

GCSE Combined Science: Trilogy

Worksheet: Cancer

TIME 35 min	TOTAL 31 marks	CALCULATOR Allowed	DIFFICULTY Easy, Medium
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Topics: Cancer

NAME _____ **CLASS** _____ **DATE** _____

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Answer all questions in the spaces provided.
- In all calculations, show clearly how you work out your answer.
- The marks for questions are shown in brackets.

0 1

Cancer is a non-communicable disease.

0 1 . 1

Complete the sentence.

Cancer is the result of changes in cells that lead to _____ growth and division.

.....

.....

.....

[1 mark]

0 1 . 2

Which statement describes a benign tumour?

Tick (✓) **one** box.

It is contained in one area, usually within a membrane.

☐

It spreads to other parts of the body in the blood.

☐

It forms secondary tumours.

☐

It invades neighbouring tissues.

☐

[1 mark]

0 1 . 3

What type of tumour invades neighbouring tissues and spreads to other parts of the body?

.....

.....

.....

.....

[1 mark]

0 1 . 4

Give **one** lifestyle risk factor for cancer.

.....

.....

[1 mark]

0 2

Cancer is the result of changes in cells that lead to uncontrolled growth and division.

0 2 . 1

The statements describe how a malignant tumour forms and spreads. They are not in the correct order.

- A** Cells break off from the tumour and enter the blood.
- B** Changes in a cell cause it to grow and divide in an uncontrolled way.
- C** The cells are carried to another part of the body.
- D** A tumour forms.
- E** The cells divide to form a secondary tumour.

Write the letters in the correct order.

.....

.....

.....

.....

[2 marks]

0 2 . 2

What is a tumour?

Tick (✓) **one** box.

A blocked blood vessel

☐

A group of white blood cells

☐

A mass of abnormal cells

☐

A type of pathogen

☐

[1 mark]

0 2 . 3

Which is a genetic risk factor for cancer?

Tick (✓) **one** box.

Drinking alcohol

☐

Exposure to ultraviolet light

☐

Inheriting a particular version of a gene

☐

Smoking

☐

[1 mark]

0 2 . 4

Give **one** way a person can reduce their risk of skin cancer.

.....

.....

[1 mark]

0 3

A tumour in the breast can usually be detected on a scan when it contains about 2×10^8 cells.
In this type of tumour, the number of cells doubles every 45 days.

$$2^{27} = 1.3 \times 10^8 \text{ and } 2^{28} = 2.7 \times 10^8$$

0 3 . 1

The tumour started from one abnormal cell.

How many doublings are needed before the tumour contains at least 2×10^8 cells?

.....

.....

.....

[1 mark]

0 3 . 2

Calculate the time taken for the tumour to reach this size.
Give your answer in years to 2 significant figures.
1 year = 365 days

.....

.....

.....

.....

Time = years

[2 marks]

0 3 . 3

Explain why it is important to find a malignant tumour while it is still small.

.....

.....

.....

.....

[2 marks]

0 4

Tumours can be benign or malignant.

0 4 . 1

Give **two** differences between benign tumours and malignant tumours.

.....

.....

.....

.....

[2 marks]

0 4 . 2

A patient has a malignant tumour in the lung. Doctors later find a secondary tumour in the brain.
Explain how the secondary tumour formed.

.....

.....

.....

.....

[2 marks]

0 4 . 3

Some people have a genetic risk factor for a type of cancer.
What is meant by a **genetic** risk factor?

.....

.....

[1 mark]

0 5

A tumour in the bowel can usually be detected on a scan when it contains about 1×10^8 cells.
In this type of tumour, the number of cells doubles every 40 days.
 $2^{26} = 6.7 \times 10^7$ and $2^{27} = 1.3 \times 10^8$

0 5 . 1

The tumour started from one abnormal cell.
How many doublings are needed before the tumour contains at least 1×10^8 cells?

.....

.....

.....

.....
[1 mark]

0 5 . 2

Calculate the time taken for the tumour to reach this size.
Give your answer in years to 2 significant figures.
1 year = 365 days

.....

.....

.....

.....

Time = years

[2 marks]

0 5 . 3

Explain why it is important to find a malignant tumour while it is still small.

