Chapter 17

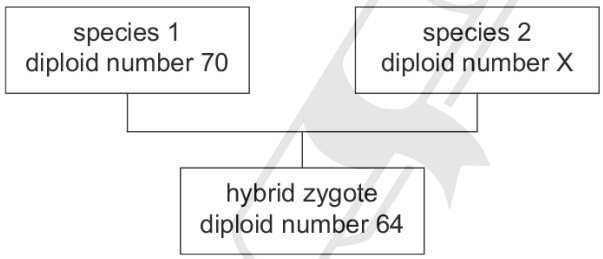
Inheritance

17.1 Chromosomes, genes and proteins

01. 0610_m22_qp_22 Q: 36

Some plants of different species can be crossed with each other to form hybrids that have a diploid number different from either of the two parent species.

The diagram shows a cross between plants with different diploid numbers.



What is the diploid number of species 2?

A 29 **B** 32 **C** 35 **D** 58

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02. 0610_m21_qp_22 Q: 32

What is defined as 'a thread-like structure of DNA, carrying genetic information in the form of genes'?

A allele

B chromosome

C protein

D zygote

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03. 0610_m21_qp_22 Q: 33

The statements describe steps in protein synthesis.

1 Copies of the gene are carried to the cytoplasm as mRNA molecules.

2 Each ribosome assembles amino acids into a protein molecule.

3 The gene coding for a protein is copied in the nucleus.

4 The mRNA molecules pass through ribosomes.

Which sequence of steps is correct?

A $1 \rightarrow 2 \rightarrow 4 \rightarrow 3$

B $1 \rightarrow 3 \rightarrow 2 \rightarrow 4$

C $3 \rightarrow 1 \rightarrow 4 \rightarrow 2$

D $3 \rightarrow 4 \rightarrow 2 \rightarrow 1$

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04. 0610_s21_qp_21 Q: 32

What carries a copy of the gene to the cytoplasm to make a protein?

A alleles

B DNA molecules

C ribosomes

D mRNA molecules

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05. 0610_s21_qp_22 Q: 32

The Tasmanian devil is an animal with seven pairs of chromosomes in each body cell.

The diagram shows the chromosomes in a cell from a Tasmanian devil.

Which statement is correct?

A The cell is a haploid cell containing pairs of chromosomes.

B The cell is a diploid cell with no pairs of chromosomes.

C The cell is a haploid cell with no pairs of chromosomes.

D The cell is a diploid cell containing pairs of chromosomes.

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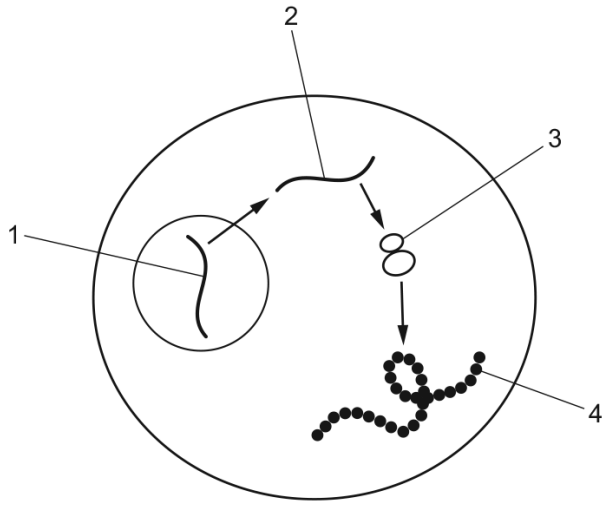
06. 0610_s21_qp_23 Q: 32

The diagram shows structures involved in the synthesis of an enzyme in a cell.



What is structure 2?

A amino acids

B DNA

C mRNA

D protein

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07. 0610_w21_qp_21 Q: 30

Some descriptions of different human cells are listed.

1 contains 46 chromosomes

2 haploid nucleus

3 diploid nucleus

4 contains one set of unpaired chromosomes

Which descriptions are correct for the nucleus of a human gamete?

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

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08. 0610_w21_qp_22 Q: 31

Which statement about a diploid human cell is correct?

A There are 22 chromosomes and an X or a Y chromosome.

B There are 22 pairs of chromosomes and two sex chromosomes.

C There are 23 chromosomes.

D There are 23 pairs of chromosomes and two sex chromosomes.

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09. 0610_w21_qp_23 Q: 31

Which row is correct for the type of cell?

	type of cell	nucleus	sets of chromosomes
A	body	diploid	two
B	gamete	diploid	one
C	gamete	haploid	two
D	body	haploid	one

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10. 0610_w21_qp_23 Q: 32

Which structures in bacterial cells synthesise proteins?

A cell wall

B chloroplasts

C nucleus

D ribosomes

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11. 0610_m20_qp_22 Q: 32

The statements describe how a protein is made.

