

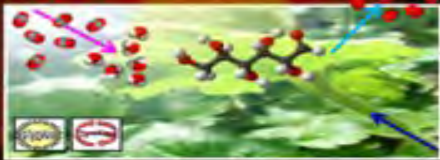
Cellular Organelles Bundle

Compressed File

• This is the largest organelle in the cell?

The Nucleus

- Equation for Photosynthesis
- $6CO_2 + 6H_2O + \text{Energy} \rightarrow C_6H_{12}O_6 + 6O_2$



performs a special function:

They... **Support**
Manufacture "Make"
Breakdown Materials
Communicate and Transport Materials

- DNA makes RNA, RNA has information to make proteins.



The RNA molecule



Enzymes of the Golgi apparatus are involved in the breakdown of macromolecules to the Golgi apparatus

18

LYSOSOMES



Enzymes of the Golgi apparatus are involved in the breakdown of macromolecules to the Golgi apparatus



Transportation

• The Nucleus

- Largest organelle in the cell (dark spot)
- Contains **genetic** information (DNA)
- DNA **transcription** to RNA Translation to Proteins.
- Chromosomes / Chromatin
 - Composed of **DNA**
 - Thicken for cellular division.
 - Set number per species.
 - Humans have **46** chromosomes (23 pairs)



– Nucleolus

- Round dark spot shape in nucleus.
- Only visible when cell is not dividing.
- Contains **RNA** for protein manufacturing.
- Makes **ribosomes** that travel out of nucleus.

– Nuclear Membrane

- Surrounds nucleus.
- Composed of two layers.
- Numerous **openings** for nuclear traffic.



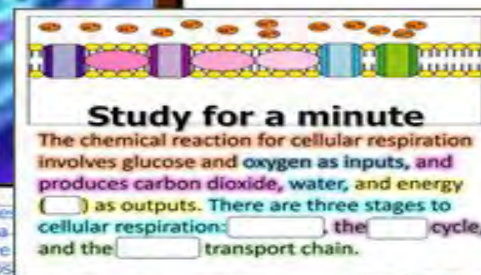
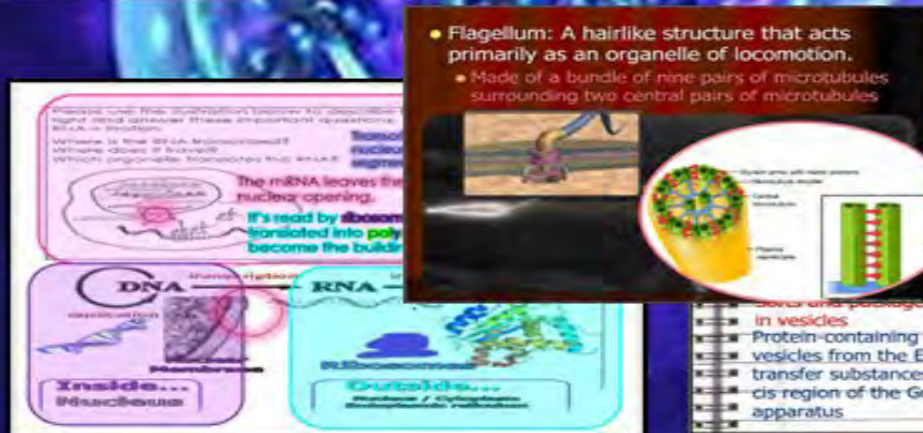
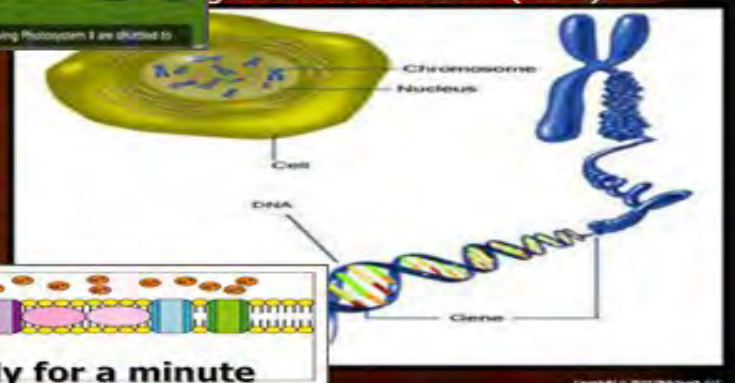
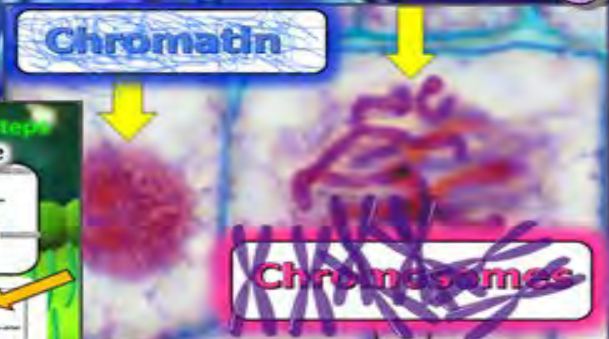
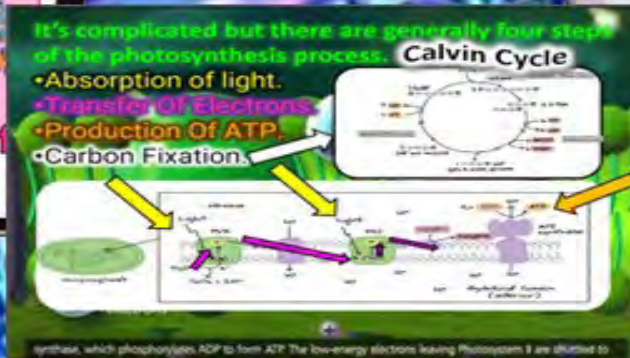
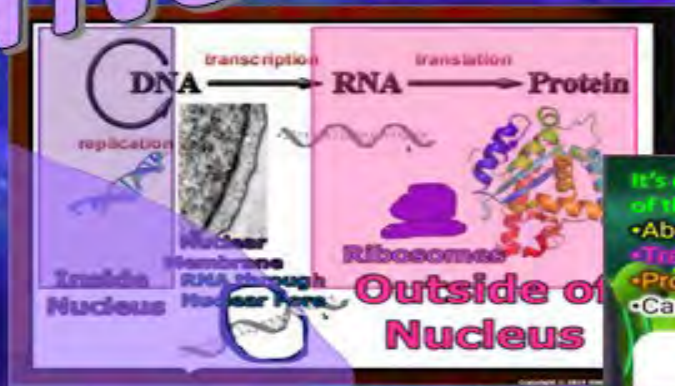
is cellular organelle synthesizes sugars, stores enzymes, regulates calcium, makes lipids and steroids.

11

Smooth Endoplasmic Reticulum

16 Lessons

Interactive Slideshows

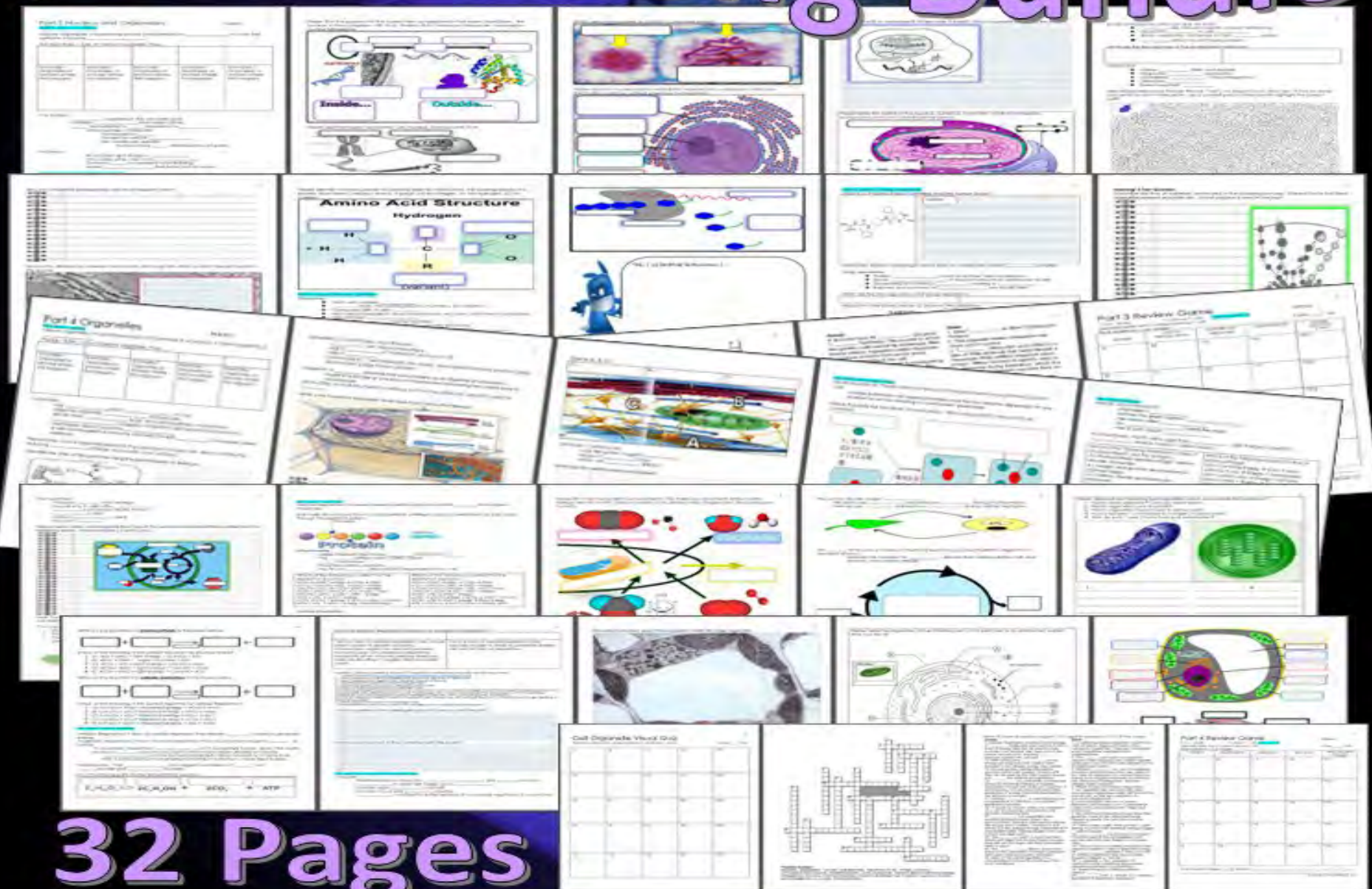


The ribosome reads the codons on the mRNA.

them to the corresponding tRNAs, the correct amino acids to add to the growing polypeptide chain.



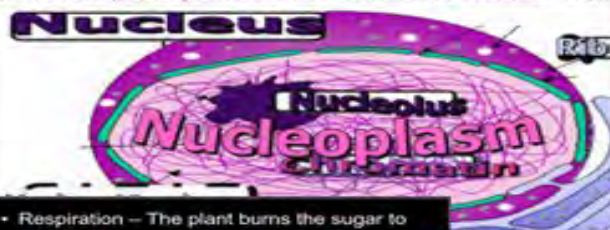
Follow Along Bundle



32 Pages

Activities, Assessments, Keys, and more all built-in

Please label the sketch of the nucleus, nucleolus, chromatin, nucleoplasm, nuclear envelope, and nuclear pores below.



- Respiration – The plant burns the sugar to make energy.



