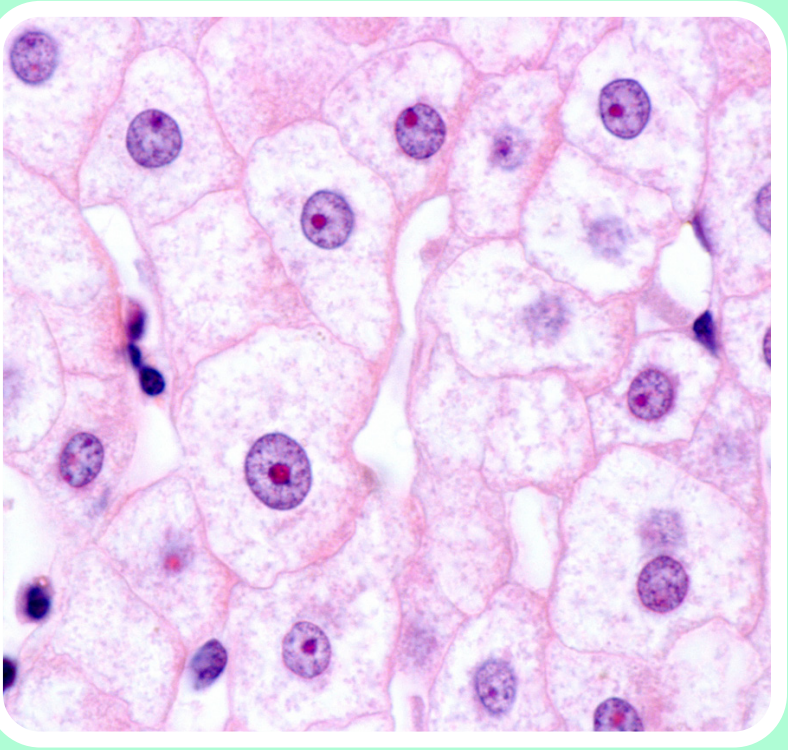
STEM Sims™

Cell Theory



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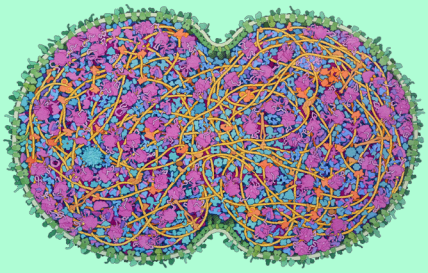
Do you need an idea for a scientific study?
Try out one of our ideas or make one of your own.

Cells make up every living organism. Take the following brief quiz to see how much you already know about the theory of cells. See the bottom of page 4 to check your answers.

1. Who is credited with first observing “cells” under a microscope, inspiring the name?
   a. Isaac Newton
   b. Robert Hooke
   c. Matthias Schleiden
   d. Theodor Schwann

2. Which scientist is known for contributing to cell theory while also inventing rebreathers for firefighters?
   a. Matthias Schleiden
   b. Theodor Schwann
   c. Robert Remak
   d. Rudolph Virchow

3. Before cell theory, a popular belief about how life arose was called the spontaneous generation theory. What was the main idea of this theory?
   a. Life came from outer space.
   b. Life appeared from non-living matter.
   c. Life was created by a divine being.
   d. Life evolved from simpler organisms.



4. What type of cells did Theodor Schwann have named after him?
   a. blood cells
   b. plant cells
   c. nerve cells
   d. skin cells

5. Anton van Leeuwenhoek is credited with being the first person to observed bacteria and some protozoa. What did Anton van Leeuwenhoek call the tiny organisms he saw swimming around in pond water?
   a. little beasties
   b. animalcules
   c. microscopic monsters
   d. tiny titans

Onion Skin Cell Safari: A Home Cell Investigation

Ever wonder what makes up a living thing? Dive into the microscopic world and explore the building blocks of life - cells! In this hands-on lab, you'll become a cell explorer, using a simple onion to uncover the hidden world of plant cells. With just a few household materials and a curious mind, you'll peel back the layers of an onion and discover the amazing world of cells that exists right before your eyes! Get ready for an "onion-believable" adventure!

Safety First!

- Always ask an adult for help when using a sharp knife.
- Iodine can stain, so handle it carefully and avoid contact with skin and clothes.

Materials

- A fresh onion
- A sharp knife (**Ask an adult for help with this!**)
- A clean glass slide and coverslip (if available, otherwise a clear plastic container will work)
- Tweezers (optional)
- A dropper or pipette
- Water
- Iodine solution (optional, can be found at a pharmacy)
- A light source (lamp or flashlight)
- A magnifying glass or a smartphone with a camera zoom function

Procedure

1. **Prepare the onion skin:** Ask an adult to carefully cut a small section from an onion. Peel off a very thin, transparent layer of the onion skin using tweezers or your fingers. This layer is only one cell thick!
2. **Mount the specimen:** Place a drop of water on the glass slide (or in the plastic container). Carefully lay the onion skin on the water drop, making sure it lies flat. If using a glass slide, gently place a coverslip on top to hold the onion skin in place.
3. **Stain the cells (optional):** If you have iodine solution, add a tiny drop to the edge of the coverslip. The iodine will stain the cells, making them easier to see.
4. **Observe the cells:** Hold the slide up to the light or shine a flashlight on it. Use your magnifying glass or zoom in with your smartphone camera to observe the onion skin.

Questions

1. Draw what you saw under magnification when you viewed the slice of onion skin.

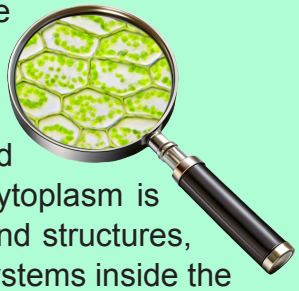
2. Were you able to identify individual cells? If so, what shape are the cells?

Cell Theory

A Tiny Discovery with a Big Impact!

Scientists are like detectives, always searching for clues and solving mysteries. Recently, they made an exciting discovery about cells that changes how we think about them!

You already know the basics of cell theory: all living things are made of cells, cells are the basic units of life, and new cells come from existing cells. But guess what? Cells are even more complex than we thought!



For a long time, scientists believed that the stuff inside cells, called cytoplasm, was like a jelly-like soup where everything floated around randomly. But new research using powerful microscopes shows that the cytoplasm is highly organized! It's more like a bustling city with different compartments and structures, all working together in incredible ways. Imagine tiny highways and delivery systems inside the cell, transporting materials exactly where they need to go. Picture tiny factories producing energy and building materials, all within the cell! This new understanding of cytoplasm organization is a

So, why is this discovery such a big deal?

- **Understanding Diseases:** Knowing how cells are organized helps us understand how diseases work. When things go wrong in the cell's transportation system or its factories, it can lead to illnesses. This knowledge can help scientists develop new medicines and treatments.
- **Creating New Technologies:** This discovery can inspire new technologies! By mimicking the cell's organization, engineers might create new materials and devices for energy production, drug delivery, and more.
- **The Mystery Continues:** This discovery opens a whole new world of questions for scientists to explore. How exactly do these structures work? How do they communicate with each other? What else is hidden within our cells?

This exciting discovery reminds us that even the tiniest things can hold the biggest secrets. Who knows what amazing things we'll learn about cells next? Maybe you'll be the scientist who makes the next big discovery!

Please visit our site for more helpful information:
STEMsims.com

Answers: **Page 2 Answers:** 1) b, 2) b, 3) b, 4) c, 5) b. **Page 3 Answers:** Onion Skin Cell Safari: A Home Cell Investigation 1) Answers will vary. 2) Answers will vary.