



In science, a theory is a reasonable explanation of observed events that are **related**. A theory often involves an imaginary model that helps scientists picture the way an observed event could be produced. A good example of **this** is found in the kinetic molecular theory, in which gases are pictured as being made up of many small particles that are in constant motion.

A useful theory, in addition to explaining past observations, helps to predict events that have not as yet been observed. After a theory has been publicized, scientists design experiments to test the theory. If observations confirm the scientists' predictions, the theory is **supported**. If observations do not confirm the predictions, the scientists must search further. There may be a fault in the experiment, or the theory may have to be revised or rejected.

Science involves imagination and creative thinking as well as collecting information and performing experiments. Facts by themselves are not science. As the mathematician Jules Henri Poincaré said: "Science is built with facts just as a house is built with bricks, but a collection of facts cannot be called science any more than a pile of bricks can be called a house."

Most scientists start an investigation by finding out what other scientists have learned about a particular problem. After known facts have been gathered, the scientist comes to the part of the investigation that requires considerable imagination. Possible solutions to the problem are formulated. These possible solutions are called hypotheses. In a way, any hypothesis is a **leap into the unknown**. It extends the scientist's thinking beyond the known facts. The scientist plans experiments, performs calculations and makes observations to test hypotheses. For without hypotheses, further investigation lacks purpose and direction. When hypotheses are confirmed, they are incorporated into theories.

1. The word “**related**” in line 2 is closest in meaning to _____.
A. connected B. described C. completed D. identified
2. The word “**this**” in line 4 refers to _____.
A. a good example
B. an imaginary model
C. the kinetic molecular theory
D. an observed event
3. According to the second paragraph, a useful theory is one that helps scientists to _____.
A. find errors in past experiments
B. make predictions
C. observe events
D. publicize new findings
4. The word “**supported**” in line 10 is closest in meaning to _____.
A. finished B. adjusted C. investigated D. upheld
5. Bricks are mentioned in paragraph 3 to indicate how _____.
A. mathematicians approach science
B. building a house is like performing experiments
C. science is more than a collection of facts
D. scientific experiments have led to improved technology
6. In the fourth paragraph, the author implies that imagination is most important to scientists when they _____.
A. evaluate previous work on a problem
B. formulate possible solutions to a problem
C. gather known facts
D. close an investigation
7. In the last paragraph, the author refers to a hypotheses as “**a leap into the unknown**” in order to show that hypotheses _____.
A. are sometimes ill-conceived
B. can lead to dangerous results
C. go beyond available facts
D. require effort to formulate
8. In the last paragraph, what does the author imply a major function of hypotheses?
A. Sifting through known facts
B. Communicating a scientist’s thoughts to others
C. Providing direction for scientific research
D. Linking together different theories

9. Which of the following statements is supported by the passage?

- A. Theories are simply imaginary models of past events.
- B. It is better to revise a hypothesis than to reject it.
- C. A scientist's most difficult task is testing hypotheses.
- D. A good scientist needs to be creative.



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In the early days of the United States, postal charges were paid by the recipient and charges **varied** with the distance carried. In 1825, the United States Congress permitted local postmasters to give letters to mail carriers for home delivery, but these carriers

5 received no government salary and their entire compensation depended on what they were paid by the recipients of individual letters.

In 1847 the United States Post Office Department adopted the idea of a postage stamp, which of course simplified the payment

10 for postal service but caused grumbling by those who did not like prepay. Besides, the stamp covered only delivery to the post office and did not include carrying it to a private address. In Philadelphia, for example, with a population of 150,000, people still had to go to the post office to get their mail. The confusion

15 and congestion of individual citizens looking for their letters was itself enough to discourage use of the mail. It is no wonder that, during the years of these **cumbersome** arrangements, private letter-carrying and express businesses developed. Although their activities were only semilegal, **they** thrived, and actually

20 advertised that between Boston and Philadelphia they were a half-day speedier than the government mail. The government postal service lost volume to private competition and was not able to handle efficiently even the business it had.

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Finally, in 1863, Congress provided that the mail carriers who delivered the mail from the post offices to private addresses should receive a government salary, and that there should be no extra charge for that delivery. But this delivery service was at first **confined** to cities, and free home delivery became a mark of urbanism. As late as 1887, a town had to have 10,000 people to be eligible for free home delivery. In 1890, of the 75 million people in the United States, fewer than 20 million had mail delivered free to their doors. The rest, nearly three-quarters of the population, still received no mail unless they went to their post office.