Name _____



These are the membrane-bound compartments inside chloroplasts and cyanobacteria.

- They are the site of the light-dependent reactions of photosynthesis.

Thylakoids



10

ation: The second stage of synthesis.

es the genetic information in RNA to a sequence of amino acids, ultimately ng a protein.

ion occurs on ribosomes, which ctures in the cell that are ble for protein synthesis.

- Digestive organelle, recycles old cell parts.

Which is the lysosome and which is the mitochondria?



The rough ER, studded with millions of membrane bound ribosomes, is involved with the production, folding, quality control and dispatch of some proteins.

- Each cell contains millions.



8



Each Golgi stack has two distinct ends, or faces. The cis face of a Golgi stack is the end of the organelle where substances enter from the endoplasmic reticulum for processing, while the trans face is where they exit in the form of smaller detached vesicles.

Cell Organelles Work Bundle

Part 3 Nucleus and Organelles

Label the organelles in the diagram below. Write the name of the organelle in the space provided. (10 marks)

Write the function of the organelle in the space provided. (10 marks)

Organelle	Function

Label the organelles in the diagram below. Write the name of the organelle in the space provided. (10 marks)

Write the function of the organelle in the space provided. (10 marks)

Inside... Outside...

Label the organelles in the diagram below. Write the name of the organelle in the space provided. (10 marks)

Write the function of the organelle in the space provided. (10 marks)

Label the organelles in the diagram below. Write the name of the organelle in the space provided. (10 marks)

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Write the function of the organelle in the space provided. (10 marks)

Amino Acid Structure

Label the parts of the amino acid structure. Write the name of the part in the space provided. (10 marks)

Write the function of the part in the space provided. (10 marks)

Label the organelles in the diagram below. Write the name of the organelle in the space provided. (10 marks)

Write the function of the organelle in the space provided. (10 marks)

Label the organelles in the diagram below. Write the name of the organelle in the space provided. (10 marks)

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Write the function of the organelle in the space provided. (10 marks)

32 Pages

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Write the function of the organelle in the space provided. (10 marks)

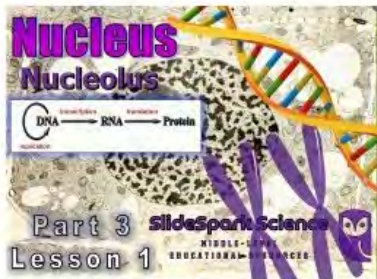
Part 3 Review Game

Write the name of the organelle in the space provided. (10 marks)

Write the function of the organelle in the space provided. (10 marks)

Parts 3 and 4: Cellular Organelles Part 3: 8 Lessons of 50 minutes and 20 Page Follow Along Work Bundle, Special Functions of Cellular Organelles in a Cell, Nucleus, Functions of the Nucleus, Information Flow of Life, DNA-RNA-Proteins, Transcription, Translation, Important Role of Proteins, Chromosomes, Chromatin, Unwinding 6 feet of string Chromosome activity, Nuclear Membrane, Nucleolus, Ribosome Creation, Visuals Matching Activity, Nuclear Pores/Openings, Phospholipid bilayer, Nucleoplasm, Rough Endoplasmic Reticulum, The Lost Art of Maze Making Activity, Smooth Endoplasmic Reticulum, Ribosomes, Flow of Information Class Simulation to Music, Gene Expression, Review of Transcription and Translation, Protein Synthesis, Initiation, Step by Step Drawing Protein Synthesis, Elongation, Termination, Review of the Steps with Visuals, Importance of Protein in our Diet, Hormones, Golgi Apparatus, Cis Face, Trans Face, Build Golgi Body Fanny Packs Activity, Visual Review of the flow of molecules, Box Game Review, Crossword Puzzle, End Unit Assessment

Parts 3 and 4: Cellular Organelles



Part 3 Lesson 1 The Nucleus



Part 3 Lesson 2 Nuclear Membrane ER



Part 3 Lesson 3 Protein Synthesis



Part 3 Lesson 4 Golgi Apparatus



Part 3 Lesson 5 Review Game



Part 3 Lesson 6 Review Game Answers



Part 3 Work Bundle Answers



Part 3 Work Bundle Print

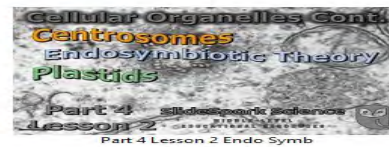
Parts 3 and 4: Cellular Organelles Part 4: 11 Lessons of 50 minutes and 18 Page Follow Along Work Bundle Special Functions of Cellular Organelles in a Cell, Lysosomes, Function of Lysosomes and the Breakdown of Materials, Cytoskeleton, Microfilaments, Intermediate Filaments, Microtubules, Flagellum, Cilium, Centrioles, Role in Mitosis, Endosymbiotic Theory, Step by Step Visual, Mitochondria, Chloroplast, Optional Chromatography Activity to see Plastids in Leaves, Plastids, Thylakoids, Granum, Photosynthesis Equation, Learning the Equation with M&M's Activity, Description of Photosynthesis Main Parts, Video Options for Photosynthesis in more detail, Four Main Steps of Photosynthetic Process, Cellular Respiration, Foods Macronutrients, Mitochondria, Function of Mitochondria, Cristae, Learning the Respiration Equation, M&M's again as a manipulative, Blowing a balloon with Yeast Demo, Step by Step of Calvin Cycle, Review of Cellular Respiration, The Carbon Dioxide and Oxygen Balance of Life, Aerobic vs. Anaerobic Respiration, Fermentation, Fermentation Equation, Activity with Cabbage Indicator and Yeast, Venn Diagram of Anaerobic and Aerobic Respiration, Dangers of Botulism, Vacuoles, The Many Functions of Vacuoles, Turgid Pressure in Plants, Contractile Vacuoles, Name that Organelle Visual Quiz, Box Game Review, Crossword Puzzle, Unit Assessment



Additional and Printables



Part 4 Lesson 1 Lysosomes



Part 4 Lesson 2 Endo Symb



Part 4 Lesson 3 Chloroplast



Part 4 Lesson 4 Photosynthesis Cont



Part 4 Lesson 5 Mitochondria



Part 4 Lesson 6 Respiration Cont



Part 4 Lesson 7 Anerobic



Part 4 Lesson 8 Vacuoles



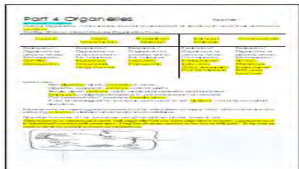
Part 4 Lesson 9 Wrap Up and Visual Quiz



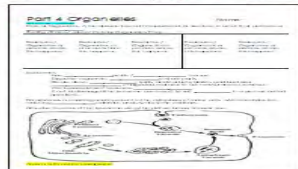
Part 4 Lesson 10 Review Game



Part 4 Lesson 11 Review Game Answers



Part 4 Work Bundle Answers



Part 4 Work Bundle Digital



Part 4 Work Bundle Print

Parts 3 and 4:
Cellular
Organelles

SlideSpark Science



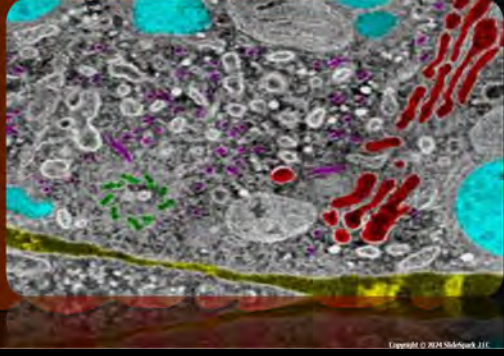
MIDDLE-LEVEL EDUCATIONAL RESOURCES

Interactive slideshows provide the roadmap for an amazing learning experience for students in grades 5-9. A Detailed set of work bundles chronologically follow the digital learning, providing a clear and intuitive roadmap to understanding. As the teacher or student advances through a slideshow, exciting hands-on activities, fantastic visuals, fill-in notes, review opportunities, video links, assessments, and much more are strategically placed throughout. Interactive learning unfolds step by step and supported by the work bundle to reach all types of learners. Everything you need to run to an amazing learning experience is provided in this one-of-a-kind science curriculum.

Each unit in the curriculum is designed to help teachers deliver the best possible learning experience for their students. Our interactive science slideshows are filled with questions and answers, important fill-in notes, hands-on activities, projects, games, built-in quizzes, and end of the unit assessment pieces. Students follow along with a work bundle that documents the entire learning experience for a fantastic review and assessment piece.



- Cellular Organelles: A membrane-bound compartment or structure in a cell that performs a special function.



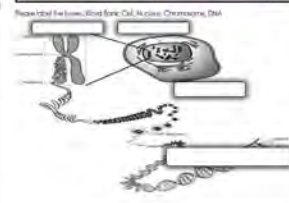
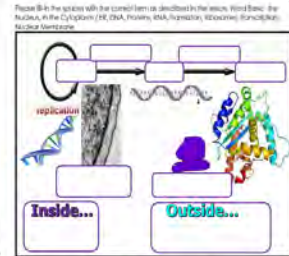
Part 3 Nucleus and Organelles

Cellular Organelles: A membrane-bound compartment or structure in a cell that performs a special function.

Organelle / Structure of animal cells	Organelle / Structure of plant cells	Organelle / Structure of fungi	Organelle / Structure of protists	Organelle / Structure of bacteria

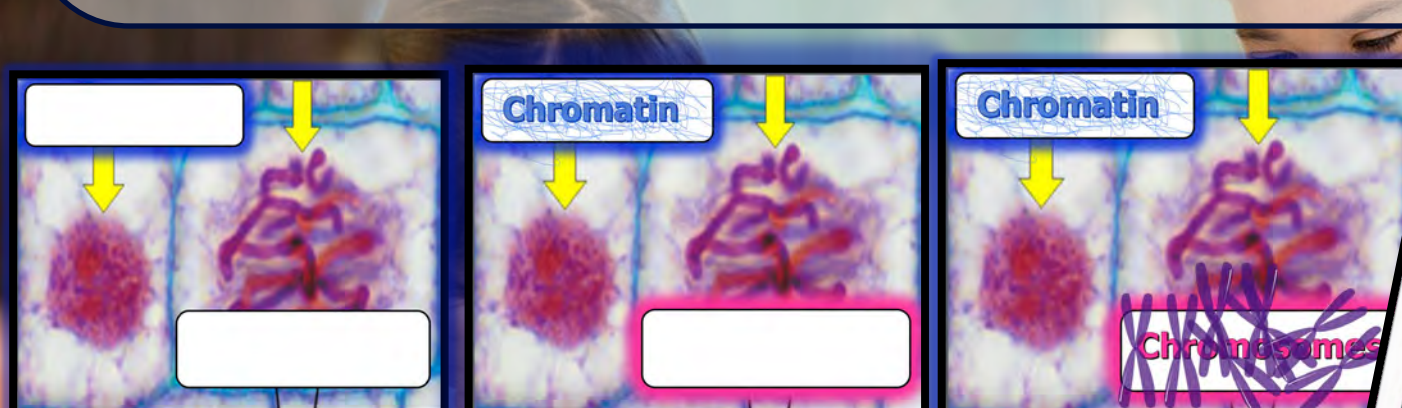
The Nucleus: _____ organelle in the cell (pink spot)
 Contains: _____ Information (DNA)
 Transcription to _____ Translation to _____
 Chromosomes / Chromatin
 Composed of _____
 Thicken to create _____
 for nuclear pore (pore)
 Nuclear pore _____ (2 pores)

Nucleolus: _____
 Nucleolus is a small, dense, spherical structure within the nucleus.
 Composed of _____
 Nucleolus _____ to nuclear pore.



