Cellular Biology Unit

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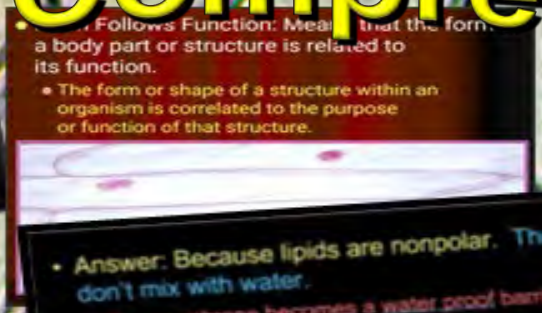
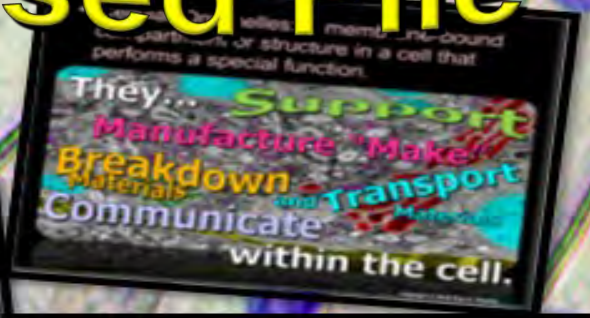
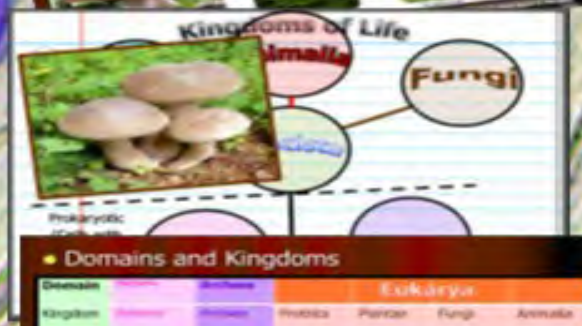
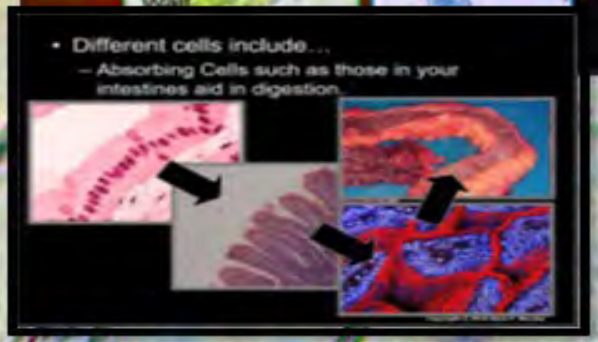


