Lesson 1. What Is A Species

1) Do you have a pet dog, cat, both, or neither?
   A. dog(s) only
   B. cat(s) only
   C. both
   D. neither

2) Which statement is true?

   A. Members of the same species must be approximately the same size.
   B. Members of the same species can breed with each other and produce offspring.
   C. Scientists always agree on whether animals are in the same species.
   D. Only animals have species.

3) If coyotes and domestic dogs can interbreed, why are they considered different species?

   A. They have distinct genetic differences and exist in separate populations.
   B. They have different diets.
   C. They live in different geographical areas.
   D. Because they can interbreed, they are actually the same species.

4) If humans on Mars were breeding dogs for two completely different purposes, how long do you estimate it would take before they became different species?
   A. 100 years
   B. 1,000 years
   C. 10,000 years
   D. 100,000 years
   E. 100,000,000 years
   F. They would always be the same species.

5) What trick should we teach Kaladin (a.k.a. Science Dog) next?
   A. Dance
   B. Jump through a hoop
   C. Hug
   D. Place (stay in place)

Key:
1.
2. B
3. A
4.
5.

Lesson 2. Life Finds A Way

1) Which of the following are advantages of asexual reproduction?

Choose all that apply:

A. Only one parent is needed.
B. The population can increase rapidly when the conditions are favourable.
C. Genetic diversity is maximized.
D. No energy is devoted to finding a mate.

2) All living things are able to reproduce.

A. True
B. False

3) What is the name of the form of reproduction where part of an organism is broken off and then grows into a genetically identical copy of the parent organism?

Choose all that apply:

A. Sexual reproduction
B. Binary fission
C. Vegetative propagation
D. Spore formation
E. Fragmentation

4) When one bacterium causes a person to become ill, the bacteria multiplied through

A. Asexual reproduction
B. Sexual reproduction

5) What is the most important advantage of sexual reproduction?

A. Multiple individuals are required for reproduction
B. One individual can reproduce and form a large population
C. High genetic diversity
D. Low genetic diversity

Key:
1. B, A, D
2. B
3. C, E
4. A
5. C

Lesson 4. Mendels Famous Experiment

1) Peas do not need bees; they can pollinate themselves.

A. True
B. False

2) If a cat burns its foot and loses all the hair on one leg, there's a good chance that its kittens will have hairless legs.

A. True
B. False

3) The idea that acquired traits are passed on to offspring is known as:

A. Mendelian Inheritance
B. Lamarkism
C. Blending

4) Mendel's research had a strong influence on other scientists living at the time such as Charles Darwin.

A. True
B. False

5) What was the ratio that Mendel observed in the F generation?

A. 4:1
B. 3:1
C. 2:1
D. 1:1

Key:
1. A
2. B
3. B
4. B
5. B

Lesson 5. Inheritance Explained

1) Today, different versions of a gene are called:

A. Factors
B. Alleles
C. Homozygous
D. Heterozygous

2) An animal or plant that has two copies of its genetic information is called

A. haploid
B. diploid
C. triploid
D. tetraploid

3) An organism is _____ when it has two identical alleles of a particular gene.

A. heterozygous
B. humungous
C. tautologous
D. homozygous

4) What is the term for the observable traits or physical characteristics of an organism?

A. Daguerreotype
B. Phenotype
C. Karyotype
D. Genotype

5) The term _____ describes a trait that will be expressed when both alleles are identical but will NOT be expressed when the alleles are heterozygous.

A. strongly-weak
B. recessive
C. introverted
D. dominant

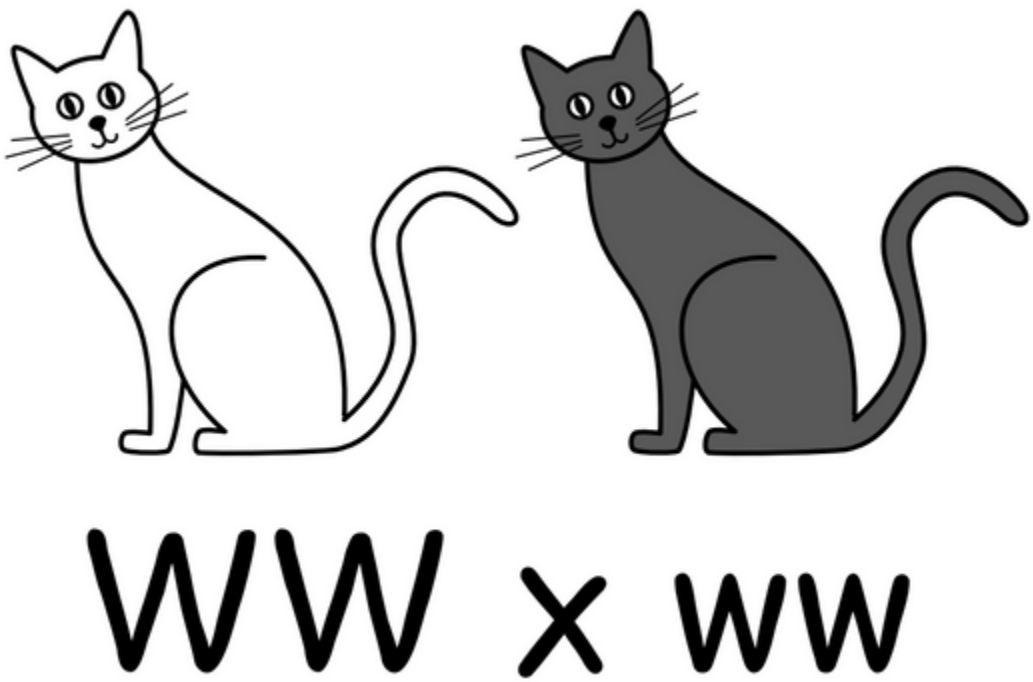
Key:
1. B
2. B
3. D
4. B
5. B

Lesson 7. Laws Of Heredity Part 1

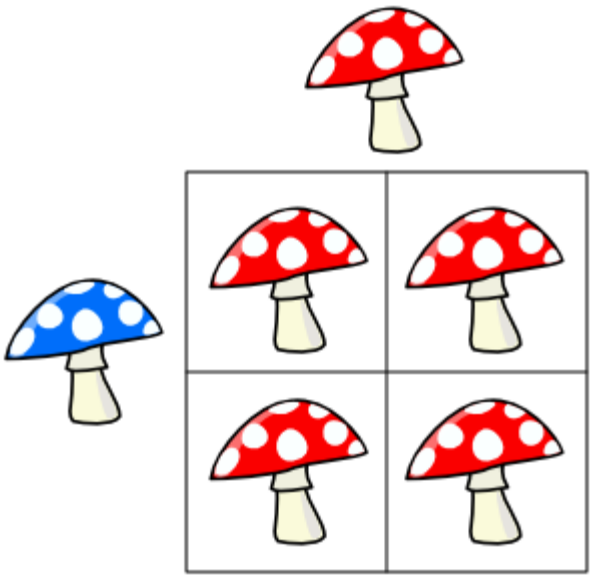
1) When you cross two animals that are heterozygous for a trait, all of the offspring will be heterozygous.

A. True
B. False

2) What portion of the offspring from this cross do we expect to be black?



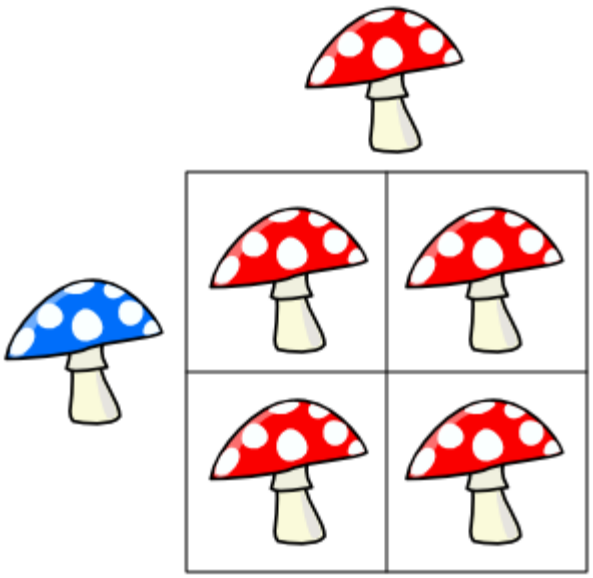
A. 0%
B. 25%
C. 50%
D. 75%
E. 100%



3)
The genotypes were erased from this Punnett square of Mendelian color traits and replaced with phenotypes. Which of the following must be true?

