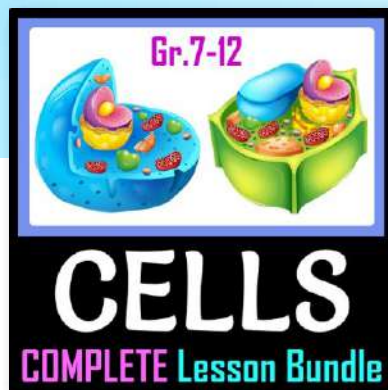


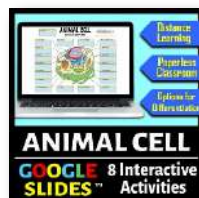
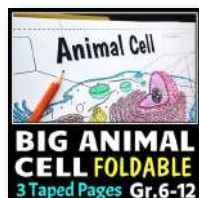
OTHER CELL RESOURCES by Tangstar Science



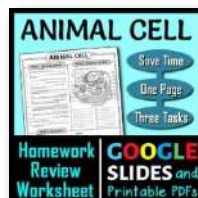
These **24 RESOURCES** are sold individually or found in the **CELLS BUNDLE** for over **40% OFF**.

20 OF THESE RESOURCES HAVE OPTIONS FOR **GOOGLE DRIVE / CLASSROOM**.

Teaching the Topic Interactive Learning/Review



Homework, Review, Test Prep



Early Finishers, Bonus Work



Science Article



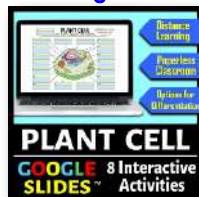
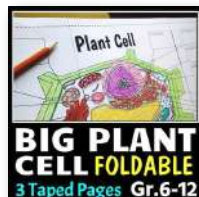
Science Article



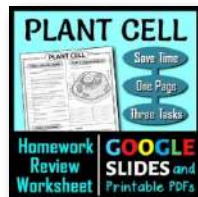
Science Article



Teaching the Topic Interactive Learning/Review



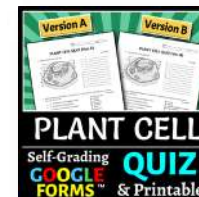
Homework, Review, Test Prep



Early Finishers, Bonus Work



Assessment



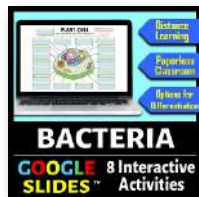
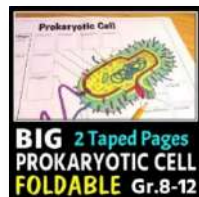
Group Review Game



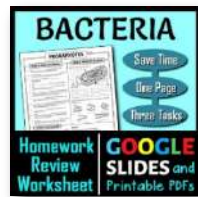
Science Article



Teaching the Topic Interactive Learning/Review



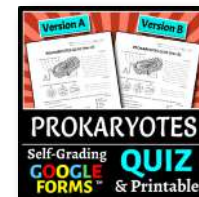
Homework, Review, Test Prep



Early Finishers, Bonus Work



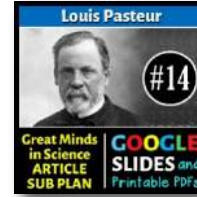
Assessment



Solo/Pair Review Game



Science Article



RESOURCE 1: TEACHING THE TOPIC - Big Animal Cell Foldable

3 pages **cut out** and **taped** together.

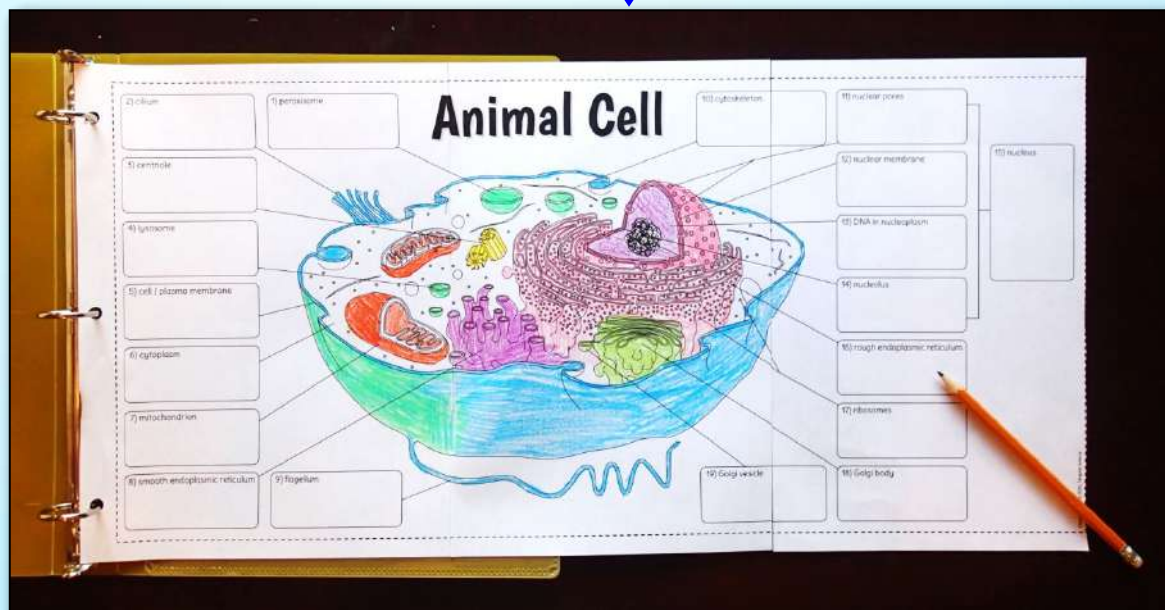
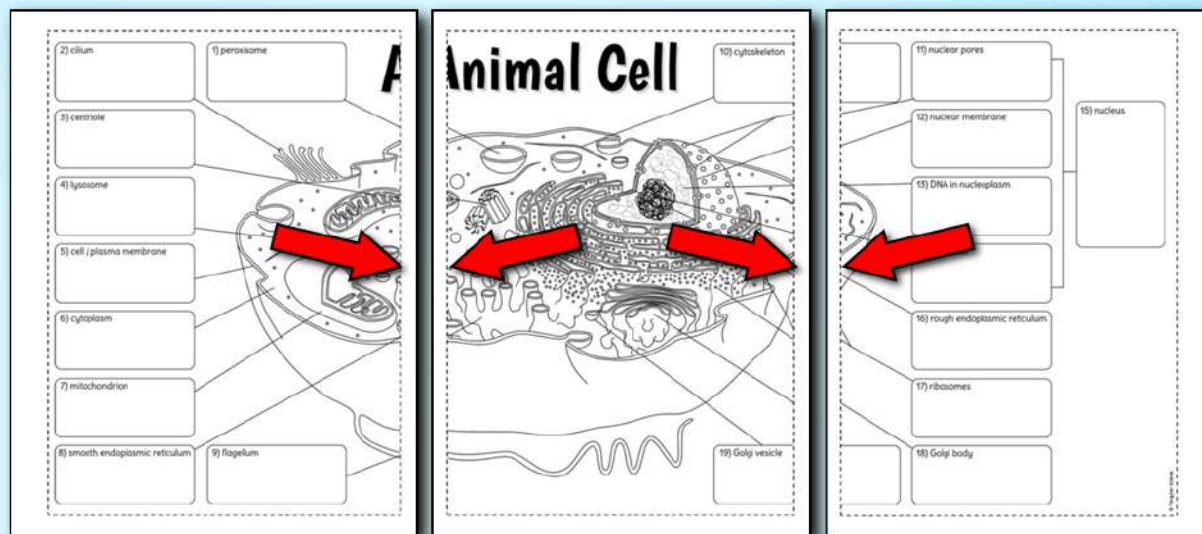
then...

Put in a **Binder**.

OR

Put in an **INB**.

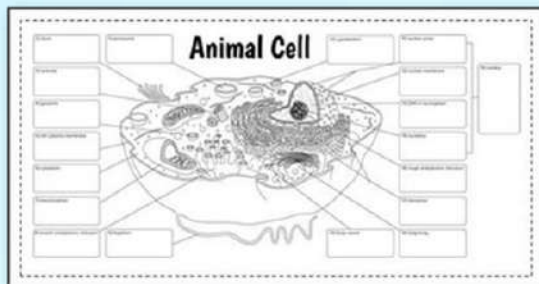
**Printable
PDFs**



RESOURCE 1: TEACHING THE TOPIC - Big Animal Cell Foldable

There are many **foldable options** for differentiation and **full answer keys** are provided for all options.

Image, Boxes and Labels



Image, Boxes and Underlines

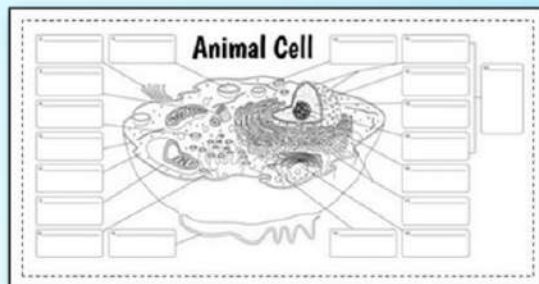


Image and Boxes

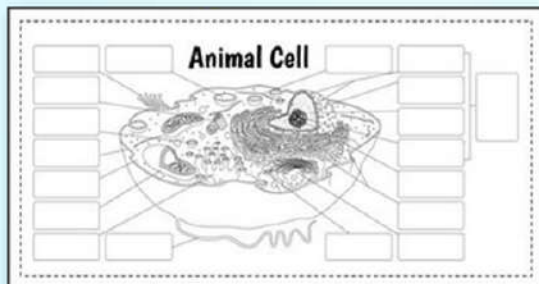


Image Only

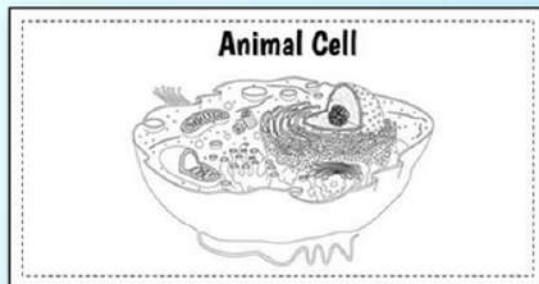


Image and Underlines

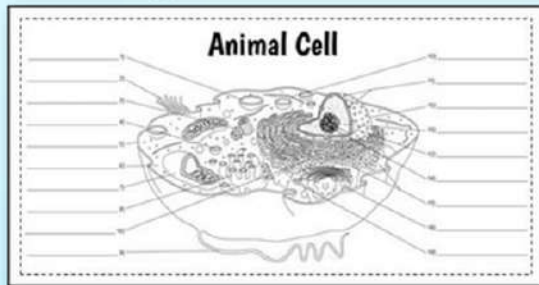
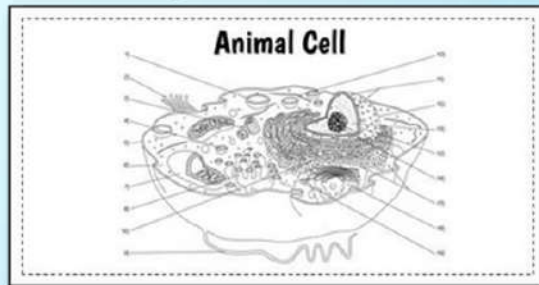


Image and Numbers



RESOURCE 2: TEACHING THE TOPIC - Big Plant Cell Foldable

3 pages **cut out** and **taped** together.