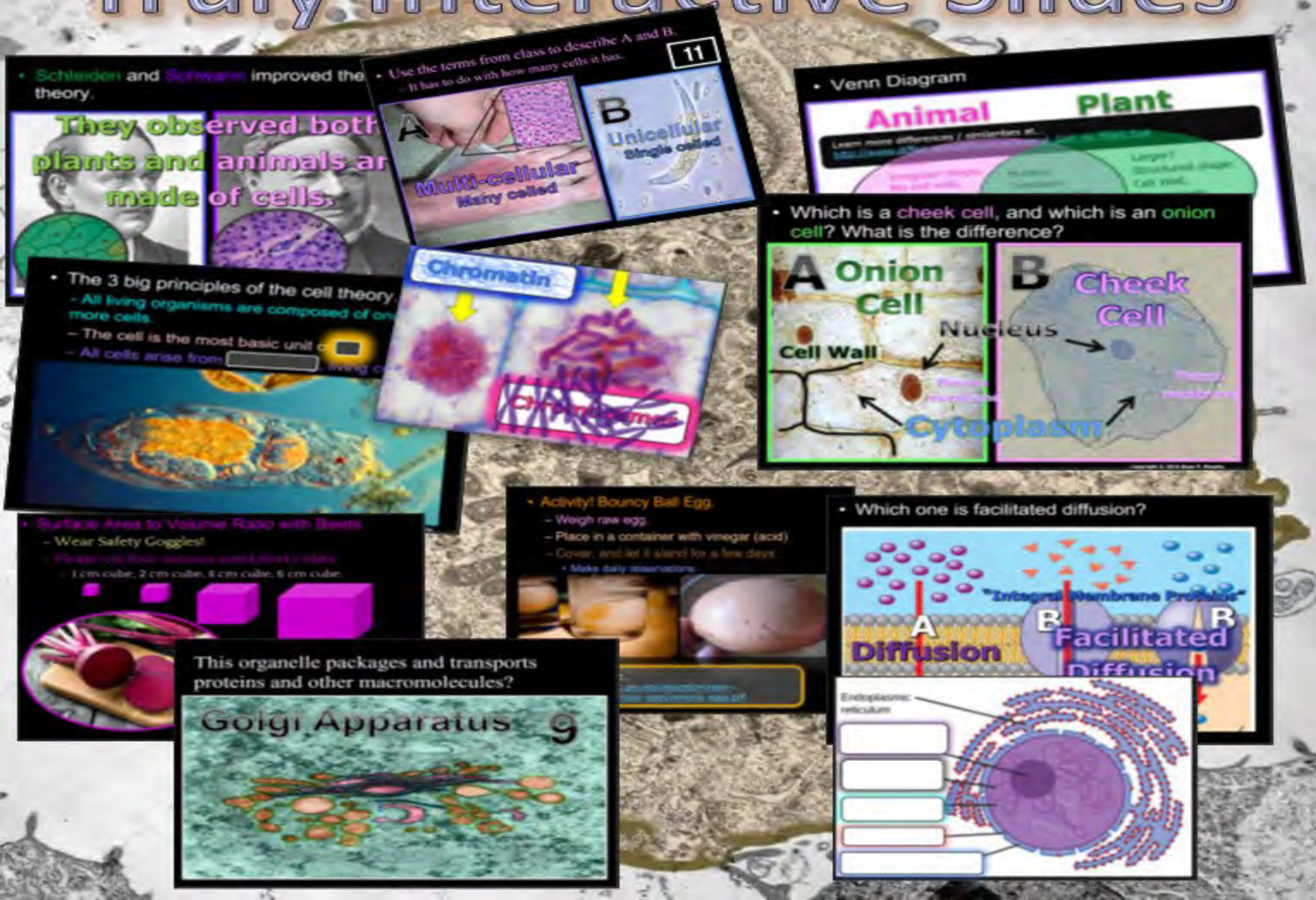




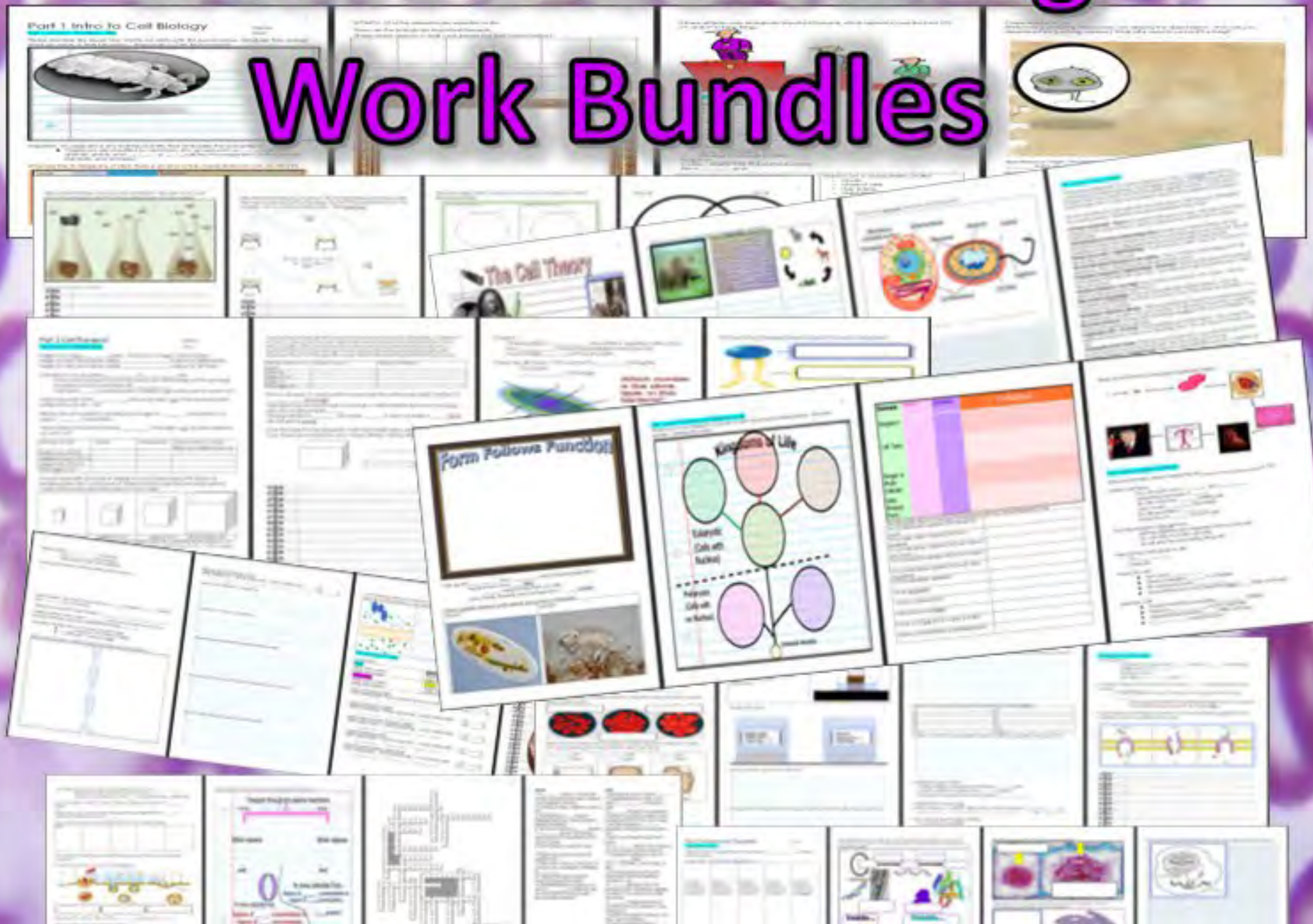


30 Lessons

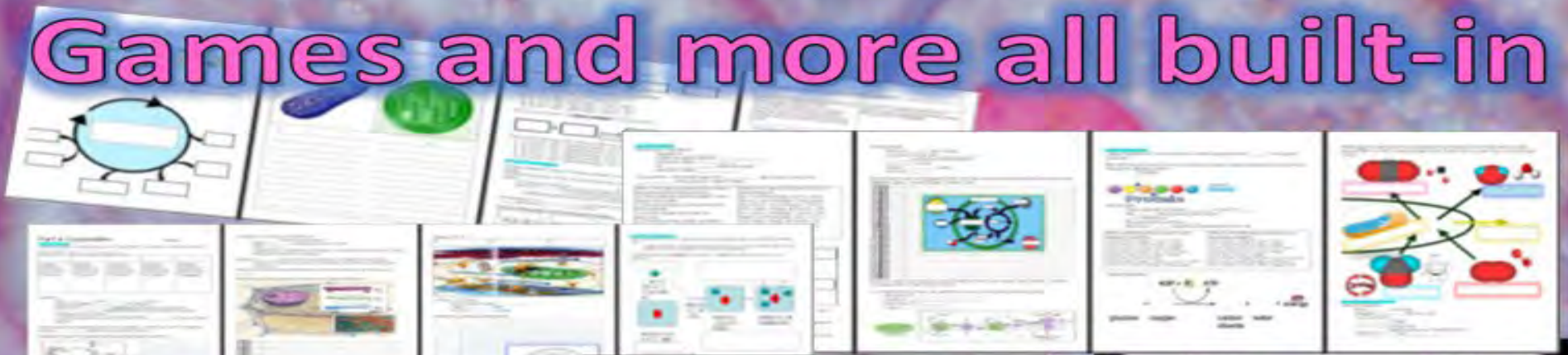
Truly Interactive Slides

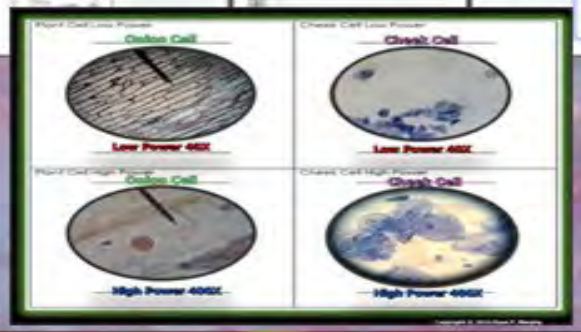


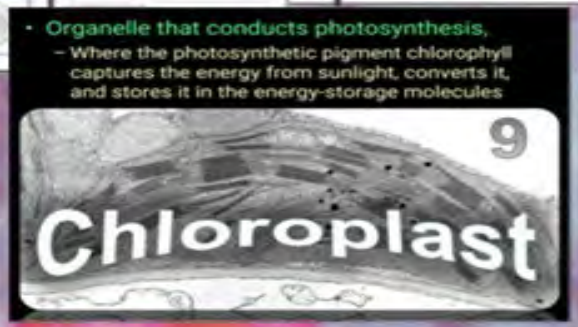
With Follow Along Work Bundles

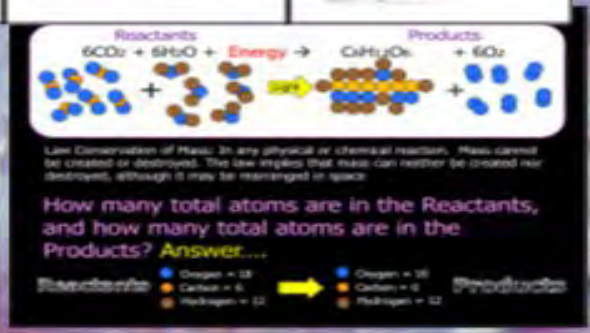


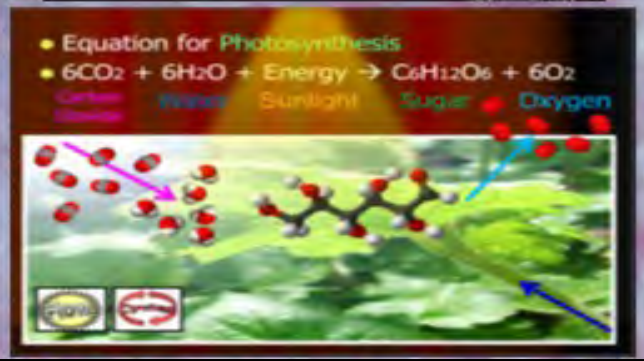
Assessments, Activities, Projects, Answers Keys, Games and more all built-in

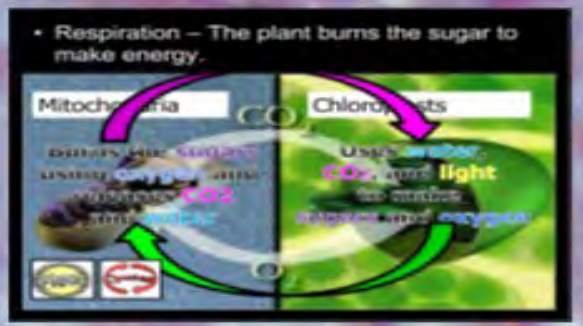










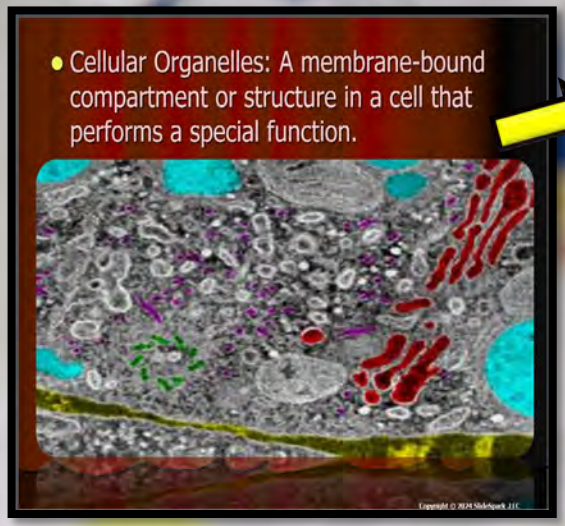


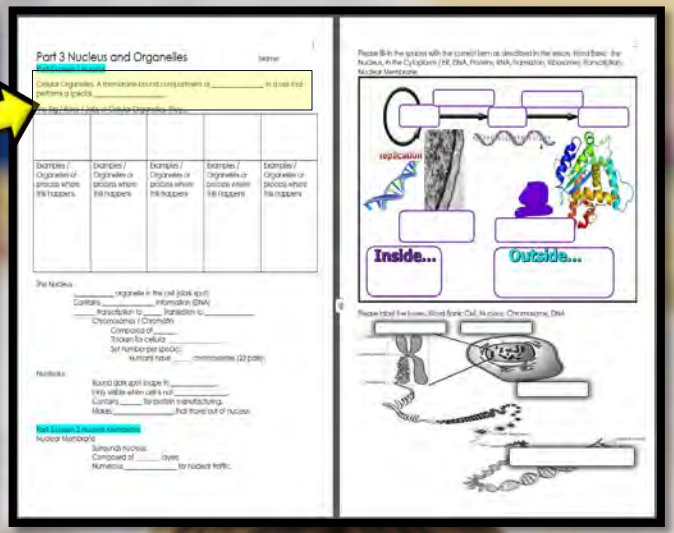
SlideSpark Science

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.

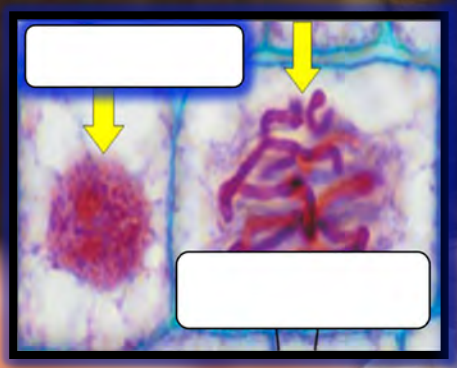
Each unit in the curriculum is designed to help teachers deliver the best possible learning experience for their students. Our interactive science slideshows are filled with questions and answers, important fill-in notes, hands-on activities, projects, games, built-in quizzes, and end of the unit assessment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

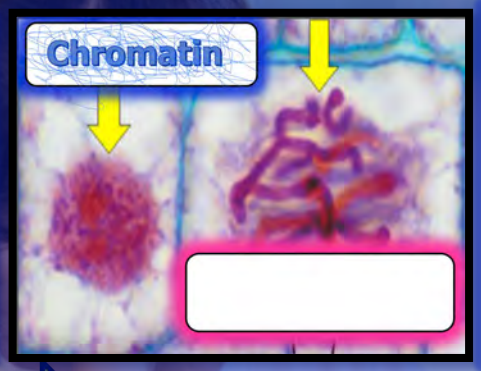


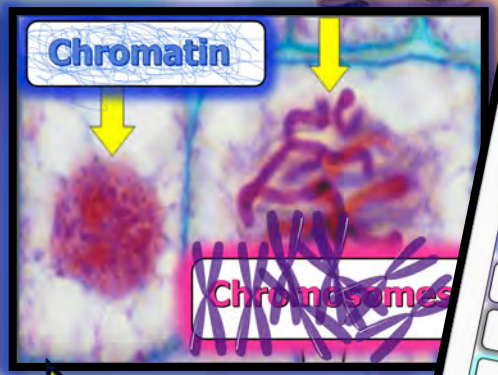


Red Slide Notes: Help students record important information in a fun and easy-to-understand way. Designed red-colored slides contain a few pieces of crucial information that students must record into their work bundle to complete the notes. Students will use these important notes throughout the work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

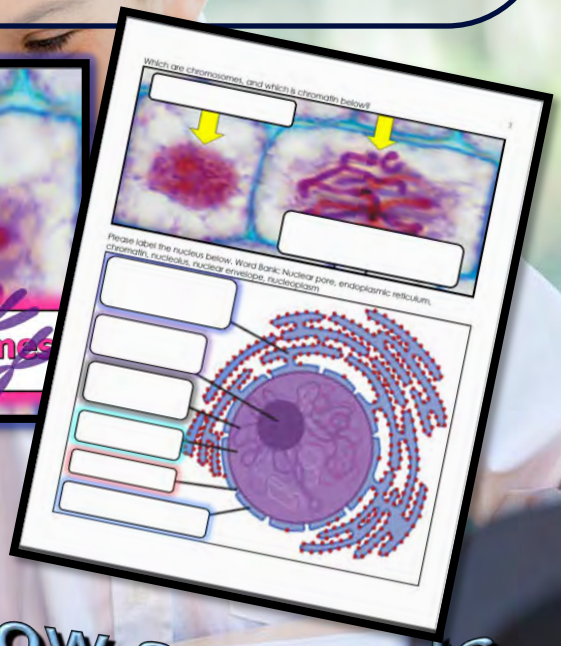
The set-up of the slideshows are designed to make learning fun and interactive for students. With a mix of questions and answers, teachers can use these slides to get their students thinking and actively participating in their education. Plus, the answers are always revealed on the next slide, providing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







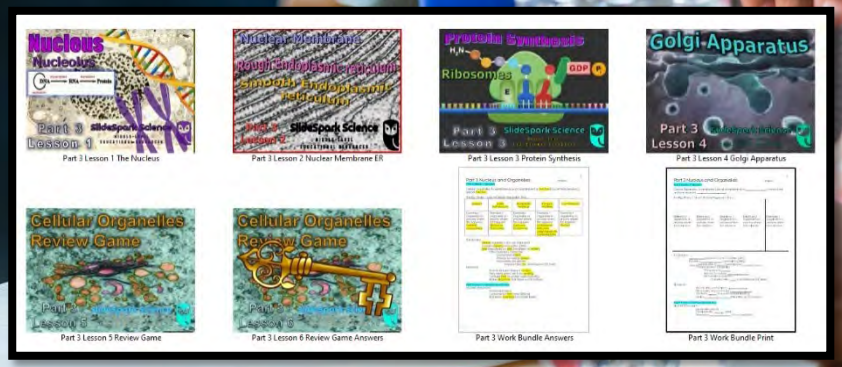
Next Slide

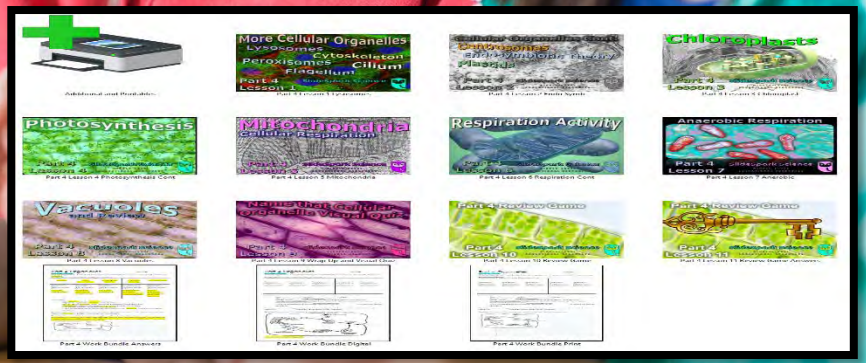


Slideshow supports Work Bundle

Lesson Planning

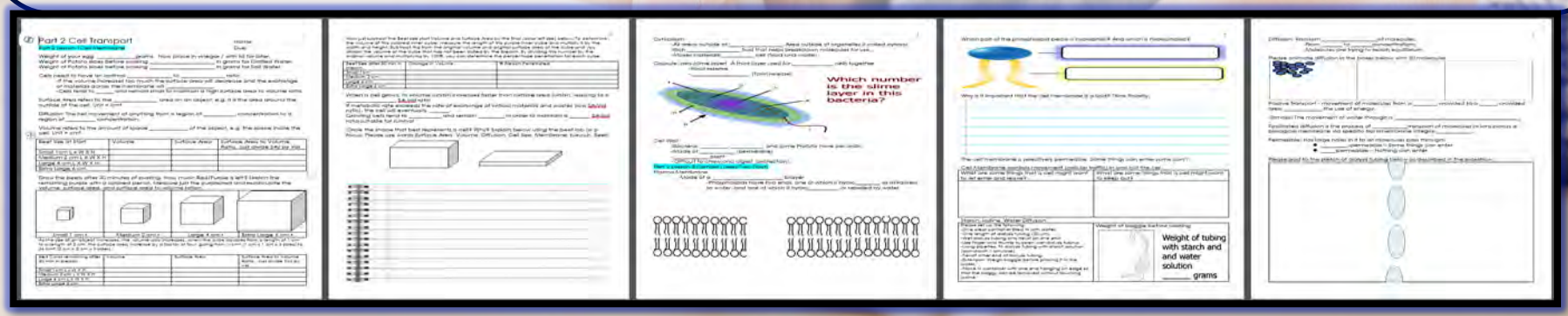
Daily lessons space exciting hands-on activities, red slide notes, video and academic links, projects, simulations, readings, built-in quizzes, and review opportunities throughout the slideshows. A typical day may have many different learning styles being targeted. Daily lesson planning becomes advancing 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.





