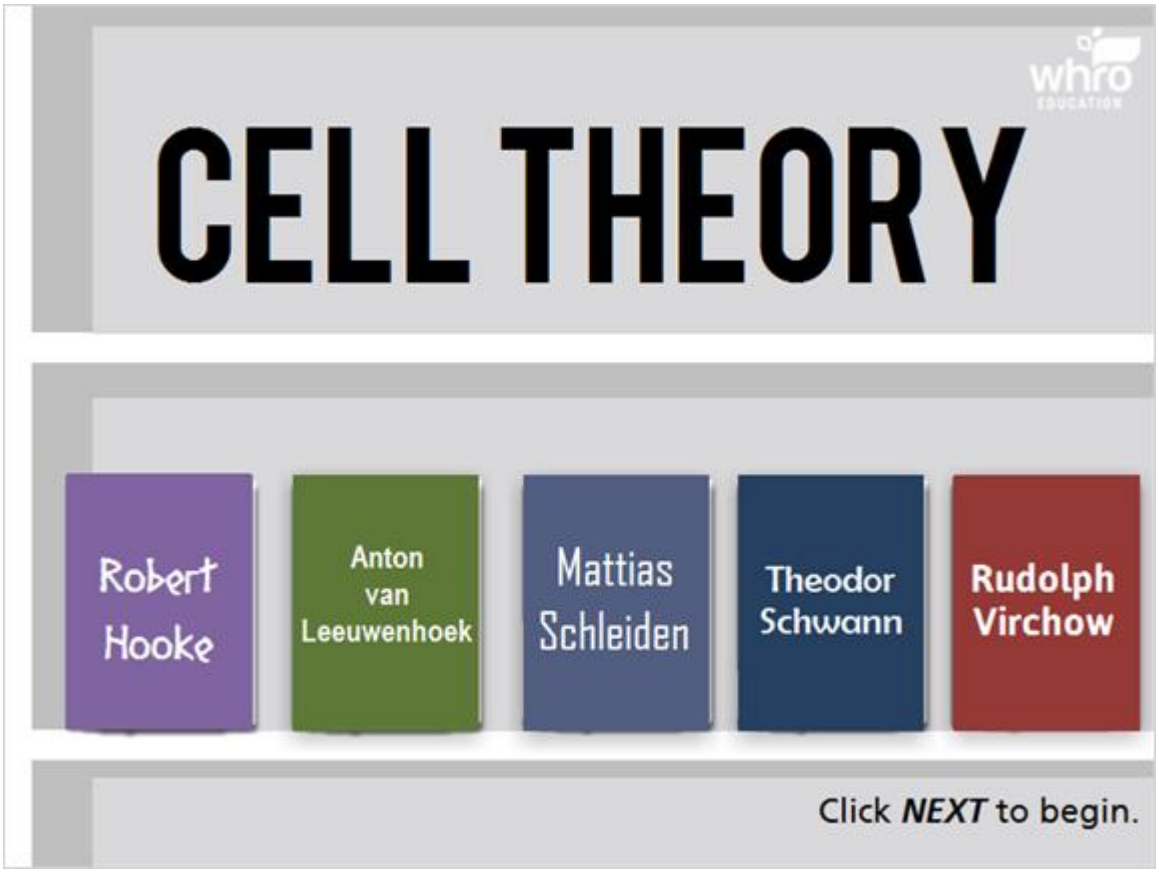
Module 3: Cell Biology - Structure and Function
Topic 1 Content: Cell Theory Notes



Cell Theory

Click N***EXT*** to begin.

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Cell theory describes the properties of cells, and cells are the basic unit of structure in all organisms. Robert Hooke, Anton van Leeuwenhoek, Mattias Schleiden, Theodor Schwann, and Rudolph Virchow all made important contributions to cell theory. In this interactivity, learn about the discovery of the cell and cell theory. Click the books in order to learn about the contributions of each scientist. Begin with Robert Hooke.

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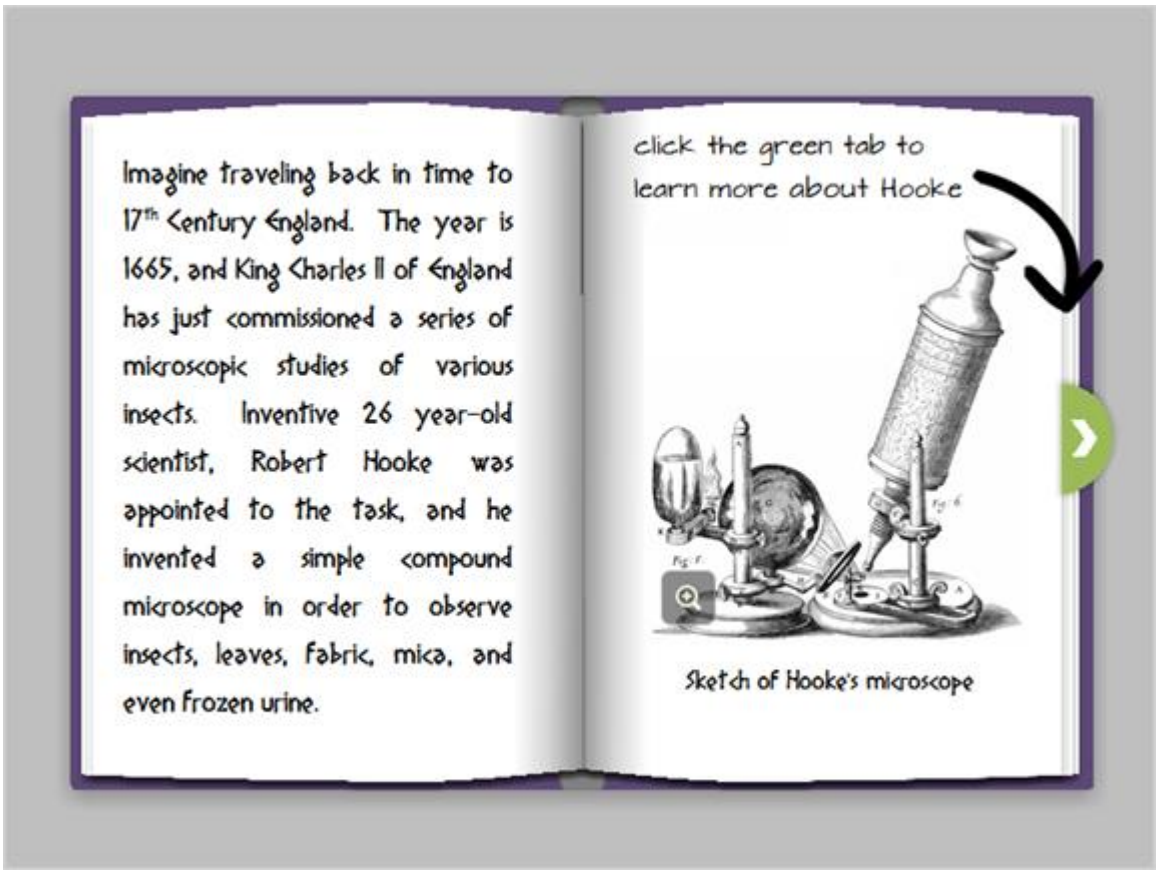

