EDEXCEL GCSE SCIENCE (360SCIENCE)

SCIENCE



EXAM QUESTION PACK

UNIT B2 MULTIPLE CHOICE 5015 PAPERS

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Surname	Initial(s)
Signature	

Paper Reference(s)

5015 5027

Edexcel GCSE

Additional Science (5015)

Biology (5027)

B2 – Topics 1 to 4

Foundation and Higher Tier

Wednesday 15 June 2011 – Morning

Time: 20 minutes

Materials required for examination
Multiple Choice Answer Sheet
HB pencil, eraser and calculator

Items included with question papers
Nil

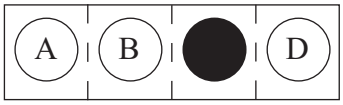
Instructions to Candidates

Use an HB pencil. Do not open this booklet until you are told to do so.
Mark your answers on the separate answer sheet.

Foundation tier candidates: answer questions 1 – 24.
Higher tier candidates: answer questions 17 – 40.
All candidates are to answer questions 17 – 24.

Before the test begins:
Check that the answer sheet is for the correct test and that it contains your candidate details.

How to answer the test:
For each question, choose the right answer, A, B, C or D and mark it in HB pencil on the answer sheet.
For example, the answer C would be marked as shown.



Mark only **one** answer for each question. If you change your mind about an answer, rub out the first mark **thoroughly**, then mark your new answer.

Do any necessary calculations and rough work in this booklet. You may use a calculator if you wish.

You must not take this booklet or the answer sheet out of the examination room.

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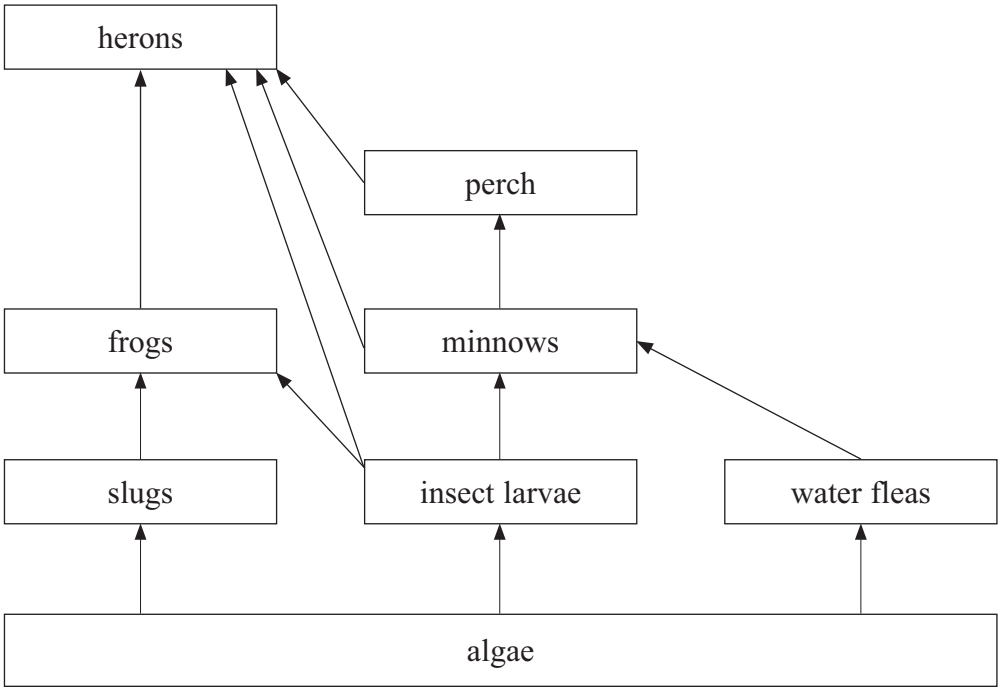
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Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.

Competing for resources

Use the diagram to answer questions 1, 2 and 3.

The diagram shows a food web in and around a pond.