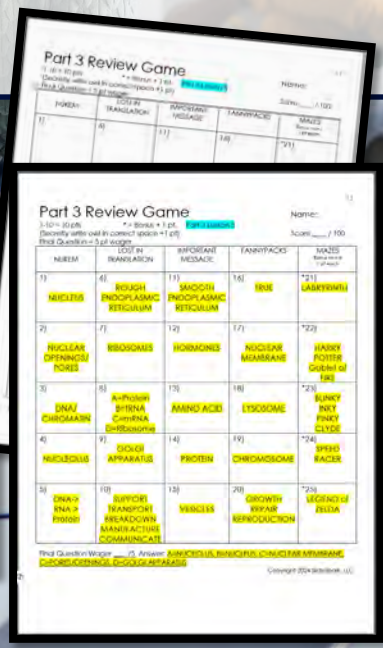
4 Follow Along Work Bundles

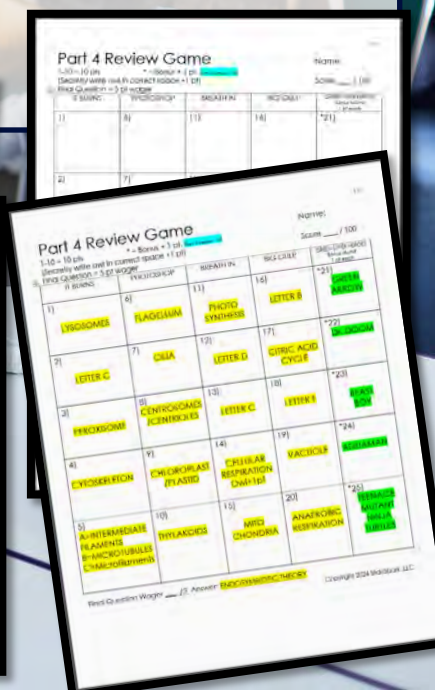
Each science unit comes with several work bundles. The bundles should be printed before the unit begins and distributed to the students on the first day of the unit. The work bundles will be due shortly after the completion of the unit. The work bundle will become a resource for the review games, crossword 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.



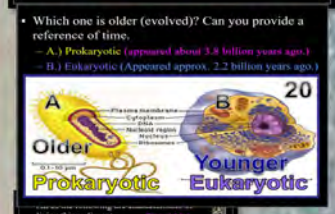
4 Review Games / Assessments

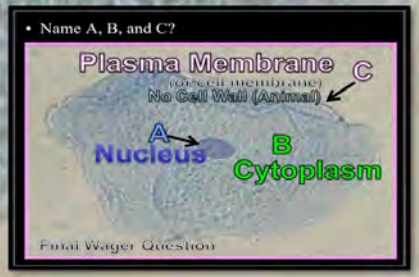
This unit concludes with a review quiz. Answers are provided in slideshow form so students can self assess. A blank template sheet is provided in the work bundle. Students can benefit from working together in small table groups with quiet communication. You can decide if you want to allow the use of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



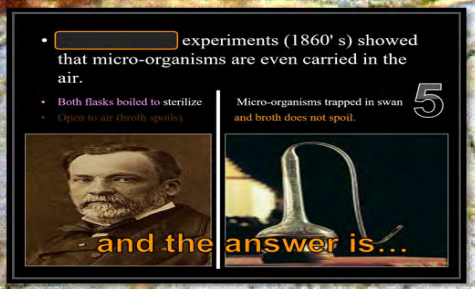


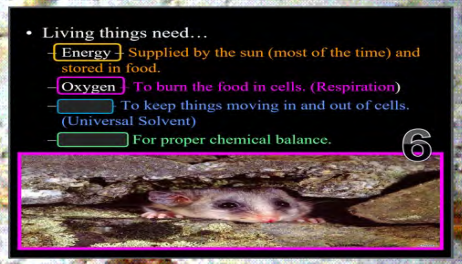
Intro to Cell Biology Review Game

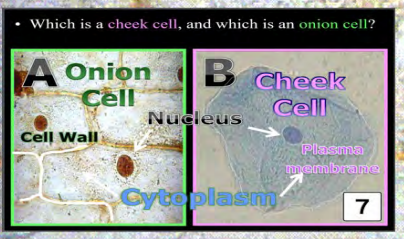


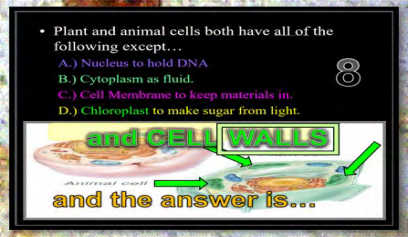


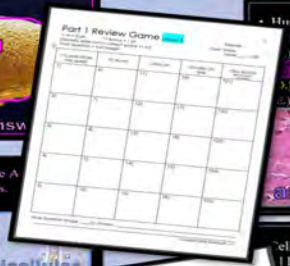
20 Questions Followed by Answer

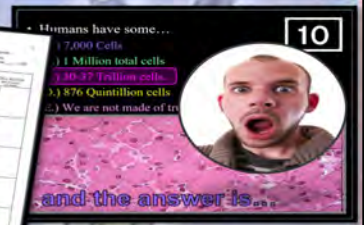


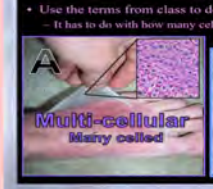


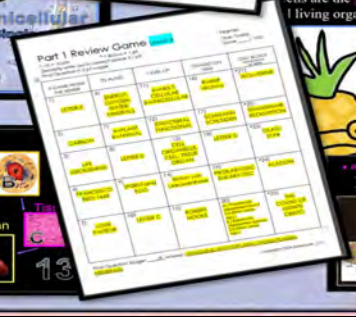


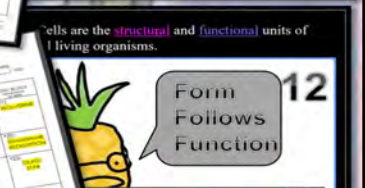


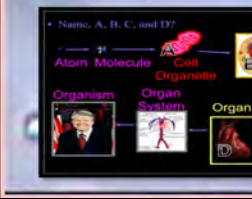


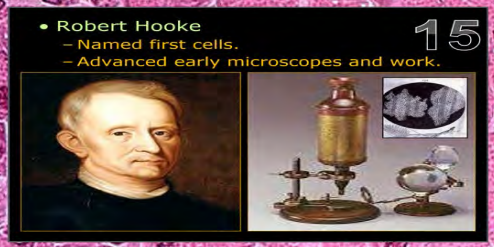


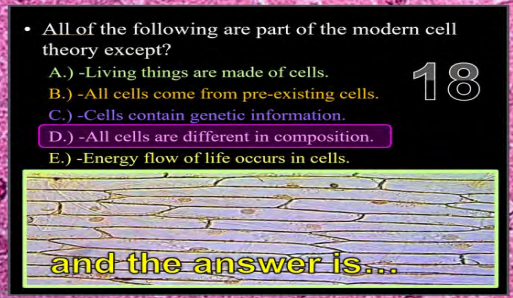


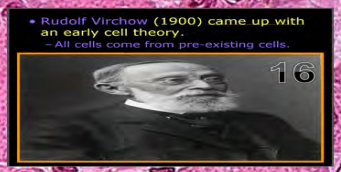


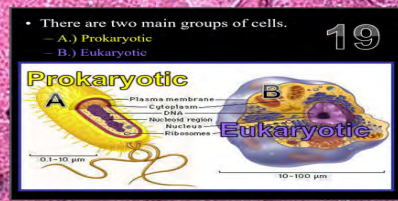








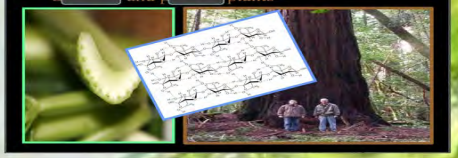




Cell Transport Review Game

- Cell Walls… (1 point each)
- Found in plants, ba[ ] and fungi
- Made of c[ ]se sugar (permeable)
- S[ ] and p[ ] plants

4



- This is the rich chemical fluid that helps breakdown molecules for use.
  - Moves materials through cell (food and waste)

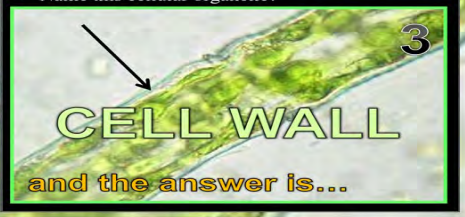
2

Cytoplasm

and the answer is…

- Name this cellular organelle?

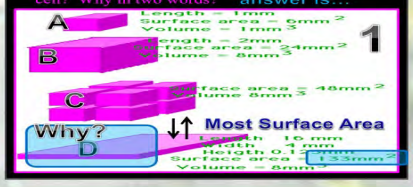
3



CELL WALL

and the answer is…

- Which letter represents the shape of a typical cell? Why in two words? answer is…



1

20 Questions Followed By Answer

- Name A and B?

Phospholipid Bilayer

Membrane Protein

5

- Name some things an animal cell would want to let in. (1 point each) The cell wants to let in…
  - Oxygen
  - Water
  - Food
  - Molecules
  - Protein

Welcome Committee

7

Outside Watery Environment

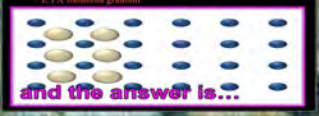
6

phile = attraction to something

phobe = Afraid of / repelled

- The animation below best represents…
  - A.) Osmosis
  - B.) Diffusion Also called passive transport
  - C.) Active Transport
  - D.) An unlimited gradient
  - E.) A balanced gradient

9



and the answer is…

- Molecules try to reach equilibrium.
  - They go from areas of…(finish)

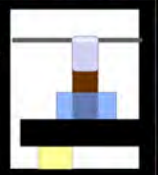
10

high concentration to areas of low concentration

and the answer is…

The corn syrup was hypertonic (more solute). Water was hypotonic. The water moved into the dialysis tubing to equal the concentrations

- The fluid in the tubing rose.

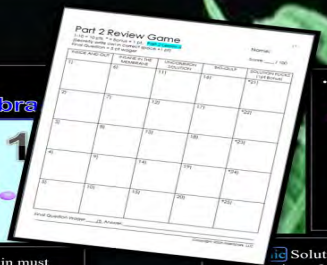


- What process is this?

Semi permeable membra[ ]

Osmosis

1



- The Solution that these plants cells are in must be…
  - A.) Hypotonic
  - B.) Hypertonic
  - C.) Isotonic
  - D.) Facilitated
  - E.) None of the above.

12

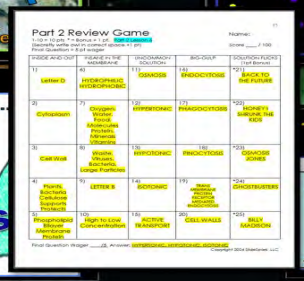
- The Solution that these plants cells are in must be…
  - A.) Hypotonic
  - B.) Hypertonic
  - C.) Isotonic
  - D.) Facilitated
  - E.) None of the above.

13

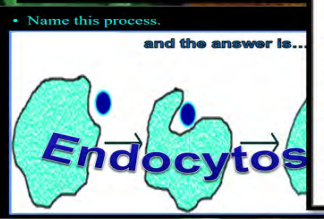
ic Solution: The cell has an equal proportion of concentration with the area surrounding.

- Water continually flows in and out to keep concentration even.

14



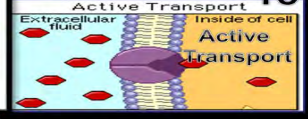
- Name this process.



- This uses energy to move molecules from areas of low concentration to areas of high concentration.

15

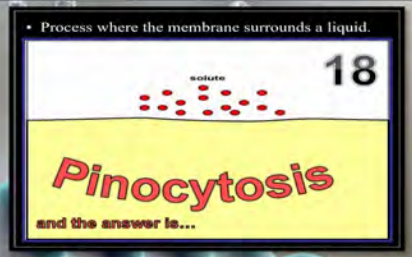
Active Transport



- This is the process where the membrane surrounds large solid particles.

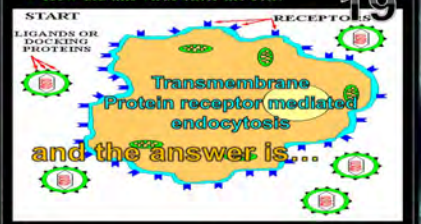
17

- Process where the membrane surrounds a liquid.



- How did this virus enter the cell?