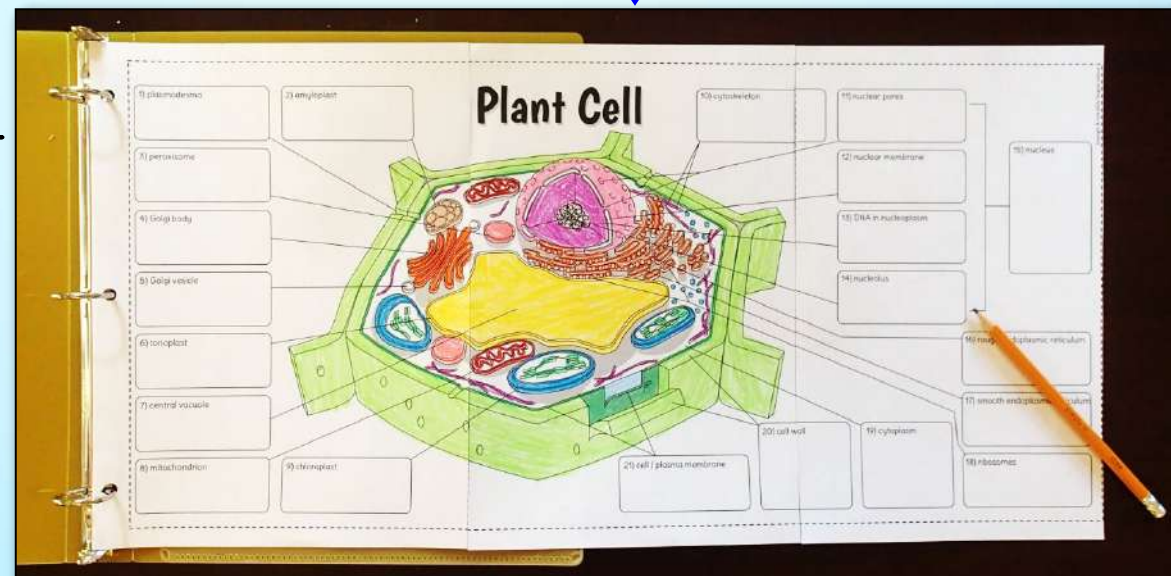
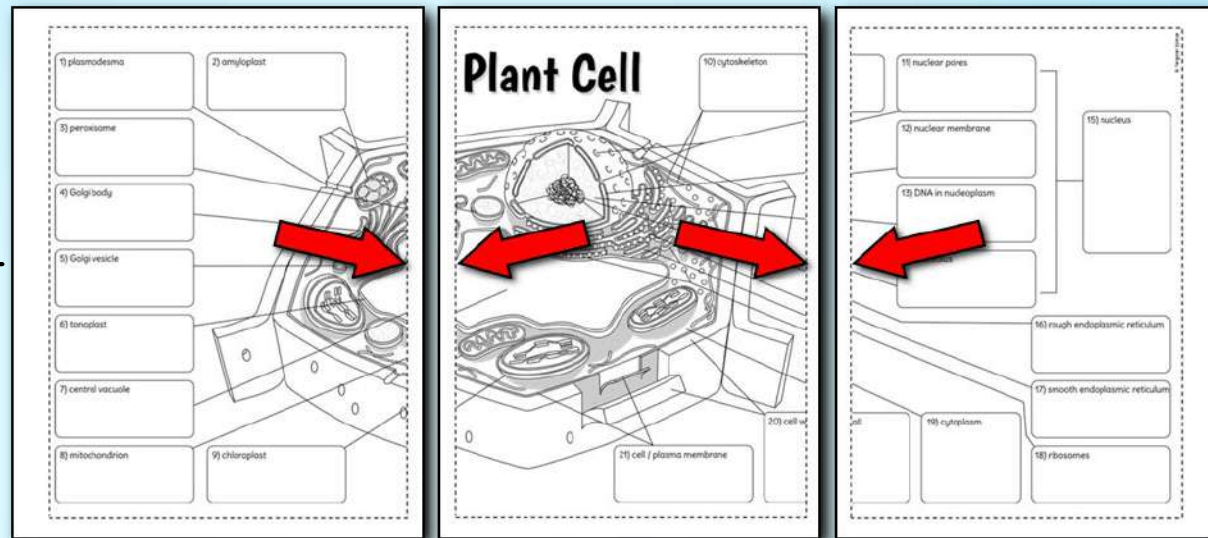
then...

Put in a **Binder**.

OR

Put in an **INB**.

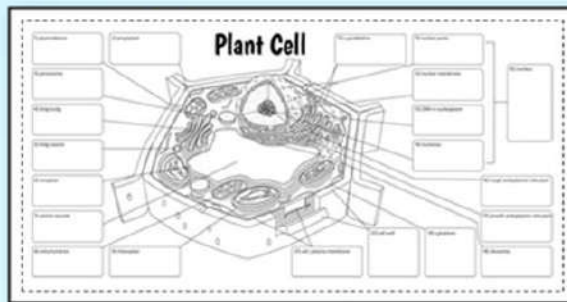
**Printable
PDFs**



RESOURCE 2: TEACHING THE TOPIC - Big Plant Cell Foldable

There are many **foldable options** for differentiation and **full answer keys** are provided for all options.

Image, Boxes and Labels



Image, Boxes and Underlines

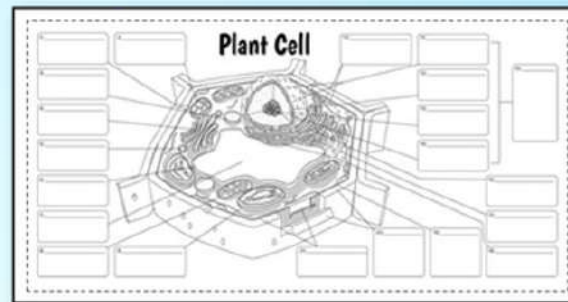


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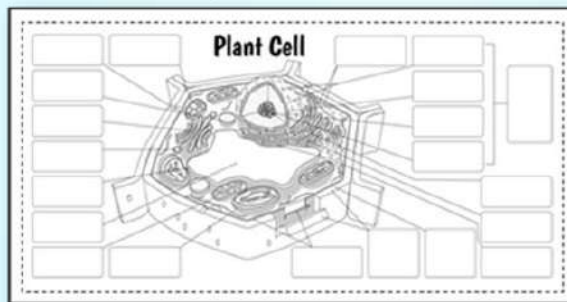


Image Only

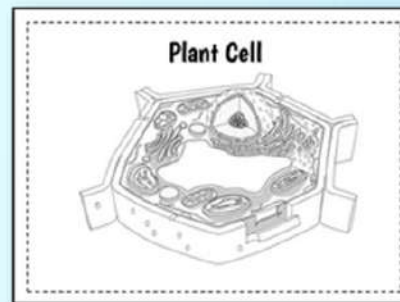


Image and Underlines

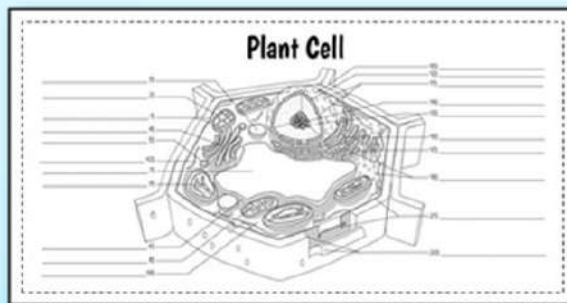
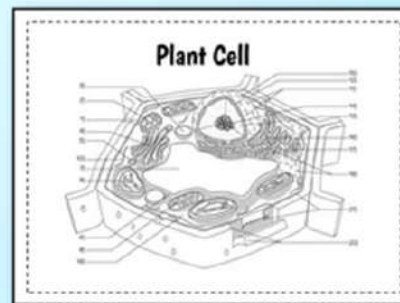


Image and Numbers



RESOURCE 3: TEACHING THE TOPIC - Big Prokaryotic Cells Foldable

2 pages **cut out** and **taped** together.

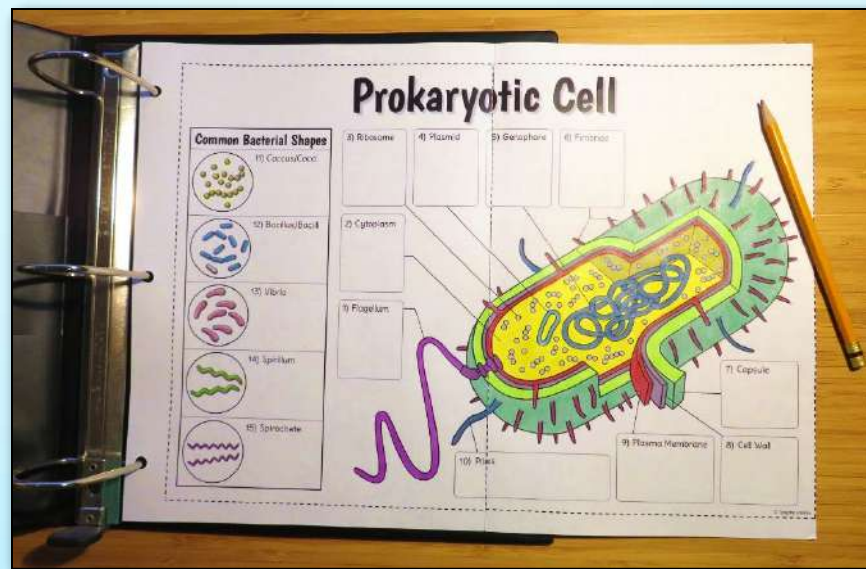
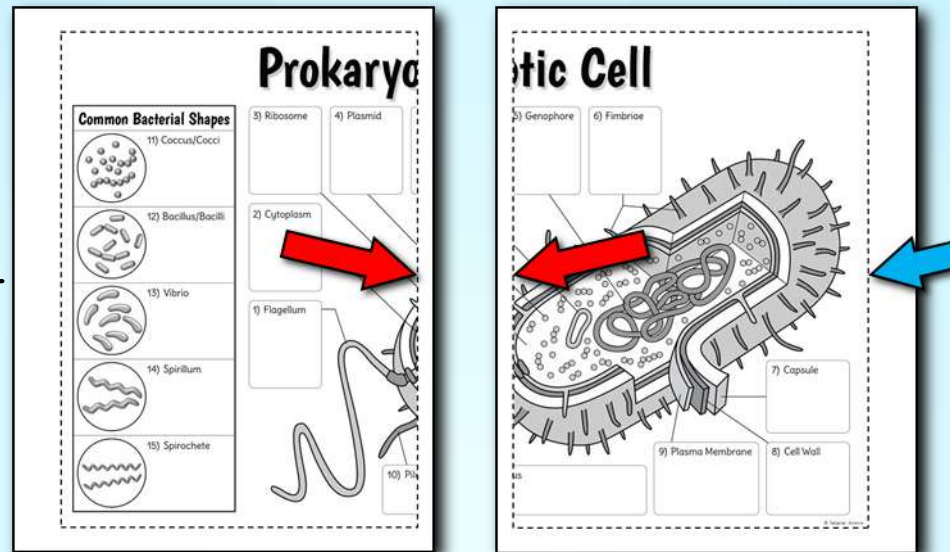
then...

Put in a **Binder**.

OR

Put in an **INB**.

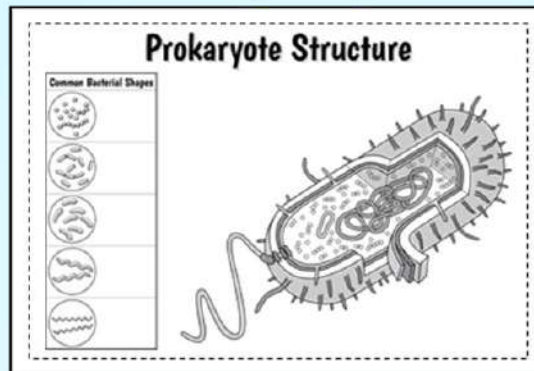
**Printable
PDFs**



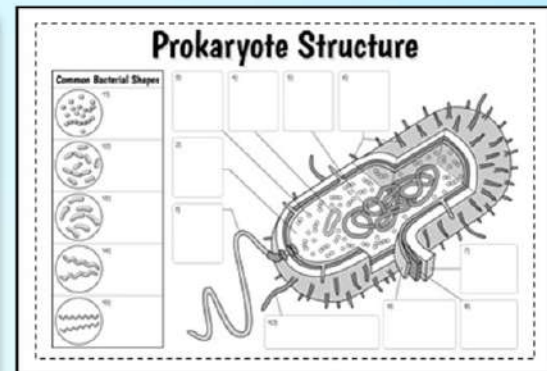
RESOURCE 3: TEACHING THE TOPIC - Big Prokaryotic Cells Foldable

There are many **foldable options** for differentiation and **full answer keys** are provided for all options.

