Cell Division Unit

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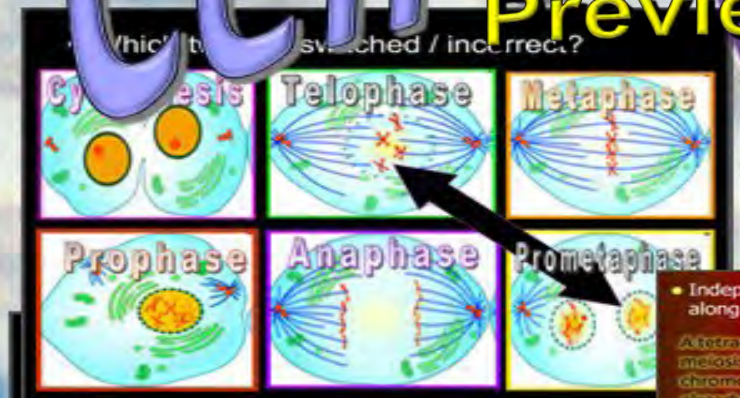
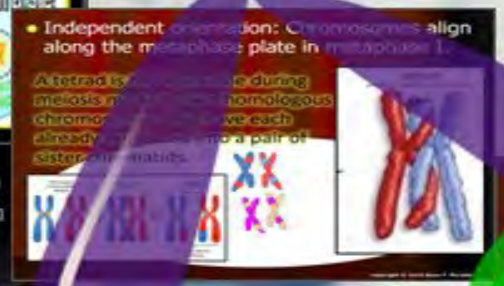
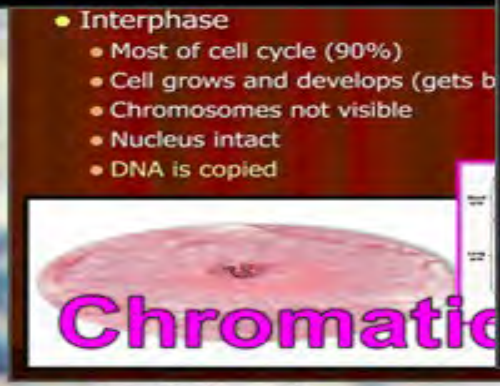
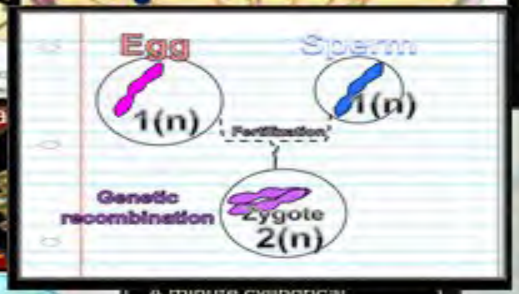
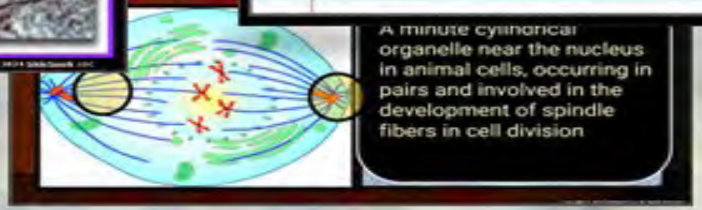






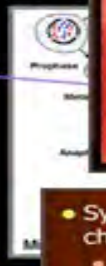




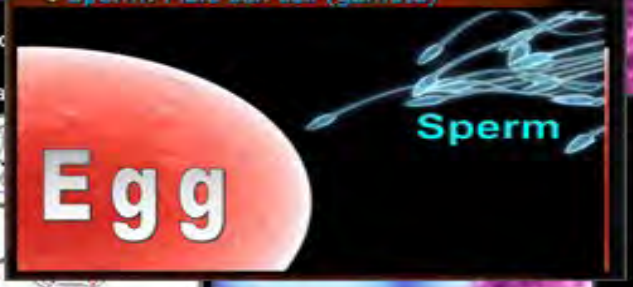
10 Lessons

Interactive Slideshows

- Use a corner of your science j
  left works well.
- Go from the back of the journa
- Interphase – 30 pages
- Prophase – 10 pages
- Prometaphase 5 pages
- Metaphase 5 pages
- Anaphase 10 pages
- Telophase 10 pages
- Cytokinesis 10 pages
- Animation →



- Egg (Ovum): Female sex cell.
- Sperm: Male sex cell (gamete)



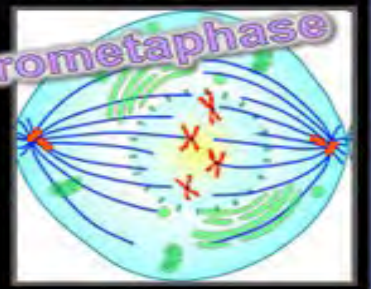
- Synapsis: The pairing of two homologous chromosomes that occurs during meiosis.
  - Allows for crossing over.

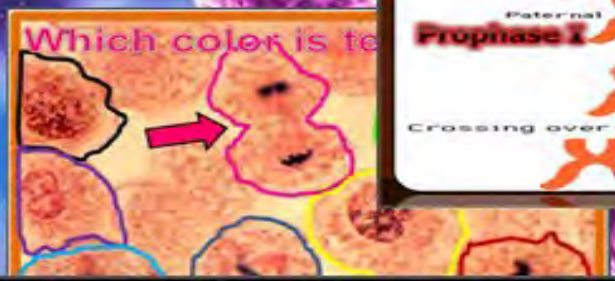
- Activity! What can you say about the picture.
  - Volunteer to say a few things about picture when it pops up.

▪Nuclear envelope breaks down.

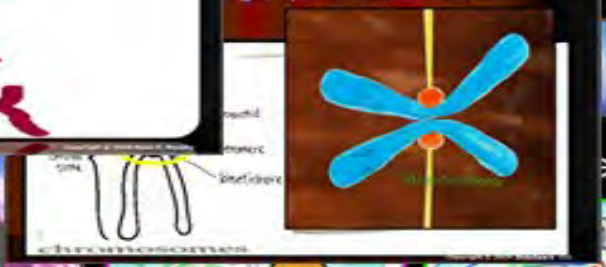
▪Centrosomes are positioned at opposite poles of the cell.

▪Spindle fibers attach to chromosome at the kinetochore

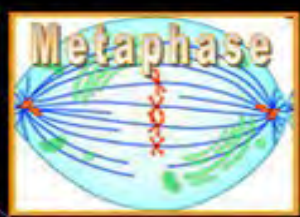




s get split at centromere

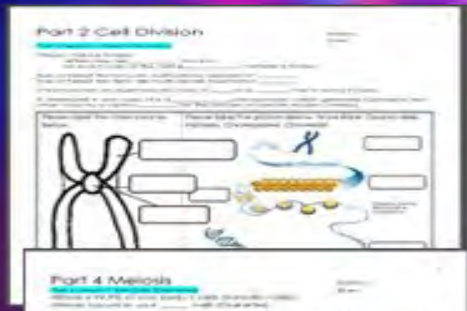


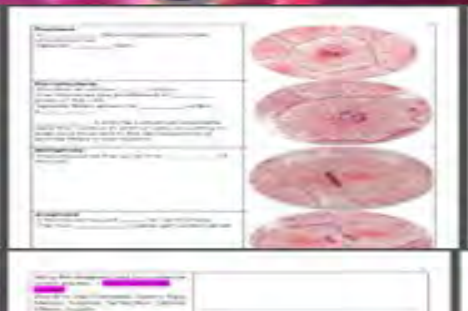
ed / incorrect?

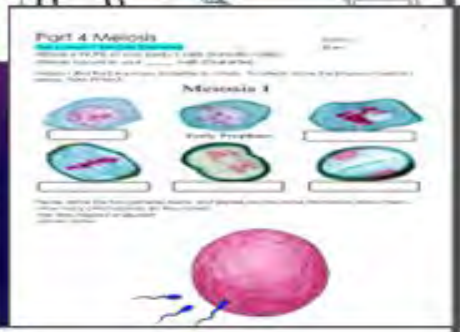


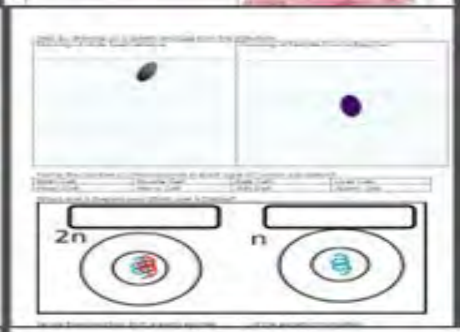
- Activity! Simulating Mitosis with beads.
  - Gummy Worms will work as well, white board, marker.
    - (Follow video. Teacher will pause and check your work)
    - https://www.youtube.com/watch?v=zGVBAHAsjJM&feature=youtu.be