1. Which organism in this food web is a producer?

A insect larvae
B algae
C frogs
D perch

2. Which two organisms compete for minnows?

A herons and water fleas
B water fleas and insect larvae
C herons and perch
D perch and insect larvae

3. Which would cause an increase in the slug population?

A a decrease in the amount of algae
B an increase in the number of frogs
C an increase in the number of water fleas
D an increase in the number of herons

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4. Producers carry out photosynthesis.
Which statements about photosynthesis are correct?

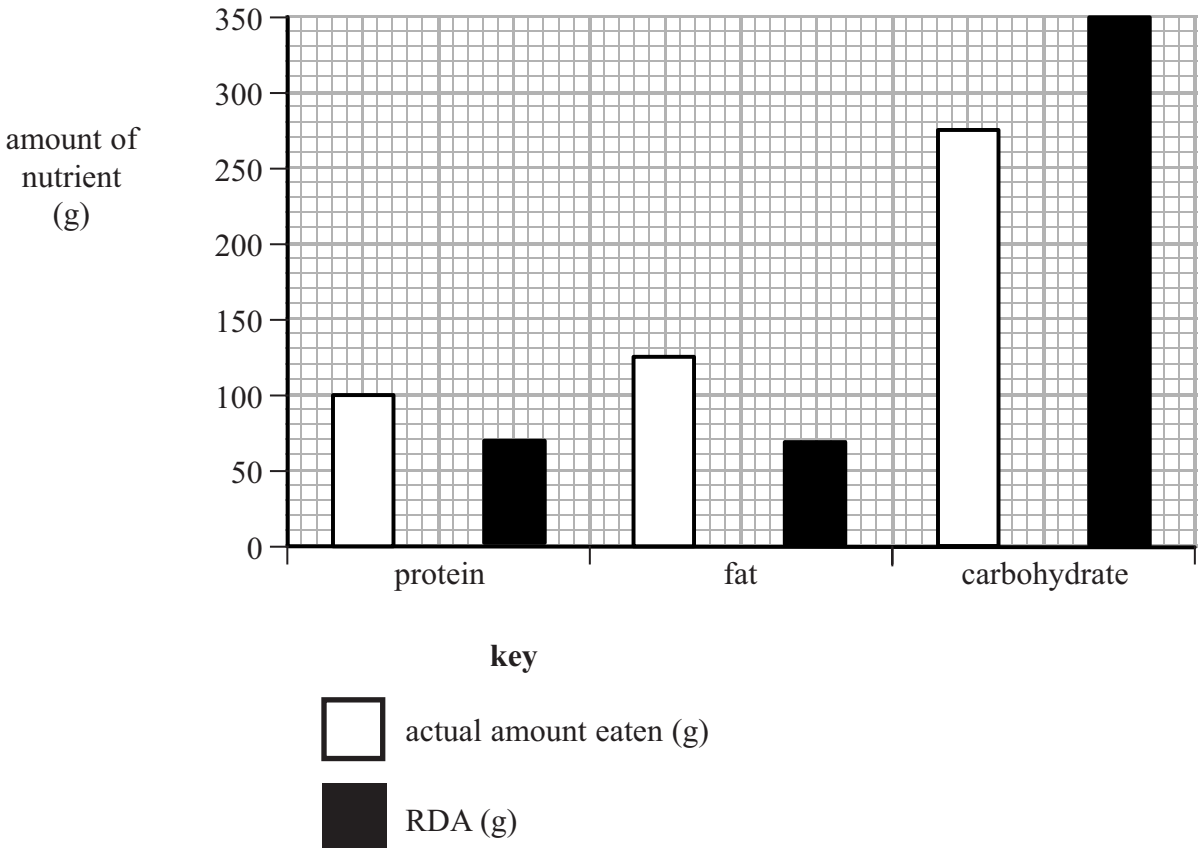
1 photosynthesis requires both water and carbon dioxide to take place
2 photosynthesis produces glucose which is then used by organisms in the food web

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

A healthy diet

Use the graph to answer questions 5 and 6.

The recommended daily allowance (RDA) is the amount of protein, fat and carbohydrate we should eat each day.
The graph shows the amount of protein, fat and carbohydrate eaten by a 30 year-old male each day.
It also shows the RDA for a 30 year-old male.



