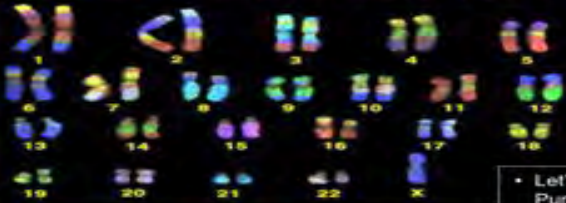


Genetics Bundle

Preview is a compressed file

- Humans have 23 pairs of chromosomes (46 total)

These are somatic cells



P1 generation

F1 generation

F2 generation

F3 generation

F4 generation

What if...?

Instead

All Black instead of All White

- Let's try one Punnett Square.



B b

B	BB	Bb
b	Bb	bb

Which is which?



	Bb	Bg	bG	bg
BG	BBGG	BBGg	BbGG	BbGg
Bg	BBGg	BBgg	BbGg	Bbgg
bG	BbGG	BbGg	bbGG	bbGg
bg	BbGg	Bbgg	bbGg	bbgg

B = Brown, Dominant
G = Green, dominant
b = blue, recessive

- 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

In **codominance**, both alleles in the genotype are seen in the phenotype. In **incomplete dominance**, a mixture of the alleles in the genotype is seen in the phenotype.



Incomplete Dominance

Codominance



Alleles

- This is the name for an organism's physical appearance or its visible traits.

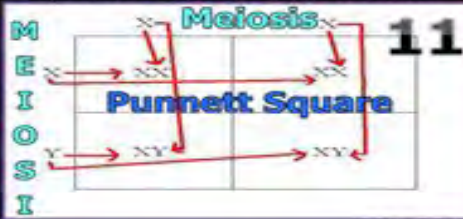


and the answer is...

12 Lessons

Interactive Slideshows

- This is the name for a diagram that is used to predict the outcome of a particular cross



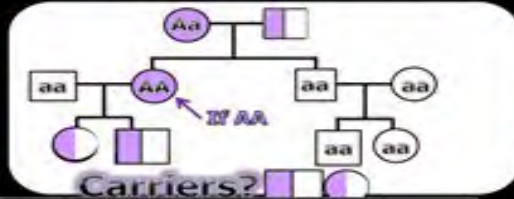
- Activity Sheet! Designing your child with dominant and recessive traits.



- Law of Segregation (Heredity), states that allele pairs separate or segregate during gamete formation, and randomly unite at fertilization.



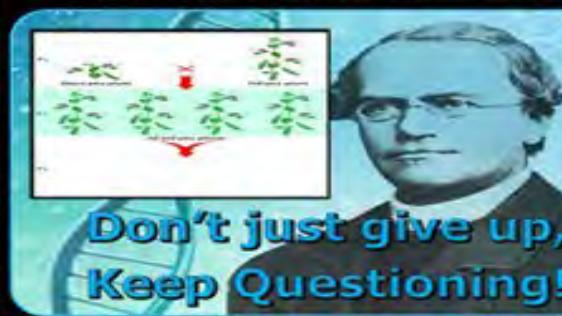
- The shaded circles and squares is a dominant allele. Shaded = Dominant
- What's probable genotypes of the missing boxes?



- This is the name for an organism's genetic makeup, or allele combinations



- He then decided to breed the tall F₁ Gen.



- Some of the variations that Mendel observed. (phenotypes)

Seed	Flower	Pod	Stem
Form	Cotyledon	Color	Form
Color	Color	Color	Place
Size	Size	Size	Size

- In the next F₂ generation, 1/4 of the pea plants were short, 3/4 were tall.



- Anyone up for a triple-het x triple-het cross?

triple-het x triple-het cross															
SsYyAa x SsYyAa															
SYA	SYa	SyA	Sya	sYA	sYa	syA	sya	YSYA	YSYy	YSyA	YSya	ySYA	ySYy	ySyA	ysYA
SYA	SYa	SyA	Sya	sYA	sYy	SyA	Sya	SYA	SYy	SyA	Sya	sYA	sYy	SyA	Sya
SYa	SYA	SYy	SYy	SYA	SYy	SYA	SYy	SYA	SYy	SYA	SYy	SYA	SYy	SYA	SYy
SyA	SYa	SYA	SYy	SyA	SYy	SyA	SYy	SyA	SYy	SyA	SYy	SyA	SYy	SyA	SYy
Sya	SyA	SyA	SYy	Sya	SYy	Sya	SYy	Sya	SYy	Sya	SYy	Sya	SYy	Sya	SYy
sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy
sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA
sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy
sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA	sYy	sYA
SYA	SYy	SyA	Sya	sYA	sYy	SyA	Sya	SYA	SYy	SyA	Sya	sYA	sYy	SyA	Sya
SYy	SYA	SYy	SYy	SYA	SYy	SYA	SYy	SYA	SYy	SYA	SYy	SYA	SYy	SYA	SYy
SyA	SyA	SYy	SyA	SyA	SYy	SyA	SYy	SyA	SYy	SyA	SYy	SyA	SYy	SyA	SYy
Sya	Sya	SyA	Sya	Sya	SyA	Sya	SyA	Sya	SyA	Sya	Sya	Sya	SyA	Sya	Sya
sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA
sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy
sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA	sYA
sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy	sYy

the Punnett Square, Bb and Bb

Black Dominant

White Recessive

B b

BB Bb

dominant heterozygous

Bb bb

heterozygous homozygous

Phenotypic ratio was 3:1,

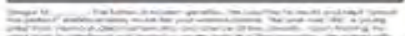
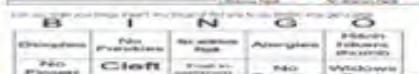
The Genotypic ratio was 1:2:1

probability of outcome is: Three black

gerbils and one white gerbil

F₂

Part 5 Go



Problem: *What is the probability that a child of a heterozygous carrier female and a heterozygous carrier male will be affected by sickle cell disease?*

Answer: 25%

Explanation: Sickle cell disease is an autosomal recessive trait. The probability of a child being affected is 25%.

Genotypes:

- Carrier female: Ss
- Carrier male: Ss

Punnett Square:

S	s
S	SS
s	Ss

Offspring: 25% SS (normal), 50% Ss (carrier), 25% ss (affected)

Genetics Worksheet

1. A Punnett square for a monohybrid cross of Gg x Gg is shown below. The Punnett square shows the possible genotypes of the offspring.

G	g
GG	Gg
Gg	gg

2. The possible phenotypes of the offspring are shown in the boxes to the right. The dominant phenotype is represented by a green box (A) and the recessive phenotype is represented by an orange box (a).

3. The possible genotypes of the offspring are shown in the boxes to the right. The dominant genotype is represented by a green box (A) and the recessive genotype is represented by an orange box (a).

