

Biology II - Classification, Virus and Bacteria Study Guide

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Card 1: Virus

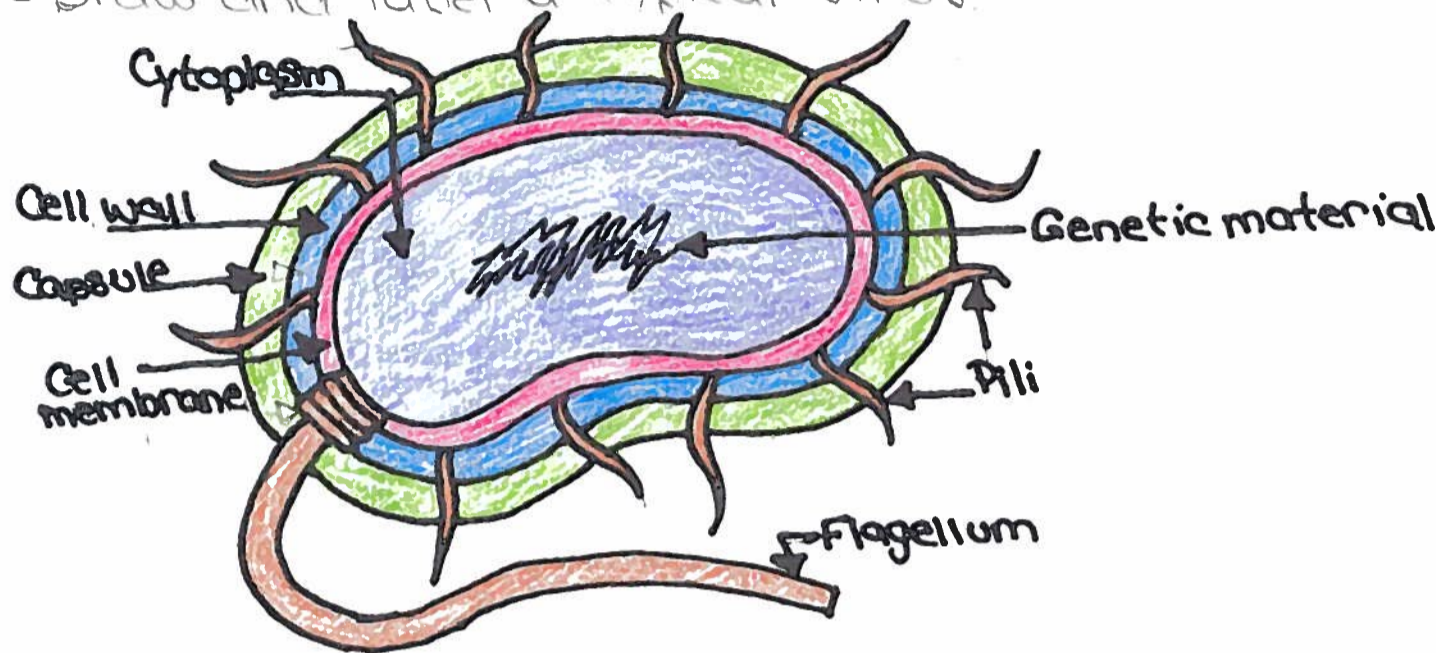
- Living or Non-Living?

↳ Not considered living, but they do reproduce

- Origin of viruses?

↳ It's difficult to determine the origin of viruses because viruses have been around for 3.5 billion years.

- Draw and label a typical virus.



- Describe the steps of a virus 'life' cycle.

↳ Virus attaches to DNA.

↳ The DNA duplicates

↳ The cell membranes grow.

↳ Cell material begins to fill space between DNA

↳ Cytoplasm is divided in two.

↳ Two new cells are formed.

- Viral specificity.

↳ means that a virus is selective in the organisms it infects, the type of cells and the disease it produces.

(ie: rabies infects the central nerve system)

Card 2: Classification

- Name the 3 domains of the tree of life and list the kingdoms.

