Write your name here

Surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Centre Number	Candidate Number

Combined Science

Paper 1: Biology 1

Foundation Tier

Sample Assessment Materials for first teaching September 2016	Paper Reference
Time: 1 hour 10 minutes	**1SC0/1BF**

You must have:
Calculator, ruler

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- Calculators may be used.
- Any diagrams may NOT be accurately drawn, unless otherwise indicated.
- You must **show all your working out** with **your answer clearly identified** at the **end of your solution**.

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- In questions marked with an asterisk (*), marks will be awarded for your ability to structure your answer logically showing how the points that you make are related or follow on from each other where appropriate.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

S50053A

1/1/1/1/2/1/

S 5 0 0 5 3 A 0 1 2 0

PEARSON

Answer ALL questions. Write your answers in the spaces provided.

Some questions must be answered with a cross in a box ☒.
If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 Eye colour is controlled by genes.

The allele for brown eyes, B, is dominant to the allele for blue eyes, b.

(a) A female with blue eyes and a male with brown eyes are about to have a child.

Complete the Punnett square to determine the phenotype of the child.

(2)

		man	
		B	B
woman	b	Bb	Bb
	b	Bb	Bb

Phenotype of child brown eyes

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

(b) A scientist recorded the eye colour of 30 people.

The results are shown in Figure 1.

blue	green	blue	brown	brown	brown	hazel	blue	
brown	hazel	blue	blue	hazel	green	brown	brown	
blue	green	brown	brown	blue	hazel	blue	brown	brown
brown	blue	brown	brown	brown				

Figure 1

(i) Complete the tally chart, in Figure 2, for this data.

(2)

eye colour			
blue	brown	green	hazel
total 9	total 14	total 3	total 4

Figure 2

(ii) Give another appropriate method of displaying this information.

(1)

Could be displayed as a bar chart/pie chart

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

A section of one allele for eye colour has the following DNA sequence:

ATGGCTAAGTA

(c) (i) Which sequence is the complementary DNA strand?

(1)

- ☒ **A** ATGGCTAAGTA
- ☒ **B** CGTTAGCCTGC
- ☒ **C** TACCGATTCAT
- ☒ **D** GCAATGGACG

(ii) Give **one** way in which a second allele for eye colour might be different.

(1)

mutation in the base sequence

(1)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Figure 3 outlines a method that can be used to extract DNA from fruit.

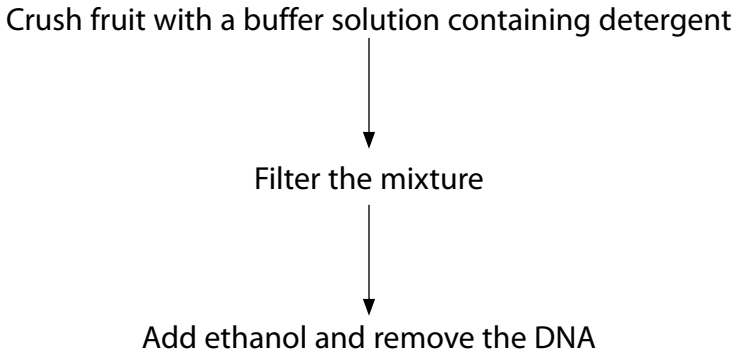


Figure 3

(d) (i) Give a reason for filtering the mixture.

(1)

To remove insoluble material

(ii) What is the role of the ethanol?

(1)

- ☐ **A** denature the enzymes
- ☐ **B** disrupt cell membranes
- ☐ **C** supercoil the DNA
- ☒ **D** to precipitate the DNA

(Total for Question 1 = 9 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

2 Antibiotics can be used to treat Chlamydia, which is a sexually transmitted infection.

(a) What type of pathogen causes Chlamydia?

(1)

☒ **A** bacteria

☒ **B** fungus

☒ **C** protist

☒ **D** virus

Figure 4 shows the number of new cases of Chlamydia diagnosed each year, in a region of the UK, between 2000 and 2008.