1. What does the passage mainly discuss?
 - A. The increased use of private mail services
 - B. The development of a government postal system
 - C. A comparison of urban and rural postal services
 - D. The history of postage stamps.
2. The word “varied” in line 2 could best be replaced by _____.
 - A. increased
 - B. differed
 - C. returned
 - D. started
3. Which of the following was seen as a disadvantage of the postage stamp?
 - A. It had to be purchased by the sender in advance.
 - B. It increased the cost of mail delivery.
 - C. It was difficult to affix to letters.
 - D. It was easy to counterfeit.
4. Why does the author mention the city of Philadelphia in lines 12?
 - A. It was the site of the first post office in the United States.
 - B. Its postal service was inadequate for its population.
 - C. It was the largest city in the United States in 1847.
 - D. It was commemorated by the first United States postage stamp.
5. The word “cumbersome” in line 17 is closest in meaning to _____.
 - A. burdensome
 - B. handsome
 - C. loathsome
 - D. quarrelsome
6. The word “they” in line 19 refers to _____.
 - A. Boston and Philadelphia
 - B. businesses
 - C. arrangements
 - D. letters
7. The private postal services of the nineteenth century claimed that they could do which of the following better than the government?
 - A. Deliver a higher volume of mail.
 - B. Deliver mail more cheaply.
 - C. Deliver mail faster.
 - D. Deliver mail to rural areas.

8. In 1863 the United States government began providing which of the following to mail carriers?

- A. A salary
- B. Housing
- C. Transportation
- D. Free postage stamps

9. The word “confined” in lines 27-28 is closest in meaning to _____

- A. granted
- B. scheduled
- C. limited
- D. recommended



117 THE HISTORY OF THE ROLLER COASTER

The first roller coasters were created in Russia in the 17th century. However, they were not like modern ones. They were more like big sleds. People rode down steep ice slides. These sleds required very good navigation skills to slide down safely, and there 5 were many accidents.

At the end of the 19th century, American railway companies introduced roller coasters. **They** set up amusement parks to make money on the weekends, when people rarely traveled. In 1884, the first real roller coaster appeared. It was a gravity-driven train. 10 Passengers climbed flights of stairs to board the car. Then the car was pushed from the station to move down a hill and over a few bumps. At the bottom, passengers got out of the car and workers lifted the car to the second station.

During the early 20th century, there was great progress in roller 15 coasters. Unlike previous coasters, the new ones **employed**

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mechanical tracks. The first was built in 1912. This was a great advance. It enabled people to enjoy greater speed and steeper hills but with much more safety than previous ones. Through the 1920s, many roller coasters were built, but after World War II, the 20 number of roller coasters significantly decreased.

Disneyland, America's first theme park, opened in 1955. It opened a new era for amusement parks. Disney adopted the first tubular steel roller coaster in 1959. Before this, roller coasters always had been built on wooden frames. The steel track not only 25 offered greater stability but also opened the door for loops and corkscrews.

1. The word "**They**" in line 7 refers to _____.
A. Russians
B. roller coasters
C. railway companies
D. passengers
2. According to paragraph 2, what can we infer about roller coasters?
A. They took a lot of effort to run.
B. They were not fun to ride.
C. They were reliant on ice.
D. They had lots of enthusiasts.
3. The word **employed** in line 15 is closest in meaning to _____.
A. followed B. used C. left D. hired
4. According to the passage, all of the following are true EXCEPT _____.
A. The first roller coaster was created in the 17th century.
B. After the Second World War, more roller coasters were built than ever before.
C. Disneyland opened in 1955.
D. The 20th century saw great advances in roller coasters.
5. All of the following are mentioned in the passage EXCEPT _____.
A. the setup of amusement parks in America
B. Disney's adoption of wooden frame coasters
C. the rise in construction of coasters in the USA
D. the advantages of tubular steel construction
6. Why does the author introduce Disney?
A. Because it created the first American roller coaster
B. Because it opened many amusement parks in the U.S.
C. Because it created many coasters during World War II
D. Because it first introduced the steel roller coaster