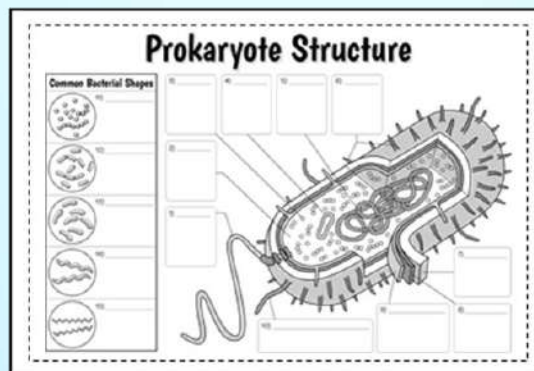
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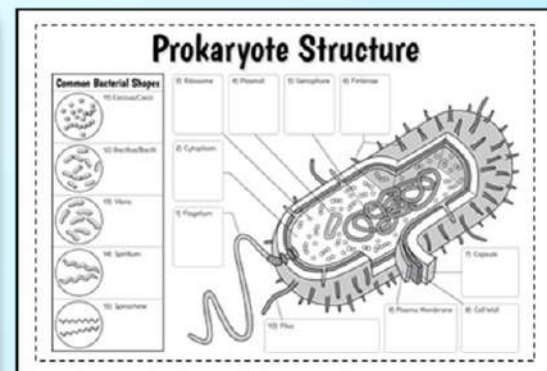
Image, Boxes
& Numbers



Image, Boxes,
Numbers & Underlines



Image, Boxes,
Numbers & Labels



RESOURCE 4: INTERACTIVE GOOGLE SLIDE - Animal Cell



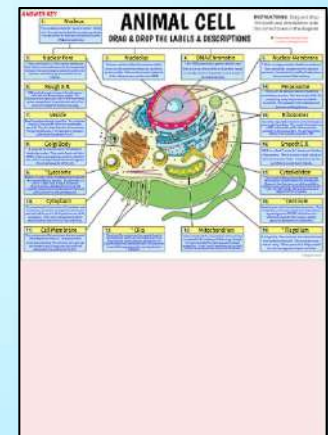
CONCEPTS

- Nucleus
- Nuclear membrane
- Nuclear pore
- Nucleolus
- Chromatin/DNA
- Cell Membrane
- Cilia
- Flagellum
- Cytoplasm
- Cytoskeleton
- Mitochondria
- Ribosomes
- Rough Endoplasmic Reticulum
- Smooth Endoplasmic Reticulum
- Golgi Body/Apparatus
- Lysosome
- Vesicle
- Centrioles

OPTIONS FOR DIFFERENTIATION

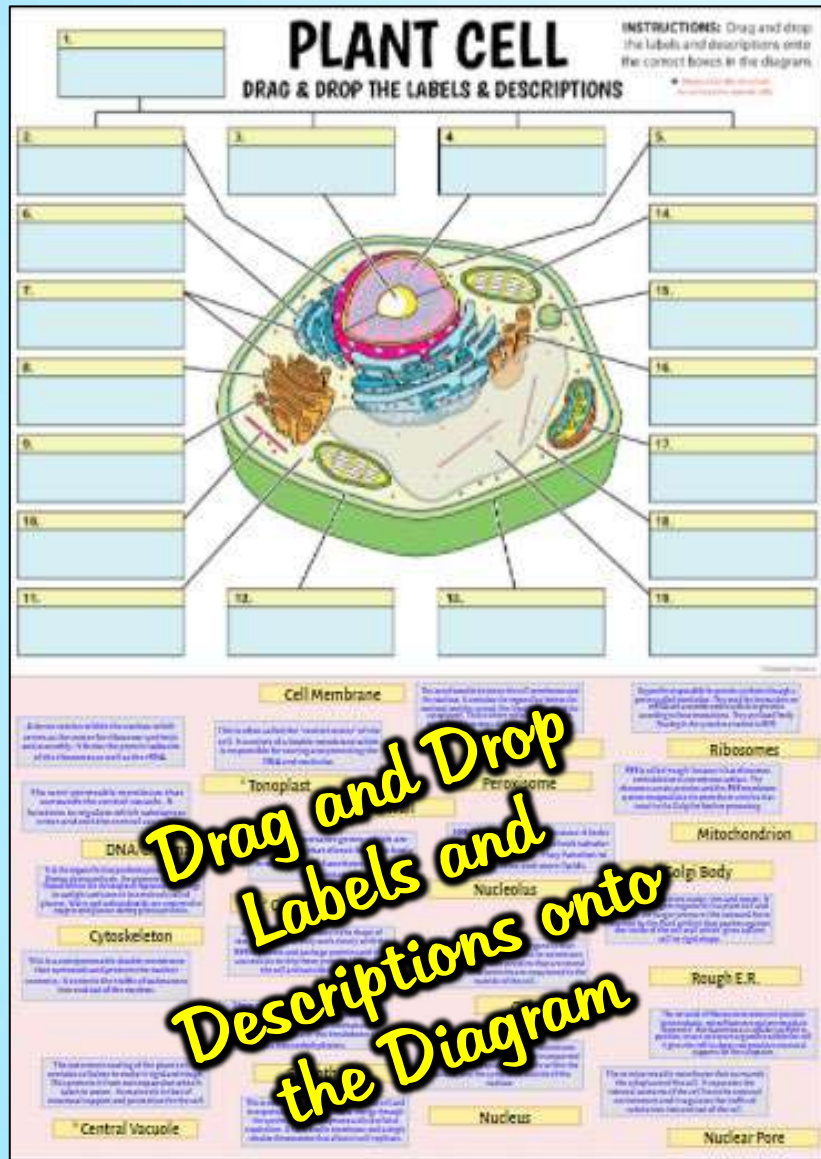
- There **EIGHT** options for differentiation that are a mix of drag and drop and fill in the text boxes for both the **LABELS** and the **DESCRIPTIONS** of the structures.

ANSWER KEY



GOOGLE SLIDES™

RESOURCE 5: INTERACTIVE GOOGLE SLIDE - Plant Cell



CONCEPTS

- Nucleus
- Nuclear Membrane
- Nuclear Pore
- Nucleolus
- Chromatin/DNA
- Cell/Plasma Membrane
- Cytoplasm
- Cytoskeleton
- Mitochondrion
- Chloroplast
- Ribosomes
- Rough Endoplasmic Reticulum
- Smooth Endoplasmic Reticulum
- Golgi Body/Apparatus
- Central Vacuole
- Tonoplast
- Cell Wall

OPTIONS FOR DIFFERENTIATION

- There **EIGHT** options for differentiation that are a mix of drag and drop and fill in the text boxes for both the **LABELS** and the **DESCRIPTIONS** of the structures.

ANSWER KEY



GOOGLE SLIDES™

RESOURCE 6: INTERACTIVE GOOGLE SLIDE - Prokaryotic Cell

COMMON BACTERIAL SHAPES

PROKARYOTIC CELL

DRAG & DROP THE LABELS AND DESCRIPTIONS

INSTRUCTIONS: Drag and drop the labels and the descriptions onto the correct boxes in the diagram.

Cytoplasm

A long whip-like appendage that extends from the cell body of the bacterium. It helps the bacterium move. Its main function is to move the cell. A bacterium may have one, more than one or none.

Genophore

A phospholipid bilayer that surrounds the cytoplasm of the cell. It is semipermeable and controls the traffic of substances entering and exiting the cell.

Cell Wall

Surrounding the plasma membrane, the cell wall provides structural support and protection for the cell and acts as a filtering mechanism. It also helps the cell to prevent cellular pressure from bursting the cell.

Spirochete

The polysaccharide layer outside of the cell envelope (cell wall) consists of the cell wall and the plasma membrane. It is made of polysaccharides and proteins. It is responsible for the attachment of the bacterium to the surface of cells and other bacteria. It is also responsible for the attachment of the bacterium to the surface of cells and other bacteria.

Plasma Membrane

These are tiny thread-like fibers that extend from the surface of the bacterium. They are typically 2-3 micrometers long. They are responsible for the attachment of the bacterium to the surface of cells and other bacteria. They are also responsible for the attachment of the bacterium to the surface of cells and other bacteria.

Pilus

Curved rod-shaped bacteria. Example: Vibrio cholerae causes cholera.

Ribosome

Rigid and thick spiral-shaped bacteria. Example: Helicobacter pylori causes stomach ulcers.

Capsule

Flexible, long and slender spiral-shaped bacteria. Example: Treponema pallidum causes syphilis.

Coccus/Cocci

Spherical bacteria. Cocci (singular: Coccus) are spherical bacteria. They are typically 2-3 micrometers long. They are responsible for the attachment of the bacterium to the surface of cells and other bacteria. They are also responsible for the attachment of the bacterium to the surface of cells and other bacteria.

Plasmid

The contents within the plasma membrane of the cell. This includes the liquid as well as the dissolved contents (amino acids, sugars, nucleotides, salts, vitamins, enzymes etc.). It contains genes and any other plasmids.

Fimbriae

These are tiny thread-like fibers that extend from the surface of the bacterium. They are typically 2-3 micrometers long. They are responsible for the attachment of the bacterium to the surface of cells and other bacteria. They are also responsible for the attachment of the bacterium to the surface of cells and other bacteria.

Spirillum

The singular coccus is a spherical bacterium. It is typically 2-3 micrometers long. It is responsible for the attachment of the bacterium to the surface of cells and other bacteria. It is also responsible for the attachment of the bacterium to the surface of cells and other bacteria.

Vibrio

A small circular DNA strand that may contain genes that control the bacterium's behavior. It is typically 2-3 micrometers long. It is responsible for the attachment of the bacterium to the surface of cells and other bacteria. It is also responsible for the attachment of the bacterium to the surface of cells and other bacteria.

Drag and Drop Labels and Descriptions onto the Diagram

CONCEPTS

- Pilus
- Fimbriae
- Flagellum
- Capsule
- Cell wall
- Cell Membrane
- Cytoplasm
- Ribosomes
- Plasmids
- Genophore
- Coccus
- Bacillus
- Vibrio
- Spirillum
- Spirochete

OPTIONS FOR DIFFERENTIATION

- There EIGHT options for differentiation that are a mix of drag and drop and fill in the text boxes for both the LABELS and the DESCRIPTIONS of the structures.

ANSWER KEY

© Tangstar Science

RESOURCE 7: INDIVIDUAL REVIEW - Animal Cell Homework Review Worksheet

ANIMAL CELL

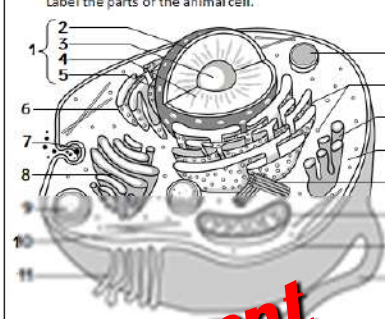
Name: _____

TASK 1: Fill in the Blanks

- The control center of the cell is the _____.
- The _____ is the liquid portion of the cytoplasm.
- _____ endoplasmic reticulum makes lipids.
- _____ make energy (ATP) for the cell.
- The _____ controls the traffic of materials into and out of the cell.
- The cytosol and the organelles within the cell (minus the nucleus) is called the _____.
- The _____ is an organelle that helps to modify and package proteins for secretion.
- The _____ is a membrane-bound organelle containing digestive enzymes.
- _____ are channels in the nuclear membrane that regulate the movement of substances between the nucleus and the cytoplasm.
- _____ moves materials from the outside to the inside of the cell using vesicles.
- The _____ gives the cell its shape.
- The plural of flagellum is _____.
- _____ are small, round, fluid-filled sacs that store and transport substances within the cell.