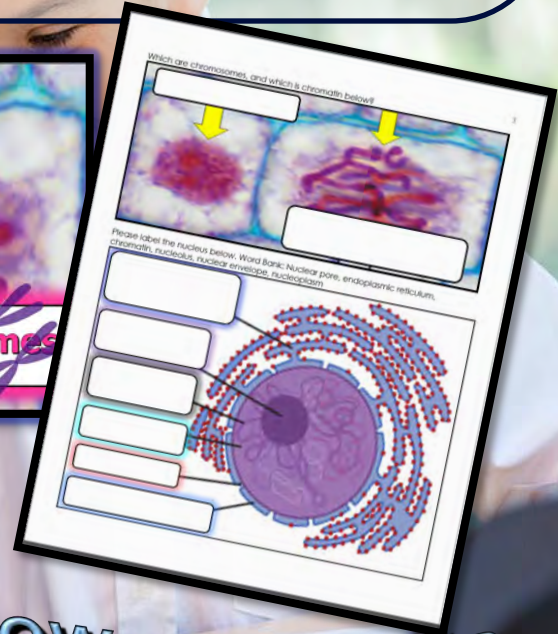
Red Slide Notes: Help students record important information in a fun and easy-to-understand way. Designed red-colored slides contain a few pieces of crucial information that students must record into their work bundle to complete the notes. Students will use these important notes throughout the work bundle.

The set-up of the slideshows are designed to make learning fun and interactive for students. With a mix of questions and answers, teachers can use these slides to get their students thinking and actively participating in their education. Plus, the answers are always revealed on the next slide, providing students with immediate feedback and helping teachers assess their understanding.



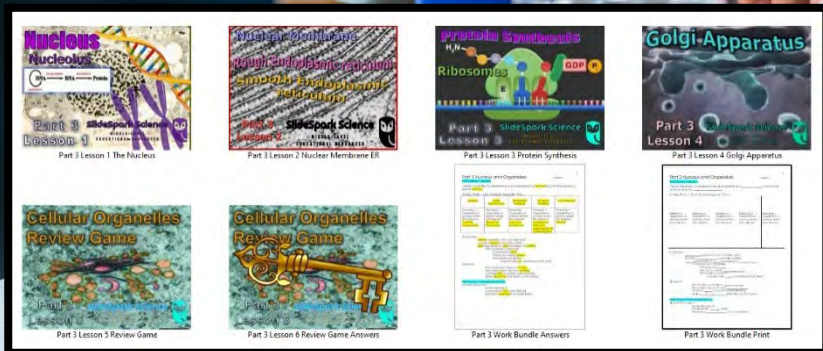
Next Slide

slideshow supports
Work Bundle



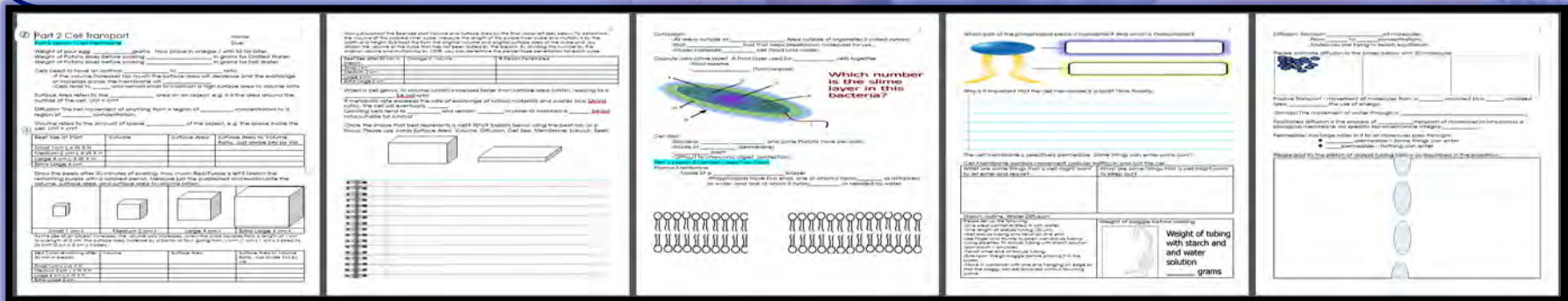
Lesson Planning

Daily lessons space exciting hands-on activities, red slide notes, video and academic links, projects, simulations, readings, built-in quizzes, and review opportunities throughout the slideshows. A typical day may have many different learning styles being targeted. Daily lesson planning becomes advancing through the slideshow roadmap the night before. Each lesson is roughly 50 minutes, but sometimes things can speed up or slow down. The best strategy is just to go at your classes own pace. The work bundle chronologically follows the interactive slideshow and you can always spend extra time assessing the quality of the writing within. If you don't quite finish a lesson, you can always pick it up the next day where you left off. The only real trick in timing is not starting a larger activity if you don't have the available time to complete. The slideshows have been designed to be a low stress, go at your classes own pace experience. Most activities are designed to be cost effective, using general materials that can be gathered from your local stores.



Follow Along Work Bundle

Each science unit comes with several work bundles. The bundles should be printed before the unit begins and distributed to the students on the first day of the unit. The work bundles will be due shortly after the completion of the unit. The work bundle will become a resource for the review games, crossword puzzles, and will be collected for assessment. The work bundle follows the entire learning experience and will be used every day. They are chronological to the lessons and provide places to record fill-in notes, answer questions, collect data, graph and much more. An answer version is provided that can that be distributed to your support professionals. A digital version of the work bundle and some writable .pdf versions are provided if you want to go paperless. These work bundles are perfect for students looking for an easy and organized way to track their progress and stay on top of their studies.



Review Game / Assessments

This unit concludes with a review quiz. Answers are provided in slideshow form so students can self assess. A blank template sheet is provided in the work bundle. Students can benefit from working together in small table groups with quiet communication. You can decide if you want to allow the use of work bundles or not. These are a nice review opportunity and get the students looking through their work bundles for the answers.

Cellular Organelles Review Game

Part 3
Lesson 5

SlideSpark Science
MIDDLE-LEVEL
EDUCATIONAL RESOURCES



Part 4 Review Game

Part 4
Lesson 10

SlideSpark Science
MIDDLE-LEVEL
EDUCATIONAL RESOURCES



Part 3 Review Game
1-10 = 10 pts
Generally write out in correct capital letters
Final Question = 3 pt bonus

Name: _____ Score: _____ / 100

1) NUCLEUS	2) RIBOSOME	3) MITOCHONDRION	4) CYTOSOL	5) GOLGI APPARATUS
1)	2)	3)	4)	5)

Part 3 Review Game
1-10 = 10 pts
Generally write out in correct capital letters
Final Question = 3 pt bonus

Name: _____ Score: _____ / 100

1) NUCLEUS	2) RIBOSOME	3) MITOCHONDRION	4) CYTOSOL	5) GOLGI APPARATUS
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1-10 = 10 pts
Generally write out in correct capital letters
Final Question = 3 pt bonus

Name: _____ Score: _____ / 100

1) CYTOSOL	2) RIBOSOME	3) MITOCHONDRION	4) CYTOSOL	5) GOLGI APPARATUS
1)	2)	3)	4)	5)

Cellular Organelles Review Game



- This is the largest organelle in the cell?

The Nucleus

and the answer is...

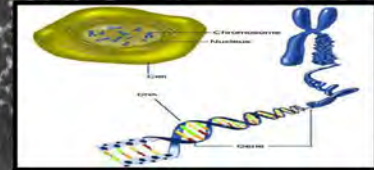
- Name these openings.

Nuclear Pores / Openings

and the answer is...

- This genetic molecule is contained in the nucleus?

DNA / Chromatin



and the answer is...

- This important organelle is a...

- Round dark spot in center of nucleus
- Only visible when cell is not dividing
- Contains RNA for protein manufacturing
- Makes ribosomes that travel out of nucleus.

The Nucleolus

and the answer is...



Name A, B, and C?

Name this organelle which is a series of folded membranes and site for protein synthesis?

Rough Endoplasmic Reticulum

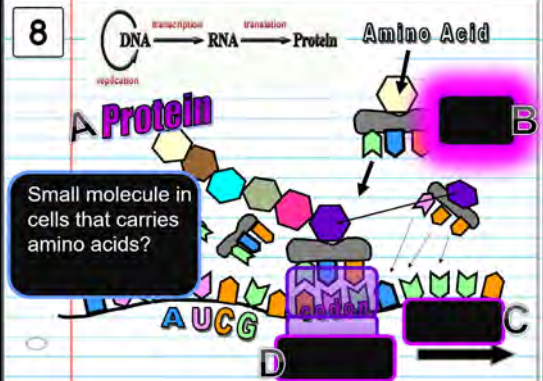
Form
Follows
Function

and the answer is...

These very numerous and small organelles are mini protein synthesizing factories?

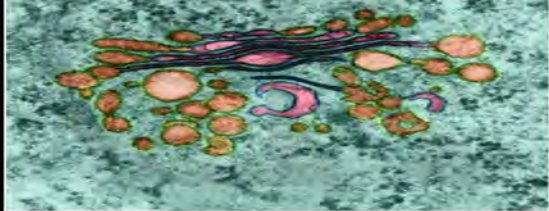
Ribosomes

and the answer is...



This organelle packages and transports proteins and other macromolecules?

Golgi Apparatus 9



These are protein messengers which help to coordinate certain bodily activities. 12

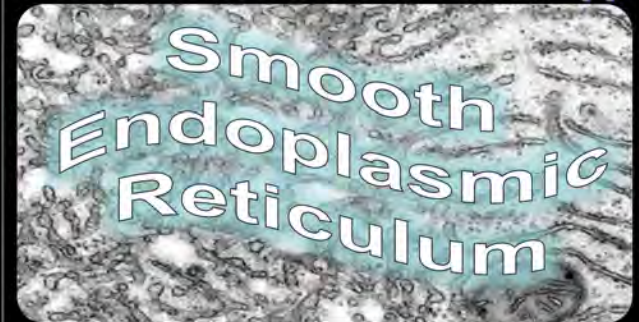


- Cellular Organelles: A membrane-bound compartment or structure in a cell that performs a special function.

They... **SUPPORT**
Manufacture "Make"
Breakdown Materials **and Transport** Materials
Communicate
within the cell.

This cellular organelle synthesizes sugars, stores enzymes, regulates calcium, makes lipids and steroids.

11



Name this a simple organic compound containing both a carboxyl ($-\text{COOH}$) and an amino ($-\text{NH}_2$) group. 13



Every cell in the human body contains these. The basic structure of these is a chain of amino acids. You need these in your diet to help your body repair cells and make new ones. It is important for growth and development in children, teens, and pregnant women.



- The Golgi Apparatus sends **vesicles** of macromolecules to destination in cell.

Vesicles 15



- True or False? The nucleolus is only visible when cell is not dividing.



This serves to separate the chromosomes from the rest of the cell and includes an array of small holes or pores that permit the passage of certain materials, such as nucleic acids and proteins, between the nucleus and cytoplasm.



Cellular Organelles Quiz Game

These have digestive enzymes and break down materials.



Which is not true of the Lysosome?

- A.) has digestive acids / enzymes
- B.) digestive organelle, recycles old cell parts
- C.) creates proteins, lipids, and carbohydrates
- D.) transports undigested material for removal
- E.) can cause a cell to self destruct

2

This is a microscopic network of protein filaments and tubules in the cytoplasm of many living cells, giving them shape and

Cytoskeleton

4

Peroxisome

3

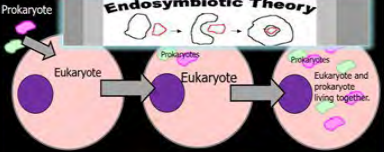
Which letter is which fiber?

