

Unit 1 – Life's History – A Review

	Beginning (1)	Developing (2)	Accomplished (3)	Exemplary (4)
<50%	50-65%	65-75%	75-90%	90-100%
I have not achieved a standard described by any of the descriptors to the right.	<p>I am able to:</p> <p>state scientific knowledge</p> <p>apply scientific knowledge and understanding to suggest solutions to problems set in familiar situations</p> <p>interpret information to make judgments.</p>	<p>I am able to:</p> <p>outline scientific knowledge</p> <p>apply scientific knowledge and understanding to solve problems set in familiar situations</p> <p>interpret information to make scientifically supported judgments.</p>	<p>I am able to:</p> <p>describe scientific knowledge</p> <p>apply scientific knowledge and understanding to solve problems set in familiar situations and suggest solutions to problems set in unfamiliar situations</p> <p>analyse information to make scientifically supported judgments.</p>	<p>I am able to:</p> <p>explain scientific knowledge</p> <p>apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations</p> <p>analyse and evaluate information to make scientifically supported judgments.</p>

Beginning and Developing

Defining Life:

All living things are made up of Cells

	Definition	Kingdom(s)	Additional Notes
Unicellular	life made of a single cell	Archaea, Bacteria, Eubacteria	Protista (most) + Fungi (some) ^{ex Yeast}
Multicellular	life made of many cells	Fungi, Plantae, Most Fungi	some Protista (ex algae)
Prokaryotic	no nucleus or membrane bound organelles	Archaea, Eubacteria	* have cell membrane, cell wall and ribosomes
Eukaryotic	have organelles + nucleus	Protista, Animal, Plant, Fungi	larger

- Name the theory that explains how the first eukaryotic cell evolved Endosymbiosis
- Are all prokaryotic organisms unicellular? True
- Are all eukaryotic organisms multicellular? False (Protists are Eukaryotic and unicellular)
- Which Kingdoms contains both unicellular and multicellular organisms Protista and Fungi
(most uni) (most multi)

All living things Reproduce

	Definition	Advantages	Disadvantages
Asexual	only 1 parent cell	less nrg + not mate	reduced diversity
Sexual	requires 2 parent cells	increase diversity	nrg + need mate

- How do unicellular organisms reproduce? Binary Fission / Asexual Mitosis
Bacteria Protista

All living things Grow and Develop

	Definition
Direct Development	Body Plan/Form stays same but gets larger
Indirect Development	Several complete changes to body form

All living things obtain and use energy

	Definition	Example
Anabolism	chem. rxn form more complex molecule	$A+B \rightarrow AB$ photosynthesis
Catabolism	chem. rxn breaks down complex molecules	$AB \rightarrow A+B$ cell respiration
Metabolism	all chem. rxn a cell does	all chemical reactions

All living things respond to their environment

	Definition
Stimulus	evokes a specific functional rxn in an organ, tissue, cell
Homeostasis	maintaining stable internal conditions ideal for that cell / organism

All living things contain DNA

	Definitions
Gene	Genome = Book Chromosome = Chapters Gene = Sentences section of DNA that codes for a protein
Genome	all genetic material in an organism
Chromosome	genome of eukaryotic cells is split into chromosomes that are supercoiled DNA

True or False: Rewrite the false statements to make them true

- Life requires oxygen? F not aerobic organisms (Some)
- Maintaining an equilibrium with its environment is important for life? F (Homeostasis)
- The first life was prokaryotic? T
- Life is made of cells? T
- Cells can be made from organic matter F (are made up of)
- Sexual reproduction is better than asexual reproduction F ^ sometimes
- Only single celled organisms reproduce asexually F
- Cells ~~is~~ a multicellular organism are different because of different genetics F cell differentiation
- Proteins code for genes F genes proteins
- DNA is made of Chromosomes F
- DNA evolved before the first cells T
- Animals were the first consumers F

(replace to make true)