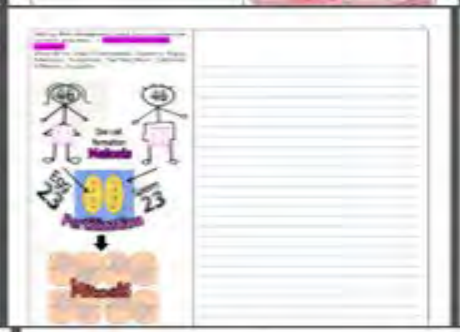
Follow Along Bundles

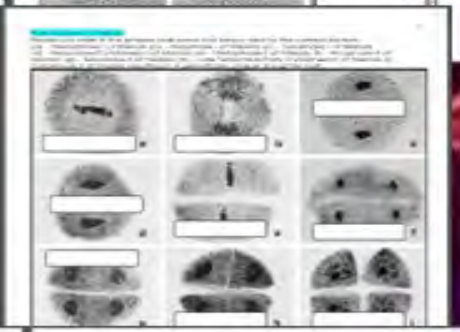


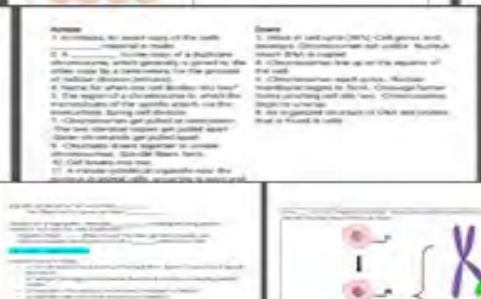


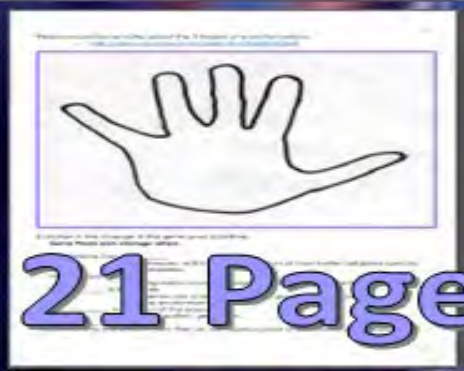


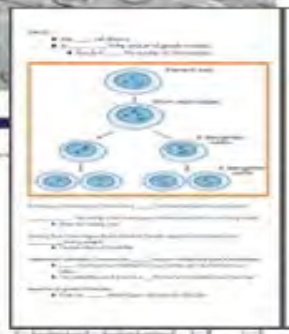


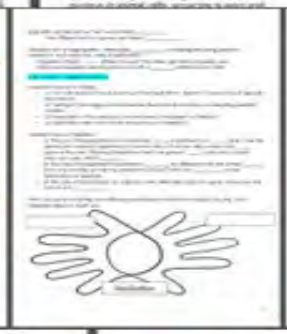


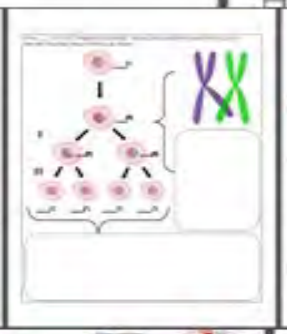


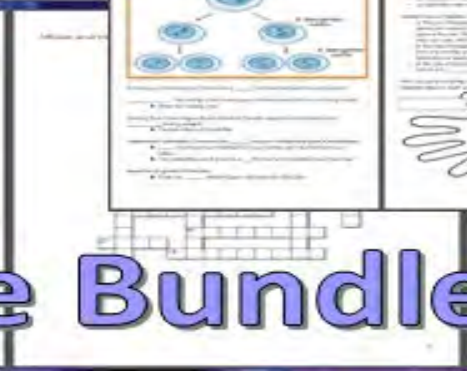


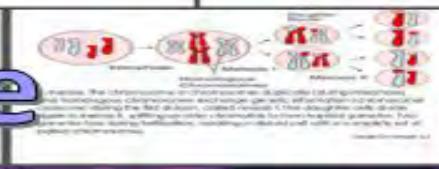






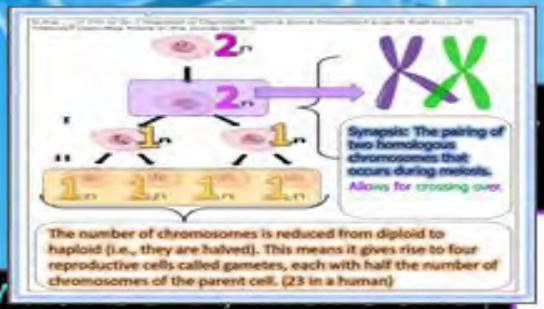


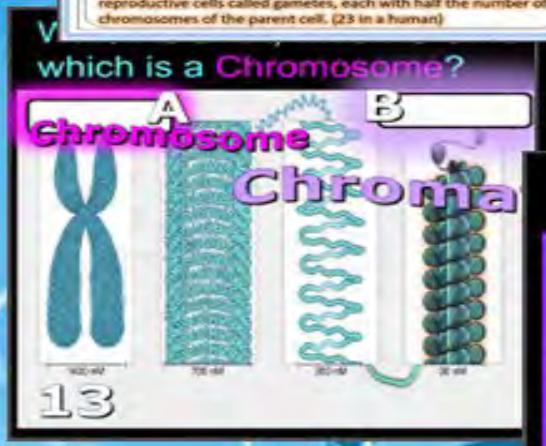


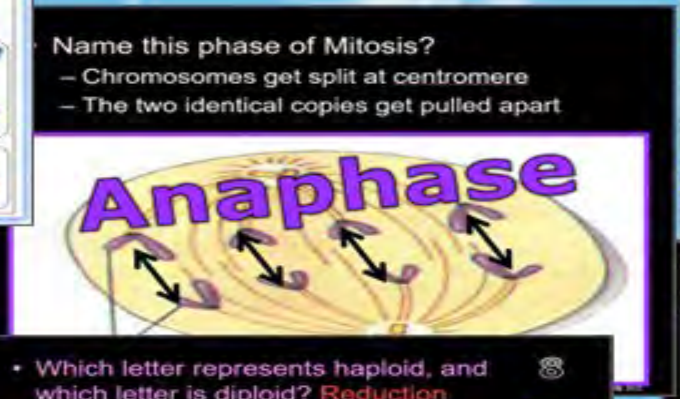


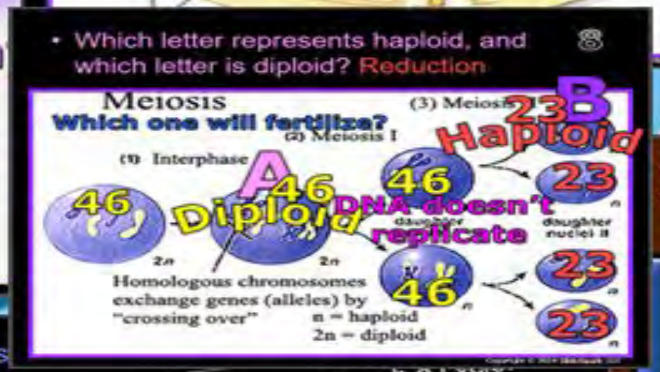
21 Page Bundle

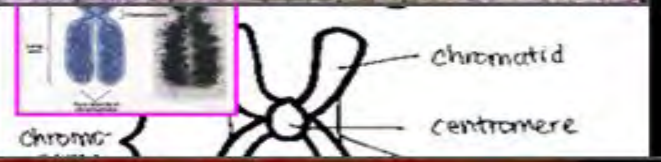
Activities, Assessments, Keys, and more all built-in

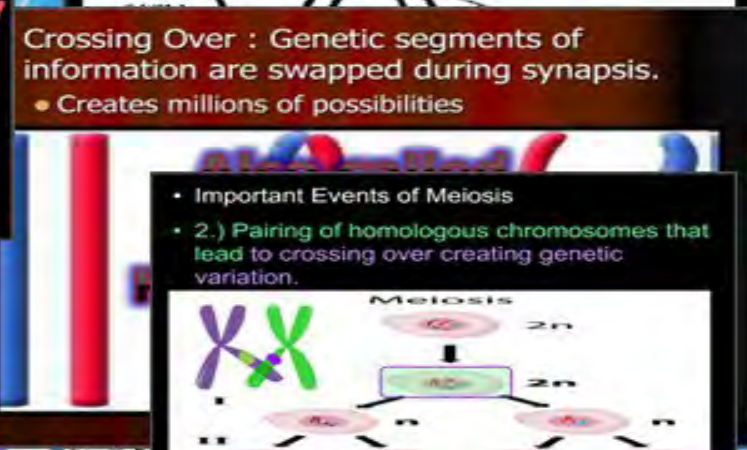


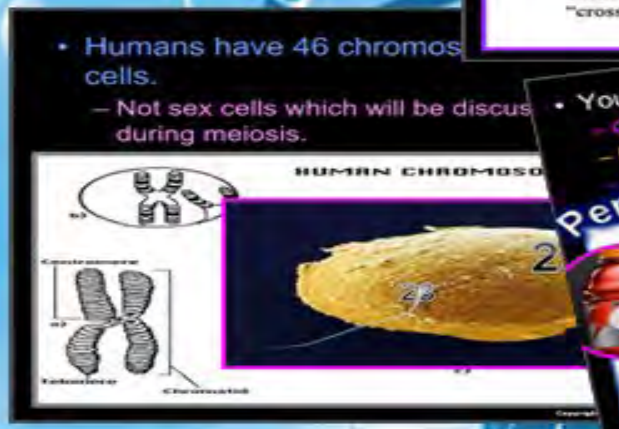


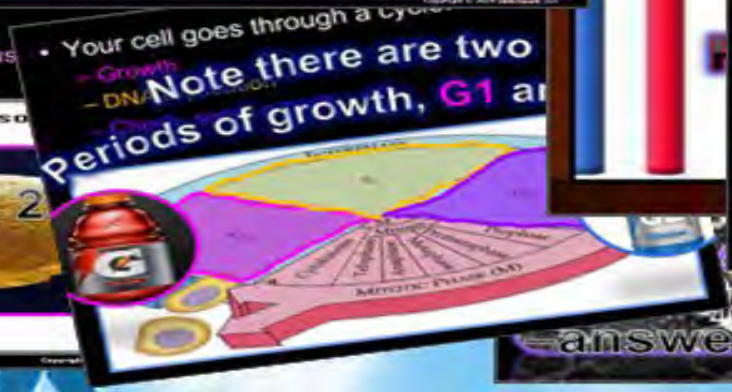








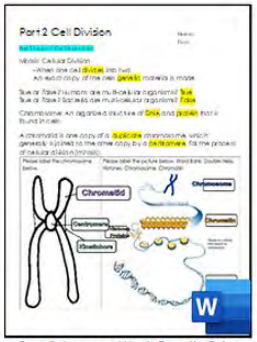


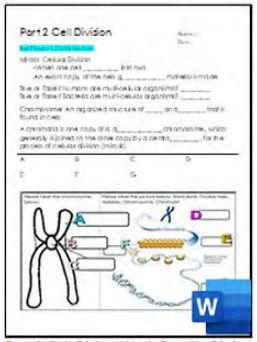


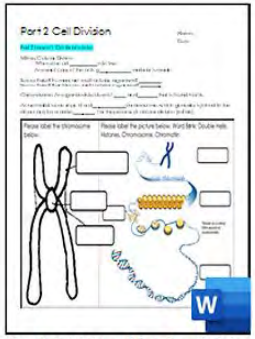
Part 2 Cell Division: 6 Lessons of 50 minutes and 9 Page Follow Along Work Bundle, Why do we Age?, Mitosis, Time Lapse of Cells Dividing, Chromosomes, Structure of a Chromosome, DNA Wrapping, Chromatin vs. Chromosome, Steps Chromosome formation, Phases of Mitosis, PPMAT, Details with Visuals and Explanations, of Each Phase, Interphase, Prophase, Prometaphase, Metaphase, Anaphase, Telophase, Cytokinesis, Mitosis Song, Review of Phases with Visuals, Complete a Mitosis Puzzle Activity, Visual Quiz of Mitosis, Box Game Review, Explanation of Why we Age, Mitosis Simulation with Gummy Worms, Crossword Puzzle, End Unit Assessment

[Parts 2-4, Mitosis, Cancer, Meiosis]


Additional and Printables


Part 2 Answers Work Bundle Print


Part 2 Cell Dision Work Bundle Digital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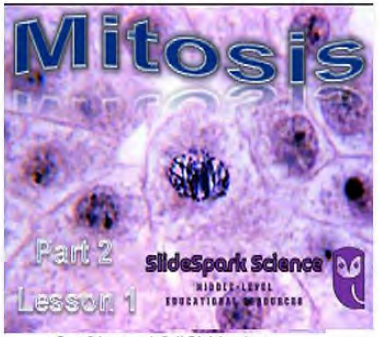
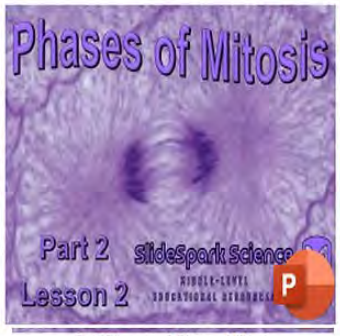
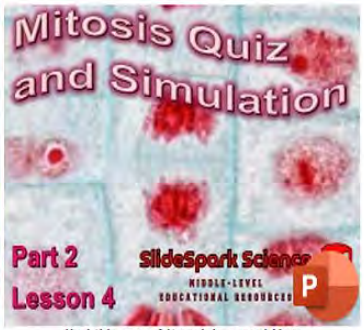


Part 2 Lesson 1 Cell Division Intro



Part 2 Lesson 2 Phases Mitosis

Part 2 Lesson 3 Mitosis Review



Part 2 Lesson 4 Simulation and Quiz

Parts 2 Lesson 5 Review Game

Parts 2 Lesson 6 Answers Review Game

Part 4 Meiosis, 4 Lessons of 50 minutes and 12 Page Follow Along Work Bundle, Somatic Cells vs. Gametes, Haploid vs Diploid, The Reproductive System, Ovum, Male Gamete, Step by Step Drawing of Male Gamete, Flagella, Male Gamete Motility, Step by Step Drawing of Ovum, Zygote, Fertilization, Phases of Meiosis, Two Cell Divisions, Synapsis, Homologous Recombination, Meiosis Puzzle Challenge, Independent Orientation, Reduction Division, Genes, Mendel's Law of Segregation, Important Events in Meiosis Review, Mendel's Laws of Heredity, Meiosis Simulation with Gummy Worms as Chromosomes Activity, Box Game Review, Connection of Meiosis to Genetics and Evolution, Crossword Puzzle, End Unit Assessment

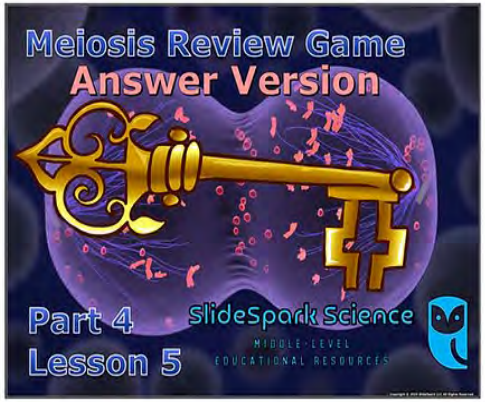
[Parts 2-4, Mitosis, Cancer, Meiosis]