Imagine traveling back in time to 17th Century England. The year is 1665, and King Charles II of England has just commissioned a series of microscopic studies of various insects. Inventive 26 year-old scientist, Robert Hooke was appointed to the task, and he invented a simple compound microscope in order to observe insects, leaves, fabric, mica, and even frozen urine.

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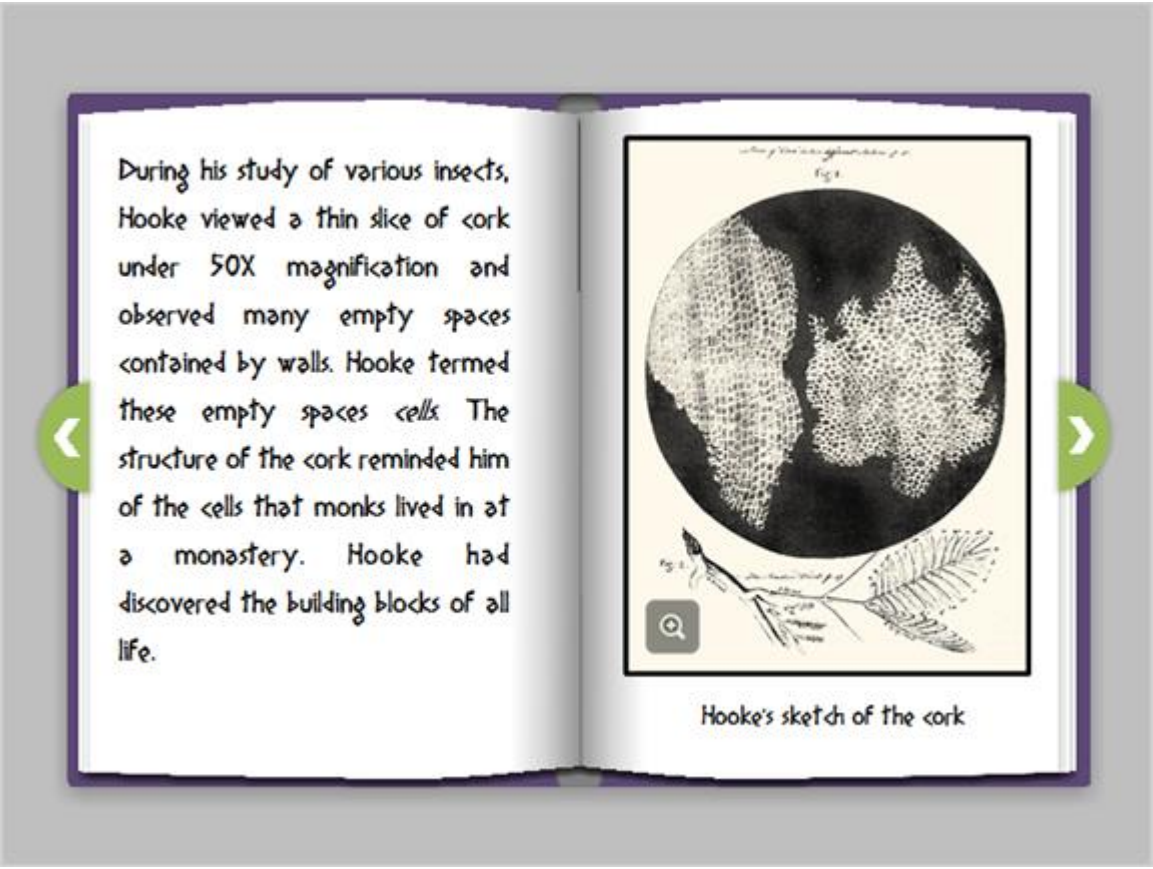
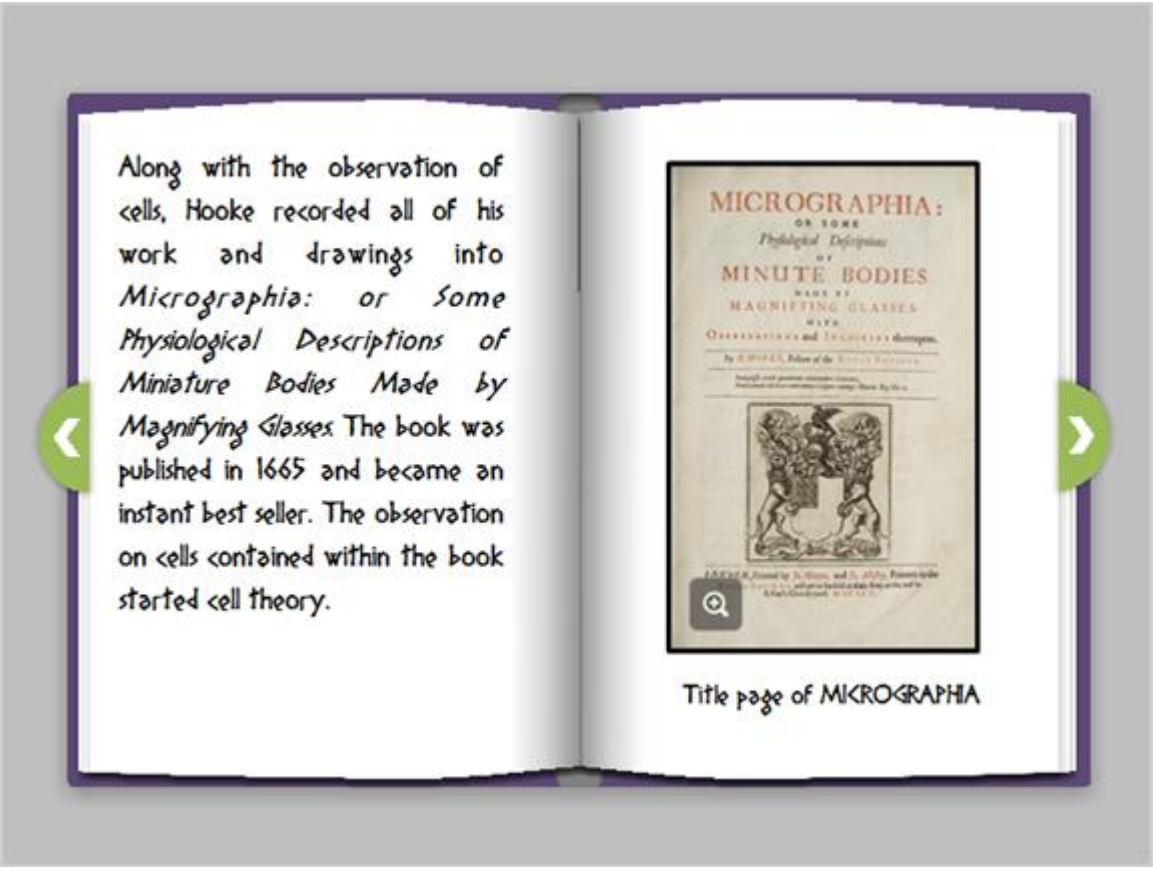
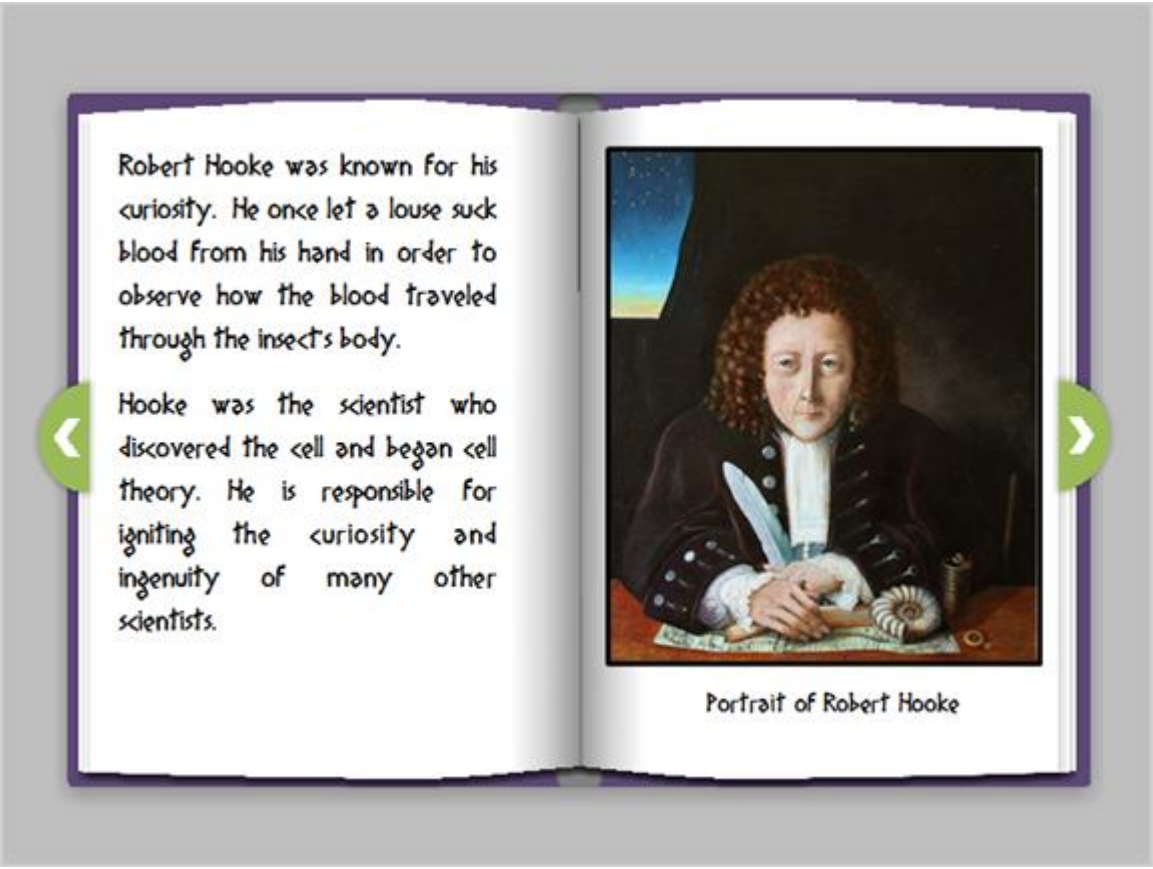