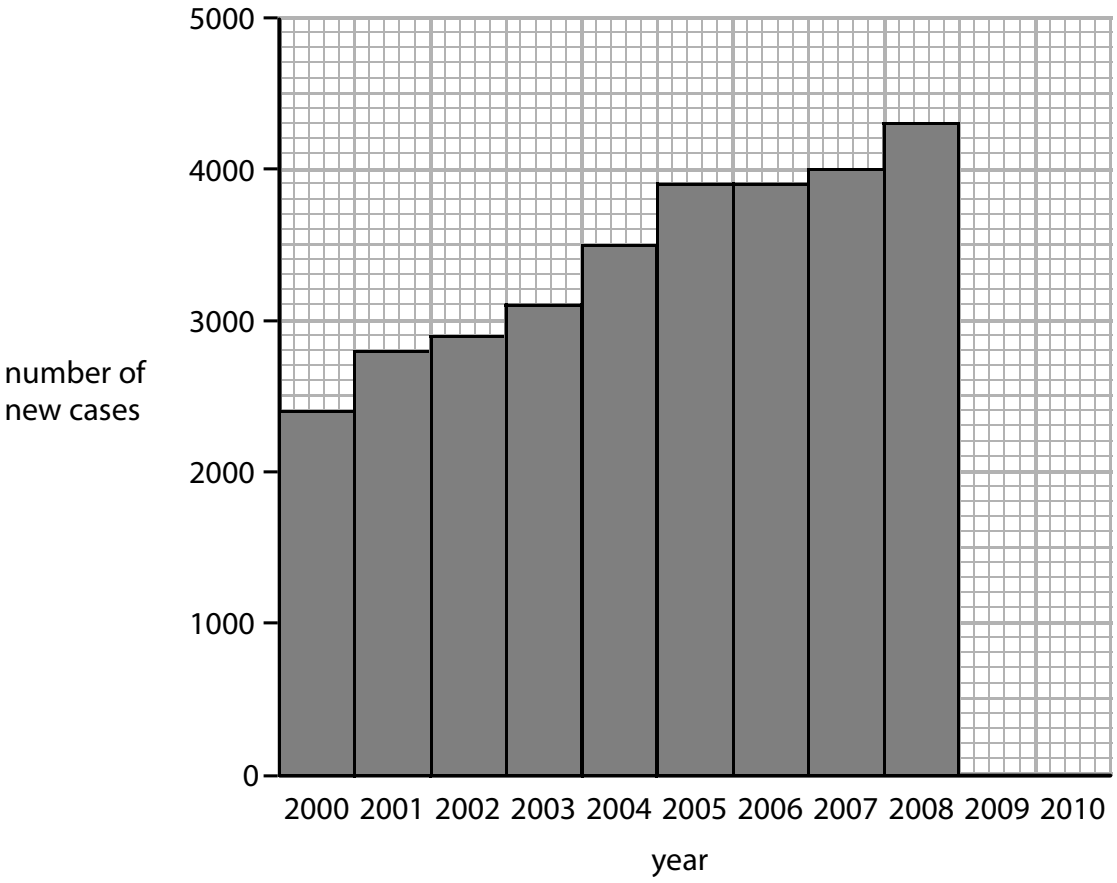


Figure 4

(b) (i) In 2009 there were 4800 new cases diagnosed.

In 2010 there were 4100 new cases diagnosed.

Plot this data on the graph in Figure 4.

(1)

2009 bar plotted at 4800 and 2010 bar plotted at 4100

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

(ii) Describe the trend in cases between 2000 and 2010.

(2)

An answer that combines points of interpretation/evaluation to provide a logical description:

overall trend increases until 2009 (1)

decrease in the number of cases in 2010/correct manipulation of the data (1)

People infected with Chlamydia are more likely to be infected with the STI Gonorrhoea.

(iii) Explain how people become infected with both Chlamydia and Gonorrhoea.

(2)

chlamydia and gonorrhoea are STI infections spread by the same mechanism (1)

individuals aren't using a barrier contraception method (1)

HIV is a sexually transmitted infection.

(c) Explain how infection with HIV can lead to AIDS.

(2)

HIV destroys white blood cells/cells of the immune system (1)

therefore a reduced immune response makes the individual more susceptible to other communicable diseases (1)

(Total for Question 2 = 8 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

3 Figure 6 shows a diagram of a cell.

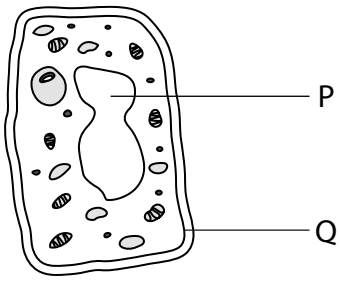


Figure 5

(a) (i) Which row of the table identifies both structure P and structure Q?

