1 In pea plants, the allele for tall stems is dominant to the allele for short stems.

A heterozygous tall plant is crossed with a short plant, and 100 offspring are produced.

How many of the offspring are likely to be tall?

A 25 **B** 50 **C** 75 **D** 100

2 The nucleus in a body cell of a fly contains 12 chromosomes.

How many chromosomes are there in the nucleus of a sperm from this fly?

A 3 **B** 6 **C** 12 **D** 24

3 In a species of plant, the allele for red flowers (R) is dominant over the allele for white flowers (r).

Two red–flowered plants were crossed.

parents plant with red flowers × plant with red flowers

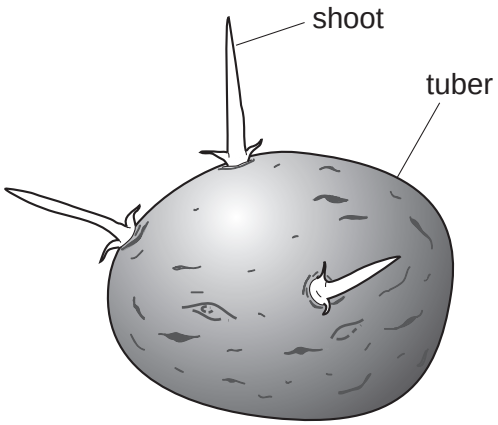
↓

offspring 93 red-flowered and 28 white-flowered

What are the genotypes of the parents?

A RR and rr **B** RR and Rr **C** Rr and Rr **D** Rr and rr

4 The diagram shows a potato tuber that developed from the stem of a parent potato plant. Three shoots are starting to grow from the tuber.



How do the genotypes of the shoots compare with the genotypes of the tuber and of the parent?

A They are all different.

B They are all identical.

C The shoots are identical to each other, but are different from the tuber and the parent.

D The shoots are identical to the tuber, but are different from the parent.

5 The colour of a mouse's fur is controlled by a single pair of alleles.

A mouse with black fur was crossed with a mouse with white fur. All the offspring had black fur.

What would be the most likely ratio in several litters of offspring if two of these black offspring were crossed?

	black fur	white fur
A	1	3
B	2	2
C	3	1
D	4	0

6 What is **always** found in female gametes and **may** be found in male gametes?

A one X chromosome

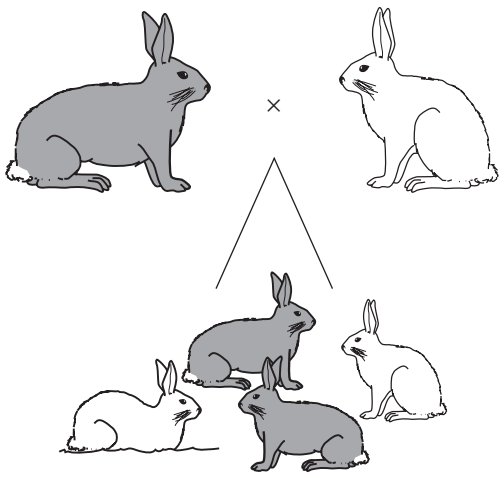
B one Y chromosome

C two X chromosomes

D one X chromosome and one Y chromosome

7 In rabbits, the allele for dark fur, R, is dominant to the allele for white fur, r.

The diagram shows a cross between a rabbit with dark fur and a rabbit with white fur.



What are the genotypes of the offspring?

A Rr and rr **B** RR and rr **C** RR and Rr **D** R and r

8 In some animals, B is the allele for normal skin (without spots) and b is the allele for spotted skin.

A pair of these animals has 37 offspring, 18 with spots and 19 without.

What are the most likely genotypes of the parents?

