

STUDY GUIDE FOR UNIT 1 TEST

YOU WILL NEED TO STUDY THE FOLLOWING TOPICS (Use notes/worksheets/labs):

- Graphing and Variables
- Contributions of the Cell Scientists
- Microscope Parts and Rules
- The significance of the Cell Theory and the 3 parts of the Cell Theory
- Cell Parts and Functions
- Spontaneous Generation / Biogenesis - 2 Theories and 3 Scientists

THE FOLLOWING TERMS YOU WILL NEED TO KNOW TO ANSWER THE QUESTIONS.

1. **Independent Variable (Manipulated)** – the variable that is changed by the scientist.
2. **Dependent Variable (Responding)** – the results of the experiment. Responds to the changes in the independent variable (measurable)
3. **Standardizing Variable (Constants)** – factors that remain the same for each test.
4. **Control** - used as a standard of comparison
5. **Control Group** – a group that compares the changes to the test group
6. **Graph** – the comparison between two variables (Examples: line, bar, histogram)

Graphing and Variables Review

1. Squidward loves playing his clarinet and believes it attracts more jellyfish than any other instrument he has played. In order to test his hypothesis, Squidward played a song on his clarinet for a total of 5 minutes and counted the number of jellyfish he saw in his front yard. He repeated the experiment using a flute and a guitar. He also recorded the number of jellyfish he observed when he was not playing an instrument. The results are shown in the chart.

Instrument	# of Jellyfish
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Clarinet	20
Flute	14
Guitar	5

What is the independent variable?

The independent variable is the different instruments he used.

What is the dependent variable?

The dependent variable is that amount of jellyfish that came.

What is the control?

The control is the time when he wasn't playing any music.

What should Squidward's conclusion be?. Good conclusion should have: restate hypothesis and claim, explain experiment, and declare hypothesis correct or incorrect.

Squidward should conclude that if he plays the clarinet more jellyfish will come to him, rather than if he played the flute or guitar. For this experiment Squidward was playing different instruments, and he was seeing what instrument attracted the most amount of jellyfish. Even though squidward's chart said that the clarinet attracts the most amount of jellyfish, but the experiment is incomplete because the amount of jellyfish that were in the area at the different times he played each instrument were unknown. So maybe when he was playing the guitar that only 5 jellyfish were in the area at the time he played the guitar but there could have been 20 in the area when he played the clarinet. I declare squidward's hypothesis, that the clarinet attracts the most jellyfish to be partially correct because it isn't completely correct because the number of jellyfish that were there in the start aren't on the chart, but it did have the most amount of jellyfish.

2. A scientist wanted to show how different concentrations of salt water affected the growth of plants. Four plants of the same kind and size were placed in pots of the same size and the same amount of soil. Plant one was watered with plain tap water. Plants #2, #3, #4 were watered with the following salt concentrations...0.2% salt, 0.4% salt and 0.6% salt. All plants were watered every other day. The height of the plants was measured at the end of 3 weeks.

IV

The independent variable is the different concentration of water.

DV

The dependent variable is the height of each plant.

Control

The control is the plant watered with tap water.

Standardizing Variables

The same type of plant, size plant pot, amount of soil, watered on the same days, and amount of water.

From the problem above, if we were making a graph, label the

- X-axis

Concentration of salt water.

- Y-axis

Height of plant.

- Title

Plant sizes in 3 weeks after being watered with different concentrations of salt.

- What type of graph

Bar graph

The Microscope

1. State the functions of the following parts of the microscope:

- Diaphragm

Regulates how much light goes into a specimen.

- Eyepiece

Lens magnifies 10x

- Objectives

Has a lens and magnifies: Low power 10x, High Power 40x, Scanning power 4x.

- Nosepiece

Holds and changes the objectives.

- Body tube

Maintains distance between the Eyepiece and the Nose piece.

- Stage

Supports the slide.

- Base

Supports the entire microscope.

2. Using the high power objective on our microscopes, what is the total magnification?

Using the High Power objective on our microscopes is 400x.

3. List the 5 rules of using a microscope.

- Carry with one hand on the arm and one hand on the base.
- Never use the Coarse adjustment knob on High power
- Always store the microscope on Scanning power.
- When examining a specimen focus on Low power then switch to High power.
- When using the Coarse adjustment knob on Low power look from the side so you don't damage the lens.