Bacteria	Archaea	Eukaryota
- Cyanobacteria	- halophiles	- chromists
- heterotrophic bacteria	- thermophiles (live in extreme environmental conditions)	- plants
		- animals
		- fungi
		- alveolates
		- rhodophytes
		- flagellates
		- basal protists

↳ difference between Prokaryote and eukaryote cells.

↳ Prokaryote → single-celled organism that lack a true nucleus

↳ Eukaryote → Organisms whose cells contain a membrane-bound nucleus.

- Name the 7 levels of classification:

• Kingdom • Phylum • Class

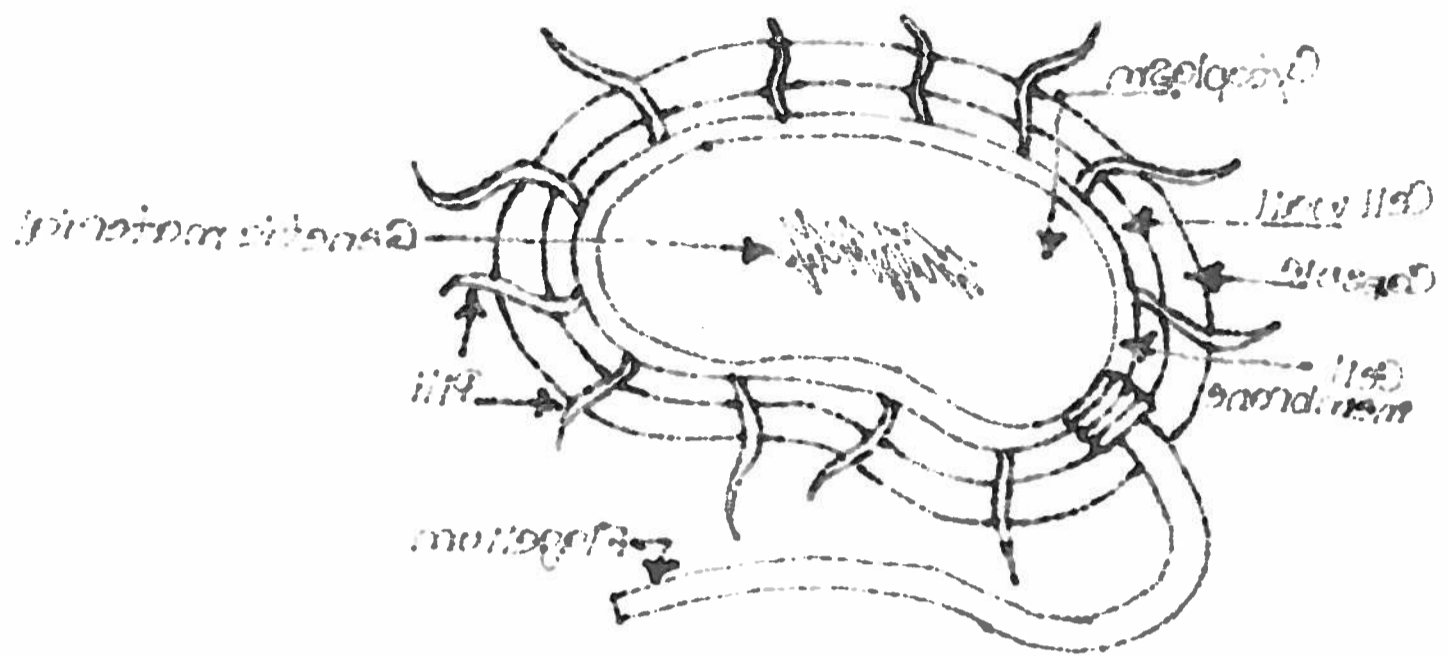
• Order • Family • Genus

• Species.

- PHYLOGENY → the branch of biology that deals with phylogenesis.

- BINOMIAL NOMENCLATURE → The system of nomenclature in which two terms are used to denote a species of living organism, the first one indicating the genus and the second an epithet.