- C.) Microfilaments (thin fibers)
- A.) Intermediate filaments (medium sized)
- B.) Microtubules (Large hollow cylinders)



5

This theory states that some of the organelles in today's eukaryotic cells were once primitive prokaryotic microbes.



Endosymbiotic Theory

Prokaryote

Eukaryote

Prokaryote

Eukaryote

Prokaryote

Eukaryote

Eukaryote and prokaryote living together

Eukaryote

Eukaryote

Eukaryote

Eukaryote

Eukaryote

Eukaryote

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Eukaryote

20 Questions with Answers

This is a hairlike structure that acts primarily as an organelle of locomotion.

- Made of a bundle of nine pairs of microtubules surrounding two central pairs of microtubules



Flagellum

Centrioles

- Look like golden nuggets (Pairs)
- Made of nine tubes
- Aid in cell division (Mitosis)



Centrioles / Centrosomes

8

These are the membrane-bound compartments inside chloroplasts and cyanobacteria.

- They are the site of the light-dependent reactions of photosynthesis

Thylakoids

10

This is a small structure that extends out from the surface of cell and is used for movement.

Cilia



Organelle that conducts photosynthesis.

- Where the photosynthetic pigment chlorophyll captures the energy from sunlight, converts it, and stores it in the energy-storage molecules

Chloroplast

9

This is the process by which green plants and some other organisms use sunlight to synthesize foods from carbon dioxide and water.

Photosynthesis

11

This cycle is a series of chemical reactions used by all aerobic organisms to generate energy.

- Requires the oxidation of acetate—derived from carbohydrates, fats, and proteins—into carbon dioxide.



17

This is a membrane-bound sac for storage, digestion, and waste removal.



19

Which is not true of cellular respiration.

- A.) Burns sugars for energy.
- B.) Energy is released.
- C.) Occurs in most cells.
- D.) Oxygen is used.
- E.) Water is produced.

18

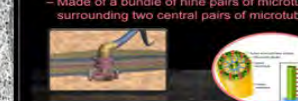
This is a form of cellular respiration that occurs when oxygen is absent or scarce.



Anaerobic Respiration

20

answer is...



Part 4 Review Game

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

Part 4 Review Game

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

Which of the following equations is the correct equation for photosynthesis?

- A) $6O_2 + 6H_2O + \text{light energy} = C_6H_{12}O_6 + 6O_2$
- B) $6CO_2 + 6H_2O + \text{sugar} = C_6H_{12}O_6 + 6O_2$
- C) $6CO_2 + 6O_2 + \text{light energy} = C_6H_{12}O_6 + 6H_2O$
- D) $6CO_2 + 6H_2O + \text{light energy} = C_6H_{12}O_6 + 6O_2$
- E) $6CO_2 + H_2O + \text{light energy} = C_6H_{12}O_6 + 6O_2$
- F) $6CO_2 + 6H_2O + \text{light energy} = C_6H_{12}O_6 + 6O_2$
- G) $6CO_2 + 6H_2O + \text{sugar} = C_6H_{12}O_6 + 6O_2$
- H) $6CO_2 + 6H_2O + \text{light energy} = C_6H_{12}O_6 + 6O_2$
- I) $6CO_2 + 6H_2O + \text{light energy} = C_6H_{12}O_6 + 6CO_2$
- J) $C_6H_{12}O_6 + 6CO_2 + 6H_2O + \text{light energy} = 6O_2$

12

Which of the following equations is the correct one for the respiration equation?

- A) $C_6H_{12}O_6 + 6H_2O = \text{Released energy} + 4CO_2 + 6H_2O$
- B) $C_6H_{12}O_6 + 6O_2 = \text{Released energy} + 6CO_2 + 6H_2O$
- C) $C_6H_{12}O_6 + 6O_2 = \text{Released energy} + 6O_2 + 6H_2O$
- D) $C_6H_{12}O_6 + 6O_2 = \text{Released energy} + 6CO_2 + 6H_2O$
- E) $C_6H_{12}O_6 + 6CO_2 = \text{Released energy} + 6O_2 + 6H_2O$
- F) $C_6H_{12}O_6 + 6CO_2 = \text{Released energy} + 6CO_2 + 6H_2O$
- G) $C_6H_{12}O_6 + 6O_2 = \text{Released energy} + 6CO_2 + 6H_2O$
- H) $C_6H_{12}O_6 + 6O_2 = \text{Light Energy} + 6CO_2 + 6H_2O$
- I) $C_6H_{12}O_6 + 6O_2 = \text{Released energy} + 6O_2 + 6H_2O$
- J) $C_6H_{12}O_6 + 6O_2 = \text{Released energy} + 6CO_2 + 6H_2O$
- K) $C_6H_{12}O_6 + 16O_2 = \text{Released energy} + 6O_2 + 6H_2O$
- L) $\text{Released energy} + 6CO_2 + 6H_2O + C_6H_{12}O_6 + 6O_2 = G$

16

This is the processes whereby certain organisms obtain energy from organic molecules.



Cellular Respiration

14

Which of the following statements is false of photosynthesis?

- A.) Photosynthesis requires sunlight, carbon dioxide, and water.
- B.) Oxygen and glucose are produced in photosynthesis.
- C.) Carbon dioxide and water are produced.
- D.) In photosynthesis, plants use radiant energy from the sun to create chemical energy in the form of sugars.
- E.) None of the above.

13

This cellular organelle uses sugar and oxygen to make energy?



Mitochondria

15

Activities / Labs

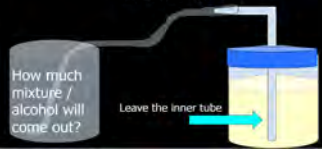
Our science activities are designed to help students explore and understand complex scientific concepts in an engaging and interactive way. Each science unit includes several hands-on activities that encourage students to collect data and think critically about the world around them. Our easy-to-follow slideshow provides detailed visuals, simple materials, and clear directions, making it easy for both students and teachers to navigate the activities.

- Procedure:
 - A.) Add 2 tablespoons (9.85 ml) of bakers yeast to one cup (236.5 ml) of warm water.



- Another group could keep the straw in and have a larger outlet opening. Collect the mixture and watch gases that comes out of the tube.

If the opening is too thin clogs may occur. Cut to widen.



- Procedure:
 - A.) Add 2 tablespoons (9.85 ml) of bakers yeast to one cup (236.5 ml) of warm water.
 - B.) Add 2 tablespoons of sugar into the container. Sucrose or Fructose.



- Questions.
 - What occurred in the cabbage solution?



- Procedure:
 - H.) Place other end of tube into the cabbage water.
 - I.) Make Observations about the colors of the cabbage solution, bubbles, and anything else.



- Questions.
 - What occurred in the cabbage solution?
 - The cabbage solution should change colors. The carbon dioxide gas coming through the tube changed the pH of the water.
 - (made more acidic)

Red cabbage contains a water-soluble pigment called anthocyanin that changes color when it is mixed with an acid or a base. The pigment turns red in acidic environments with a pH less than 7 and the pigment turns bluish green to alkaline (basic) environments with a pH greater than 7.

Which is aerobic respiration and which is anaerobic respiration?

This is a form of cellular respiration that occurs when oxygen is absent or scarce. Microscopic organisms use such as yeast. Humans carry out anaerobic respiration, especially when muscles perform strenuous exercise resulting in oxygen debt (example - sprint).	This is a form of cellular respiration that requires oxygen in order to generate energy. We use this form of respiration.
---	--

Activity! (Optional) Making Alcohol This alcohol is poisonous and will not be consumed. Learn more at <http://www.unh.edu/~microbiology/fergus1.pdf>

- Add 2 tablespoons (9.85 ml) of bakers yeast to one cup (236.5 ml) of warm water.
- Add 2 tablespoons of sugar into the container. Sucrose or Fructose
- Four make use only of glucose under aerobic and anaerobic.
- Attach tubing to the end of the container. Securely.
- Attach tube to container filled with cabbage water.
- Chop the cabbage into small pieces (if you have about 2 cups of chopped cabbage). Place the cabbage in a large beaker or other glass container and add boiling water to cover the cabbage. Allow at least ten minutes for the color to seep out of the cabbage. Alternatively, you can choose about 2 cups of cabbage in a blender, cover it with boiling water, and blend it.
- Filter out the plant material to obtain a clear purple-red colored liquid. This liquid is at about pH 7. (The exact color may vary depending on the pH of the water.)
- Place other end of tube into the cabbage water.
- Make Observations about the colors of the cabbage solution, bubbles, and anything else.

What occurred in the cabbage solution? Can you test the pH?

What was produced in the container with the yeast?

Red Cabbage Indicator

Vacuole

Membrane-bound sacs for _____, _____, and _____ removal

_____ in plant cell. Keeps good _____

_____ Create turgid _____ in plants

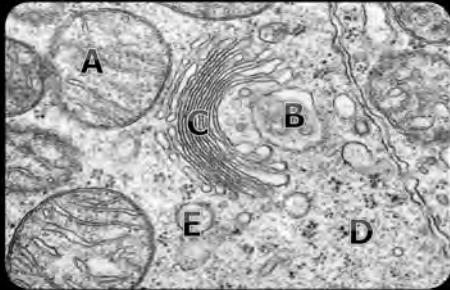
_____ Contains food and _____ solution

_____ _____ vacuoles for water removal (in unicellular organisms) + locomotion.

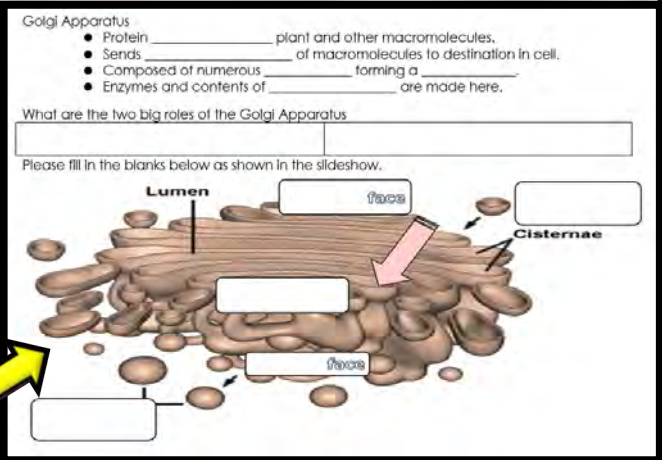
Built-in Assessment

Each unit contains several built-in assessment questions that students answer in their work bundle. With the question revealed before the answer, the teacher can easily call on individual students or table groups to respond. These provide an effective and efficient way for teachers to assess student learning.

• Which letter is the Golgi Apparatus?



• Which letter is the Golgi Apparatus?

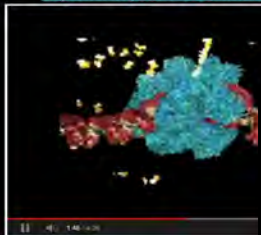


Questions in Work Bundle

Built-in Video Links

Our science education program is designed with the modern, multimedia learner in mind, and our video links are a perfect complement to our educational materials. These short clips are embedded into the slideshow at just the right places for a fantastic review. Whether you're studying biology, chemistry or physics, our video links are an excellent way to reinforce your learning.