.....

.....

.....

.....

[2 marks]

0 6

Two patients each have a tumour.

- Patient 1 has a tumour in the brain. The tumour has stayed in one place inside a membrane, but it is pressing on the brain tissue around it.
- Patient 2 has a small tumour in the breast. Cells from the tumour have also been found in the lungs and in the bones.

0 6 . 1

Which patient has a malignant tumour?
Give a reason for your answer.

.....

.....

.....

.....

[2 marks]

0 6 . 2

The tumour in patient 1 is benign, but it could still be dangerous.
Suggest why.

[1 mark]

0 6 . 3

Patient 2's mother and grandmother both had breast cancer.
Suggest what this shows about patient 2's risk of developing cancer.

[2 marks]

0 6 . 4

Give **two** changes to lifestyle that could reduce a person's risk of developing cancer.

[2 marks]

END OF QUESTIONS

Original practice questions written to match the specification. Not produced by, affiliated with or endorsed by AQA.

Mark scheme

GCSE Combined Science: Trilogy · Worksheet: Cancer · 31 marks

Question 1 (4 marks)

01.1 [1 mark]

Answer: uncontrolled

- uncontrolled (1)
-

01.2 [1 mark]

Correct: It is contained in one area, usually within a membrane.

01.3 [1 mark]

Answer: malignant

- malignant (1)
-

01.4 [1 mark]

- smoking / obesity / drinking alcohol / exposure to UV (sunlight or sunbeds) / poor diet (1)
-

Question 2 (5 marks)

02.1 [2 marks]

Answer: B, D, A, C, E

- B, D (in this order) first (1)
 - A, C, E (in this order) last (1)
-

02.2 [1 mark]

Correct: A mass of abnormal cells

02.3 [1 mark]

Correct: Inheriting a particular version of a gene

02.4 [1 mark]

- use sunscreen / avoid sunbeds / cover skin or stay in the shade in strong sunlight (1)
-

Question 3 (5 marks)

03.1 [1 mark]

Answer: 28

- 28 (1)

03.2 [2 marks]

Answer: 3.5 years

- $28 \times 45 = 1260$ (days) (1)
- $(1260 \div 365 =) 3.5$ (years) (1)

Notes: Allow ECF from their number of doublings.

03.3 [2 marks]

- before cells break off and spread in the blood to form secondary tumours (1)
- so the tumour is easier to remove / treat successfully (1)

Question 4 (5 marks)

04.1 [2 marks]

- benign tumours are contained in one area / within a membrane, malignant tumours invade neighbouring tissues (1)
- malignant tumours spread in the blood to form secondary tumours, benign tumours do not spread (1)

04.2 [2 marks]

- cells broke off the lung tumour and were carried in the blood (to the brain) (1)
- they divided (uncontrollably) in the brain to form a new tumour (1)

04.3 [1 mark]

- an inherited gene / allele that increases the likelihood of developing the cancer (1)
-

Question 5 (5 marks)

05.1 [1 mark]

Answer: 27

- 27 (1)

05.2 [2 marks]

Answer: 3.0 years

- $27 \times 40 = 1080$ (days) (1)
- $(1080 \div 365 =) 3.0$ (years) (1)

Notes: Allow ECF from their number of doublings.

05.3 [2 marks]

- before cells break off and spread in the blood to form secondary tumours (1)
- so the tumour is easier to remove / treat successfully (1)

Question 6 (7 marks)

06.1 [2 marks]

- patient 2 (1)
- cells from the tumour have spread to other parts of the body / have formed secondary tumours in the lungs and bones (1)

Notes: The reason mark can only be awarded if patient 2 is chosen.

06.2 [1 mark]

- it is pressing on / damaging brain tissue, which could affect how the brain works (1)

06.3 [2 marks]

- patient 2 may have inherited a genetic risk factor (a gene that increases the risk) (1)
- so patient 2 has an increased likelihood of developing cancer, but it is not certain (1)

06.4 [2 marks]

- stop smoking (1)
- avoid sunbeds / protect skin from strong sunlight (1)
- keep to a healthy body mass / avoid obesity (1)
- drink less alcohol (1)

Any 2 of the points above.
