مراجعة هيكل



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المزيد من مادة أحياء: ملفات ا كتب للمعلم ا كتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس
إعداد: كريم زهو

التواصل الاجتماعي بحسب الصف الثاني عشر المتقدم					
صفحة المناهج الإماراتية على فيسبوك					
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المزيد من الملفات بحسب الصف الثاني عشر المتقدم والمادة أحياء في الفصل الأول	
1	مراجعة هيكل
2	هيكل اختبار نهاية الفصل – انسباير
3	هيكل اختبار نهاية الفصل - سيناريو 2 – بريدج
4	شرح ارتباط الجينات وتعدد المجموعات الكروموسومية – الوحدة 4 القسم 3
5	شرح وحل علم الوراثة التطبيقي – التناسل الانتقائي والتهجين

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الأحياء

مراجعة هيكل

للصف الثاني عشر متقدم



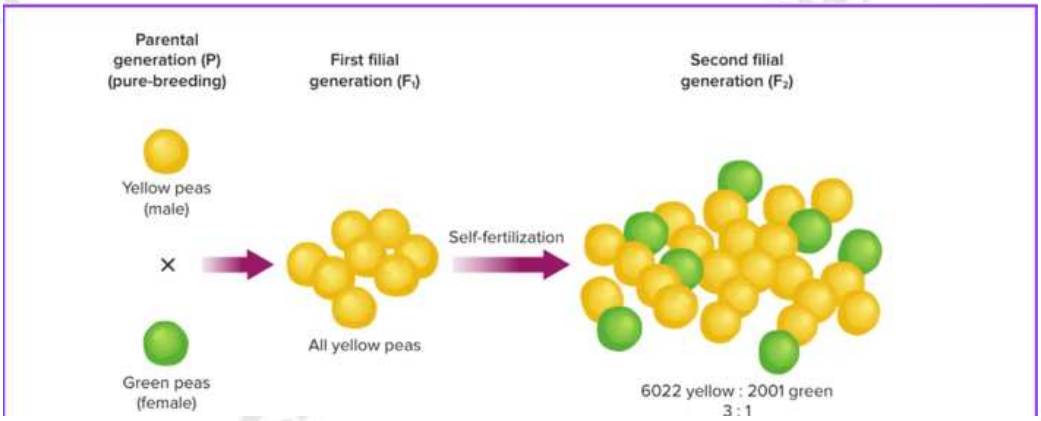
دكتور
كريم زهو

HOW GENITICS BEGAN

- AT 1866 MENDEL PUPLISHED HIS FIRST STUDY ON THE METHODS OF INHERITANCE.
- HE SUCCEDED IN BREEDING PEA PLANTS TOGETHER.
- Inheritance / Heridety : is the passing of traits to the next generation.
- Genitics is the study of Heridety.

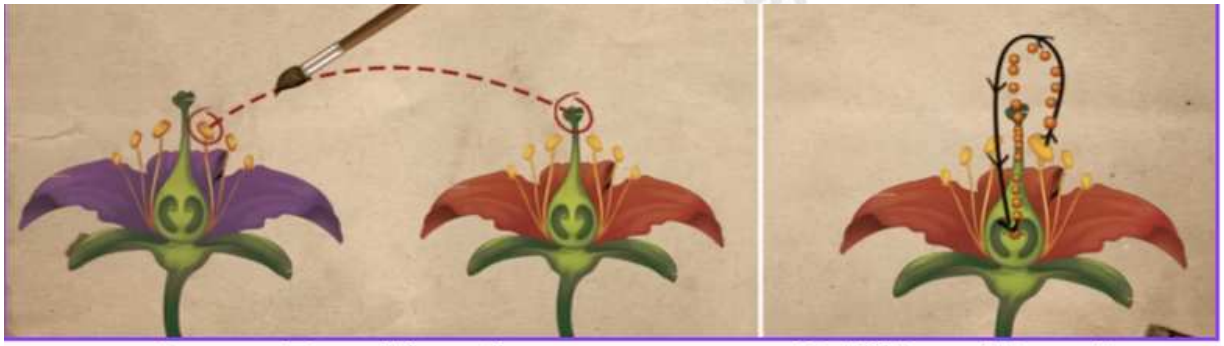
MENDIL EXPERIMENT

- 1. Mendel crossed pure-breeding yellow-seeded pea plants (male) with pure-breeding green-seeded pea plants (female) in the parental generation (P).
- 2. All the offspring in the first filial generation (F_1) had yellow seeds.
- 3. Mendel allowed the F_1 plants to self-fertilize.
- 4. In the second filial generation (F_2), both yellow and green seeds appeared.
- 5. The total number of seeds was:
- 6022 yellow seeds.
- 2001 green seeds.
- 6. The phenotypic ratio of yellow to green seeds was approximately 3 : 1.



