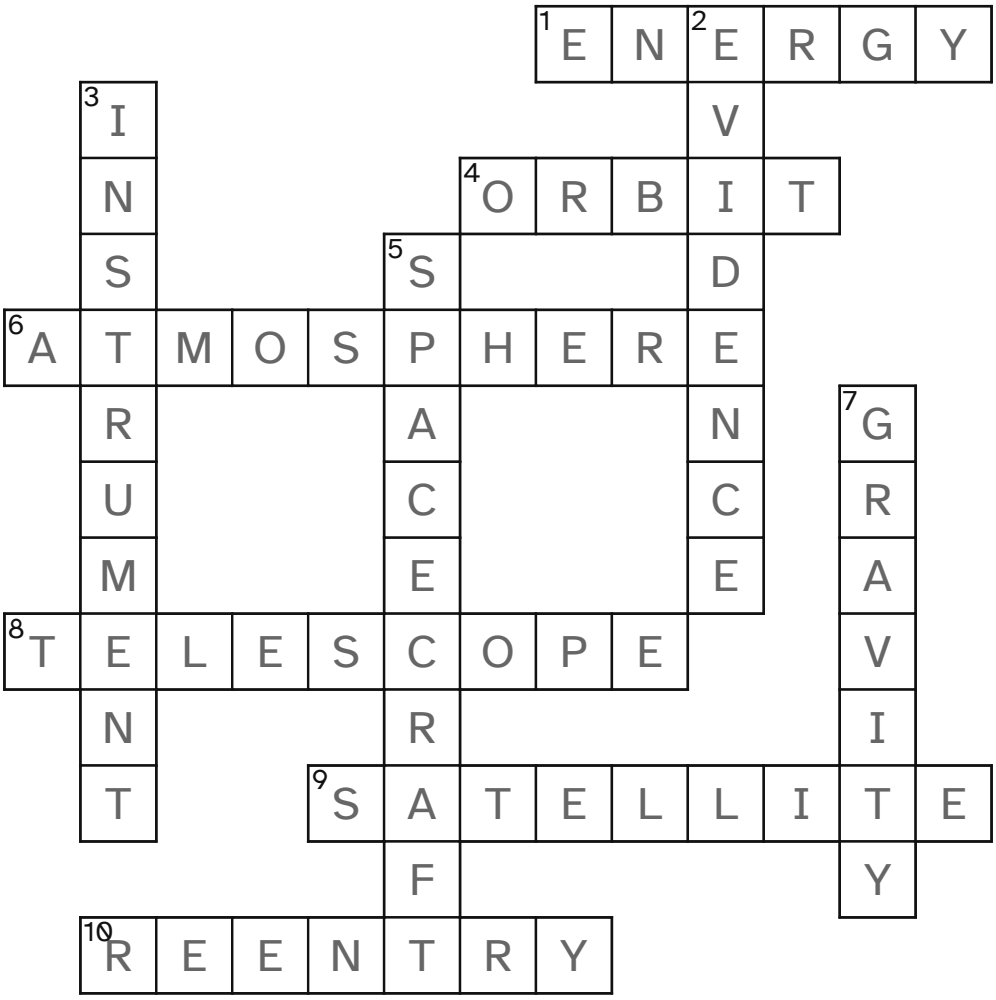
— answer key



ATMOSPHERE ENERGY EVIDENCE GRAVITY INSTRUMENT
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— answer key



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Where this came from

This article was written for 3andB from the reporting below. It is not a reprint — the wording is ours and the facts are theirs.

NASA

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