

Name _____

Who Was Isaac Newton?

By Cindy Grigg

In science class, you might measure forces with newtons. This unit of force was named for Sir Isaac Newton. This English scientist has been called "the greatest scientist of all time."

Isaac Newton was born on Christmas Day, 1642, at Woolsthorpe Manor in England. You may see his birthday recorded as January 4, 1643. During Newton's lifetime, two calendars were in use in England. The Julian calendar (or Old Style) was ten days behind the Gregorian calendar (the one we use today). So, Newton was born on December 25, 1642, by the Julian calendar, or he was born on January 4, 1643, by the Gregorian calendar. His father was a farmer who died three months before Isaac was born. Isaac was born early and was so tiny that no one expected him to live.

When Isaac was three, his mother remarried and left young Isaac to be raised by his grandparents. Around the age of twelve, Newton was sent to the King Edward Grammar School in Grantham. He boarded with the town's apothecary, William Clark, who mixed medicines for the townspeople. It was here that Newton's interest in science began. He learned about herbal medicines. He made toys like kites and a mouse-powered windmill. He experimented with different kite sizes and shapes to see which ones flew the best. He used measurement. He tested his hypotheses, and he revised his ideas based on his experiments. He was really the first to use the scientific method.

His mother wanted him to take over Woolsthorpe and become a farmer. Isaac was not suited for farm life, and his uncle helped convince his mother to let Isaac attend Cambridge University. In 1661, Isaac took the three-day journey by carriage to Cambridge. At Cambridge, Newton became interested in mathematics, optics, physics, and astronomy.

This time was not wasted. He had already read the works of Copernicus and Kepler about the movements of planets and the works of Galileo about how objects fall to earth. He was able to make a connection between the two. He imagined the same force that caused apples on earth to fall to the ground on Earth to be the same force that keeps planets moving around the sun. What was this mysterious force?

Newton was able to define the laws of gravity and planetary motion. He also defined the "three laws of motion" governing the movement of all objects at all times and in all circumstances. His laws described how the physical universe acts. Newton was able to use these laws to explain how the gravitational force of the earth's mass held the moon in its orbit, the same way the planets are held in their orbits by the gravitational force of the sun.

Forces affect everyone and everything, but no one had defined them until Newton. They are the basic laws of matter and energy and the interactions between them. Because the mathematics available to him was unable to find the speed and direction of something that was constantly changing, Newton invented a new branch of mathematics that we now call calculus. This would be a valuable tool for the rest of Newton's life's work. With it, he calculated the masses of planets and predicted the paths of comets.

Also during this time, he began to study light. He discovered that light is made up of particles. He disproved what everyone else thought about light at that time- light was NOT white, and the colors seen using a prism were NOT caused by mixtures of white light and darkness. Light, though it appears white, is actually a mixture of seven colors. His findings on optics and motion were not published until much later in his life, but the basic thinking was done during his "miracle year" at Woolsthorpe.

In 1667, he returned to Cambridge and finished his master's degree. In two years, he became a professor of mathematics. He taught classes on his new discoveries about light and optics. These discoveries led



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him to invent a better telescope for his study of astronomy. He invented a reflecting telescope that used concave mirrors instead of lenses.

Newton gave one of these telescopes to the Royal Society founded in 1660 "for the furthering of natural knowledge." This brought him to the attention of the scientific community, who then elected him as one of their members. In 1703, he was elected president of the Royal Society. He was reelected each year as president until his death. He was knighted by Queen Anne in 1705 for his contributions. This was the first time a man had been awarded a knighthood for scientific achievements. When he died in 1727, he was buried in Westminster Abbey, the first scientist to be awarded this high honor.

Who Was Isaac Newton?

Questions

- In what country was Isaac Newton born?
 - Russia
 - England
 - the United States
 - France
- Why are there two different birthdays given for Isaac Newton?
 - Two calendars were in use at that time.
 - He was a twin.
 - He was born twice.
 - There were two men with the same name.
- Isaac Newton was important to science because he was the first to use _____.
 - the scientific method
 - a mouse-powered windmill
 - herbal medicines
 - kites to experiment with

_____ 4. Why did Newton leave Cambridge and return home to Woolsthorpe?

- Cambridge closed because of the Great Plague.
- He flunked his classes at Cambridge.
- His uncle needed him at home.
- His mother wanted him to become a farmer.

_____ 5. Why was this time at Woolsthorpe known as Newton's "miracle year"?

- Newton figured out the laws of motion, forces, and gravity.
- Newton did experiments with light and optics.
- Newton invented a new branch of mathematics.
- All of these

_____ 6. What brought Newton, a mathematics professor, to the attention of the Royal Society?

- his work with motion and forces
- his invention of the prism
- his work with light
- his invention of a reflecting telescope

_____ 7. Newton's discoveries about light _____.

- disproved what everyone thought about light
- backed up what everyone thought about light

_____ 8. What were some of the honors awarded to Newton?

- a knighthood for scientific achievement
- presidency of the Royal Society until his death
- burial in Westminster Abbey
- all of the above