5. How much more carbohydrate would the male need to eat to meet the RDA?

A 25g
B 75g
C 125g
D 150g

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6. The graph shows that the male is eating

A an equal amount of protein and fat each day
B three times as much carbohydrate as fat
C more fat than protein each day
D less than the RDA of proteins

7. Which statements are true about eating too much fat?

1 too much fat can lead to obesity
2 too much fat increases the risk of heart disease

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

8. Which factors, other than diet, are involved in human growth?

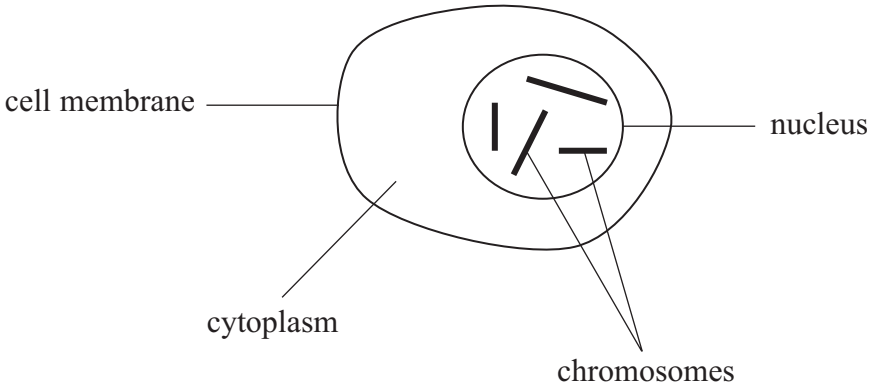
A genes only
B hormones only
C genes and hormones
D neither genes nor hormones

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Producing new cells

Use the diagram to answer questions 9 and 10.

The diagram shows an animal cell.



9. Which structure controls substances going in and out of a cell?

A cell membrane
B nucleus
C chromosomes
D cytoplasm

10. This animal cell divides into two new cells by mitosis.
How many chromosomes will each new cell contain?

A 2
B 4
C 6
D 8

11. Chromosomes contain DNA which is a

A single strand with single bases
B single strand with paired bases
C double helix with single bases
D double helix with paired bases

12. Plant cells differ from animal cells because plant cells

A do not have cytoplasm
B do not have a nucleus
C have cell walls
D have chromosomes

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Living on Mars

Biosphere II was built on Earth to find out if humans could live on Mars.



13. Biosphere II contains many plants to carry out photosynthesis.
Photosynthesis is needed to provide

A nitrogen
B oxygen
C sunlight
D carbon dioxide

14. Scientists inside Biosphere II became tired easily as there were so many microorganisms respiring.
Aerobic respiration uses

A oxygen and glucose
B glucose and carbon dioxide
C carbon dioxide and water
D water and oxygen

15. The atmosphere on Mars is mainly carbon dioxide.
Which row of the table shows processes involved in the carbon cycle on Earth?

	decomposition	**respiration**
A	yes	no
B	no	yes
C	no	no
D	yes	yes

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16. Maintaining biodiversity is important inside Biosphere II.
One technique which could help to maintain biodiversity on Earth involves

A burning trees rather than using wood for building
B filtering and recycling water
C cutting down some trees close to ground level once their leaves have fallen
D using pesticides to maintain the insect population

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Higher tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.

Changing organisms

Different varieties of dogs are a result of selective breeding.



