مراجعة تغطية نهاية الفصل في قوانين مندل للوراثة





تم تحميل هذا الملف من موقع المناهج الإماراتية	
موقع المناهج ⇦ المناهج الإماراتية ⇦ الصف الثاني عشر المتقدم ⇦ أحياء ⇦ الفصل الأول ⇦ ملفات متنوعة ⇦ الملف	
تاريخ إضافة الملف على موقع المناهج: 2026-11-13 23:34:05	
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	المزيد من مادة أحياء:
إعداد: Gilgil Omar	

التواصل الاجتماعي بحسب الصف الثاني عشر المتقدم					
صفحة المناهج الإماراتية على فيسبوك					
المواد على تلغرام	التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات	

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

تحميل تطبيق المناهج للهواتف الذكية	
تطبيق المناهج على Store App (آبل)	تطبيق المناهج على Play Google (أندرويد)

12ADV (Coverage)(S1-2)

Eot coverage revision

Questions (1-11)



12ADV (Coverage)(S1-2)

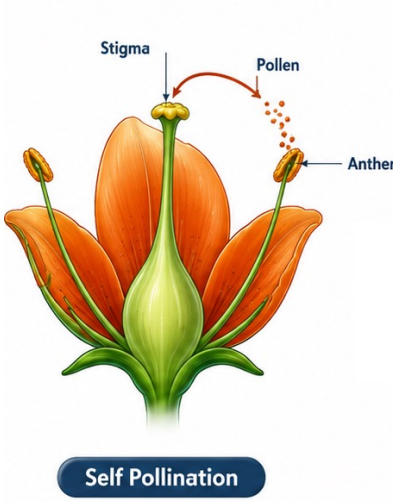
Q1-11

1	Explain the concepts of genotype, phenotype, dominance, incomplete dominance, codominance, recessiveness, and sex linkage according to Mendelian laws of inheritance	Information from text Figure 2	5
2	Explain the concepts of genotype, phenotype, dominance, incomplete dominance, codominance, recessiveness, and sex linkage according to Mendelian laws of inheritance	Information from text Figure 3	7
3	Explain the concepts of genotype, phenotype, dominance, incomplete dominance, codominance, recessiveness, and sex linkage according to Mendelian laws of inheritance	Information from text Figure 4	8

The Inheritance of Traits :

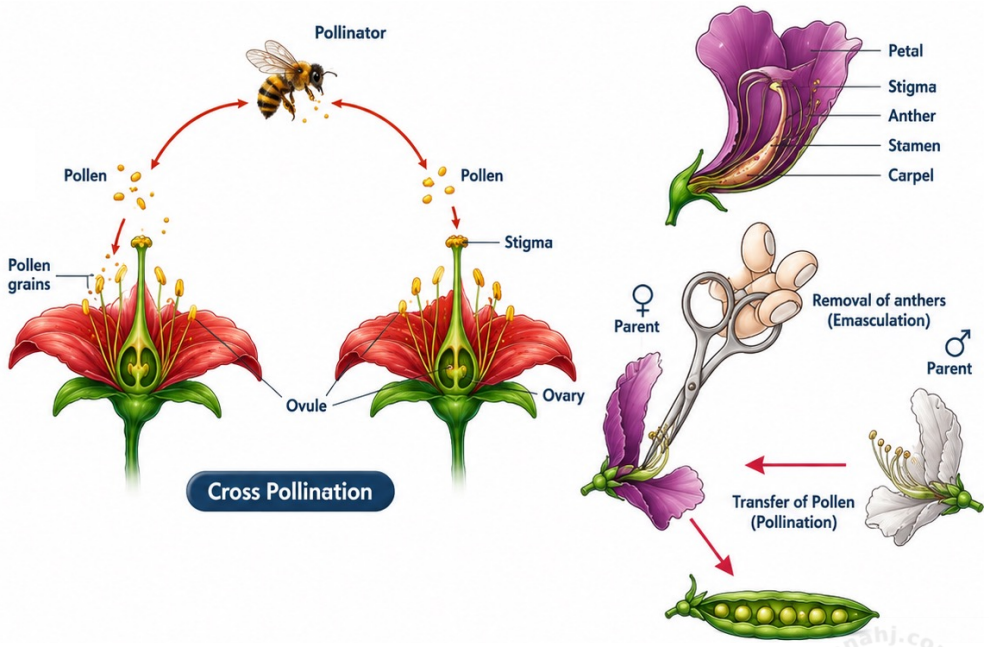
Self pollination

Combine of male and female gamete of same plant



Cross pollination (nature-artificial)

Combine of male and female gamete different plants



DR OMAR BIOLOGY COURSES

Why Mendel use pea plant for studies?