- Video Link! Transcription and Translation.
- Optional / Advanced
– http://www.youtube.com/watch?v=41_Ne5m



- Video! Protein Synthesis
– <http://www.youtube.com>

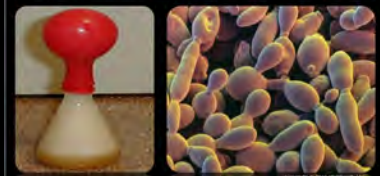


- Activity! Optional. Let's see some Chlorophyll / Pigments and Carotenoids
- Short Video with set-up:
<https://www.youtube.com/watch?v=qH-AJDqsSI>

Pigment: A pigment is a material that changes the color of reflected or transmitted light as the result of wavelength-selective absorption.



- Blow up a balloon with cellular respiration.
<https://www.scienceworld.ca/resource/yeast-inflated-balloons/#~:text=Pour%201%20tablespoon%20of%20yeast,balloon%20in%20a%20warm%20place>



- "Thriller" – Photosynthesis
– Photosynthesis Song ("Thriller" (youtube.com))



- If you're interested to learn more / significantly more advanced than this lesson.
– <https://www.mrgscience.com/topic-82-cell-respiration.html>

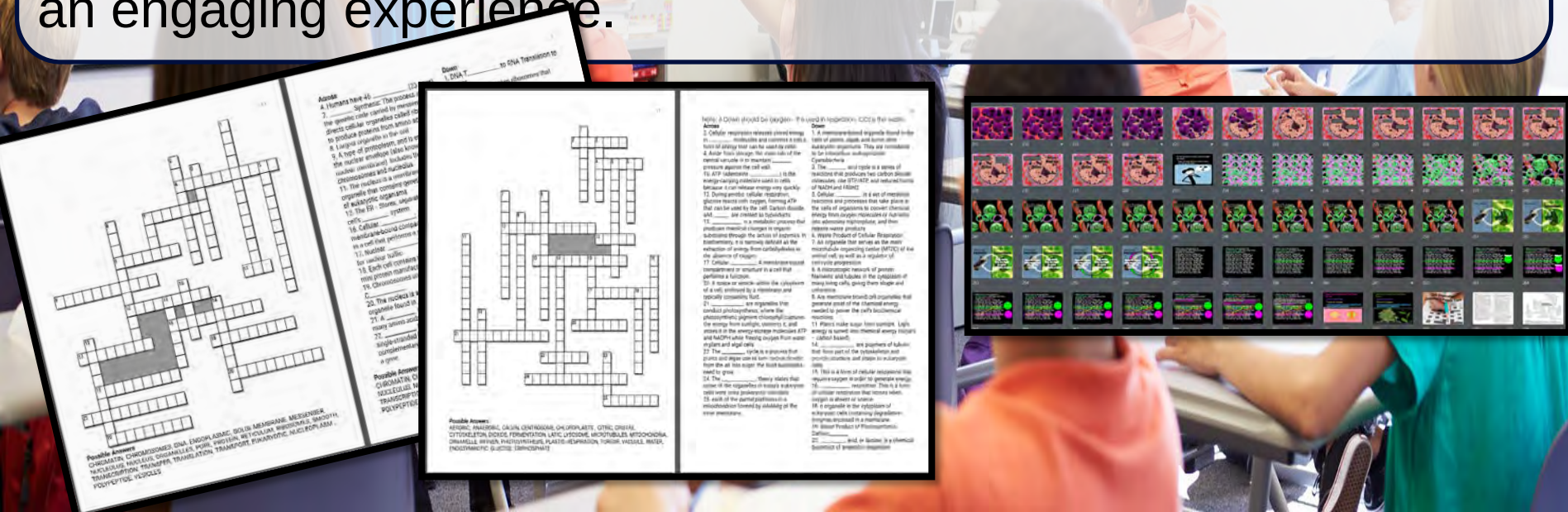


- Citric Acid Cycle summarized in 4 minutes.
– <https://www.youtube.com/watch?v=SkPwVO9BFI>

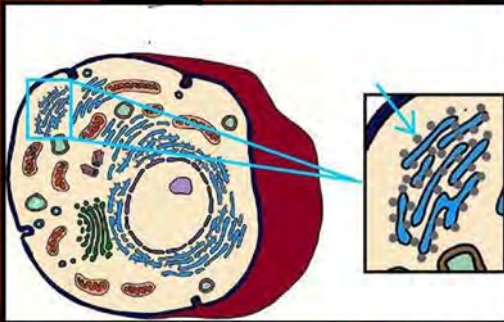


Games and Review

Games are a fantastic way for students to learn scientific concepts while having fun. We incorporate a variety of games into our curriculum, including interactive quizzes and puzzles that challenge students to think critically about the material. Our Hidden Box Games are a particularly popular feature, which conclude each unit by revealing a picture related to the topic. Students try to guess what the picture might be, making learning an engaging experience.

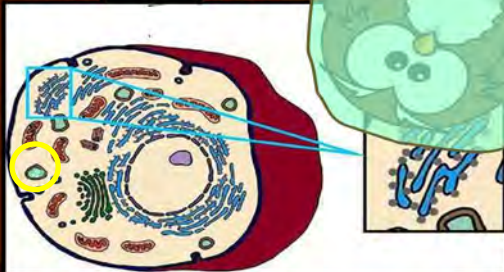


- Makes : that travel out of nucleus.



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- Makes : that travel



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The Owl - Each Part of the slideshow has a small clipart Owl hiding somewhere in a slide. The owl is incredibly small and blended into just the right slide. If a student spots the "Owl" they can raise their hand high into the air. When you call upon the student they can say "Owl" and be the student who spotted the Owl. Each PowerPoint Review game also has an owl hiding in it worth one point. Remind the students that they secretly write the word "owl" rather than yell it out during the review games. The Owl search is not included in every lesson. A slide at the beginning of the lesson will alert the students that today is an "Owl" day. Everything arrives editable so delete if you wish. You will find that some students will become the expert owl hunters in the group.

Google Classroom Compatible

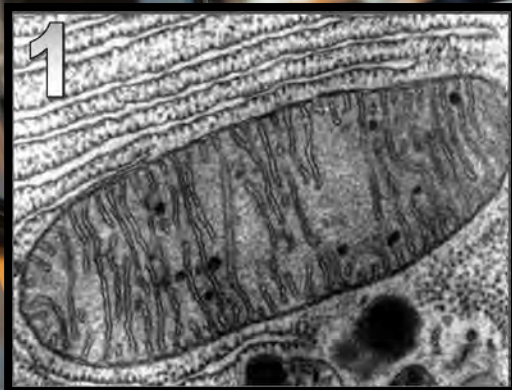
Our digital learning programs are designed for students to learn science in a flexible and engaging environment. Our Google Classroom-compatible units provide a seamless learning experience whether your students are in the classroom or learning from home. Our step-by-step slideshows and student work bundles ensure that students can complete their work independently. The PowerPoint Slideshows and step-by-step work bundles can easily be loaded to your Google Drive and posted in your Google Classroom. These are great for daily lessons, students who need additional time, and for a student who was absent and looking to catch up in their work bundle.

	<u>Part 3 Lesson 2 Nuclear Me...</u> Google Slides		<u>Part 3 Lesson 1 The Nucleus</u> Google Slides
	<u>Part 3 Lesson 3 Protein Synt...</u> Google Slides		<u>Part 3 Lesson 4 Golgi Appar...</u> Google Slides
	<u>Part 3 Lesson 5 Review Game</u> Google Slides		

	<u>Part 4 Lesson 1 Lysosomes</u> Google Slides		<u>Part 4 Lesson 8 Vacuoles</u> Google Slides
	<u>Part 4 Lesson 10 Review Ga...</u> Google Slides		<u>Part 4 Lesson 6 Respiration ...</u> Google Slides
	<u>Part 4 Lesson 9 Wrap Up an...</u> Google Slides		<u>Part 4 Lesson 2 Endo Symb</u> Google Slides
	<u>Part 4 Lesson 3 Chloroplast</u> Google Slides		<u>Part 4 Lesson 4 Photosynth...</u> Google Slides
	<u>Part 4 Lesson 5 Mitochondria</u> Google Slides		<u>Part 4 Lesson 7 Anerobic</u> Google Slides

Built-in Questions and Assessments

Many slides will have relevant terms covered with a box. When advancing through the slideshow an outline around the box will glow with a bright color. The next slide will make the box disappear. These slides allow the teacher to call upon students or table groups / check for understanding before advancing. The team at SlideSpark has found that using this technique helps to keep the students focused. Constantly recalling and reviewing information learned is necessary when moving through a large unit. The slideshows don't just give everything away for free. Students should be able to demonstrate knowledge before moving on. Some slides have full questions instead of just covered terms. In these slides, the teacher should encourage small group work. The teacher can then call upon one or two groups to share before advancing the slide. The next slide will always reveal the correct answer.



Cellular Biology Unit

Cell Biology Unit



30 Lessons 3 Parts. (8th-10th Most Difficult) Part 1 is an Introduction to Cells and contains 8 Lessons and 20 Page Work Bundle. Part 2 about Cell Transport and contains 7 Lessons and 17 Page Work Bundle. Part 3 explores Cellular Organelles and has 5 Lessons and 13 Page Work Bundle. Part 4 Finishes exploring Cell Organelles and wrap up. It contains 11 Lessons and 18 Page Work Bundle.

Part 1: Cell Biology Unit: 8 Lessons of 50 minutes and 20 Page Follow Along Work Bundle, What is Life, Sewer Lice / Raisins in Ginger Ale Activity, What is an Organism, Introduction to CHNOPS/SPONCH biologically Important Atoms/Molecules, % of CHNOPS graph in Animals, Characteristics of Living Things, Spontaneous Origin, Case Study of Francesco Redi Experiment, Case Study of Pasteur's Swan Necked Flask Experiment, Needs of Living Things, Cheek and Onion Cells Under the Microscope Activity, Differences between Plants and Animal Cells, Plant and Animal Cell Venn Diagram, Visual Tour of Types of Cells, Introduction to Forms Follows Function Concept, Forms Follows Function Object Activity, Multicellular vs. Unicellular, Kingdoms of Life Step by Step Diagram, Adding of Bacteria to Venn Diagram, Eukaryotic Cells vs. Prokaryotic Cells, Energy Flow of Life through Cells, Chemosynthesis, Deep Ocean Life at Hydrothermal Vents, Archaea, Domains and Kingdoms Diagram, Autotrophic vs. Heterotrophic, Levels of Biological Organization, Introduction to the Cell Theory, Microscope Creation by Hans and Zacharias Janssen, Robert Hooke, Anton van Leeuwenhoek, Schleiden and Schwann, Rudolf Virchow, Robert Remak, The Modern Cell Theory, Three Big Principles of the Cell Theory, Introduction to the Cellular Organelle Poster Project, Cell City Project, Students design a cell modeled after the Jobs and Functions of a City, Box Games, Crossword Puzzle, End Unit Assessment