17. Selective breeding involves

A choosing two organisms, each with desired characteristics, to produce offspring
B choosing one organism with desired characteristics to produce clones
C genetically modifying two organisms to produce offspring
D genetically modifying one organism to give it desired characteristics

18. One problem with the process of selective breeding is that it could result in

A improved crop and milk yields
B environmental factors affecting the offspring
C an increase in genetic variation within a species
D a decrease in genetic variation within a species

19. Which row of the table shows the benefits of selectively breeding dwarf wheat?

	more straw produced at harvest	**higher grain yield**
A	yes	yes
B	no	yes
C	yes	no
D	no	no

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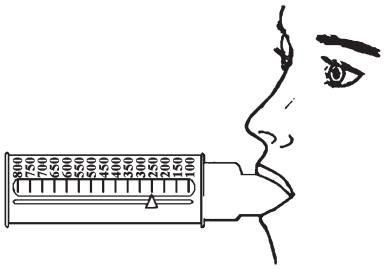
20. The grains of dwarf wheat can be grown into new plants.
When plants grow their cells

A elongate only
B divide only
C differentiate and divide only
D differentiate, divide and elongate

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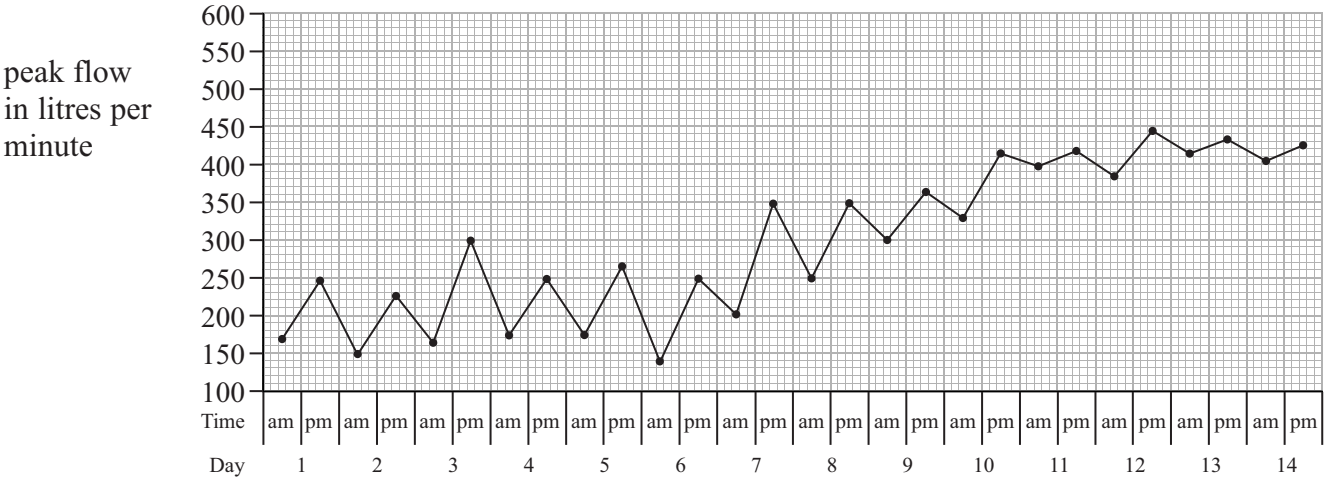
Asthma

People with asthma measure their peak flow using a meter.



Use the graph to answer questions 21 and 22.

The graph shows peak flow measurements taken from a child with asthma.
Measurements were taken in the morning and afternoon each day for 14 days.



21. On which day and time was the lowest peak flow reading?

A day 3 in the afternoon
B day 6 in the morning
C day 7 in the morning
D day 12 in the afternoon

22. Asthma can be treated by using an inhaler.
The child with asthma used the inhaler from day 7 onwards.
What is the change in peak flow from day 7 to day 14?

A each morning's peak flow was higher than the previous morning's
B each afternoon's peak flow was lower than the previous afternoon's
C the afternoon peak flow is greater than the morning peak flow
D the morning peak flow is greater than the afternoon peak flow

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23. People with severe asthma may have difficulty breathing due to narrowed airways. A direct consequence of the narrowed airways is that

A there is a reduction in blood glucose levels
B there is a reduction in blood flow to muscles
C less oxygen diffuses into the blood
D too much carbon dioxide enters the blood

24. People with asthma are more likely to respire anaerobically during exercise. Which statements are correct for anaerobic respiration?

1 lactic acid is needed for anaerobic respiration to take place
2 anaerobic respiration releases energy from glucose

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

Foundation tier candidates do not answer any more questions after question 24.