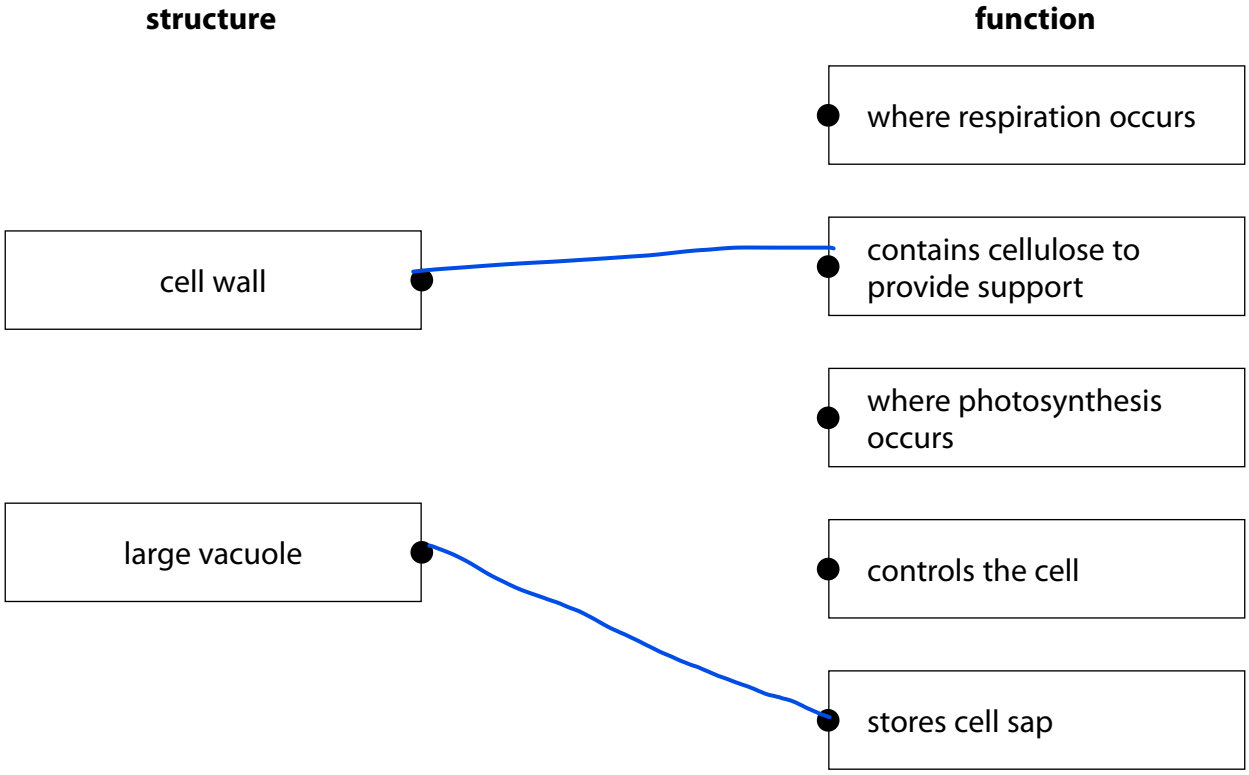
(1)

		structure P	structure Q
☒	**A**	nucleus	cell membrane
☐	**B**	nucleus	cell wall
☒	**C**	vacuole	cell membrane
☐	**D**	vacuole	cell wall

(ii) Plant cells have a cell wall and a large vacuole.

Draw one straight line from each structure to its function.

(2)

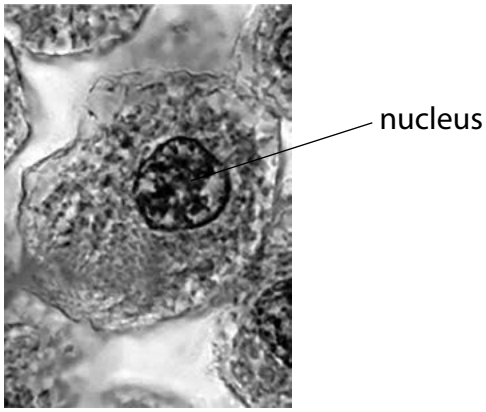


DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Figure 6 shows an image of an animal cell taken using a microscope with a 10× eyepiece lens and a 40× objective lens.



(Source: © Ed Reschke/Getty Images)

Figure 6

(b) (i) The total magnification of the animal cell is

(1)

- ☐ **A** ×50
- ☐ **B** ×140
- ☒ **C** ×400
- ☐ **D** ×4000

(ii) The diameter of the cell is 15 μm.

Use Figure 7 to estimate the diameter of the cell nucleus.

(1)

diameter of nucleus = 5 (μm) ± 1.5 μm

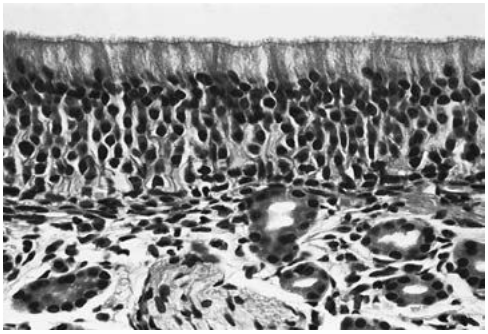
(iii) Give the measurement of 15 μm in mm.

(1)

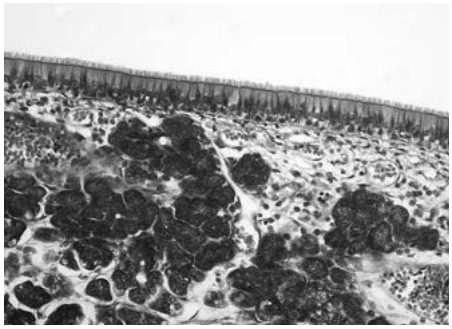
0.015 (mm) mm

The development of electron microscopes has increased our understanding of cells and their features.

Figure 7 shows two images of ciliated epithelium, one taken using a light microscope and one using an electron microscope.



Light microscope



Electron microscope

(Science photolibrary Epithelium C022/2228 C023/4048)

Figure 7

(c) Explain how the electron microscope image helps us to understand more about ciliated epithelium.

(3)

higher magnification can be used (1)

so the cilia are more visible (1)

and the sub-cellular structures are visible (1)

(Total for Question 3 = 9 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA