



# Vulcan: The Phantom Planet

**Activity:** Vulcan: The Phantom Planet

**Category:** Writing Assignment

**Series:** Science Myths, Busted! (Space Myths, Busted!)

## Supplies

- *Space Myths, Busted!*
- The book's 12StoryLibrary.com page: <http://www.12storylibrary.com/non-fiction/science-myths-busted/space-myths-busted/>
  - “The Hunt for Vulcan, the Planet That Wasn’t There” web resource
- Paper and pencils

## Prep

Read Chapter 4 (“Busted: Our Solar System Has Only Six Planets”) and Chapter 5 (“Busted: Planet Vulcan Exists”) of *Space Myths, Busted!* with the students, or assign it to them to read before class. Also have the students read through the web resource “The Hunt for Vulcan, the Planet That Wasn’t There.”

## Directions

Neptune and Vulcan had similar discovery stories. But only Neptune was actually a planet. Have the students answer the following questions to compare these two stories. They should use specific details from the web resource and from both chapters of *Space Myths, Busted!* in their answers.

1. How did astronomers discover Neptune?
2. How did astronomers “discover” Vulcan?
3. What are three things that were similar about these two planets’ discoveries?
4. What are three things that were different?
5. How did Newton describe gravity?
6. How did Einstein describe gravity?
7. In “The Hunt for Vulcan, the Planet That Wasn’t There,” Simon Worrall writes, “Facts on their own don’t mean anything unless you have a framework to put them in.” What do you think this quote means? How does it relate to the story of Vulcan?
8. What new framework did Einstein’s idea of gravity give scientists? How did this change the way they interpreted facts?

**Evaluation**

Give the students up to 26 points, using the attached answer key. RI 4.3, RI 4.9, RI 5.3

**Purpose**

To help students compare and contrast events, focusing on how similar events can have different results, and to begin exploring how the framework scientists use to approach and interpret facts affects the conclusions those scientists reach.

## **Vulcan: The Phantom Planet (ANSWER KEY)**

**1. How did astronomers discover the planet Neptune?**

Astronomers noticed something unusual about Uranus' orbit. They predicted that another planet was causing it. They used their calculations to look for that planet in the sky. Galle first observed the new planet on Sept 9, 1896. (4 points)

**2. How did astronomers “discover” the planet Vulcan?**

Astronomers noticed something unusual about Mercury's orbit. They predicted that another planet was causing it. They used their calculations to look for that planet in the sky. An astronomer claimed to see this new planet on March 26, 1859. (4 points)

**3. What are 3 things that are similar about these two planets' discoveries?**

Answers may vary. Examples: Both times scientists began by noticing an unusual orbit. Both times scientists thought they found the planet in the sky. Both planets were names after Roman gods. (3 points, 1 for each accurate similarity)

**4. What are 3 things that are different?**

Answers may vary. Examples: A German astronomer found Neptune while an amateur astronomer claimed to see Vulcan. Unlike with Neptune, not everyone agreed that Vulcan was spotted in the sky. Newton's law of gravity was used to find Neptune while Einstein's law of gravity was used to disprove Vulcan. (3 points, 1 for each accurate difference)

**5. How did Newton describe gravity?**

Newton described gravity as a force keeping moons and planets in their orbits. He thought it pulled on objects like a rubber band does. More massive objects have stronger pulls on the objects around them. (3 points)

**6. How did Einstein describe gravity?**

Einstein described gravity as a force that warped or bent the fabric of space and time. When a heavy object sits on it, the fabric dips based on how massive the object is. That dip is gravity. (3 points)

**7. In “The Hunt for Vulcan, the Planet That Wasn't There,” Simon Worrall writes, “Facts on their own don't mean anything unless you have a framework to put them in.” What do you think this quote means? How does it relate to the story of Vulcan?**

Answers may vary, but should be similar to this quote from the article: “Until you have a framework that allows you to see that there's an alternative to what you thought before, you can't easily assimilate new facts. People kept discovering Vulcan because the way they saw the world required Vulcan to be there.” (3 points.)

**8. What new framework did Einstein's idea of gravity provide? How did this change the way people interpreted facts?**

Answers may vary, but should be similar to the following: It changed how people understood gravity, it gave an explanation for the orbit that didn't include another planet, and it helped show that Einstein's' Theory of Relativity was correct. (3 points)