[illegible]

Handwriting practice sheet for the letter 'w'. It includes a large 'w' with stroke order arrows and numbers 1, 2, 3, 4. Below it are three rows of boxes for tracing and writing. The first row has a 'w' in the first box. The second row has a 'w' in the first box. The third row has a 'w' in the first box. The fourth row has a 'w' in the first box. The fifth row has a 'w' in the first box. The sixth row has a 'w' in the first box. The seventh row has a 'w' in the first box. The eighth row has a 'w' in the first box. The ninth row has a 'w' in the first box. The tenth row has a 'w' in the first box. The eleventh row has a 'w' in the first box. The twelfth row has a 'w' in the first box. The thirteenth row has a 'w' in the first box. The fourteenth row has a 'w' in the first box. The fifteenth row has a 'w' in the first box. The sixteenth row has a 'w' in the first box. The seventeenth row has a 'w' in the first box. The eighteenth row has a 'w' in the first box. The nineteenth row has a 'w' in the first box. The twentieth row has a 'w' in the first box. The twenty-first row has a 'w' in the first box. The twenty-second row has a 'w' in the first box. The twenty-third row has a 'w' in the first box. The twenty-fourth row has a 'w' in the first box. The twenty-fifth row has a 'w' in the first box. The twenty-sixth row has a 'w' in the first box. The twenty-seventh row has a 'w' in the first box. The twenty-eighth row has a 'w' in the first box. The twenty-ninth row has a 'w' in the first box. The thirtieth row has a 'w' in the first box. The thirty-first row has a 'w' in the first box. The thirty-second row has a 'w' in the first box. The thirty-third row has a 'w' in the first box. The thirty-fourth row has a 'w' in the first box. The thirty-fifth row has a 'w' in the first box. The thirty-sixth row has a 'w' in the first box. The thirty-seventh row has a 'w' in the first box. The thirty-eighth row has a 'w' in the first box. The thirty-ninth row has a 'w' in the first box. The fortieth row has a 'w' in the first box. The forty-first row has a 'w' in the first box. The forty-second row has a 'w' in the first box. The forty-third row has a 'w' in the first box. The forty-fourth row has a 'w' in the first box. The forty-fifth row has a 'w' in the first box. The forty-sixth row has a 'w' in the first box. The forty-seventh row has a 'w' in the first box. The forty-eighth row has a 'w' in the first box. The forty-ninth row has a 'w' in the first box. The fiftieth row has a 'w' in the first box. The fifty-first row has a 'w' in the first box. The fifty-second row has a 'w' in the first box. The fifty-third row has a 'w' in the first box. The fifty-fourth row has a 'w' in the first box. The fifty-fifth row has a 'w' in the first box. The fifty-sixth row has a 'w' in the first box. The fifty-seventh row has a 'w' in the first box. The fifty-eighth row has a 'w' in the first box. The fifty-ninth row has a 'w' in the first box. The sixtieth row has a 'w' in the first box. The sixty-first row has a 'w' in the first box. The sixty-second row has a 'w' in the first box. The sixty-third row has a 'w' in the first box. The sixty-fourth row has a 'w' in the first box. The sixty-fifth row has a 'w' in the first box. The sixty-sixth row has a 'w' in the first box. The sixty-seventh row has a 'w' in the first box. The sixty-eighth row has a 'w' in the first box. The sixty-ninth row has a 'w' in the first box. The seventieth row has a 'w' in the first box. The seventy-first row has a 'w' in the first box. The seventy-second row has a 'w' in the first box. The seventy-third row has a 'w' in the first box. The seventy-fourth row has a 'w' in the first box. The seventy-fifth row has a 'w' in the first box. The seventy-sixth row has a 'w' in the first box. The seventy-seventh row has a 'w' in the first box. The seventy-eighth row has a 'w' in the first box. The seventy-ninth row has a 'w' in the first box. The eightieth row has a 'w' in the first box. The eighty-first row has a 'w' in the first box. The eighty-second row has a 'w' in the first box. The eighty-third row has a 'w' in the first box. The eighty-fourth row has a 'w' in the first box. The eighty-fifth row has a 'w' in the first box. The eighty-sixth row has a 'w' in the first box. The eighty-seventh row has a 'w' in the first box. The eighty-eighth row has a 'w' in the first box. The eighty-ninth row has a 'w' in the first box. The ninetieth row has a 'w' in the first box. The ninety-first row has a 'w' in the first box. The ninety-second row has a 'w' in the first box. The ninety-third row has a 'w' in the first box. The ninety-fourth row has a 'w' in the first box. The ninety-fifth row has a 'w' in the first box. The ninety-sixth row has a 'w' in the first box. The ninety-seventh row has a 'w' in the first box. The ninety-eighth row has a 'w' in the first box. The ninety-ninth row has a 'w' in the first box. The hundredth row has a 'w' in the first box.

1. Write the genotype of each parent on the left side of the Punnett square.
 2. Write the genotype of each parent on the top of the Punnett square.
 3. Fill in the Punnett square with the possible genotypes of the offspring.
 4. Determine the probability of each genotype of the offspring.

Example: A heterozygous dominant parent (Bb) is crossed with a heterozygous dominant parent (Bb).

	B	b
B	BB	Bb
b	Bb	bb

The possible genotypes of the offspring are BB, Bb, Bb, and bb. The probability of each genotype is 1/4 for BB, 2/4 for Bb, and 1/4 for bb.

BS BS BS BS BS
 BS BS BS BS BS
 BS BS BS BS BS

Introduction of the 2D-DE image analysis software

1. Acquisition of the 2D-DE image
 2. Image enhancement
 3. Spot detection
 4. Spot identification
 5. Spot quantification
 6. Spot comparison
 7. Spot classification
 8. Spot visualization
 9. Spot export
 10. Spot import

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10. Spot import

11. Spot analysis

12. Spot visualization

13. Spot export

14. Spot import

15. Spot analysis

16. Spot visualization

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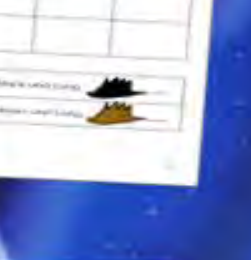
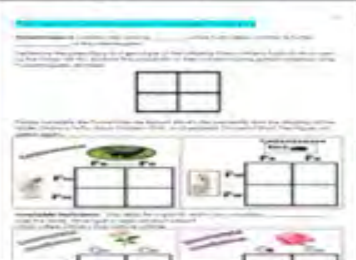
334. Spot import

335. Spot analysis

336. Spot visualization

337. Spot export

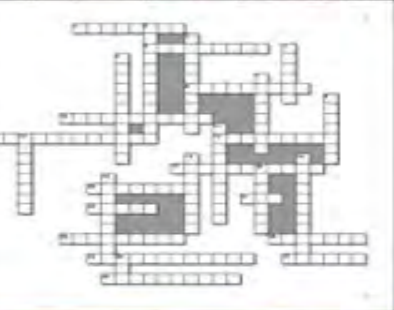
338. Spot import



The image is a composite. At the top left is a pedigree chart showing three generations of a family. The first generation consists of an unaffected male (square) and an affected female (shaded circle). They have four children: an affected male, an unaffected female, an affected male, and an unaffected female. The second generation shows the offspring of the first generation's children. The first couple (affected male and unaffected female) has two children: an affected male and an unaffected female. The second couple (unaffected male and affected female) has two children: an affected male and an unaffected female. The third generation shows the offspring of the second generation's children. The first couple (affected male and unaffected female) has two children: an affected male and an unaffected female. The second couple (unaffected male and affected female) has two children: an affected male and an unaffected female. The third couple (affected male and unaffected female) has two children: an affected male and an unaffected female. The fourth couple (unaffected male and affected female) has two children: an affected male and an unaffected female.

At the top right is a Punnett square. The columns are labeled 'X' and 'Y'. The rows are labeled 'X' and 'Y'. The cells contain the following genotypes: 'XX' (top-left), 'XY' (top-right), 'XY' (bottom-left), and 'YY' (bottom-right). To the right of the Punnett square is a legend: 'XX' (female), 'XY' (male), 'YY' (male), and 'YY' (male).

At the bottom is a large purple watermark that reads '20 Pa'.

[illegible][illegible]

20 Pages

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

• Review!

- In complete dominance, the effect of one allele in a heterozygous genotype completely masks the effect of the other. The allele that masks the other is said to be dominant to the latter, and the allele that is masked is said to be recessive to the former.



- Heterozygous:** Has two different alleles Tt, One capital, and one lower case.

Which are heterozygous?

	N	a
N	NN	Na
a	Na	aa

- Most traits are polygenic, controlled by two or more genes with six alleles.
- Height, eye color, skin color are all controlled by multiple alleles.

Phenotypes	Genotypes	Units of pigment
Extremely dark	AAABBBCC	6
Very dark	AABBCC	5
Dark	AABBCc	4
Intermediate	AABBCc	3
Extremely light	aabbbc	0

If you were dominant for all three alleles for skin color then you might have darker skin etc...