Choose all that apply:

A. Blue coloring is a dominant trait.
B. Blue coloring is a recessive trait.
C. Red coloring is a dominant trait
D. Red coloring is a recessive trait.



4)
The genotypes were erased from this Punnett square of Mendelian color traits and replaced with phenotypes. Which of the following must be true?

Choose all that apply:

A. Both of the mushrooms in this cross are homozygous.
B. All the offspring are homozygous.
C. All the offspring must be heterozygous.
D. There is no way to identify the genotypes of the offspring.

5) Select each true statement.

Choose all that apply:

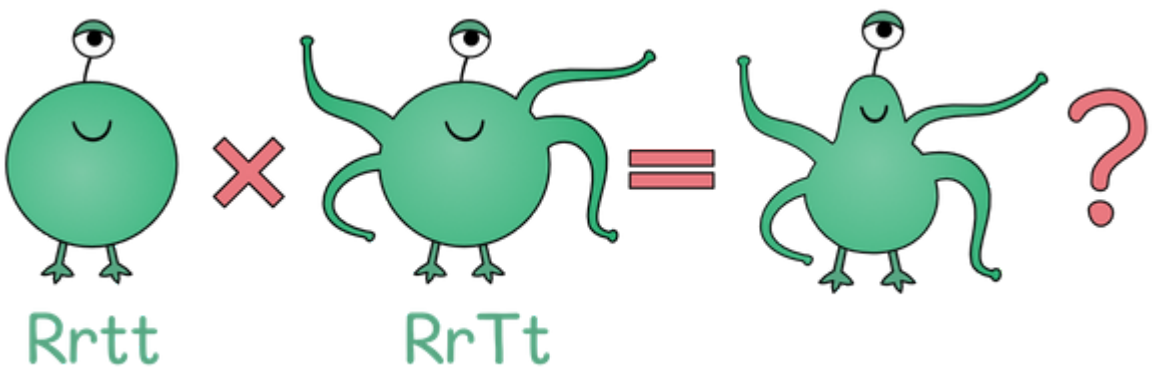
A. The most common phenotype of a trait is the dominant version of that trait.
B. The genotypes **Aa** and **aA** give the same phenotype.
C. When you cross a dominant phenotype with a recessive phenotype, all of the offspring will have the dominant phenotype.
D. A recessive phenotype must always have a homozygous recessive genotype.

Key:
1. B
2. A
3. C, B
4. A, C
5. B, D

Lesson 8. Laws Of Heredity Part 2

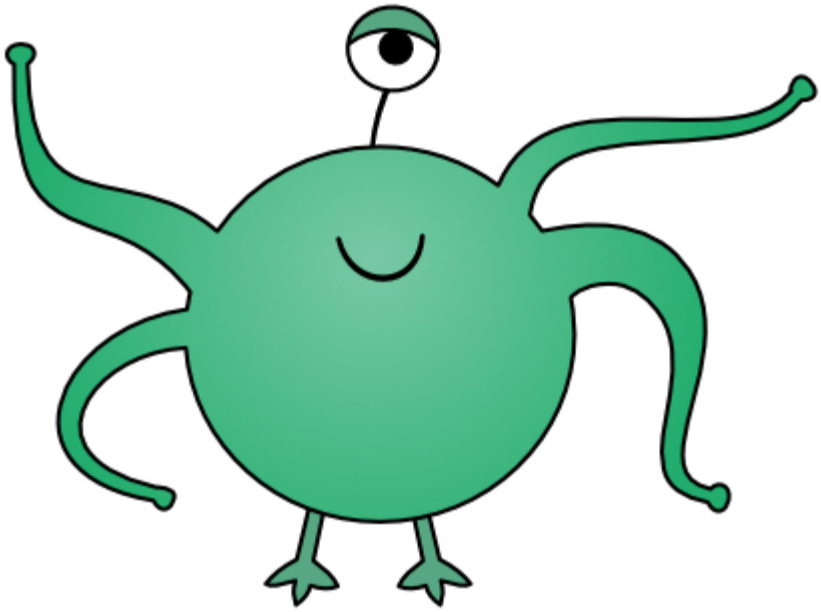
1) If short hair is a dominant Mendelian trait, what will the result be of breeding a homozygous long-haired and homozygous short-haired cat?

A. 100% of offspring will be short-haired.
B. 75% of offspring will be short-haired.
C. 50% of offspring will be short-haired.
D. 25% of offspring will be short-haired.
E. 0% of offspring will be short-haired.



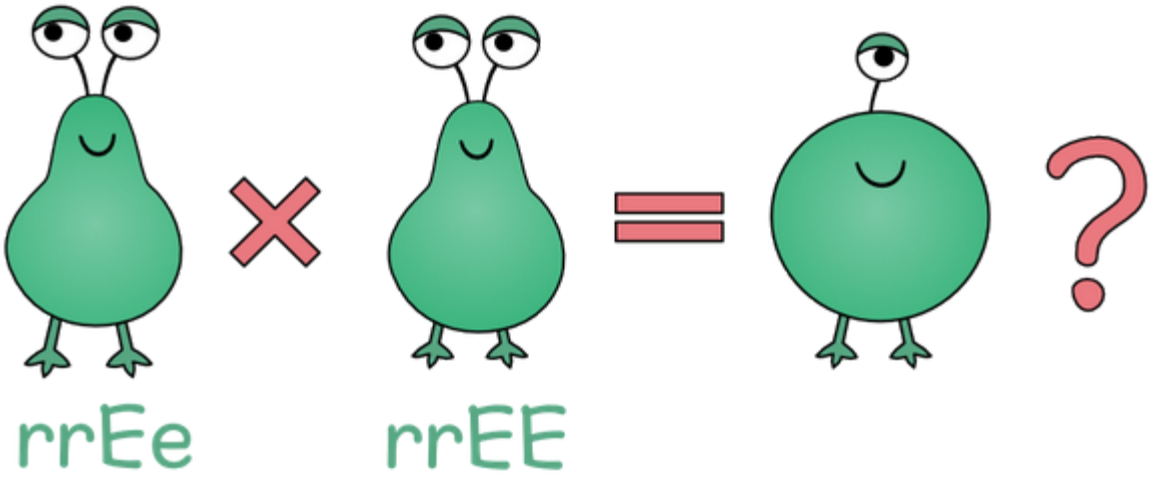
2)
If round body shape (R) and tentacle arms (T) are both dominant traits, can the cross RrTt x Rrtt produce a pear-shaped tentacled alien?

A. Yes
B. No



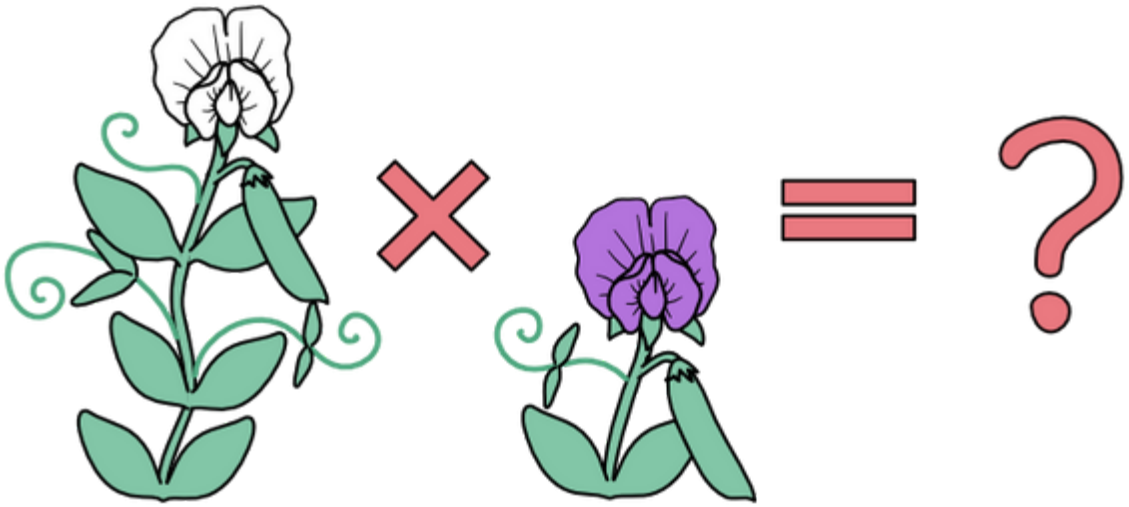
3)
If round body shape (R) and tentacle arms (T) are both dominant traits, which of these statements are true?