- They are **TRUE BREEDING (PURE)** -(plants that produce offspring of the same trait when they self-fertilized generation after generation).

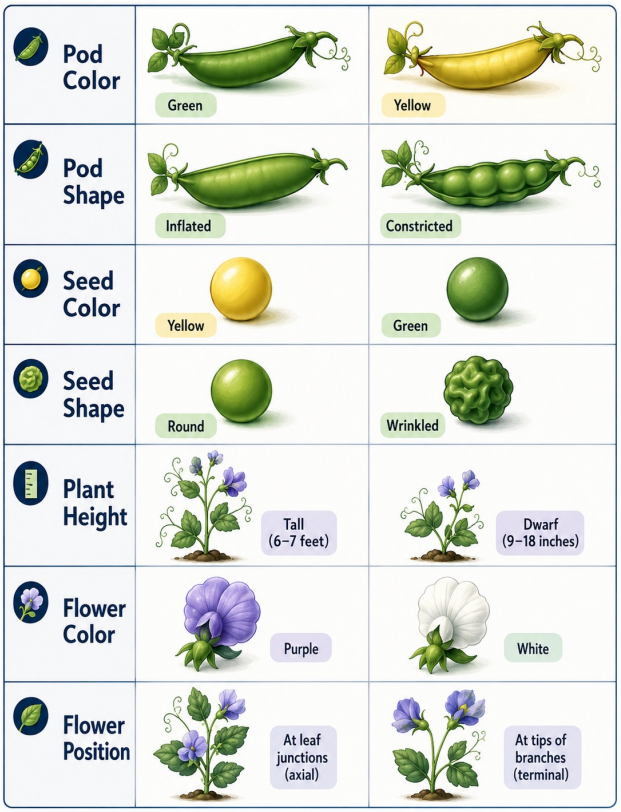
Mendel studied 7 different traits.

Seed pod :

1. Color (green or yellow).
2. Shape (inflated or constricted).

Seed or pea:

1. Color (yellow or green).
2. Shape (round or wrinkled).
3. Stem length tall or short.
4. Flower color purple or white.
5. Flower position axial or terminal.



The Inheritance of Traits :

- One trait Mendel noticed was seed color.
- Some plants always produced green seeds; others always produced yellow seeds.
- Mendel cross-bred the green and yellow seed plants.
- Mendel called the green-seed and yellow-seed plants the parent, or P generation.