- TAXONOMY → The branch of science concerned with classification, esp. of organisms; systematics



Card 3: Science Processes

- Starting point for scientific inquiry:
 - ↳ Learner Engages in Scientifically Oriented questions.
 - ↳ Learner formulates explanations from evidence.
 - ↳ Learner Communicates and Justifies explanations.
- Independent, Dependent, Controlled Variables
 - ↳ Independent → something you change on purpose during a lab.
 - ↳ Dependent → the thing you are trying to find out during a lab
 - ↳ Controlled → the thing that stays the same during the whole lab
- Experimental and control group:
 - ↳ Experimental → The experimental group is the group that you subject to the variable with which you are experimenting.
 - ↳ Control → The control group is a group that nothing happens to.

→ Learner gives priority to evidence in responding to questions.

→ Learner connects explanations to Scientific knowledge.

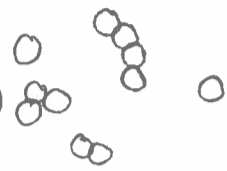
Card 4: Bacteria → general characteristics.

- Characteristics common to bacteria:

- ↳ Bacterial cells are prokaryotic. All bacteria are basically single celled.
- ↳ The cytoplasm of bacterial cells contains no membrane-bound organelles
- ↳ Bacterial cells have a single chromosome
- ↳ Most bacteria reproduce by binary fission
- ↳ Bacteria show great metabolic diversity.

- Bacterial shapes:

↳ Cocci (round)



↳ Bacilli (rod)



↳ Spirilla (spiral)



- Bacterial requirements for life:

↳ obligate aerobes → requires oxygen for respiration

↳ obligate anaerobes → conduct respiratory processes in the absence of oxygen

↳ facultative anaerobes → prefer environments with oxygen, but can live in environments with reduced oxygen levels

↳ fermentation → is a chemical change caused by bacteria and yeasts in which a carbohydrate, usually a sugar, is changed to ethyl alcohol (ethanol) and CO₂

- Symbiotic vs. Non-symbiotic

↳ Symbiotic → either one or both organisms require the relationship

↳ Non-symbiotic → neither organisms require the relationship.

- How do bacteria consume nutrients? Considered decomposers?

↳ Most bacteria consume things already dead.

↳ Considered decomposers because they decompose stuff like shed skin, carcasses, and plant bits such as leaves

Card 5: Bacteria → Reproduction.

- Binary Fission:

- ↳ Attaches to the DNA
- ↳ DNA duplicates
- ↳ Cell membranes grow
- ↳ Cells divide into two
- ↳ Two new cells.

- Conjugation:

- ↳ Attaches to DNA
- ↳ DNA duplicates
- ↳ Virus hides in DNA
- ↳ Virus is released from cell

Asexual

Sexual

- Bacteria survival:

- ↳ Binary fission → reproduces bacteria by dividing into two cells
- ↳ Conjugation → reproduces bacteria by exchanging DNA between two cells
- ↳ Endospores → contains genetic material.

- Bacterial Growth Rates:

- ↳ Lag Phases → Bacteria adapt themselves to growth conditions
- ↳ Growth Phase → Bacteria grows within their conditions
- ↳ Death Phase → Bacteria runs out of nutrients and die.

Card 6: Bacteria - what and why

- 2 diseases caused by bacteria:

↳

↳

- 3 ways bacterial growth can be controlled:

↳ Amount of nutrients

↳ Temperature

↳ Space

- How does penicillin 'kill' bacteria:

↳ Because penicillin has a beta-lactam ring which prevents bacteria

- How does bacteria become resistant to antibiotics?

↳ Survival of the fittest

↳ Bigger colonies are stronger and become more immune to antibiotics.

- Survival of the fittest?

↳ The bigger the colonies the stronger the colonies get

- Why might cattle be feed antibiotics and why might this be a concern for humans?

↳ Cattle are feed antibiotics to assist the animals' growth and subsequent weight gain and also to help livestock survive in the harsh farming conditions through antibiotic treatment

↳ This is a concern for humans because many of the antibiotics given to livestock are the same drugs used to cure human afflictions like urinary tract infections and pneumonia.