1 mRNA passes through a ribosome.

2 mRNA molecules carry a copy of the gene to the cytoplasm.

3 The gene coding for the protein is copied in the nucleus.

4 Ribosomes assemble amino acids into proteins.

What is the order of statements that correctly describes how a protein is made?

A 2 → 1 → 3 → 4

B 2 → 3 → 4 → 1

C 3 → 1 → 2 → 4

D 3 → 2 → 1 → 4

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12. 0610_s20_qp_21 Q: 30

Which cell contains a haploid nucleus?

A neurone

B sperm cell

C skin cell

D red blood cell

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13. 0610_s20_qp_22 Q: 30

What is a diploid nucleus?

A a nucleus containing one set of chromosomes

B a nucleus containing two sets of chromosomes

C a nucleus with one double helix of DNA

D a nucleus with two genes

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14. 0610_s20_qp_23 Q: 29

Which row describes what happens in the production of proteins?

	what forms the genetic code	what the DNA codes for	what carries a copy of the gene to the cytoplasm
A	sequence of amino acids	sequence of bases	mRNA
B	sequence of amino acids	sequence of proteins	ribosomes
C	sequence of bases	sequence of amino acids	mRNA
D	sequence of bases	sequence of proteins	ribosomes

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15. 0610_w20_qp_23 Q: 30

Which substance is coded for by a length of DNA?

A base

B glucose

C glycerol

D lipase

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16. 0610_s19_qp_21 Q: 29

A human zygote is a diploid cell.

Which statement about human diploid cells is correct?

A They do not have a nucleus.

B They fuse to form gametes.

C The nucleus contains a single set of chromosomes.

D The nucleus contains two sets of chromosomes.

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17. 0610_s19_qp_23 Q: 33

During protein synthesis, what is the function of the ribosome?

A assemble amino acids in a chain

B carry a copy of a gene to the cytoplasm

C contain the code for the synthesis of a protein

D determine the order of bases in the protein

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18. 0610_m18_qp_22 Q: 26

Which sex chromosomes in the egg and the sperm will produce a male child?

	sex chromosome in egg	sex chromosome in sperm
A	X	X
B	X	Y
C	Y	X
D	Y	Y

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19. 0610_w18_qp_21 Q: 30

What is the role of mRNA?

A assembles amino acids into protein molecules

B carries a copy of the gene out of the nucleus

C controls cell function by controlling the production of proteins

D duplicates chromosomes before mitosis

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20. 0610_w18_qp_23 Q: 30

Which name is given to different versions of a gene?

A allele

B chromosome

C length of DNA

D protein

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21. 0610_s17_qp_21 Q: 28

An alligator has 32 chromosomes in each of the cells of its nose.

How many chromosomes will an alligator zygote contain?

A 16 **B** 32 **C** 46 **D** 64

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22. 0610_s17_qp_21 Q: 33

The list shows the diploid number of chromosomes of four organisms.

fruit fly	8
human	46
potato	48
garden pea	14

What is the correct chromosome number of a male sex cell in each of these organisms?

	fruit fly	human	potato	garden pea
A	4	23	24	7
B	4	46	12	7
C	8	46	48	14
D	16	92	96	28

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23. 0610_s17_qp_22 Q: 32

Which row describes the genetic code in DNA?

	what forms the genetic code	what the DNA codes for
A	sequence of amino acids	sequence of bases
B	sequence of amino acids	sequence of proteins
C	sequence of bases	sequence of amino acids
D	sequence of bases	sequence of proteins

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24. 0610_s17_qp_23 Q: 6

The bases on one of the strands of a DNA molecule have the sequence shown.

A-A-T-C-T-G

What is the corresponding sequence of bases on the other strand?

A A-A-T-C-T-G

B C-C-G-A-G-T

C G-G-C-T-C-A

D T-T-A-G-A-C

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25. 0610_s17_qp_23 Q: 32

Four of the processes involved in the production of a protein are shown.

1 mRNA attaches to a ribosome.

2 mRNA moves to the cytoplasm.

3 The ribosome assembles amino acids into a protein molecule.

4 An mRNA copy of the gene is made.

In which sequence do these events normally occur?

A $1 \rightarrow 2 \rightarrow 3 \rightarrow 4$

B $2 \rightarrow 1 \rightarrow 3 \rightarrow 4$

C $4 \rightarrow 2 \rightarrow 1 \rightarrow 3$

D $4 \rightarrow 3 \rightarrow 2 \rightarrow 1$

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26. 0610_s17_qp_23 Q: 33

Which statement about the sex chromosomes is correct?

A Men and women can inherit characteristics from genes carried on the X chromosome.

B Men and women can inherit characteristics from genes carried on the Y chromosome.

C Only men can inherit characteristics from genes carried on the X chromosome.