DR OMAR BIOLOGY COURSES

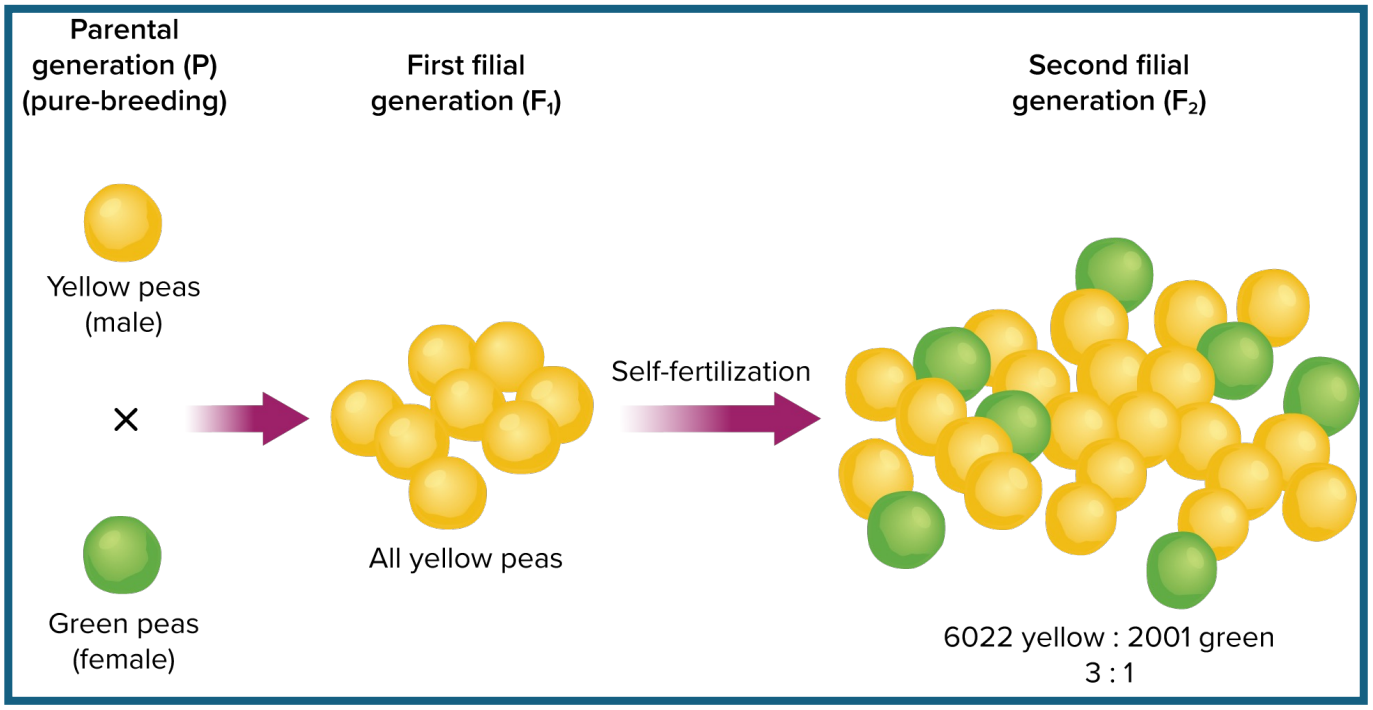


Figure 2 – The results of Mendel's cross involving true-breeding pea plants with yellow seeds and green seeds are shown here

F_1 and F_2 Generations :

- The offspring of this P cross are called the first filial (F_1) generation.
- To prevent self-fertilization, Mendel removed the male organs from the flower of the yellow-seed plant.
- The second filial (F_2) generation is the offspring from the F_1 cross.
- In Mendel's peas, the green-seed trait disappeared in the F_1 generation but reappeared in the F_2 generation.
- The F_2 generation showed a 3:1 ratio of yellow: green seeds.

The Inheritance of Traits

Mendel noticed that certain varieties of garden pea plants produced specific forms of a trait, generation after generation. For instance, he noticed that some varieties always produced green seeds and others always produced yellow seeds. In order to understand how these traits are inherited, Mendel performed cross-pollination by transferring male gametes from the flower of a true-breeding green-seed plant to the female organ of a flower from a true-breeding yellow-seed plant. To prevent self-fertilization, Mendel removed the male organs from the flower of the yellow-seed plant. Mendel called the green-seed plant and the yellow-seed plant the parent generation—also known as the P generation.

F_1 and F_2 generations

When Mendel grew the seeds from the cross between the green-seed and yellow-seed plants, all of the resulting offspring had yellow seeds. The offspring of this P cross are called the first filial (F_1) generation. The green-seed trait seemed to have disappeared in the F_1 generation, and Mendel decided to investigate whether the trait was no longer present or whether it was hidden, or masked.

Mendel planted the F_1 generation of yellow seeds, allowed the plants to grow and self-fertilize, and then examined the seeds from this cross. The results of the second filial (F_2) generation—the offspring from the F_1 cross—are shown in **Figure 2**. Of the seeds Mendel collected, 6022 were yellow and 2001 were green; almost a perfect 3:1 ratio of yellow to green seeds. Mendel studied seven traits—seed or pea color, flower color, seed pod color, seed shape or texture, seed pod shape, stem length, and flower position—and found that the F_2 generation from these crosses also showed a 3:1 ratio.