Part 4 Lesson 1 Sex Cells

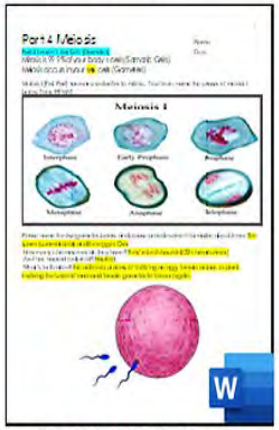
Part 4 Lesson 2 Meiosis

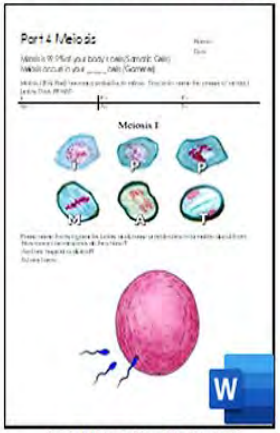
Part 4 Lesson 3 Meiosis Wrap Up

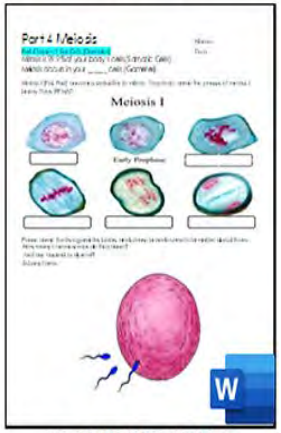
Part 4 Lesson 4 Meiosis Review Game



Part 4 Lesson 5 Answer Review Game


Part 4 Work Bundle Answers


Part 4 Work Bundle Digital

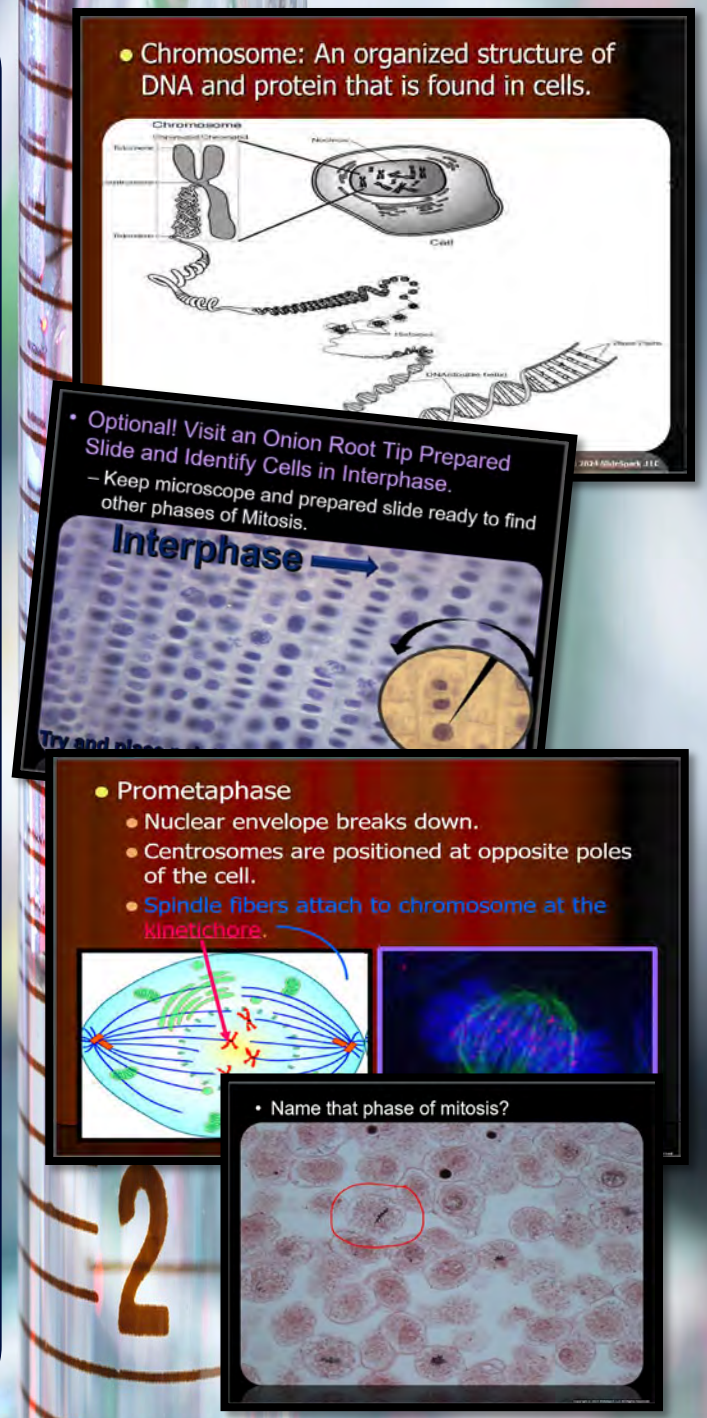

Part 4 Work Bundle Print

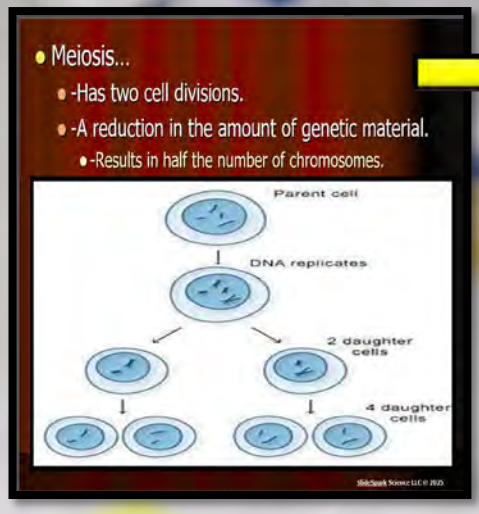
SlideSpark Science

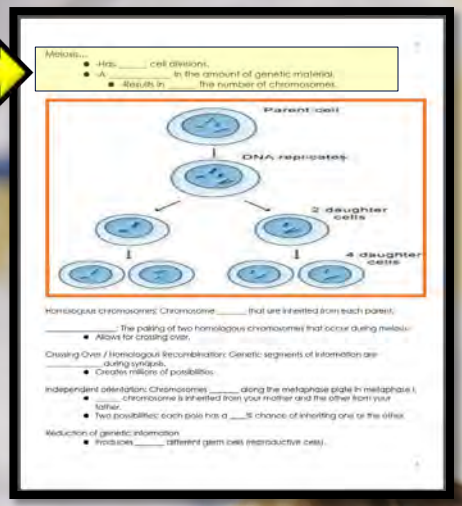
MIDDLE-LEVEL EDUCATIONAL RESOURCES

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.

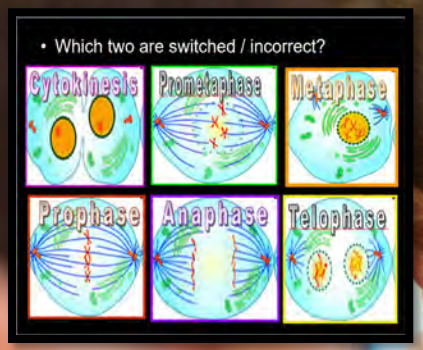


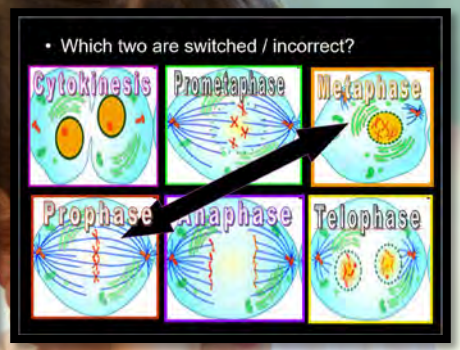


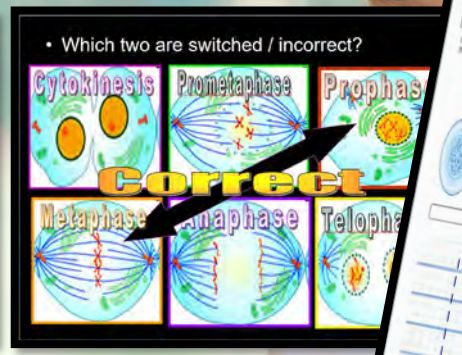


Red Slide Notes: Help students record important information in a fun and easy-to-understand way. Designed red-colored slides contain a few pieces of crucial information that students must record into their work bundle to complete the notes. Students will use these important notes throughout the work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





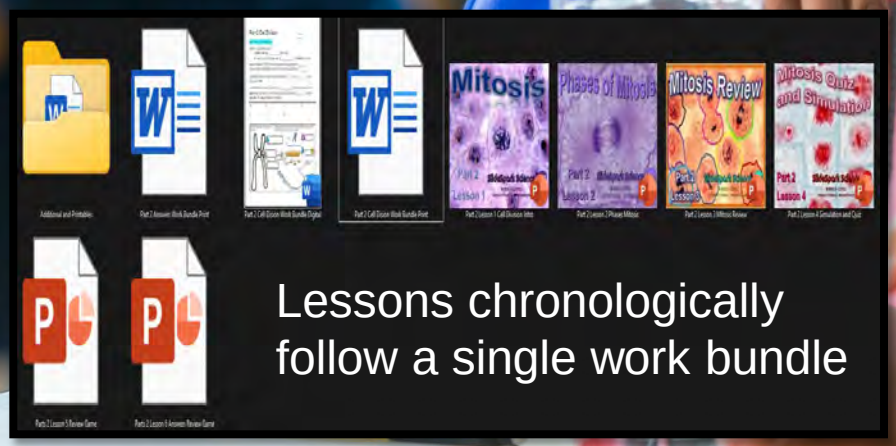


Next Slide

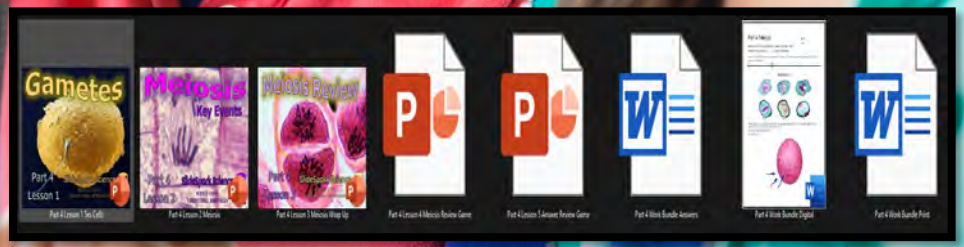
Slideshow supports Work Bundle

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.



Lessons chronologically follow a single work bundle

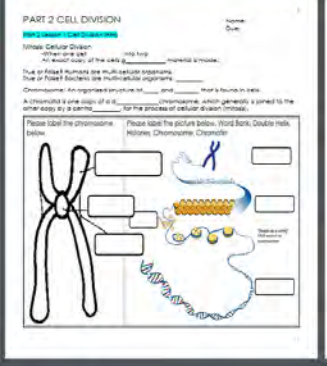


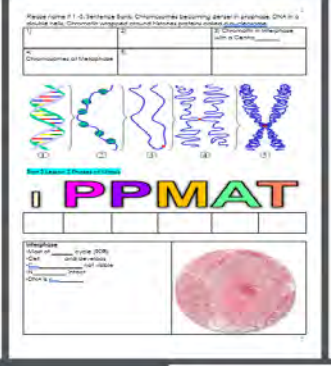
Follow Along Work Bundle

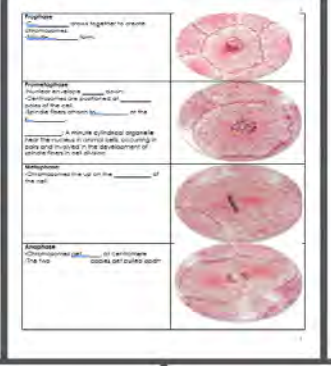
Each science unit comes with several work bundles. The bundles should be printed before the unit begins and distributed to the students on the first day of the unit. The work bundles will be due shortly after the completion of the unit. The work bundle will become a resource for the review games, crossword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