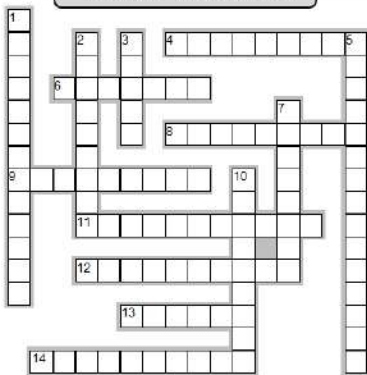
TASK 2: Diagram Analysis

Label the parts of the animal cell.



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____

TASK 3: Crossword



ACROSS

- DNA in its non-condensed form.
- An organelle used for the storage of nutrients or waste.
- Any structure in the cell that performs a specialized function.
- Found in the nucleus and is the site of ribosome synthesis.
- A protein polymer that helps to form the cytoskeleton.
- The process of removing materials using vesicles.
- The singular for cilia.
- Found in animal cells, these help with spindle fiber formation during cell division.

DOWN

- The singular form of mitochondria.
- A tail-like structure that helps move the cell.
- _____ endoplasmic reticulum helps synthesize proteins.
- The double membrane surrounding the nucleus contents.
- An organelle that transports materials within the cell.
- Small organelles that help to make proteins.

CONCEPTS

- Nucleus
- Nuclear membrane
- Nuclear pore
- Nucleolus
- Chromatin
- Cell/Plasma Membrane
- Cilia, Cilium
- Flagella, Flagellum
- Cytoplasm
- Cytosol
- Organelles
- Cytoskeleton
- Microtubules
- Mitochondrion, Mitochondria
- Ribosomes
- Rough Endoplasmic Reticulum
- Smooth Endoplasmic Reticulum
- Golgi Body/Apparatus
- Lysosome
- Vesicle
- Vacuole
- Centrioles
- Endocytosis
- Exocytosis



ANSWER KEY


ANIMAL CELL

ANSWER KEY

TASK 1: Fill in the Blanks


- Nucleus
- Cytoplasm
- Rough
- Mitochondria
- Cell membrane
- Cytosol
- Golgi apparatus
- Lysosome
- Nuclear pores
- Vesicle
- Centrioles
- Flagella
- Vacuole

TASK 2: Diagram Analysis



1. Nucleus
2. Nuclear membrane
3. Nuclear pore
4. Nucleolus
5. Chromatin
6. Cell/Plasma Membrane
7. Cilia, Cilium
8. Flagella, Flagellum
9. Cytoplasm
10. Cytosol
11. Organelles
12. Cytoskeleton
13. Microtubules
14. Mitochondrion, Mitochondria
15. Ribosomes
16. Rough Endoplasmic Reticulum
17. Smooth Endoplasmic Reticulum
18. Golgi Body/Apparatus
19. Lysosome

TASK 3: Crossword



ACROSS

- Chromatin
- Vacuole
- Organelle
- Nucleolus
- Microtubule
- Exocytosis
- Cilium
- Centrioles

DOWN

- Nucleus
- Cilia
- Rough endoplasmic reticulum
- Mitochondrion
- Smooth endoplasmic reticulum
- Golgi apparatus
- Lysosome
- Vesicle

3 TASKS

- Assign the whole page, or break it up into in class tasks, exit tickets and homework tasks.
- The variety of different tasks helps students review in different ways and holds their interest.

RESOURCE 8: INDIVIDUAL REVIEW - Plant Cell Review Worksheet

PLANT CELL

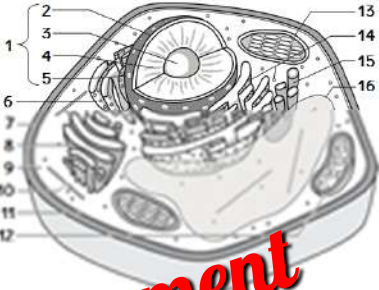
Name: _____

TASK 1: Fill in the Blanks

- _____ endoplasmic reticulum helps to synthesize proteins.
- _____ make sugars for the cell.
- The _____ pressure of the central vacuole helps the plant cell maintain its structure.
- Non-membrane bound organelles called _____ help synthesize proteins.
- The plural form of mitochondrion is _____.
- A _____ membrane surrounds both mitochondria and chloroplasts.
- Mitochondria, chloroplasts, RER, SER, Golgi and ribosomes are some examples of _____.
- DNA is contained within the _____.
- DNA stands for _____ nucleic acid.
- The _____ is the liquid portion of the cytoplasm.
- Nuclear _____ are channels in the nuclear membrane.
- The _____ DNA and nucleolus _____.
- The _____ make it green.

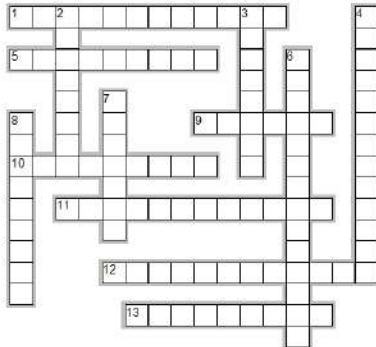
TASK 2: Diagram Analysis

Label the parts of the plant cell.



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____

TASK 3: Crossword



ACROSS

- Protein strands that help make up the cytoskeleton.
- This modifies and packages proteins for secretion.
- _____ endoplasmic reticulum synthesizes lipids.
- The cell wall is made up of this indigestible polymer.
- The semipermeable lipid bilayer around the cell.
- This is made up of proteins which are responsible for the movement seen in cytoplasmic streaming.
- Long uncondensed strands of DNA.

DOWN

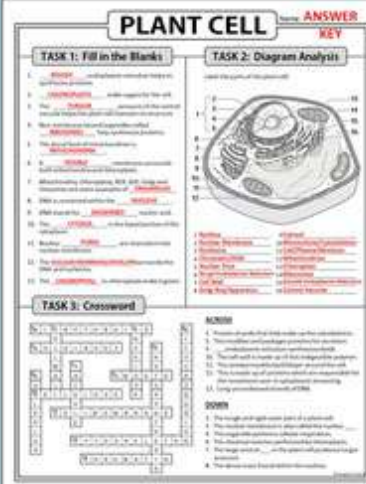
- The tough and rigid outer part of a plant cell.
- The nuclear membrane is also called the nuclear _____.
- This organelle performs cellular respiration.
- The chemical reaction performed by chloroplasts.
- The large central _____ in the plant cell produces turgor pressure.
- The dense mass found within the nucleus.

CONCEPTS

- Nucleus
- Nuclear Membrane
- Nuclear Pore
- Nucleolus
- Chromatin
- Cell/Plasma Membrane
- Cytoplasm
- Cytosol
- Organelles
- Cytoskeleton
- Microtubules
- Mitochondrion, Mitochondria
- Cellular Respiration
- Chloroplast
- Chlorophyll
- Photosynthesis
- Ribosomes
- Rough Endoplasmic Reticulum
- Smooth Endoplasmic Reticulum
- Golgi Body/Apparatus
- Vacuole
- Turgor Pressure
- Cell Wall
- Cellulose



ANSWER KEY



3 TASKS

- Assign the whole page, or break it up into in class tasks, exit tickets and homework tasks.
- The variety of different tasks helps students review in different ways and holds their interest.

RESOURCE 9: INDIVIDUAL REVIEW - Prokaryotes Review Worksheet

PROKARYOTES

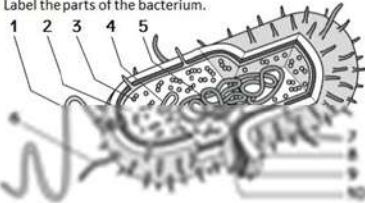
Name: _____

TASK 1: Fill in the Blanks

- The _____ is the region where the bacterium's chromosomal DNA is found.
- Prokaryotes are _____ organisms meaning that they are single-celled organisms.
- Binary fission is a form of _____ reproduction.
- The _____ in bacteria create proteins.
- The _____ is a tail-like structure that helps the bacterium move.
- The _____ is a hair-like structure on the surface of a bacterium. It is used to connect to other bacteria for the purpose of conjugation.
- _____ are thread-like appendages that help a bacterium attach to other cells.
- _____ are pieces of DNA that can contain genes which give bacteria some sort of beneficial advantage like antibiotic resistance.
- _____ is the term to describe a rod-shaped bacterium.
- Gram _____ bacteria are made mostly of peptidoglycan and purple for Gram staining.
- Bacteria _____ involves a direct exchange of genetic material between bacteria.


TASK 2: Diagram Analysis

Label the parts of the bacterium.

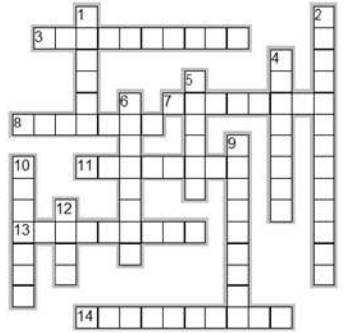


- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____

Label the bacteria below based on their shapes. Use the singular term.



TASK 3: Crossword



ACROSS

- A more scientific term for bacterium.
- Prokaryotic DNA is _____ instead of linear.
- The outermost layer of a bacterium.
- Gram _____ bacteria stain red instead of purple with Gram staining.
- A spiral-shaped bacterium that is short and rigid.
- A spiral-shaped bacterium that is long, slender and flexible.

DOWN

- A spherical shaped bacterium.
- Prokaryotic cell division.
- The layer found between the plasma membrane and capsule.
- A curved or spiral-shaped bacterium.
- The plural for flagellum.
- The DNA of a prokaryote.
- A small circular piece of non-chromosomal DNA.
- The plural of pilus.

CONCEPTS

- Prokaryote
- Pilus
- Pili
- Fimbriae
- Flagellum
- Flagella
- Capsule
- Cell wall
- Ribosomes
- Plasmids
- Nucleoid
- Genophore
- Unicellular
- Circular DNA
- Coccus
- Bacillus
- Vibrio
- Spirillum
- Spirochete
- Conjugation
- Binary fission
- Asexual reproduction
- Gram positive bacteria
- Gram negative bacteria




ANSWER KEY

PROKARYOTES

TASK 1: Fill in the Blanks

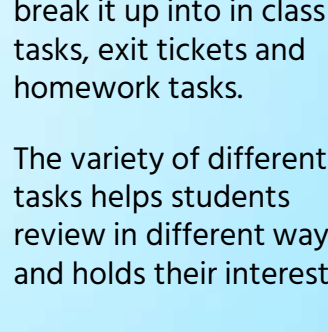
- Nucleoid
- unicellular
- binary fission
- Ribosomes
- Flagellum
- Pili
- Fimbriae
- Plasmids
- Coccus
- Bacillus
- Conjugation

TASK 2: Diagram Analysis



1. Capsule
2. Fimbriae
3. Flagellum
4. Cell wall
5. Nucleoid
6. Ribosomes
7. Plasmid
8. Pilus
9. Coccus
10. Bacillus

TASK 3: Crossword



ACROSS

1. A more scientific term for bacterium.
2. Prokaryotic DNA is _____ instead of linear.
3. The outermost layer of a bacterium.
4. Gram _____ bacteria stain red instead of purple with Gram staining.
5. A spiral-shaped bacterium that is short and rigid.
6. A spiral-shaped bacterium that is long, slender and flexible.

DOWN

1. A spherical shaped bacterium.
2. Prokaryotic cell division.
3. The layer found between the plasma membrane and capsule.
4. A curved or spiral-shaped bacterium.
5. The plural for flagellum.
6. The DNA of a prokaryote.
7. A small circular piece of non-chromosomal DNA.
8. The plural of pilus.

3 TASKS

- Assign the whole page, or break it up into in class tasks, exit tickets and homework tasks.
- The variety of different tasks helps students review in different ways and holds their interest.

RESOURCE 10: EXTRA PRACTICE/EARLY FINISHERS - Animal Cell Diagram Crossword

FULLY EDITABLE WORD DOC INCLUDED

- Reword questions according to your classroom needs.