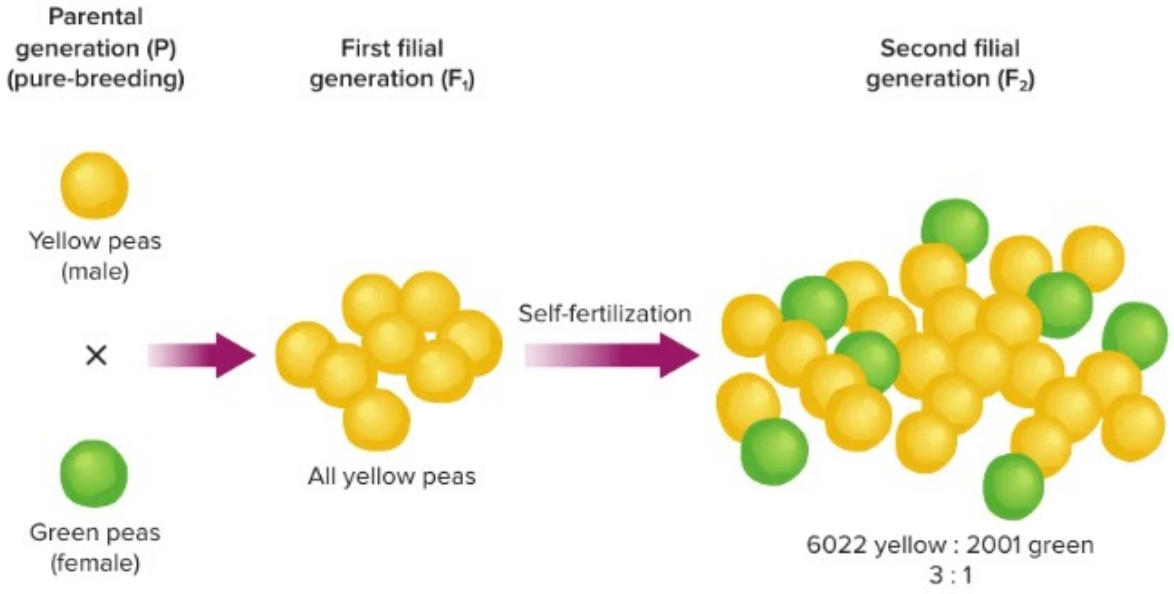


Figure 2 The results of Mendel's cross involving true-breeding pea plants with yellow seeds and green seeds are shown here.

Explain *why the seeds in the F_1 generation were all yellow.*

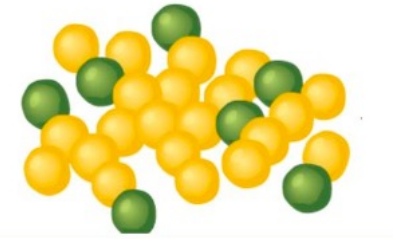
almanahj.com/ae
DR OMAR BIOLOGY COURSES

1-Why did Mendel choose pea plants for his experiments? MOE

a. They reproduce only through cross-pollination
b. They are true-breeding for certain traits
c. They change traits every generation
d. They cannot self-fertilize

2-Imagine you are performing a cross involving seed color in garden pea plants. What F_1 offspring would you expect if you cross true-breeding parents with green seeds and yellow seeds? Yellow seed color is dominant over green? MOE

a. 100 percent yellow-green seeds
b. 100 percent yellow seeds
c. 50 percent yellow, 50 percent green seeds
d. 25 percent green, 75 percent yellow seeds



3-What did Mendel call the two kinds of traits exhibited by the pea plants (one coming from the father, one from the mother)? MOE

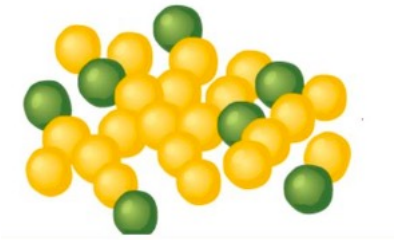
a. Alleles
b. Genesis
c. Quadrants
d. Elective traits

4-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? MOE

a. Because the short pea plant had different genes.
b. Because he wanted to prevent growth.
c. Because the short pea plant was not a pure line.
d. Because he wanted to prevent self-pollination.

5-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?

MOE



a. 25%
b. 50%
c. 75%
d. 100%

MOE

6- What describes an allele?

a. A form of a gene
b. A part of the nucleus
c. A part of the centriole
d. A single haploid cell with chromosomes

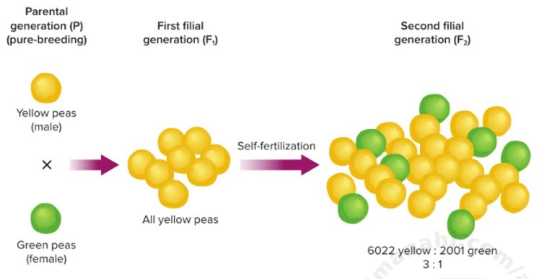
7- Which of the following best describes an organism that has different genes (alleles)?