- The year was 1851, a young priest from Vienna studied mathematics and science at the university.

— Upon finishing, he went back to priesthood and tended a garden outside of the monastery.



Learn more about Mendel at <http://www.ple/gregor392827pe>

Heterozygous X Heterozygous

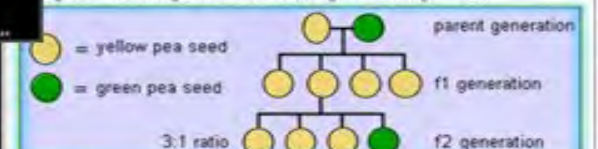
	Pp	Pp	pP	pp
Pp	PPSS	PPSs	PpSS	PpSs
Pp	PPSs	PPss	PpSs	Ppss
pP	PpSS	PpSs	ppSS	ppSs
pp	PpSs	Ppss	ppSs	ppss

Phenotype: Purple Smooth, Purple Wrinkled, White Smooth, White Wrinkled

Ratio: 9 : 3 : 3 : 1



He was about Gregor Mendel and his reputation as a priest and his genetics work. What is so significant when comparing the F1 and F2 generation?

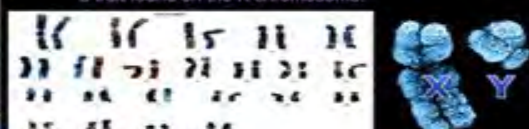


Mendel did experiments with various characteristics or phenotypes. In each case, one value of the characteristic disappeared in the F1 plants and then showed up again in the F2 plants. 75% percent of F2 plants had one value of the characteristic and 25% percent had the other value. Based on these observations, Mendel formulated his first law of inheritance. This law is called the law of segregation. It states that there are two factors controlling a given characteristic, one of which is dominant, and the other which is recessive. The factors separate and go to a different gamete when a parent reproduces.

- Codominance** is a relationship between alleles where both alleles contribute to the phenotype of the heterozygote.



- Autosomal trait vs. sex linked trait.**
 - Traits carried on chromosomes 1-22 are autosomal traits.
 - Traits carried on the X and Y chromosomes are sex linked traits.
 - Not all traits on the X and Y chromosome are to do with sexual characteristics. Ex -color blindness is a trait found on the X chromosome.



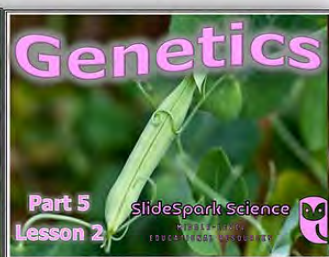
- He can study different characteristics or traits.



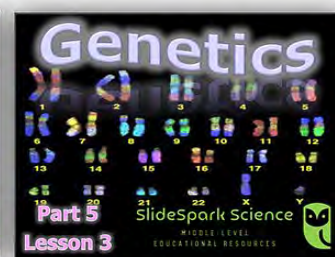
Part 5: Genetics: 12 Lesson of about 50 minutes and 16 Page Follow Along Work Bundle, Introduction to Genetics with the exploration of some common phenotypes, Tasting PTC Paper, Case Study Gregor Mendel, Selective Breeding, Descent with Modification, Survival of the Fittest, Heredity / Law of Segregation, 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



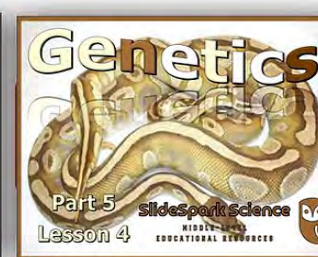
Part 5 Lesson 1 Genetics



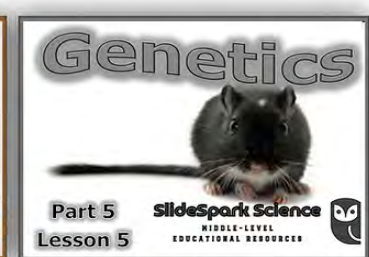
Part 5 Lesson 2 Mendel and terms



Part 5 Lesson 3 Genetics Alleles



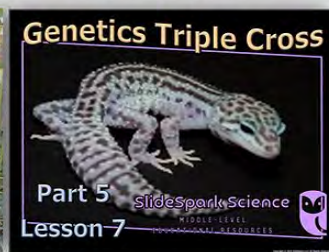
Part 5 Lesson 4 Probability Punnett Sq



Part 5 Lesson 5 Punnett Sq cont.



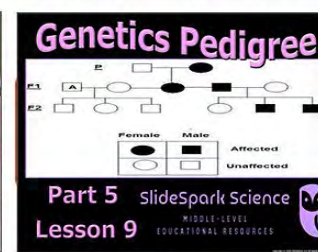
Part 5 Lesson 6 Dihybrid Cross



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**

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.



• Let's try one Punnett Square.

Phenotypic Ratio **3:1**
Genotypic Ratio **1:2:1**

- Some of the various traits in pea plants that Mendel observed. (phenotypes)

Seed		Flower	Pod		Stem	
Form	Cotyledon	Color	Form	Color	Place	Size
Round	Yellow	White	Full	Green	Axial pods	Tall
Wrinkled	Green	Purple	Wrinkled	Yellow	Terminal pods	Short

• **Review!**

- In complete dominance, the effect of one allele in a heterozygous genotype completely masks the effect of the other. **The allele that masks the other is said to be dominant to the latter**, and the allele that is masked is said to be recessive to the former.



- He worked with pea plants and became curious as to why some pea plants had different characteristics or **traits**.



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Please record some information about the person below.



Gregor _____ the father of modern genetics. He counted his results and kept "almost too perfect" statistical notes, much like your science journal. The year was 1854, a young priest from Vienna studied mathematics and science at the university. Upon finishing, he went back to priesthood and tended a garden outside of the monastery. He worked with pea plants and became curious as to why some pea plants had different characteristics or _____.

_____ Breeding: the intentional breeding of organisms with desirable traits to produce offspring with similar desirable characteristics or with improved traits.

Descent with _____: the passing on of traits from parent organisms to their offspring.

Offspring will display small _____ found that nature is just like selective breeding but is done automatically.

_____ The _____ decides who lives and dies.

_____ Mendel seemed to notice that pea plants tended to pass traits from parents to offspring, which is called _____.

Guided Notes: Help students record important information in a fun and easy-to-understand way. Designed blue-colored text 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.

Male (B**G**bg) is crossed with female (B**G**bg)

Gametes (male & female)	BG	Bg	bG	bg
BG				
Bg				
bG				
bg				

B=Brown, Dominant G= Green, b=blue recessive

Male (B**G**bg) is crossed with female (B**G**bg)

	BG	Bg	bG	bg
BG	BBGG	BBGg	BbGG	BbGg
Bg	BBGg	BBgg	BbGg	Bbgg
bG	BbGG	BbGg	bbGG	bbGg
bg	BbGg	Bbgg	bbGg	bbgg

B=Brown, Dominant G= Green, b=blue recessive

12 : 3 : 1

What would happen if we went back to the pet store and got two homozygous dominant black gerbils over four generations? What would the color be? Explain.

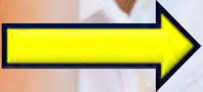
HW: 3 lessons about 2 traits cross

Dihybrid Cross: A cross that involves _____ traits of characteristics. Please complete the dihybrid cross below and record the probability of the outcomes at the bottom. The husband is BbGg and the wife is the same BbGg. (BbGg x BbGg). Use a.

Gametes
Female (→ Male)

	BG	Bg	bG	bg
BG				
Bg				
bG				
bg				

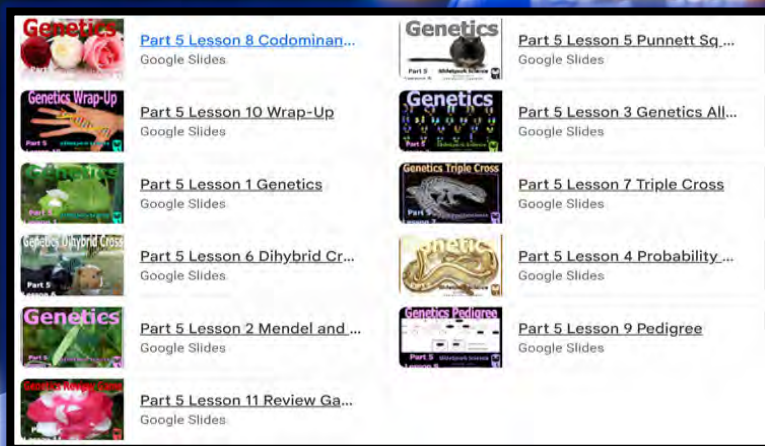
What's the probability that the offspring will have:
 Brown Eyes Green Eyes Blue Eyes


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 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.



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.

Genetics Review Game

Part 5 Slidespark Science
Lesson 11 MIDDLE-LEVEL EDUCATIONAL RESOURCES



PART 5 GENETICS REVIEW GAME

1:00 = 5 pts. Lesson 11 Review Game
1:00-1:25 = Bonus = 1 pt.
(Solelyly write out in correct space +1 pt)
Final Question = 5 pt wager

MENUBLE	TIPO	MEDICORD	THINK INSIDE THE BOX	FAM
1)	6)	11)	16)	21)
2)	7)	12)	17)	22)
3)	8)	13)	18)	23)
4)	9)	14)	19)	24)
5)	10)	15)	20)	25)

Final Question / 5 Point Wager = ____ / 5

Genetics Review GAME

1:00 = 5 pts. Lesson 11 Review Game
1:00-1:25 = Bonus = 1 pt.
(Solelyly write out in correct space +1 pt)
Final Question = 5 pt wager

MENUBLE	TIPO	MEDICORD	THINK INSIDE THE BOX	FAM
1) Gregor Mendel	Genotype	Runnett Square	3:1 Tall to Short	Guern, Martin and Charlie
2) Letter D Heredity	DNA-GENA-2 Protein	XY = Male	2:2 Tall to Short	Minnesota Twins
3) Letter B Pure bred (Cross tall)	Genes	Probability	C and R are Brown with Red Eyes B's Black with Red Eyes B's Black with Brown Eyes	Williams Sisters Serena and Venus
4) 3:1 Ratio 3 Tall, 1 Short	Letter B Dominant allele	Letter I Homozygous Dominant and Heterozygous	Codominance	Silly Bob and Miley Cyrus
5) Phenotype	Recessive allele	Sexes reproduction	Letter C Incomplete Dominance	JK and Ted Kennedy

Final Question Wager = ____ / 5

Genetics Quiz Game

When two purebreds mate, they always produce...

- A.) Offspring with different traits as the parents
- B.) Offspring with the same traits as the parents
- C.) Offspring without any traits
- D.) Purebreds cannot produce offspring

3

and the answer is...

What were Mendel's results in the F2 Generation?

- In the next F2 generation, 1/4 of the pea plants were short, 3/4 were tall.

4

3 Tall : 1 Short

- This is the name for an organism's physical appearance or its visible traits.

phenotype

5

and the answer is...

- This is the term for when organisms pass traits from parents to offspring.
- A.) Genetics
 - B.) Punnett Squares
 - C.) Alleles
 - D.) Heredity
 - E.) Homozygous
- 2**

and the answer is...

This Monk is known as the father of modern genetics for his work with pea plants.

1

Gregor Mendel

and the answer is...

- This is the name for an organism's genetic makeup, or allele combinations

6 **Genotype**

GAAAAA
GGAAG
GHAHH ? codes for...

Phenotype

This is the name for an organism's physical appearance or its visible traits.

Answer is...



- This type of allele always shows up in the organism when the allele is present.

- A.) Recessive
- B.) Dominant**
- C.) Heterozygous
- D.) Incomplete
- E.) Mendellion Allele

Answer is...

9

	A	a
A	AA	Aa
a	Aa	aa

- This type of allele is covered up when the dominant allele is with it?

Recessive Allele

and the answer is...

10

	A	a
A	AA	Aa
a	Aa	aa

- Geneticists call the factors that control traits **genes**.

8



Flow of Information

7

DNA

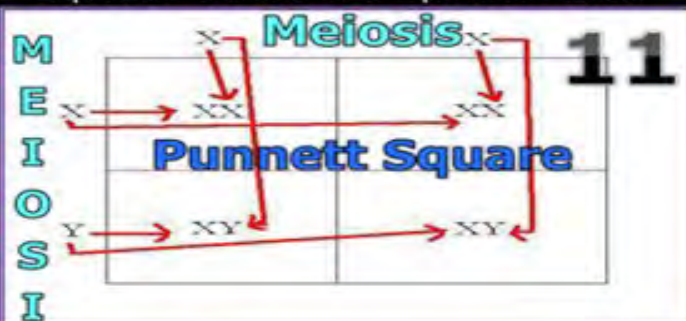
transcription

translation



20 Questions

- This is the name for a diagram that is used to predict the outcome of a particular cross



- Which gender decides the child's gender?
- Use the Punnett Square below to help you.
XX=Female XY=Male



- The letters below represent...
- A.) Both are Heterozygous Dominant
- B.) Homozygous recessive and Homozygous Dominant
- C.) Heterozygous and Heterozygous
- D.) Both are Heterozygous Recessive
- E.) Homozygous Dominant and Heterozygous

ZZHh

Answer is...

- Genetics deals heavily with **probability**, or the likelihood that a particular event will occur.



Flip Coin

- From all of Mendel's results, he reasoned that individual factors must control the inheritance of traits in peas.
- Mendel knew that the female contributes one factor, while the male contributes the other factor in **sexual** reproduction.



- Please complete the Punnett Square, 16
- Tt and Tt
 - T = Tall
 - tt = Short

	T	t
T	TT Tall	Tt Tall
t	Tt Tall	tt Short

Both parents are heterozygous

- Please complete the Punnett Square, 17
- Tt and tt
 - T = Tall
 - tt = Short

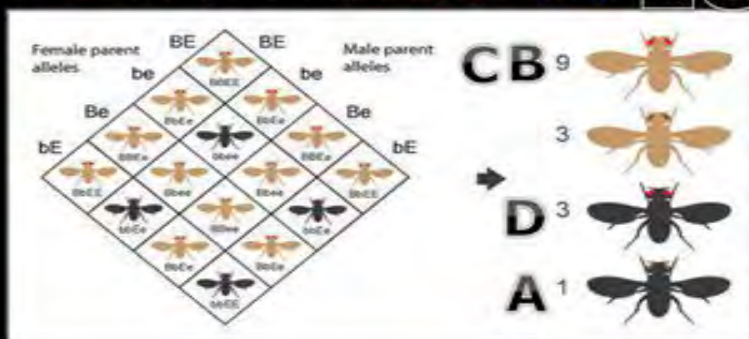
	T	t
Tt	Tt Tall	tt Short
tt	Tt Tall	tt Short

One parent heterozygous and one homozygous recessive.

- How many will be tall, and how many will be short 2 : 2

- What color body and eye type will the fly be for A, B, C, and D?

- B=Brown, b=black, E=Red, e=brown



- This is an example of...
 - A.) Homozygous Dominant
 - B.) Heterozygous Dominant
 - C.) Incomplete Dominance
 - D.) Recessive Alleles
 - E.) Pure Breeding



answer is...