Part 2: Cell Biology Unit: 7 Lessons of 50 minutes and 17 Page Follow Along Work Bundle Placing Eggs into Vinegar for Later in Unit, Surface Area to Volume Ratio, Why Surface Area Matters, Reasons for being multicellular, Explanation of Surface Area and Volume, Introduction to Diffusion, Beets in Bleach Lab Activity / Demonstration, Calculating Surface Area to Volume Ratio, Finding the % Bleach penetration into the Beets, How various cells increase their surface area to volume ratio, Set-Up for Gummy Bears in water, saltwater, vinegar, soda Lab in two Days, Potato Slices in Water vs. Salt Water Lab, Cytoplasm, Capsule Slime Layer in Bacteria and Need for good oral hygiene, Cell Wall, Functions of the Cell Wall, Set-up of Osmosis and Diffusion lab with Iodine Solution and Starch / Dialysis Tubing, Cell Membrane, Aquaporins, Phospholipid Bilayer, Hydrophilic vs. Hydrophobic, Transport Proteins, Polarity of the Phospholipid, Oil vs Water demo, Selectively Permeable, What might go in and out of a cell, Diffusion, Diffusion Demo, Bumper Boats Diffusion Activity, Visiting the Iodine and Starch Lab, Sketching Out the Dialysis Tubing, Osmosis, Calculating the % Change in Mass, Passive Transport, Permeable vs. Impermeable, Facilitated Diffusion, Active vs. Passive Transport with Visuals, Finding % Change of Gummy Bears placed in various Solutions, Hypertonic Solutions, Hypotonic Solutions, Isotonic Solutions, Built-In Visual Quiz, Cells Walls preventions in Lysis, Prefixes Visual Quiz, Why we can't drink Saltwater, Set-up Syrup in Dialysis Tubing Demo, Revisiting Potato Slice in Water and Salt Water and calculating % change in Mass, Visiting Eggs in Vinegar and explanation of what occurred, Find % change, Active Transport, Sodium Potassium Pump, Class Simulation of Active Transport, Cell Communication, Endocytosis, Phagocytosis, Class Engulfs a Particle Activity, Pinocytosis, Transmembrane Proteins Receptor Mediated Endocytosis, Exocytosis, Movement through a cell Flow Chart, Box Game Review, Crossword Puzzle, End Unit Assessment

[Parts 3 and 4: Cellular Organelles](#) Part 3: 8 Lessons of 50 minutes and 20 Page Follow Along Work Bundle, Special Functions of Cellular Organelles in a Cell, Nucleus, Functions of the Nucleus, Information Flow of Life, DNA-RNA-Proteins, Transcription, Translation, Important Role of Proteins, Chromosomes, Chromatin, Unwinding 6 feet of string Chromosome activity, Nuclear Membrane, Nucleolus, Ribosome Creation, Visuals Matching Activity, Nuclear Pores/Openings, Phospholipid bilayer, Nucleoplasm, Rough Endoplasmic Reticulum, The Lost Art of Maze Making Activity, Smooth Endoplasmic Reticulum, Ribosomes, Flow of Information Class Simulation to Music, Gene Expression, Review of Transcription and Translation, Protein Synthesis, Initiation, Step by Step Drawing Protein Synthesis, Elongation, Termination, Review of the Steps with Visuals, Importance of Protein in our Diet, Hormones, Golgi Apparatus, Cis Face, Trans Face, Build Golgi Body Fanny Packs Activity, Visual Review of the flow of molecules, Box Game Review, Crossword Puzzle, End Unit Assessment

[Parts 3 and 4: Cellular Organelles](#) Part 4: 11 Lessons of 50 minutes and 18 Page Follow Along Work Bundle Special Functions of Cellular Organelles in a Cell, Lysosomes, Function of Lysosomes and the Breakdown of Materials, Cytoskeleton, Microfilaments, Intermediate Filaments, Microtubules, Flagellum, Cilium, Centrioles, Role in Mitosis, Endosymbiotic Theory, Step by Step Visual, Mitochondria, Chloroplast, Optional Chromatography Activity to see Plastids in Leaves, Plastids, Thylakoids, Granum, Photosynthesis Equation, Learning the Equation with M&M's Activity, Description of Photosynthesis Main Parts, Video Options for Photosynthesis in more detail, Four Main Steps of Photosynthetic Process, Cellular Respiration, Foods Macronutrients, Mitochondria, Function of Mitochondria, Cristae, Learning the Respiration Equation, M&M's again as a manipulative, Blowing a balloon with Yeast Demo, Step by Step of Calvin Cycle, Review of Cellular Respiration, The Carbon Dioxide and Oxygen Balance of Life, Aerobic vs. Anaerobic Respiration, Fermentation, Fermentation Equation, Activity with Cabbage Indicator and Yeast, Venn Diagram of Anaerobic and Aerobic Respiration, Dangers of Botulism, Vacuoles, The Many Functions of Vacuoles, Turgid Pressure in Plants, Contractile Vacuoles, Name that Organelle Visual Quiz, Box Game Review, Crossword Puzzle, Unit Assessment

Cellular Biology Unit

- **Organism:** An organism is any individual entity that embodies the properties of life.
 - Organisms are classified by taxonomy into groups such as multicellular animals, plants, and fungi, or unicellular microorganisms such as prokaryotes, bacteria, and archaea.
- **Form Follows Function:** Means that the form of a body part or structure is related to its function.
 - The form or shape of a structure within an organism is correlated to the purpose or function of that structure.
- **Cellular Organelles:** A membrane-bound compartment or structure in a cell that performs a special function.

They Support Manufacturing, Breakdown Materials, and Transport Materials within the cell.

Answer: Because lipids are nonpolar. They don't mix with water.

- The membrane becomes a water proof barrier between two liquid areas.

Kingdoms of Life

	Eukarya				
	Protista	Fungi	Plantae	Animalia	Archaea
Cell Type	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Prokaryotic
Cell Wall	Cell wall	Cell wall	Cell wall	Cell wall	Cell wall
Plant Cell	No	No	Yes	No	No
Animal Cell	No	Yes	No	Yes	No

Domains and Kingdoms

	Bacteria	Eukarya	Archaea
Cell Type	Prokaryotic	Eukaryotic	Prokaryotic
Cell Wall	Cell wall	Cell wall	Cell wall
Plant Cell	No	Yes	No
Animal Cell	No	Yes	No

Answer: Eukaryotic cells have a nucleus, and are much larger and have more organelles. (More complex)

Form Follows Function

DNA (Double Strand)

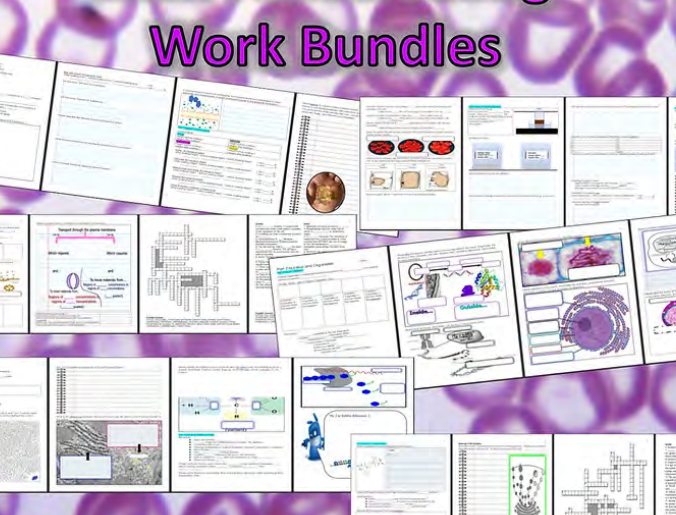
The RNA molecule

30 Lessons of 50 minutes

With Follow Along Work Bundles

68 Pages

With Follow Along Work Bundles



68 Pages

Truly Interactive Slides

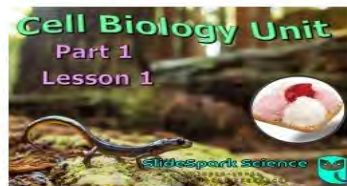
The image is a collage of various educational slides and diagrams related to cell biology. The slides are arranged in a non-linear fashion, overlapping each other. The background is a textured, light-colored surface.

- Slide 1 (Top Left):** Title: "Truly Interactive Slides".
- Slide 2 (Top Left):** Title: "Schleiden and Schwann improved the cell theory." Content: "They observed both plants and animals are made of cells." Includes a diagram of a plant cell and an animal cell.
- Slide 3 (Top Left):** Title: "The 3 big principles of the cell theory." Content: "All living organisms are composed of one or more cells." "The cell is the most basic unit of life." "All cells arise from pre-existing cells." Includes a diagram of a cell.
- Slide 4 (Top Left):** Title: "Surface Area to Volume Ratio with Beets". Content: "Wear Safety Goggles!" "Beets will have maximum sized beet cubes." "1 cm cube, 2 cm cube, 4 cm cube, 6 cm cube." Includes a diagram of beets and a table.
- Slide 5 (Top Left):** Title: "Venn Diagram". Content: "Learn more differences / similarities at: [http://www.ck12.org/interactive/animal-cell-vs-plant-cell](#)". Includes a Venn diagram comparing animal and plant cells.
- Slide 6 (Top Left):** Title: "Which is a cheek cell, and which is an onion cell? What is the difference?". Content: "A Onion Cell" "B Cheek Cell". Includes a diagram of an onion cell and a cheek cell.
- Slide 7 (Top Left):** Title: "Which one is facilitated diffusion?". Content: "A Diffusion" "B Facilitated Diffusion". Includes a diagram of a cell membrane showing diffusion and facilitated diffusion.
- Slide 8 (Top Left):** Title: "Endoplasmic Reticulum". Content: "Endoplasmic reticulum". Includes a diagram of a cell showing the endoplasmic reticulum.
- Slide 9 (Top Left):** Title: "Golgi Apparatus". Content: "Golgi Apparatus". Includes a diagram of a cell showing the Golgi apparatus.
- Slide 10 (Top Left):** Title: "Chromatin". Content: "Chromatin". Includes a diagram of a cell showing chromatin.
- Slide 11 (Top Left):** Title: "Unicellular Single celled". Content: "Unicellular Single celled". Includes a diagram of a single-celled organism.
- Slide 12 (Top Left):** Title: "Multicellular Many celled". Content: "Multicellular Many celled". Includes a diagram of a multicellular organism.
- Slide 13 (Top Left):** Title: "Chloroplasts". Content: "Chloroplasts". Includes a diagram of a chloroplast.
- Slide 14 (Top Left):** Title: "Mitochondria". Content: "Mitochondria". Includes a diagram of a mitochondrion.
- Slide 15 (Top Left):** Title: "Cell Wall". Content: "Cell Wall". Includes a diagram of a cell wall.
- Slide 16 (Top Left):** Title: "Nucleus". Content: "Nucleus". Includes a diagram of a nucleus.
- Slide 17 (Top Left):** Title: "Cell Membrane". Content: "Cell Membrane". Includes a diagram of a cell membrane.
- Slide 18 (Top Left):** Title: "Cytoplasm". Content: "Cytoplasm". Includes a diagram of cytoplasm.
- Slide 19 (Top Left):** Title: "Vacuole". Content: "Vacuole". Includes a diagram of a vacuole.
- Slide 20 (Top Left):** Title: "Lysosome". Content: "Lysosome". Includes a diagram of a lysosome.
- Slide 21 (Top Left):** Title: "Peroxisome". Content: "Peroxisome". Includes a diagram of a peroxisome.
- Slide 22 (Top Left):** Title: "Centriole". Content: "Centriole". Includes a diagram of a centriole.
- Slide 23 (Top Left):** Title: "Cytoskeleton". Content: "Cytoskeleton". Includes a diagram of a cytoskeleton.
- Slide 24 (Top Left):** Title: "Cell Division". Content: "Cell Division". Includes a diagram of a cell dividing.
- Slide 25 (Top Left):** Title: "Cell Differentiation". Content: "Cell Differentiation". Includes a diagram of a cell differentiating.
- Slide 26 (Top Left):** Title: "Cell Death". Content: "Cell Death". Includes a diagram of a cell dying.
- Slide 27 (Top Left):** Title: "Cell Signaling". Content: "Cell Signaling". Includes a diagram of a cell signaling.
- Slide 28 (Top Left):** Title: "Cell Communication". Content: "Cell Communication". Includes a diagram of a cell communicating.
- Slide 29 (Top Left):** Title: "Cell Homeostasis". Content: "Cell Homeostasis". Includes a diagram of a cell maintaining homeostasis.
- Slide 30 (Top Left):** Title: "Cell Adaptation". Content: "Cell Adaptation". Includes a diagram of a cell adapting.
- Slide 31 (Top Left):** Title: "Cell Evolution". Content: "Cell Evolution". Includes a diagram of a cell evolving.
- Slide 32 (Top Left):** Title: "Cell Speciation". Content: "Cell Speciation". Includes a diagram of a cell speciating.
- Slide 33 (Top Left):** Title: "Cell Extinction". Content: "Cell Extinction". Includes a diagram of a cell becoming extinct.
- Slide 34 (Top Left):** Title: "Cell Biogenesis". Content: "Cell Biogenesis". Includes a diagram of a cell being created.
- Slide 35 (Top Left):** Title: "Cell Reproduction". Content: "Cell Reproduction". Includes a diagram of a cell reproducing.
- Slide 36 (Top Left):** Title: "Cell Growth". Content: "Cell Growth". Includes a diagram of a cell growing.
- Slide 37 (Top Left):** Title: "Cell Development". Content: "Cell Development". Includes a diagram of a cell developing.
- Slide 38 (Top Left):** Title: "Cell Maturation". Content: "Cell Maturation". Includes a diagram of a cell maturing.
- Slide 39 (Top Left):** Title: "Cell Aging". Content: "Cell Aging". Includes a diagram of a cell aging.
- Slide 40 (Top Left):** Title: "Cell Senescence". Content: "Cell Senescence". Includes a diagram of a cell becoming senescent.
- Slide 41 (Top Left):** Title: "Cell Apoptosis". Content: "Cell Apoptosis". Includes a diagram of a cell undergoing apoptosis.
- Slide 42 (Top Left):** Title: "Cell Necrosis". Content: "Cell Necrosis". Includes a diagram of a cell undergoing necrosis.
- Slide 43 (Top Left):** Title: "Cell Autophagy". Content: "Cell Autophagy". Includes a diagram of a cell undergoing autophagy.
- Slide 44 (Top Left):** Title: "Cell Mitochondrial Dysfunction". Content: "Cell Mitochondrial Dysfunction". Includes a diagram of a cell with mitochondrial dysfunction.
- Slide 45 (Top Left):** Title: "Cell Endoplasmic Reticulum Dysfunction". Content: "Cell Endoplasmic Reticulum Dysfunction". Includes a diagram of a cell with endoplasmic reticulum dysfunction.
- Slide 46 (Top Left):** Title: "Cell Golgi Apparatus Dysfunction". Content: "Cell Golgi Apparatus Dysfunction". Includes a diagram of a cell with Golgi apparatus dysfunction.
- Slide 47 (Top Left):** Title: "Cell Lysosomal Dysfunction". Content: "Cell Lysosomal Dysfunction". Includes a diagram of a cell with lysosomal dysfunction.
- Slide 48 (Top Left):** Title: "Cell Peroxisomal Dysfunction". Content: "Cell Peroxisomal Dysfunction". Includes a diagram of a cell with peroxisomal dysfunction.
- Slide 49 (Top Left):** Title: "Cell Centriole Dysfunction". Content: "Cell Centriole Dysfunction". Includes a diagram of a cell with centriole dysfunction.
- Slide 50 (Top Left):** Title: "Cell Cytoskeletal Dysfunction". Content: "Cell Cytoskeletal Dysfunction". Includes a diagram of a cell with cytoskeletal dysfunction.
- Slide 51 (Top Left):** Title: "Cell Division Dysfunction". Content: "Cell Division Dysfunction". Includes a diagram of a cell with division dysfunction.
- Slide 52 (Top Left):** Title: "Cell Differentiation Dysfunction". Content: "Cell Differentiation Dysfunction". Includes a diagram of a cell with differentiation dysfunction.
- Slide 53 (Top Left):** Title: "Cell Death Dysfunction". Content: "Cell Death Dysfunction". Includes a diagram of a cell with death dysfunction.
- Slide 54 (Top Left):** Title: "Cell Signaling Dysfunction". Content: "Cell Signaling Dysfunction". Includes a diagram of a cell with signaling dysfunction.
- Slide 55 (Top Left):** Title: "Cell Communication Dysfunction". Content: "Cell Communication Dysfunction". Includes a diagram of a cell with communication dysfunction.
- Slide 56 (Top Left):** Title: "Cell Homeostasis Dysfunction". Content: "Cell Homeostasis Dysfunction". Includes a diagram of a cell with homeostasis dysfunction.
- Slide 57 (Top Left):** Title: "Cell Adaptation Dysfunction". Content: "Cell Adaptation Dysfunction". Includes a diagram of a cell with adaptation dysfunction.
- Slide 58 (Top Left):** Title: "Cell Evolution Dysfunction". Content: "Cell Evolution Dysfunction". Includes a diagram of a cell with evolution dysfunction.
- Slide 59 (Top Left):** Title: "Cell Speciation Dysfunction". Content: "Cell Speciation Dysfunction". Includes a diagram of a cell with speciation dysfunction.
- Slide 60 (Top Left):** Title: "Cell Extinction Dysfunction". Content: "Cell Extinction Dysfunction". Includes a diagram of a cell with extinction dysfunction.
- Slide 61 (Top Left):** Title: "Cell Biogenesis Dysfunction". Content: "Cell Biogenesis Dysfunction". Includes a diagram of a cell with biogenesis dysfunction.
- Slide 62 (Top Left):** Title: "Cell Reproduction Dysfunction". Content: "Cell Reproduction Dysfunction". Includes a diagram of a cell with reproduction dysfunction.
- Slide 63 (Top Left):** Title: "Cell Growth Dysfunction". Content: "Cell Growth Dysfunction". Includes a diagram of a cell with growth dysfunction.
- Slide 64 (Top Left):** Title: "Cell Development Dysfunction". Content: "Cell Development Dysfunction". Includes a diagram of a cell with development dysfunction.
- Slide 65 (Top Left):** Title: "Cell Maturation Dysfunction". Content: "Cell Maturation Dysfunction". Includes a diagram of a cell with maturation dysfunction.
- Slide 66 (Top Left):** Title: "Cell Aging Dysfunction". Content: "Cell Aging Dysfunction". Includes a diagram of a cell with aging dysfunction.
- Slide 67 (Top Left):** Title: "Cell Senescence Dysfunction". Content: "Cell Senescence Dysfunction". Includes a diagram of a cell with senescence dysfunction.
- Slide 68 (Top Left):** Title: "Cell Apoptosis Dysfunction". Content: "Cell Apoptosis Dysfunction". Includes a diagram of a cell with apoptosis dysfunction.
- Slide 69 (Top Left):** Title: "Cell Necrosis Dysfunction". Content: "Cell Necrosis Dysfunction". Includes a diagram of a cell with necrosis dysfunction.
- Slide 70 (Top Left):** Title: "Cell Autophagy Dysfunction". Content: "Cell Autophagy Dysfunction". Includes a diagram of a cell with autophagy dysfunction.
- Slide 71 (Top Left):** Title: "Cell Mitochondrial Dysfunction". Content: "Cell Mitochondrial Dysfunction". Includes a diagram of a cell with mitochondrial dysfunction.
- Slide 72 (Top Left):** Title: "Cell Endoplasmic Reticulum Dysfunction". Content: "Cell Endoplasmic Reticulum Dysfunction". Includes a diagram of a cell with endoplasmic reticulum dysfunction.
- Slide 73 (Top Left):** Title: "Cell Golgi Apparatus Dysfunction". Content: "Cell Golgi Apparatus Dysfunction". Includes a diagram of a cell with Golgi apparatus dysfunction.
- Slide 74 (Top Left):** Title: "Cell Lysosomal Dysfunction". Content: "Cell Lysosomal Dysfunction". Includes a diagram of a cell with lysosomal dysfunction.
- Slide 75 (Top Left):** Title: "Cell Peroxisomal Dysfunction". Content: "Cell Peroxisomal Dysfunction". Includes a diagram of a cell with peroxisomal dysfunction.
- Slide 76 (Top Left):** Title: "Cell Centriole Dysfunction". Content: "Cell Centriole Dysfunction". Includes a diagram of a cell with centriole dysfunction.
- Slide 77 (Top Left):** Title: "Cell Cytoskeletal Dysfunction". Content: "Cell Cytoskeletal Dysfunction". Includes a diagram of a cell with cytoskeletal dysfunction.
- Slide 78 (Top Left):** Title: "Cell Division Dysfunction". Content: "Cell Division Dysfunction". Includes a diagram of a cell with division dysfunction.
- Slide 79 (Top Left):** Title: "Cell Differentiation Dysfunction". Content: "Cell Differentiation Dysfunction". Includes a diagram of a cell with differentiation dysfunction.
- Slide 80 (Top Left):** Title: "Cell Death Dysfunction". Content: "Cell Death Dysfunction". Includes a diagram of a cell with death dysfunction.
- Slide 81 (Top Left):** Title: "Cell Signaling Dysfunction". Content: "Cell Signaling Dysfunction". Includes a diagram of a cell with signaling dysfunction.
- Slide 82 (Top Left):** Title: "Cell Communication Dysfunction". Content: "Cell Communication Dysfunction". Includes a diagram of a cell with communication dysfunction.
- Slide 83 (Top Left):** Title: "Cell Homeostasis Dysfunction". Content: "Cell Homeostasis Dysfunction". Includes a diagram of a cell with homeostasis dysfunction.
- Slide 84 (Top Left):** Title: "Cell Adaptation Dysfunction". Content: "Cell Adaptation Dysfunction". Includes a diagram of a cell with adaptation dysfunction.
- Slide 85 (Top Left):** Title: "Cell Evolution Dysfunction". Content: "Cell Evolution Dysfunction". Includes a diagram of a cell with evolution dysfunction.
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- Slide 91 (Top Left):** Title: "Cell Development Dysfunction". Content: "Cell Development Dysfunction". Includes a diagram of a cell with development dysfunction.
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Part 1: Cell Biology Unit: 8 Lessons of 50 minutes and 20 Page Follow Along Work Bundle, What is Life, Sewer Lice / Raisins in Ginger Ale Activity, What is an Organism, Introduction to CHNOPS/SPONCH biologically Important Atoms/Molecules, % of CHNOPS graph in Animals, Characteristics of Living Things, Spontaneous Origin, Case Study of Francesco Redi Experiment, Case Study of Pasteur's Swan Necked Flask Experiment, Needs of Living Things, Cheek and Onion Cells Under the Microscope Activity, Differences between Plants and Animal Cells, Plant and Animal Cell Venn Diagram, Visual Tour of Types of Cells, Introduction to Forms Follows Function Concept, Forms Follows Function Object Activity, Multicellular vs. Unicellular, Kingdoms of Life Step by Step Diagram, Adding of Bacteria to Venn Diagram, Eukaryotic Cells vs. Prokaryotic Cells, Energy Flow of Life through Cells, Chemosynthesis, Deep Ocean Life at Hydrothermal Vents, Archaea, Domains and Kingdoms Diagram, Autotrophic vs. Heterotrophic, Levels of Biological Organization, Introduction to the Cell Theory, Microscope Creation by Hans and Zacharias Janssen, Robert Hooke, Anton van Leeuwenhoek, Schleiden and Schwann, Rudolf Virchow, Robert Remak, The Modern Cell Theory, Three Big Principles of the Cell Theory, Introduction to the Cellular Organelle Poster Project, Cell City Project, Students design a cell modeled after the Jobs and Functions of a City, Box Games, Crossword Puzzle, End Unit Assessment