MOE

a. Dominant
b. Genotype
c. Purebred
d. Hybrid

8-If Y = yellow and y = green, what is the genotype of the F 1 peas in Figure 2?

a. YY
b. yy
c. Yy
d. Y

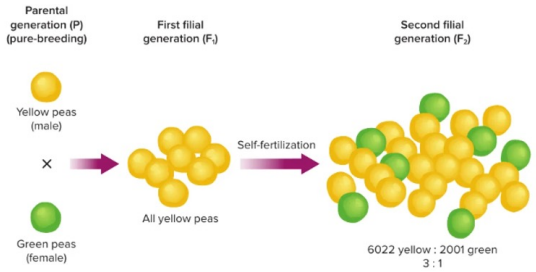


9- Which describes an individual that is represented by Bb in a Mendelian cross?

a. homozygous
b. parental
c. heterozygous
d. recessive

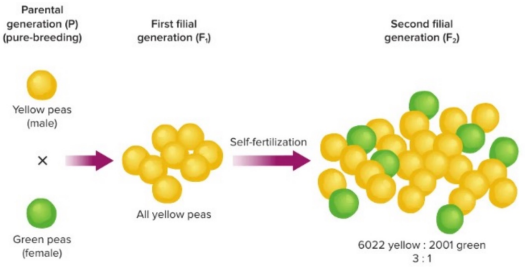
10-What is the genotype of the green pure-breeding parent in the P generation?

a. yy
b. Yy
c. YY
d. Y



11-Which ratio do 6022 yellow : 2001 green approximate?

a. 1 : 1
b. 3 : 1
c. 2 : 1
d. 9 : 3

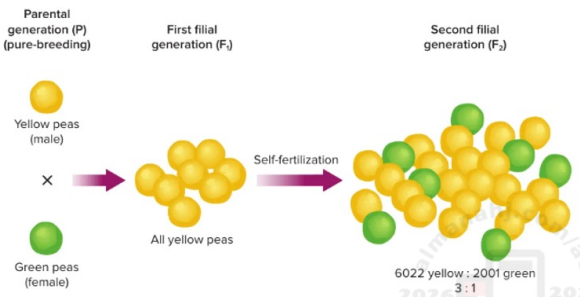


12-What does pure-breeding mean for the P generation in?

a. Heterozygous for the trait
b. Hybrid for two traits
c. Unable to self-fertilize
d. Homozygous for the trait

13-Which statement explains why green seeds reappear in the F 2 generation?

a. The F 1 peas mutate
b. Green seeds come from the male parent only
c. The F 2 peas are homozygous dominant
d. Two y alleles combine in some F 2 seeds



Mendel's Law of Segregation

- The law of segregation states that the two alleles for each trait separate during meiosis. During fertilization, two alleles for that trait unite.
- Heterozygous organisms are called **hybrids**.

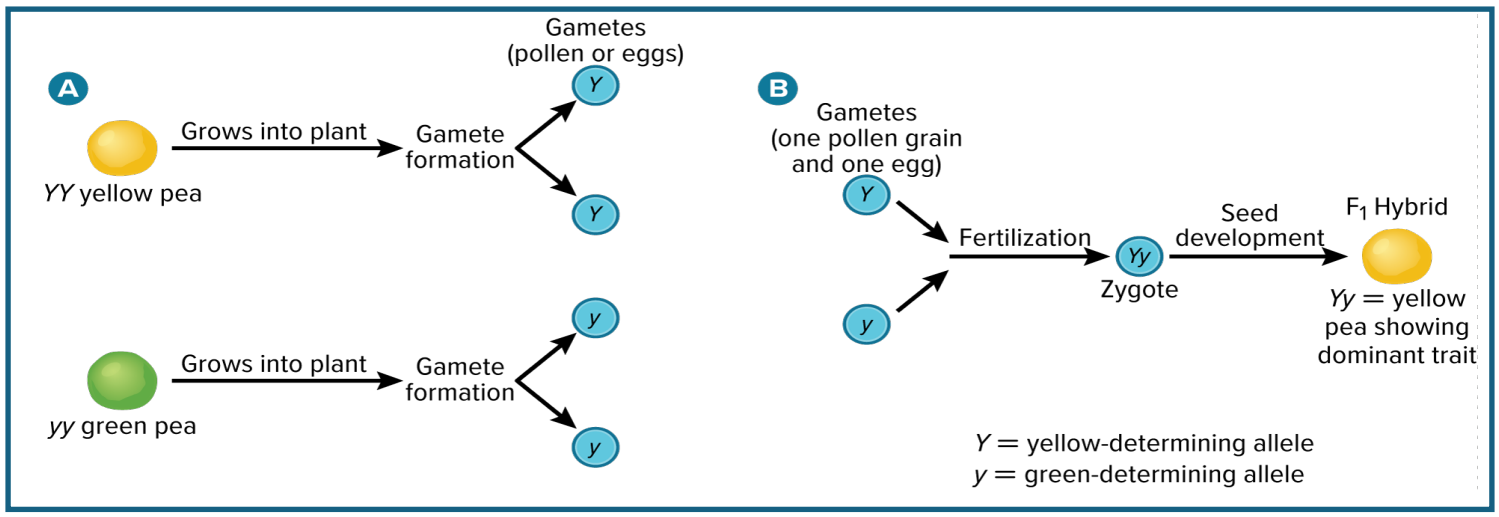


Figure 3 – During gamete formation in the YY or yy plant, the two alleles separate, resulting in Y or y in the gametes. Gametes from each parent unite during fertilization.