History of the Cell

1. Explain in detail the contributions of the following scientists

- Robert Hooke

Robert Hooke was the first person to use the word "cell" to describe the little room like things inside of his piece of cork. And improved the compound microscope.

- Anton van Leeuwenhoek

Anton van Leeuwenhoek discovered the microscopic world, and looked at the first living cell.

- Hans Jansson

Hans Jansson and his son Zacharias made the first compound microscope.

- Matthias Schleiden

Matthias Schleiden discovered that all plants are made up of cells, and they are the basic building blocks of life.

- Theodor Schwann

Theodor Schwann discovered that all animals are made up of cells, and are the basic building blocks of life.

- Rudolph Virchow

Rudolph Virchow discovered that all cells come from other living cells.

2. State the 3 parts of the Cell Theory

All cells come from other living cells.
Cells are the basic unit of structure and function of all living things.
All living things are made up of one or more cells.

3. What have we learned about the cell with the advancement of technology?

We have learned a lot about the cell because of advances in technology. We have learned about all the tiny organelles and how they function because of new technology. Stem cell research can help modify the progression of certain cancers. We've also learned how cells work, and can help a cure be found for diseases. The human genome has been mapped, and we now know where genes were that influence different diseases. In conclusion, the advances in technology helped us learn about the cell a lot.

4. State the functions of the following cell parts.

Structure	Function
Nucleolus	Exact location of the DNA and chromosomes and ribosomes are made here.
Nucleus	Controls and directs all cell activities.
Nuclear membrane	Surrounds and protects the Nucleus.
Cytoplasm	The organelles float in it.
Cell membrane	Controls cell movement in and out of the cell.
Cell wall	Outermost layer of only plant cells.
Ribosome	Make proteins.
Mitochondria	Releases energy in the form of ATP.
Endoplasmic Reticulum	Transports materials from one part of the cell to the other.
Golgi Apparatus	Releases gases from the cell.
Lysosome	Breaks down foods, bacteria, and worn out parts of the cell.
Chloroplast	Site of photosynthesis.
Vacuole	Stores water and takes up 90% of a plant cell.

5. What organelles are just in a plant cells?

Cell Wall, Chloroplast.

6. What organelle is just in an animal cell?

Lysosomes.

7. How are the cell wall and the cell membrane similar? How are the cell wall and the cell membrane different?

The cell wall and cell membrane are very similar and very different. The cell wall is only found in plant cells and is the outermost layer of the cell. But, the cell membrane is found in plants and animal, but is right underneath the cell wall. In addition, the cell wall doesn't let anything through the cell, but the cell membrane lets some things pass through and controls movement in and outside of the cell. In conclusion, the cell wall and cell membrane are alike and very different.

Spontaneous Generation and Biogenesis

1. Define:

- Spontaneous Generation

Spontaneous Generation is a theory that was just recently proved to be incorrect because it states that living things can be generated from nonliving things.

- Biogenesis

This is a theory that states that living things can only come from other living things.

2. Explain the experiments of the following scientist.

Francesco Redi

Francesco Redi put meat in a jar that was open, one that was completely sealed off, and one that was with gauze so the maggots could smell the meat but not get in. And if Spontaneous Generation was possibly all of the jars even the sealed ones would have life on them, but the sealed ones didn't have anything on them.

Lazzaro Spallanzani

Lazzaro Spallanzani boiled broth to kill all of the organisms that may have been in the broth, and then opened the bottles. When he opened the bottles air came in and organisms grew because the broth was no longer sealed. But the other bottle had nothing growing in it because it wasn't opened. This proved Francesco's experiment. But Spontaneous Generation was not disproved.

Louis Pasteur

Louis Pasteur used beef broth and long neck flasks that were curved with a thin opening. He did this because air could get in but dust and other organisms got caught in the curved neck. So nothing grew until the neck was broken off. So this experiment showed that organisms can only grow if they come into contact with a living organism.

3. Why did it take so long to disprove the Theory of Spontaneous Generation?

It took so long to disprove the Theory of Spontaneous Generation because of many things. But Kings and Queens were in power and they didn't want the masses of people to be intelligent so they tried to stop it. They did this because they didn't want to lose their power. That is why it took so long to disprove the theory of Spontaneous Generation.