Additional and Printables



Part 1 Lesson 1 Sewer Lice SPONCH



Part 1 Lesson 2 Characteristics of Life



Part 1 Lesson 3 Cheek and Onion



Part 1 Lesson 4 Form Function Archaea



Part 1 Lesson 5 Domains and Kingdoms



Part 1 Lesson 6 Cell Theory



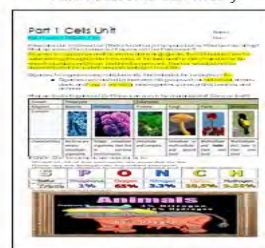
Part 1 Lesson 7 Cell City Project



Part 1 Lesson 8 Review Game



Part 1 Lesson 9 Review Game Answers



Part 1 Work Bundle Answers



Part 1: Cell Biology Unit

Part 2: Cell Biology Unit: 7 Lessons of 50 minutes and 17 Page Follow Along Work Bundle Placing Eggs into Vinegar for Later in Unit, Surface Area to Volume Ratio, Why Surface Area Matters, Reasons for being multi-cellular, Explanation of Surface Area and Volume, Introduction to Diffusion, Beets in Bleach Lab Activity / Demonstration, Calculating Surface Area to Volume Ratio, Finding the % Bleach penetration into the Beets, How various cells increase their surface area to volume ratio, Set-Up for Gummy Bears in water, saltwater, vinegar, soda Lab in two Days, Potato Slices in Water vs. Salt Water Lab, Cytoplasm, Capsule Slime Layer in Bacteria and Need for good oral hygiene, Cell Wall, Functions of the Cell Wall, Set-up of Osmosis and Diffusion lab with Iodine Solution and Starch / Dialysis Tubing, Cell Membrane, Aquaporins, Phospholipid Bilayer, Hydrophilic vs. Hydrophobic, Transport Proteins, Polarity of the Phospholipid, Oil vs Water demo, Selectively Permeable, What might go in and out of a cell, Diffusion, Diffusion Demo, Bumper Boats Diffusion Activity, Visiting the Iodine and Starch Lab, Sketching Out the Dialysis Tubing, Osmosis, Calculating the % Change in Mass, Passive Transport, Permeable vs. Impermeable, Facilitated Diffusion, Active vs. Passive Transport with Visuals, Finding % Change of Gummy Bears placed in various Solutions, Hypertonic Solutions, Hypotonic Solutions, Isotonic Solutions, Built-In Visual Quiz, Cells Walls preventions in Lysis, Prefixes Visual Quiz, Why we can't drink Saltwater, Set-up Syrup in Dialysis Tubing Demo, Revisiting Potato Slice in Water and Salt Water and calculating % change in Mass, Visiting Eggs in Vinegar and explanation of what occurred, Find % change, Active Transport, Sodium Potassium Pump, Class Simulation of Active Transport, Cell Communication, Endocytosis, Phagocytosis, Class Engulfs a Particle Activity, Pinocytosis, Transmembrane Proteins Receptor Mediated Endocytosis, Exocytosis, Movement through a cell Flow Chart, Box Game Review, Crossword Puzzle, End Unit Assessment



Additional and Printables



Part 2 Lesson 1 Cell Membrane



Part 2 Lesson 2 Osmosis



Part 2 Lesson 3 Gummy Bear Lab



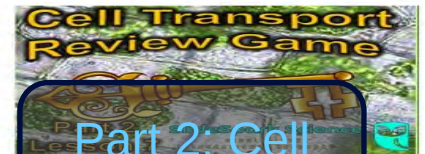
Part 2 Lesson 4 Extensions



Part 2 Lesson 5 Active Transport



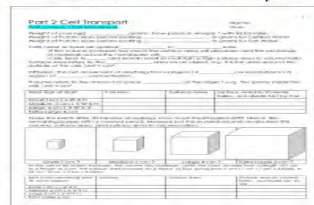
Part 2 Lesson 6 Review Game



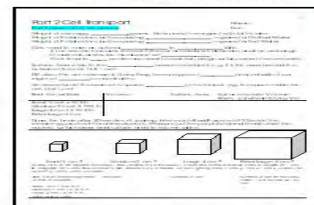
Part 2: Cell
Biology Unit



Part 2 Work Bundle Answers



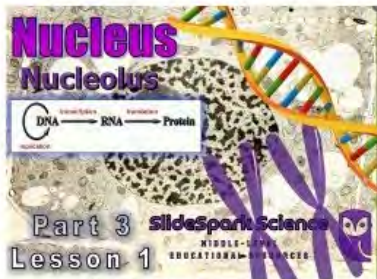
Part 2 Work Bundle Digital



Part 2 Work Bundle Print

Parts 3 and 4: Cellular Organelles Part 3: 8 Lessons of 50 minutes and 20 Page Follow Along Work Bundle, Special Functions of Cellular Organelles in a Cell, Nucleus, Functions of the Nucleus, Information Flow of Life, DNA-RNA-Proteins, Transcription, Translation, Important Role of Proteins, Chromosomes, Chromatin, Unwinding 6 feet of string Chromosome activity, Nuclear Membrane, Nucleolus, Ribosome Creation, Visuals Matching Activity, Nuclear Pores/Openings, Phospholipid bilayer, Nucleoplasm, Rough Endoplasmic Reticulum, The Lost Art of Maze Making Activity, Smooth Endoplasmic Reticulum, Ribosomes, Flow of Information Class Simulation to Music, Gene Expression, Review of Transcription and Translation, Protein Synthesis, Initiation, Step by Step Drawing Protein Synthesis, Elongation, Termination, Review of the Steps with Visuals, Importance of Protein in our Diet, Hormones, Golgi Apparatus, Cis Face, Trans Face, Build Golgi Body Fanny Packs Activity, Visual Review of the flow of molecules, Box Game Review, Crossword Puzzle, End Unit Assessment

Parts 3 and 4: Cellular Organelles



Part 3 Lesson 1 The Nucleus



Part 3 Lesson 2 Nuclear Membrane ER



Part 3 Lesson 3 Protein Synthesis



Part 3 Lesson 4 Golgi Apparatus



Part 3 Lesson 5 Review Game



Part 3 Lesson 6 Review Game Answers



Part 3 Work Bundle Answers



Part 3 Work Bundle Print

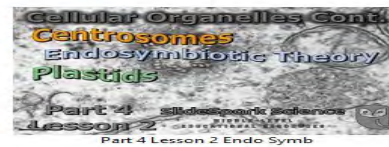
Parts 3 and 4: Cellular Organelles Part 4: 11 Lessons of 50 minutes and 18 Page Follow Along Work Bundle Special Functions of Cellular Organelles in a Cell, Lysosomes, Function of Lysosomes and the Breakdown of Materials, Cytoskeleton, Microfilaments, Intermediate Filaments, Microtubules, Flagellum, Cilium, Centrioles, Role in Mitosis, Endosymbiotic Theory, Step by Step Visual, Mitochondria, Chloroplast, Optional Chromatography Activity to see Plastids in Leaves, Plastids, Thylakoids, Granum, Photosynthesis Equation, Learning the Equation with M&M's Activity, Description of Photosynthesis Main Parts, Video Options for Photosynthesis in more detail, Four Main Steps of Photosynthetic Process, Cellular Respiration, Foods Macronutrients, Mitochondria, Function of Mitochondria, Cristae, Learning the Respiration Equation, M&M's again as a manipulative, Blowing a balloon with Yeast Demo, Step by Step of Calvin Cycle, Review of Cellular Respiration, The Carbon Dioxide and Oxygen Balance of Life, Aerobic vs. Anaerobic Respiration, Fermentation, Fermentation Equation, Activity with Cabbage Indicator and Yeast, Venn Diagram of Anaerobic and Aerobic Respiration, Dangers of Botulism, Vacuoles, The Many Functions of Vacuoles, Turgid Pressure in Plants, Contractile Vacuoles, Name that Organelle Visual Quiz, Box Game Review, Crossword Puzzle, Unit Assessment



Additional and Printables



Part 4 Lesson 1 Lysosomes



Part 4 Lesson 2 Endo Symb



Part 4 Lesson 3 Chloroplast



Part 4 Lesson 4 Photosynthesis Cont



Part 4 Lesson 5 Mitochondria



Part 4 Lesson 6 Respiration Cont



Part 4 Lesson 7 Anerobic



Part 4 Lesson 8 Vacuoles



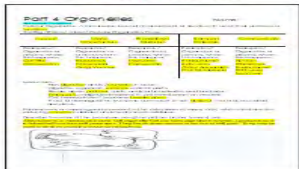
Part 4 Lesson 9 Wrap Up and Visual Quiz



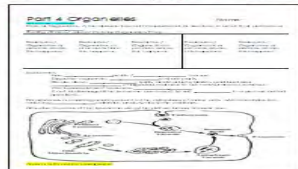
Part 4 Lesson 10 Review Game



Part 4 Lesson 11 Review Game Answers



Part 4 Work Bundle Answers



Part 4 Work Bundle Digital



Part 4 Work Bundle Print

Parts 3 and 4:
Cellular
Organelles

Curriculum Guide

Number of Lessons in each unit (50 min, daily lessons) and difficult rating scale / intended grade level.

 =Easier,

 = More difficult,

 =Most difficult

Earth Science Units	Daily Lessons	Intended Grade	
Geology Topics Unit	60 Lessons	6-8 medium difficulty	
Weather and Climate Unit	40 Lessons	6-8 medium difficulty	
Astronomy Unit	60 Lessons	6-8 medium difficulty	
Weathering, Soil Sciences	28 Lessons	5-7 easier	
Rivers and Water Quality	25 Lessons	5-7 easier	
Water Molecule Unit	20 Lessons	5-7 easier	

Life Science Units

Life Science Units	Daily Lessons	Intended Grade	
Ecology Feeding Levels Unit	13 Lessons	5-6 easier	
Ecology Interactions Unit	30 Lessons	5-6 easier	
Ecology Abiotic Factors Unit	24 Lessons	5-6 easier	
Botany Unit	50 Lessons	5-7 easier	
Evolution and Natural Selection	40 Lessons	5-7 easier	
Taxonomy and Classification	50 Lessons	6-8 medium difficulty	
Infectious Diseases Unit	30 Lessons	7-9 more difficult	
DNA and Genetics Unit	42 Lessons	8-10 most difficult	
Human Body Systems Unit	85 Lessons	6-8 medium difficulty	
Cell Biology Unit	30 Lessons	8-10 most difficult	

Physical Science

	Daily Lessons	Intended Grade	
Laws of Motion and Machines Unit	33 Lessons	8-10 most difficult	
Matter Energy and the Environment	58 Lessons	7-10 medium difficulty	
Atoms and Periodic Table Unit	44 Lessons	8-10 most difficult	
Science Skills Unit	30 Lessons	5-7 medium difficulty	

[Physical Science Curriculum](#)

[Entire SlideSpark Science Curriculum](#)



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With appreciation,

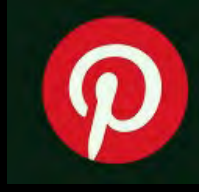
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Thank you for your time and interest in our Science curriculum. We strive to provide students with engaging and informative lessons that will spark their curiosity and encourage scientific exploration. Should you have any questions or concerns, please do not hesitate to contact us. Thank you again for considering our curriculum, and we wish you all the best in your educational journey.

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MIDDLE-LEVEL
EDUCATIONAL RESOURCES



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