WHY PEA PLANTS EXACTLY

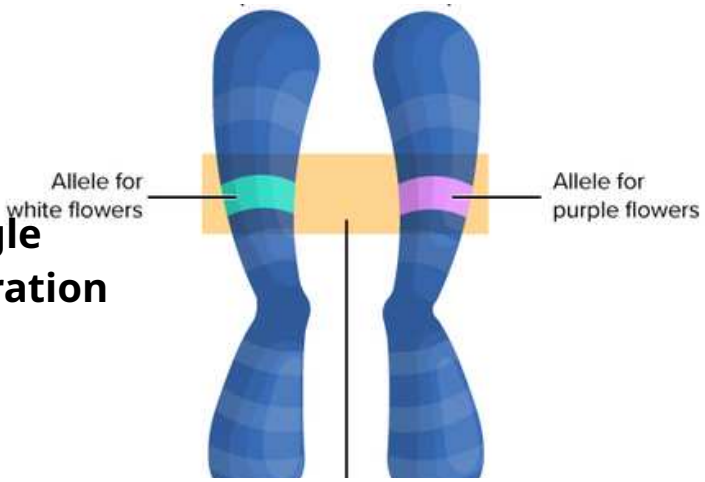
- They are true-breeding plants.
- They consistently produce offspring with the same traits.
- They are capable of self-fertilization.
- They are easy to cross-fertilize.



Cross Fertilization | Self Fertilization

ALLELES

- Mendel concluded that there must be a factor affecting pea seed colour.
- This factor is called an ALLELE.
- Allele: An alternative form of a single gene that is passed from one generation to another.
- An allele is a variant of a gene responsible for a particular trait.



- **The allele must come in pair Either:**
- - HOMOZYGOUS: An Organism with two of the same alleles for the trait YY Or yy.
- - Heterozygous: An Organism with two of different alleles for a trait Yy

TRAITS

- **Dominant trait:** is the trait that appears in the first generation.

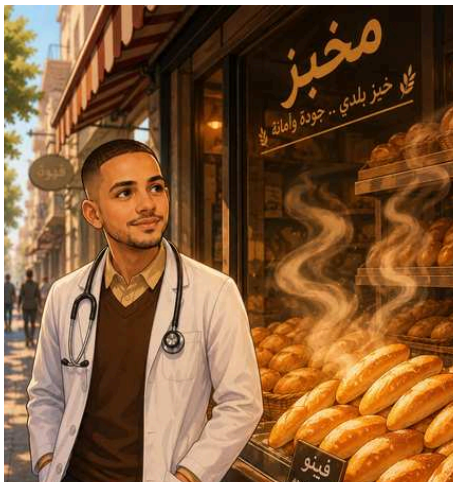


- **Recessive trait:** is a trait masked in the first generation and appears later on.



GENOTYPE VS PHENOTYPE

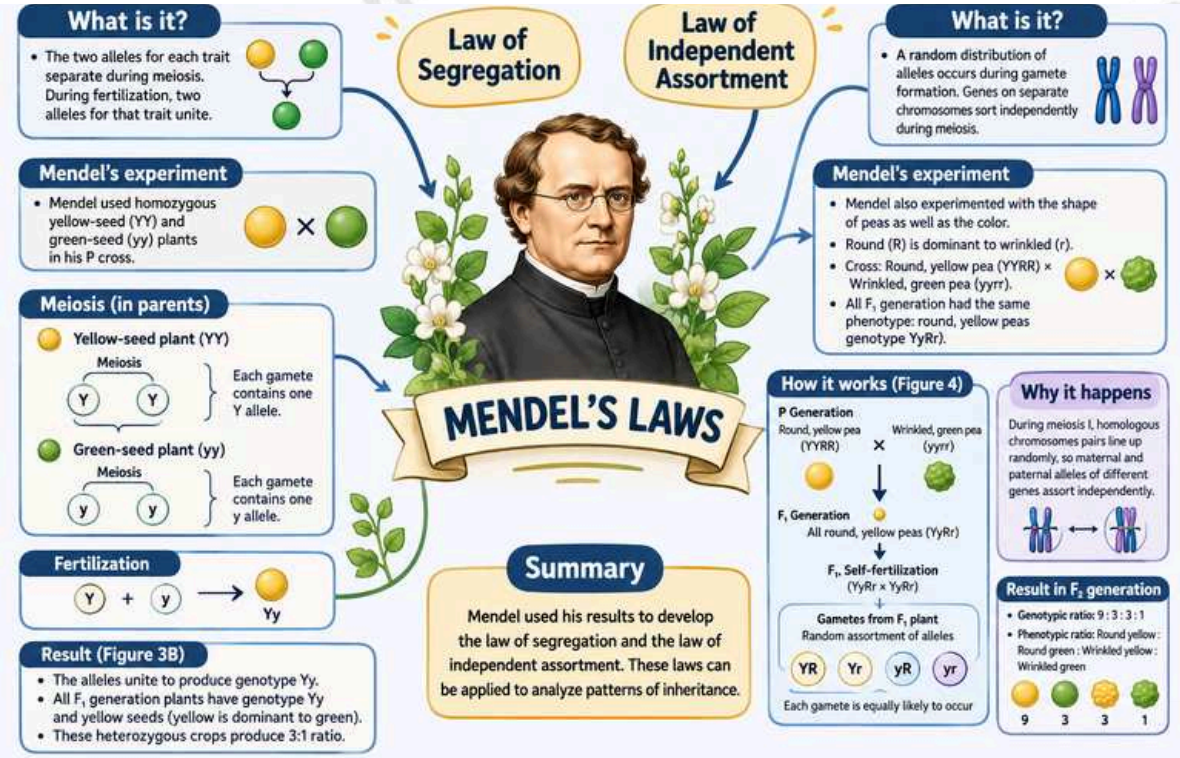
- **Genotype: The organism's allele pair YY OR Yy.**
- **Phenotype: The Observable characteristics or outward expression of an allele pair.**