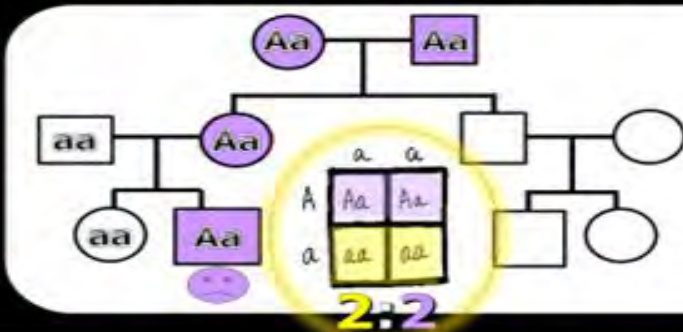
20

- Codominance is a relationship among alleles where both alleles contribute to the phenotype of the heterozygote.



19

- The shaded circles and squares is a dominant allele. Shaded = Dominant
 - What's the probable genotypes of the two below?



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.

• Activity Sheet! Designing your child with dominant and recessive traits.

Designing your Child



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Designing your Child Part 5 Lesson 4 Project

Please partner up with a member of the opposite sex. If numbers don't work then the remaining students can work solo. Determine the genotype by flipping a coin and looking at the letters on the left (Ex. H or h). Male coin and female flip coin. Record a capital letter if you flip a head, or lower case letter if you flip a tail. Genotype will determine the phenotype.

Heads = Dominant (Capital Letter)
Tails = Recessive (Lower Case Letter)

Genotype	Phenotype
HH	Widow Peak
Hh	Widow Peak
hh	No Widow Peak
EE	Large eyes
Ee	Large eyes
ee	Small eyes
BB	Brown eyes
Bb	Brown eyes
bb	Blue eyes
DD	Dimples
Dd	Dimples
dd	No dimples
TT	Tongue rollers
Tt	Tongue rollers
tt	Not tongue rollers



Name goes here

Draw all

Www
homozygous
dominant
"unibrow"



Name goes here

Designing your Child Part 5 Lesson 4 Project

Please partner up with a member of the opposite sex. If numbers don't work then the remaining students can work solo. Determine the genotype by flipping a coin and looking at the letters on the left (Ex. H or h). Male coin and female flip coin. Record a capital letter if you flip a head, or lower case letter if you flip a tail. Genotype will determine the phenotype.

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ee	Small eyes
BB	Brown eyes
Bb	Brown eyes
bb	Blue eyes
DD	Dimples
Dd	Dimples
dd	No dimples
TT	Tongue rollers
Tt	Tongue rollers
tt	Not tongue rollers

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 Wiz 1-10 Answers will follow each questions.
- Word Bank: Homozygous Dominant (HH), Homozygous recessive (hh), heterozygous (Hh)

XxYY 9

XxYY 9
Heterozygous and

XxYY 9
Heterozygous and
Homozygous Dominant

g

G	GG	Gg
g	Gg	gg

A **a**

A	Aa	aa
a		
A	Aa	aa
a		

Build It! Quiz: Word Sorts-Homogeneous recessive, Homozygous dominant, heterozygous

1)	2)	3)	4)
5)	6)	7)	8)
9)	10)	*11)	

Genotype for Child **BBB.B session & Project**

Partner up with a member of the opposite sex. If numbers don't work, then having students can work solo. Determine the genotype by flipping a coin and looking at the results on the left (B is a H, b is a h). Male flips coin and female flips coin. Record a capital letter if you flip a head, or lower-case letter if you flip a tail. Genotype will determine the phenotype.

Heads = Dominant (Capital Letter)
Tails = Recessive (Lower Case Letter)

Trait	Male B b	Female B b	Genotype	Phenotype	Phenotype	Phenotype
Hair (B or b)			BB - Lots of hair	BB - Average hair	bb - Bald	
Widows Peak (B or b)			BB - Widows Peak	BB - Widows Peak	bb - No Widows Peak	
Ears (B or b)			BB - Big Ears	BB - Average Ears	bb - Small Ears	
Earlobes (B or b)			BB - Unattached	BB - Unattached	bb - Attached	
Hairy Knobs (B or b)			BB - No Knobs	BB - No Knobs	bb - Hairy Knobs	
Head (B or b)			BB - Wide Head	BB - Average Head	bb - Small Head	

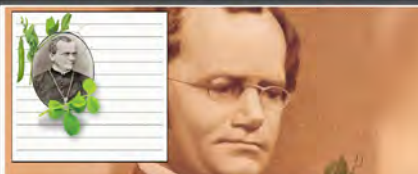
Quiz in Work Bundle

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.

- Quick Bio on Gregor Mendel

- <https://www.youtube.com/watch?v=QmSJGI>



- X and Y Song.

- <https://www.youtube.com/watch?v=NU3hoJDqX70>



- Heredity / Genetics 101

- <https://www.youtube.com/watch?v=v8UJGicp8>



- Really interesting NPR (Radio Lab) Science Friday. (Optional) **Adult Content**

- Genghis Khan, the Y chromosome and his 16 million descendants.

- <https://radiolab.org/episodes/91519-genghis-khan>



- Complete Dominance, Incomplete Dominance, and Codominance.

- <https://www.youtube.com/watch?v=FXc5F9AMAiQ>

A Punnett square diagram showing the inheritance of eye color. The top row shows the genotypes C¹C¹, C¹C², and C¹C³. The left column shows the genotypes C¹C¹, C¹C², and C¹C³. The cells contain cartoon characters with different eye colors: blue, yellow, and green.

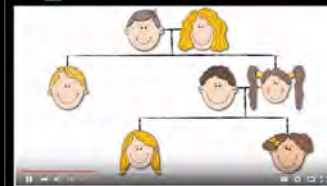
- Punnett Squares Virtual Lab (Optional)

- http://www.mhhe.com/biosci/genbio/virtual_lab/BL_05/BL_05.html



- Video Review! Pedigree Charts (Optional)

- <https://www.youtube.com/watch?v=Wuk0W10EvqU>



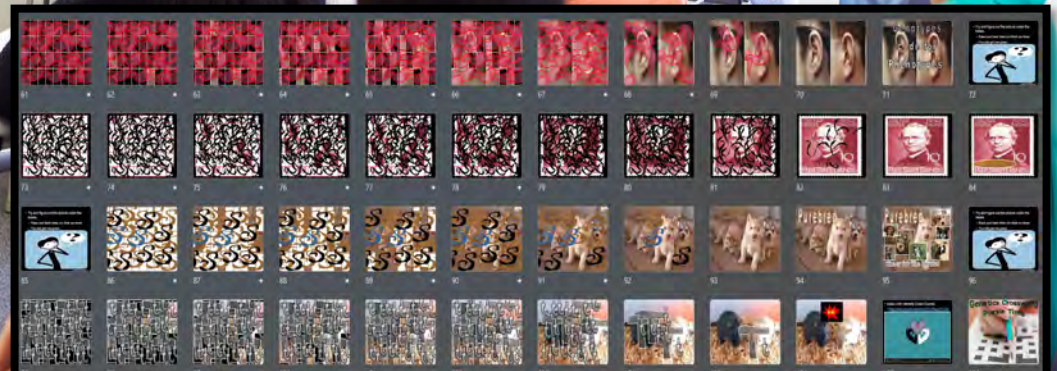
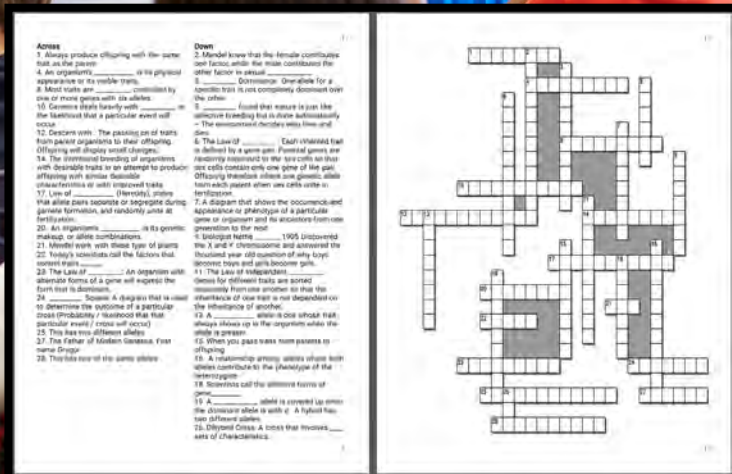
- Optional Video (Start at 6:30) Breeding Gecko's

- <https://www.youtube.com/watch?v=D8nTS2S5Evw&t=787s>



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.