DR OMAR BIOLOGY COURSES

Mendel's laws

Mendel used his results to develop the law of segregation and the law of independent assortment. These laws can be applied to analyze patterns of inheritance.

Law of segregation Mendel used homozygous yellow-seed and green-seed plants in his P cross. In **Figure 3(A)**, the top drawing shows that each gamete from the yellow-seed plant contains one *Y*. Recall that the chromosome number is divided in half during meiosis. The gametes that are generated contain only one of the pair of seed-color alleles.

The bottom drawing in **Figure 3(A)** shows that each gamete from the green-seed plant contains one *y* allele. Mendel's **law of segregation** states that the two alleles for each trait separate during meiosis. During fertilization, two alleles for that trait unite.

The third drawing in **Figure 3(B)** shows the alleles uniting to produce the genotype *Yy* during fertilization. All resulting F_1 generation plants will have the genotype *Yy* and will have yellow seeds because yellow is dominant to green. These heterozygous organisms are called **hybrids.**

Get It?

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

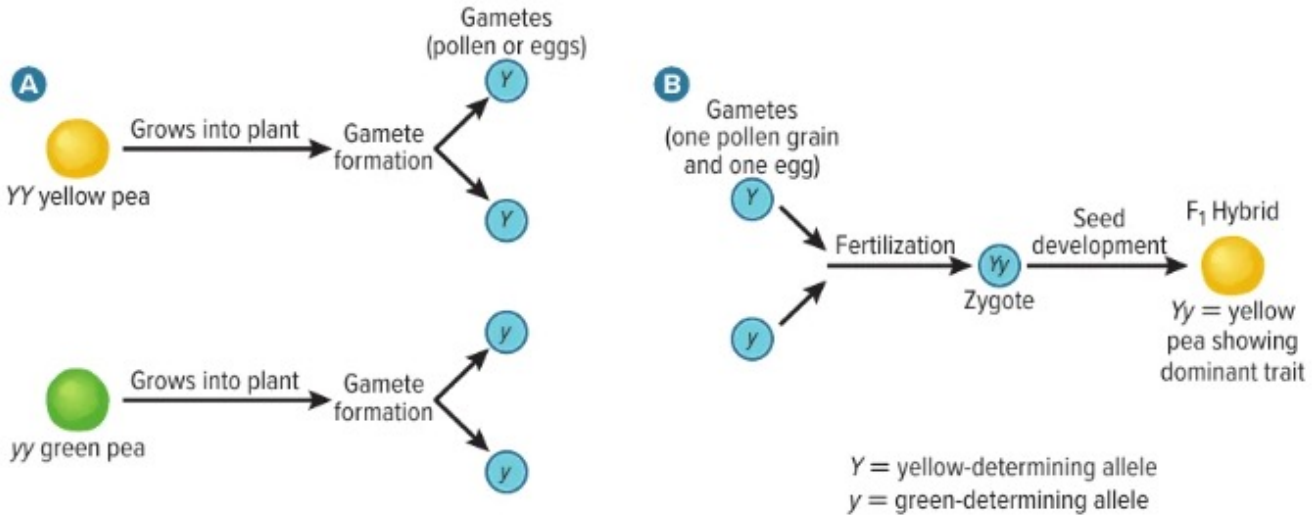


Figure 3 During gamete formation in the *YY* or *yy* plant, the two alleles separate, resulting in *Y* or *y* in the gametes. Gametes from each parent unite during fertilization.

Explain *how the zygote that results from fertilization has a different genotype than either parent plant.*

almanahj.com/ae
DR OMAR
BIOLOGY COURSES

Mendel's Law of Independent Assortment

Mendel also studied pea shape. Round (R) is dominant over wrinkled (r). He crossed a round, yellow pea (YYRR) with a wrinkled, green pea (yyrr). All F1 offspring were round and yellow (YyRr).

He let the F1 plants self-fertilize and compared the ratios of the F1 and F2 offspring. This led to the law of independent assortment: alleles are distributed randomly into gametes, so genes on separate chromosomes sort independently during meiosis (Figure 4).