19



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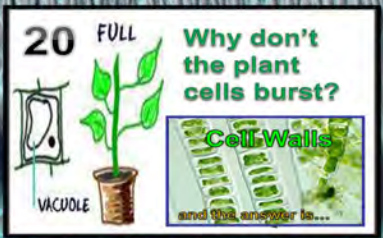


Cellular Organelles Review Game

This is the ganelle in the cell?

1

The Nucleus

and the answer is...

...these openings.

...wer is...

2

Openings

Name A,B,C,D,E

C Nuclear Membrane

B NUCLEUS

E GOLGI BODY

D NUCLEAR PORE

A NUCLEOLUS

This genetic molecule is contained in the nucleus?

DNA / Chromatin

3

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.

4

The Nucleolus

and the answer is...

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

10

They... Support Manufacture Make Breakdown Materials and Transport Materials Communicate within the cell.

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

16

TRUE

Name the four important roles of proteins.

Grrr...
G-Growth
r-Repair
r-Reproduction
r-Regulate

20

Enzymes of the lysosomes are synthesized in the rough endoplasmic reticulum and exported to the Golgi apparatus

18

LYSOSOMES

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.

17

Nuclear Membrane

20 Questions Followed with Answers

This organelle packages and transports proteins and other macromolecules?

Golgi Apparatus

9

This cellular organelle synthesizes sugars, ... calcium, makes

11

Smooth Endoplasmic Reticulum

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

12

What is Hormone Imbalance?

HORMONES

Name this a simple organic compound containing both a carboxyl (—COOH) and an amino (—NH_2) group.

13

Amino Acid

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

15

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.

14

PROTEIN

8

DNA → RNA → Protein

Amino Acid

A Protein

tRNA B

AUCG

Ribosom

Part 3 Review Game

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

Ribosomes

7

A DNA transcription B RNA

replication

Ribosomes

Name A, B, and C?

5

...lame ...olded ...ynthe

...ough Endoplasmic Reticulum

6

Form Follows Function

and the answer is...

Cellular Organelles Quiz Game

These have digestive en… parts and break down m…

1

Lysosomes

Mitochondria being recycled

Lysosome

- Which is not true of the Lysosome?

2

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

- These are small organelles present in the cytoplasm of many cells, which contains the reducing enzyme catalase and usually some oxidases.

Peroxisome 3

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

Cytoskeleton 4

- Which letter is which fiber?
  - C.) Microfilaments (thin fibers)
  - A.) Intermediate filaments (medium sized)
  - B.) Microtubules (Large hollow cylinders)

5

C B A

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

Endosymbiotic Theory

Prokaryote → Eukaryote → Eukaryote → Eukaryote and prokaryote living together.

- 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.

Simplified a bit

17

Citric acid cycle

1 FADH₂ · 1 FADH · 1 ATP · 3 NADH · 2 CO₂ · 3 NAD+

- 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.
  - F.) Oxygen is produced.
  - G.) Occurs in dark and light.

18

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

19

Vacuole

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

Anaerobic Respiration 20

answer is…?

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

Flagellun

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

7 Cilia

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

8

Centrioles / Centrosomes

Part 4 Review Game

Organelle that conducts photosynthesis,
– Where the photosynthetic pigment chlorophyll captures the energy from sunlight, converts it, and stores it in the energy-storage molecules

9

Chloroplast

- These are the membrane-bound compartments inside chloroplasts and cyanobacteria.
  - They are the site of the light-dependent reactions of photosynthesis

10

Thylakoids

Part 4 Review Game

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

11

Photosynthesis

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

12

- A) $6O_2 + 6H_2O$ + light energy = $C_2H_6O_6 + 6O_2$
- B) $6CO_2 + 6H_2O$ + sugar = $C_6H_{12}O_6 + 6O_2$
- C) $6CO_2 + 6O_2$ + light energy = $C_6H_{12}O_6 + 6H_2O$
- D) $6CO_2 + 6H_2O$ + light energy = $C_6H_{12}O_6 + 6O_2$
- E) $6CO_2 + H_2O$ + light energy = $C_6H_{12}O_6 + 6O_2$
- F) $6CO_2 + 6H_2O$ + light energy = $C_6H_{12}O_6 + 6O_2$
- G) $6CO_2 + 6H_2O$ + sugar = $C_6H_{12}O_6 + 6O_2$
- H) $6CO_2 + 6H_2O$ + light energy = $C_6H_{12}O_3 + 6O_2$
- I) $6CO_2 + 6H_2O$ + light energy = $C_6H_{12}O_6 + 6CO_2$
- J) $C_6H_{12}O_6 = 6CO_2 + 6H_2O$ + light energy + $6O_2$

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

14

Cellular Respiration

- 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

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

16

- A) $C_6H_{12}O_6 + 6H_2O$ = Released energy + $6CO_2 + 6H_2O$
- B) $C_6H_{12}O_6 + 6O_2$ = Released energy + $6CO_2 + 6H_2O$. ATP
- C) $C_6H_{12}O_6 + 6O_2$ = Released energy + $6O_2 + 6H_2O$.
- D) $C_{12}H_6O_6 + 6O_2$ = Released energy + $6CO_2 + 6H_2O$.
- E) $C_6H_{12}O_6 + 6CO_2$ = Released energy + $6O_2 + 6H_2O$.
- F) $C_6H_{12}O_6 + 6CO_2$ = Released energy + $6CO_2 + 6H_2O$.
- G) $C_6H_{12}O_6 + 6O_2$ = Released energy + $6CO_2 + 6O$.
- H) $C_6H_{12}O_6 + 6O_2$ = Light Energy + $6CO_2 + 6H_2O$.
- I) $C_6H_{12}O_6 + 6O_2$ = Released energy + $6O_2 + 6H_2O$.
- J) $C_6H_{12}O_6 + 6O_2$ = Released energy + $6CO_2 + 6H_2O$.
- K) $C_6H_{12}O_6 + 16O_2$ = Released energy + $6O_2 + 6H_2O$.
- L) Released energy + $6CO_2 + 6H_2O$ $C_6H_{12}O_6 + 6O_2$ = ☺

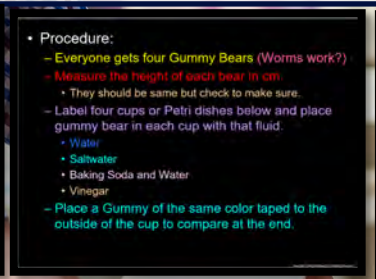
This cellular organelle uses sugar and oxygen to make energy?

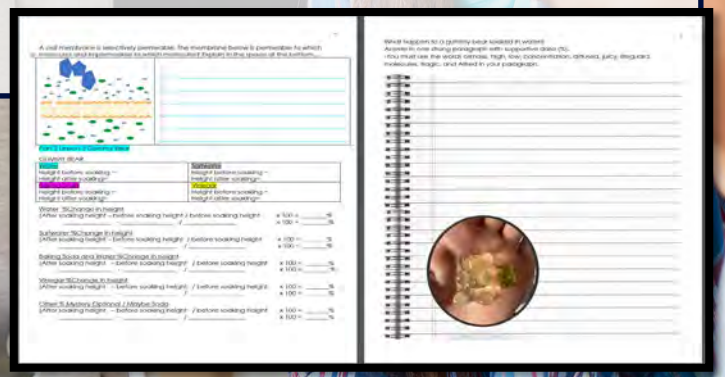
15

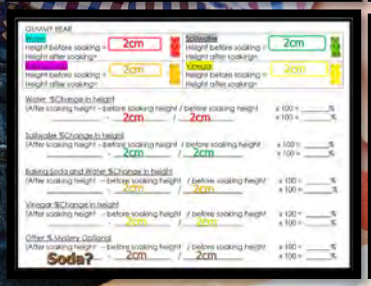
Mitochondria

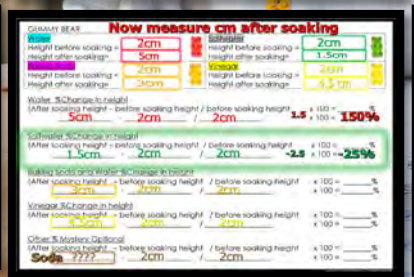
Activities / Labs

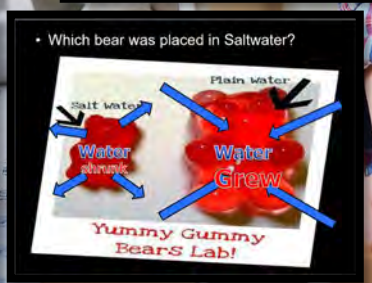
Our science activities are designed to help students explore and understand complex scientific concepts in an engaging and interactive way. Each science unit includes several hands-on activities that encourage students to collect data and think critically about the world around them. Our easy-to-follow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





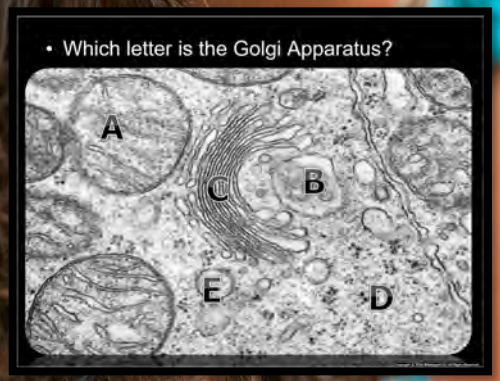


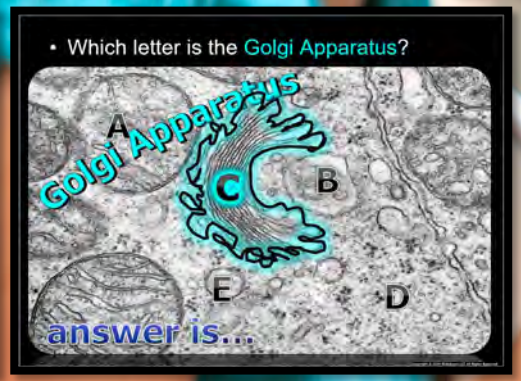


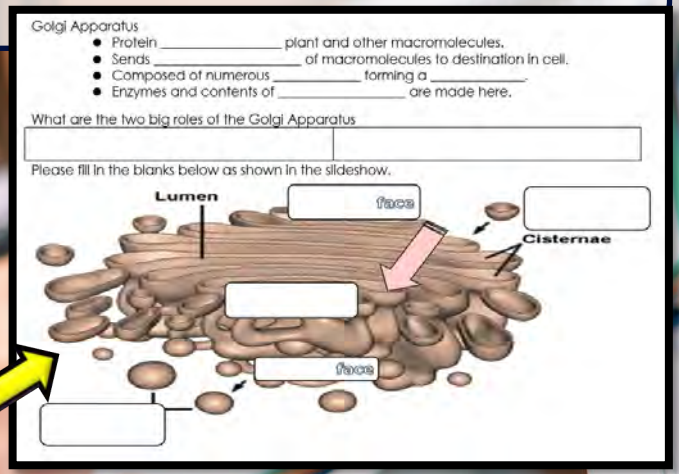


Built-in Assessment

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.