Get It?

Infer whether an individual with a recessive phenotype for a trait is heterozygous or homozygous for that trait.

MENDEL'S LAWS



Get It?

Restate Mendel's law of segregation in your own words.

LAW OF SEGREGATION

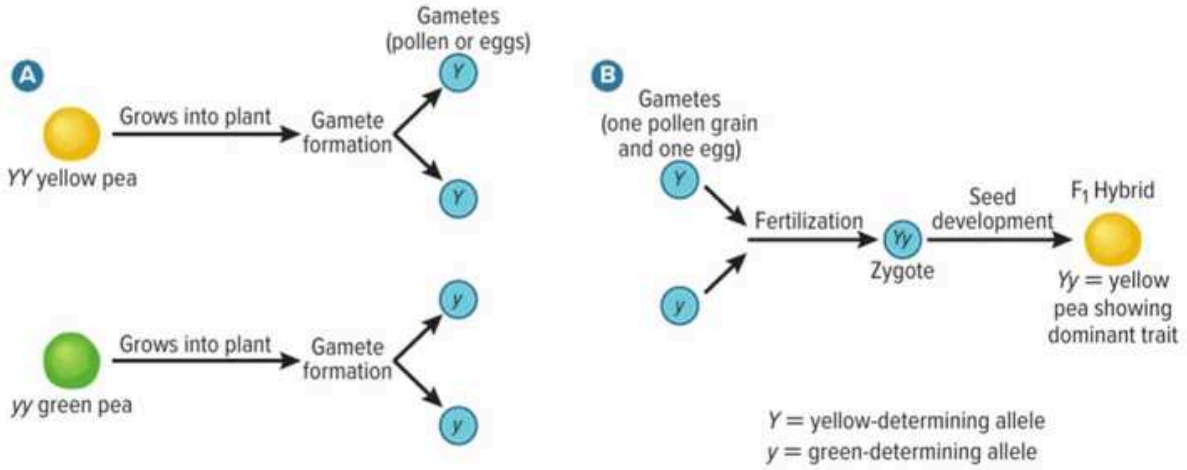


Figure 3 During gamete formation in the *YY* or *yy* plant, the two alleles separate, resulting in *Y* or *y* in the gametes. Gametes from each parent unite during fertilization.

