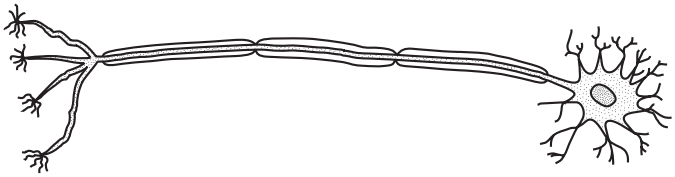
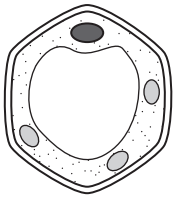
1 Cells are formed by the division of existing cells. Four different cells are shown.

Which cell is produced by meiosis?

A 

B 

C 

D 

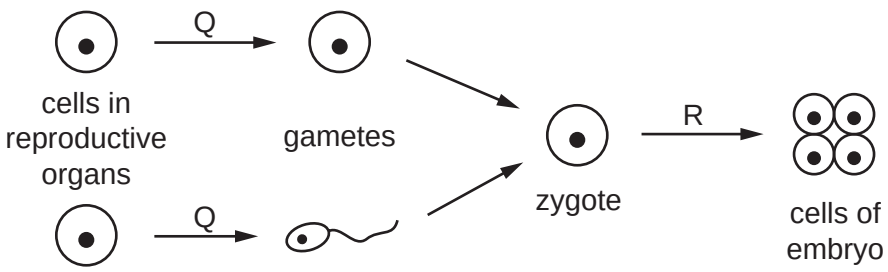
2 Albinism is an inherited condition in which pigment does not develop in the skin, hair and eyes.

The allele for albinism is recessive.

What are the chances of albino parents having an albino child?

A 0% **B** 25% **C** 75% **D** 100%

3 The diagram represents processes in sexual reproduction.



Which processes are represented by stages Q and R?

	Q	R
A	meiosis	meiosis
B	meiosis	mitosis
C	mitosis	meiosis
D	mitosis	mitosis

4 Which name is given to the observable features of an organism?

A alleles

B genes

C genotype

D phenotype

5 Which structure will be found in the nucleus of a body cell in a woman?

A X allele

B X chromosome

C Y allele

D Y chromosome

6 Owners of successful race horses hope that the horses' offspring will be like their parents.

How does a young race horse inherit its characteristics?

A equally from its mother and father

B mainly from its father

C mainly from its mother

D passed across the placenta

7 In pea plants the allele for tall, T, is dominant to the allele for dwarf, t.

Which cross would produce plants in the proportion of 1 tall : 1 dwarf?

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

8 Which substance is coded for by a length of DNA?

A fat

B fatty acid

C glycerol

D lipase

9 What are alleles?

A a pair of chromosomes

B different versions of the same gene

C the total number of genes on one chromosome

D two genes side by side on the same chromosome

10 A pure-breeding plant with smooth stems was crossed with a heterozygous plant with hairy stems.

What will be the ratio of hairy : smooth stems in the resulting plants?

A 1 hairy : 1 smooth

B 1 hairy : 3 smooth

C 3 hairy : 1 smooth

D all hairy

11 Which statement about the human sex chromosomes is correct?

A All boys have two Y chromosomes.

B Everybody has at least one X chromosome.

C Girls have a Y chromosome and an X chromosome.

D Nobody has two X chromosomes.

12 What results from meiosis of a diploid cell?

A genetically different diploid cells

B genetically different haploid cells

C genetically identical diploid cells

D genetically identical haploid cells

13 What will be the genotypes of the offspring resulting from a genetic cross between two individuals, one of which is homozygous dominant, (TT), and the other heterozygous?

A all Tt

B 50% TT, 50% tt

C 50% TT, 50%Tt

D 25%T Tt,

14 Which of these cells is haploid?

A liver cell

B red blood cell

C sperm cell

D zygote

15 A genetic cross between two organisms may be shown as Gg × Gg.

What does g represent?

