

GCSE Combined Science: Trilogy

Worksheet: Health issues

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

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

Different types of disease can interact with each other.

0 1 . 1

Figure 1

Example	Type of interaction
A person with HIV often gets tuberculosis (TB)	Viruses living in cells can trigger cancers
An HPV infection leads to cancer of the cervix	Severe physical ill health can lead to mental illness
An infection triggers a skin rash or asthma	Defects in the immune system make infectious diseases more likely
A person with a long-term illness becomes depressed	Immune reactions caused by pathogens can trigger allergies

Figure 1 shows four examples and four types of interaction between diseases. Draw **one** line from each example to the type of interaction it shows.

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.....

[4 marks]

0 1 . 2

Which of these is a communicable disease?

Tick (✓) **one** box.

- Cancer☐
- Coronary heart disease☐
- Tuberculosis☐
- Type 2 diabetes☐

[1 mark]

0 1 . 3

What is meant by a **communicable** disease?

.....

.....

[1 mark]

0 2

Health researchers collected data about asthma in one region.

0 2 . 1

In a town of 60 000 people, 120 in every 1000 people have asthma.
Calculate the number of people in the town with asthma.

.....

.....

.....

.....

Number of people =

[2 marks]

0 2 . 2

In a random sample of 400 people from a different town, 36 had asthma.
Calculate the percentage of the sample with asthma.

.....

.....

.....

Percentage = %

[1 mark]

0 2 . 3

Suggest why the researchers chose people for the sample at random.

.....

.....

[1 mark]

0 3

Diseases are major causes of ill health.

0 3 . 1

What is meant by **health**?

[1 mark]

0 3 . 2

Which **two** of these are non-communicable diseases?

Tick (✓) **two** boxes.

Coronary heart disease

☐

Measles

☐

Salmonella food poisoning

☐

Type 2 diabetes

☐

[2 marks]

0 3 . 3

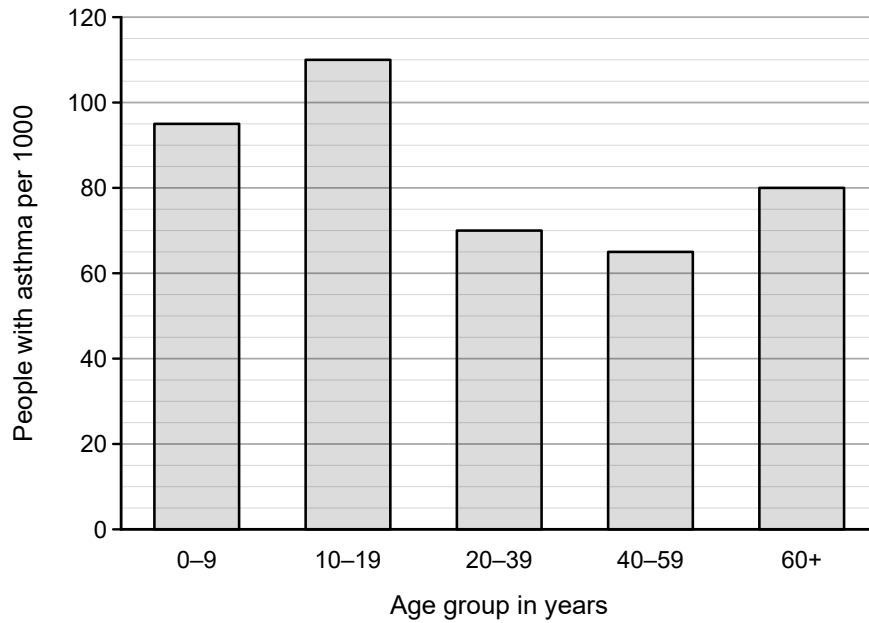
Other than disease, give **one** factor that can affect a person's physical and mental health.

[1 mark]

0 4

Researchers surveyed a random sample of 5000 people in a town. Figure 2 shows the number of people with asthma per 1000 people in each age group.

Figure 2



0 4 . 1

Which age group had the highest rate of asthma?

.....

.....

[1 mark]

0 4 . 2

There are 12 000 people aged 10–19 in the town.
Use Figure 2 to estimate how many of them have asthma.

.....

.....

.....

.....

.....
[2 marks]

0 4 . 3

Explain why the researchers used a large, randomly chosen sample.

.....

.....

.....

.....

[2 marks]

0 4 . 4

Asthma is a non-communicable disease.
What is meant by a **non-communicable** disease?

.....

.....

