Name: _____ Date: _____

Why Is Pluto Not a Planet?

Reading level 11 (7th grade) · 1021 words

Why is Pluto not a planet? The short answer is that in 2006 astronomers wrote a rule, and Pluto did not pass it. The longer answer is stranger, and it starts with a farm boy in Kansas. Clyde Tombaugh grew up on farms there and built his own telescopes, grinding the lenses and mirrors himself. In June 1928 a hailstorm wrecked his family's crops, and with them his plans for college. So he kept looking at the sky instead, and he drew what he saw.

Tombaugh mailed his drawings of Jupiter and Mars to Lowell Observatory in Flagstaff, Arizona. The observatory offered him a job. He was twenty-three, and the task they gave him was enormous. Years earlier, the observatory's founder, Percival Lowell, had started a hunt for a ninth planet that he called Planet X. Lowell believed something big and unseen was tugging on the outer planets. Nobody had found it. Now the hunt belonged to a young man who had never been to college.

His method was patient and clever. He photographed the same patch of sky twice, a few nights apart. Then he put the two glass plates into a machine called a blink comparator, which flipped his view back and forth between them. Stars stay put. A planet moves, so it seems to jump from one spot to another. Tombaugh blinked through plate after plate, each one crowded with tiny dots, looking for the one that hopped. It was slow, squinting work, and it went on for nearly a year.

On February 18, 1930, he finally found it: a faint dot that had shifted between two plates taken six nights apart. The news went out by telegram, and the world cheered for a brand-new ninth planet. Letters and telegrams poured in with more than a thousand ideas for its name, and about 150 of them suggested Pluto. The first to suggest it was an eleven-year-old girl in Oxford, England, who thought of it at breakfast. Her grandfather passed it on to the observatory, and Pluto was the name they chose.

Then Pluto began to shrink, at least on paper. No telescope could show it as more than a faint dot, so astronomers had to estimate its size. In 1931 they worked out that it had about as much mass as Earth, which fit the idea of a big Planet X. By 1948 the estimate had fallen to about the mass of Mars. Each new measurement made Pluto smaller, and each one made it harder to believe that Pluto was tugging on anything.

In 1976 astronomers found methane ice on Pluto's surface. Ice is shiny, so a bright, icy Pluto had to be small to look as faint as it did. The new estimate put it smaller than our own Moon. Then, in 1978, an astronomer named James Christy spotted a moon going around Pluto. That moon, Charon, was the key, because the way a moon circles depends on the weight of the world it circles. By timing its orbit, astronomers could weigh Pluto for the first time.

The answer was tiny: about two tenths of one percent of Earth's mass. That was far too small to explain the tugs on the outer planets. In 1992 astronomers redid the math with a better measurement of Neptune's mass, taken by the Voyager 2 spacecraft, and the strange tugs disappeared completely. Lowell's Planet X had never been there to find. Tombaugh had found Pluto not because a prediction was right, but because he searched the sky so thoroughly, one plate at a time.

That same year, 1992, two astronomers in Hawaii, David Jewitt and Jane Luu, found a small icy object beyond Neptune. They nicknamed it Smiley. It was the first object found out there since Pluto and its moon, and newspapers soon called it a tenth planet. It would not be the last. By 2018 about 2,400 more had been spotted. Pluto was not alone at the edge of the solar system. It was one member of a huge ring of icy worlds called the Kuiper Belt.

In 2005 Mike Brown and two other astronomers announced a world out there about the size of Pluto, with slightly more mass. They nicknamed it Xena, and it was later named Eris, after the Greek goddess of discord. The name fit, because Eris caused a big argument. If Pluto was a planet, then Eris had to be one too, and so might dozens of other round icy worlds. The solar system could end up with a very long list of planets.

So in 2006, at a meeting in Prague, the International Astronomical Union voted on a definition by raising yellow cards in the air. A planet must go around the Sun. It must have enough gravity to pull itself into a round shape. And it must have cleared the neighborhood around its orbit, which means it is by far the biggest thing in its lane. Pluto passes the first two tests easily. It fails the third, because it shares its lane with thousands of Kuiper Belt objects.

Pluto became a dwarf planet: round and circling the Sun, but not the boss of its neighborhood. Many people were furious about it. A word was even invented for it. To be "plutoed" means to be demoted, and in 2007 the American Dialect Society named it the Word of the Year for 2006. New Mexico's House of Representatives, honoring Tombaugh, who had lived in the state for many years, declared that Pluto would always be a planet in New Mexican skies. Some planetary scientists still call it a planet today.

In 1992 a scientist at NASA's Jet Propulsion Laboratory phoned Tombaugh to ask permission to visit his planet. Tombaugh said he was welcome to it, though it would be one long, cold trip. He died in 1997, at the age of ninety, years before the vote. In 2015 New Horizons flew past Pluto carrying a little of his ashes. It found mountains of water ice and a pale heart, now named Tombaugh Regio. If you wrote the rule for planets, would Pluto make your list?

Questions

1. How did Tombaugh's blink comparator help him find Pluto?

A. It made faint stars brighter
B. It flipped between two photos so a moving dot seemed to jump
C. It measured how heavy Pluto was

2. Why was the discovery of Charon so important?

A. It let astronomers weigh Pluto for the first time
B. It proved Pluto was a planet
C. It was the first moon ever found

3. Why did Pluto fail the third test?

A. It is not round
B. It does not go around the Sun
C. It shares its lane with thousands of icy objects

4. Why did each new measurement make Planet X harder to believe in?

A. Pluto kept moving farther away
B. A smaller Pluto could not tug on the outer planets
C. Telescopes kept breaking

5. In this book, what does "demoted" mean?

A. Moved to a lower rank
B. Found by accident
C. Given a new moon

6. What does the author mean by "Pluto began to shrink, at least on paper"?

A. Pluto was melting
B. The estimates of its size kept getting smaller
C. Somebody tore the photographs

Words to know

astronomers: sky scientists
observatory: telescope building
estimate: careful guess
definition: exact meaning
demoted: moved lower

Answer key: Why Is Pluto Not a Planet?

1. B. It flipped between two photos so a moving dot seemed to jump
2. A. It let astronomers weigh Pluto for the first time
3. C. It shares its lane with thousands of icy objects
4. B. A smaller Pluto could not tug on the outer planets
5. A. Moved to a lower rank
6. B. The estimates of its size kept getting smaller