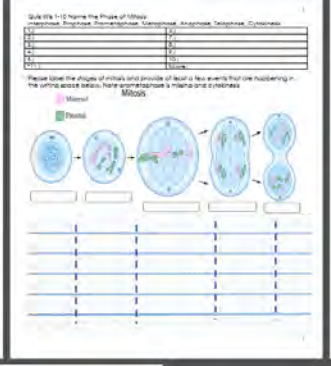
Mitosis Work Bundle

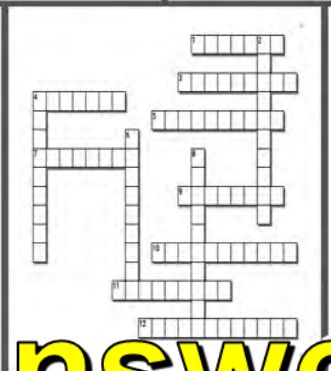
with Answer Key

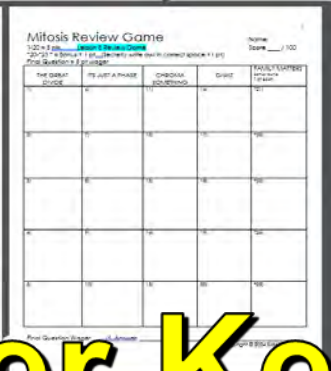


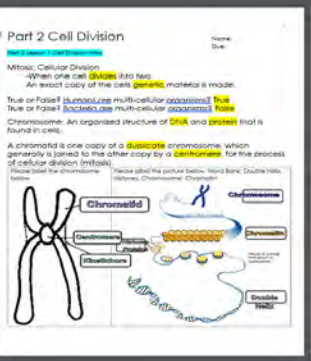


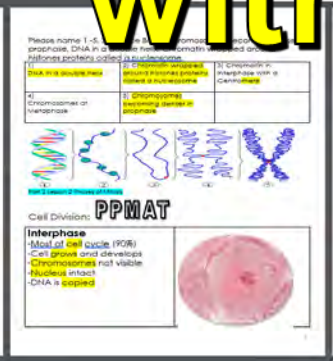


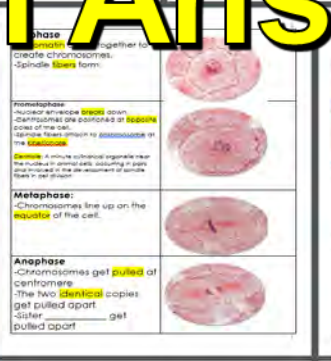


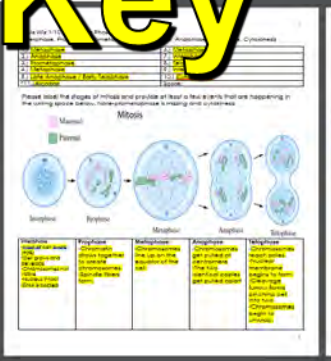


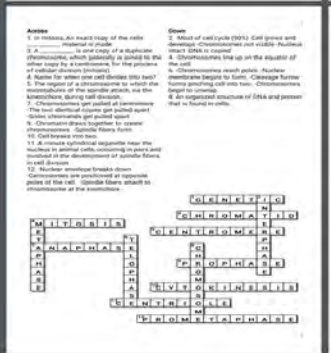


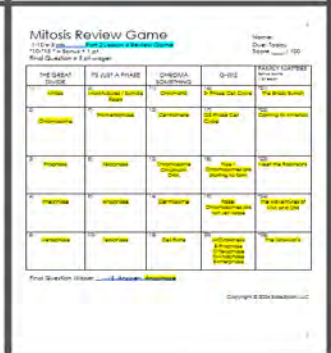






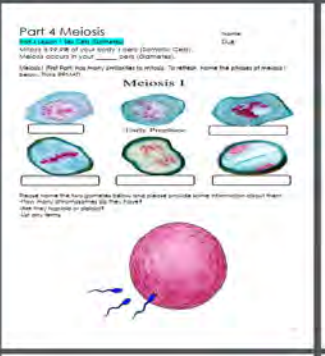


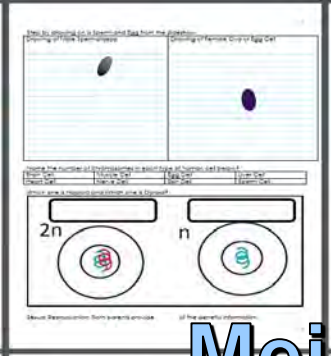


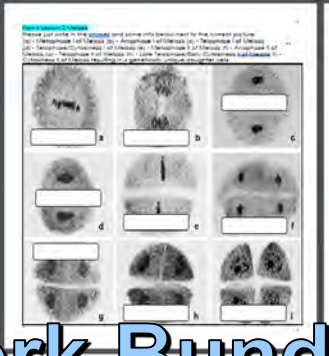


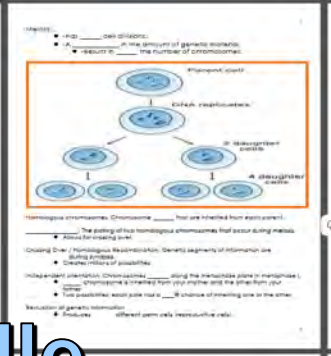
Meiosis Work Bundle

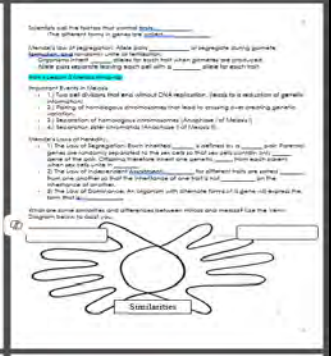
with Answer Key

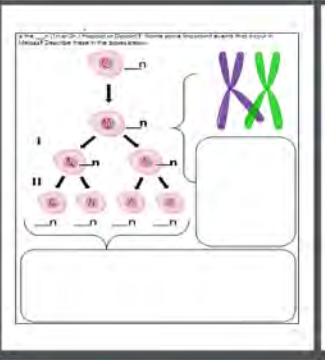


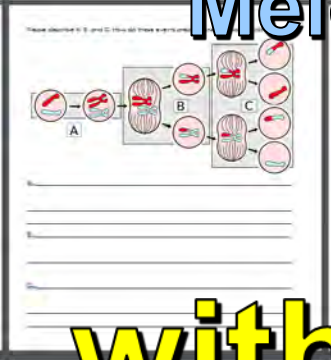


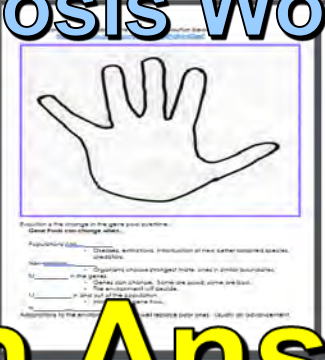


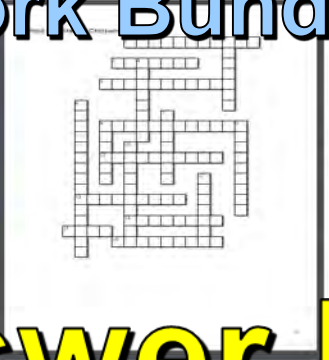


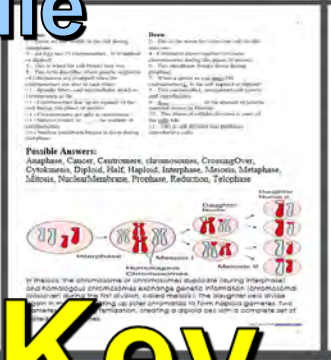


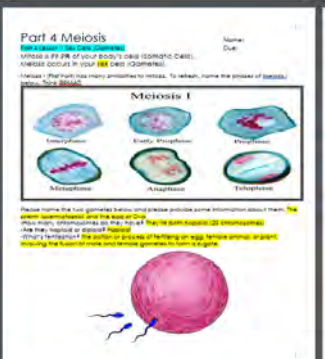


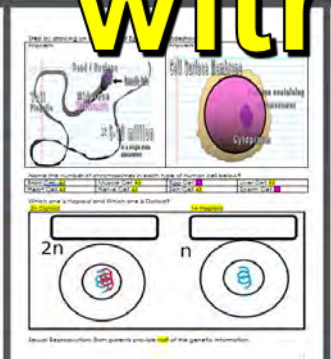


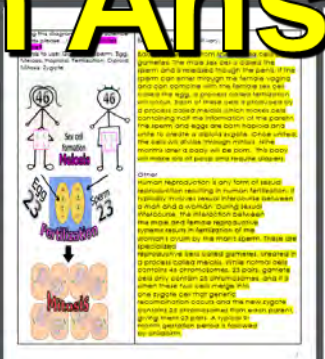


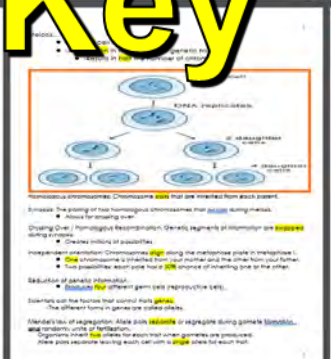


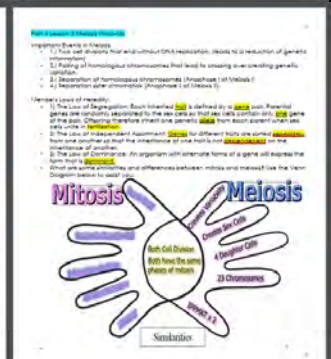


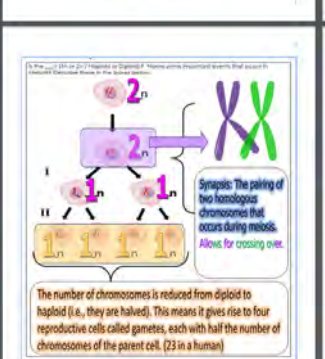


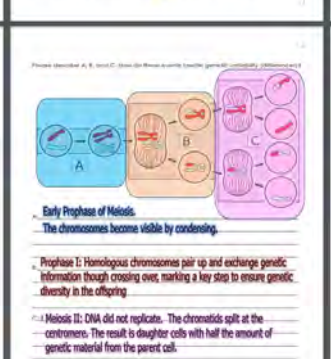


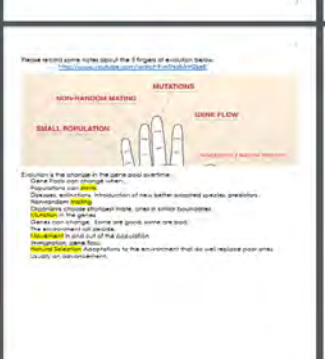


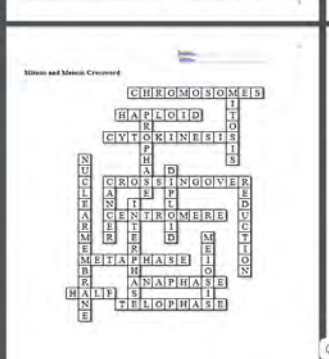


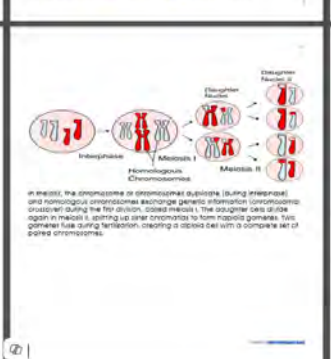


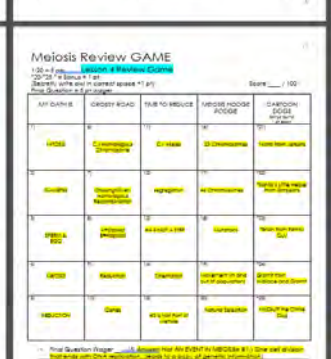






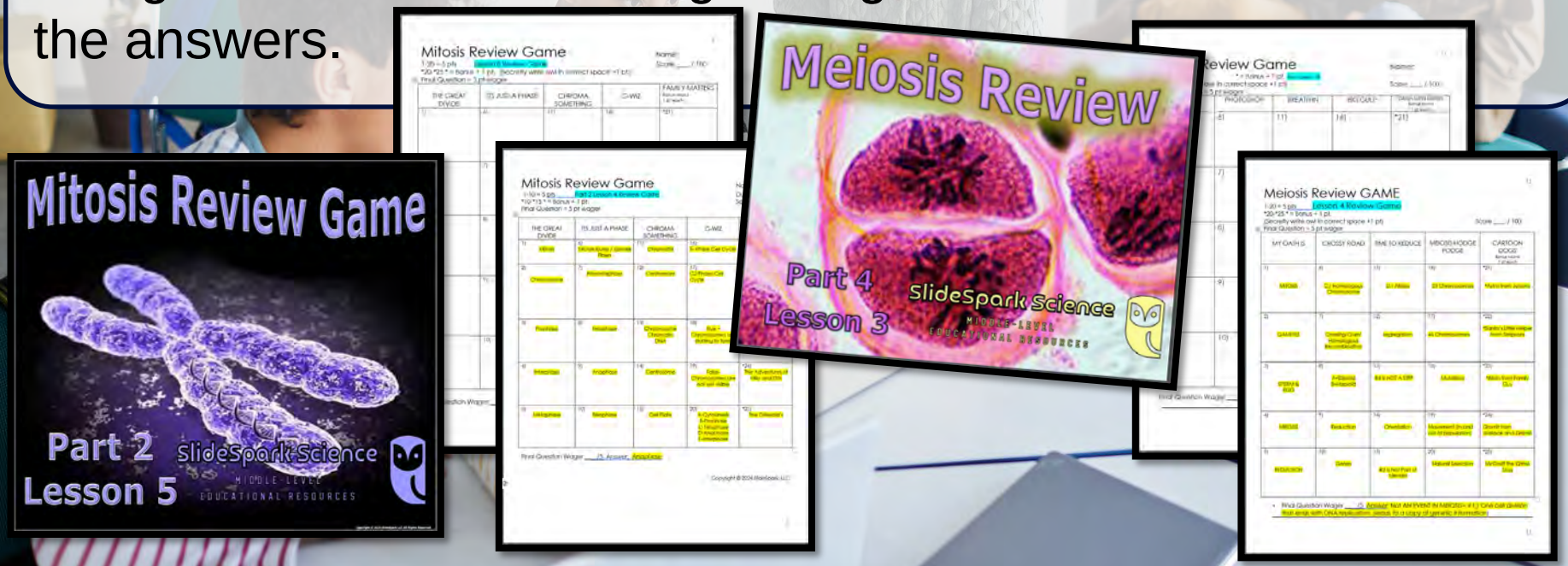






Review Game / Assessments

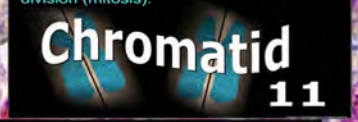
This unit concludes with a review quiz. Answers are provided in slideshow form so students can self assess. A blank template sheet is provided in the work bundle. Students can benefit from working together in small table groups with quiet communication. You can decide if you want to allow the use of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



Cell Division Quiz Game

This phase of mitosis (cellular division) is best represented by the image below?

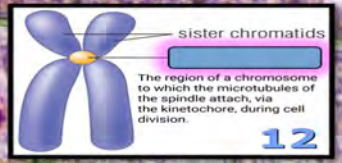
A duplicated chromosome, which generally is joined to the other copy by a centromere, for the process of cellular division (mitosis).



Which is DNA, which is Chromatin, and which is a Chromosome?

- Name this phase of Mitosis. 4
  - Most of cell cycle (90%)
  - Cell grows and develops (gets bigger)
  - Chromosomes not visible
  - Nucleus intact
  - DNA is copied

- Name this phase of Mitosis. 3
  - Chromatin draws together to create chromosomes.
  - Spindle fibers form.

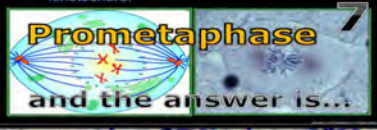


- These structures help pull the chromosomes to opposite poles of the cell.
  - A.) DNA
  - B.) Cytoplasm
  - C.) Spindle Fibers / Microtubules
  - D.) Membrane
  - E.) None of the above.

and the answer is...

- Name this phase of Mitosis?
  - Chromosomes get split at centromere
  - The two identical copies get pulled apart

- Name this phase just before metaphase?
  - Nuclear envelope breaks down.
  - Centrosomes are positioned at opposite poles of the cell.
  - Spindle fibers attach to chromosome at the kinetochore.

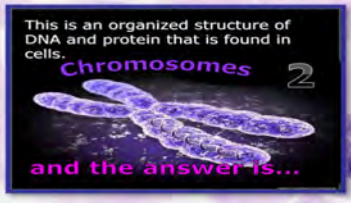


- Name this phase of Mitosis? 8
  - Chromosomes reaching poles.
  - Nuclear membrane begins to form.
  - Cleavage furrow forms pinching cell into two.
  - Chromosomes begin to unwrap.

- These are a minute cylindrical organelle near the nucleus in animal cells, occurring in pairs and involved in the development of spindle fibers in cell division 14

- True or False? This cell are undergoing cell division.

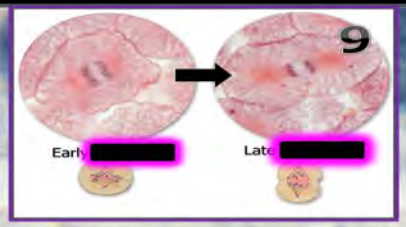
This is an organized structure of DNA and protein that is found in cells.



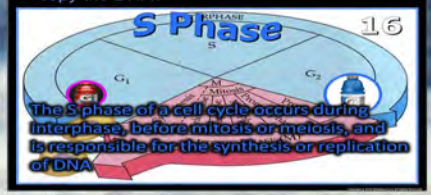
- This is the name of the process where one cell divides into two?
  - An exact copy is made. (Hopefully)

- Cytokinesis in Plants
  - This is the name for the partition formed during cell division in plants and some algae.

50 µm

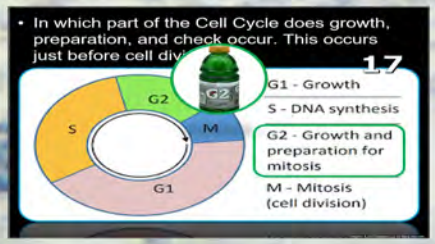


- In which part of Interphase does the cell copy the DNA?

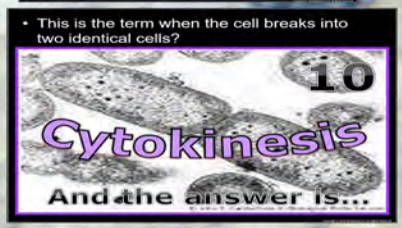


- True or False? These cheek cell are undergoing cell division.