[1 mark]

0 5

Health researchers compared the number of new cases of Type 2 diabetes in two areas in one year.

- Area A has a population of 120 000. There were 420 new cases of Type 2 diabetes.
- Area B had 700 new cases per 100 000 people.

0 5 . 1

Calculate the number of new cases per 100 000 people in area A.

.....

.....

.....

.....

Rate = new cases per 100 000 people

[2 marks]

0 5 . 2

Calculate how many times greater the rate was in area B than in area A.

.....

.....

.....

[1 mark]

0 5 . 3

Explain why the researchers compared the number of new cases per 100 000 people rather than the total number of new cases in each area.

.....

.....

[1 mark]

0 6

A researcher wants to estimate the percentage of adults in a city who have high blood pressure. The city has 400 000 people, of whom 300 000 are adults.

0 6 . 1

The researcher plans to measure the blood pressure of adults at a gym. Explain why this sample would not be representative of adults in the city.

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.....

.....

[2 marks]

0 6 . 2

Describe how the researcher could choose a representative sample.

.....

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.....

[2 marks]

0 6 . 3

In a random sample of 1200 adults, 324 had high blood pressure.
Estimate the number of adults in the city who have high blood pressure.

.....

.....

.....

.....

Number of adults =

[2 marks]

0 6 . 4

Explain why a larger sample gives a more reliable estimate.

.....

.....

[1 mark]

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: Health issues · 31 marks

Question 1 (6 marks)

01.1 [4 marks]

Answer: HIV/TB – immune defects; HPV – viruses trigger cancers; infection/rash or asthma – allergies; long-term illness/depression – physical ill health leads to mental illness

- HIV and TB – defects in the immune system make infectious diseases more likely (1)
- HPV and cancer of the cervix – viruses living in cells can trigger cancers (1)
- infection and rash / asthma – immune reactions caused by pathogens can trigger allergies (1)
- long-term illness and depression – severe physical ill health can lead to mental illness (1)

Notes: If more than one line is drawn from an example, award no mark for that example.

01.2 [1 mark]

Correct: Tuberculosis

01.3 [1 mark]

- a disease caused by a pathogen that can be passed from one person / organism to another (1)
-

Question 2 (4 marks)

02.1 [2 marks]

Answer: 7200

- $120 \div 1000 \times 60\,000$ (1)
 - 7200 (1)
-

02.2 [1 mark]

Answer: 9%

- $(36 \div 400 \times 100 =) 9\%$ (1)
-

02.3 [1 mark]

- so that the sample is representative of the whole population / to avoid bias (1)
-

Question 3 (4 marks)

03.1 [1 mark]

- the state of physical and mental well-being (1)

03.2 [2 marks]

Correct: Coronary heart disease; Type 2 diabetes

03.3 [1 mark]

- diet / stress / life situations (1)

Notes: Allow exercise, smoking, alcohol, money problems, relationships.

Question 4 (6 marks)

04.1 [1 mark]

Answer: 10–19 years

- 10–19 (years) (1)

04.2 [2 marks]

Answer: 1320

- $110 \div 1000 \times 12\,000$ (1)
- 1320 (1)

04.3 [2 marks]

- so the sample is representative of the whole population / to avoid bias (1)
- so the results are less affected by chance / the estimate is more accurate (1)

04.4 [1 mark]

- a disease that cannot be passed / spread from one person to another (1)
-

Question 5 (4 marks)

05.1 [2 marks]

Answer: 350

- $420 \div 120\,000 \times 100\,000$ (1)
- 350 (1)

05.2 [1 mark]

Answer: 2 times

- $(700 \div 350 =) 2$ (1)

Notes: Allow ECF from their rate for area A.

05.3 [1 mark]

- the areas have different populations, so rates allow a fair comparison (1)

Question 6 (7 marks)

06.1 [2 marks]

- people who go to a gym are likely to be fitter / younger / healthier than average (1)
- so fewer of them would have high blood pressure, and the estimate would be too low / biased (1)

06.2 [2 marks]

- choose adults at random, e.g. using random numbers to pick names from a list of all adults / doctors' patient lists (1)
- use a large sample, e.g. at least several hundred adults, from all areas and age groups (1)

06.3 [2 marks]

Answer: 81 000

- $324 \div 1200 = 0.27 / 27\%$ (1)
- $0.27 \times 300\,000 = 81\,000$ (1)

Notes: An answer of 108 000 (using 400 000) scores 1 mark.

06.4 [1 mark]

- a few unusual individuals / chance have less effect on the result, so the sample is more likely to be representative (1)
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