TOEFL iBT® Online Prep Course | Activity 1 | Reading

Reading > Lesson 8: Completing Summaries/Charts > Exercise 8.1

FOCUS: Recognizing the most important topics and ideas of paragraphs and answering complete-the-summary questions.

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DIRECTIONS: Read each passage. As you are reading, take brief notes on the main idea of each paragraph. At the end of the passage, you will find the introductory sentence for a brief summary of the passage. Complete the summary by dragging **three** of the answer choices that express the most important ideas of the passage next to the bullet points in the box. Three answer choices will not be used. *On an actual test, these questions would be worth 2 points each.*

Continue

Isaac Newton's Contributions

Johannes Kepler discovered the laws of planetary orbits but had no physical understanding of them. Only with the work of Isaac Newton 60 years later did we find out why the laws existed. Newton was born in England in 1642, the year of Galileo's death. He became the greatest scientist of his time and perhaps of all time.

Newton's work on optics, his discovery that visible light can be broken down into a spectrum of colors, and his invention of the reflecting telescope merit him a place in our astronomy texts. His work on motion and gravity greatly advanced the field of physics, and his contribution to mathematics may be his greatest gift to science.

Newton astonished the fields of physics and mathematics in a monumental work that mathematically formulated how objects move by the force of gravity. Newton did not publish his work for many years until Edmond Halley (whose name is given to the famous comet) finally convinced him to do so. Newton then set forth the laws of gravity and motion in *Principia* (pronounced "Prin-kip'ee-a"), or *Mathematical Principles of Natural Philosophy,* which appeared in 1687. The first law is that bodies in motion tend to remain in motion, in a straight line with constant speed, unless acted upon by an **external** force. This is the law of inertia that was discovered by Galileo. The second law, the law of gravity, establishes a force of attraction between any two objects that Newton relates to mass and distance. A third is the law of action and reaction: "For every action, there is an equal and opposite reaction." Mathematically, the law of gravity included the invention of a basic law of modern physics, the inverse square law, which became the basis for our method of "weighing" the planets today.

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Newton became famous for his discoveries, so much so that tales are still told about how he made them. According to one of the most popular tales, an apple fell on Newton's head and led to his discovery of the concept of gravity. Though no apple actually hit Newton's head, the story that Newton told, years later, is that he saw an apple fall and realized that just as the apple fell to Earth, the moon is falling to Earth but its forward motion keeps it far from us. In other words, he realized that the distance the moon travels toward Earth is compensated by the distance the moon travels forward. The compensation and the brief intervals of the travel result in a stable orbit rather than a **collision course** with Earth.

In order to work out the law of gravity, Newton had to invent calculus, a new branch of mathematics. When he calculated that the acceleration of the moon fit the same formula as the acceleration of the apple, he knew he had the right method. Newton was the first to understand that gravity is a force that acts in the same way throughout the universe. Newton's impact on science is realized in the continuing strength of the apple-and-the-tree myth. Many pieces of the original apple tree have been enshrined. No one knows which, if any, of the apple trees now growing in front of Newton's house at Woolsthorpe actually came from the famous original.

1 Newton made significant contributions to science and mathematics.

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The advancement of physics is due largely to Newton's several discoveries in light, motion, and gravity.

His desire to explain the movement of the moon around Earth led to his development of the laws of gravity and motion.

After the publication of *Principia*, the results of Newton's research reached a wide audience of scientists.

Newton's law of gravity has helped modern-day astronomers to "weigh" planets.

Newton's importance to science is due, at least in part, to the encouragement of scientists such as Edmond Halley.

The enduring apple myth reflects the monumental

The enduring apple myth reflects the monumental scientific importance of his establishment of physical laws by formal equations.