Kemnal Technology College

Year 9 term 1 – Kemnal Keys

ambitious minds

Biology

1

Animal Cells: Nucleus, cell membrane, cytoplasm, mitochondria and ribosomes.
Plant Cells contain all the above as well as cell wall, vacuole and chloroplasts.
Cell → Tissue → Organ → Organ System → Organism

2

Cells **differentiate** to become **specialised**.
Differentiation is the process where a cell changes to become specialised for its job. E.g. root hair cells are specialised for absorbing water and minerals because of the large surface area.

3

Light microscopes use light and lense to form an image of a specimen and magnify it.
Magnification = Image Size / Real Size

Electron microscopes use electrons instead of light to form an image. They have a much higher magnification.

4

Mitosis is a process of cell replication, where one cell divides into **two** genetically **identical** daughter cells. In the various stages of **mitosis**, the cell's chromosomes are copied and then distributed equally between the two new nuclei of the daughter cells.

5

Stem cells are found in early human embryos. These stem cells are **undifferentiated**, and can divide to produce lots more undifferentiated cells which can then become specialised.

Chemistry

The atomic number = number of **protons**

The mass number = number of **protons** + number of **neutrons**

Number of protons = number of **electrons**

Particle	Relative Mass	Relative Charge
Proton	1	+1
Neutron	1	0
Electron	Very Small	-1

Electrons always occupy shells (energy levels
The lowest energy levels are always filled first (closest to nucleus)
1st Shell: 2
2nd Shell: 8
3rd Shell: 8

In 1896 **Mendeleev** arranged 50 known elements into his table of elements. With various gaps.

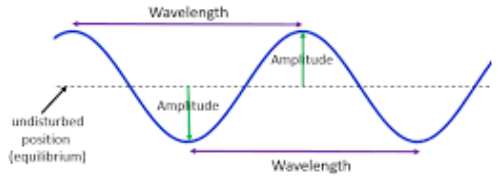
He arranged them by order of atomic mass.

Metals are elements which can form positive ions when they react.
They're towards the bottom and to the left of the periodic table
Most elements in the periodic table are metals
Non-metals are at the far right and top of the periodic table
Non-metals don't generally form positive ions when they react

Physics

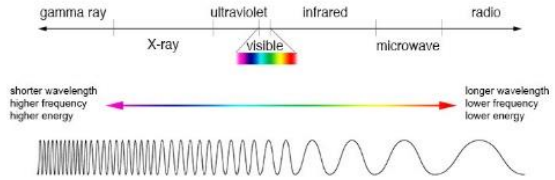
Transverse Wave – a wave with undulations that are at right angles to the direction of the wave travel.
Longitudinal Wave – a wave with vibrations that are parallel to the direction of wave travel

Waves transfer energy from place to place



Light – a wave produced by luminous objects, which always travels in a straight line.
All light rays reflect at the same angle along a smooth surface e.g. mirror. A rough surface will cause light rays to reflect in many different directions.
Angle of incidence = angle of reflection

Electromagnetic spectrum



A perfect **black body** is an object that absorbs all of the radiation that hits it. No radiation is reflected or transmitted.

Quiz Time

Week 1 Quiz

1. Identify 3 organelles plant cells have that animal cells do not.
2. Cells. _____ Organ _____. Fill in the gaps.
3. Atomic Mass = number of protons + _____
4. Describe the difference between transverse and longitudinal waves
5. Describe the role of the nucleus.

Week 2 Quiz

1. Identify the process in which cells become specialised.
2. Describe how a specialised cells is adapted for its role.
3. Draw and label a transverse wave
4. What is the relative mass for a Proton, Neutron and Electron?
5. What is the charge of a Proton, Neutron and Electron?

Week 3 Quiz

1. How many electrons are in the 2^{nd} shell?
2. Which electron shell has the lowest energy level?
3. What is the law of reflection?
4. Identify the differences between a light microscope and electron microscope
5. Describe how light rays reflect of smooth and rough surfaces

Week 4 Quiz

1. Identify the waves of the EM spectrum
2. Describe the process of Mitosis
3. Describe how Mendeleev arranged the periodic table from 1896
4. Describe the mass and charge of protons, neutrons and electrons
5. Draw and label an animal cell.

Week 5 Quiz

1. Describe a perfect black body
2. Describe the layout of the current periodic table
3. Describe a stem cell
4. Explain and compare the positives and negatives of using stem cells in research.
5. Draw and label an atom, include charges.

Week 6 Quiz