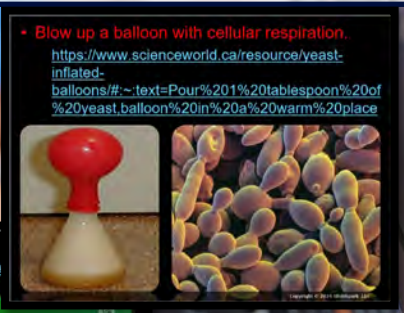




Questions in Work Bundle

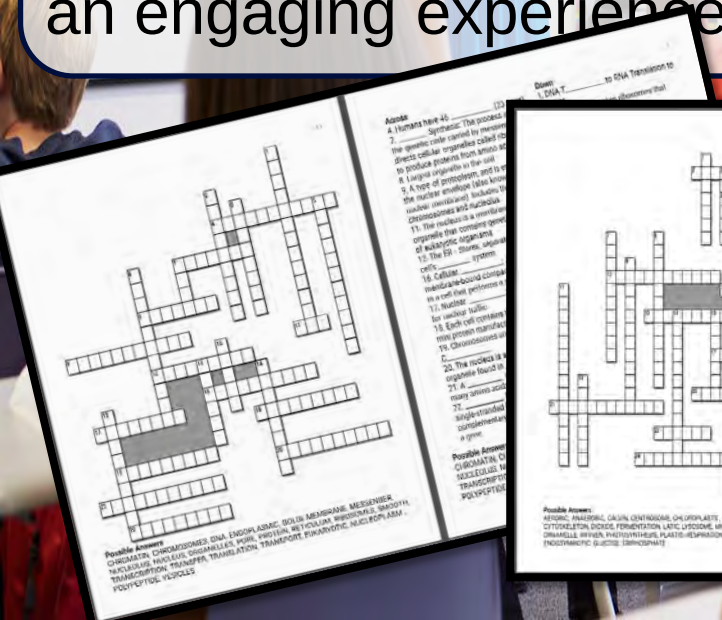
Built-in Video Links

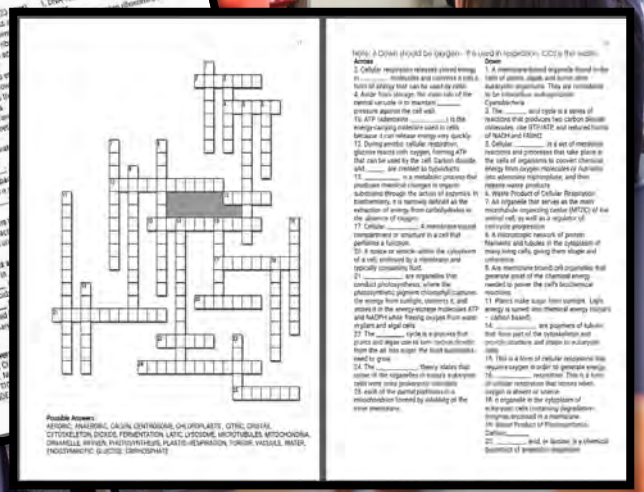
Our science education program is designed with the modern, multimedia learner in mind, and our video links are a perfect complement to our educational materials. These short clips are embedded into the slideshow at just the right places for a fantastic review. Whether you're studying biology, chemistry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

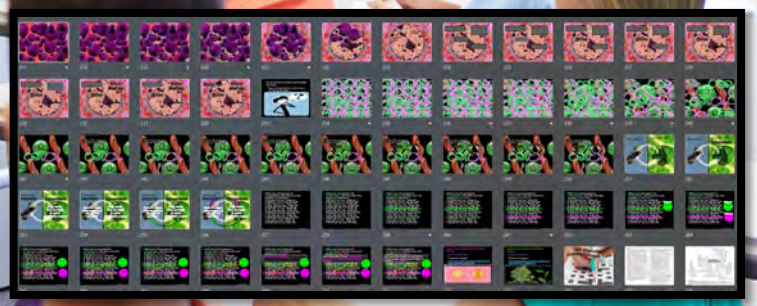


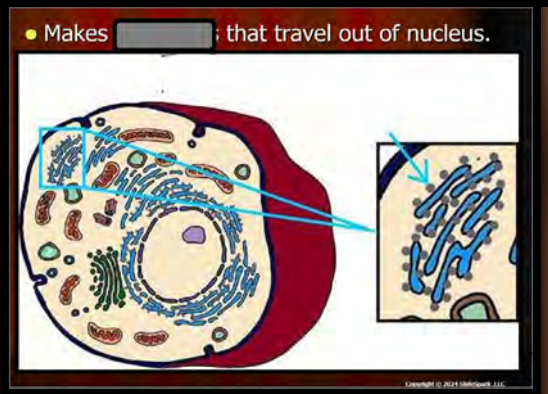
Games and Review

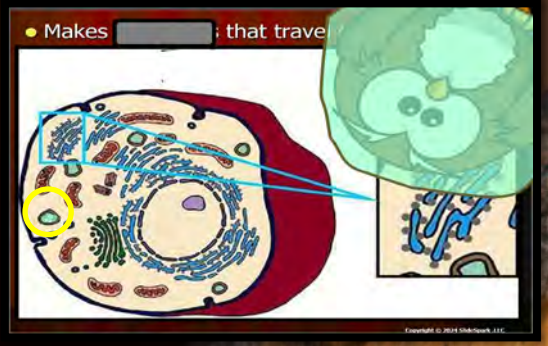
Games are a fantastic way for students to learn scientific concepts while having fun. We incorporate a variety of games into our curriculum, including interactive quizzes and puzzles that challenge students to think critically about the material. Our Hidden Box Games are a particularly popular feature, 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.

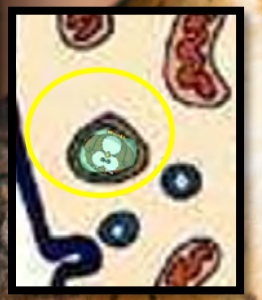








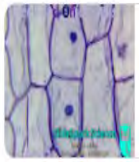




The Owl - Each Part of the slideshow has a small clipart Owl hiding somewhere in a slide. The owl is incredibly small and blended into just the right slide. If a student spots the “Owl” they can raise their hand high into the air. When you call upon the student they can say “Owl" and be the student who 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.



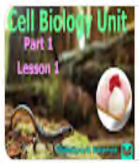
Part 1 Lesson 3 Cheek and ...
Google Slides

Part 1 Lesson 2 Characterist...
Google Slides

Part 1 Lesson 6 Cell Theory
Google Slides

Part 1 Lesson 5 Domains an...
Google Slides

Part 1 Lesson 4 Form Functi...
Google Slides



Part 1 Lesson 1 Sewer Lice S...
Google Slides

Part 1 Lesson 7 Cell City Pro...
Google Slides

Part 1 Lesson 8 Review Game
Google Slides

Part 3 Lesson 2 Nuclear Me...
Google Slides

Part 3 Lesson 1 The Nucleus
Google Slides

Part 3 Lesson 3 Protein Synt...
Google Slides

Part 3 Lesson 4 Golgi Appar...
Google Slides

Part 3 Lesson 5 Review Game
Google Slides

Part 2 Lesson 1 Cell Membra...
Google Slides

Part 2 Lesson 5 Active Trans...
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Part 2 Lesson 3 Gummy Bea...
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Part 2 Lesson 4 Extensions
Google Slides

Part 2 Lesson 6 Review Game
Google Slides

Part 2 Lesson 2 Osmosis
Google Slides

Part 4 Lesson 1 Lysosomes
Google Slides

Part 4 Lesson 8 Vacuoles
Google Slides

Part 4 Lesson 10 Review Ga...
Google Slides

Part 4 Lesson 6 Respiration ...
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Part 4 Lesson 9 Wrap Up an...
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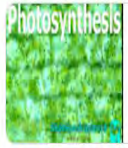
Part 4 Lesson 2 Endo Symb
Google Slides

Part 4 Lesson 3 Chloroplast
Google Slides



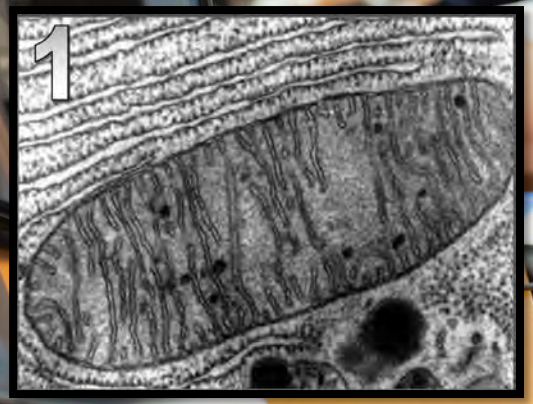
Part 4 Lesson 4 Photosynth...
Google Slides

Part 4 Lesson 5 Mitochondria
Google Slides

Part 4 Lesson 7 Anerobic
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

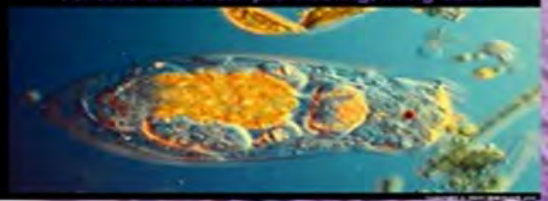
Cell Biology Unit

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

Intro to Cells, Cell Theory

- The 3 big principles of the cell theory.
  - 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, living cells.



- Cells are the structural and functional units of all living organisms.
  - Humans have some 37.2 Trillion
    - Multi-cellular (More than one cell)
  - Protists, Archaea, and Bacteria have 1 - Unicellular

- Pasteur' s experiments (1860' s) showed that micro-organisms are even carried in the air.

- Spontaneous Origin: The belief that living organisms are produced / generated from non-living sources.

Do turtles come from the sand?

Life Comes from Life

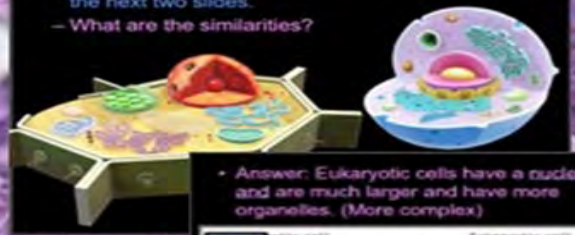
Do flies emerge from meat?

Life Comes from Life

Do fish emerge from the mud in a pond?

Life Comes from Life

- Questions? Plant Cell and Animal Cell
  - What are differences you noticed between a plant cell and an animal cell – Study these pictures and the next two slides.
  - What are the similarities?



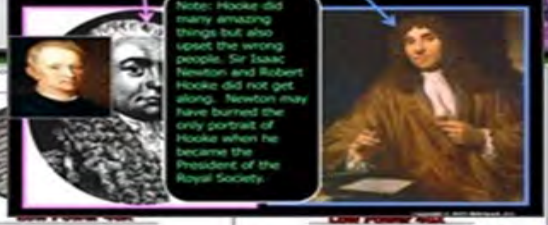
- Answer: Eukaryotic cells have a nucleus, and are much larger and have more organelles. (More complex)

Form Follows Function

- 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.

- Robert Hooke
  - First Cells

- Anton van Leeuwenhoek
  - First living cells



Note: Hooke did many amazing things but also upset the wrong people. Sir Isaac Newton and Robert Hooke did not get along. Newton may have burned the only portrait of Hooke when he became the President of the Royal Society.

Onion Cell

Cheek Cell

- Use the [illegible] and B.
  - It has to do with how many cells it has.

11

A

Multi-cellular

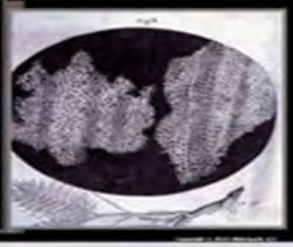
Many celled

B

Unicellular

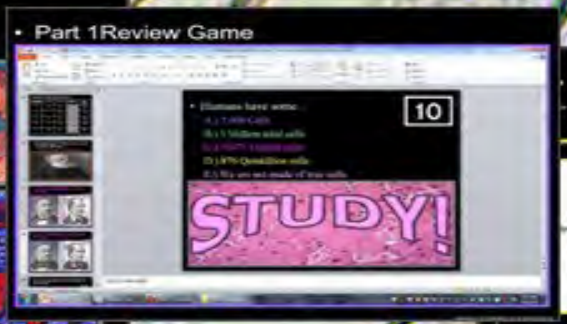
Single celled

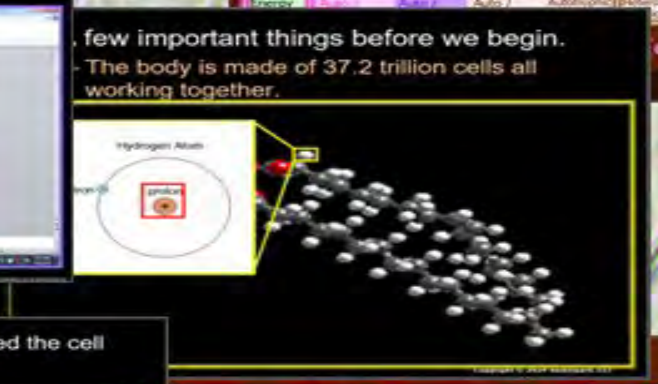
Robert Hooke called [illegible] after monastery cells.