ONE PAGE

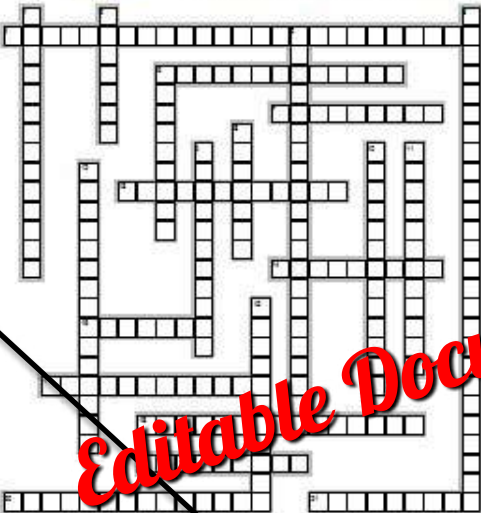
- For easy and economical printing.

CLEAR DIAGRAMS

- Helps students practice labeling biological diagrams. Diagram crosswords are a fun twist on the usual labeling worksheet.
- **BONUS ACTIVITY:** After completing the crossword, have students cut out the diagram, paste it in their notes and then label the structures for extra reinforcement.

NAME: _____
DATE: _____

ANIMAL CELL DIAGRAM Crossword

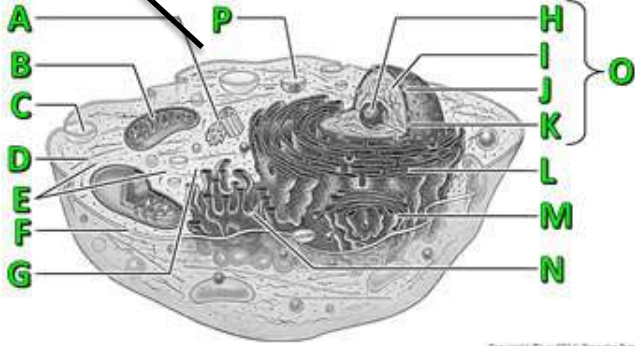


ACROSS

- Identify L in the diagram.
- Identify A in the diagram.
- Identify H in the diagram.
- What is the plural of B?
- Identify E in the diagram.
- Identify F in the diagram.
- Identify K in the diagram.
- Identify M in the diagram.
- What is another term for P?
- What area is indicated by G?

DOWN

- What is another term for M?
- Identify O in the diagram.
- What chemical reaction does B perform?
- Identify I in the diagram.
- What is the liquid found within G?
- What is the area found within G?
- Identify B in the diagram.
- Identify D in the diagram.
- Another term for K.
- Identify J in the diagram.



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**GOOGLE
SLIDES™**
Options

FULL ANSWER KEY

- Easy for you or your students to take up the answers.

NAME: _____
DATE: _____

ANIMAL CELL DIAGRAM Crossword

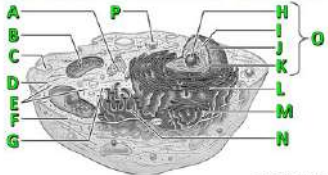


ACROSS

- Identify L in the diagram.
- Identify A in the diagram.
- Identify H in the diagram.
- What is the plural of B?
- Identify E in the diagram.
- Identify F in the diagram.
- Identify K in the diagram.
- Identify M in the diagram.
- What is another term for P?
- What area is indicated by G?

DOWN

- What is another term for M?
- Identify O in the diagram.
- What chemical reaction does B perform?
- Identify I in the diagram.
- What is the liquid found within G?
- What is the area found within G?
- Identify B in the diagram.
- Identify D in the diagram.
- Another term for K.
- Identify J in the diagram.



RESOURCE 11: EXTRA PRACTICE/EARLY FINISHERS - Plant Cell Diagram Crossword

FULLY EDITABLE WORD DOC INCLUDED

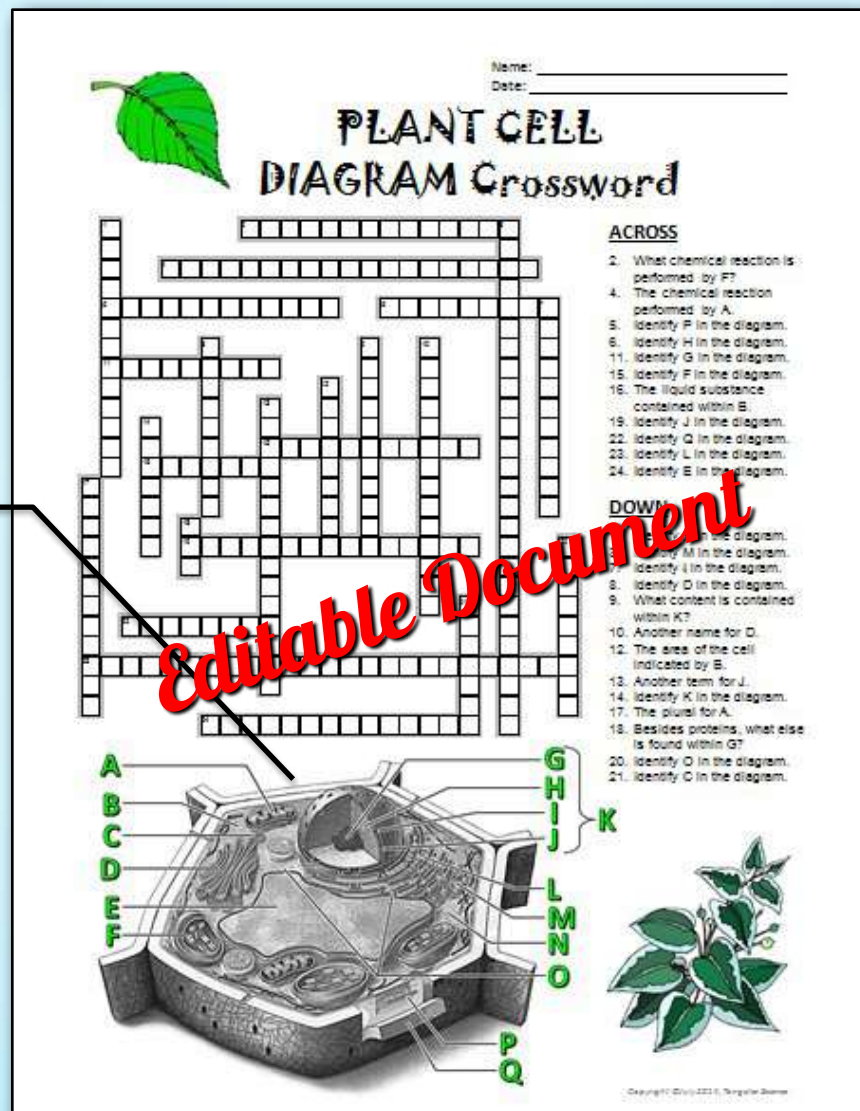
- Reword questions according to your classroom needs.

ONE PAGE

- For easy and economical printing.

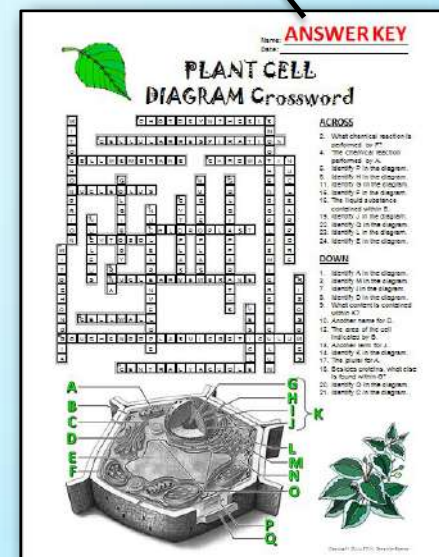
CLEAR DIAGRAMS

- Helps students practice labeling biological diagrams. Diagram crosswords are a fun twist on the usual labeling worksheet.
- **BONUS ACTIVITY:** After completing the crossword, have students cut out the diagram, paste it in their notes and then label the structures for extra reinforcement.



FULL ANSWER KEY

- Easy for you or your students to take up the answers.



RESOURCE 12: EXTRA PRACTICE/EARLY FINISHERS - Prokaryotes Word Scramble

Fun Group (or Solo) Activity

- Several students can work together to decipher the terms and figure out the final mystery phrase.
- You can turn it into a fun competition with prizes or bonus marks for the first group who finishes correctly.
- Great for early finishers too!

1 Page Printing

- Saves you time and money.
- Easy materials management

Answer Key

- Gives you or your students an easy and fast way to check their work.

Name: _____ Class: _____ Date: _____

PROKARYOTES Word Scramble

INSTRUCTIONS: There are 15 scrambled terms related to prokaryotic cells. Unscramble each term and write them in the boxes provided. The first one is done. Some boxes have numbers under them that match the numbers in the boxes of the mystery statement at the bottom of the page. Place the same letter in the corresponding numbered box in the mystery statement. This will help provide you with clues to a mystery phrase you must complete.

- CSLUABIL BACILLUS
- MIDASPL
- TAUKEYERO
- LUASECP
- IUSLP
- GAUMLFLE
- 7) NUCLEOID
- 8) CONJUGATION
- 9) CAPSULE
- 10) CELL WALL
- 11) PLASMA MEMBRANE
- 12) RIBOSOME
- 13) UNICELLULAR
- 14) PROKARYOTE
- 15) GENOPHORE

_____ I _____ C _____

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

_____ S _____ A _____

23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49

50 51 52 53 54 55 56 57 58 59 60 61 62 63 64

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Name: _____ Class: _____ Date: _____

ANSWER KEY PROKARYOTES Word Scramble

INSTRUCTIONS: There are 15 scrambled terms related to prokaryotic cells. Unscramble each term and write them in the boxes provided. The first one is done. Some boxes have numbers under them that match the numbers in the boxes of the mystery statement at the bottom of the page. Place the same letter in the corresponding numbered box in the mystery statement. This will help provide you with clues to a mystery phrase you must complete.

- CSLUABIL BACILLUS
- MIDASPL PLASMID
- TAUKEYERO EUKARYOTE
- LUASECP CAPSULE
- IUSLP PILUS
- GAUMLFLE FLAGELLUM
- 7) NUCLEOID BINARY FISSION
- 8) CONJUGATION
- 9) CAPSULE
- 10) CELL WALL
- 11) PLASMA MEMBRANE
- 12) RIBOSOME
- 13) UNICELLULAR
- 14) PROKARYOTE
- 15) GENOPHORE

BACTERIA ARE UNICELLULAR

ORGANISMS LACKING ANY MEMBRANE

BOUND ORGANELLES

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49

50 51 52 53 54 55 56 57 58 59 60 61 62 63 64

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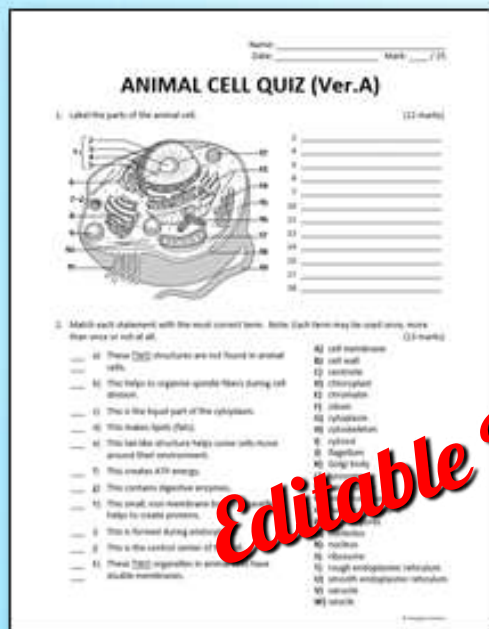
RESOURCE 13: ASSESSMENT - Animal Cell Quiz with Two Versions

TWO VERSIONS PREVENT CHEATING

- Version A and B contain the same questions but in mixed order.
- This allows you to alternate them between adjacent neighbours to deter cheating.