A a dominant allele

B a dominant chromosome

C a recessive allele

D a recessive chromosome

16 Some fruit flies have orange eyes and others have red eyes.

If two orange-eyed fruit flies are crossed, their offspring always have orange eyes.

If two red-eyed fruit flies are crossed, their offspring sometimes include both orange-eyed and red-eyed flies.

What can be concluded from these observations?

A Crossing an orange-eyed fly with a red-eyed fly will produce a 1 : 1 ratio in the offspring.

B The allele for orange eyes is dominant.

C The allele for red eyes is dominant.

D We could determine which allele is dominant only by doing a cross that produces a 3 : 1 ratio.

17 What are correct descriptions of mitosis and meiosis?

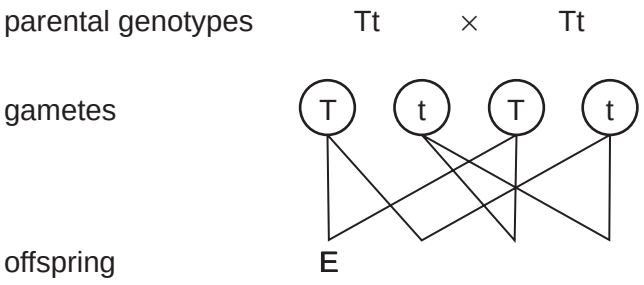
	mitosis	meiosis
A	cells produced are genetically identical	repairs damaged cells
B	halves the chromosome number	cells produced are genetically identical
C	involved in asexual reproduction	halves the chromosome number
D	involved in sexual reproduction	doubles the chromosome number

18 A man has three sons.

What is the chance of his next child being a son?

A 0% **B** 25% **C** 50% **D** 75%

19 The diagram shows a cross between heterozygous tall pea plants.



Which statement is **not** correct?

A Offspring E and H are both homozygous.

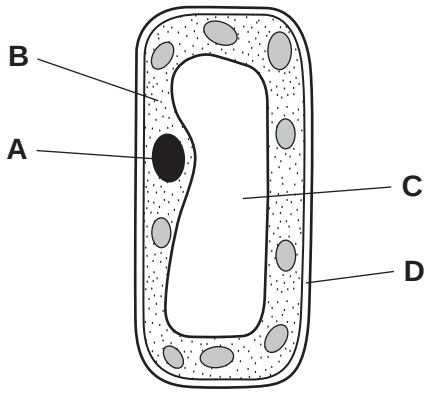
B Offspring F and G are both heterozygous.

C The phenotypes of offspring E, F and G are the same.

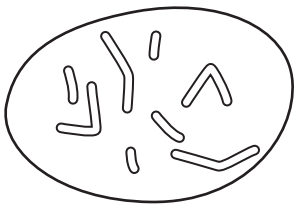
D The ratio of different phenotypes in the offspring is 1 : 1.

20 The diagram shows a plant cell.

Where is most of the DNA found?

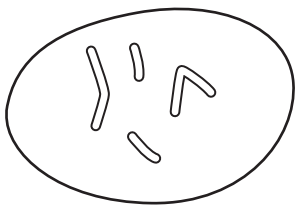


21 The diagram shows the chromosomes in the nucleus of a cell that divides by mitosis.

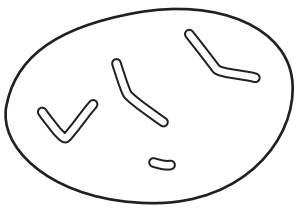


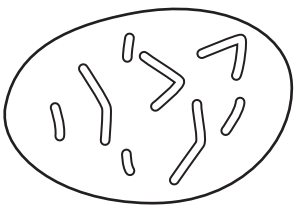
Which diagram shows the chromosomes in the nucleus of one of the daughter cells produced?