LAW OF INDEPENDENT ASSORTMENT

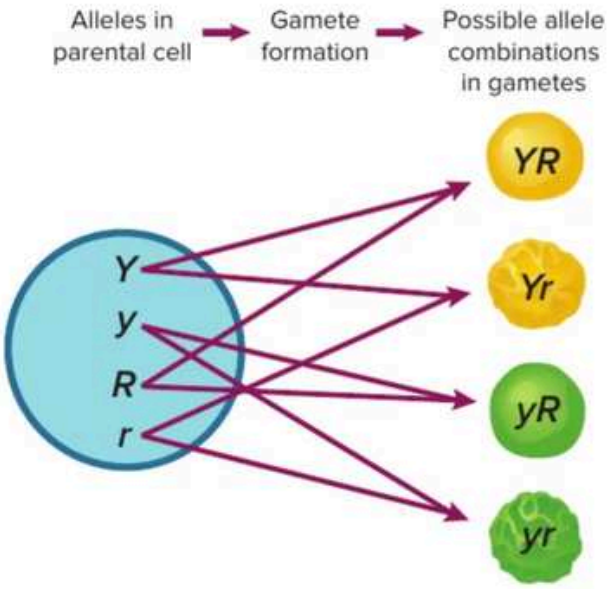


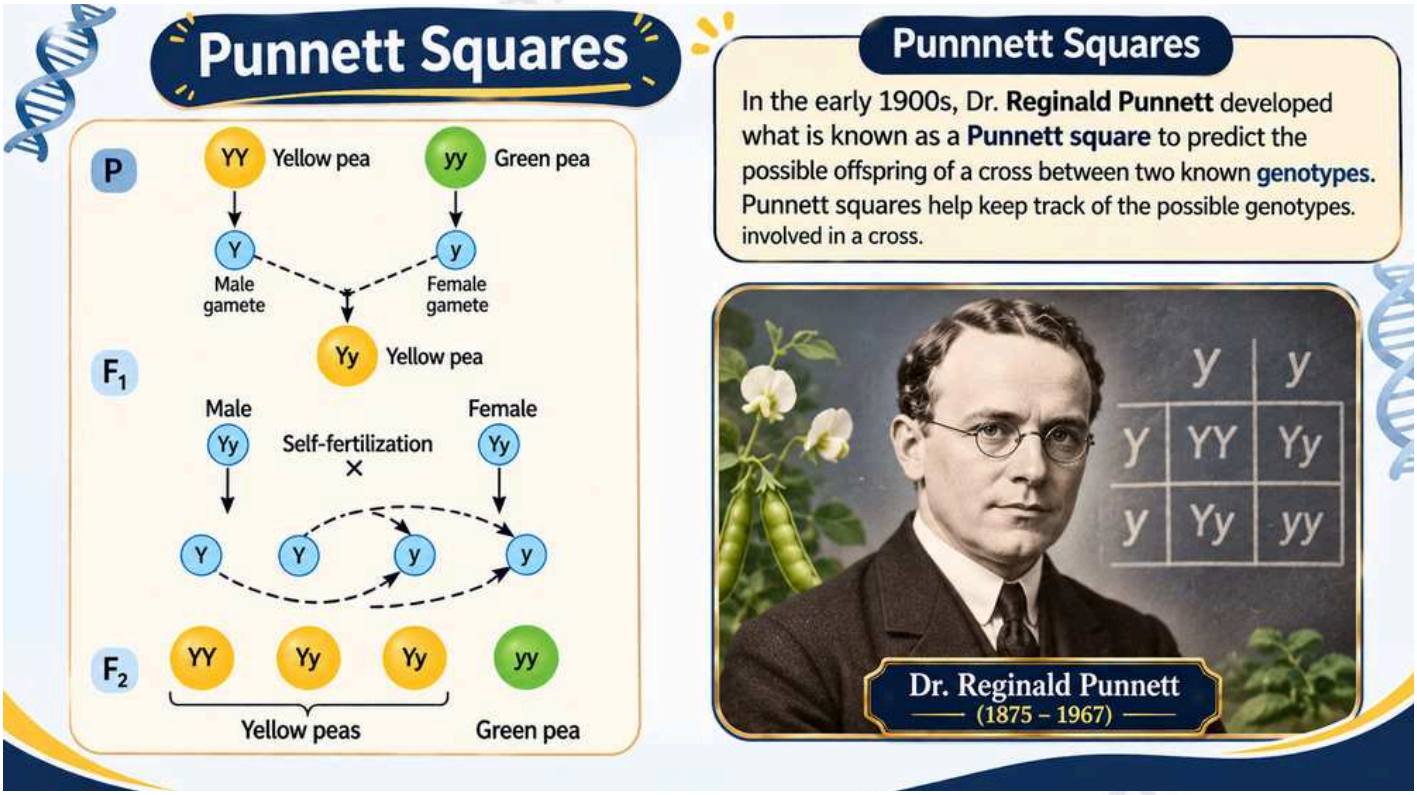
Figure 4 The law of independent assortment is demonstrated by the equal chance that each pair of alleles (*Yy* and *Rr*) can randomly combine with each other.

Predict *how many possible gamete types can be produced.*

Get It?

Evaluate How can the random distribution of alleles result in a predictable ratio?

PUNNET SQUARE

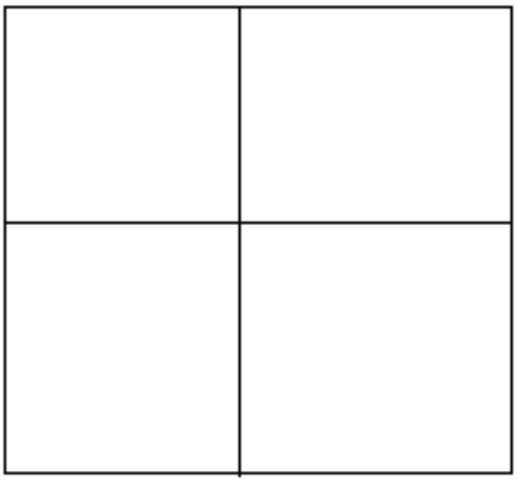


- **Monohybrid Cross:** involves hybrids for a single trait.