A. Round tentacled aliens will be the most common type of alien in the population.
B. Round tentacled aliens will be the least common type of alien in the population.
C. More information is needed to know which trait will be most common in the population.



4)
If round body shape (R) and two eyes (E) are both dominant traits, can a round one-eyed alien be produced from rrEe x rrEE?

A. Yes
B. No

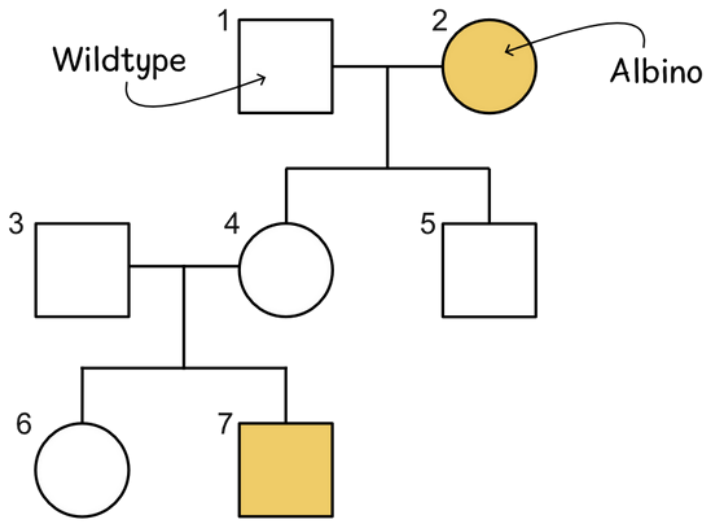


5)
If tall white pea plants are crossed with dwarf purple pea plants, which of the following statements must be true:

A. Most of the tall plants will have white flowers.
B. Most of the short plants will have purple flowers.
C. If both parent plants are homozygous, all of the offspring will be tall plants with purple flowers.
D. Dwarf plants with white flowers cannot be produced from this cross.

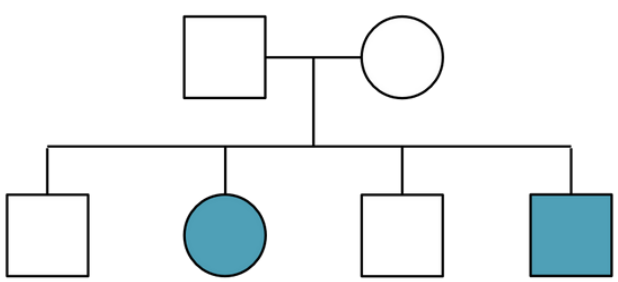
Key:
1. A
2. A
3. C
4. B
5. C

Lesson 10. Pet Pedigree Puzzle



1)
Albinism is a recessive trait. What is the genotype of the individual numbered 4 in this pedigree tracking albinism?

A. Homozygous dominant
B. Heterozygous
C. Homozygous recessive



2)
If both parents do not show the trait but some of the offspring do, which of these statements are true?

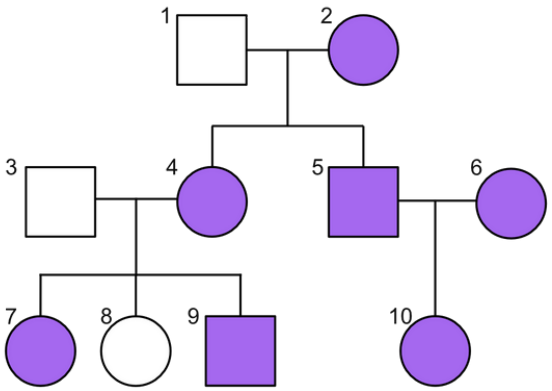
Choose all that apply:

A. The trait must be dominant.
B. The trait must be recessive.
C. Both parents must be heterozygous.
D. Both parents must be homozygous.

3) In a pedigree chart for most animals and plants, which statement(s) are correct?

Choose all that apply:

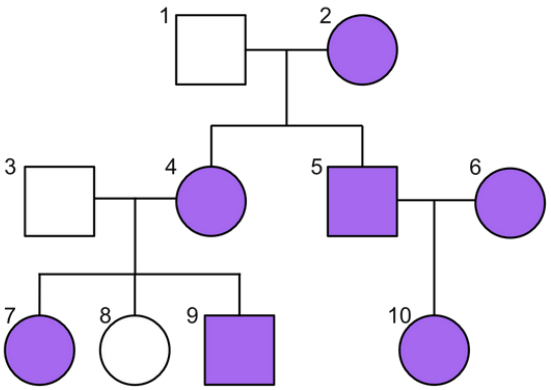
A. Traits tracked in the chart can be either dominant or recessive.
B. Traits tracked in the chart are always recessive.
C. Each individual has two alleles, one from each parent.
D. Each individual has one allele obtained from one parent.



4)

Tentacles are a dominant trait. What is the genotype of individual number 5 in this pedigree **tracking tentacles**?

A. TT
B. Tt
C. Either Tt or TT
D. tt



5)

Tentacles are a dominant trait. What is the genotype of individual number 10 in this pedigree **tracking tentacles**?

A. TT
B. Tt
C. Either Tt or TT
D. tt

Key:
1. B
2. B, C
3. C, A
4. B
5. C

Lesson 11. Bigger Punnett Squares

1) In the cross AaBb × Aabb, what is the chance that an offspring will have the genotype AaBb? (Use a slash / to type a fraction.)

_____

2) In the cross AaBB × Aabb, what is the chance that an offspring will have the genotype AaBb? (Use a slash / to type a fraction.)

_____

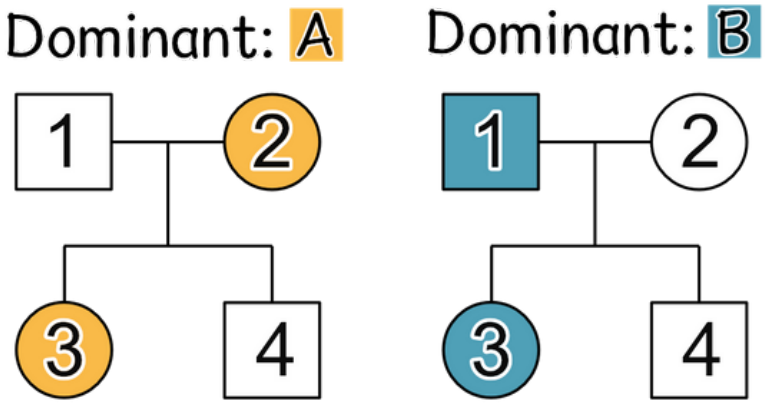
3) Which crosses below can result in all 4 possible phenotypes?

Choose all that apply:

A. AABB × aabb
B. Aabb × aaBb
C. AaBb × AaBb
D. aaBb × AAbb

4) The cross AABbCc × AabbCC can result in an offspring with genotype AaBbCc.

A. True
B. False



5)

Above, you can see two pedigree charts for the same family. One chart tracks trait A and the other tracks trait B. Both traits are dominant traits. Which person has the genotype AaBb?

A. person 1
B. person 2
C. person 3
D. person 4

Key:
1. 1/4
2. 1/2
3. B, C
4. A
5. C

Lesson 12. Heredity Quiz Show

1) When two parents share the same phenotype and genotype, their offspring will also have that same phenotype and genotype.

A. True
B. False

2) If purple flowers are dominant and white flowers are recessive, then what color(s) of flowers will be expected when homozygous dominant purple-flowered plants are crossed with homozygous recessive white-flowered plants?