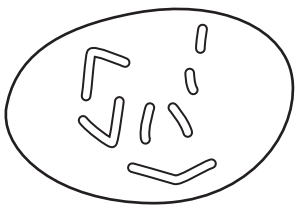
A



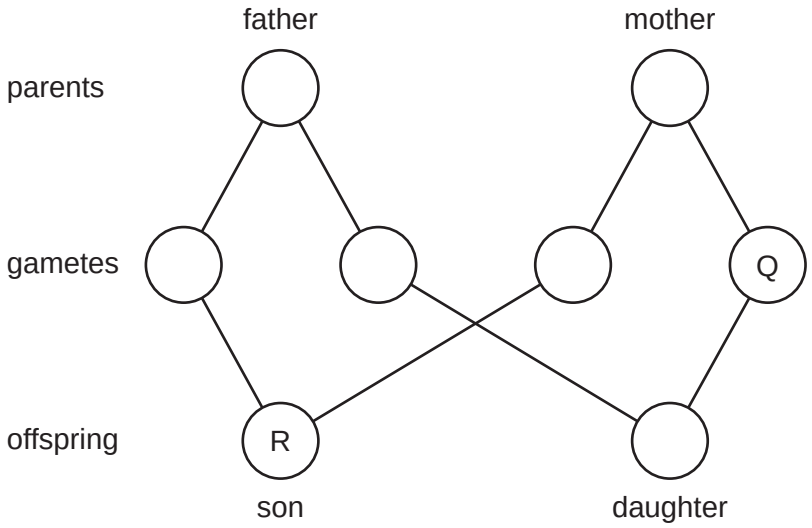
B







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



What are the sex chromosomes in gamete Q and son R?

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

23 What are the sex chromosomes for human females and males?

	female	male
A	XX	XY
B	XX	YY
C	XY	XX
D	YY	XY

24 In fruit flies, the allele for grey body, G, is dominant over the allele for black body, g.

The result of a mating between two flies is shown.

(parents) grey-bodied fly × black-bodied fly

↓

(offspring) 33 grey-bodied flies + 38 black-bodied flies

What were the genotypes of the parents?

A Gg × gg **B** Gg × Gg **C** GG × gg **D** GG × Gg

25 A plant has two different alleles of a gene resulting in it having a green seed.

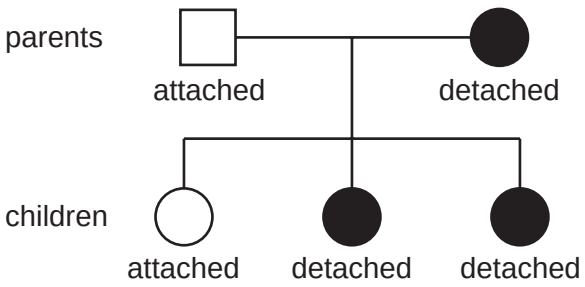
Which row describes the phenotype and genotype of the seeds of this plant?

	henotype	genotype
A	Gg	heterozygous
B	Gg	homozygous
C	green	heterozygous
D	green	homozygous

26 The shape of a person's earlobes is determined by a single gene. This gene has dominant and recessive alleles.

The allele for detached earlobes is dominant to the allele for attached earlobes.

The diagram shows the inheritance of earlobe shape in a family.



What is the probability of the next child from the same parents having detached earlobes?

A 0% **B** 25% **C** 50% **D** 75%

27 Which sex chromosomes are present in all mature human sperm cells?

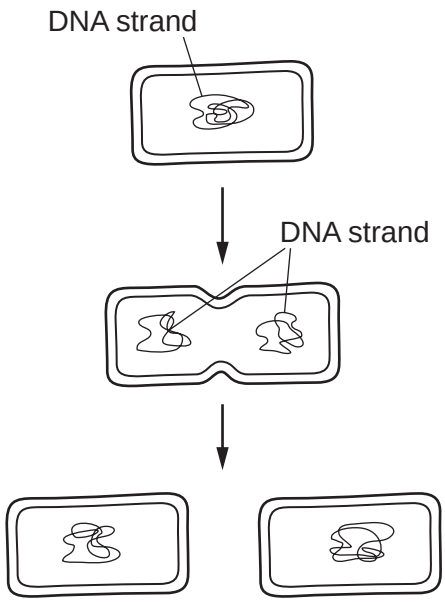
A both X and Y chromosomes

B either X or Y chromosomes

C only X chromosomes

D only Y chromosomes

28 The diagram shows a cell dividing into two.



Which process is shown in the diagram?