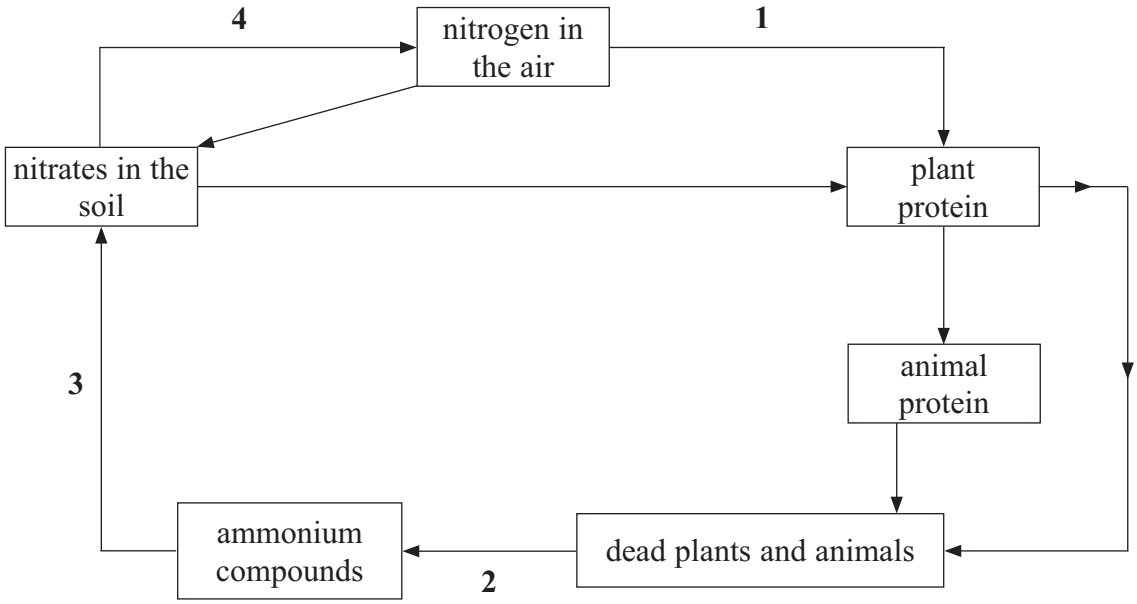
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Questions 25 to 40 must be answered by Higher tier candidates only.
Foundation tier candidates do not answer questions 25 to 40.

Nitrogen cycle

Use the diagram to answer questions 25 and 26.

The diagram shows the nitrogen cycle.



25. Which number represents the action of nitrifying bacteria?

A 1
B 2
C 3
D 4

26. At which point does decomposition occur?

A 1
B 2
C 3
D 4

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27. Plants use nitrates mainly for producing