D Only women can inherit characteristics from genes carried on the Y chromosome.

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27. 0610_w17_qp_21 Q: 2

The diagram shows a section of DNA from a chimpanzee.

A	G	C	T	A	C	A	G	A	G

Which diagram shows a section of DNA from the organism that is most closely related to the chimpanzee?

A

A	G	C	T	A	C	A	G	A	T

B

A	G	C	T	A	C	A	G	T	T

C

A	T	C	A	A	C	A	G	T	T

D

A	T	C	T	A	C	A	G	T	T

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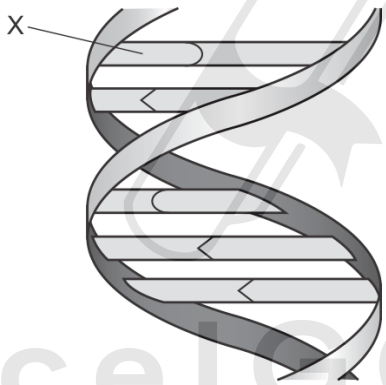
28. 0610_w17_qp_21 Q: 8

The diagram shows the structure of part of a DNA molecule.



What does X represent?

A amino acid

B base

C carbon

D protein

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29. 0610_w17_qp_21 Q: 31

Which term is defined as a length of DNA that codes for a protein?

A amino acid

B chromosome

C gene

D mutation

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30. 0610_w17_qp_21 Q: 32

The following are involved in protein synthesis.

1 amino acids assembled in order

2 mRNA moves to the cytoplasm

3 mRNA passing through a ribosome

4 DNA in the nucleus

In which order do they become involved when proteins are made?

A $1 \rightarrow 3 \rightarrow 2 \rightarrow 4$

B $3 \rightarrow 2 \rightarrow 1 \rightarrow 4$

C $4 \rightarrow 2 \rightarrow 3 \rightarrow 1$

D $4 \rightarrow 3 \rightarrow 2 \rightarrow 1$

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31. 0610_w17_qp_22 Q: 30

In some plants, H is the dominant allele for hairy stems and h is the recessive allele for smooth stems.

A pair of these plants produce 37 offspring, 18 with hairy stems and 19 with smooth stems.

What are the most likely genotypes of the parents?

A HH × HH **B** Hh × Hh **C** Hh × hh **D** hh × hh

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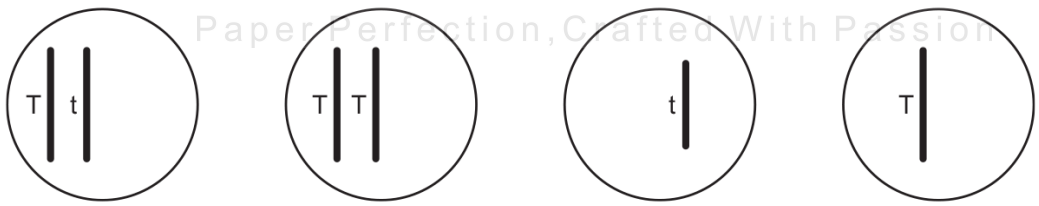
32. 0610_w17_qp_23 Q: 31

An organism is heterozygous for a gene with the alleles T and t.

Which diagram represents a diploid cell from this organism?

A **B** **C** **D**



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33. 0610_s16_qp_22 Q: 30

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

SN	Paper	Q. No.	Answer
01	0610_m22_qp_22	36	D
02	0610_m21_qp_22	32	B
03	0610_m21_qp_22	33	C
04	0610_s21_qp_21	32	D
05	0610_s21_qp_22	32	C
06	0610_s21_qp_23	32	C
07	0610_w21_qp_21	30	C
08	0610_w21_qp_22	31	B
09	0610_w21_qp_23	31	A
10	0610_w21_qp_23	32	D
11	0610_m20_qp_22	32	D
12	0610_s20_qp_21	30	B
13	0610_s20_qp_22	30	B
14	0610_s20_qp_23	29	C
15	0610_w20_qp_23	30	D
16	0610_s19_qp_21	29	D
17	0610_s19_qp_23	33	A
18	0610_m18_qp_22	26	B
19	0610_w18_qp_21	30	B
20	0610_w18_qp_23	30	A
21	0610_s17_qp_21	28	B
22	0610_s17_qp_21	33	A
23	0610_s17_qp_22	32	C
24	0610_s17_qp_23	6	D
25	0610_s17_qp_23	32	C
26	0610_s17_qp_23	33	A
27	0610_w17_qp_21	2	A
28	0610_w17_qp_21	8	B
29	0610_w17_qp_21	31	C
30	0610_w17_qp_21	32	C
31	0610_w17_qp_22	30	C
32	0610_w17_qp_23	31	A
33	0610_s16_qp_22	30	B