

The Cell : Notes/W.S.-10

Living and Non-living things

In general, living things have two main characteristics. They can grow, and reproduce (produce young).

The Cell

The cell is the basic unit of living things. The cell theory states that all living things (plants and animals) are made up of cells. A living organism such as an egg or a bacteria contains only one cell. Larger organisms such as humans contain about 6.0×10^{13} cells.

Generally, cells are too small to be seen. Egg cells are an exception. Birds eggs can be several centimeters across. A human egg is only about 0.1 mm across. The human eye can just see a human egg. Most cells are much smaller than this and can only be seen by using a microscope. In the human body, most cells are a few microns across. (one micron = 1.0×10^{-6} m).

A light microscope can magnify an object by a factor of 700 times. A more powerful electron microscope can magnify an object by up to 700,000 times.

Problems:

1) Give two characteristics of living things. _____,
_____.

2) Label the following as living (L) or non-living (N).

trees _____, eggs _____, wood _____, amoeba _____, crystals
_____, mushrooms _____.

3)a) What is a cell? _____

b) What is the cell theory? _____

4) Name two living things that contain only one cell. _____,
_____.

5) How many cells make up the human body? _____

6)a) Give the magnification for an object seen using a light microscope.

b) Give the magnification for an object seen using an electron microscope. _____

c) Using a light microscope, how big will a 0.05 mm object seem to be?

d) The eye can see an object 0.1 mm across without a microscope. If a light microscope is used, what size object can the eye now see?

7) In terms of cells, why is a whale bigger than a dolphin? (Assume that all cells are approximately the same size)

_____ .

Answers: 1) Living things grow and reproduce., 2) L, L (unless cooked!), N, L, N, L, 3)a) It is the basic unit of living things., b) It is the theory which states that all living things (plants and animals) are composed of cells., 4) eggs and bacteria, 5) 6.0×10^{13} , 6)a) 700, b) 700,000, c) $700 \times 0.05 = 35$ mm, d) $0.1 \text{ mm} / 700 = 1.4 \times 10^{-4}$ mm, 7) Whales contain more cells.