Version A

Version B

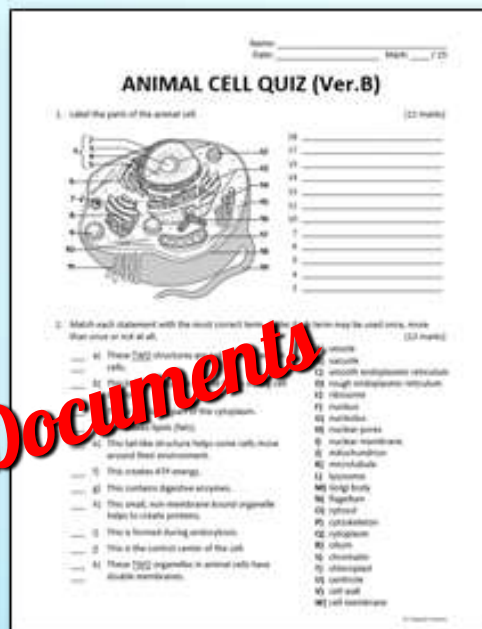


ANIMAL CELL QUIZ (Ver.A)

1. Label the parts of the animal cell. (12 marks)

2. Match each statement with the most correct term. Some (each term may be used once, more than once or not at all). (12 marks)

3. Match each statement with the most correct term. Some (each term may be used once, more than once or not at all). (12 marks)



ANIMAL CELL QUIZ (Ver.B)

1. Label the parts of the animal cell. (12 marks)

2. Match each statement with the most correct term. Some (each term may be used once, more than once or not at all). (12 marks)

3. Match each statement with the most correct term. Some (each term may be used once, more than once or not at all). (12 marks)

Editable Documents

IT'S EDITABLE

- Allows you to customize, add or delete questions.

EASY PRINTING

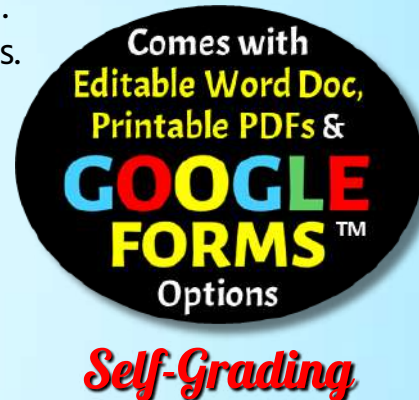
- Single page quiz saves on printing, time and money.

25 MARKS, STRAIGHTFORWARD QUESTIONS

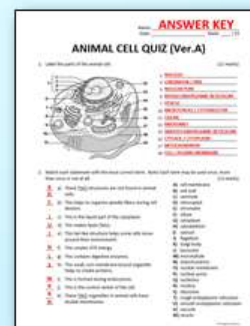
- 12 marks labelling a diagram.
- 13 marks matching questions.

DIAGRAM

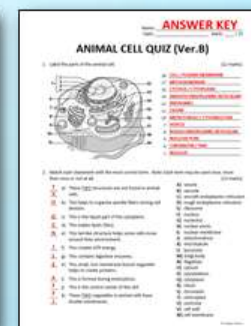
- I drew the diagram myself in Adobe Illustrator so that it would be clear and accurate.



ANSWER KEY • Makes marking quick and easy.



ANSWER KEY
ANIMAL CELL QUIZ (Ver.A)



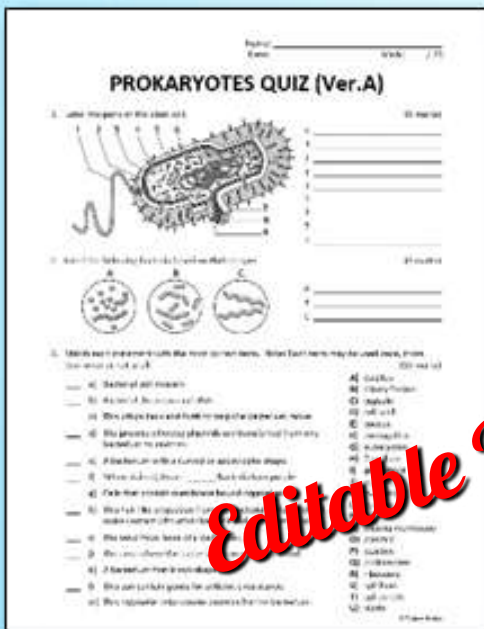
ANSWER KEY
ANIMAL CELL QUIZ (Ver.B)

RESOURCE 15: ASSESSMENT - Prokaryotes Quiz with Two Versions

TWO VERSIONS PREVENT CHEATING

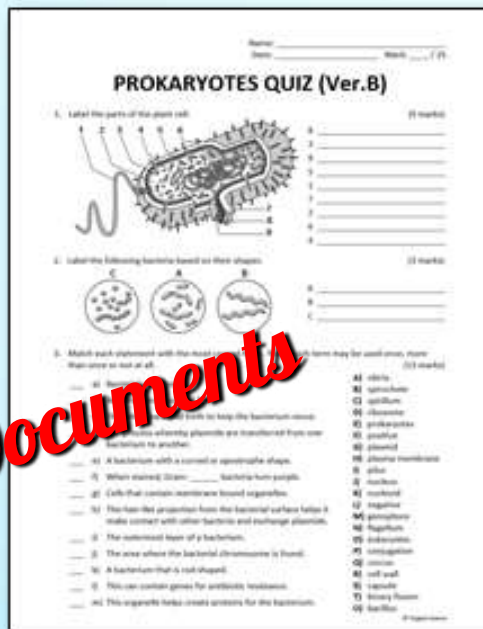
- Version A and B contain the same questions but in mixed order.
- This allows you to alternate them between adjacent neighbours to deter cheating.

Version A



Prokaryotes Quiz (Ver.A) form. It includes a diagram of a prokaryotic cell with labels 1-10. Below the diagram are 10 multiple-choice questions. A large red diagonal watermark 'Editable Documents' is overlaid across the bottom half of the form.

Version B



Prokaryotes Quiz (Ver.B) form. It includes a diagram of a prokaryotic cell with labels 1-10. Below the diagram are 10 multiple-choice questions. A large red diagonal watermark 'Editable Documents' is overlaid across the bottom half of the form.

IT'S EDITABLE

- Allows you to customize, add or delete questions.

EASY PRINTING

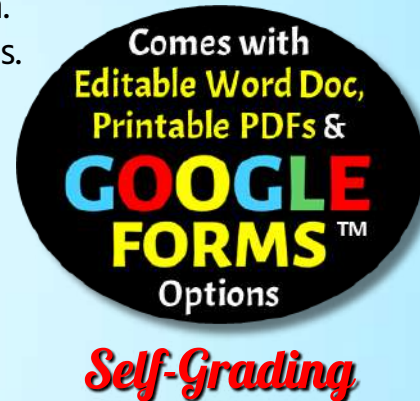
- Single page quiz saves on printing, time and money.

25 MARKS, STRAIGHTFORWARD QUESTIONS

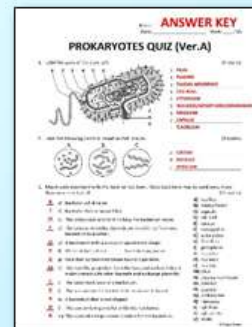
- 12 marks labelling a diagram.
- 13 marks matching questions.

DIAGRAM

- I drew the diagram myself in Adobe Illustrator so that it would be clear and accurate.



ANSWER KEY • Makes marking quick and easy.



Answer Key for Prokaryotes Quiz (Ver.A). It includes the same diagram and questions as Ver.A, with the correct answers highlighted in red.



Answer Key for Prokaryotes Quiz (Ver.B). It includes the same diagram and questions as Ver.B, with the correct answers highlighted in red.

Zoom in to read.

ROBERT HOOKE

biology physics

16

(1) Some historians call me the "Leonardo da Vinci of England" because I made discoveries in numerous fields of study, even though many of you know little about me. This is partially my fault. In the later stages of my life, despite my significant contributions to astronomy, physics, chemistry and biology, I became involved in many jealous fights over who was the real inventor or discoverer of this or that idea and theory. Unfortunately one of scientists I had the most conflict with was Isaac Newton. I am sure you have heard of him and his famous apple! We argued over who should get the credit for discoveries in gravity, the planets and light. If these fights were happening today, we would be having a huge fight on Twitter over this! Since few people know my name, you can guess who won these battles. It is even rumored that Newton had the only known portrait of me destroyed after my death. No one knows what I really look like; they can only guess.



Robert Hooke
Physicist, Inventor (1635-1703)

(2) I was born on July 28th, 1635 in the town of Freshwater, on the Isle of Wight, England. I was the youngest of four children. My father was a minister for the Church of England and both of my brothers followed in his footsteps. It was expected that I would do the same, but I showed other interests as a child. Though I was very frail and sickly for most of my childhood, and stayed at home almost as much as I went to school because of my frailty, I had a very curious mind. I was interested in how machines worked, especially clocks. I would take them apart and put them back together. This would begin my long career in and fascination for scientific instruments and mechanical devices. I also became a fairly expert draftsman and loved to sketch various things I observed in nature as well as those I

(4) My time spent with Boyle earned me a reputation as an expert in experimentation and in 1662, at the age of 27, the members of the Royal Society (a London-based organization formed to promote excellence and public awareness in science) unanimously offered me a position as the Royal Society's curator. In this role, I was supposed to demonstrate experiments from my own research as well as the research of other members of the Royal Society. It was a role I was well suited for. I loved devising and conducting experiments! If a member had a hypothesis, I was there to help them prove or disprove it through experimentation. The Royal Society's motto was *Nullus In Verba* meaning "Take nobody's word for it". I was their curator until I died.

Great Minds in Science

ROBERT HOOKE

16

Great Minds in Science

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ROBERT HOOKE

16

Great Minds in Science

Article Questions

1. What type of person is Robert Hooke according to the text?

2. Why did Hooke call himself the "Leonardo da Vinci of England"?

3. What do you think Hooke's personality was like? Give evidence from the text to support your answer.

4. What does Hooke's discovery of cells tell us about the structure of life?

5. What does Hooke's discovery of cells tell us about the structure of life?

6. The text says that Hooke was a "curator" of the Royal Society. What does this mean? How do you think Hooke's role as curator was important?

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RESOURCE 17: ARTICLE/SCIENCE LITERACY - "Alexander Fleming"

Zoom in to read.

ALEXANDER FLEMING

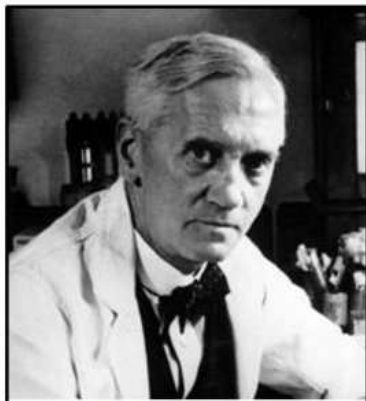
microbiology

9

(1) I am most well known as the scientist who discovered the first antibiotic, penicillin, in 1928. Until this time, many people died prematurely from pneumonia, tuberculosis and *Staphylococcus* and *Streptococcus* infections that are easily treatable with antibiotics today. My discovery has saved the lives of hundreds of millions of people around the world. Not only that but since the advent of antibiotics, life expectancy has gone from an average of 50 years of age in the early 1900s to almost 80 years of age today. All of this happened because I chose not to become a doctor!

(2) I was born on August 6th, 1881 in Ayrshire, Scotland. I had a countryside upbringing that nurtured an ability to keenly observe nature. My powers of observation would become one of the biggest assets in my career. My early childhood education was very humble. I walked for 8 miles every day to go to and from school. At the age of 11, my potential was recognized and I got awarded a scholarship to Kilmarnock Academy for two years before moving to live with my older brother Tom in London, where I attended school. Tom was a successful doctor and under his influence I wanted to be one as well. In 1901, I wrote my medical school entrance exams and passed with the highest marks in the United Kingdom. In 1906, when I was 25, I graduated London's St. Mary's Hospital Medical School with a Bachelor of Medicine and Bachelor of Surgery. I seemed destined to become a prosperous doctor one day.