- **Selective Breeding:** The intentional breeding of organisms with desirable traits in an attempt to produce offspring with similar desirable characteristics or with improved traits.



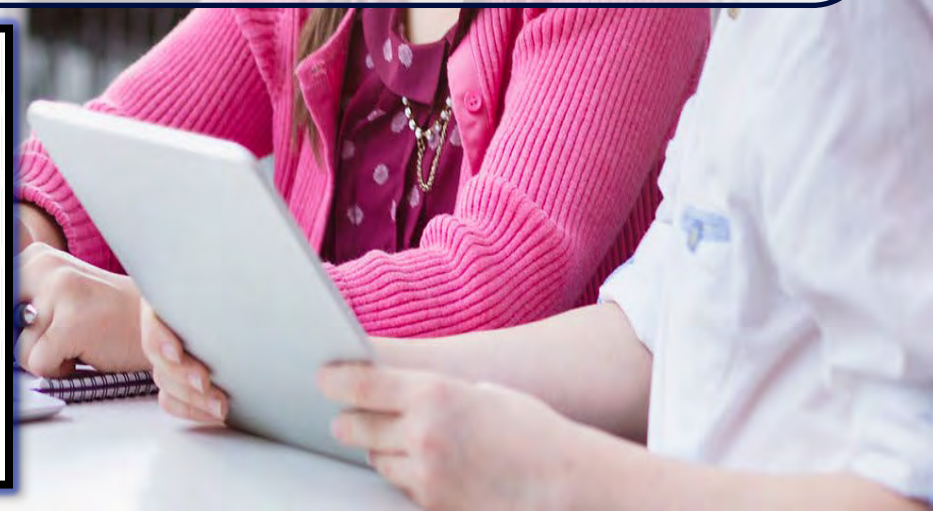
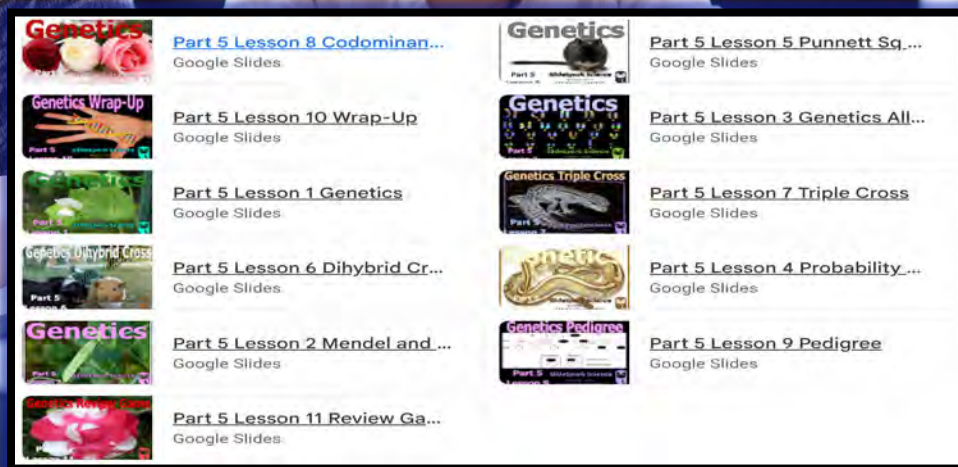
- **Selective Breeding:** The intentional breeding of organisms with desirable traits in an attempt to produce offspring with similar desirable characteristics or with improved traits.



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.

P1 generation 

F1 generation 

What if...?

F2 generation 

F3 generation 

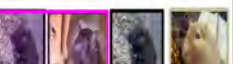
F4 generation 

P1 generation 

F1 generation 

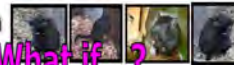
What if...?

F2 generation 

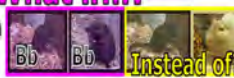
F3 generation 

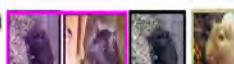
F4 generation 

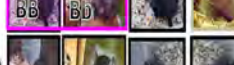
P1 generation 

F1 generation 

What if...?

F2 generation 

F3 generation 

F4 generation 

All Black instead of All White

Parents complete the Punnett Squares below.

Punnett Square 1:

	B	b
B	BB	Bb
b	Bb	bb

Punnett Square 2:

	W	V
W	WW	WV
V	VW	VV

The F1 Generation (Two black genets)

	B	b
B	BB	Bb
b	Bb	bb

The F2 Generation (from four genets)

	B	b
B	BB	Bb
b	Bb	bb

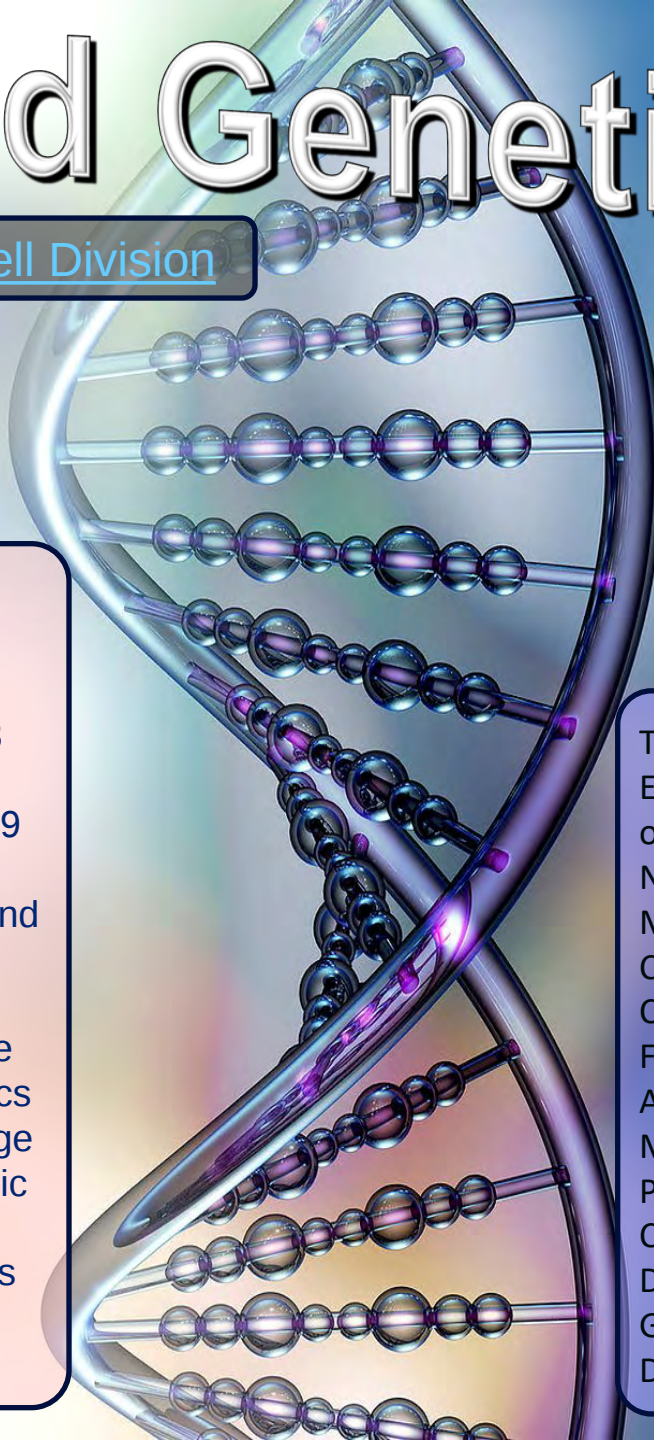
The F3 Generation (One heterozygous black genet and one homozygous recessive white genet)

	b	b
B	Bb	Bb
b	bb	bb

The F4 Generation (Two homozygous recessive white genets)

	b	b
b	bb	bb
b	bb	bb

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, Buerger'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

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

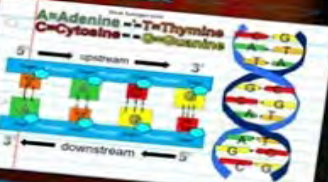


Watson and Crick were able to figure out that one strand went up and the other went down.