A glucose
B protein
C ammonia
D minerals

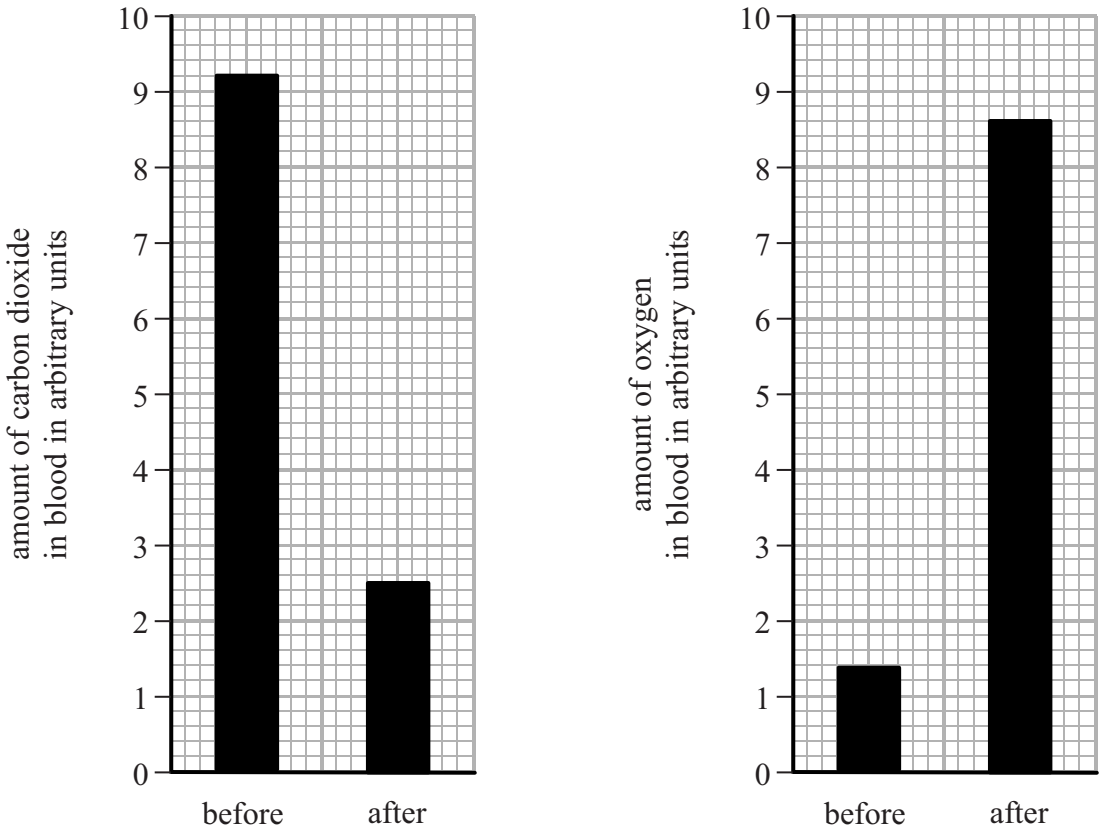
28. Which conditions are most likely to affect the growth of plants?

	low light intensity	**low carbon dioxide levels**	**low temperature**
A	yes	yes	no
B	yes	yes	yes
C	no	yes	no
D	no	no	yes

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Exchange of gases

29. The charts show the amount of carbon dioxide and oxygen in the blood before and after the blood goes through organ X.



Which of the following is organ X?

A heart
B lungs
C brain
D muscle

30. Carbon dioxide leaves muscle cells by diffusion.
Which row of the table shows the conditions needed for diffusion?

	concentration of carbon dioxide in		
	muscle cells	**blood**	**energy required**
A	high	low	yes
B	low	high	yes
C	high	low	no
D	low	low	no

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31. Muscle cells can respire anaerobically. This can build up an oxygen debt.
To repay the oxygen debt, oxygen is used to break down

A lactic acid into carbon dioxide and water
B carbon dioxide into lactic acid and water
C lactic acid into glucose and carbon dioxide
D water into lactic acid and carbon dioxide

32. Cells in organ X were produced from stem cells.
How many of these statements are true about the use of stem cells?

- transplanted organs produced from stem cells are less likely to be rejected
- stem cells cannot be obtained from embryos left over from fertility treatment
- stem cells are limited in the number of times they can divide so cannot be used for transplants

A none
B one
C two
D three

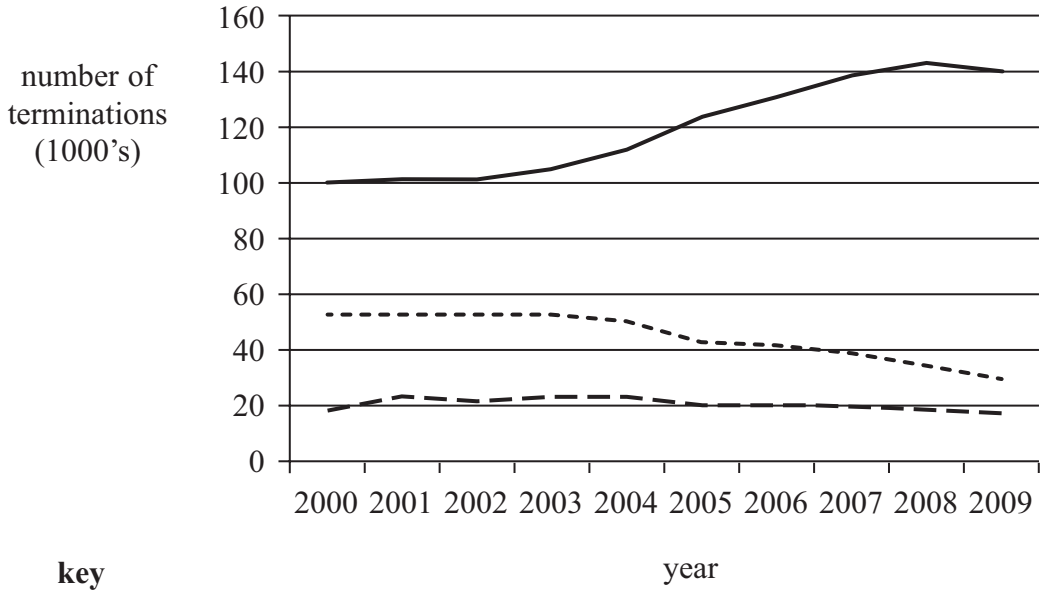
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Human life

In May 2010, UK doctors said that there is no new evidence to show that a fetus feels pain in the womb before 24 weeks.

Use the graph to answer questions 33 and 34.

The graph shows the number of pregnancies that were terminated from 2000 to 2009.



33. How many more pregnancies were terminated, when the fetus was aged between 4 and 9 weeks, in 2009 compared with 2000?

A 40
B 140
C 4 000
D 40 000

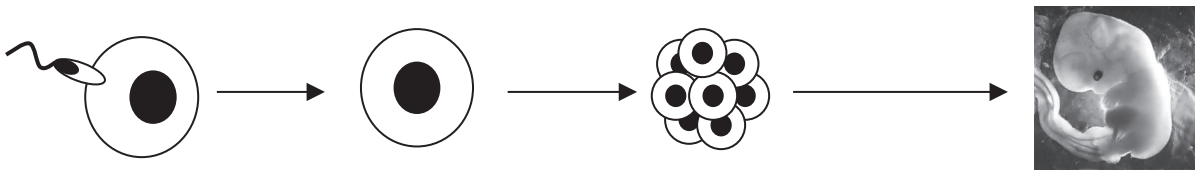
34. The information in the graph shows that

A the number of pregnancies between 2000 and 2009 has shown an overall increase
B more terminations were carried out in 2001 than at any other time regardless of the age of the fetus
C the number of pregnancies terminated when the fetus was aged between 10 to 12 weeks halved between 2000 and 2009
D the greatest number of pregnancies were terminated at 4 to 9 weeks

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Use the diagram to answer questions 35 and 36.

The diagram shows how a human fetus develops following the fertilisation of an egg by a sperm.



fertilisation fertilised egg embryo fetus

35. Each cell of the embryo is formed by

A meiosis and contains 46 chromosomes
B mitosis and contains 46 chromosomes
C meiosis and contains 23 chromosomes
D mitosis and contains 23 chromosomes

36. An embryo contains stem cells which have the ability to differentiate.
These stem cells are genetically

A identical to each other and have a limit to the number of divisions they can undergo
B different from each other and have a limit to the number of divisions they can undergo
C identical to each other and have no limit to the number of divisions they can undergo
D different from each other and have no limit to the number of divisions they can undergo

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The genetic code

A section of a DNA molecule contains 1000 base pairs.

37. 30% of the bases are guanine.
How many adenine bases are contained in this section of the DNA molecule?