This gives four equally likely gametes: YR, Yr, yR, or yr. Any of the four can be in the male gamete and any in the female gamete.

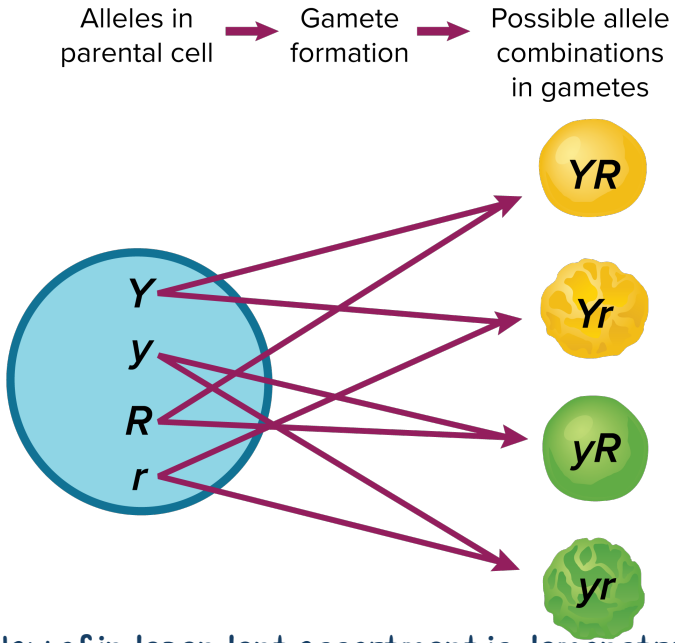


Figure 4 – The law of independent assortment is demonstrated by the equal chance that each pair of alleles (Yy and Rr) can randomly combine with each other.

Law of independent assortment Mendel also experimented with the shape of the peas as well as the color. He noticed that smooth, round peas were expressed more than wrinkled peas. He noted the dominant, round peas to have an allele *R* and the recessive, wrinkled peas to have an allele *r*.

Mendel crossed two types of peas in the parental generation: a dominant round, yellow pea (*YYRR*) with a recessive wrinkled, green pea (*yyrr*). He found that all of the F_1 generation had the same phenotype: round, yellow peas, or the genotype *YyRr*.

Mendel allowed F_1 pea plants with the genotype *YyRr* to self-fertilize in a dihybrid cross. Mendel calculated the genotypic and phenotypic ratios of the offspring in both the F_1 and F_2 generations. From these results, he developed the **law of independent assortment,** which states that a random distribution of alleles occurs during gamete formation. Genes on separate chromosomes sort independently during meiosis, as shown in **Figure 4.**

The random assortment of alleles results in four possible gametes: *YR*, *Yr*, *yR* or *yr*, each of which is equally likely to occur. When a plant self-fertilizes, any of the four allele combinations could be present in the male gamete, and any of the four combinations could be present in the female gamete.

Get It?

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

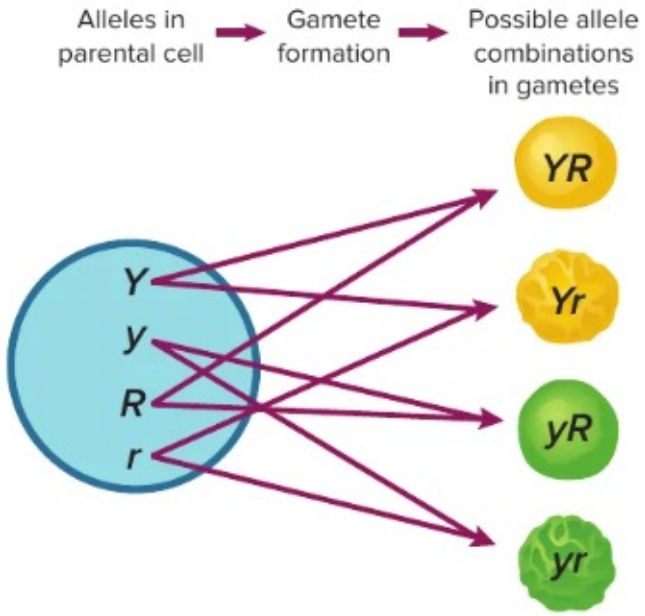


Figure 4 The law of independent assortment is demonstrated by the equal chance that each pair of alleles (*Yy* and *Rr*) can randomly combine with each other.