A. 100% purple plants
B. 75% purple plants, 25% white plants
C. 50% purple plants, 50% white plants
D. 25% purple plants, 75% white plants
E. 100% white plants

3) If purple flowers are dominant in a plant and white flowers are recessive, what will the outcome be, on average, from crossing two heterozygous plants?

A. 100% purple plants
B. 75% purple plants, 25% white plants
C. 50% purple plants, 50% white plants
D. 25% purple plants, 75% white plants
E. 100% white plants

4) Select each genotype below that is possible for the offspring of the cross
AABb × Aabb

Choose all that apply:

A. AAbb
B. AABB
C. aaBb
D. AaBb

5) In the cross Aa × aa, the probability of a dominant phenotype in the offspring is

A. 0
B. 1/4
C. 1/2
D. 3/4
E. 1

6) Select each true statement below.

Choose all that apply:

A. A parent always has the same genotype as its offspring.
B. A parent always has the same phenotype as its offspring.
C. If you know an organism's genotype for a trait, then you also know its phenotype.
D. If you know an organism's phenotype for a trait, then you also know its genotype.

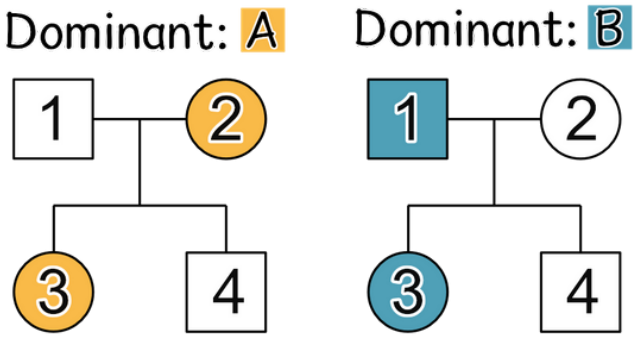
7) Would you rather go into the past and meet your ancestors or go into the future and meet your great-great-grandchildren?

A. Future
B. Past

8) How many distinct genotypes are possible for two traits with two distinct alleles (such as AaBB)? Remember order doesn't matter, so we count Aa and aA as being the same.

_____

9)



These pedigree charts for a family of 4 show two different dominant traits. What is the genotype of individual 2?

A. AABB
B. AABb
C. AAbb
D. AaBB
E. AaBb
F. Aabb
G. aaBB
H. aaBb
I. aabb

10) What is the probability that an offspring of the cross Aa × Aa will have a homozygous genotype?

A. 0
B. 1/4
C. 1/2
D. 3/4
E. 1

11) If an organism is homozygous recessive for a trait that follows Mendelian inheritance patterns, which of the following must be true?

A. Its offspring will share its phenotype.
B. Its offspring will share its genotype.
C. At least one of its parents was also homozygous recessive.
D. Neither parent was homozygous dominant.

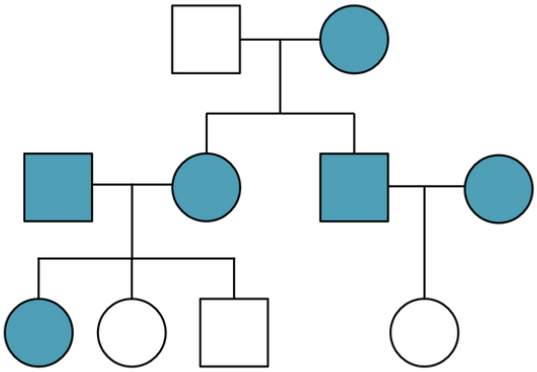
12) Select each true statement below.

Choose all that apply:

A. Wolves and coyotes are the same species.
B. Two organisms that share some of the same genes are members of the same species.
C. Humans are classified as being diploid.
D. Only animals have species.

13) Which words best describe the genotype AA?

A. homozygous dominant
B. heterozygous
C. homozygous recessive



14)
Is the trait in this pedigree chart dominant or recessive?

A. dominant
B. recessive
C. not enough info

15) How many cells are in a Punnett square for 3 traits?

_____

Key:
1. B
2. A
3. B
4. D, A
5. C
6. C
7.
8. 9
9. F
10. C
11. D
12. C
13. A
14. A
15. 64

Lesson 13. What Are Genes

1) A strand of DNA of nucleotides "GGAAT" is paired with:

A. ATTCC
B. TCCAA
C. CCTTA
D. AACCG

2) What do we call the subunits of a DNA polymer?

A. bases
B. phosphates
C. nucleotides
D. sugars
E. amino acids

3) The condition of being albino is caused by

A. a dominant gene
B. a recessive gene
C. a missing gene

4) A mutation in DNA will always cause a recessive trait.

A. True
B. False

5) Melanism is caused by

A. overexpression of the pigment melanin
B. underexpression of the pigment melanin
C. a mutation that is always dominant
D. a mutation that is always recessive

Key:
1. C
2. C
3. B
4. B
5. A

Lesson 14. Chromosomes

1) Chromosomes are made of:

A. Only DNA
B. DNA and protein
C. DNA, protein, and a lipid bilayer

2) How many chromosome pairs do human beings have?

_____

3) In humans, what is the chance that a new baby will be a boy?

A. 50% - The phenotypes will split 50/50 because it's a homozygous by heterozygous cross.
B. 75% - The phenotypes will split 3:1 because Y is dominant.
C. It can't be predicted because chromosomes don't follow Mendelian inheritance patterns.

4) Which of the following statements are true?

Choose all that apply:

A. A person can be born without a Y chromosome but not without an X.
B. A person can be born without an X chromosome but not without a Y.
C. The X chromosome has >10× as many genes as the Y chromosome.
D. The Y chromosome has >10× as many genes as the X chromosome.

5) Which of the following statements are true?

Choose all that apply:

A. Trisomy is the condition of having 3 copies of 1 chromosome type.
B. Trisomy is the condition of having 3 copies of every chromosome.
C. Trisomy is a common condition because an extra chromosome doesn't cause many side effects.
D. Trisomy is a rare condition because an extra chromosome is usually fatal.

Key:
1. B
2. 23
3. A
4. A, C
5. A, D

Lesson 16. Meiosis

1) All cells in an organism go through meiosis.

A. True
B. False

2) Cells used in reproduction that have half the number of chromosomes are called

A. diploid
B. somatic cells
C. gametes
D. stem cells

3) If an organism received a chromosome from one parent with genes A, B, C, and D, and a chromosome from another parent with genes a, b, c, and d, it could give a chromosome with genes A, B, c, and d to its offspring.

A. True
B. False

4) How many and what type of daughter cells does meiosis produce?

A. four haploid
B. four diploid
C. two haploid
D. two diploid

5) Why are some bananas in the supermarket seedless?

A. They have a mutation that stops meiosis from working.
B. They are a hybrid of a diploid plant and a tetraploid plant.
C. The high sugar content dissolves the seeds.
D. Actually, the whole banana is a giant seed.

Key:
1. B
2. C
3. A
4. A
5. B

Lesson 17. The Genetic Code 1

1) Use the idea of codons in the message below to answer the question.
RTIRNYTHENEWCATSAWTHEOLDDOGRINIOPLE
Who observed the old dog?

A. A swine
B. A fowl
C. A feline
D. A serpent

2) How many amino acids do humans need to get through their diet because they can't produce them on their own?

_____

3) How many amino acids are used to make proteins?

_____

4) How do we know where a gene starts or ends?

A. The gene is the whole length of the DNA but it skips every third letter.
B. Genes are formed by loops in the DNA, so the gene ends when the nucleotides start repeating.
C. The DNA sequence is converted to binary numbers by proteins.
D. The "start codon" and "stop codon" indicate where to start and stop reading the gene.

5) An albino animal has

A. genes that secrete extra calcium into the skin
B. enzymes that cannot produce melanin
C. enzymes that produce too much melanin
D. full immunity to sunburns

Key:
1. C
2. 9
3. 20
4. D
5. B

Lesson 19. The Genetic Code 2

1) In transcription, uracil replaces

A. adenine
B. thymine
C. guanine
D. cytosine

2) Proteins are made

A. inside the nucleus
B. outside the nucleus

3) The process of converting DNA to mRNA is called

A. substantiation
B. m-prependation
C. transcription
D. translation

4) The damaging effects of PKU can be avoided through a carefully controlled diet.