A asexual reproduction in a bacterium

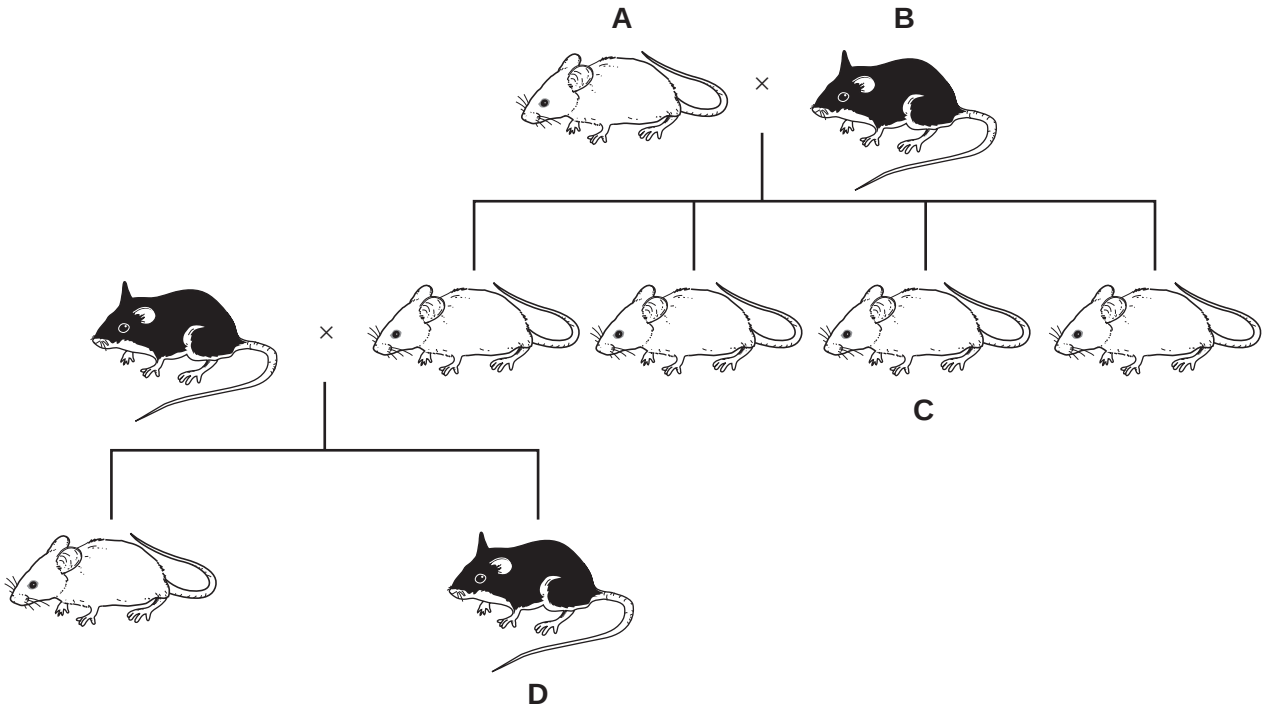
B asexual reproduction in a potato plant

