Chapter 11

Isaac Newton and His Questions

I am curious how many of my readers ask questions. I fancy many of you do. But I am also curious how many of my readers set out to answer their questions for themselves. It is much easier to sit and wait for someone else to discover and explain the answers, is it not? And yet, if every person sat and waited for others to do the work, answers would be few and far between.

The man I want to tell you about now was such a man as asked questions and then set about to find the answers himself. Like the great Galileo, he carefully observed what was going on around him, then set up experiments to learn more. His name was Isaac Newton, and he was born in England the same year that Galileo died in Italy.

Even as a boy, Isaac liked to look carefully at the things around him and learn how they worked. He watched the shadows that the sun cast as it moved across the sky, and he made his own sundial to help him tell the time from those shifting shadows. He folded and tied pocket handkerchiefs into little parachutes, then set one against the other in races to see which would go farthest or hit a target more accurately.

He made himself a water clock. If any of my readers have read about Ancient Greece, you know that the Greeks used water

clocks to time their speeches. Isaac's water clock had a container of water on the top that allowed the water to drip out at a steady rate and turn the dial of the clock at just the right speed.

And Isaac learned something about himself right from the start that proved very helpful throughout his life. He discovered that he could remember things best by writing them down, and it is a good thing for us that he did! For now, hundreds of years later, we can read his notes and learn from his quests to find answers to his questions.

He would write down his questions in a notebook under different headings: time, motion, color, light, vision. Then any time he learned something about how a piece of that part of the world around him worked, he would add his notes to those pages and sketch his ideas in the margins.

You can be sure that Isaac Newton read books that told what others had discovered. He read Galileo's works and Johanne Kepler's books and other scientists, as well. But he would not simply take their word for everything; he always thought carefully about what they said and compared their ideas to his own notes to see if he agreed with their findings.

One day Isaac went to a fair. As he walked through the rows of booths, with all their goods to sell, he noticed a glass prism in one of the booths, flashing as it caught the brilliant light of the sun. Eagerly he bought it and set it near the window in his room. Soon the sunlight was making rainbows on the walls. Isaac Newton watched and thought and asked himself a question. For 2,000 years the wise old scholars had said that white light was pure and that colored light could be seen only by making a change in that pure white light. But Isaac had not made any change in the pure white light from the sun. He had merely set the prism in its path. What if the white light actually contained all the colors of the rainbow and a prism merely bent and separated those colors so you could see them? It was quite a question. Isaac set to work at once, trying experiments with his prism set this way and that way,

in order to find the answer. We know now that the answer was Yes. White light contains all the colors of the rainbow; we just cannot see them until they are separated. But it was Isaac Newton who discovered that answer for us.

On another day, as Isaac was sitting in the garden of his home farm, he watched as the ripe apples started falling from the tree. Questions began to pop into his mind: Why do the apples always fall straight down? Why do they not curve or even fall upward? Could there be something in the earth that attracts the apples? Like pulling a loose thread of a sweater, one question led to another question to another question. Could that something that attracts the apples also be what keeps the moon in its orbit around the Earth? But why doesn't the moon crash into the Earth? Could distance affect the pull of the attraction? Isaac's mind raced onward. Hurriedly he wrote down all his questions and then set about to read and experiment and find the answers.

I fancy my readers have realized that Newton was learning about gravity, but we must remember that no one had thought about gravity or explained it, or even named it, before Isaac Newton asked his questions.

Soon word about this curious scientist spread among the scholars of the day. A respected group of scientists, the Royal Society, invited Newton to join them and encouraged him to continue his studies. After many years, Queen Anne knighted Isaac and ever after he was known as Sir Isaac Newton, a high honor indeed! Honor is not easily won, but Isaac Newton earned it through asking and answering many questions about our big world.