During his study of various insects, Hooke viewed a thin slice of cork under 50X magnification and observed many empty spaces contained by walls. Hooke termed these empty spaces *cells*. The structure of the cork reminded him of the cells that monks lived in at a monastery. Hooke had discovered the building blocks of all life.



Along with the observation of cells, Hooke recorded all of his work and drawings into *Micrographia: or Some Physiological Descriptions of Miniature Bodies Made by Magnifying Glasses*. The book was published in 1665 and became an instant best seller. The observation on cells contained within the book started cell theory.



Robert Hooke was known for his curiosity. He once let a louse suck blood from his hand in order to observe how the blood traveled through the insect's body.

Hooke was the scientist who discovered the cell and began cell theory. He is responsible for igniting the curiosity and ingenuity of many other scientists.

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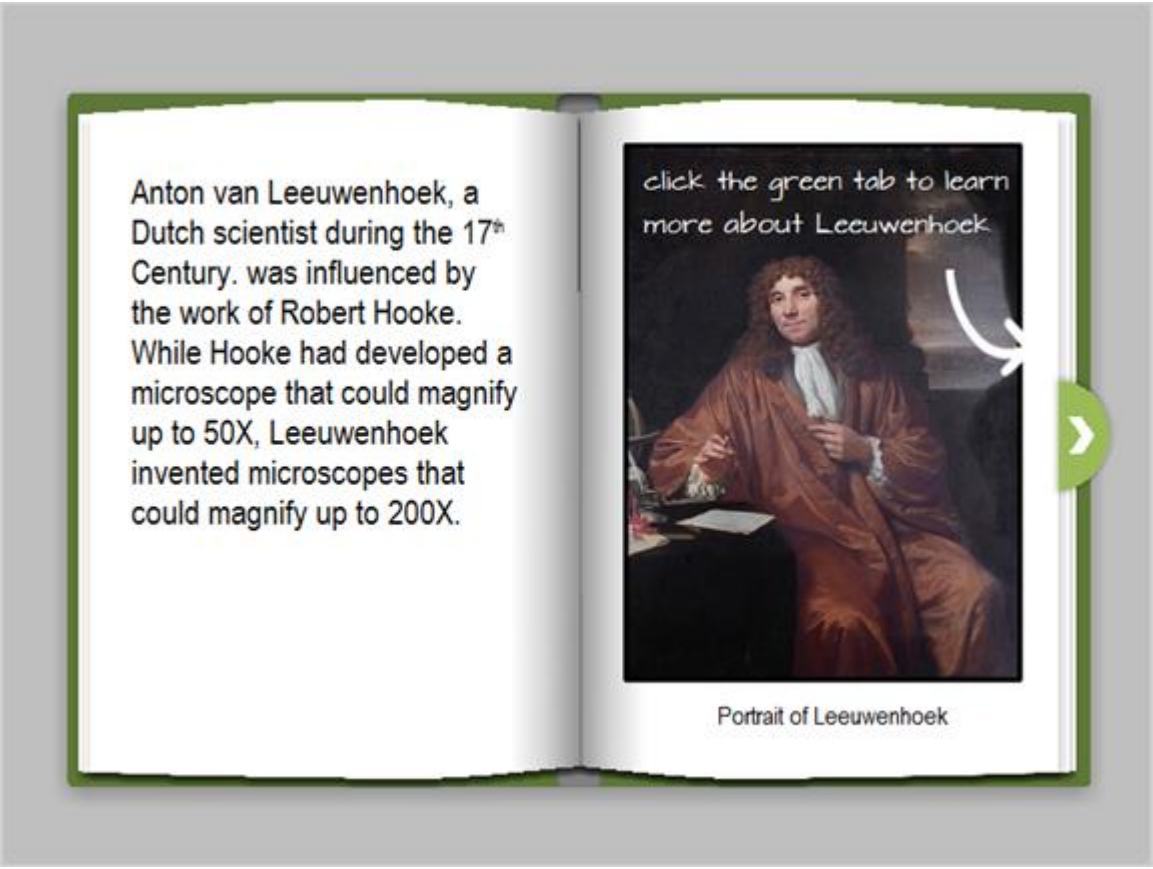
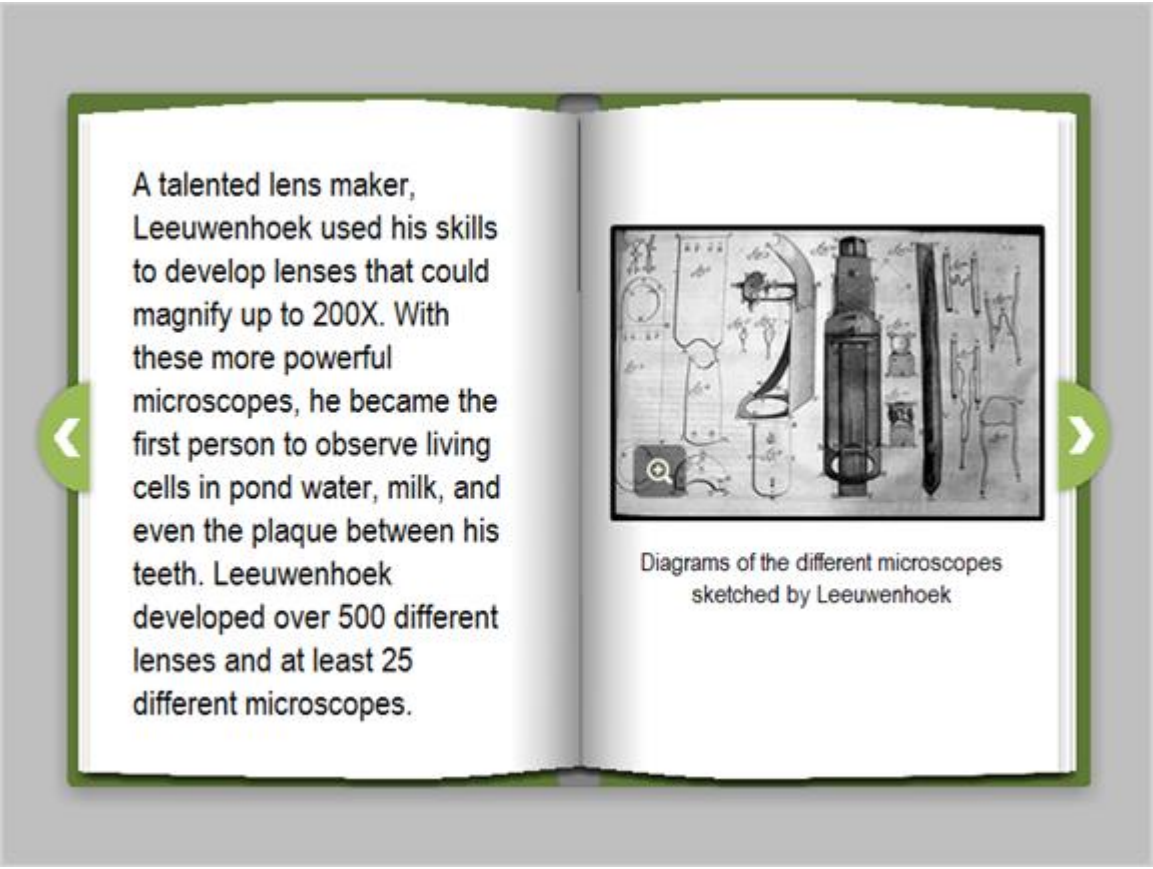
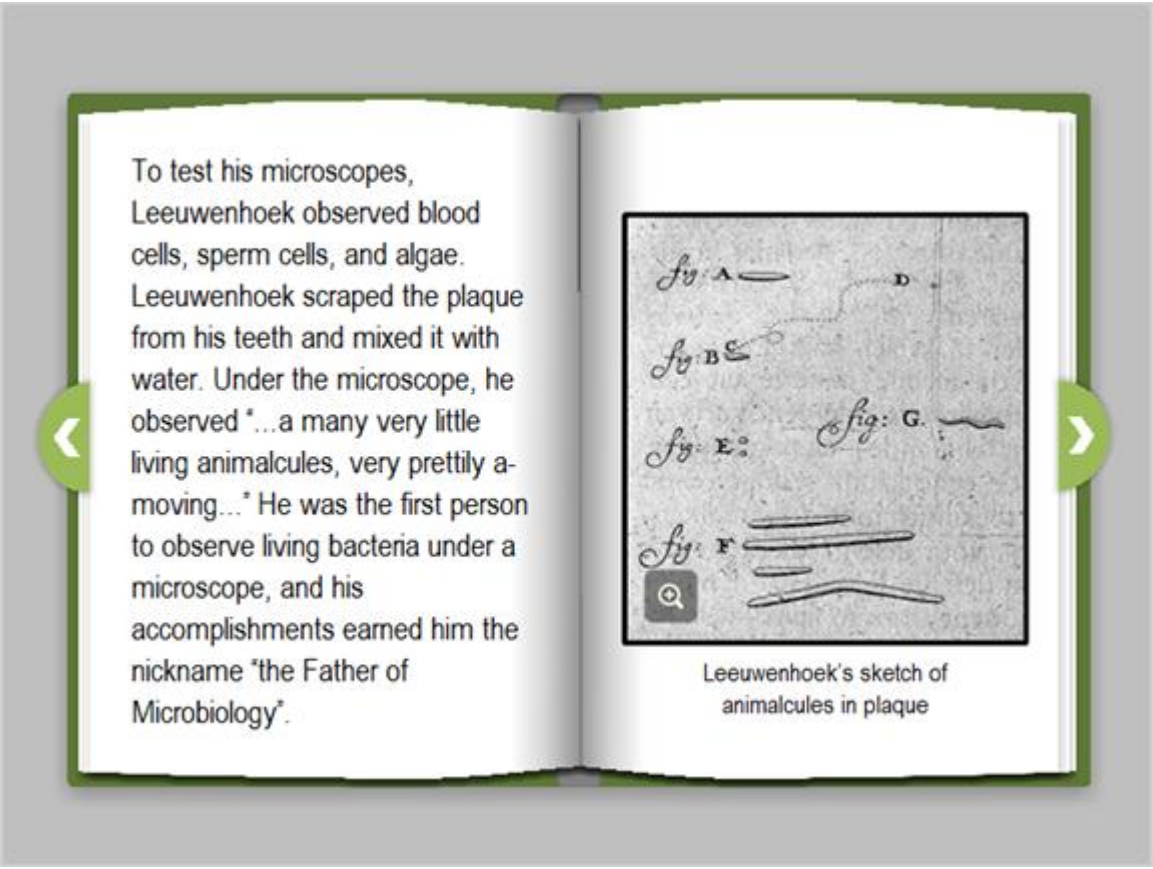