A. True
B. False

5) Amino acids are essential in a person's diet because

A. they keep your stomach acid at the right pH.
B. they are needed as a source of energy
C. they are needed to make DNA
D. they are needed to make proteins

Key:
1. B
2. B
3. C
4. A
5. D

Lesson 20. Blood Types Explained

1) Which of the following statements are true:

Choose all that apply:

A. The carbohydrates or proteins on the surface of blood cells are called antigens.
B. The carbohydrates or proteins on the surface of blood cells are called antibodies.
C. Type A and B blood are determined by a different gene than Rh factor (+ or -).
D. Type A and B blood are determined by the same gene as Rh factor (+ or -).

2) Which of the following statements about blood type is true?

A. Type A is dominant over type B.
B. Type B is dominant over type A.
C. Type A is codominant with type B.
D. Type A is incompletely dominant to type B.

3) Which of the following statements are true?

Choose all that apply:

A. The O allele produces the O antigen.
B. The O allele is a mutated form of the A or B allele that produces no antigen.
C. Anyone can receive a type O blood donation.
D. Only someone with type O blood can receive a type O blood donation.

4) If a person has B- blood type and their mother has O- blood type, which of these are possible blood types for their father?

Choose all that apply:

A. O-
B. B-
C. B+
D. A-
E. A+
F. AB+

5) What are the chances that parents with the blood types AB+ and O- will have a child with O+ blood?

A. 0%
B. 25%
C. 50%
D. 75%
E. 100%

Key:
1. C, A
2. C
3. C, B
4. B, C, F
5. A

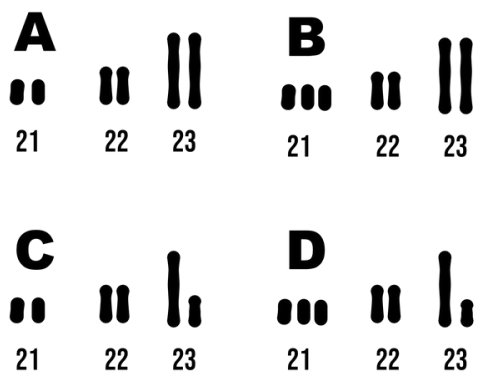
Lesson 22. Mutations

1) Which of the following can cause a mutation?

Choose all that apply:

A. Radiation
B. Viruses
C. Exercise
D. Mutagenic compounds
E. Random Chance

2) Which karyotype below displays a male with Down syndrome?



A. A
B. B
C. C
D. D

3) A mutation is defined to be:

A. a change in cellular structure
B. A change in physical features
C. A change in mitochondrial function
D. A change in the DNA sequence

4) Would a mutation in the DNA of skin cells be passed on to an organism's offspring?

A. Yes, because our DNA is replicated so that it matches in every cell.
B. No. Only mutations that occur in the gametes are passed on to offspring.
C. Maybe. Gametes only use half of the genetic code, so the mutation might get a copy of the gene that was mutated.
D. Yes, for mammals, but not for other animals.

5) Agents **A**, **B**, **C**, **D**, **E**, **F**, **G**, **H**, **I**, and **J** are being considered for a secret mission. How many ways are there to choose 2 agents out of those 10 to go on the mission?

_____

Key:
1. B, A, D, E
2. D
3. D
4. B
5. 45

Lesson 23. Nature And Nurture

1) Which of the following statements about teeth decay are false?

Choose all that apply:

A. Whether or not someone develops cavities is mostly due to their genetics.
B. Genetics can influence the amount and type of saliva produced in the mouth.
C. Diet and environmental conditions have a strong impact on the formation of cavities.
D. Diet and environmental conditions have no impact on the formation of cavities.

2) How tall a dandelion grows is primary due to:

A. Genetic variation
B. The amount of water and light available

3) Environmental conditions can determine whether a gene is expressed or not.

A. True
B. False

4) How many copies of each gene do you have?

A. 1 because that is all that is needed
B. 2 because humans are diploid
C. 3 because humans are triploid
D. 4 because two copies were received from each parent

5) How is RNA different from DNA?

A. RNA is double-stranded and DNA single-stranded.
B. RNA contains deoxyribose and DNA contains ribose.
C. RNA contains uracil and DNA contains thymine.
D. DNA is made of nucleotides and RNA is made of amino acids.

Key:
1. D, A
2. B
3. A
4. B
5. C

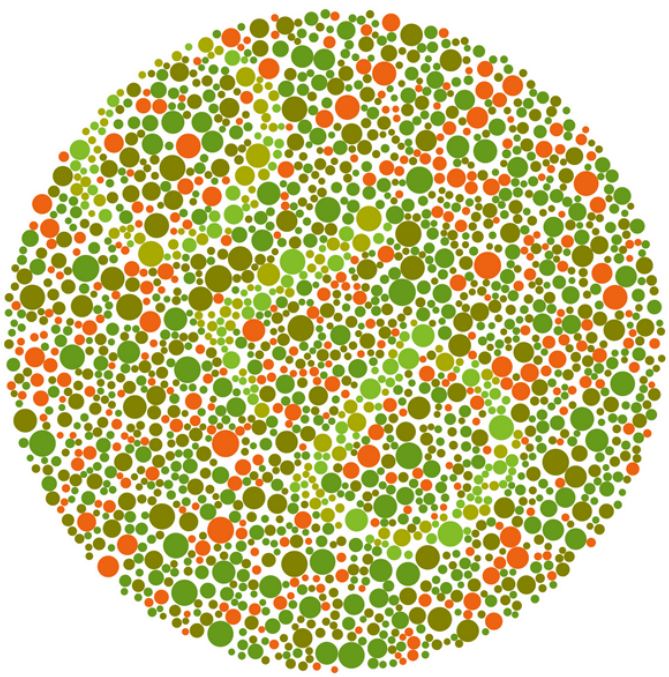
Lesson 25. Calico Cats And X-Linked Traits

1) Which statement is true about calico cats?

Choose all that apply:

A. A male calico cat would have to have Klinefelter syndrome (XXY).
B. On average, half of the calico cats are male.
C. White fur is determined by the X-chromosome.
D. Orange or black fur is determined by the X-chromosome.

2) What is the secret message in the image below?



_____

3) A child has a red-green colorblind father and a non-carrier mother. What are the chances that this child is red-green colorblind?

A. 0%
B. 50% if male, 0% if female
C. 50% if female, 0% if male
D. 25%

4) A child has a red-green colorblind mother and a non-carrier father. What are the chances that this child is red-green colorblind?

A. 50%
B. 100% if male, 0% if female
C. 50% if male, 0% if female
D. 50% if male, 100% if female

5) If someone has two X-chromosomes, which statement is true.

A. Both chromosomes will be expressed in every cell.
B. Only one chromosome will be expressed in each cell, but which one is expressed is based on random chance.
C. Neither chromosome will be expressed unless they match.

Key:
1. A, D
2. OLD
3. A
4. B
5. B

Lesson 26. Modifying Genes And Gene Therapy

1) A child has a red-green colorblind father and a mother who is a carrier for red-green colorblindness (but not colorblind herself). What are the chances that this child is red-green colorblind?

A. 50%
B. 100% if male, 50% if female
C. 100% if female, 50% if male
D. 100%

2) Corn grown in the United States has been made resistant to insect pests by using a gene from

A. corn
B. bacteria
C. fungi
D. trees

3) Advantages to genetic engineering include

Choose all that apply:

A. a better understanding of gene function
B. it's a technology that is not controversial
C. no risk of unintended consequences
D. ability to control gene expression

4) Some crops can be genetically modified to be more nutritious.

A. True
B. False

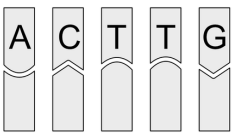
5) Can salt be genetically modified?

A. Yes
B. No

Key:
1. A
2. B
3. D, A
4. A
5. B

Lesson 27. Genetics Quiz Show

1) The nucleotide sequence **ACTTG** is paired with what sequence?