GENOTYPIC RATIO:

PHENOTYPIC RATIO:

FRECKLESS EXAMPLE

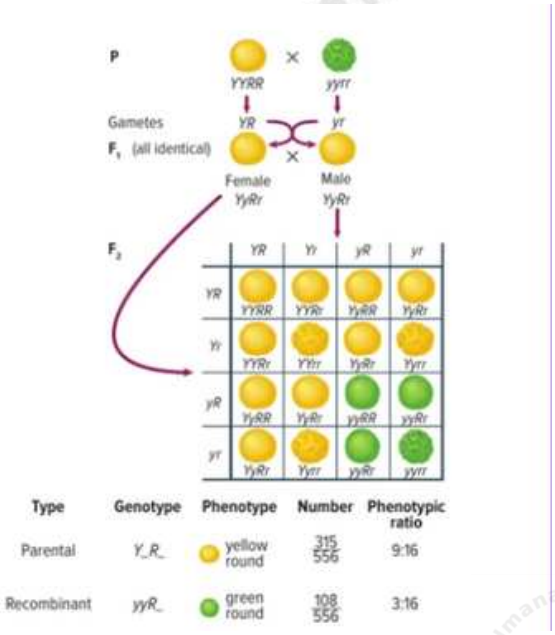


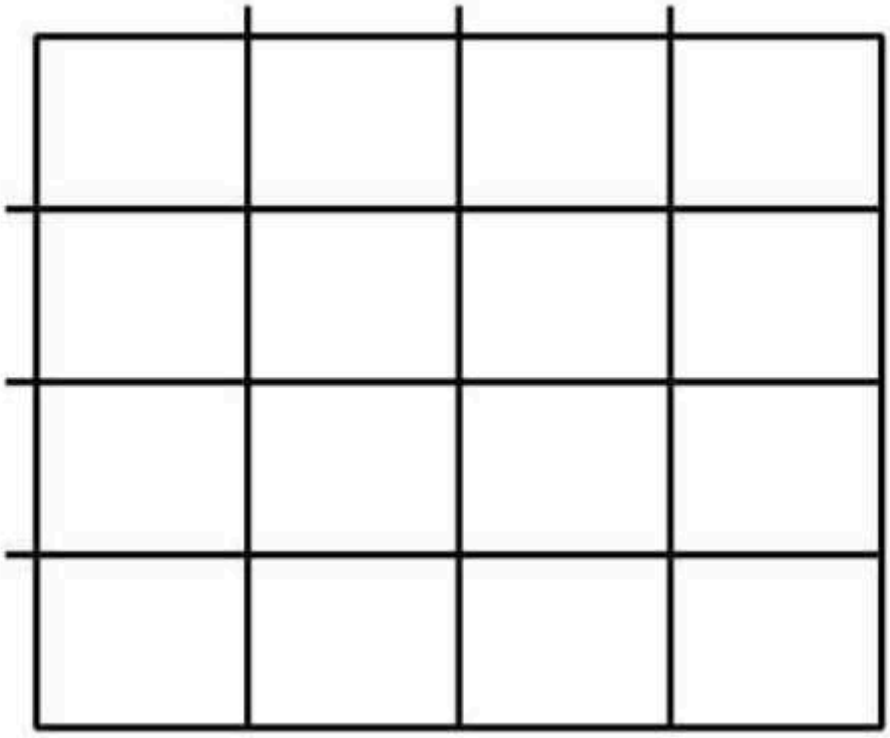
GENOTYPIC RATIO:

PHENOTYPIC RATIO:

- **Dihybrid Cross**
- **- After studying the inheritance of a single trait, Mendel studied the simultaneous inheritance of two or more traits in the same plant.**