Watson and Crick also found that if they paired Thymine with Adenine and Cytosine with Guanine.

DNA works like a ladder.

Phosphate backbone



Enzymes are essential for DNA replication



Label your paper with genetics your genetic code



40 Lessons

Interactive Slideshows

Activity! Simulating Mitosis with beads.

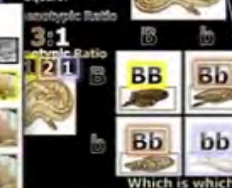
- Gummy Worms will work as well, while board markers.
- Follow video. Teacher will pause and check your work.
- <https://www.youtube.com/watch?v=xGVBH1U1HMA&list=PLy0u0u0u0>



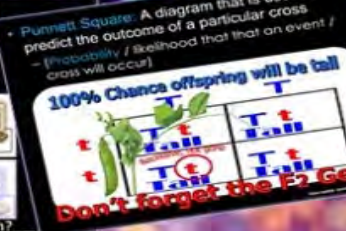
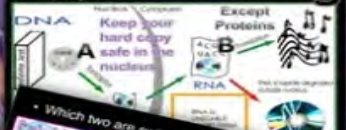
- Decide if the picture / information is a learned behavior or inherited trait. 1-10



Let's try one Punnett Square.



- DNA has the information for our cells to make proteins. Name A and B?



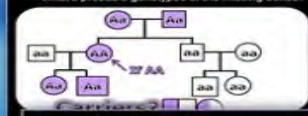
With Follow Along Work Bundles



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 the probable genotypes of the missing boxes?

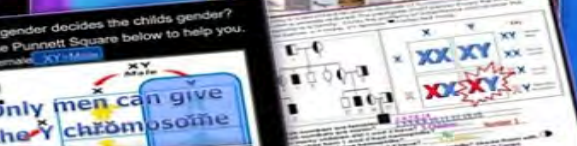


- This is the name for an organism's genetic makeup, or allele combinations.



Male (Bb) is crossed with female (Bb)	BG	Bg
BG	BBGG	BBGg
Bg	BBGg	BbGg
bG	BbGg	Bbgg
bg	Bbgg	bbgg

- Anyone up for a triple-het x triple-het cross?

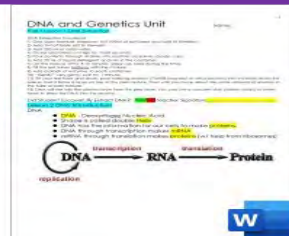


Part 1: DNA 9 Lessons of 50 minutes and 13 Page Follow Along Work Bundle, Introduction to DNA, DNA Extraction Lab with Split Peas, DNA structure and Role, Double Helix, Flow of Information, DNA to RNA to Proteins, Transcription, Translation, Friedrich Miescher Isolation of DNA, DNA's Discovery Case Study 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.

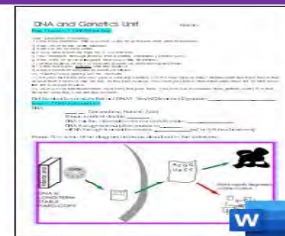
Part 1: DNA



Additional and Printables



Part 1 DNA Work Bundle Answers



Part 1 DNA Work Bundle Print



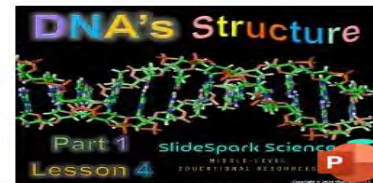
Part 1 Lesson 1 DNA Extraction Lab



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



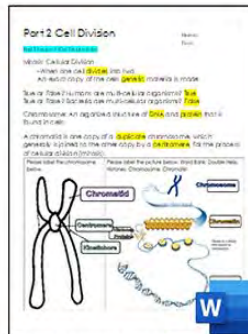
Part 1 Lesson 9 Review Game Answers

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



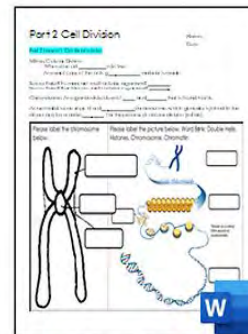
Additional and Printables



Part 2 Answers Work Bundle Print



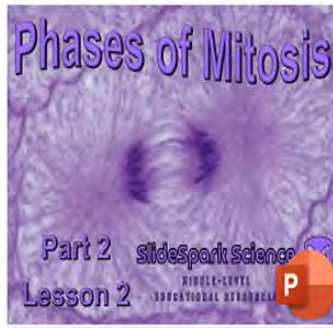
Part 2 Cell Division Work Bundle Digital



Part 2 Cell Division Work Bundle Print



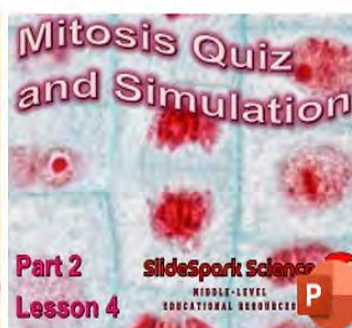
Part 2 Lesson 1 Cell Division Intro



Part 2 Lesson 2 Phases Mitosis



Part 2 Lesson 3 Mitosis Review



Part 2 Lesson 4 Simulation and Quiz



Part 2 Lesson 5 Review Game

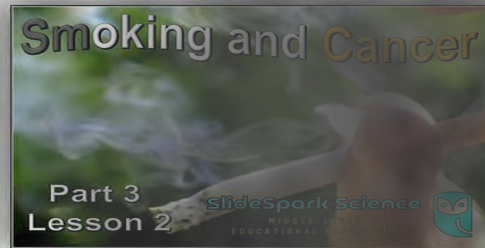


Part 2 Lesson 6 Answers Review Game

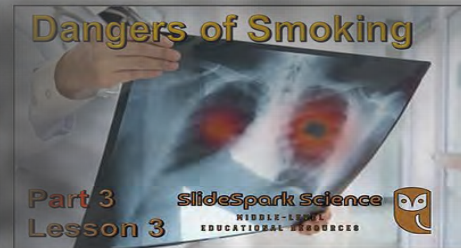
Part 3: Cancer, 8 Lessons of 50 Minutes and 9 Page Follow Along Work Bundle, What is Cancer?, Lifestyle Choices to help aid in the prevention of Cancer, Skin Cancer, Dangers of Skin Cancer, Ways to avoid UV Exposure, Dangers of Tanning, Abcede's of Understanding Skin Moles and Cancer, Dangers of Smoking, 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