A. TCAAG
B. GTTCA
C. TGAAC
D. GCTTA

2) Every human cell has 46 chromosomes.

A. True
B. False

3) Three copies of this chromosome result in Down syndrome.

_____

4) Select each true statement.

Choose all that apply:

A. Every cell goes through meiosis.
B. Only gametes go through meiosis.
C. Skin cells go through mitosis.
D. Gametes are diploid.

5) Use the idea of codons to identify the most likely reason he was upset.
RVTTHEBOYWASMADCUZTHESUNHADSETYYRCS

A. The ice cream was gone.
B. The dog ate his homework.
C. It was almost bedtime.
D. His pet cat was lost.

6) Which is bigger, a gene or a chromosome?

A. chromosome
B. gene

7) Select each true statement.

Choose all that apply:

A. All white cats are female.
B. All calico cats are female.
C. Red-green colorblindness is more common in males than females.
D. Colorblindness only affects adults because the gene for seeing color deactivates during puberty.

8) How many codons are in a sequence of 21 nucleotides?

_____

9) Which superpower would you most like to have?

A. Super hearing
B. Be able to see all wavelengths of light

10) A gene responsible for making an enzyme is usually

A. dominant
B. recessive
C. neither. Genes don't have anything to do with creating enzymes.

11) A diploid human cell contains

A. 46 genes
B. 46 base pairs
C. 46 amino acids
D. 46 chromosomes

12) DNA is

A. transcripted to RNA, then translated to protein
B. translated to RNA, then transcripted to protein
C. transcripted to amino acids, then translated to nucleotides
D. translated to amino acids, then transcripted to nucleotides

13) Which of the following is not an example of a phenotype?

A. Length of a snake
B. DNA sequence of the antibiotic resistance gene of bacteria
C. Color of a feather
D. Potato resistance to fungal blight

14) When an organism is diploid, that means it has

A. one version of each chromosome
B. two versions of each chromosome
C. no chromosomes
D. chromosomes from only one parent

15) Select each true statement.

Choose all that apply:

A. Genotype determines phenotype.
B. Phenotype determines genotype.
C. Genotype and the environment determine phenotype.
D. Phenotype and the environment determine genotype.

16) Select each true statement below.

Choose all that apply:

A. A daughter of a red-green colorblind father will be colorblind.
B. A daughter of a red-green colorblind mother will be colorblind.
C. A son of a red-green colorblind father will be colorblind.
D. A son of a red-green colorblind mother will be colorblind.

Key:
1. C
2. B
3. 21
4. B, C
5. C
6. A
7. B, C
8. 7
9.
10. A
11. D
12. A
13. B
14. B
15. A, C
16. D

Lesson 28. Endangered Vs Invasive

1) The electric ant has what type of diet?

A. Specialized - only eats carrion from small rodents
B. Strict vegetarian - only eats plants
C. Opportunistic - will eat just about anything

2) Most invasive plants can reproduce by

A. seeds only
B. vegetative propagation only
C. both seeds and vegetative propagation

3) Orchids need to partner with a specific species of fungus to germinate.

A. True
B. False

4) Why is kudzu an invasive species?

Choose all that apply:

A. It's not invasive. Humans just overplanted it.
B. It grows over other plants, stealing their light.
C. It is very cold tolerant.
D. It can reproduce by runners, and any part of it can root to the ground.

5) Invasive species will never go extinct.

A. True
B. False

Key:
1. C
2. C
3. A
4. B, D
5. B

Lesson 29. Darwin And Galapagos

1) How long did the HMS Beagle take to sail around the world?

A. 3 months
B. 1 year
C. 5 years
D. 10 years

2) Why did Darwin think finches from different islands in the Galapagos had different beaks?

A. They ate different food.
B. They used their beaks to attract a mate.
C. Random mutations occurred in their DNA.
D. Darwin didn't have any idea why the finches had different beaks.

3) Each island in the Galapagos had tortoises with different patterns and shapes to their shells.

A. True
B. False

4) When did Darwin publish On the Origin of Species, his famous writings about evolution?

A. 1 year after finishing his voyage on the Beagle
B. 23 years after he finished his voyage on the Beagle

5) If you could visit one of the stops mentioned in class, which would you choose?

A. Cape Verde Islands
B. Punta Alta, Argentina
C. Concepcion, Chile
D. Galapagos Islands
E. Wallerawang, Australia
F. Keeling-Cocos Islands
G. Ascension Island

Key:
1. C
2. A
3. A
4. B
5.

Lesson 31. Survival Of The Fittest

1) What do we mean when we say that resources are limited?

Choose all that apply:

A. Habitable space is finite.
B. There are too many predators.
C. There is only so much food to go around.
D. The gene pool needs more variation.

2) Animals that have one offspring at a time will always have a shrinking population.

A. True
B. False

3) In the phrase "survival of the fittest", what does the word "fittest" mean?

A. Strongest
B. Longest life span
C. Most likely to evade predators
D. Most likely to reproduce
E. Fastest

4) In animals, why is sexual reproduction more common than asexual reproduction?

A. Genetic variation increases the chance of survival.
B. Cloning increases the chance of survival.
C. Animals that reproduce sexually always care for their young.
D. It requires less energy when you don't have to seek out a mate.

5) A population of animals will contain a high degree of genetic diversity because

Choose all that apply:

A. they would find it boring if everything was the same
B. mutations occur during cell division and DNA repair
C. predators prefer diverse flavors of prey.
D. meiosis increases genetic diversity

Key:
1. A, C
2. B
3. D
4. A
5. D, B

Lesson 32. Selection And Adaptation

1) Which conditions are needed for natural selection to occur:

Choose all that apply:

A. Genetic variation
B. Chance of survival being random
C. Advantageous traits are taught to the next generation by the parents
D. Advantageous traits are inherited

2) In biology, what is an adaptation?

A. A characteristic that helps an organism survive in its habitat.
B. A behavior that is learned in response to a situation.

3) If you have variation, differential reproduction, and heredity, what will be the result?

A. Natural selection
B. Random selection
C. No change in the traits of the population.

4) Natural selection will always ensure that the best genes are passed on to the next generation.

A. True
B. False

5) If some otters have webbed feet but others don't, what would be expected to occur after many generations? (Note that webbed feet allow an otter to swim better which helps them eat more food and better survive extreme weather events.)

A. All the otters would have webbed feet.
B. None of the otters would have webbed feet.
C. Some otters would have webbed feet and others wouldn't.

Key:
1. A, D
2. A
3. A
4. B
5. A

Lesson 34. What Is Evolution

1) Which of the following are examples of evolution?

Choose all that apply:

A. The beaks of finches are larger the year after a drought.
B. A tree loses its leaves in the fall.
C. A coastline erodes after a strong storm.
D. Caterpillars are more resistant to insecticides than they were 50 years ago.

2) Select each true statement.

Choose all that apply:

A. Evolutionary theory implies that life evolved (and continues to evolve) randomly, or by chance.
B. Individual organisms can evolve during a single lifespan.
C. If you have variation, differential reproduction, and heredity, you will have evolution by natural selection as an outcome.
D. Natural selection involves organisms learning to adapt.

3) Select each true statement.

Choose all that apply:

A. Evolution results in progress; organisms are always getting better through evolution.
B. Species are still evolving today.
C. The fittest organisms in a population are those that are strongest, healthiest, fastest, and/or largest.
D. Natural selection always results in organisms perfectly suited to their environments.

4) The ability of an organism to survive and reproduce in its specific environment is what biologists call:

A. adaptation
B. fitness
C. evolution
D. selection

5) Sharks are so well-suited to their environment that they haven't changed in almost 400 million years.

A. True
B. False

Key:
1. D, A
2. C
3. B
4. B
5. B

Lesson 35. Genetic Drift

1) An allele is more likely to disappear from a gene pool in

A. large populations
B. small populations

2) What do we mean when we refer to a **gene pool**?

A. The liquid where the chromosomes are stored in cells
B. The region of a chromosome where a gene is located
C. The dating pool
D. All of the genetic information found in a population

3) A change in the genetic composition of a population that happens after a small number of individuals colonizes a new area is called:

A. founder effect
B. genetic drift
C. population bottleneck
D. artificial selection

4) Which of the following is an example of the bottleneck effect?