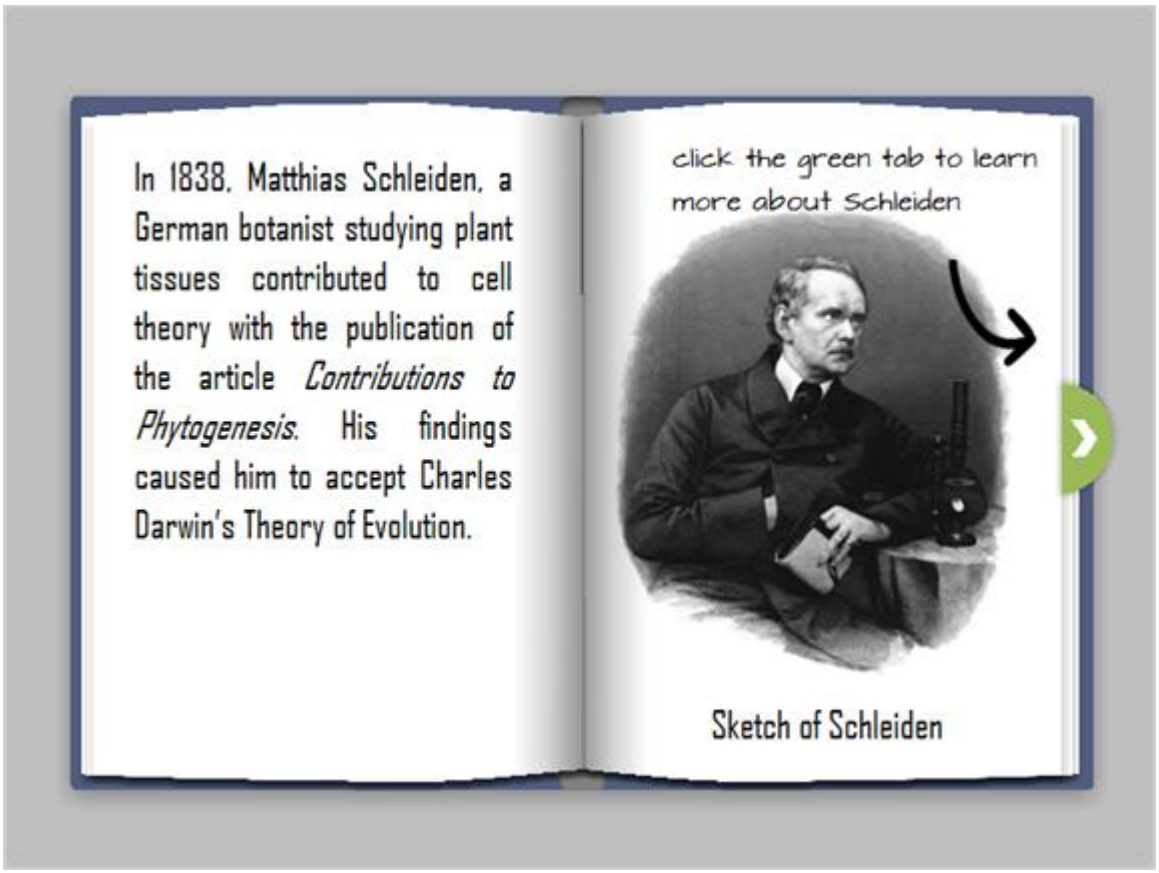
Anton van Leeuwenhoek, a Dutch scientist during the 17th century, was influenced by the work of Robert Hooke. While Hooke had developed a microscope that could magnify up to 50X, Leeuwenhoek invented microscopes that could magnify up to 200X.



