

Name			
Class		Term	2
Year		Quiz Number:	Quiz 3
		Total Marks	/

- 1 Scientists did an experiment to find out if nicotine affects the production of sperm cells in rats. They gave different quantities of nicotine to 40 rats. They collected sperm cells from the rats and counted the percentage of abnormal sperm cells. Abnormal sperm cells are not the normal shape or cannot swim properly. The table shows their results.

Quantity of nicotine	Percentage of abnormal sperm cells
none	6.87
small quantity	19.88
large quantity	32.89

- a Write down a conclusion that the scientists can make from their results. [1]

- b Explain why sperm cells need to be able to swim. [1]

- c Sex inheritance in rats is the same as sex inheritance in humans.
Explain how sperm cells help to determine the sex of a baby rat.

[3]

- 2 Draw **one** line from each word to its description.

[]

words

DNA

chromosome

gene

inheritance

descriptions

a thread-like structure
contained in the nucleus
of a cell

a chemical with
molecules shaped like a
twisted ladder

the passing on of DNA
from parents to offspring

part of a chromosome
that helps to determine a
characteristic

a sex cell, for example an
egg or a sperm

3 a Farmers who grow rice use pesticides to kill insects called leaf hoppers that eat the rice plants.

A pesticide is a chemical that kills organisms that can damage a crop.

After a while, the leaf hoppers become resistant to the pesticides so that the pesticides do not kill them. The sentences describe how this happens, but they are not in the correct order.

- A They pass their genes on to their offspring.
- B Over many generations, more and more of the leafhoppers have genes that give them resistance to pesticides.
- C The leafhoppers that are resistant are more likely to survive when pesticide is sprayed onto the rice plants.
- D Some leafhoppers have versions of their genes that make them resistant to pesticides.
- E The resistant leafhoppers are the only ones that are able to reproduce.

Write the **letters** of the sentences in the correct order. One has been placed for you. [.]

		E		
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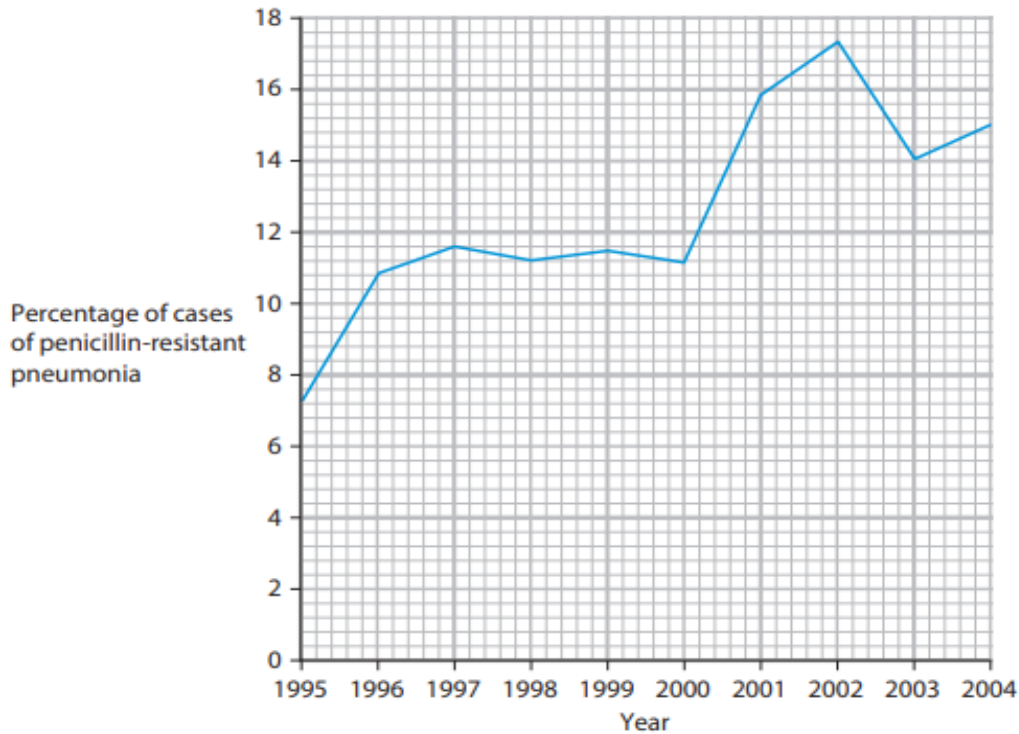
b What is the process that is described by the five sentences A to E? Circle the correct answer. [1]

- development**
extinction
natural selection
variation

Copy and complete the table. Put a tick in a space if you think the description is correct. Leave the space empty if the description is not correct. [5]

Description	Egg cells	Sperm cells
contain a nucleus	<input type="checkbox"/>	<input type="checkbox"/>
are gametes	<input type="checkbox"/>	<input type="checkbox"/>
can swim	<input type="checkbox"/>	<input type="checkbox"/>
in humans, contain 23 chromosomes	<input type="checkbox"/>	<input type="checkbox"/>
contain either an X chromosome or a Y chromosome	<input type="checkbox"/>	<input type="checkbox"/>

A bacterium called *Staphylococcus pneumoniae* causes a serious infection of the lungs, called pneumonia. The graph shows the percentage of cases of pneumonia in which the bacteria were resistant to penicillin (an antibiotic).



- a What is an antibiotic? [1]
- b Describe the trend shown in the graph. [1]
- c Suggest how natural selection has caused this trend. [3]