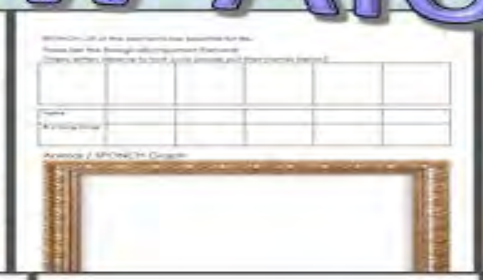
8 Lessons

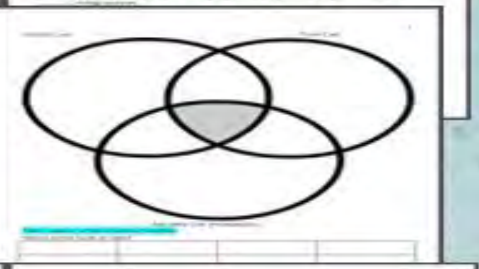
Interactive Slideshows

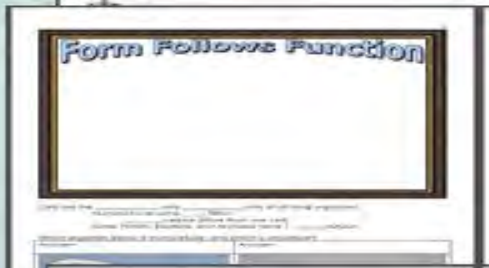


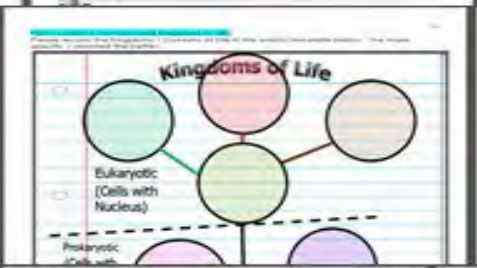


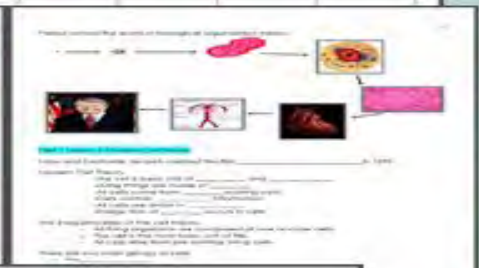
Follow Along Bundle

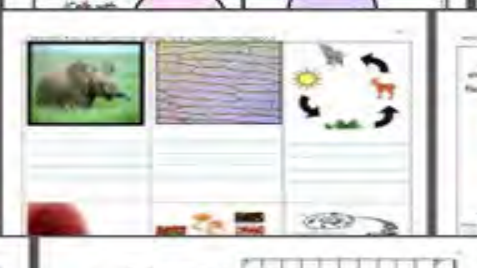


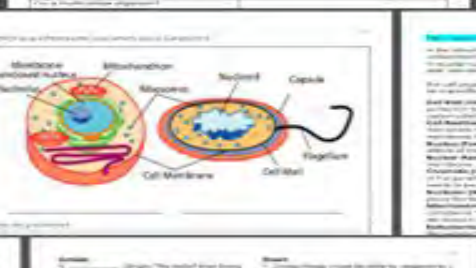


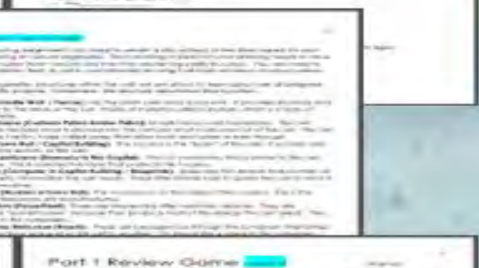


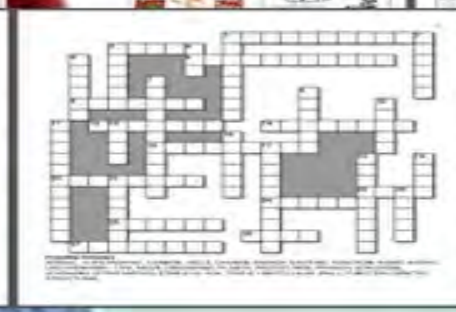






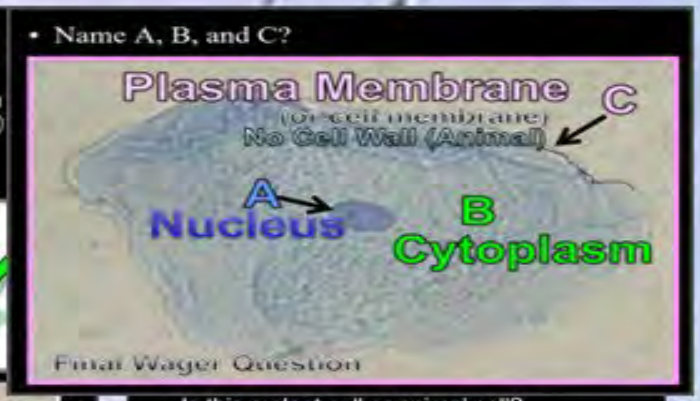


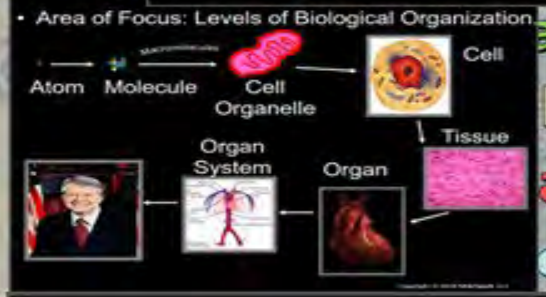


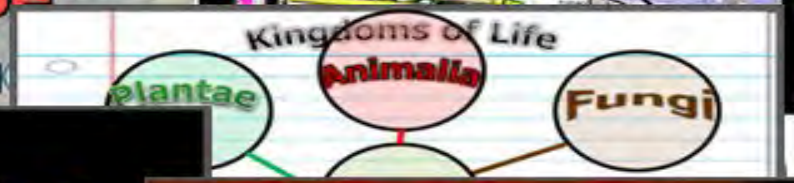


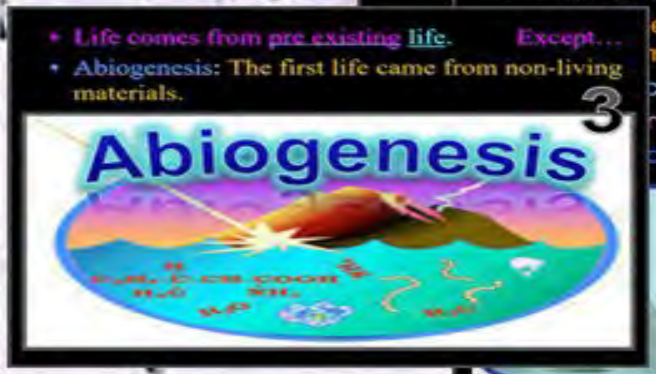
20 Pages

Activities, Assessments, Keys, and more all built in









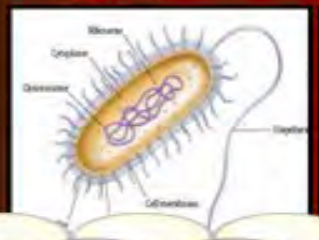
Part 2: Cell Biology Unit: 7 Lessons of 50 minutes and 17 Page Follow Along Work Bundle Placing Eggs into Vinegar for Later in Unit, Surface Area to Volume Ratio, Why Surface Area Matters, Reasons for being multi-cellular, Explanation of Surface Area and Volume, Introduction to Diffusion, Beets in Bleach 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. Slat 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

Cell Transport Unit

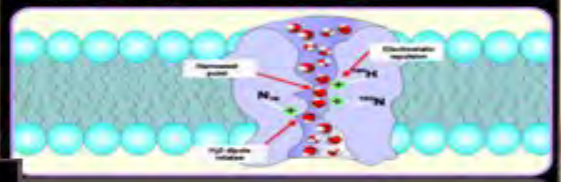
- Cells can increase their SA to Vol ratio by…
  - Folding like the cells in your intestine.

- Endocytosis: (Endo - means to bring in) Energy requiring process where a cell engulfs a particle.

- Bacteria, Plants, Fungi, and some Protista have cell walls.



through the phospholipid bilayer.



- After Procedure:
  - Gently remove the Gummy Bear or worm from the container by pouring out the liquid
    - (Caution they are Fra-Gee-Lay)
  - Dry gently with paper towel and record the height in centimeters on work bundle
  - Observations

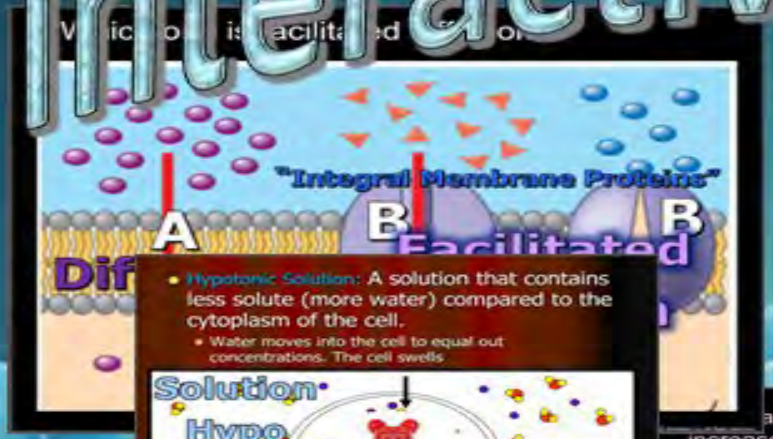
- Follow-up Questions:
  - What moved into and out of the dialysis tubing? How do you know?
  - The water moved both into and out of the dialysis tubing. The iodine moved into the tubing but the starch was unable to leave the tubing.

could test for the sence of glucose

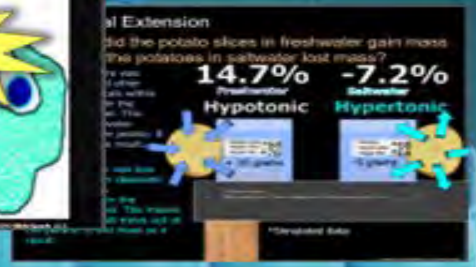
- By being a multicellular [illegible] eature, ani[illegible]gls and plants have overco[illegible] e th[illegible]ro[illegible]m[illegible] Cell sizes and surfa[illegible] area. W[illegible]ll cells and ev[illegible]d fea[illegible]
  - Unicellular crea[illegible] ratio and must be extremel[illegible]

7 Lessons

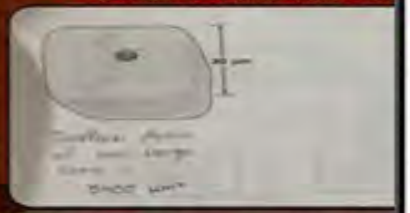
Interactive Slideshows



- Endocytosis: (Endo - means to bring in) Energy requiring process where a cell engulfs a particle.



- Cells
- If the cell grows, its volume (units³) increases faster than surface area (units²), leading to a [redacted] SA:Vol ratio
- If metabolic rate exceeds the rate of exchange of critical materials and waste (low SA:Vol ratio), the cell will eventually
- Growing cells tend to [redacted] and remain [redacted] in order to maintain a [redacted] SA:Vol



Circle the shape that best represents a cell! Why? Explain below using the best lab as a focus. Please use words Surface Area, Volume, Diffusion, Cell Size, Membrane, Bleach, Teeth

Use below to assist you

- When a cell grows, its volume (units³) increases faster than surface area (units²), leading to a decreased SA:Vol ratio
- If metabolic rate exceeds the rate of exchange of critical materials and wastes (low SA:Vol ratio), the cell will eventually die.
- Growing cells tend to divide and remain small in order to maintain a high SA:Vol ratio suitable for survival.

GUMMY BEAR — Now measure cm after soaking

	Before soaking	After soaking
Water	2cm	5cm
[redacted]	2cm	3cm
Saltwater	2cm	1.5cm
Vinegar	2cm	4.5 cm

Water %Change in height: (After soaking height – before soaking height / before soaking height) 5cm - 2cm / 2cm = 1.5 x 100 = 150%

Saltwater %Change in height: (After soaking height – before soaking height / before soaking height) 1.5cm - 2cm / 2cm = -.5 x 100 = -25%

Baking Soda and Water %Change in height: (After soaking height – before soaking height / before soaking height) 3cm - 2cm / 2cm = .5 x 100 = 50%

Vinegar %Change in height: (After soaking height – before soaking height / before soaking height) 4.5cm - 2cm / 2cm = 1.25 x 100 = 125%

Other % Mystery Optional: (After soaking height – before soaking height / before soaking height) Soda 7cm - 2cm / 2cm = 2.5 x 100 = 250%

- Calculate the following.

Beef Size at Start	Volume	Surface
Small 1cm L x W X H	1x1x1=1cm³	1x1x6=
Medium 2 cm L X W X H	2x2x2=8cm³	2x2x6=
Large 4 cm L X W X H	4x4x4=64cm³	4x4x6=
Extra Large 6 cm	6x6x6=216cm³	6x6x6=216cm² 216 to 216 [redacted]1 Ratio

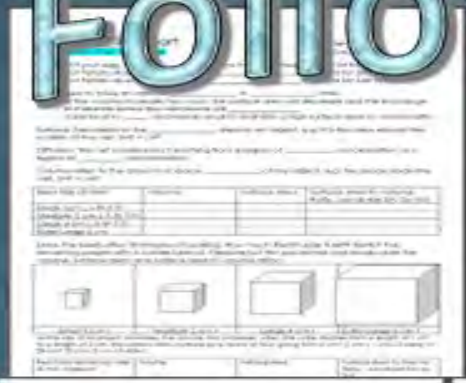
- The Solution that these plants cells are in must be…
  - A.) Hypotonic
  - B.) Hypertonic
  - C.) Isotonic
  - D.) Facilitated
  - E.) None of the above.