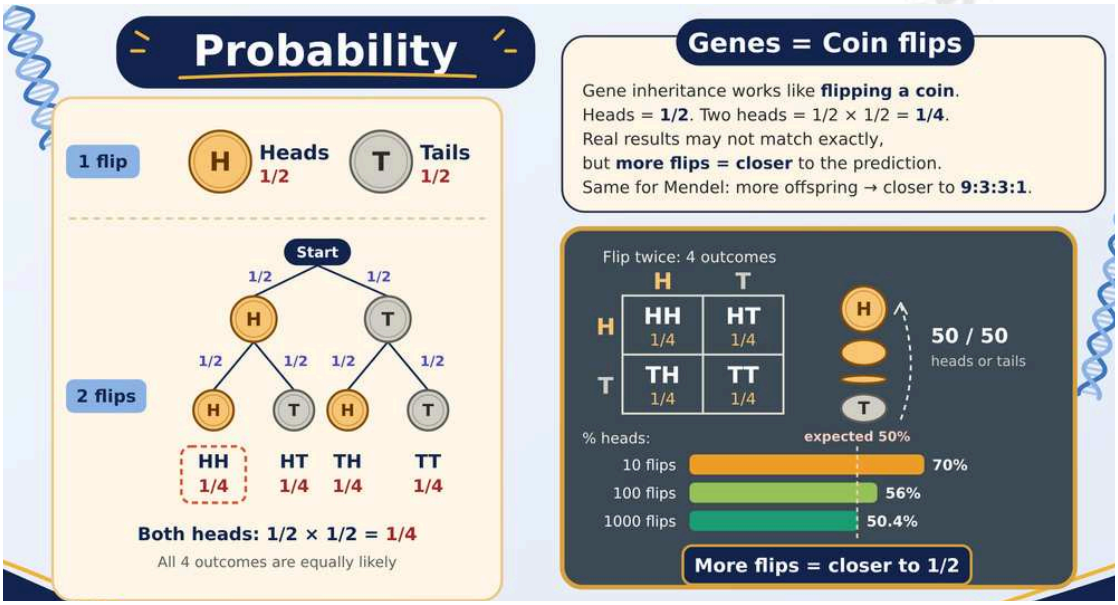




YELLO ROUNDED:

GREEN ROUNDED:

PROBABILITY



QUESTIONS

1. The genotype of an organism is:

A) its observable characteristics
B) its allele pair for a trait
C) the number of its offspring
D) the environment it lives in

2. The phenotype is:

A) the observable characteristic, or outward expression, of an allele pair
B) the allele pair itself
C) only the recessive allele
D) the ratio of the offspring

3. A pea plant with the genotype yy has which phenotype?

A) yellow seeds
B) wrinkled seeds
C) a mix of yellow and green seeds
D) green seeds

4. Which of these is a genotype?

A) yellow seeds
B) green seeds
C) Yy
D) tall plant

5. Which of these is a phenotype?

A) YY
B) Yy
C) yy
D) green seeds

6. A YY pea plant and a Yy pea plant have:

A) the same phenotype (yellow seeds)
B) YY yellow seeds, Yy green seeds
C) both green seeds
D) YY yellow seeds, Yy pale yellow seeds

7. Can two organisms have the same phenotype but different genotypes?

A) No, never
B) Only in animals
C) Yes, for example YY and Yy pea plants
D) Only if both are recessive

8. The genotype of a homozygous recessive green-seed pea plant is:

A) YY
B) Yy
C) yY
D) yy

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9. Why does the phenotype not always reveal the genotype?

A) The alleles disappear after fertilization

B) A dominant allele can mask a recessive allele

C) The phenotype is completely random

D) Genes change with the age of the plant

10. A dominant trait is the trait that:

A) is masked in the first generation

B) appears in the first generation (F1)

C) is always rare in a population

D) disappears in the second generation

11. A recessive trait is a trait that:

A) appears in every F1 plant

B) can never be inherited

C) is masked in the first generation and appears later on

D) is written with a capital letter

12. When modeling inheritance, the dominant allele is written as:

A) a capital letter

B) a lowercase letter

C) a number

D) a Greek symbol

13. The recessive allele is written as:

A) a capital letter

B) a number

C) a lowercase letter

D) a symbol

14. Mendel crossed homozygous yellow (YY) with homozygous green (yy) pea plants. The F1 plants were:

A) YY, yellow

B) Yy, yellow

C) Yy, green

D) yy, green

15. Why did the green-seed trait not show up in the F1 generation?

A) The y allele was lost during meiosis

B) The yellow allele is dominant and masks the green allele

C) The green allele mutated

D) Green plants cannot reproduce

16. When the Yy F1 plants self-fertilize, the phenotypic ratio of yellow to green seeds in F2 is about:

A) 3:1

B) 1:1

C) 1:2:1

D) 9:3:3:1

17- Mendel's law of segregation states that:

A) The dominant allele always replaces the recessive allele
B) The two alleles for each trait separate during meiosis and unite again at fertilization
C) Each gamete carries both alleles of a trait
D) Alleles of different genes sort independently of each other

18- Mendel's law of independent assortment states that:

A) All traits are inherited together
B) Only dominant alleles enter the gametes
C) The F1 generation always looks like the P generation
D) Genes on separate chromosomes sort independently during gamete formation

19- Mendel crossed round yellow peas (YYRR) with wrinkled green peas (yyrr). What were the F1 plants?

A) 9 round yellow : 3 : 3 : 1
B) All YyRr, round and yellow
C) Half round yellow and half wrinkled green
D) All yyrr, wrinkled and green

20- Two YyRr plants are crossed. What fraction of the offspring is expected to be wrinkled and green (yyrr)?