- In which part of the Cell Cycle does growth, preparation, and check occur. This occurs just before cell div



- This is the term when the cell breaks into two identical cells?



Meiosis Quiz Game

- This is the name of the cell division that produces reproductive cells.

4

Meiosis

and the answer is...

- 99.9% of your cells replicate by using mitosis or meiosis?

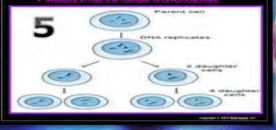
1

Mitosis

Meiosis occurs only in your sex cells

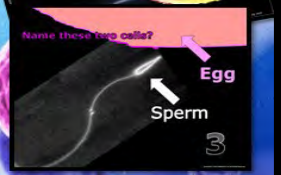
- Meiosis has two cell divisions that results in a reduction in the amount of genetic material.
  - Results in half the number of chromosomes

5



- Your sex cells are called?
  - A.) Love Cells
  - B.) Diploid Cells
  - C.) Nucleated Cells
  - D.) Gametes
  - E.) Socratic Cells

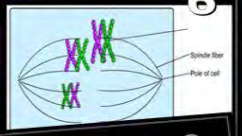
2



3

- This is the name for a set of one maternal and one paternal chromosome that pair up with each other inside a cell during fertilization.
  - A.) Two Set Chromosome
  - B.) Nucleosome
  - C.) Homologous Chromosome
  - D.) Daughter Cells
  - E.) A DNA Diploid

6



- This is when genetic segments of information are swapped when the chromosomes are next to each other.
  - Occurs at random and creates millions of possibilities.

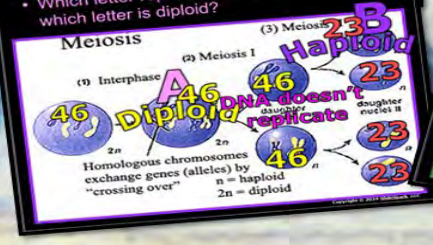
Crossing Over

Also called Homologous Recombination

answer is...

- Which letter represents haploid, and which letter is diploid?

8



- In Meiosis, there's a _____ of genetic information
  - Produces four different germ (reproductive cells).

9

20 Questions with Answers

Scientists call the factors that control traits...

A.)DNA B.)Genes C.)Helicase D.)Meiosis II

10

- Mendel's law of _____ Allele pairs separate during gamete formation, and randomly unite at fertilization.
  - Organisms inherit two alleles for each trait when gametes are produced.
  - Allele pairs separate leaving each cell with a single allele for each trait.

12

- Which is not an important event of Meiosis
  - #1.) Two cell divisions that end w/ihout DNA replication. (leads to a reduction of genetic information).
  - #2.) Pairing of homologous chromosomes that lead to crossing over creating genetic variation.
  - #3.) Separation of homologous chromosomes (Anaphase I of Meiosis I)
  - #4.) The DNA replicates and divides one last time during prophase II. **Not a step!**
  - #5.) Separation sister chromatids (Anaphase II of Meiosis II)

13

- Independent orientation: Chromosomes align along the metaphase plate in metaphase I.
  - One chromosome is inherited from your mother and the other from your father.
  - Two possibilities; each pole has a 50% chance of inheriting one or the other.

Orientation of Assortment

14

- Which is not one of Mendel's Laws of Heredity:
- 1) The Law of Segregation: Each inherited trait is defined by a gene pair. Parental genes are randomly separated to the sex cells so that sex cells contain only one gene of the pair. Offspring therefore inherit one genetic allele from each parent when sex cells unite in fertilization.
- 2) Sexual reproduction will always result in a new individual that is genetically identical to either the father or mother.
- 3) The Law of Independent Assortment: Genes for different traits are sorted separately from one another so that the inheritance of one trait is not dependent on the inheritance of another.
- 4) The Law of Dominance: An organism with alternate forms of a gene will express the form that is dominant.

15

- How many chromosomes are in the sex cells of a human?

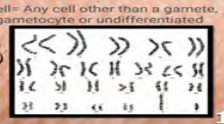
16

23 Chromosomes

How many Chromosomes are in our somatic cells?

Somatic Cell= Any cell other than a gamete, germ cell, gametocyte or undifferentiated stem cell.

46



17

- Evolution is the change in the gene pool overtime.
  - Gene Pools can change when...
  - Mutations in the genes
    - Genes can change. Some are good, some are bad.
    - The environment will decide.

18

Mutation in the genes

- Evolution is the change in the gene pool overtime.
  - Gene Pools can change whe
  - Movement in and out of the p
    - Immigration, gene flow.

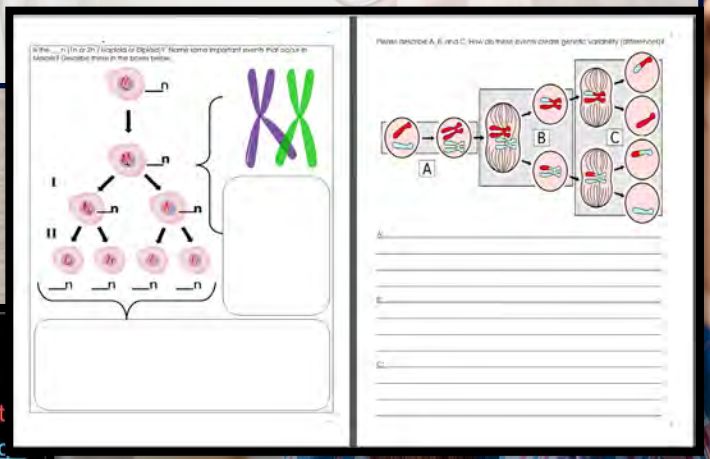
- Evolution is the change in the gene pool overtime.
  - Gene Pools can change when...
  - Adaptations to the environment that do well replace poor ones. Usually an advancement.

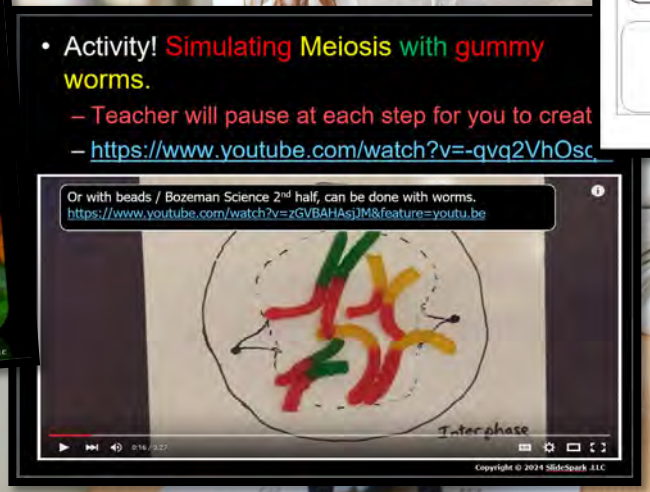
20

- Which is not an Important Event of Meiosis
- 1.) One cell division that ends with DNA replication (leads to a copy of genetic information)
- 2.) Pairing of homologous chromosomes that lead to crossing over creating genetic variation.
- 3.) DNA replicates during Anaphase I of Meiosis I to create two identical cells.
- 4.) Separation of homologous chromosomes (Anaphase I of Meiosis I)

Activities / Labs

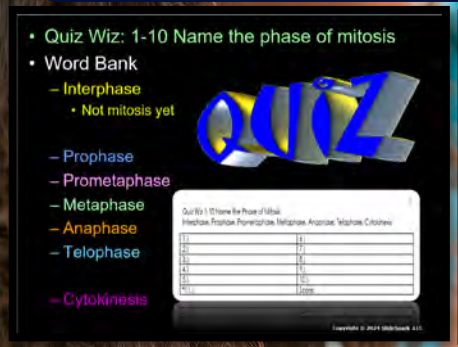
Our science activities are designed to help students explore and understand complex scientific concepts in an engaging and interactive way. Each science unit includes several hands-on activities that encourage students to collect data and think critically about the world around them. Our easy-to-follow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

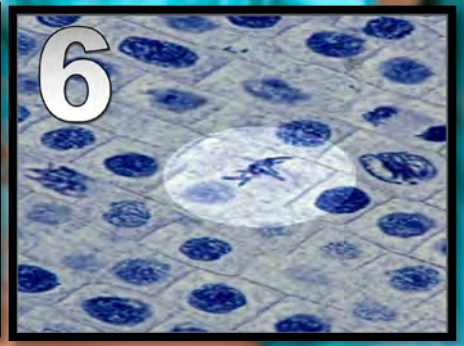


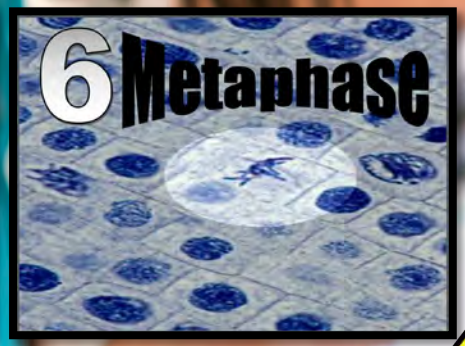


Built-in Assessment

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.



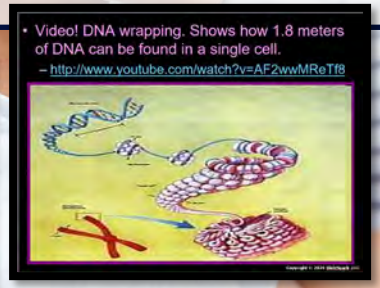


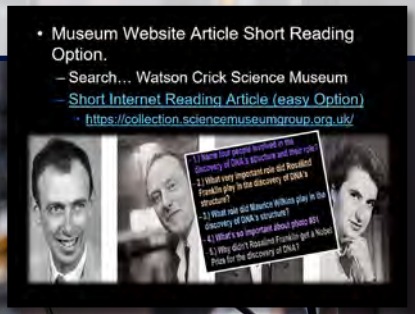


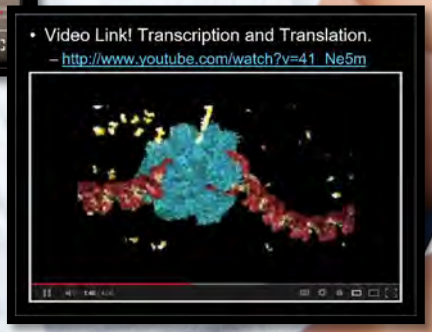
Quiz in Work Bundle

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.

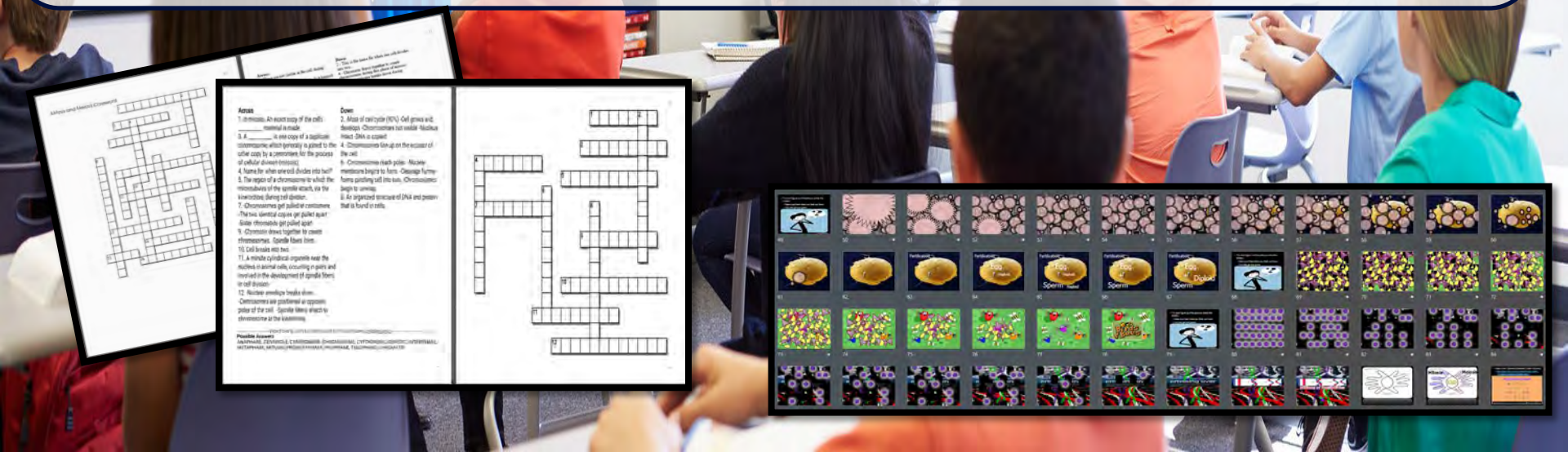






Games and Review

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.