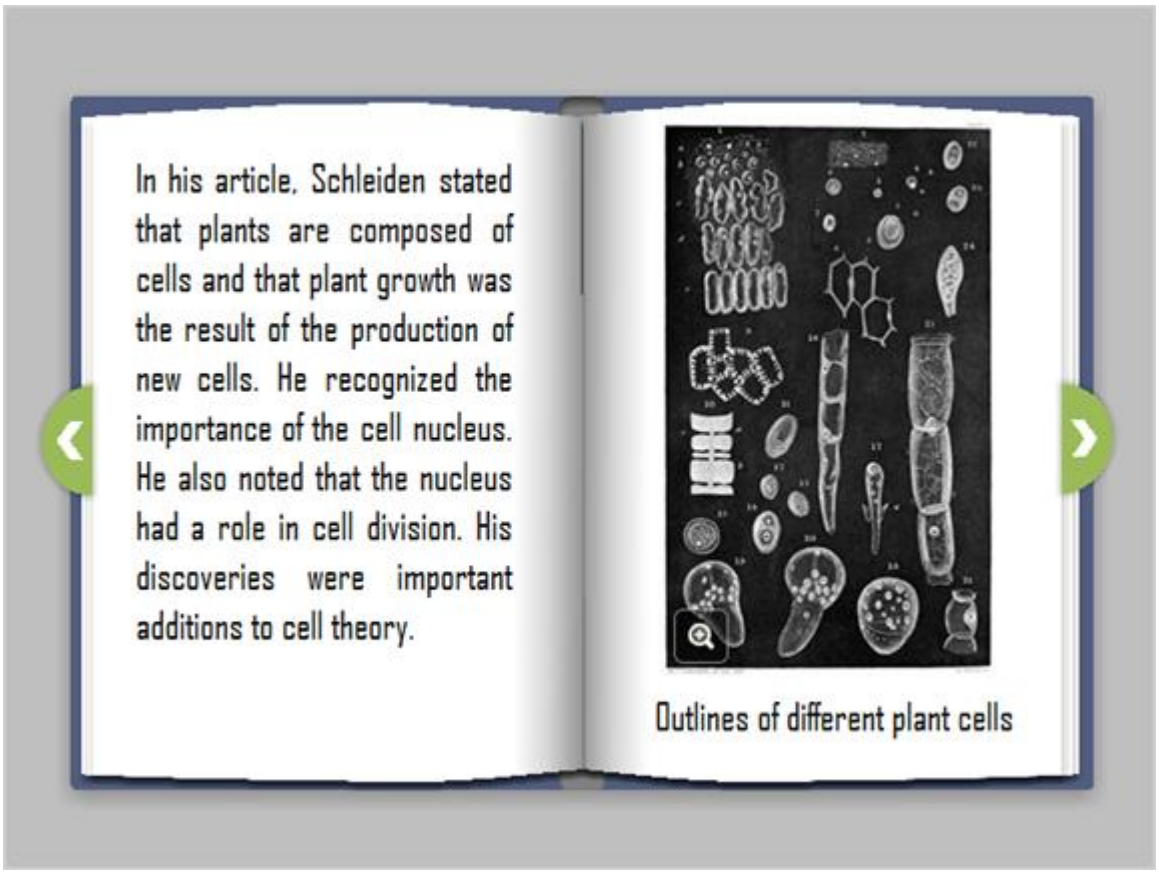
A talented lens maker, Leeuwenhoek used his skills to develop lenses that could magnify up to 200X. With these more powerful microscopes, he became the first person to observe living cells in pond water, milk, and even the plaque between his teeth. Leeuwenhoek developed over 500 different lenses and at least 25 different microscopes.



To test his microscopes, Leeuwenhoek observed blood cells, sperm cells, and algae. Leeuwenhoek scraped the plaque from his teeth and mixed it with water. Under the microscope, he observed "…a many very little living animalcules, very prettily a-moving…" He was the first person to observe living bacteria under a microscope, and his accomplishments earned him the nickname "the Father of Microbiology".



In 1838, Matthias Schleiden, a German botanist studying plant tissues contributed to cell theory with the publication of the article *Contributions to Phytogenesis*. His findings caused him to accept Charles Darwin's Theory of Evolution.



In his article, Schleiden stated that plants are composed of cells and that plant growth was the result of the production of new cells. He recognized the importance of the cell nucleus. He also noted that the nucleus had a role in cell division. His discoveries were important additions to cell theory.