(3) At the time, I was also a voluntary member of the London Scottish Regiment of the British Army. My rifle captain suggested that I work with Sir Almroth Wright, who was a pioneering researcher of vaccines and immunology at St. Mary's Hospital. I was assigned to his laboratory and



Alexander Fleming
Bacteriologist (1881-1955)

to use antiseptic agents (e.g. boric acid, carbolic acid and hydrogen peroxide) to kill the infectious agents. Since antiseptics were effective at killing bacteria on surfaces, they should kill them in the wound. However, I didn't believe they were working because many of the soldiers died. I investigated the effect of the antiseptics in deep wounds and discovered that the antiseptics were killing the immune system's white blood cells. Using salt water instead of an antiseptic would clean a deep wound without killing the white blood cells. I tried to convince other army doctors to restrict the use of antiseptics only to superficial (surface) wounds and use salt water for deep wounds. Most of them refused to listen to me and this resulted in many preventable deaths.

Great Minds in Science

ROBERT HOOKE

16

Great Minds in Science

(1) Robert Hooke was an English naturalist, polymath and scientist. He is best known for his work in microscopy, where he coined the term "cell" after observing the structure of cork under a microscope. He also made significant contributions to the fields of astronomy, geology, and anatomy.

(2) Hooke's most famous work, "Micrographia", was published in 1665. It contained detailed descriptions of the structures he observed through his microscope, including the cell wall of cork and the structure of the eye.

(3) Hooke's work in microscopy was revolutionary at the time, as it was the first time that the structure of the cell had been described. This discovery laid the foundation for the development of cell theory.

ALEXANDER FLEMING

9

Great Minds in Science

After reading different books, I discovered that the structure of the cell was the key to understanding the structure of the body. I was fascinated by the way that the cell was organized and how it functioned. I wanted to know more about the cell and how it worked.

(1) I was born on August 6th, 1881 in Ayrshire, Scotland. I had a countryside upbringing that nurtured an ability to keenly observe nature. My powers of observation would become one of the biggest assets in my career. My early childhood education was very humble. I walked for 8 miles every day to go to and from school. At the age of 11, my potential was recognized and I got awarded a scholarship to Kilmarnock Academy for two years before moving to live with my older brother Tom in London, where I attended school. Tom was a successful doctor and under his influence I wanted to be one as well. In 1901, I wrote my medical school entrance exams and passed with the highest marks in the United Kingdom. In 1906, when I was 25, I graduated London's St. Mary's Hospital Medical School with a Bachelor of Medicine and Bachelor of Surgery. I seemed destined to become a prosperous doctor one day.

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RESOURCE 18: ARTICLE/SCIENCE LITERACY - "Louis Pasteur"

Zoom in to read.

LOUIS PASTEUR

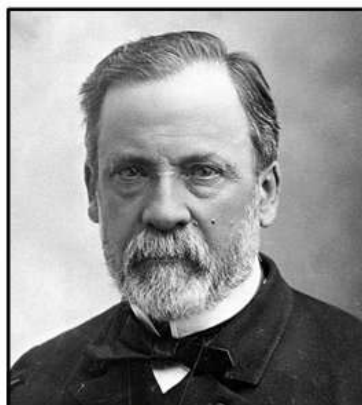
microbiology

14

(1) If my name sounds familiar, it's probably because you know about the process of pasteurization, which is named after me. Pasteurization is the process of killing microorganisms using low heat. I developed this technique which has become widely used to ensure the safety of various foods, most notably, milk products. In my day, scientists had no idea that microorganisms were responsible for many diseases. It wasn't until I came up with my "germ theory" of disease that doctors understood that certain microbes could make people sick. For this, I am considered the father of microbiology.

(2) I was born into a poor family on December 27th, 1822 in Dole, France. I never showed any promise in school and I'm sure my teachers didn't think I would make much of myself because I preferred sketching and fishing over studying all day. I really enjoyed drawing portraits of my friends and family. When I was sent to Paris to continue my studies, I became homesick and returned home. I managed to earn a degree in 1840 from the Collège Royal de Besançon. I continued my studies at the Besançon, but failed my first exams in 1841. Though I earned another degree in science in 1842, I got poor marks in Chemistry. After this I tried to gain entrance to the *École Normale Supérieure* but I failed the entrance exam. Though I wasn't great at getting good grades or passing exams, I was interested in science. This interest motivated me to continue my scientific education. I tried again in 1844 and this time I passed and started my studies. A year later I received my Bachelor of Science.

(3) Ironically, I became a professor of chemistry in 1848 at the University of Strasbourg at the age of 26. I think my students would have



Louis Pasteur
Microbiologist, Chemist (1822-1895)

that I was arrogant. I had high standards and great discipline and expected the same from students. My authoritarian leadership led to two student revolts. At one point, the school was only left with 7 students after 73 of the 80 students resigned when I threatened to expel any students that were caught smoking. I was not well liked and my contributions to science were not destined to lie in educating others.

(5) My scientific research is what has led to my greatest achievements. At the time, it was generally accepted that bacteria and other microorganisms existed, but that they formed spontaneously out of nothing. This popular idea was called spontaneous generation. I disagreed with this and felt that any existing or new microbes could only form from pre-

Great Minds in Science

LOUIS PASTEUR

14

Great Minds in Science

LOUIS PASTEUR

14

Great Minds in Science

Comes with

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Options

Zoom in to read.

STEM CELL SCIENCE

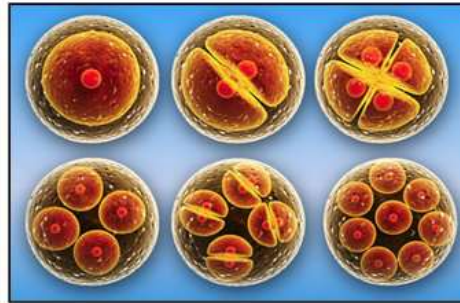
cells genetics

50

(1) Stem cells have been a hot area of research for over the last three decades and researchers have been making very interesting medical advances recently. Let's look at the fundamentals of stem cell science before we get into the newest research. There are three different types of stem cells: embryonic stem cells, adult stem cells and induced-pluripotent stem cells (iPSCs), though all share common traits. First, all can divide for long periods of time. Second, stem cells are not specialized, meaning that they have not become a specific type of cell yet (e.g. neurons and skeletal muscle cells are specific and specialized cells). Third, they have plasticity, so they are capable of becoming more than one cell type.

(2) Embryonic stem cells were first isolated in human embryos in 1998. Stem cells are used in the research of diseases, like cancer and birth defects, as well as drug research and medical treatments where stem cells can be used to make new tissues. However, obtaining these stem cells is the most controversial part of stem cell research as they are harvested from embryos which are destroyed in the process.

(3) Embryos are obtained by using the unused embryos from IVF (*in vitro* fertilization) treatments. IVF helps infertile couples have a child. In this process, several eggs are harvested from a woman and mixed with the sperm taken from her partner. If fertilization results and produces embryos, often only one or two embryos are transplanted back into the woman's uterus. The couple can consent for the unneeded and leftover embryos to be



(4) Embryonic stem cells obtained from early embryos are totipotent, which literally means "totally powerful". They have the ability to become any cell type in the body and any one of these cells, in isolation, can form an entire human. Four days after fertilization the cells divide into a blastocyst with two cell layers. The surrounding layer forms the placenta and the inner layer are the stem cells that form the tissues of the fetus. At this point, stem cells are no longer totipotent. Though they can still form any and all the tissues of the body, they have lost the ability to form an entire individual if removed from the embryo, thus instead of being totipotent, they are now considered pluripotent. As an embryo continues to develop, the pluripotent stem cells increasingly lose their plasticity.

(5) As adult stem cells are even less plastic than pluripotent stem cells, they are called multipotent stem cells. This means they only have the ability to become a small and limited selection of related cell types. A good example are the multipotent stem cells found in your

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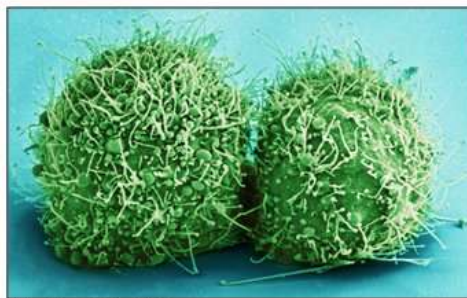
IMMORTAL CANCER CELLS

19

(1) Henrietta Lacks was an African American woman born on August 1st 1920 in Virginia. In 1951, while pregnant with her fifth child, she was diagnosed with cervical cancer at Johns Hopkins Hospital, which was the only hospital in her area that would treat black patients. She underwent radiation therapy for the cancer and during this time, two samples of the tumor were removed. Unfortunately, the treatment failed and she died on October 4th 1951, nine months after being diagnosed. Though Henrietta Lacks has now been dead for over six decades, her cells still live on and have proved to be one of the most important tools used in medical science.

(2) The cell samples taken from Henrietta Lacks were given to a researcher named George Gey. Gey had been trying to grow cells in culture, meaning grow them outside of the body in a nutrient-filled container, for years. None of the cells he had been working with could survive for longer than a few days before dying. Henrietta Lacks' tumor cells were different and when grown in culture they continued to divide without dying. George Gey called these "immortal" cells HeLa cells after the woman they came from. Remarkably, these HeLa cells have continued to divide, up to this day, long after George Gey himself died in 1970.

(3) Normally cells divide 40-70 times before they hit their maximum ability to divide. This is called the Hayflick limit which is named after American anatomist Leonard Hayflick who first researched this phenomenon. After the Hayflick limit is reached, a cell goes into



HeLa Cells Just After Division

(5) An enzyme called telomerase is able to reverse the process of telomere shortening. Telomerase does this by building short sections of DNA and then adding them onto the ends of the telomeres to prevent them from shortening during cell division. Embryonic cells make a lot of telomerase, allowing them to divide rapidly and go beyond the Hayflick limit. In adults, however, telomerase is not found in most cells with the exception of those that need to divide rapidly, like male germ cells that produce sperm or adult stem cells that make blood cells. Some cancer cells also produce a lot of telomerase which allows them to divide beyond the Hayflick limit and possibly divide forever. HeLa cells produce a lot of telomerase allowing them to divide indefinitely (meaning without end) and this is why Henrietta Lacks' cells are called "immortal cells".

(6) Due to their immortal nature, HeLa cells were in huge demand by medical researchers around the world. They wanted to use the cells to test the effect of different medicines and

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Article Questions

- What was George Gey trying to accomplish with his research?
- What does the Hayflick limit mean?
- What is telomerase?
- What happens when telomeres shorten?
- What are telomeres and what happens to them during cell division?
- Why does the presence of telomerase allow a cell to divide beyond the Hayflick limit?
- How does telomerase allow a cell to divide beyond the Hayflick limit?
- What is a telomerase and what happens to them during cell division?
- What is a telomerase and what happens to them during cell division?

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ANTIBIOTICS: PENICILLIN AND BEYOND

29

microbiology ♦ medical ♦ public health

(1) Most of us have taken antibiotics at some point in our lives and the majority of us will need to take them multiple times before we die. Antibiotics are prescription drugs used to treat infections caused by bacteria like strep throat, ear infections, pneumonia, cholera, syphilis and tuberculosis. Some antibiotics also work against certain infections caused by fungi and protozoans. Antibiotics don't work on colds and flus because these are infections caused by viruses, though some doctors still wrongly prescribe antibiotics for these illnesses.

(2) Antibiotics either work by being bactericidal, meaning they kill bacteria, or by being bacteriostatic, meaning that they prevent bacteria from replicating. Bactericidal antibiotics destroy bacterial cell walls and cell membranes and can interfere with bacterial enzymes vital to the bacteria's survival; these include penicillin, sulfonamides and polymyxins. Bacteriostatic antibiotics work by disrupting the ability of bacteria to make proteins; these include tetracyclines and lincosamides.