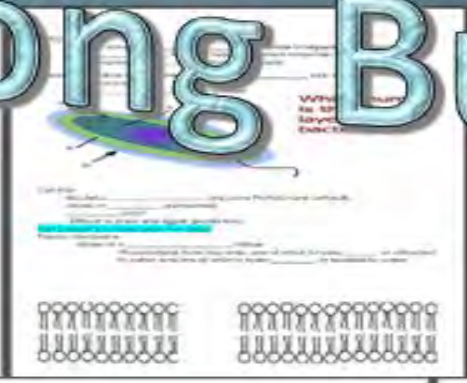
13

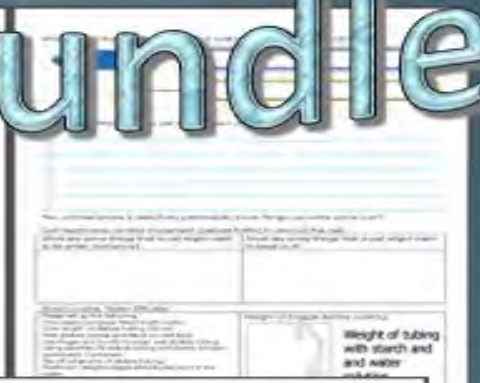
Function

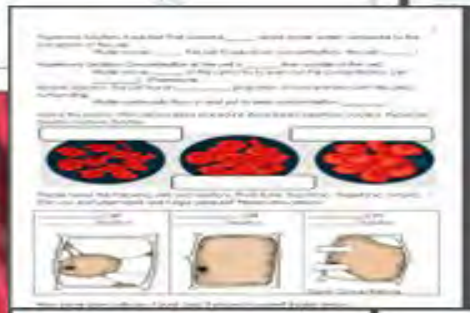
…ivity! Revisiting the egg in vinegar.
…eigh the egg? Did it gain or lose mass?
…line % Change in mass
…aw and describe the eggs properties.
…w else has it changed?

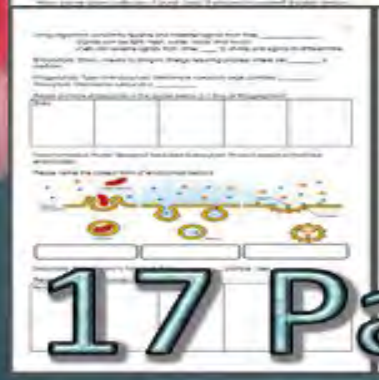
Follow Along Bundle







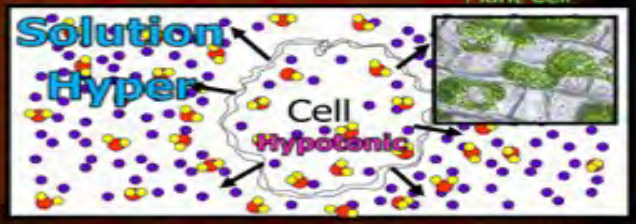




17 Pages

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

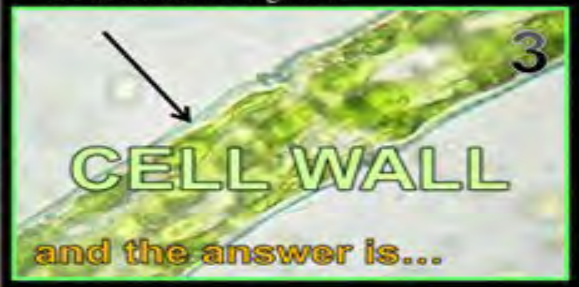
- Hypertonic Solution: Concentration of the cell is less than outside of the cell.
  - Water moves out of the cell to try to even out the concentration. Cell Shrinks (Plasmolysis)

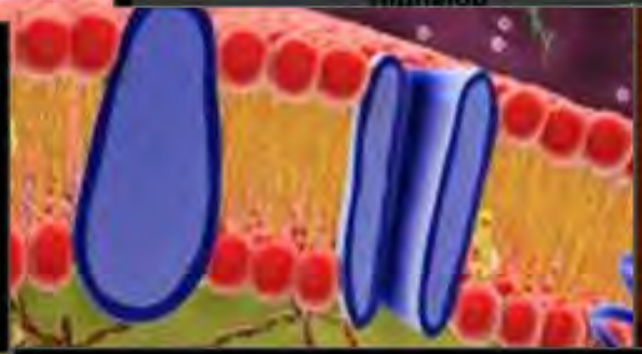


- Follow-up Questions:
  - Use the word "diffusion" in a sentence that has to do with this lab.

- Answer: Because lipids are nonpolar. They don't mix with water.
  - The membrane becomes a water proof barrier between two liquid areas.

- Name this cellular organelle?



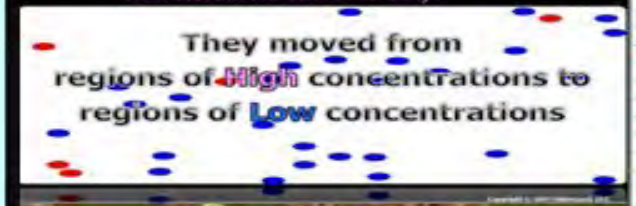


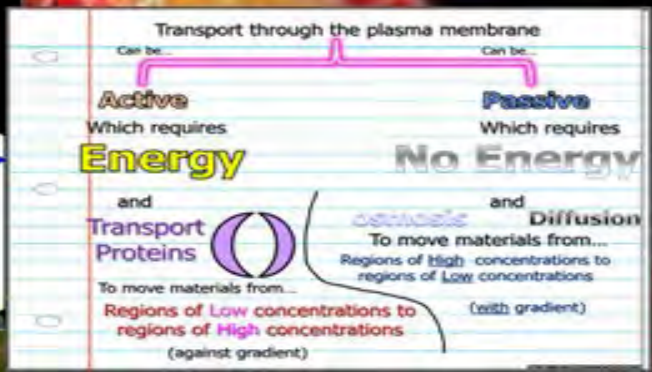
- Made of a phospholipid bilayer.

Phospholipids have two ends, one of which is hydrophilic, or attracted to water, and one of which is hydrophobic, or repelled by water.

- Osmosis: The movement of water through a semi-permeable membrane.

- Activity! (Optional) Bumper Boats.
  - Teacher will assign a few students to move in one direction. If they bump into another student or object they change directions.
    - Open doors in the classroom. What will happen to our molecule students eventually?





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 Organelles Bundle

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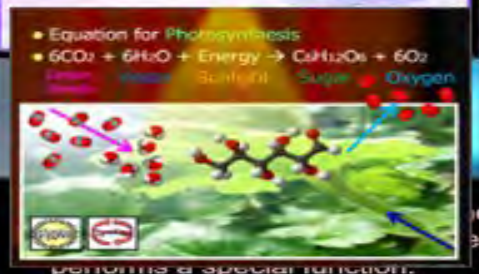
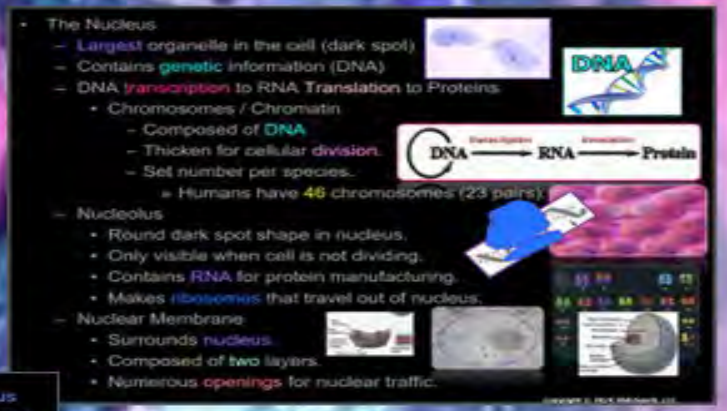
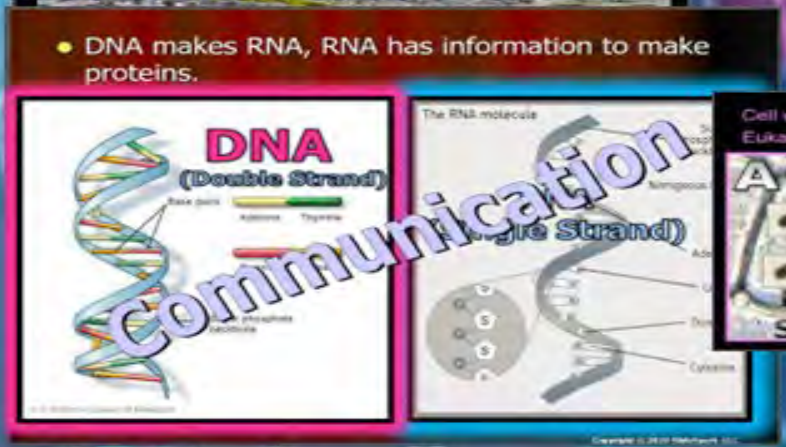
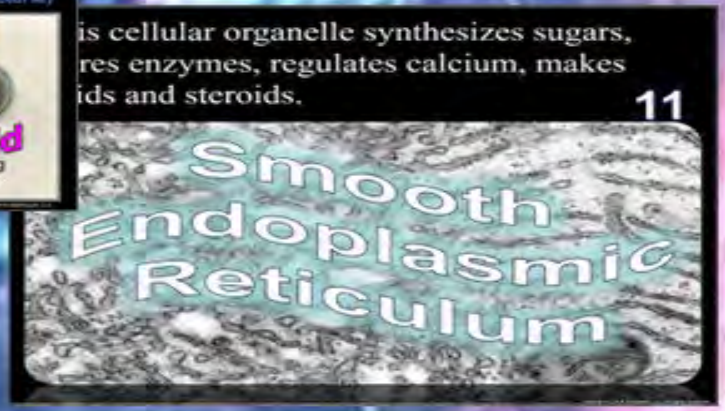