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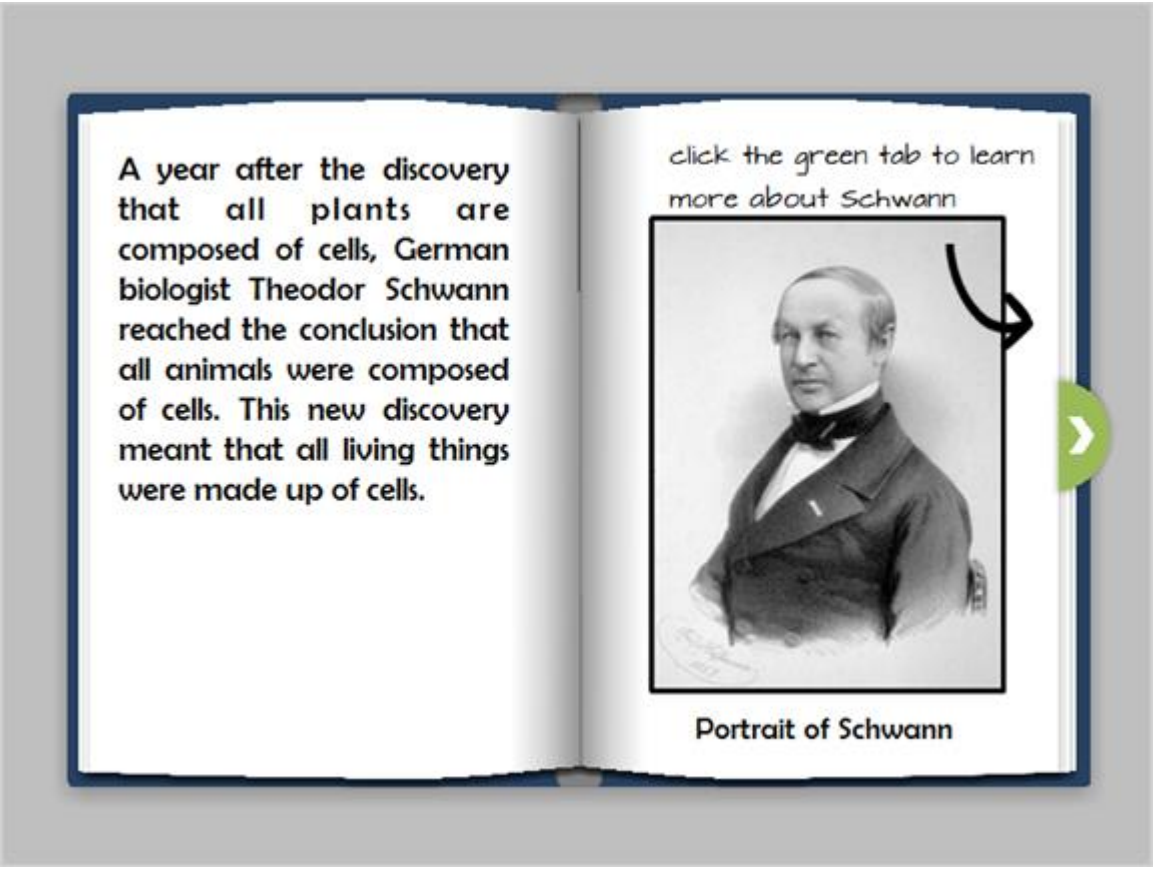
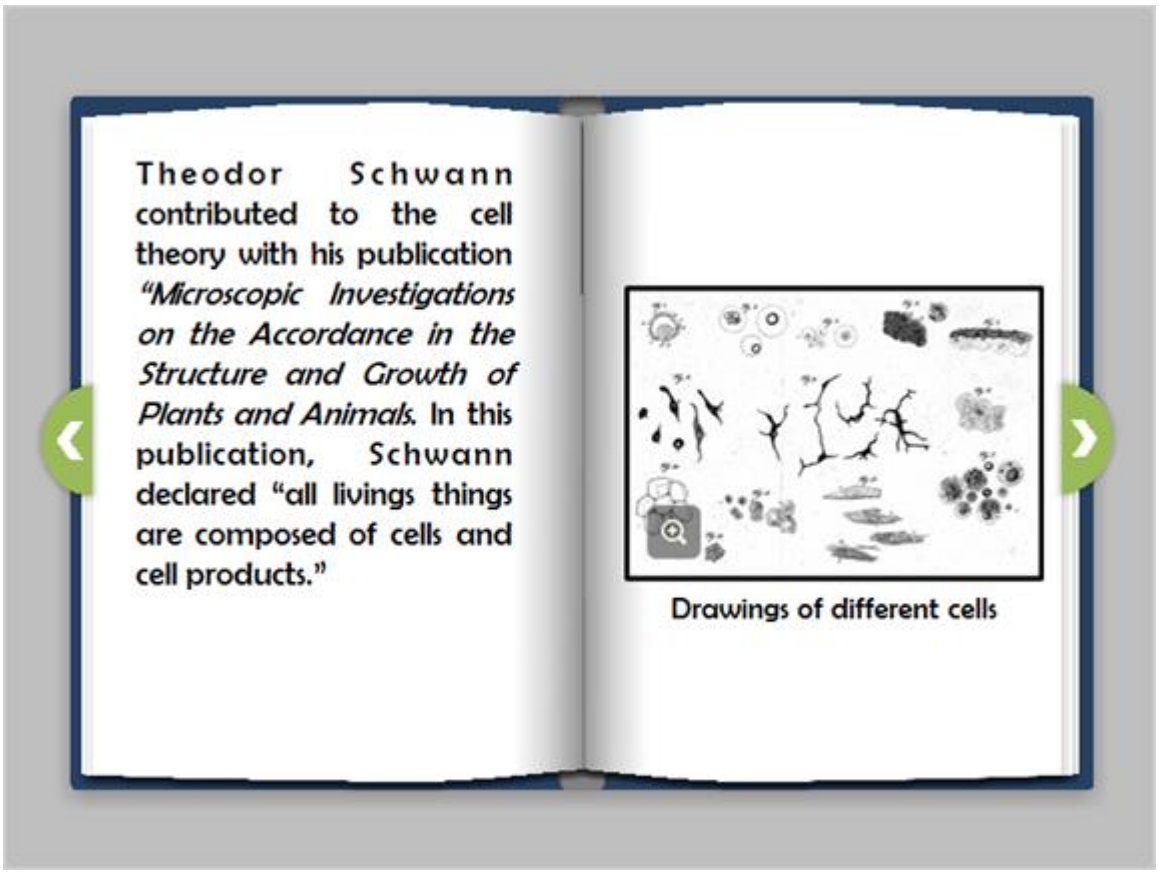


A year after the discovery that all plants are composed of cells, German biologist Theodor Schwann reached the conclusion that all animals were composed of cells. This new discovery meant that all living things were made up of cells.



Theodor Schwann contributed to the cell theory with his publication *"Microscopic Investigations on the Accordance in the Structure and Growth of Plants and Animals*. In this publication, Schwann declared "all livings things are composed of cells and cell products."