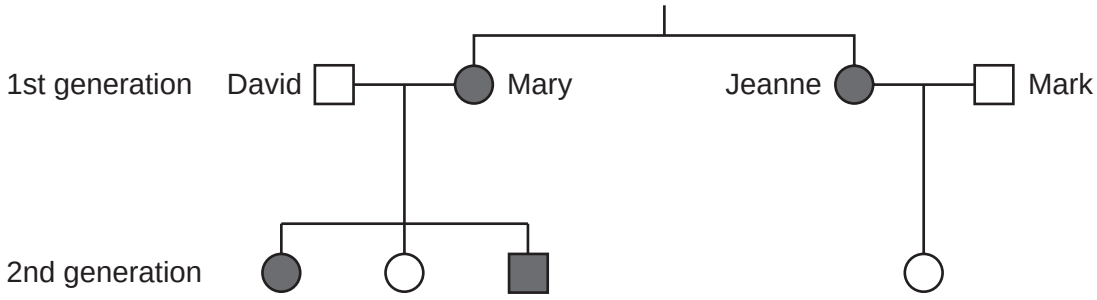
A BB × BB **B** Bb × Bb **C** Bb × bb **D** bb × bb

9 Which type of reproduction and which type of cell division produces nuclei with half the number of chromosomes?

	type of reproduction	type of cell division
A	asexual	meiosis
B	asexual	mitosis
C	sexual	meiosis
D	sexual	mitosis

10 The diagram shows a family tree and the inheritance of the ability to taste a certain substance.

The allele for the ability to taste this substance is dominant.



key

represents a male 'taster'

represents a male 'non-taster'

represents a female 'taster'

represents a female 'non-taster'

Which statement about the genotypes of the sisters Mary and Jeanne is correct?

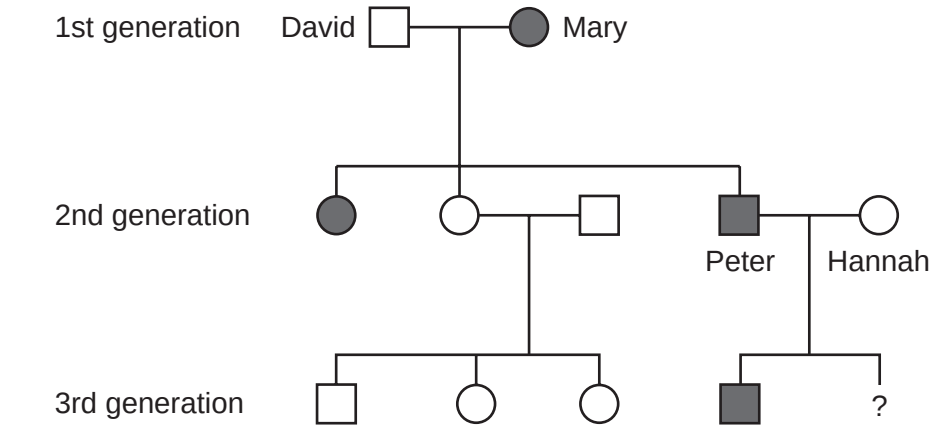
A Mary is heterozygous and Jeanne is homozygous.

B Mary is homozygous and Jeanne is heterozygous.

C They are both heterozygous.

D They are both homozygous.

11 The family tree shows the inheritance of the ability to taste a certain substance. The allele for the ability to taste this substance is dominant to the allele for the inability to taste it.



key

represents a male 'taster'

represents a male 'non-taster'

represents a female 'taster'

represents a female 'non-taster'

What is the chance of the second child of Peter and Hannah being a 'non-taster'?

A 1 in 1 **B** 1 in 2 **C** 1 in 3 **D** 1 in 4

12 Albinism is an inherited condition in which pigment does not develop in the skin, hair and eyes.

The albino allele is recessive.

What are the chances of albino parents having a normal child?

A 0 % **B** 50 % **C** 75 % **D** 100 %

13 In cats, the allele for short hair is dominant to the allele for long hair.

A short-haired cat and a long-haired cat had several families of offspring (kittens). All their kittens were short-haired.

One of these kittens matured and mated with a long-haired cat.

What would be the expected phenotypes of their offspring?