(3) Antibiotics can also be classified as either narrow spectrum, meaning they kill only specific types of bacteria, or broad spectrum, meaning they can kill a wide range of bacteria. You might think that broad spectrum antibiotics are superior because they can kill many types of bacteria, but this means that they are also capable of killing good bacteria that do not cause infection. Broad spectrum antibiotics can kill the beneficial bacteria in



was an empty area where none of the bacteria seemed to grow. Fleming concluded that the mould must be secreting a chemical capable of killing or preventing the bacteria's growth. On further analysis, he discovered that the mould produced a bactericidal compound and Fleming named it penicillin after the mold growing in the dish, which was called *Penicillium*. Though penicillin was discovered in 1928, the technology to mass produce it wasn't developed until the 1940s. This is when antibiotics became the number one treatment for bacterial infections. Antibiotics were a huge advancement for medicine and Fleming, along with Howard Florey and Ernst Boris Chain, the two scientists who helped create the mass production method, were awarded the Nobel Prize in Medicine in 1945 for their work. Before the use of antibiotics, life expectancy was lower and childhood death rates were much higher. Infections easily cured by today's antibiotics killed many children during that era.

(5) We have now figured out that all

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RESOURCE 22: FUN GROUP REVIEW - 80 Cells Task Cards with Game Board

THIS TASK CARD SET INCLUDES:

- 1) 80 Question Cards
- 2) 80 Answer Cards
- 3) 1 Game Board
- 4) 1 Cell Diagram Card
- 5) 1 Cover Card
- 6) Student Worksheet & Answer Key
- 7) Editable Template Cards

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7 Cell Structure & Function

Name two organelles found in animals cells but not found in plant cells.

7 ANSWER

Any two of the following:
centrioles, lysosomes,
flagella, cilia

13 Cell Structure & Function

What are two structural differences between the rough endoplasmic reticulum and the smooth endoplasmic reticulum?

13 ANSWER

- 1) RER has ribosomes while SER does not.
- 2) RER is made up of membrane sacs while SER is made up of membrane tubes.

64 Cell Structure & Function

What two organelles in a plant cell are capable of self-replication?

64 ANSWER

chloroplasts
and
mitochondria

31 Cell Structure & Function

Identify S in the diagram.

31 ANSWER

lysosome

28 Cell Structure & Function

What is the function of the cytoskeleton?

- A) the recycling of dead/damaged organelles
- B) the formation and storage of starch
- C) the synthesis of proteins
- D) provides a scaffold to secure and move organelles within the cell
- E) the breakdown of lipids

28 ANSWER

d) provides a scaffold to secure and move organelles within the cell



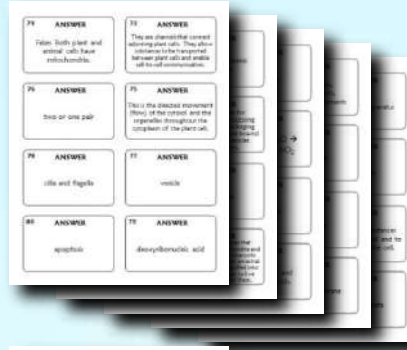
OTHER CELL RESOURCES by Tangstar Science

RESOURCE 22: FUN GROUP REVIEW - 80 Cells Task Cards with Game Board

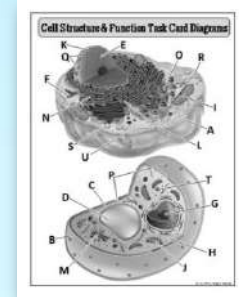
80 Question Cards



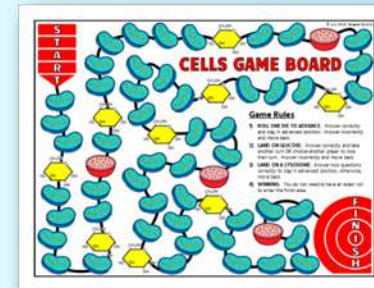
80 Answer Cards



Cell Diagram Cards



Game Board



Student Worksheets & Answer Keys



Cover Cards

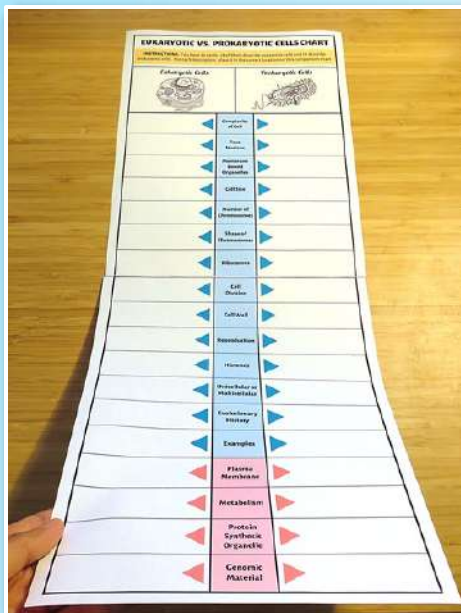


Editable Template



OTHER CELL RESOURCES by Tangstar Science

RESOURCE 23: FUN GROUP REVIEW - Eukaryotes vs. Prokaryotes Card Sort Review Game



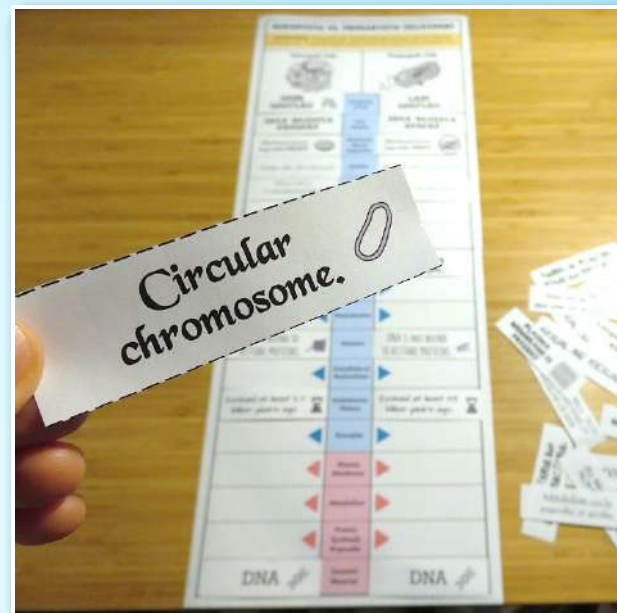
STEP 1:

Assemble the eukaryotes vs. prokaryotes chart.



STEP 2:

Cut out cards containing descriptions of eukaryotes and prokaryotes.



STEP 3:

Sort the cards on the chart on either the eukaryotes or the prokaryotes side.

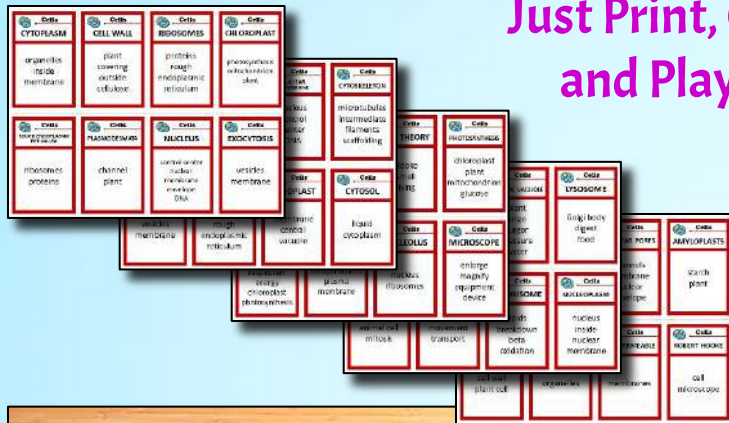
THIS RESOURCE INCLUDES:

- 1) 36 Cards
- 2) Eukaryotes vs. Prokaryotes Chart (two 8.5"x11" pages taped together)
- 3) Student Worksheet
- 4) Answer Key



RESOURCE 24: FUN PAIR/GROUP REVIEW - Cells Taboo Card Game

40 CARDS ON 5 PAGES



Just Print, Cut
and Play.



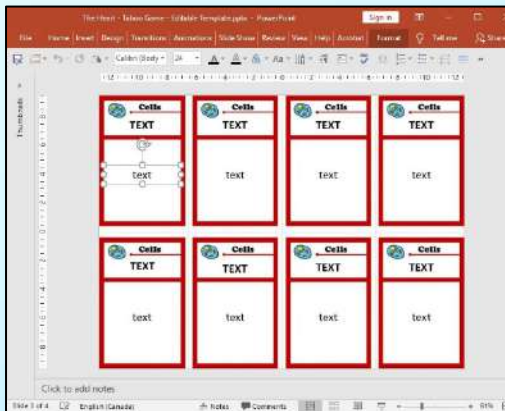
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40 TERMS

- Organelles
- Cytoplasm
- Cytosol
- Cytoskeleton
- Mitochondria
- Cellular respiration
- Cell membrane
- Semipermeable
- Lysosome
- Peroxisome
- Centrioles
- Ribosomes
- Chloroplast
- Photosynthesis
- Chlorophyll
- Cell wall
- Cellulose
- Turgor pressure
- Tonoplast
- Central vacuole
- Flagella
- Cilia
- Nucleus
- Nuclear membrane
- Nuclear pores
- Nucleolus
- Nucleoplasm
- Proteins
- Golgi body
- Rough endoplasmic reticulum
- Smooth endoplasmic reticulum
- Amyloplasts
- Endocytosis
- Exocytosis
- Plasmodesmata
- Cytoplasmic streaming
- Robert Hook
- Cell Theory
- Microscope
- Endosymbiotic theory

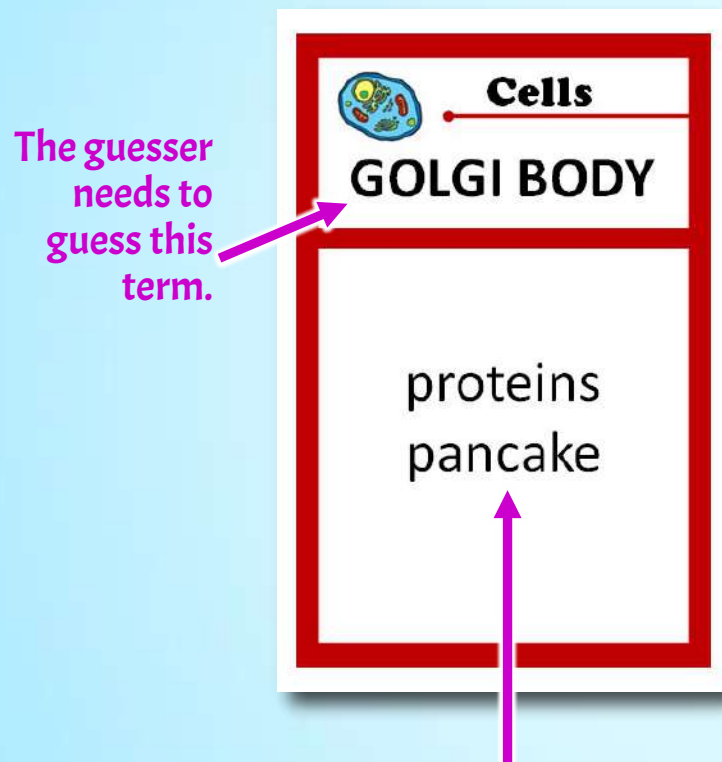
EDITABLE TEMPLATE



Make Your
Own Cards in
PowerPoint.

RESOURCE 24: FUN PAIR/GROUP REVIEW - Cells Taboo Card Game

HOW TO PLAY TABOO



Step 1: Form groups (or pairs) where one person is the **guesser** and the remaining students are the **clue givers**. Group members take turns being the guesser.

Step 2: The **guesser needs to guess the term** on the card (in this case it's "GOLGI BODY"). Clue givers will give descriptions of the term to help the guesser guess the right term. Use a timer to limit the guessing time.

Step 3: The **clue givers have to describe the term without using the taboo words** on the card (in this case the taboo words are "proteins" and "pancake"). Also, clue givers cannot use root words found in the term or the taboo words. For example, if the term was "kicking", the root word "kick" cannot be used in the clue giving.

ASSIGNING POINTS: **3 points** are given to the **guesser** for every correct term guessed. **2 points** are deducted from any **clue giver that uses a taboo word OR root word** during clue giving. Alternatively they can choose to lose their next turn as the guesser.

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