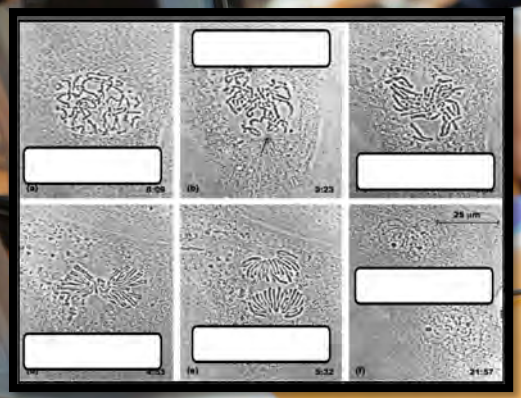
The Owl - Each Part of the slideshow has a small clipart Owl hiding somewhere in a slide. The owl is incredibly small and blended into just the right slide. If a student spots the “Owl” they can raise their hand high into the air. When you call upon the student they can say “Owl" and be the student who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

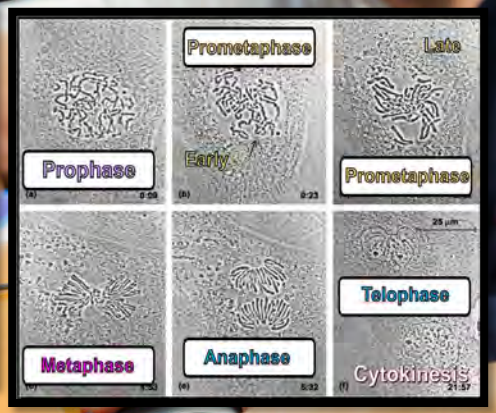
Google Classroom Compatible

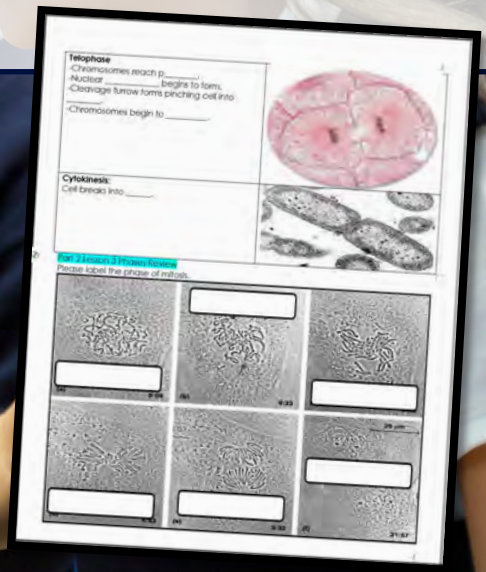
Our digital learning programs are designed for students to learn science in a flexible and engaging environment. Our Google Classroom-compatible units provide a seamless learning experience whether your students are in the classroom or learning from home. Our step-by-step slideshows and student work 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.

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.

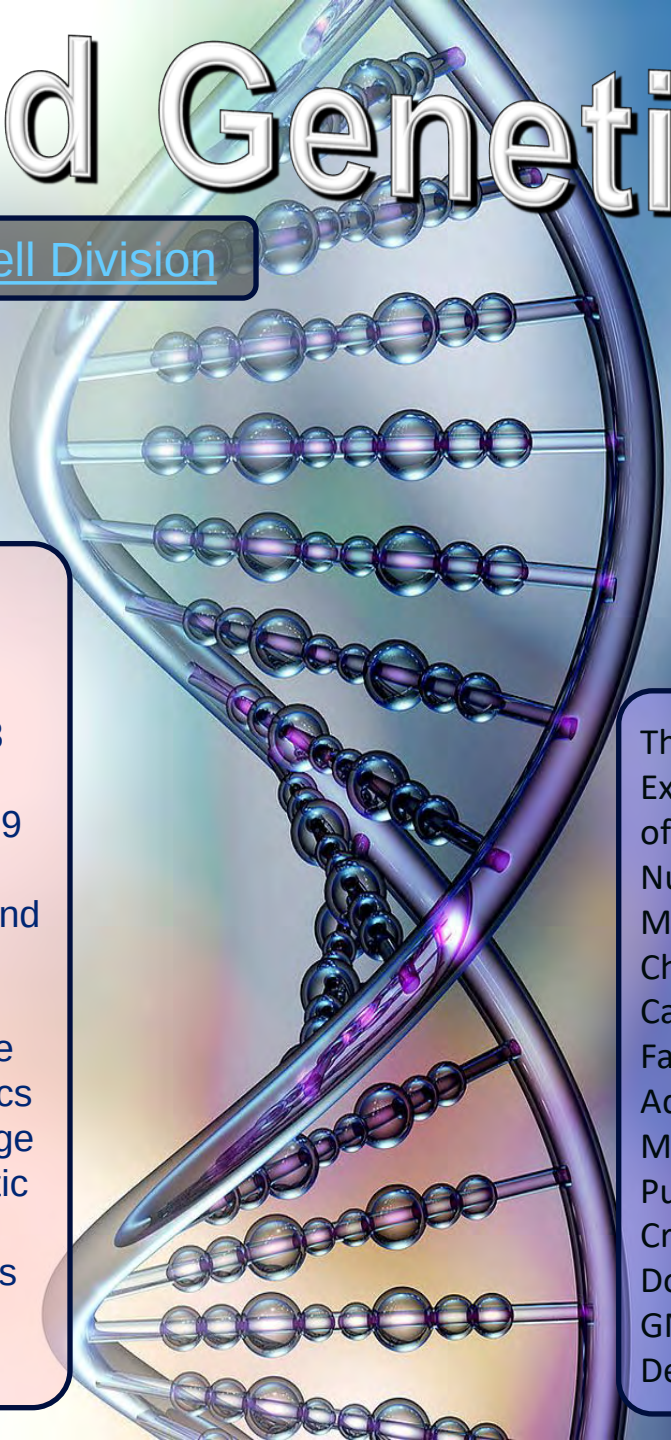






DNA and Genetics Unit

DNA and Genetics Unit, Cell Division



DNA and Genetics Unit
42 Lessons 6 Parts. (8th-10th Most Difficult) Part 1 is an Introduction to DNA and contains 9 Lessons and 13 Page Work Bundle. Part 2 about Mitosis and contains 6 Lessons and 9 Page Work Bundle. Part 3 explores Cancer / Anti-Smoking and Vaping and has 8 Lessons and 9 Page Work Bundle. Part 4 investigates Meiosis and contains 4 Lessons and 12 Page Work Bundle. Part 5 is about Genetics and contains 12 Lessons and 16 Page Work Bundle. Part 6 Explores Genetic Disorders, Karyotypes and some issues in Bio-Ethics. It has 6 Lessons and 11 Page Work Bundle.

The DNA and Genetics Unit: DNA, DNA Extraction, Structure of DNA, Discovery of the Double Helix, Rosalind Franklin, Nucleotides, RNA, Cell Division, Mitosis, Phases of Mitosis, Chromosomes, Cancer, Ways to Avoid Cancer, What is Inside a Cigarette?, Facts about Smoking?, Anti-Smoking Ads, Meiosis, Phases in Meiosis, Mendelian Genetics, Gregor Mendel, Punnett Squares, Probability, Dihybrid Cross, Codominance, Incomplete Dominance, Karyotypes, Bio-Ethics, GMO's, Genetic Disorders, Stem Cell Debate, Cloning Debate.

Part 1: DNA 9 Lessons of 50 minutes and 13 Page Follow Along Work Bundle, Introduction to DNA, DNA Extraction Lab with Split Peas, DNA structure and Role, Double Helix, Flow of Information, DNA to RNA to Proteins, Transcription, Translation, Friedrich Miescher Isolation of DNA, DNA's Discovery Case Study and Reading, Watson and Crick 1953, Maurice Wilkins, Rosalind Franklin, X-Ray Diffraction, DNA's Structure, Step by Step Drawing and Labeling of DNA, Nucleotide, Base Pairs, Adenine, Thymine, Cytosine, Guanine, Games with Base Pairs, Phosphate Backbone, Ribose Sugar, RNA, Differences between RNA and DNA, Build DNA Model, Review of the Flow of Information, DNA Replication, Step by Step Diagram of DNA Replication, Inherited vs. Acquired Traits, Eukaryotic Cells, Prokaryotic Cells, Box Game Review, Crossword Puzzle, Unit Assessment.

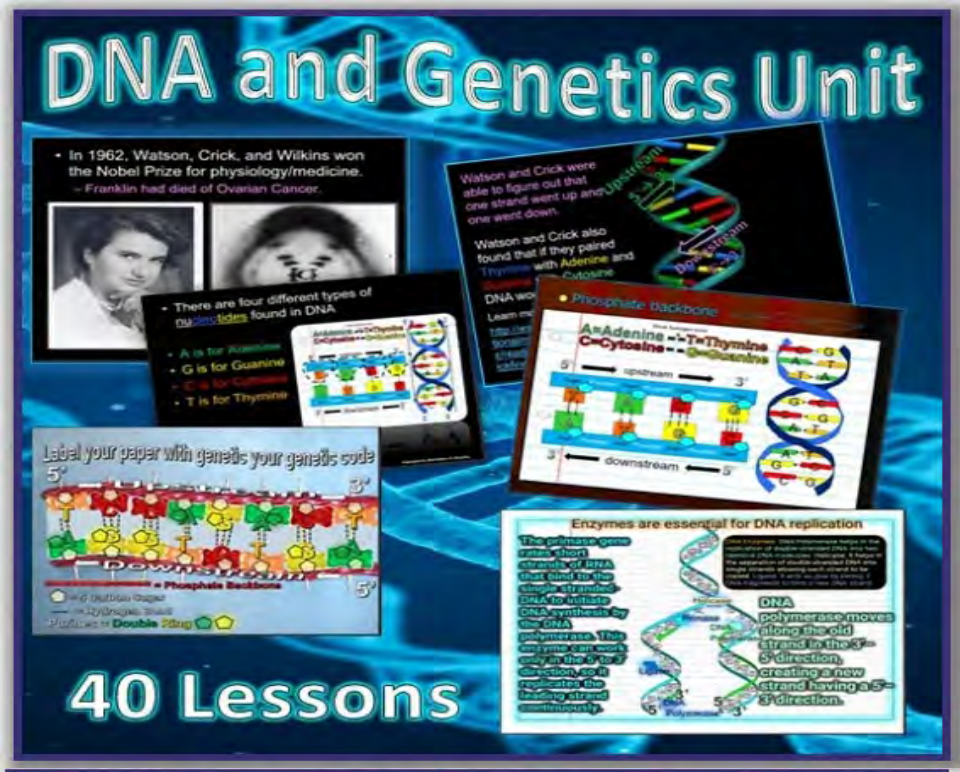
Parts 2-4, Mitosis, Cancer, Meiosis: **Part 2** Cell Division: 6 Lessons of 50 minutes and 9 Page Follow Along Work Bundle, Why do we Age?, Mitosis, Time Lapse of Cells Dividing, Chromosomes, Structure of a Chromosome, DNA Wrapping, Chromatin vs. Chromosome, Steps Chromosome formation, Phases of Mitosis, PPMAT, Details with Visuals and Explanations, of Each Phase, Interphase, Prophase, Prometaphase, Metaphase, Anaphase, Telophase, Cytokinesis, Mitosis Song, Review of Phases with Visuals, Complete a Mitosis Puzzle Activity, Visual Quiz of Mitosis, Box Game Review, Explanation of Why we Age, Mitosis Simulation with Gummy Worms, Crossword Puzzle, End Unit Assessment

Parts 2-4, Mitosis, Cancer, Meiosis: **Part 3**: Cancer, 8 Lessons of 50 Minutes and 9 Page Follow Along Work Bundle, What is Cancer?, Lifestyle Choices to help aid in the prevention of Cancer, Skin Cancer, Dangers of Skin Cancer, Ways to avoid UV Exposure, Dangers of Tanning, Abcde's of Understanding Skin Moles and Cancer, Dangers of Smoking, Starting Anti-Tobacco Campaign Project, Dissection of a Typical US Blended Cigarette, Case Study on the Filter and how they don't work, Facts about Smoking, Start of Ad Campaign Portion of Unit, Students watch Anti-tobacco ads and reflect on their usefulness, Visual Tour of some harmful chemical in cigarettes, Full Ingredient List, Nitrosamines, How Chemicals Impact DNA, Visual Tour of the Negative Health Impacts Smoking Can Cause, Stroke, Heart Disease, Smokers Lung vs Non-Smoker, Coating of Alveoli in Tar, Neck Breathers, laryngectomy Laryngectomy, tracheostomy, Emphysema, Chronic Bronchitis, Danger of Second Hand Smoke, Buergers Disease, Hairy Tongue / lingua villosa, Tour of the the nastiest hairy tongues out there, Dangers of Smokeless Tobacco, Mouth and Throat Cancer, Dangers of Smoking while Pregnant, Comparing Twins Study, Vaping, Dangers of Vaping, Popcorn Lung, Wet Lung, A lot Still Unknown, Case Study on JUUL, Nicotine Levels in Vaping / e-juices, Nicotine and the Adolescent Brain, Anti-Tobacco Campaign Projects, Box Game Review, Crossword Puzzle, End Unit Assessment

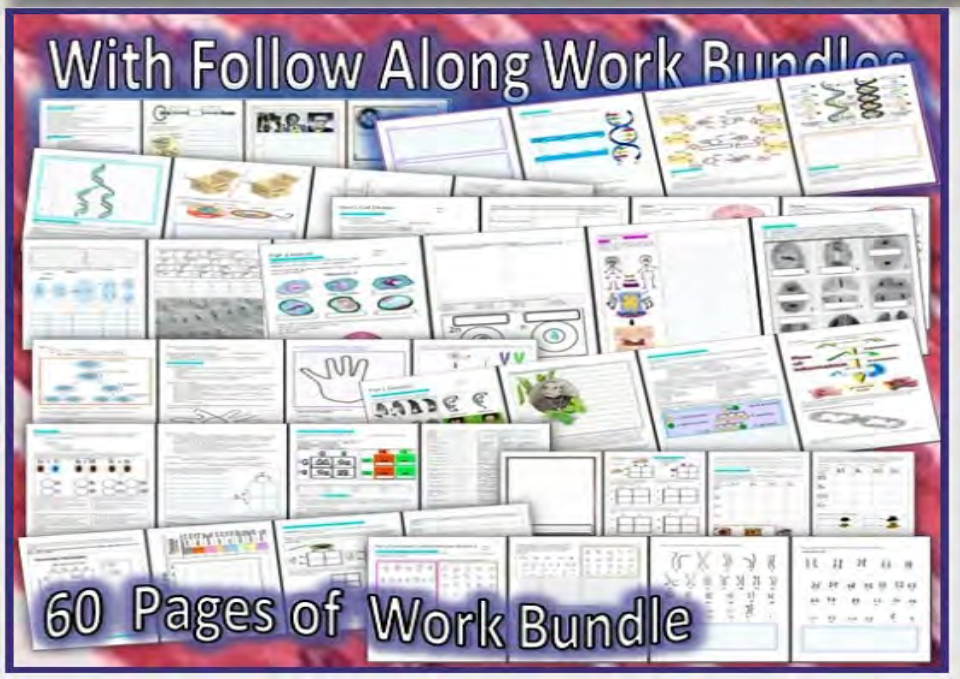
Parts 2-4, Mitosis, Cancer, Meiosis Part 4 Meiosis, 4 Lessons of 50 minutes and 12 Page Follow Along Work Bundle, Somatic Cells vs. Gametes, Haploid vs Diploid, The Reproductive System, Ovum, Male Gamete, Step by Step Drawing of Male Gamete, Flagella, Male Gamete Motility, Step by Step Drawing of Ovum, Zygote, Fertilization, Phases of Meiosis, Two Cell Divisions, Synapsis, Homologous Recombination, Meiosis Puzzle Challenge, Independent Orientation, Reduction Division, Genes, Mendel's Law of Segregation, Important Events in Meiosis Review, Mendel's Laws of Heredity, Meiosis Simulation with Gummy Worms as Chromosomes Activity, Box Game Review, Connection of Meiosis to Genetics and Evolution, Crossword Puzzle, End Unit Assessment