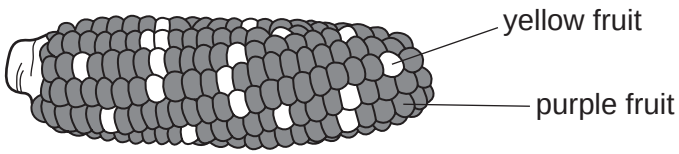
A 1 : 1 short to long

B 3 : 1 short to long

C all long-haired

D all short-haired

14 The diagram shows a maize (corn) cob with purple and yellow fruits. Purple (P) is dominant to yellow (p).



What are the genotypes of the parent maize plants?

A PP × Pp **B** PP × pp **C** Pp × Pp **D** pp × Pp

15 What is true of the chromosomes present in the daughter nuclei after meiosis and after mitosis?

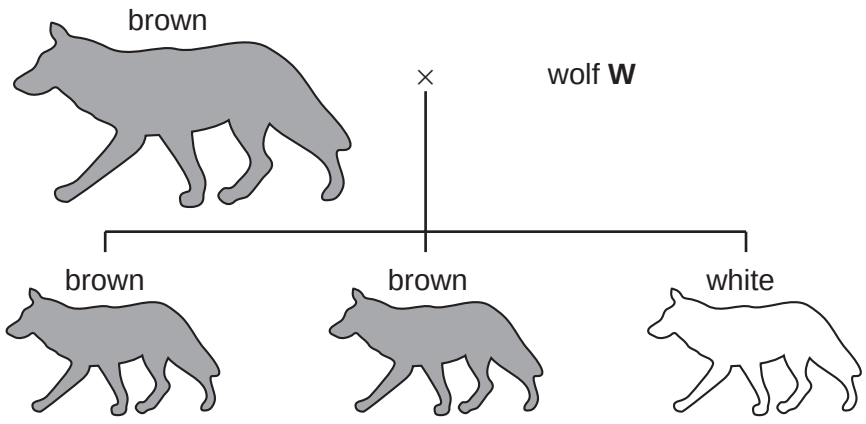
	meiosis	mitosis
A	identical	identical
B	identical	non-identical
C	non-identical	identical
D	non-identical	non-identical

16 The nucleus in each cell in the stem of a plant contains 32 chromosomes.

How many chromosomes are there in the nuclei of its pollen grains?

A 8 **B** 16 **C** 32 **D** 64

17 The diagram shows the offspring of a cross between two wolves.



Brown colour is caused by a dominant allele B and white colour by a recessive allele b.

What are the genotype and the phenotype of wolf **W**?

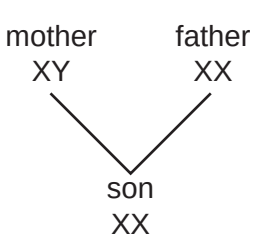
	genotype	phenotype
A	B	brown
B	Bb	brown
C	brown	B
D	brown	Bb

18 In the life cycle of a mammal, what describes the eggs or sperms and the cells of the embryo?

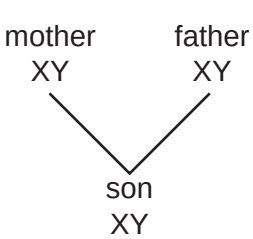
	eggs or sperms	cells of the embryo
A	diploid	diploid
B	diploid	haploid
C	haploid	diploid
D	haploid	haploid