A) 1/16
B) 3/16
C) 9/16
D) 1/4



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MENISTRY AND PREVIOUS EXAM QUESTIONS

In a population of chickens, feather color is determined by a single gene with two alleles: B (for black feathers) and W (for white feathers). When a homozygous black-feathered chicken (BB) is crossed with a homozygous white-feathered chicken (WW), the offspring have feathers that are a blend of black and white, resulting in a blue appearance (BW). What phenotypic ratios would you expect from crossing two heterozygous chicken?

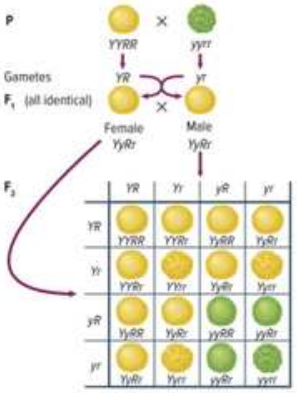


a. 2 black : 2 white
b. 1 black : 1 blue : 1 white
c. 1 black : 2 blue : 1 white
d. 2 blue : 2 white

Two parents, both heterozygous for a specific gene (Aa), are expecting a child. This gene has two alleles: A (dominant) and a (recessive). What is the probability that their child will inherit the homozygous dominant genotype (AA)?

a. The probability that the children will inherit the homozygous dominant genotype is 25 percent.
b. The probability that the children will inherit the homozygous dominant genotype is 50 percent.
c. The probability that the children will inherit the homozygous dominant genotype is 75 percent.
d. The probability that the children will inherit the homozygous dominant genotype is 100 percent.

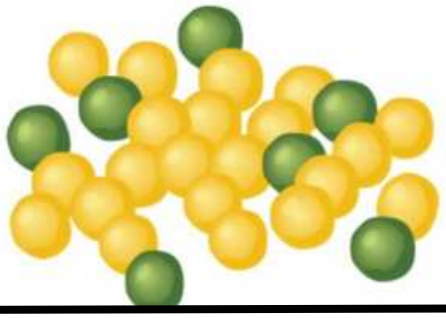
The dihybrid Punnett square below visually presents the combination of the possible alleles of two pea plants. Which is the phenotypic ratio of pea plants with yellow round peas in the second generation?



A. 9:16
B. 3:16
C. 1:16
D. 8:16

The figure below represents the offspring of two pea plants.

Which is the ratio of pea plant offspring with recessive green seeds if both parents are hybrids?



A) 25%
B) 50%
C) 75%
D) 100%

If a black hamster (Bb) were crossed with a white hamster (bb) what would be the resulting phenotypic ratio?

A) 3:1 black to white
B) 1:1 black to white
C) 0:1 black to white
D) 1:0 black to white

The figure below shows a cat with curled ears that was crossed with a cat with non-curled ears. All the kittens born from that cross had noncured ears. Later, when these offspring were crossed with each other, the phenotypic ratio was 3:1 noncured to curled ears.

Which conclusion can be made regarding the curled ears trait?



A) It is a recessive trait
B) It is a dominant trait
C) More crosses need to be done to determine how the trait is linked
D) Curled ears are a result of crossing over

In the guinea pigs shown below, black coat (B) is dominant to brown coat (b). If one black and one brown guinea pigs that are homozygous for the trait of the fur color were used in a test cross, what percentage of the offspring will have black coats?



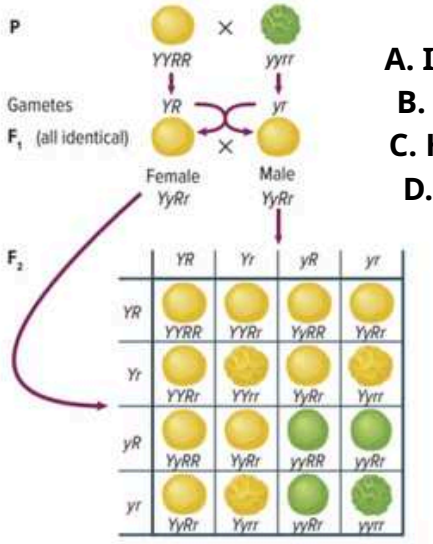
A. 50 % black
B. 25 % black
C. 75 % black
D. 100 % black

In chickens, red comb (R) is dominant to white comb (r). If a homozygous red-combed rooster is mated with a white-combed hen and all the chicks in the F1 generation were kept together as a group for several years. They were allowed to mate only within their own group. What is the expected phenotype of the F2 chicks?

A. 100% red comb
B. 100% white comb
C. 75% red comb and 25% white comb
D. 50% red comb and 50% white comb

The dihybrid Punnett square below visually presents the combination of the possible alleles of two pea plants.