Bacteria

Cell Structure

	Function	Indicate all, some or none for cells from each Kingdom					
		Eubacteria	Archea	Protista	Fungi	Plantae	Animalia
Cell wall	rigid + protect	✓	✓	some	✓ chitin	✓ cellulose	
Cell membrane	semipermeable	✓	✓	✓	✓	✓	✓
Nucleus	protect + hold DNA			✓	✓	✓	✓
Mitochondria	cellular respiration			✓	✓	✓	✓
Chloroplast	photosynthesis			some		✓	
Golgi Apparatus	package + export			✓	✓	✓	✓
Endoplasmic Reticulum	helps in protein synth			✓	✓	✓	✓
Ribosome	actually synth the protein	✓	✓	✓	✓	✓	✓

What are the basic components of a cell membrane? Protein and phospholipids

What is the Fluid Mosaic Model of the cell membrane? double layer of lipids w/ proteins moving throughout

Kingdoms of Life

Kingdom	Unicellular/Multicellular	Prokaryote or Eukaryote	Cell Wall	Cell Energy
Eubacteria & Archea	all uni	prok	Yes + vary	all variations 1+2
Protista	Mostly unicellular	euk	some + vary	all variations / mostly aerobic
Fungi	most multi	euk	Chitin	Heterotrophic decomposer mostly aerobic
Plantae	all multi	eukaryotic	Cellulose	phototrophic + aerobic
Animalia	all multi	euk	None	consumer + aerobic

Timeline of Life

***Ask me for the set of events papers and practice putting them into order.

Endosymbiont Theory

This theory explains the evolution of the first Eukaryotic cells.

Prior to the first eukaryotic cells, all of the cell energy reactions and diversity seen in life today already existed in prokaryotic cells but they lacked specialized organelles.

The nucleus is believed to have formed as a result of endosymbiosis between prokaryotes but there is recent evidence that suggests that it might actually be the result of a symbiosis with a virus

The origin of the mitochondria is thought to be an engulfed aerobic prokaryote

It also states that the origin of the chloroplast occurred when a large consumer prokaryote, engulfed a photo autotrophic prokaryote and they formed a symbiotic relationship.

Cell Energy

Step 1 -				
Definition		Definition		Kingdoms
Heterotroph Auto	make nrg molecule	Chemotroph	chem nrg to make	some bacteria
		Phototroph	sun nrg to make	all plants
Autotroph Hetero	take nrg molecule	Decomposer	digest then ingest	all fungi
		Consumer	ingest then digest	all animals
Step 2 -				
Definition		Most Common Rxn		Kingdoms
Anaerobic	rxn w/out O ₂ to release nrg	Fermentation		most Archea some Eubac others rare
Aerobic	rxn with O ₂ that releases nrg	Cellular Respiration		all have at least some

some bacteria + protista

Accomplished

Single celled organisms are limited in size state the two reasons AND explain each

What is the advantage of being multicellular?

Compare and Contrast prokaryotic and eukaryotic cells?

Outline the evidence of the Endosymbiotic Theory?

Which had to have evolved first, Plants or Animals? Explain

What evidence resulted in the 5 Kingdoms of life becoming 6 Kingdoms

The cell membrane contains proteins. What is the connection between the permeability of a membrane and cell control?

How is it that bacteria respond to a stimulus?

Two of the following will be asked on the Test

1. Outline the evidence of the Endosymbiotic Theory? //5
2. Relate diversity in cell functions, cell membrane structure, and genetics. //5
3. What are the two required elements of cell energy and the diversity of these that we see in living cells today //5
4. Cells became multi-cellular rather than larger, explain why? //5
5. Why do we see fungi like plant like and animal like cells in kingdom protista but in the multicellular kingdoms all cells are of one type //5

Exemplary - Extensions

How is chemistry related to cell control?

Why is cell energy required to maintain homeostasis?

Why do scientists believe that the symbiosis of an aerobic bacteria occurred before the symbiosis of a photosynthetic bacteria?

What is the connection between the evolution of Cellular Respiration and the evolution of Multicellularity?