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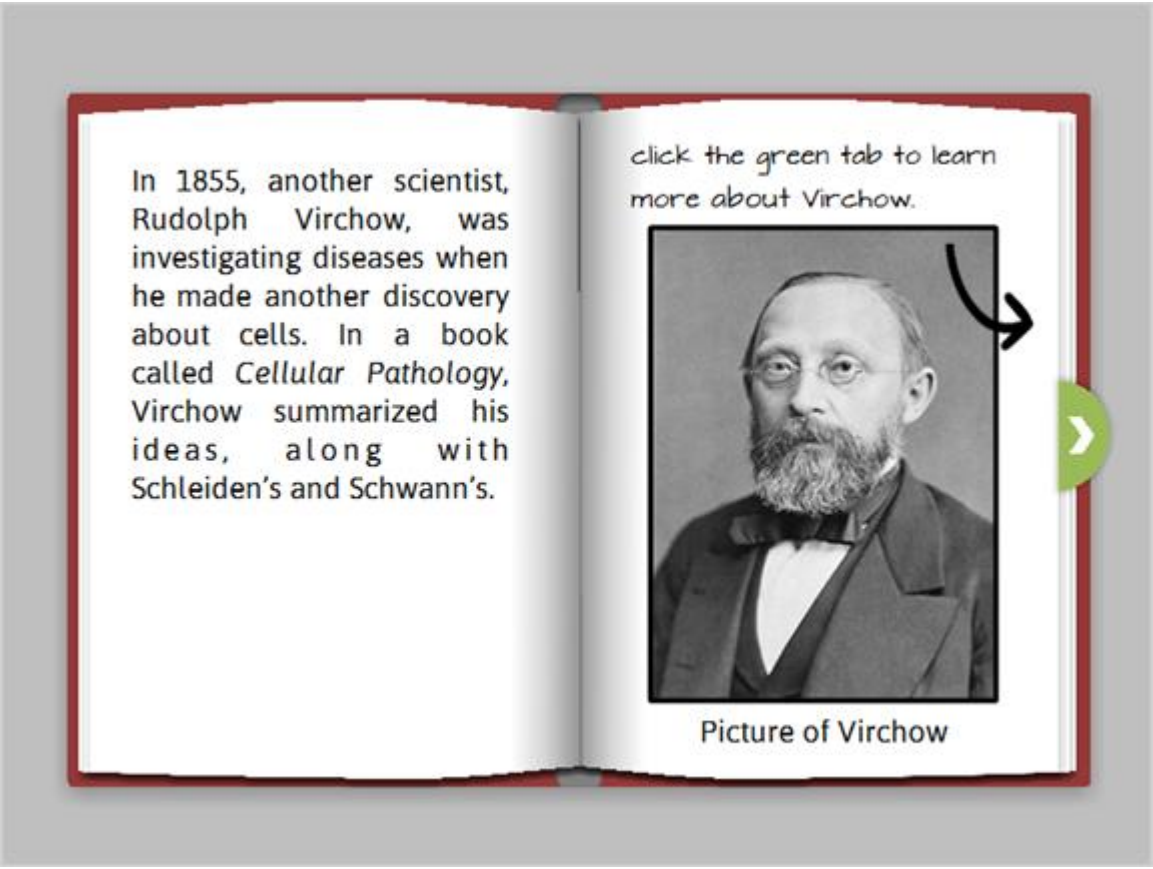

In 1855, another scientist, Rudolph Virchow, was investigating diseases when he made another discovery about cells. In a book called *Cellular Pathology*, Virchow summarized his ideas, along with Schleiden's and Schwann's.

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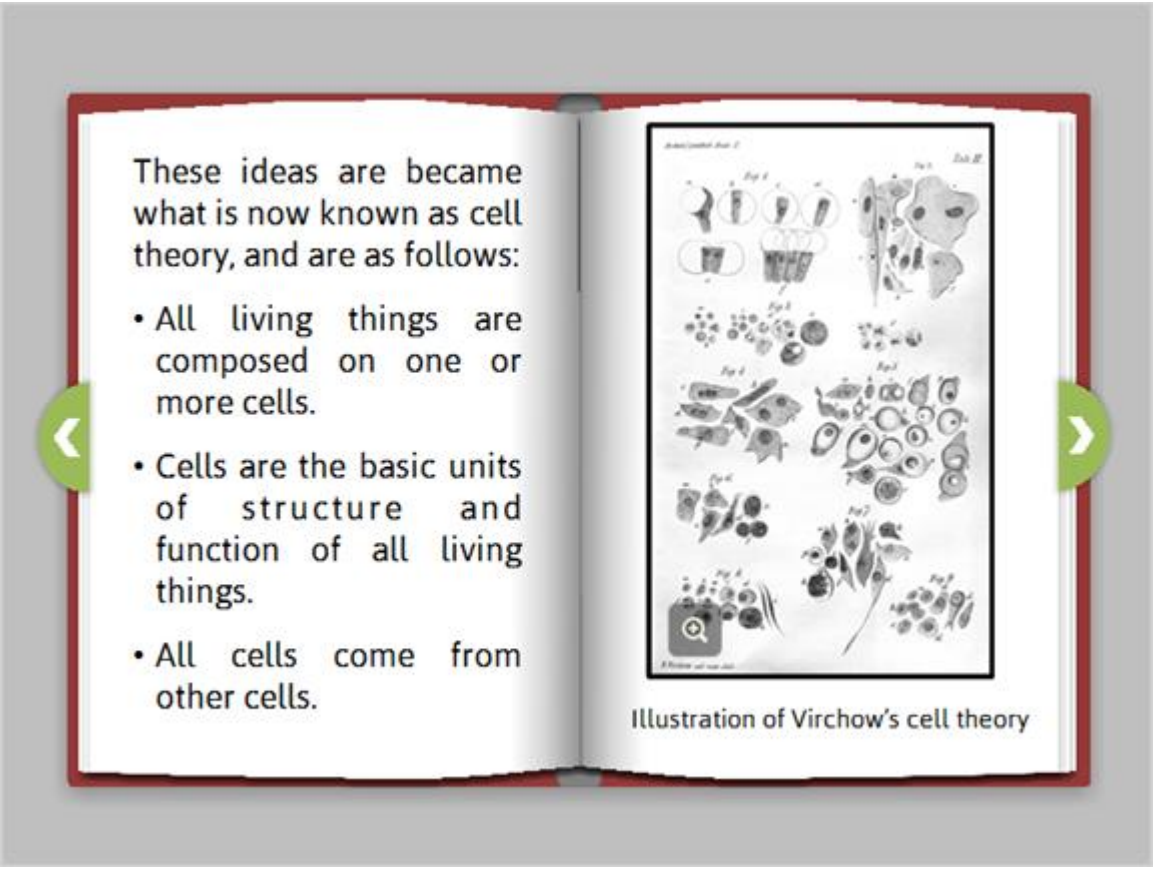

These ideas are became what is now known as cell theory, and are as follows:

- All living things are composed on one or more cells.
- Cells are the basic units of structure and function of all living things.
- All cells come from other cells.