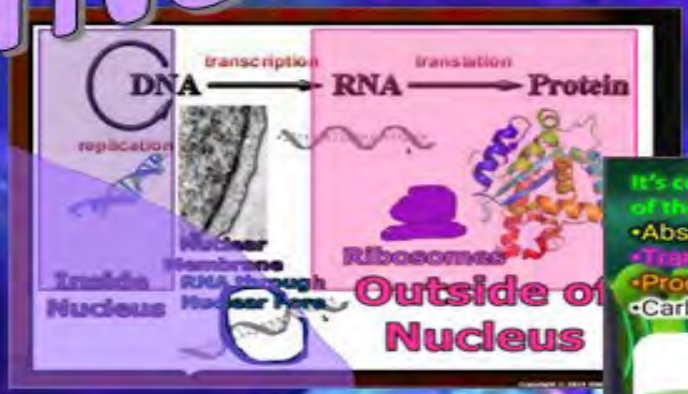


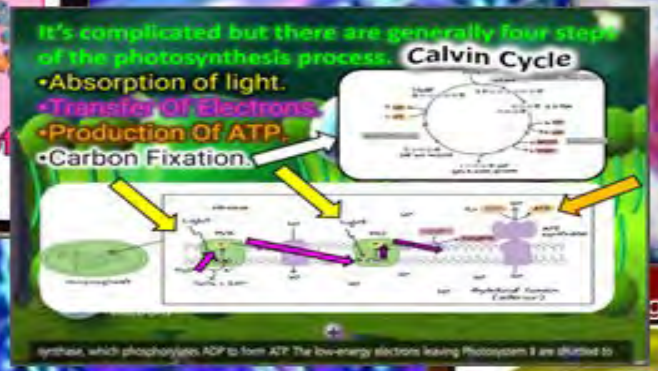


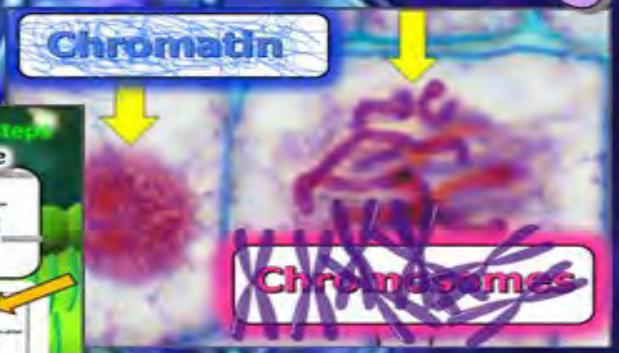


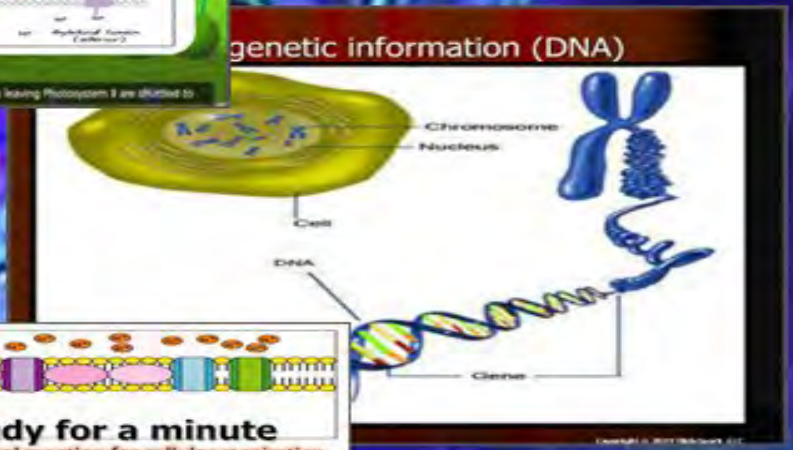
16 Lessons

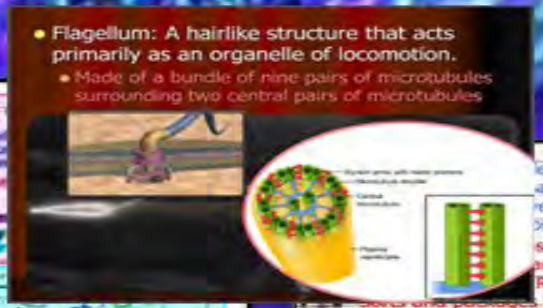
Interactive Slideshows

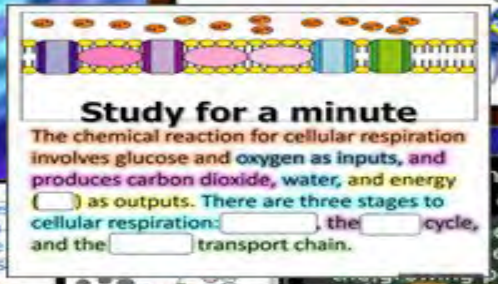


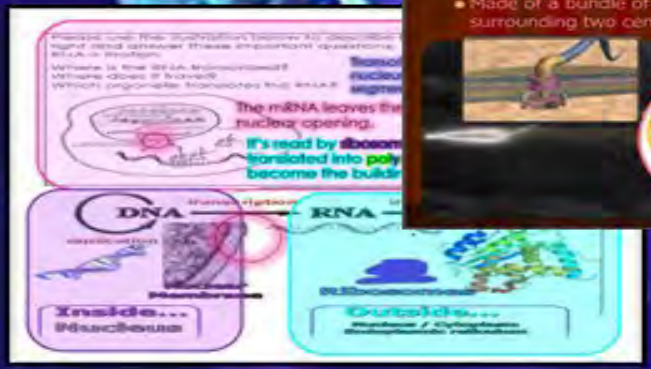


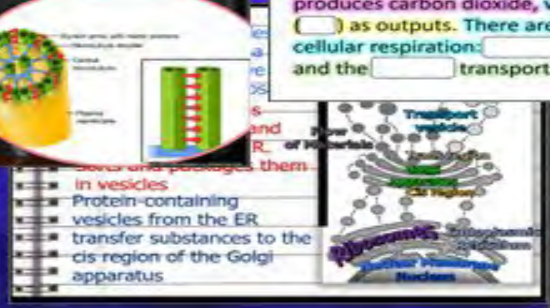


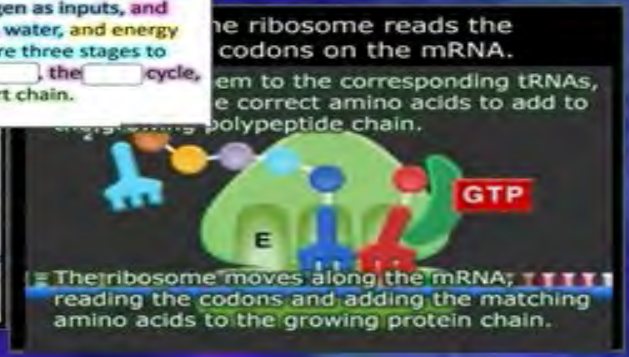




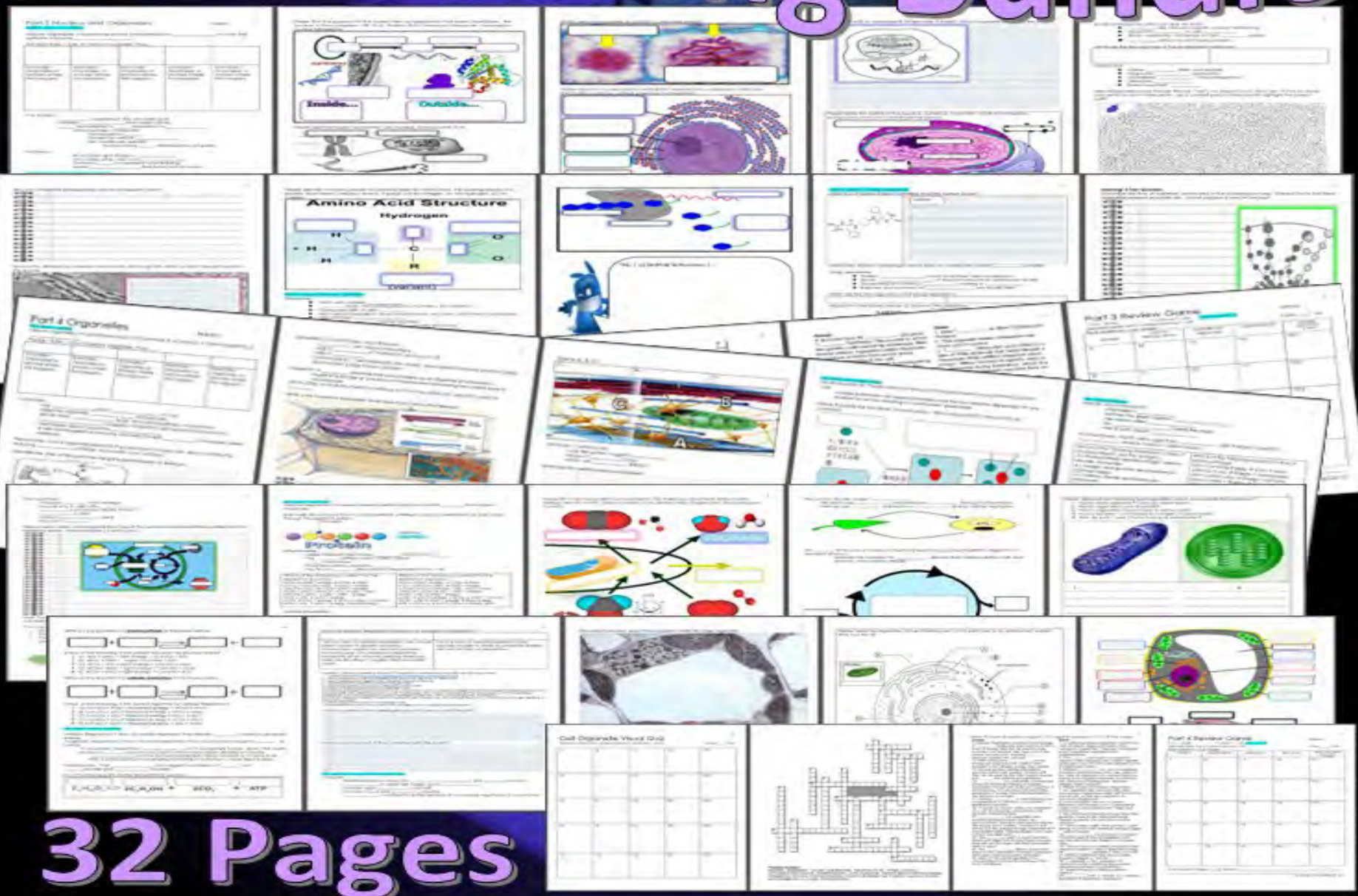






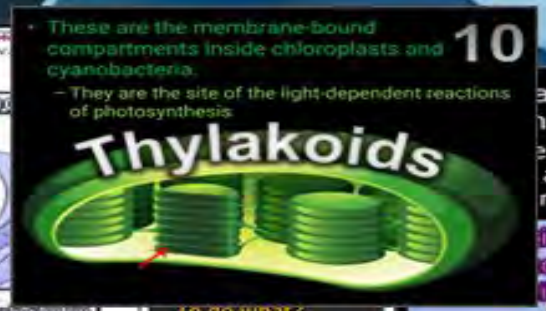


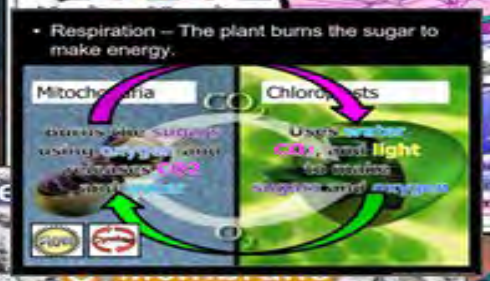
Follow Along Bundle

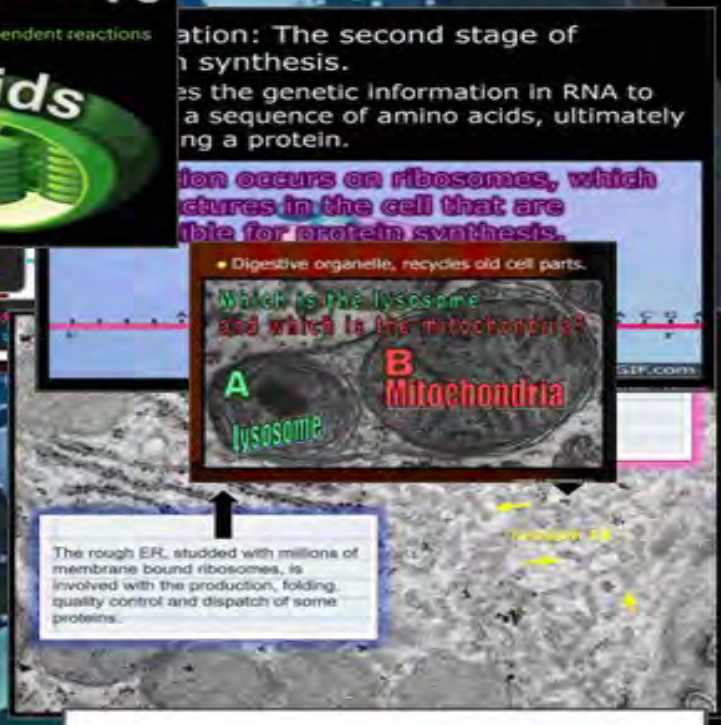


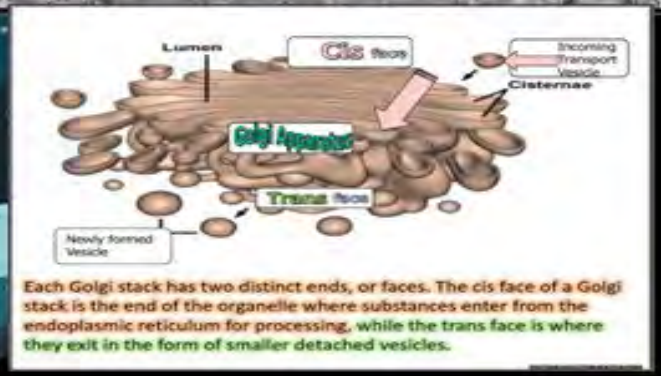
32 Pages

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









Curriculum Guide

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

=Easier, 

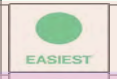
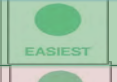
= More difficult, 

=Most difficult

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

Earth Science Curriculum

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	

Life Science Curriculum

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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Our fully editable .pptx and .doc resources are perfect for educators looking to bring enthusiasm and creativity to their lessons. We encourage you to make changes to fit your needs and style. As science educators, we're committed to providing students with the tools they need to succeed in the classroom and beyond. Each unit in the curriculum includes a range of resources that have been developed through extensive research and use in a busy classroom. Our teaching approach is designed to make science education engaging and exciting for learners of all ages. We offer a one-of-a-kind science curriculum that will challenge, inspire, and educate students to become tomorrow's scientists and leaders. Join us today and learn more about how our program can help you achieve your classroom goals.

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Sincerely,

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MIDDLE-LEVEL

EDUCATIONAL RESOURCES

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