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

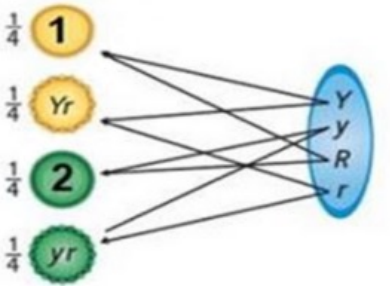
1- Which describes an individual that is represented by Bb in a Mendelian cross?

a. homozygous
b. parental
c. heterozygous
d. recessive

MOE

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

a. yR : (2) and YY : (1)
b. RR : (2) and YR : (1)
c. YR : (2) and YY : (1)
d. yR : (2) and YR : (1)



MOE

3- Which of the following concepts does NOT follow Mendel's Law of Independent Assortment?

a. Chromosome number
b. Law of Segregation
c. Crossing over
d. Gene linkage

MOE

almanahj.com/ae
DR OMAR BIOLOGY COURSES

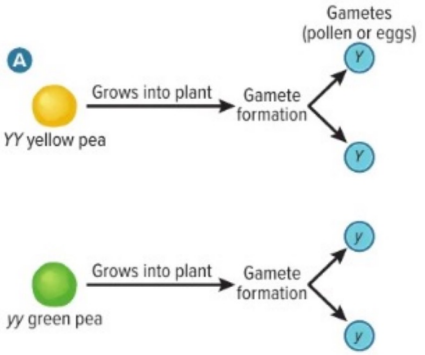
1-How many kinds of gametes does the YY plant in Figure 3(A) produce?

a. Two kinds (Y and y)

b. Four kinds

c. None

d. One kind (Y)



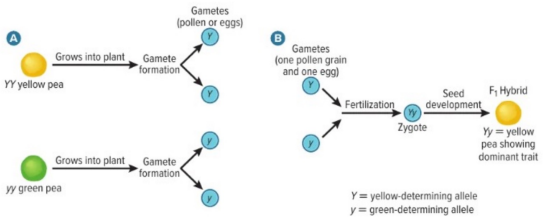
2-Which law does Figure 3 illustrate?

a. Law of independent assortment

b. Law of segregation

c. Incomplete dominance

d. Codominance



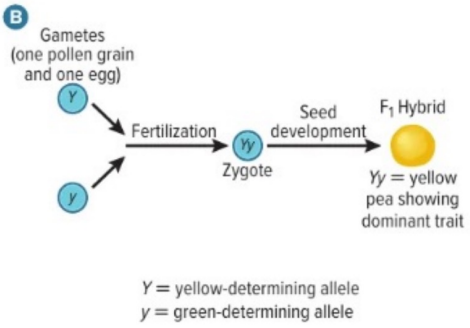
3-From which parents do the alleles of the zygote in Figure 3(B) come?

a. One allele from each parent

b. Both from the yellow parent

c. Both from the green parent

d. From the seed coat



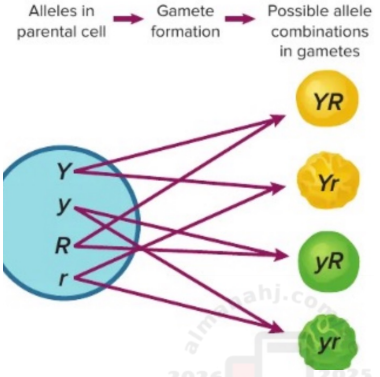
4-How many gamete types can the parental cell in Figure 4 produce?

a. 2

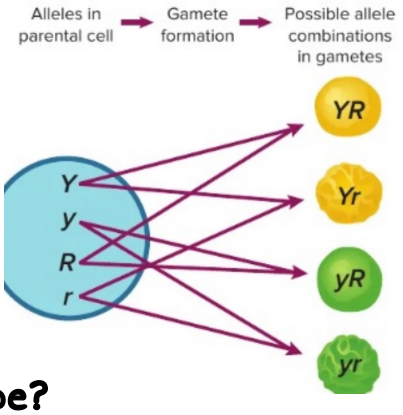
b. 4

c. 6

d. 8







5-Which law does Figure 4 demonstrate?

a. Segregation

b. Incomplete dominance

c. Independent assortment

d. Sex linkage

6-Fusion of a Yr gamete with a yr gamete gives which genotype?

a. YyRr

b. Yyrr

c. yyrr

d. YYrr

7-Why can the alleles Y and R end up together in one gamete?

a. They are on the same chromosome

b. They are both recessive

c. They are codominant

d. Genes on separate chromosomes sort independently

almanahj.com/ae
DR OMAR BIOLOGY COURSES