Part 5: Genetics: 12 Lesson of about 50 minutes and 16 Page Follow Along Work Bundle, Introduction to Genetics with the exploration of some common phenotypes, Tasting PTC Paper, Case Study Gregor Mendel, Selective Breeding, Descent with Modification, Survival of the Fittest, Heredity / Law of Segregation, Genetic Variation, Pure Breed Offspring, Mendel's Results with Pea Plants F1, F2, Generation, Phenotypes, Genotypes, Flow of Information DNA to RNA to Gene Expression, Fertilization, Asexual Reproduction, Genes and Alleles, Polygenic Traits, Dominant and Recessive Alleles, Vocabulary Review, Mendel's Laws of Heredity, Biologist Nettie Stevens Case Study, Punnett Squares, Monohybrid Crosses, How to complete a Punnett Square, Probability, Homozygous and Heterozygous, Built-in Quiz, Designing Your Child Coin Flip / Learning Terms Activity, More Practice with Punnett Squares, Dihybrid Crosses, Why Inbreeding can lead to mutations, Triple Crosses with Gecko Punnett Square, Complete Dominance, Incomplete Dominance, Codominance, Pedigree Chart, Autosomal Trait vs. Sex linked trait, Five Fingers of Evolution, Box Game Review, Crossword, End Unit Assessment

Part 6: DNA and Genetics Unit: 6 Lessons of 50 minutes and 11 Page Follow Along Work Bundle, Karyotype, X and Y Chromosome, Human Karyotype vs Chimpanzee, Identifying Abnormalities in Karyotypes and their corresponding Disorder, Various Syndromes associated with Genetic Disorders, Sex Linked Disorders, Genetic Disorders with Descriptions, Virtual Lab Karyotype, Genetic Disorder Research Project, Students Partner up and complete research about a Genetic Disorder, Circle Discussion about Genetic Disorders, Bio-Ethics, Some Topics in the Biosciences, Sinking Ship Ethical Dilemma Activity, Genetic Engineering, GMO's, Difference b/t USDA Organics and Non-GMO Verified, Stem Cells, Types of Stem Cells, Embryonic Stem Cells and Stances, Cloning, Different Types of Cloning, Understanding the Differences, Applications of Cloning, Negatives of Cloning, Synthetic Life, Designer Babies, Box Game Review, Crossword Puzzle, Optional Movie with Worksheet Extension


DNA and Genetics Unit
In 1962, Watson, Crick, and Wilkins won the Nobel Prize for physiology/medicine.
– Franklin had died of Ovarian Cancer.
There are four different types of nucleotides found in DNA
A is for Adenine
G is for Guanine
C is for Cytosine
T is for Thymine
Watson and Crick were able to figure out that one strand went up and one went down.
Watson and Crick also found that if they paired Thymine with Adenine and Cytosine with Guanine
Upstream
Downstream
Phosphate backbone
A=Adenine
T=Thymine
C=Cytosine
G=Guanine
upstream
downstream
Label your paper with genetic your genetic code
Phosphate Backbone
Double Ring
Enzymes are essential for DNA replication
The primase gene codes short strands of RNA that bind to the template strands. DNA helicase unzips DNA synthesis by the DNA polymerase. This enzyme can work only in the 5' to 3' direction, so it replicates the leading strand continuously.
DNA polymerase moves along the old strand in the 3'- 5' direction, creating a new strand having a 5'- 3' direction.
40 Lessons


Interactive Slideshows
Activity! Simulating Mitosis with beads.
Gummy Worms will work as well. white board, marker).
(Follow video. Teacher will pause and check your work)
Decide if the picture / information is a learned behavior or inherited trait. 1-10
Paws for gripping
DNA has the information for our cells to make proteins.
DNA
Keep your hard copy safe in the nucleus
Except Proteins
RNA
Which two are switched / incorrect?
Prophase
Metaphase
Anaphase
Telophase
Cytokinesis
P1 generation
F1 generation
F2 generation
F3 generation
F4 generation
Let's try one Punnett Square.
Punnett Square: A diagram that is used to predict the outcome of a particular cross
– (Probability / likelihood that that an event / cross will occur)
100% Chance offspring will be tall
Don't forget the F2 Gen
Which is which?

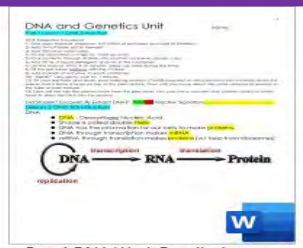

With Follow Along Work Bundles
60 Pages of Work Bundle


Assessments, Video Links, Hands-On Activities,
Answer Keys, Games, and more all built-in
The shaded circles and squares is a dominant allele. Shaded = Dominant
– What's probable genotypes of the missing boxes?
This is the name for an organism's genetic makeup, or allele combinations
Genotype
Answer is.
Which gender decides the childs gender?
Use the Punnett Square below to help you.
Only men can give the Y chromosome
Anyone up for a triple-het x triple-het cross?
triple-het x triple-het cross
Which is the human and which is the chimpanzee karyotype?
23 pairs
46 Chromosomes
24 pairs
48 Chromosomes
Phenotype
Male (BGbg) is crossed with fe
B=Brown, Dominant
G= Green,

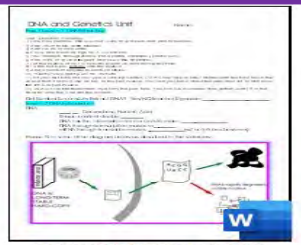
Part 1: DNA 9 Lessons of 50 minutes and 13 Page Follow Along Work Bundle, Introduction to DNA, DNA Extraction Lab with Split Peas, DNA structure and Role, Double Helix, Flow of Information, DNA to RNA to Proteins, Transcription, Translation, Friedrich Miescher Isolation of DNA, DNA's Discovery Case Study and Reading, Watson and Crick 1953, Maurice Wilkins, Rosalind Franklin, X-Ray Diffraction, DNA's Structure, Step by Step Drawing and Labeling of DNA, Nucleotide, Base Pairs, Adenine, Thymine, Cytosine, Guanine, Games with Base Pairs, Phosphate Backbone, Ribose Sugar, RNA, Differences between RNA and DNA, Build DNA Model, Review of the Flow of Information, DNA Replication, Step by Step Diagram of DNA Replication, Inherited vs. Acquired Traits, Eukaryotic Cells, Prokaryotic Cells, Box Game Review, Crossword Puzzle, Unit Assessment.

Part 1: DNA

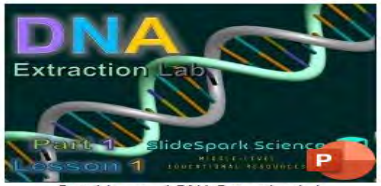

Additional and Printables



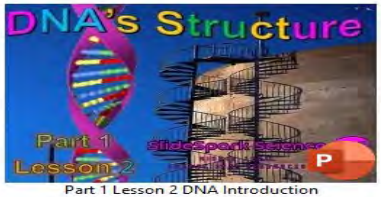
Part 1 DNA Work Bundle Answers



Part 1 DNA Work Bundle Print

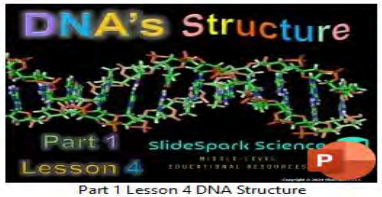


Part 1 Lesson 1 DNA Extraction Lab



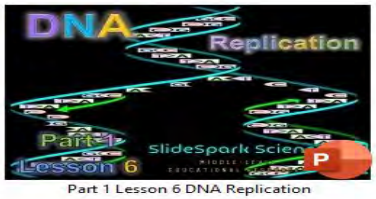
Part 1 Lesson 2 DNA Introduction

Part 1 Lesson 3 DNA Discovery



Part 1 Lesson 4 DNA Structure

Part 1 Lesson 5 Build DNA Model RNA



Part 1 Lesson 6 DNA Replication

Part 1 Lesson 7 Inherited Traits

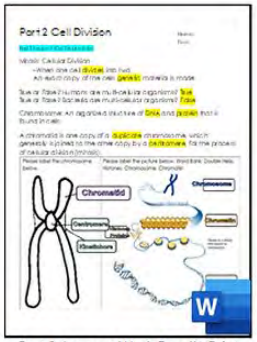
Part 1 Lesson 8 Review Game

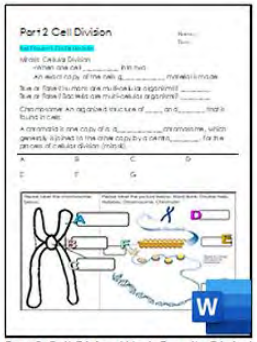
Part 1 Lesson 9 Review Game Answers

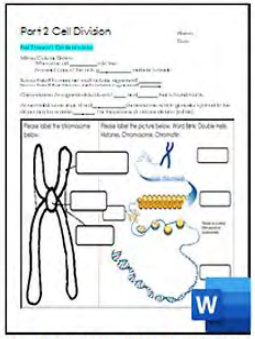
Part 2 Cell Division: 6 Lessons of 50 minutes and 9 Page Follow Along Work Bundle, Why do we Age?, Mitosis, Time Lapse of Cells Dividing, Chromosomes, Structure of a Chromosome, DNA Wrapping, Chromatin vs. Chromosome, Steps Chromosome formation, Phases of Mitosis, PPMAT, Details with Visuals and Explanations, of Each Phase, Interphase, Prophase, Prometaphase, Metaphase, Anaphase, Telophase, Cytokinesis, Mitosis Song, Review of Phases with Visuals, Complete a Mitosis Puzzle Activity, Visual Quiz of Mitosis, Box Game Review, Explanation of Why we Age, Mitosis Simulation with Gummy Worms, Crossword Puzzle, End Unit Assessment

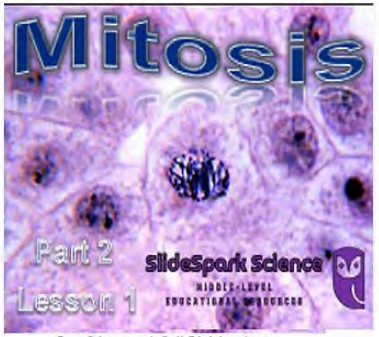
[Parts 2-4, Mitosis, Cancer, Meiosis]


Additional and Printables

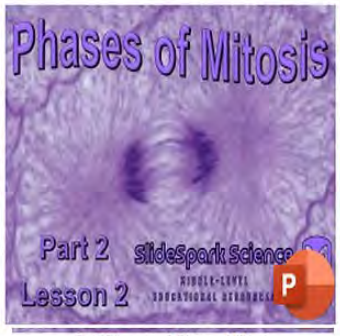

Part 2 Answers Work Bundle Print


Part 2 Cell Dision Work Bundle Digital


Part 2 Cell Dision Work Bundle Print

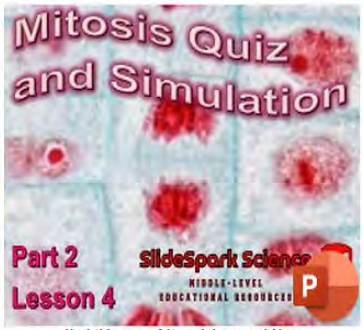


Part 2 Lesson 1 Cell Division Intro



Part 2 Lesson 2 Phases Mitosis

Part 2 Lesson 3 Mitosis Review



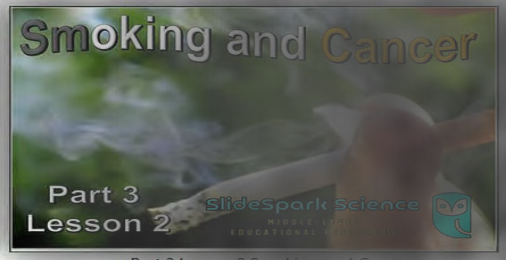
Part 2 Lesson 4 Simulation and Quiz

Parts 2 Lesson 5 Review Game

Parts 2 Lesson 6 Answers Review Game

Part 3: Cancer, 8 Lessons of 50 Minutes and 9 Page Follow Along Work Bundle, What is Cancer?, Lifestyle Choices to help aid in the prevention of Cancer, Skin Cancer, Dangers of Skin Cancer, Ways to avoid UV Exposure, Dangers of Tanning, Abcde's of Understanding Skin Moles and Cancer, Dangers of Smoking, Starting Anti-Tobacco Campaign Project, Dissection of a Typical US Blended Cigarette, Case Study on the Filter and how they don't work, Facts about Smoking, Start of Ad Campaign Portion of Unit, Students watch Anti-tobacco ads and reflect on their usefulness, Visual Tour of some harmful chemical in cigarettes, Full Ingredient List, Nitrosamines, How Chemicals Impact DNA, Visual Tour of the Negative Health Impacts Smoking Can Cause, Stroke, Heart Disease, Smokers Lung vs Non-Smoker, Coating of Alveoli in Tar, Neck Breathers, laryngectomy Laryngectomy, tracheostomy, Emphysema, Chronic Bronchitis, Danger of Second Hand Smoke, Berger's Disease, Hairy Tongue / lingua villosa, Tour of the the nastiest hairy tongues out there, Dangers of Smokeless Tobacco, Mouth and Throat Cancer, Dangers of Smoking while Pregnant, Comparing Twins Study, Vaping, Dangers of Vaping, Popcorn Lung, Wet Lung, A lot Still Unknown, Case Study on JUUL, Nicotine Levels in Vaping / e-juices, Nicotine and the Adolescent Brain, Anti-Tobacco Campaign Projects, Box Game Review, Crossword Puzzle, End Unit Assessment