19 Which cross shows how a boy inherits sex chromosomes from his parents?

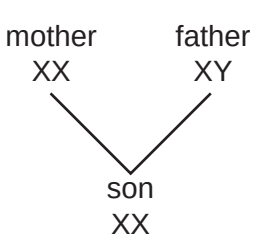
A



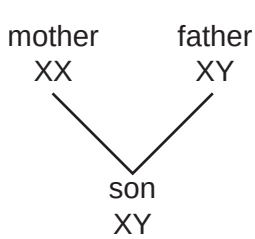
B



C



D



20 What causes humans to have different blood groups?

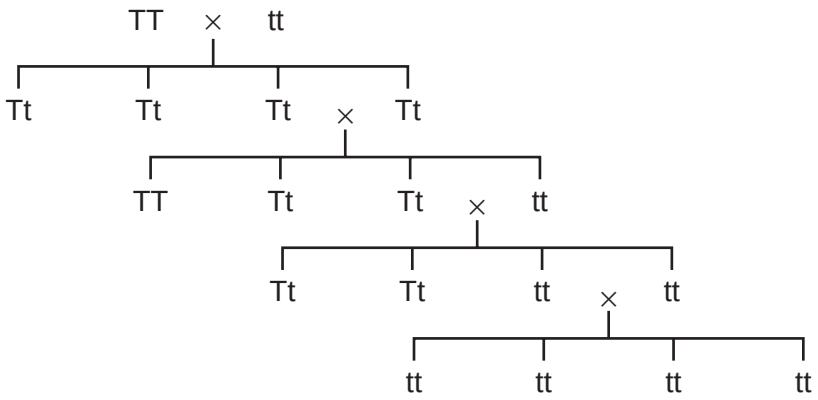
A differences in climates

B differences in diets

C differences in genes

D differences in hormones

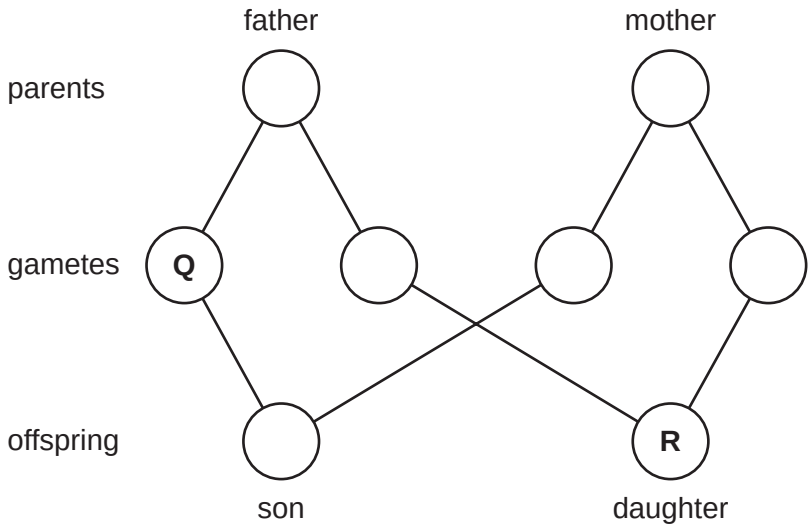
21 The genetic diagram shows a breeding experiment that starts with crossing a homozygous tall plant (TT) with a homozygous short plant (tt).



Which genetic cross gives 1 : 1 phenotypic and genotypic ratios?

A Tt × Tt **B** TT × tt **C** Tt × tt **D** tt × tt

22 The diagram shows the fusion of gametes to produce a son and a daughter.



What are the sex chromosomes in gamete **Q** and daughter **R**?

	Q	R
A	X	XX
B	X	XY
C	Y	XX
D	Y	XY

23 Which feature of a human is controlled by genes only?

A age at death

B blood group

C dietary deficiency disease

D lung cancer

24 A dominant allele

A causes only harmful characteristics.

B is responsible for male characteristics.

C never undergoes mutation.

D produces the same phenotype in heterozygotes and homozygotes.

25 In one type of plant, the allele for red flowers (R) is dominant to the allele for white flowers (r).

A plant with red flowers is crossed with a plant with white flowers. Half of the offspring have red flowers and half have white flowers.

What are the genotypes of the parent plants?

A R and r

B RR and rr

C Rr and Rr

D Rr and rr

26 A gene for the colour of hair in mice has two alleles. B represents the allele for grey hair, and b represents the allele for white hair.

A mouse with grey hair breeds with a mouse with white hair producing four offspring, with genotypes Bb, Bb, bb and bb.

What are the genotypes of the parents?

A both heterozygous

B both homozygous dominant

C one heterozygous and one homozygous dominant

D one heterozygous and one homozygous recessive

27 A heterozygous tall pea plant, **Tt**, is self-fertilised.

What are the offspring most likely to be?

A all tall plants

B all plants of medium height

C one tall plant to three short plants

D three tall plants to one short plant