A 300
B 400
C 600
D 700

38. This section of the DNA molecule could code for a maximum of

A 333 amino acids
B 666 amino acids
C 1000 amino acids
D 3000 amino acids

39. Amino acids are linked together to form proteins.
Which statements are correct for protein synthesis?

1 translation of mRNA by tRNA occurs on ribosomes
2 mRNA is transcribed into DNA in the nucleus

A 1 only
B 2 only
C both 1 and 2
D neither 1 nor 2

40. DNA and RNA are important for protein synthesis.
RNA differs from DNA because RNA is

A double stranded and contains adenine and thymine
B double stranded and contains adenine and uracil
C single stranded and contains adenine and thymine
D single stranded and contains adenine and uracil

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

END

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Mark Scheme (Results)

June 2011

360Science

GCSE Additional Science
Multiple Choice Paper B2 (5015)

GCSE Biology
Multiple Choice Paper B2 (5027)

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You can also telephone 0844 576 0037 to speak to a member of our Subject Advisor team.

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5015 & 5027 (B2) Mark Scheme
June 2011

Unit B2 – 5015 / 5027	
Topics 1, 2, 3 & 4	
1	B
2	C
3	D
4	C
5	B
6	C
7	C
8	C
9	A
10	B
11	D
12	C
13	B
14	A
15	D
16	C

Unit B2 – 5015 / 5027	
Topics 1, 2, 3 & 4	
17	A
18	D
19	B
20	D
21	B
22	C
23	C
24	B

Unit B2 – 5015 / 5027	
Topics 1, 2, 3 & 4	
25	C
26	B
27	B
28	B
29	B
30	C
31	A
32	B
33	D
34	D
35	B
36	C
37	B
38	A
39	A
40	D

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Additional Science 5015 / Biology 5027 (B2)

Unit B2 - 5015 / 5027	
Topics 1, 2, 3 & 4	
1	C
2	A
3	D
4	C
5	C
6	A
7	B
8	D
9	C
10	C
11	B
12	C
13	D
14	C
15	A
16	C

Unit B2 - 5015 / 5027	
Topics 1, 2, 3 & 4	
17	B
18	C
19	D
20	C
21	A
22	C
23	B
24	D

Unit B2 - 5015 / 5027	
Topics 1, 2, 3 & 4	
25	A
26	B
27	B
28	C
29	C
30	C
31	A
32	B
33	D
34	C
35	D
36	B
37	B
38	C
39	D
40	B

Additional Science 5017 / Chemistry 5037 (C2)

Unit C2 - 5017/5037	
Topics 5, 6, 7 & 8	
1	D
2	C
3	A
4	B
5	D
6	C
7	A
8	B
9	C
10	A
11	C
12	B
13	B
14	A
15	B
16	B

Unit C2 - 5017/5037	
Topics 5, 6, 7 & 8	
17	C
18	A
19	C
20	B
21	A
22	D
23	C
24	B

Unit C2 - 5017/5037	
Topics 5, 6, 7 & 8	
25	C
26	B
27	C
28	D
29	C
30	B
31	C
32	D
33	A
34	D
35	B
36	B
37	D
38	C
39	C
40	D

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5015 / 5027 (B2)

Unit B2 – 5015 / 5027	
Topics 1, 2, 3 & 4	
1	C
2	B
3	C
4	B
5	D
6	A
7	C
8	A
9	B
10	A
11	B
12	C
13	C
14	A
15	B
16	B

Unit B2 – 5015 / 5027	
Topics 1, 2, 3 & 4	
17	D
18	C
19	A
20	C
21	B
22	D
23	C
24	A

Unit B2 – 5015 / 5027	
Topics 1, 2, 3 & 4	
25	B
26	C
27	C
28	D
29	B
30	B
31	C
32	C
33	B
34	C
35	C
36	B
37	D
38	C
39	C
40	D

5017 / 5037 (C2)

Unit C2 – 5017/5037	
Topics 5, 6, 7 & 8	
1	C
2	B
3	C
4	D
5	B
6	C
7	B
8	A
9	B
10	B
11	C
12	C
13	D
14	D
15	C
16	A

Unit C2 – 5017/5037	
Topics 5, 6, 7 & 8	
17	A
18	A
19	C
20	D
21	B
22	B
23	C
24	D

Unit C2 – 5017/5037	
Topics 5, 6, 7 & 8	
25	D
26	C
27	B
28	A
29	B
30	C
31	B
32	B
33	A
34	B
35	D
36	D
37	A
38	D
39	D
40	C