A. The Northern Elephant Seal population has low genetic diversity because they almost went extinct.
B. Sherpas carry a gene that helps them to survive at high altitudes.
C. Raccoons learn to open trashcans, allowing them to access a new food source in urban environments.
D. Humans choose two horses they like the characteristics of and breed them together.

5) Select each of the following that could cause a population bottleneck?

Choose all that apply:

A. Habitat destruction
B. Overhunting
C. Too much genetic variability
D. Natural disaster

Key:
1. B
2. D
3. A
4. A
5. A, B, D

Lesson 37. Species And Gene Pools

1) Which statement about species is most correct?

A. There are multiple ways to define a species.
B. Each member of a species will look alike.
C. If two animals can interbreed, then they belong to the same species.

2) Organisms that appear alike and share common traits will belong to the same species.

A. True
B. False

3) Different versions of the same gene are called:

A. Mutations
B. Variants
C. Alleles
D. Phenotypes

4) What word is used to describe an organism that has two copies of the same allele?

A. Carrier
B. Heterozygous
C. Homozygous

5) Which of the following could be the result of one mutation?

Choose all that apply:

A. A reduction in the genetic diversity of a population
B. The loss of a gene
C. The creation of a new allele
D. An individual acquires the ability to grow wings.

Key:
1. A
2. B
3. C
4. C
5. C, B

Lesson 38. Taxonomy And Shared Traits

1) Which category is the broadest (i.e. biggest and least specific)?

A. species
B. phylum
C. order
D. genus

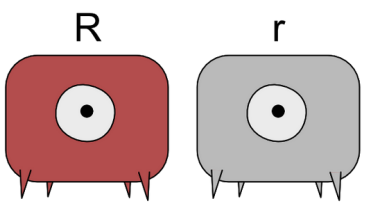
2) Dragonflies and birds both have wings. This shared trait is a

A. convergent trait
B. homologous trait

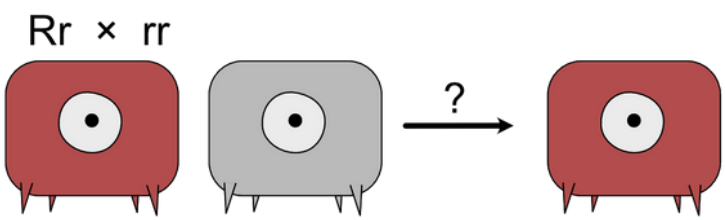
3) Traits that are inherited from a common ancestor are called

A. homologous traits
B. convergent traits

4) Glarps can either be red or gray. Being red is dominant (R) and being gray is recessive (r).

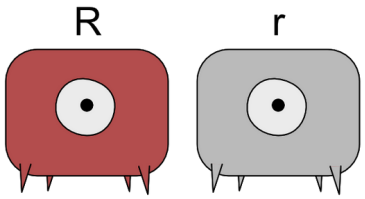


What is the chance that an offspring of the cross Rr × rr will be red?

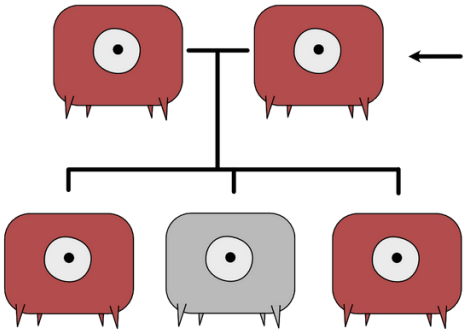


_____

5) Glarps can either be red or gray. Being red is dominant (R) and being gray is recessive (r).



Select each possible phenotype for the glarp that the arrow is pointing to in the pedigree below.



Choose all that apply:

A. RR
B. Rr
C. rr

Key:
1. B
2. A
3. A
4. 1/2
5. B

Lesson 40. The Fossil Record

1) Select each true statement.

Choose all that apply:

A. The majority of animals from the Cretaceous will be found in the fossil record.
B. All fossils are more than 10,000 years old.
C. Fossils are only found in igneous rocks.
D. The rarest type of fossil is an actual specimen fossil.

2) Why do pythons have femur bones?

A. The bones aid in digestion.
B. It's a vestigial trait because their ancestors had legs.
C. It's an acquired trait because pythons are evolving to have legs.
D. Pythons secretly have legs that they keep tucked underneath.

3) What is a transition fossil?

A. A fossil found near the borders of continental plates.
B. A fossil with features that all animals share in common.
C. A fossil that comes between a known ancestor and a descendent.
D. A fossil that is one-of-a-kind.

4) What is a codon?

A. the part of a chromosome where *crossing over* occurs.
B. an allele that only females inherit
C. a sequence of three amino acids
D. a sequence of three nucleotides

5) All living organisms have two copies of each gene.

A. True
B. False

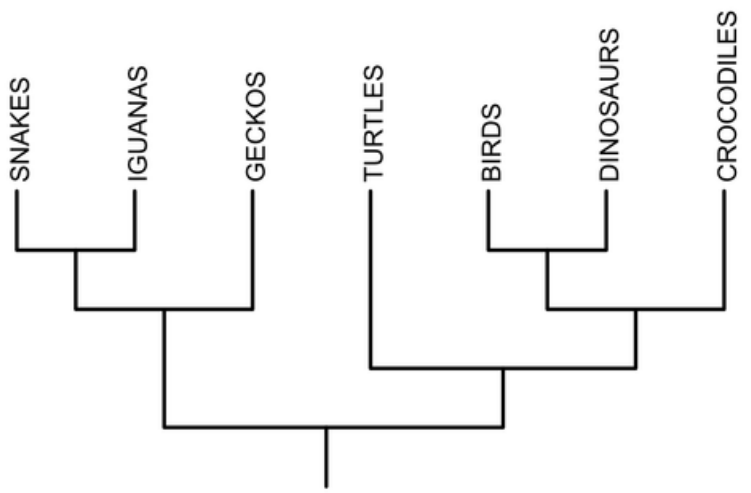
Key:
1. B, D
2. B
3. C
4. D
5. B

Lesson 41. Phylogenies And Family Trees

1) Pandas and red pandas both have pseudo-thumbs that are useful for eating bamboo. This shared trait is an example of a

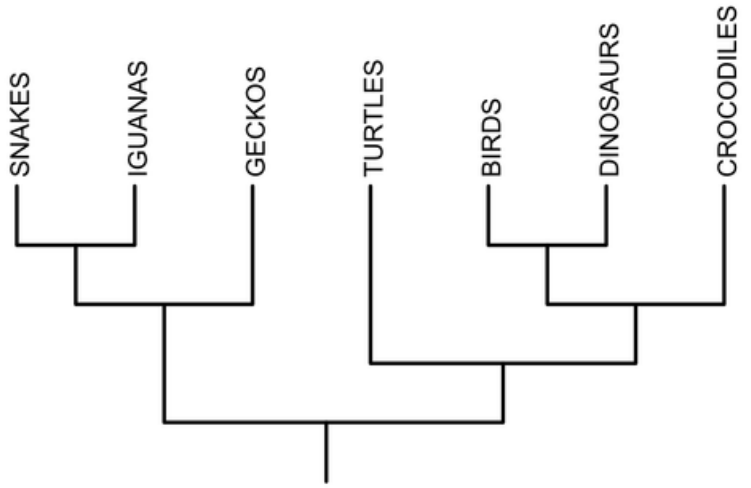
A. convergent trait
B. homologous trait

2) Of the animals listed below, which is most closely related to geckos?



A. Birds
B. Turtles
C. Crocodiles
D. Snakes

3) Of the animals listed below, which is most closely related to birds?



A. Iguanas
B. Turtles
C. Crocodiles
D. Snakes

4) Select each true statement.

Choose all that apply:

A. A dominant trait can skip a generation.
B. A recessive trait can skip a generation.
C. Each trait is either dominant or recessive.
D. Observed traits are always homozygous.

5) For cats, white is the dominant color (**W**) and black is recessive (**w**). In the cross **WW × ww**, what portion of the offspring do we expect will be white on average?