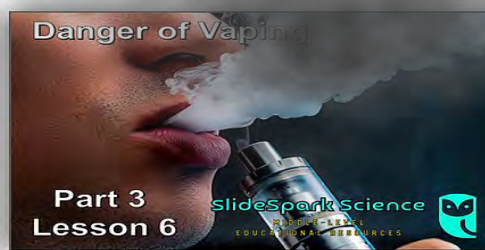
Part 3 Lesson 3 Smoking Cont I



Part 3 Lesson 4 Smoking Cont II



Part 3 Lesson 5 Smoking Cont III



Part 3 Lesson 6 Vaping Dangers



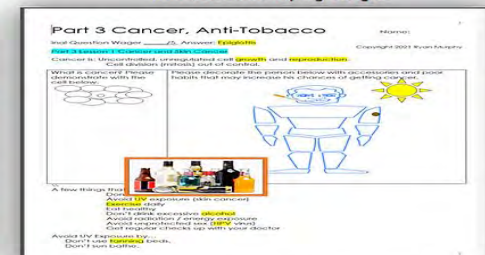
Part 3 Lesson 7 Campaign and Wrap Up



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



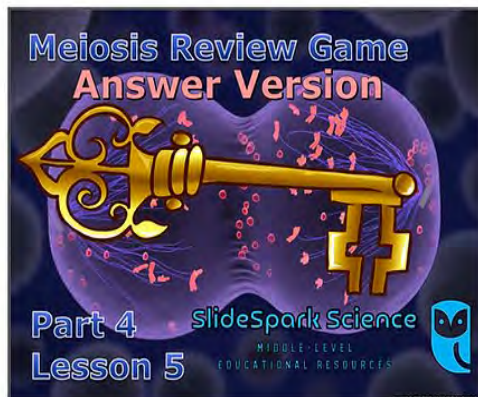
Part 4 Lesson 2 Meiosis



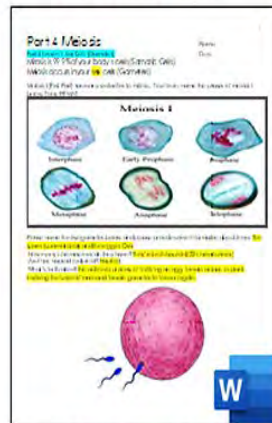
Part 4 Lesson 3 Meiosis Wrap Up



Part 4 Lesson 4 Meiosis Review Game



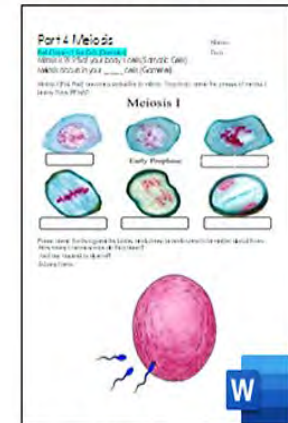
Part 4 Lesson 5 Answer Review Game



Part 4 Work Bundle Answers



Part 4 Work Bundle Digital

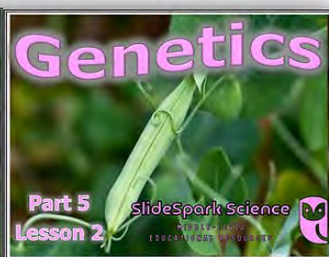


Part 4 Work Bundle Print

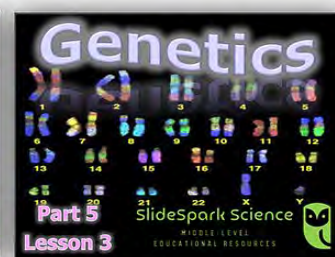
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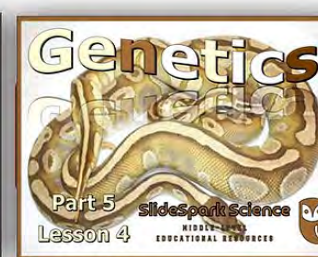
Part 5 Lesson 1 Genetics



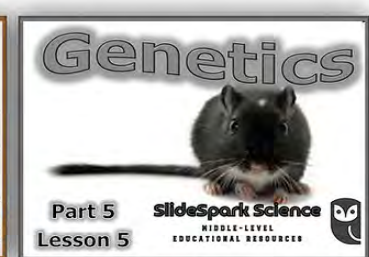
Part 5 Lesson 2 Mendel and terms



Part 5 Lesson 3 Genetics Alleles



Part 5 Lesson 4 Probability Punnett Sq



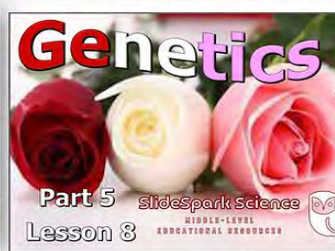
Part 5 Lesson 5 Punnett Sq cont.



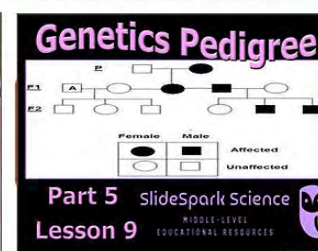
Part 5 Lesson 6 Dihybrid Cross



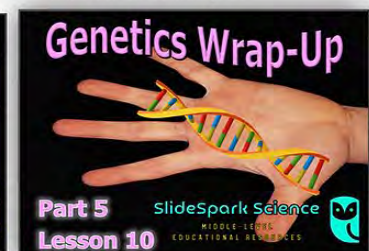
Part 5 Lesson 7 Triple Cross



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

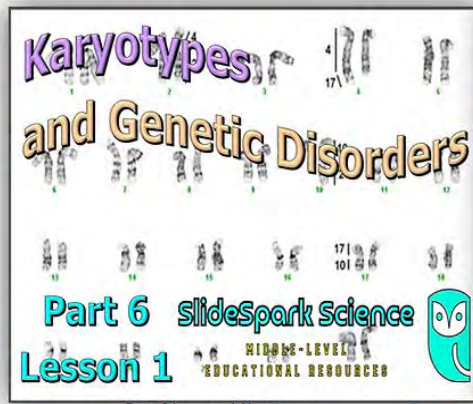


Part 5 Work Bundle Print

**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

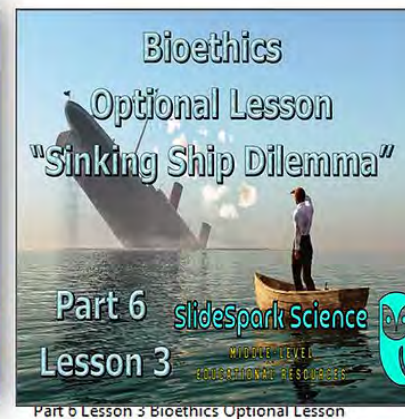
Part 6: DNA and Genetics Unit



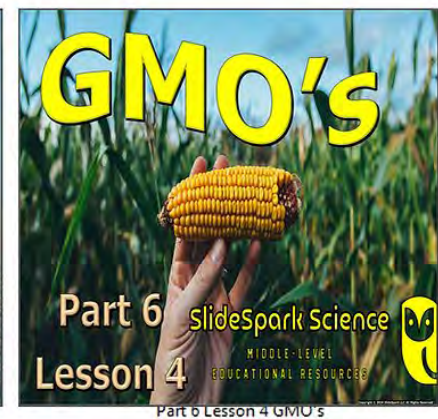
Part 6 Lesson 1 Karyotypes



Part 6 Lesson 2 Genetic Disorder Research



Part 6 Lesson 3 Bioethics Optional Lesson



Part 6 Lesson 4 GMO's



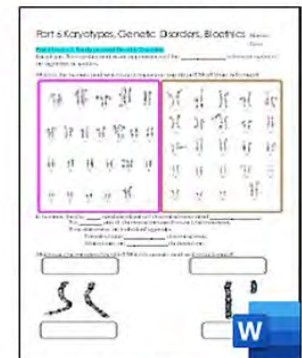
Part 6 Lesson 5 Stem Cells



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	
Weather and Climate Unit	40 Lessons	6-8 medium difficulty	
Astronomy Unit	60 Lessons	6-8 medium difficulty	
Weathering, Soil Sciences	28 Lessons	5-7 easier	
Rivers and Water Quality	25 Lessons	5-7 easier	
Water Molecule Unit	20 Lessons	5-7 easier	

Life Science Units

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

Physical Science

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

[Physical Science Curriculum](#)

[Entire SlideSpark Science Curriculum](#)



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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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