C meiosis in a woman's ovary

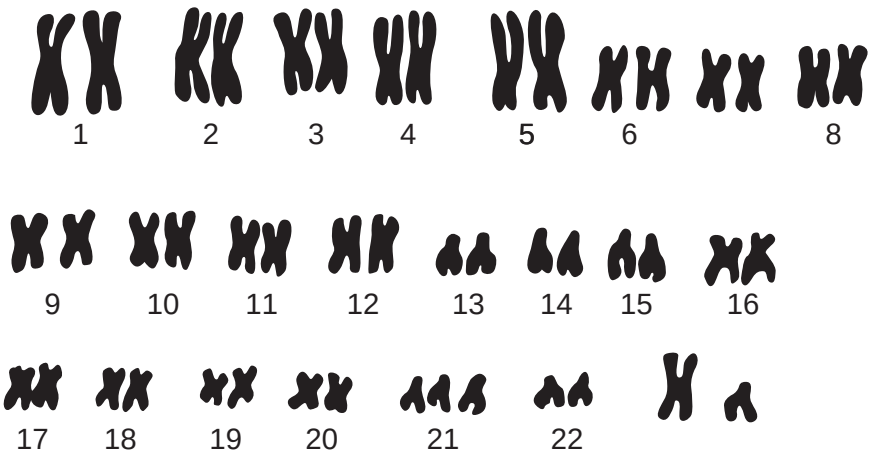
D mitosis in the root of a plant

29 The chart shows the inheritance of fur colour in a small mammal.

If the allele for white fur is dominant, which animal **must** be heterozygous for the gene controlling fur colour?



30 The diagram shows the chromosomes from one person.



What can be deduced about the person who has these chromosomes?

A a female with Down's syndrome

B a male with Down's syndrome

C a normal female

D a normal male

31 Genetics is the study of

A development of organisms.

B mechanisms of inheritance.

C nuclear division.

D variation between species.

32 What is **unlikely** to be affected by the environment?

A blood group

B body mass

C health

D height

33 Which statement is true of both chromosomes and genes?

A Each codes for a specific protein.

B Each may be copied and passed on in mitosis.

C Each may be either dominant or recessive.

D Each may exist as two or more alleles.

34 Most birds have a coloured pigment in their feathers, but in a few individuals, pigment is absent and the birds are albinos.

Albinism occurs when a bird is homozygous recessive for the gene which creates the coloured pigment.

If two albino birds mated, what describes the appearance of their offspring?

A all albino

B all coloured

C 50% coloured, 50% albino

D 75% coloured, 25% albino

35 In an animal, the allele for straight fur is dominant to the allele for curly fur.

A pair of these animals mate and have nine offspring with straight fur and three with curly fur.

F represents the allele for straight fur and f represents the allele for curly fur.

What are the most likely genotypes of the parents?

A F and f **B** FF and ff **C** FF and Ff **D** Ff and Ff

36 What defines a diploid nucleus?

A a nucleus containing two sets of chromosomes

B a nucleus containing two unpaired chromosomes

C a nucleus with two alternative forms of a gene

D a nucleus with two separate threads of DNA

37 Albinism in humans is caused by a recessive allele.

Parents who do not suffer from the condition produce an albino child.

What is the probability that their second child will be born albino?

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

38 An individual has the genotype **Bb**.

What is the correct description of this genotype?

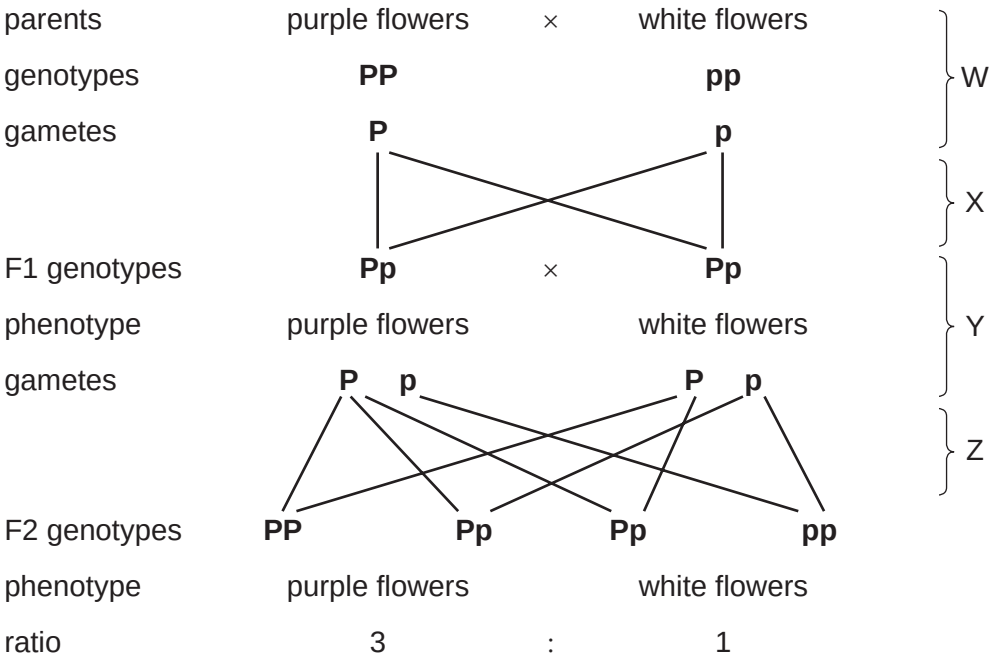
A heterozygous, with two different alleles of the same gene

