Answer Key

Cell Theory and Microscopes

Review Questions

1. Why is Redi’s experiment on spontaneous generation considered a controlled experiment?

It is considered a controlled experiment because he only changed one variable (presence or absence of a screen) and had a control (no screen).

1. How did the design of Pasteur’s flask help him successfully refute the hypothesis of spontaneous generation?

Air was still able to access the broth but because of the shape of the flask, the microbes were not able to enter. The broth stayed clear; therefore, spontaneous generation did not occur.

1. Why is it advantageous for scientists to test only one variable at a time during an experiment?

To understand what is causing the change. If more than one variable is changed, it cannot be determined which variable is causing the results.

1. What are some advantages and disadvantages of light microscopes and electron microscopes?

Light Microscope

Advantage= can be used on living material, inexpensive

Disadvantage= less magnification

Electron Microscope

Advantage= higher magnification, 3D images

Disadvantage= cannot be used on living material, expensive

1. Explain why you cannot draw a conclusion about the effect of one variable in an investigation when the other key variables are not controlled.

All variables but one have to be controlled, otherwise you cannot be sure what is causing the change,

1. What three statements make up the modern cell theory state?
2. All living things are made of cells
3. The cell is the basic unit of structure and function in all living things
4. All cells come from pre-existing cells
5. What are the differences between prokaryotic and eukaryotic cells?

Prokaryotic= no true membrane bound nucleus

Eukaryotic= true nucleus