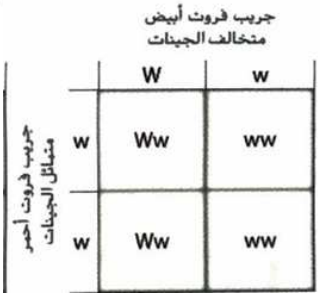
Which of the following results in four possible gametes, each of which is equally likely to occur?



A. Independent assortment
B. Heterozygous recessive
C. Homozygous dominance
D. Homozygous recessive

Use the corresponding Punnet box to answer the following questions:
What is the percentage of genotypes of offspring members in the mating described

A. 1:2:1
B. All are heterogeneous
C. 1:1
D. All are homogeneous recessive



Which term describes an organism that has two different alleles for a particular trait?

A. True-breeding
B. Homozygous
C. Heterozygous
D. Recessive

What phenotypic ratio did Mendel observe in the F2 generation during a monohybrid cross between heterozygous pea plants?

A. 1:2:1
B. 9:3:3:1
C. 3:1
D. 1:1

Mendel's Law of Segregation states that during gamete formation, what happens to the two alleles for a trait?

A. They separate so that each gamete receives only one allele.
B. They stay bound together on the same chromosome.
C. They duplicate to give each gamete two identical alleles.
D. They blend together into a single intermediate allele.

Which law states that random distribution of alleles occurs during gamete formation when genes are located on separate chromosomes?

A. Law of Independent Assortment
B. Law of Segregation
C. Law of Probability
D. Law of dependent assortment

How many distinct gamete combinations can be produced by a pea plant with the genotype YyRr?

A. 2
B. 16
C. 8
D. 4

In a dihybrid cross between two heterozygous individuals (YyRr×YyRr), what phenotypic ratio is expected in the offspring?

A. 1:2:1
B. 9:3:3:1
C. 3:1
D. 1:1:1:1

If two parents are both heterozygous for freckles (Ff), a dominant trait, what is the probability that their child will NOT have freckles?

A. 3/4
B. 1/4
C. 1/16
D. 1/2

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Why might actual experimental results differ slightly from the predicted ratios in a Punnett square?

A. Punnett squares are mathematically inaccurate.
B. Small sample sizes are more subject to chance variation.
C. Meiosis produces unequally functional gametes.
D. Dominant alleles change into recessive alleles randomly.

Which of the following statements summarizes the genetic research completed by the Austrian plant breeder Gregor Mendel?

A. Mendel bred various dog breeds to discover the science of genetics.
B. Mendel hypothesized that the offspring of pea plant traits are inherited.
C. After years of research, Mendel identified the genes for flower colors.
D. Using Punnett squares, Mendel developed the principles of genetics.

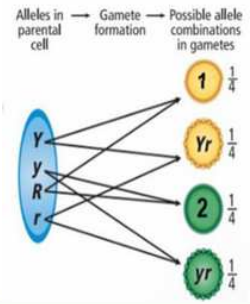
Mendel took the pollen from a tall pea plant and pollinated the flower of a short pea plant. When he did this, he removed the male parts of the flower of the short plant. Why was it important that he remove the male parts from the flower of the short plant?

A. Because he wanted to prevent growth.
B. Because the short pea plant was not a pure line.
C. Because the short pea plant had different genes.
D. Because he wanted to prevent self-pollination.

What describes an allele?

A. A form of a gene
B. A part of the nucleus
C. A single haploid cell with chromosomes
D. A part of the centriole

The figure below illustrates Mendel' Law of Independent Assortment. Assortment in a dihybrid cross, which gives equal chances for each pair of alleles (Yy and Rr) to Which of the following best represents the meaning of numbers (1) and (2) in the diagram?



A. YY : (1) and yR : (2)
B. YR : (2) and YY : (1)
C. RR : (2) and YR : (1)
D. yR : (2) and YR : (1)

The figure below shows a dihybrid cross in a Punnett square that displays the possible allele combinations from each parent. Which of the following genotypes corresponds to the box labeled (A)?

	YR	Yr	yR	yr
YR	YYRR	YYRr	YyRR	YyRr
Yr	YYRr	YYrr	YyRr	Yyrr
yR	YyRR	A	yyRR	yyRr
yr	YyRr	Yyrr	yyRr	yyrr

A. yyRr
B. YYrr
C. YyRr
D. yyrr

If there are five boys and no girls born into a family, what is the probability that the sixth offspring will be a girl?

A. 1/2
B. 1/3
C. 1/6
D. 1/4



DONE

سُبْحَانَكَ اللَّهُمَّ وَبِحَمْدِكَ، أَشْهَدُ أَنْ لَا إِلَهَ إِلَّا أَنْتَ، أَسْتَغْفِرُكَ وَأَتُوبُ إِلَيْكَ

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مـــــانت يابطـــــل
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