B heterozygous, with two different genes of the same allele

C homozygous, with two different alleles of the same gene

D homozygous, with two different genes of the same allele

39 The diagram shows the inheritance of flower colour in pea plants.



At which stages in the diagram does meiosis occur?

A W and Y **B** W and Z **C** X and Y **D** X and Z

40 In cats, the allele for short hair is dominant to the allele for long hair. A short-haired cat gives birth to five kittens. Two of them have long hair.

Which statement **must** be correct?

A Neither of the parents is heterozygous.

B One parent is homozygous.

C The female cat is heterozygous.

D The male cat is heterozygous.

41 Cystic fibrosis is an inherited disease that occurs when an individual is homozygous for a recessive allele.

If parents are both heterozygous for this characteristic, what is the probability that their first child will have cystic fibrosis?

A 0% **B** 25% **C** 50% **D** 100%

42 What determines the sex of a baby?

A the father's blood group

B the father's chromosomes

C the mother's blood group

D the mother's chromosomes

43 When white-flowered pea plants are crossed with red-flowered pea plants, the offspring (F_1) all have red flowers.

If these F_1 plants pollinate themselves, the next generation (F_2) contains both red and white-flowered plants.

Which statement explains this?

A The allele for red flowers is dominant and the F_1 plants are heterozygous.

B The allele for red flowers is dominant and the F_1 plants are homozygous.

C The allele for red flowers is recessive and the F_1 plants are heterozygous.

D The allele for red flowers is recessive and the F_1 plants are homozygous.

44 A pure-breeding white mouse was crossed with a pure-breeding black mouse. All their offspring were black.

Then, one of the offspring was bred with a pure-breeding white mouse. They produced 10 baby mice.

What are the most likely colours of these mice?

A 5 black and 5 white

B 8 white and 2 black

C 10 black

D 10 white

45 How does a haploid nucleus differ from a diploid nucleus of the same species?

A It has different genes.

B It has fewer chromosomes.

C It has more alleles.

D It is the result of fertilisation.

46 What results from meiosis of a diploid cell?

A genetically different diploid cells

B genetically different haploid cells

C genetically identical diploid cells

D genetically identical haploid cells

47 What is an allele?

A a length of DNA that codes for a gene

B any one of two or more alternative forms of a gene

C a thread of DNA made up of a string of genes

D the genetic make up of an organism

48 Which types of variation can be inherited?

	variation caused by genes	variation caused by the environment
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

49 Which statement describes human cells formed by meiosis?

A They are genetically identical and they become gametes.

B They are genetically identical and they become tissues.

C They are not genetically identical and they become gametes.

D They are not genetically identical and they become tissues.

50 A short-toed animal was crossed with a long-toed animal of the same species. All the offspring had short toes. One of these offspring was crossed with another long-toed animal of the same species.

Which ratio of short-toed to long-toed animals should be expected?

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