Part 3 Lesson 1 Cancer and Skin Cancer



Part 3 Lesson 2 Smoking and Cancer

Part 3 Lesson 3 Smoking Cont I

Part 3 Lesson 4 Smoking Cont II

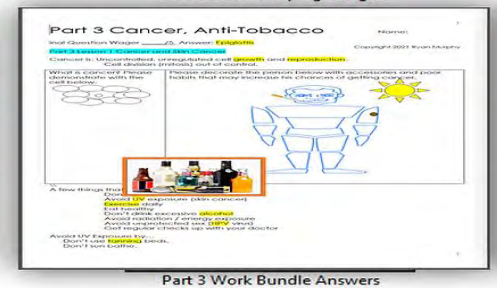
Part 3 Lesson 5 Smoking Cont III

Part 3 Lesson 6 Vaping Dangers

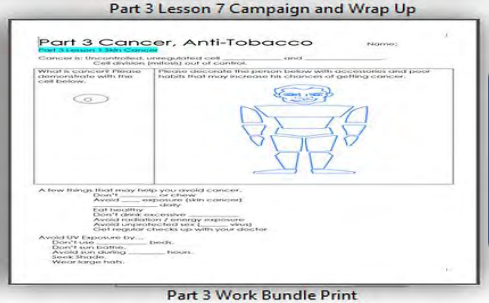
Part 3 Lesson 7 Campaign and Wrap Up

Part 3 Lesson 8 Review Game

Part 3 Lesson 9 Review Game Answers



Part 3 Work Bundle Answers



Part 3 Work Bundle Print

[Parts 2-4, Mitosis, Cancer, Meiosis]

Part 4 Meiosis, 4 Lessons of 50 minutes and 12 Page Follow Along Work Bundle, Somatic Cells vs. Gametes, Haploid vs Diploid, The Reproductive System, Ovum, Male Gamete, Step by Step Drawing of Male Gamete, Flagella, Male Gamete Motility, Step by Step Drawing of Ovum, Zygote, Fertilization, Phases of Meiosis, Two Cell Divisions, Synapsis, Homologous Recombination, Meiosis Puzzle Challenge, Independent Orientation, Reduction Division, Genes, Mendel's Law of Segregation, Important Events in Meiosis Review, Mendel's Laws of Heredity, Meiosis Simulation with Gummy Worms as Chromosomes Activity, Box Game Review, Connection of Meiosis to Genetics and Evolution, Crossword Puzzle, End Unit Assessment

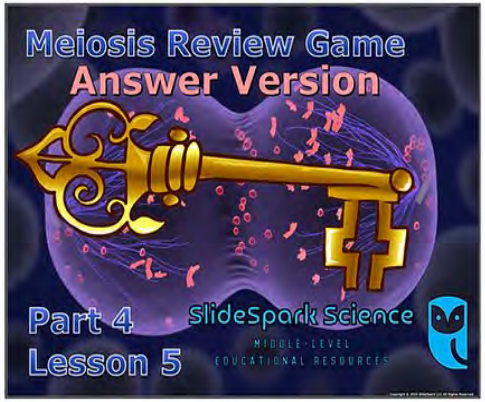
[Parts 2-4, Mitosis, Cancer, Meiosis]

Part 4 Lesson 1 Sex Cells

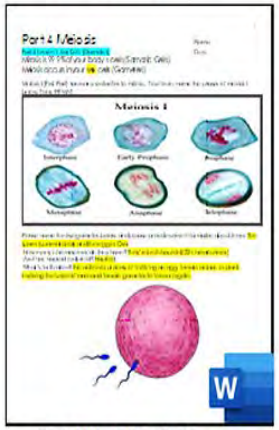
Part 4 Lesson 2 Meiosis

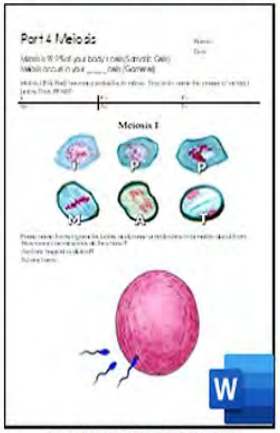
Part 4 Lesson 3 Meiosis Wrap Up

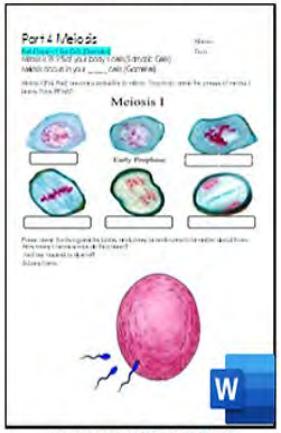
Part 4 Lesson 4 Meiosis Review Game



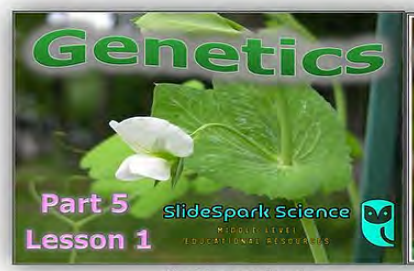
Part 4 Lesson 5 Answer Review Game


Part 4 Work Bundle Answers

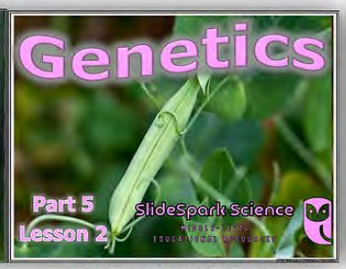

Part 4 Work Bundle Digital


Part 4 Work Bundle Print

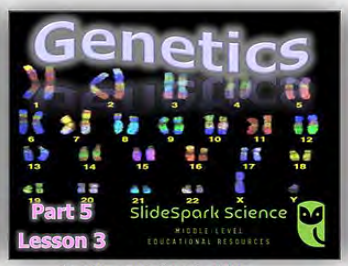
Part 5: Genetics: 12 Lesson of about 50 minutes and 16 Page Follow Along Work Bundle, Introduction to Genetics with the exploration of some common phenotypes, Tasting PTC Paper, Case Study Gregor Mendel, Selective Breeding, Descent with Modification, Survival of the Fittest, Heredity / Law of Segregation, Genetic Variation, Pure Breed Offspring, Mendel's Results with Pea Plants F1, F2, Generation, Phenotypes, Genotypes, Flow of Information DNA to RNA to Gene Expression, Fertilization, Asexual Reproduction, Genes and Alleles, Polygenic Traits, Dominant and Recessive Alleles, Vocabulary Review, Mendel's Laws of Heredity, Biologist Nettie Stevens Case Study, Punnett Squares, Monohybrid Crosses, How to complete a Punnett Square, Probability, Homozygous and Heterozygous, Built-in Quiz, Designing Your Child Coin Flip / Learning Terms Activity, More Practice with Punnett Squares, Dihybrid Crosses, Why Inbreeding can lead to mutations, Triple Crosses with Gecko Punnett Square, Complete Dominance, Incomplete Dominance, Codominance, Pedigree Chart, Autosomal Trait vs. Sex linked trait, Five Fingers of Evolution, Box Game Review, Crossword, End Unit Assessment



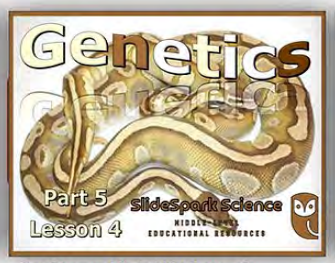
Part 5 Lesson 1 Genetics



Part 5 Lesson 2 Mendel and terms



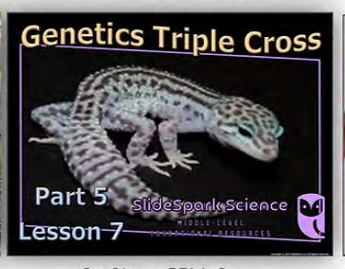
Part 5 Lesson 3 Genetics Alleles



Part 5 Lesson 4 Probability Punnett Sq

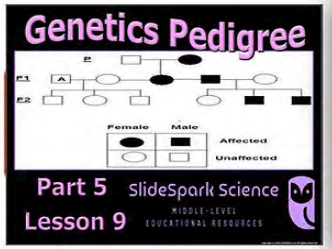
Part 5 Lesson 5 Punnett Sq cont.

Part 5 Lesson 6 Dihybrid Cross



Part 5 Lesson 7 Triple Cross

Part 5 Lesson 8 Codominance More



Part 5 Lesson 9 Pedigree

Part 5 Lesson 10 Wrap-Up

Part 5 Lesson 11 Review Game

Part 5 Lesson 12 Review Game Answers

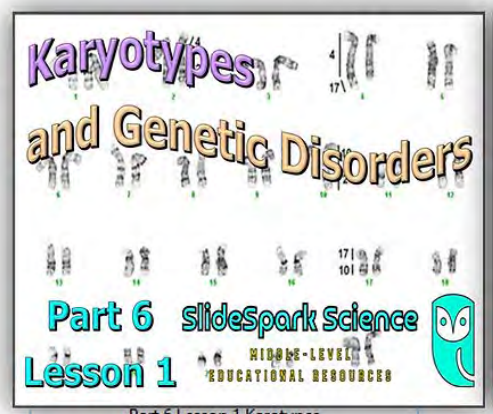

Part 5 Work Bundle Answers


Part 5 Work Bundle Print

Part 5: Genetics

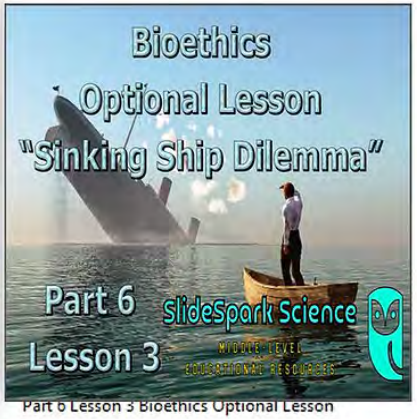
Part 6: DNA and Genetics Unit 6 Lessons of 50 minutes and 11 Page Follow Along Work Bundle, Karyotype, X and Y Chromosome, Human Karyotype vs Chimpanzee, Identifying Abnormalities in Karyotypes and their corresponding Disorder, Various Syndromes associated with Genetic Disorders, Sex Linked Disorders, Genetic Disorders with Descriptions, Virtual Lab Karyotype, Genetic Disorder Research Project, Students Partner up and complete research about a Genetic Disorder, Circle Discussion about Genetic Disorders, Bio-Ethics, Some Topics in the Biosciences, Sinking Ship Ethical Dilemma Activity, Genetic Engineering, GMO's, Difference b/t USDA Organics and Non-GMO Verified, Stem Cells, Types of Stem Cells, Embryonic Stem Cells and Stances, Cloning, Different Types of Cloning, Understanding the Differences, Applications of Cloning, Negatives of Cloning, Synthetic Life, Designer Babies, Box Game Review, Crossword Puzzle, Optional Movie with Worksheet Extension

Part 6: DNA and Genetics Unit

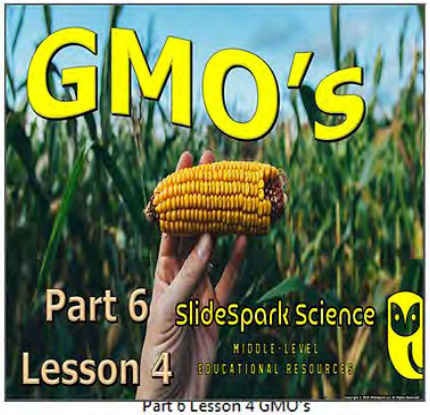


Part 6 Lesson 1 Karotypes

Part 6 Lesson 2 Genetic Disorder Research



Part 6 Lesson 3 Bioethics Optional Lesson

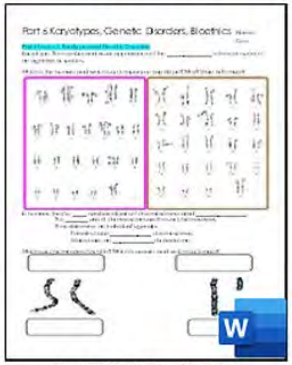


Part 6 Lesson 4 GMO's

Part 6 Lesson 5 Stem Cells

Part 6 Lesson 6 Cloning and Wrap Up


Part 6 Work Bundle Answers


Part 6 Work Bundle Print

Curriculum Guide

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

=Easier, 

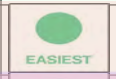
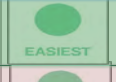
= More difficult, 

=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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MIDDLE-LEVEL

EDUCATIONAL RESOURCES

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