A. 0%
B. 25%
C. 50%
D. 75%
E. 100%

Key:
1. A
2. D
3. C
4. B
5. E

Lesson 43. Australia Vs New Zealand

1) Which of the following is a large hervibore?

Choose all that apply:

A. Thylacine
B. Bandicoot
C. Morepork
D. Quoll
E. Moa

2) Why doesn't New Zealand have any native rodents?

A. New Zealand was the first landmass to leave Pangea.
B. Rodents aren't able to survive on islands.
C. New Zealand is too warm for rodents.
D. New Zealand lost most of its animals during glacial periods

3) What is the name for the reproductive strategy of bacteria and archaea where one cell is divided into two identical cells?

A. sexual reproduction
B. binary fission
C. fragmentation
D. spores
E. vegetative propagation

4) What is the name for the process of converting DNA to RNA?

A. Transcription
B. Translation
C. Segregation
D. Recombination

5) A son of a red-green colorblind mother will also be red-green colorblind.

A. True
B. False

Key:
1. E
2. D
3. B
4. A
5. A

Lesson 44. Timeline Of Life On Earth

1) Which is longest?

A. an eon
B. an epoch
C. a period

2) The biggest extinction event of the last 500 million years was the

A. Ordovician/Silurian (O-S) extinction
B. Permian/Triassic (P-T) extinction
C. Late Devonian (Late-D) extinction
D. Triassic-Jurassic (Tr-J) extinction
E. Cretaceous Paleogene (K-Pg) extinction

3) Which came first?

A. flowers
B. fish
C. dinosaurs
D. whales

4) What is the name of the predator that would eat a moa?

A. Thylacine
B. Haast's Eagle
C. Livingston's Roc
D. Smilodon

5) Haploid cells have half the number of chromosomes as their parent cell. We call these haploid cells

A. trisomy
B. somatic cells
C. gametes
D. offspring

Key:
1. A
2. B
3. B
4. B
5. C

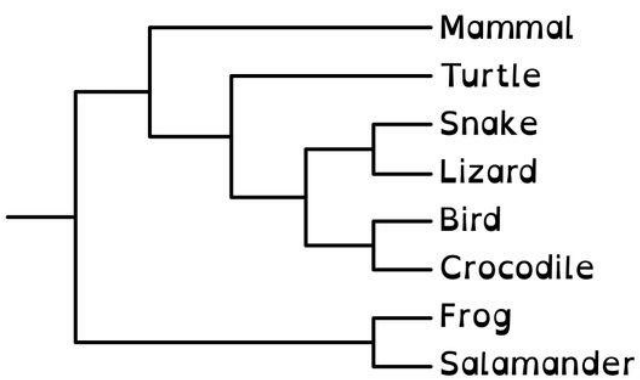
Lesson 45. Final Quiz Show

1) Select each true statement below.

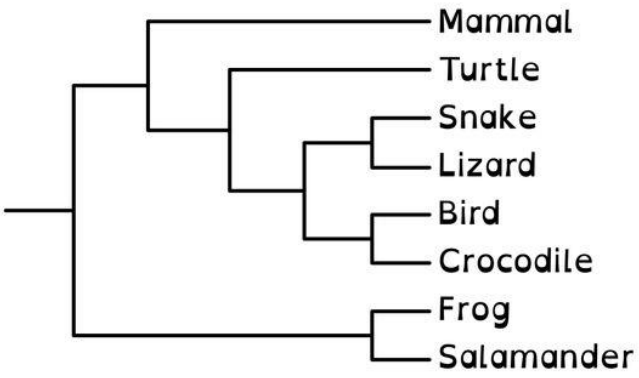
Choose all that apply:

A. Natural selection guarantees that organisms are improving over time.
B. Because evolution is slow, humans cannot influence it.
C. Organisms that are more adapted to their environment are more likely to survive and pass on their genes.
D. Individual organisms can evolve during a single lifespan.

2) Of the families listed in the phylogeny below, which is most closely related to crocodiles?



A. Mammals
B. Salamanders
C. Birds
D. Snakes

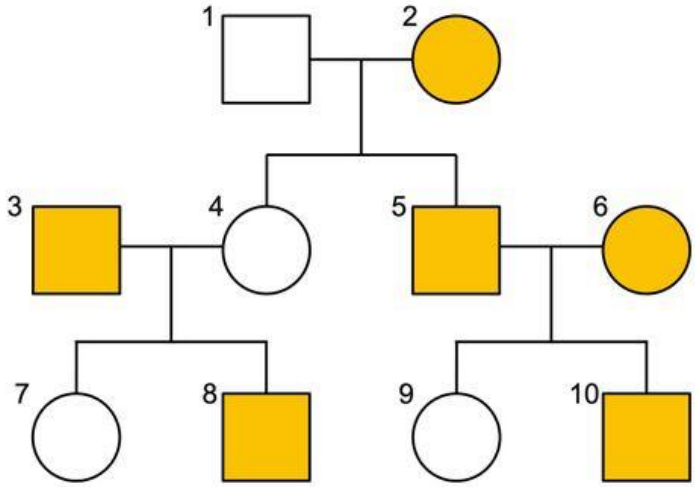


3)

Consider the phylogeny above. Of the animals listed, which is most **distantly** related to humans?

A. Gecko
B. Falcon
C. Tree frog
D. Desert Tortoise

4) A dominant Mendelian trait is displayed in yellow on the pedigree chart below.



How many of the 10 organisms are known to be carriers (heterozygous) for of the recessive gene for this trait? (Only count those that you can prove must be heterozygous.)

A. 0
B. 1
C. 2
D. 3
E. 4
F. 5
G. 6

5) Select each true statement about a Mendelian trait.

Choose all that apply:

A. If you know the genotype of an organism, then you know its phenotype.
B. If you know the phenotype of an organism, then you know its genotype.
C. The genotype of an organism can be different than both of its parents.
D. The phenotype of an organism can be different than both of its parents.

6) A child of a red-green colorblind father will always be either colorblind or a carrier for colorblindness.

A. True
B. False

7) We are currently experiencing a mass extinction event. How many mass extinctions has Earth experienced before the current extinction event?_____

8) Sometimes one allele becomes more common than another allele in a population due to random chance. We call that phenomenon:

A. Mitochondrial Decay
B. Population Bottleneck
C. Founder Effect
D. Genetic Drift

9) In the cross **AaBb × AaBb**, what portion of the offspring do we expect to have the dominant phenotype for both trait **A** and trait **B**?

_____

10) Which of the following are examples of GMOs?

Choose all that apply:

A. Iodine-free Table Salt
B. Insulin-producing bacteria
C. Insect-resistant crops
D. Modified mosquitos

11) Where would you rather live?

A. Sahara Desert
B. Antarctica

12) Select each blood type that could result from the cross of the genotypes:
AO-- × AA+-

Choose all that apply:

A. AB+
B. AB-
C. B+
D. B-
E. A+
F. A-
G. O+
H. O-

13) Select each blood type that could result from the cross of the genotypes:
BO++ × AO+-

Choose all that apply:

A. AB+
B. AB-
C. B+
D. B-
E. A+
F. A-
G. O+
H. O-

14) Select each blood type that is possible for a parent of a child with **O+** blood.

Choose all that apply:

A. AB+
B. AB-
C. B+
D. B-
E. A+
F. A-
G. O+
H. O-

15) Use the code below and the idea of codons to explain why she wasn't able to view the sky.
BIINLMTYTHEFOGDIDNOTLETHERSEETHESKYJYMRRKJ

A. Her eyes were closed.
B. Her view was impeded by too much mist.
C. She was indoors.
D. She was colorblind.

16) How many amino acids need to come from our diet?

_____

17) How many chromosome pairs do humans have?

_____

18) What nucleotide sequence in a DNA strand is paired with the sequence ACCTGAG?

A. TAACGTG
B. CAAGTCT
C. CGGATCT
D. TGGACTC

Key:
1. C
2. C
3. C
4. F
5. C, D, A
6. B
7. 5
8. D
9. 9/16
10. C, D, B
11.
12. F, E
13. E, A, C, G
14. E, C, G, D, F, H
15. B
16. 9
17. 23
18. D