

Human Nutrition

Question Paper

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Human Nutrition
Sub-Topic	
Paper Type	Alternative to Practical
Booklet	Question Paper

Time Allowed: 46 minutes

Score: /38

Percentage: /100

1 Seeds from the plant family *Papilionaceae* form an important part of the human diet.

Fig. 1.1 shows three different types of seed that have been soaked in water for 24 hours.



lentils

chickpeas

soya beans

Fig. 1.1

(a) Describe the differences in shape **and** appearance of the seed coat (testa) between the three types of seed.

Write your answers in Table 1.1.

Table 1.1

feature	lentil	chickpea	soya bean
shape of seed			
appearance of seed coat			

- (b) A group of students were planning an investigation into the effect of temperature on the germination of seeds.

The teacher gave them a list of possible variables.

temperature	number of seeds germinated
intensity of light	time
length of seedling	volume of water

From this list, select the most suitable:

variable to change;

variable to measure.

[2]

Fig. 1.2 shows the same three seeds after they have been germinated in suitable conditions.

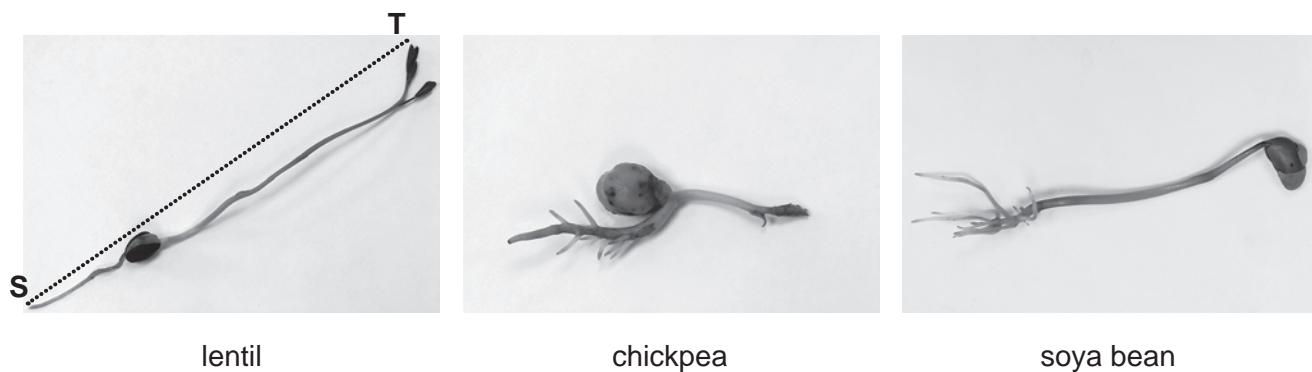


Fig. 1.2

(c) (i) Make a large, labelled drawing of the **lentil** seedling.

- (ii) You are going to calculate the magnification of your drawing.

Measure the length of the line **ST** on Fig. 1.2.

length of line **ST** mm

Draw line **ST** on your drawing in the same position as in Fig. 1.2.

Measure the corresponding length of **ST** on your drawing.

length of **ST** in drawing mm

Calculate the magnification of your drawing.

Show your working.

magnification \times [4]

Lentils contain protein and a small quantity of fat.

- (d) Describe the food tests you could carry out to show that lentil seeds contain:

- (i) protein;

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.....
.....
..... [2]

- (ii) fat.

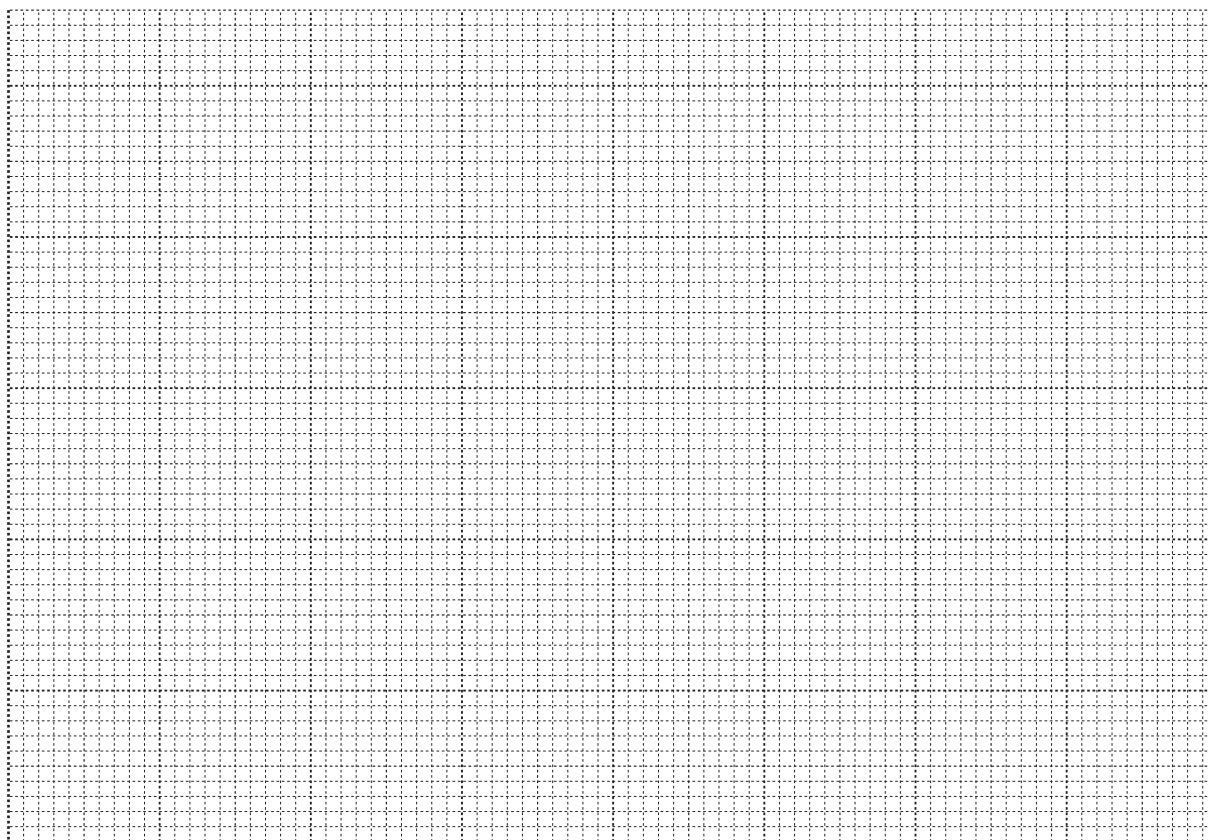
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..... [3]

- (e) The percentage of protein and fat in five types of seed, are shown in Table 1.2.

Table 1.2

type of seed	percentage of protein / %	percentage of fat / %
chickpea	8.0	2.5
lentil	9.0	0.6
lima bean	8.0	0.4
mung bean	7.0	0.4
soya bean	16.0	8.0

- (i) Construct a bar chart to show the percentages of protein and fat in the five types of seed. Use the same axes for the two sets of data.



[5]

- (ii) Meat is a good source of protein.

Name the type of seed in Table 1.2 that would be a good alternative to meat in the human diet.

.....

[1]

- 2 Fig. 2.1 shows part of a yellow maize cob, *Zea mays*.

A cob is composed of many individual fruits known as grains.



Fig. 2.1

Many colours of maize grains are known. The colour is inherited.

Fig. 2.2 shows part of a cob with light and dark coloured grains.

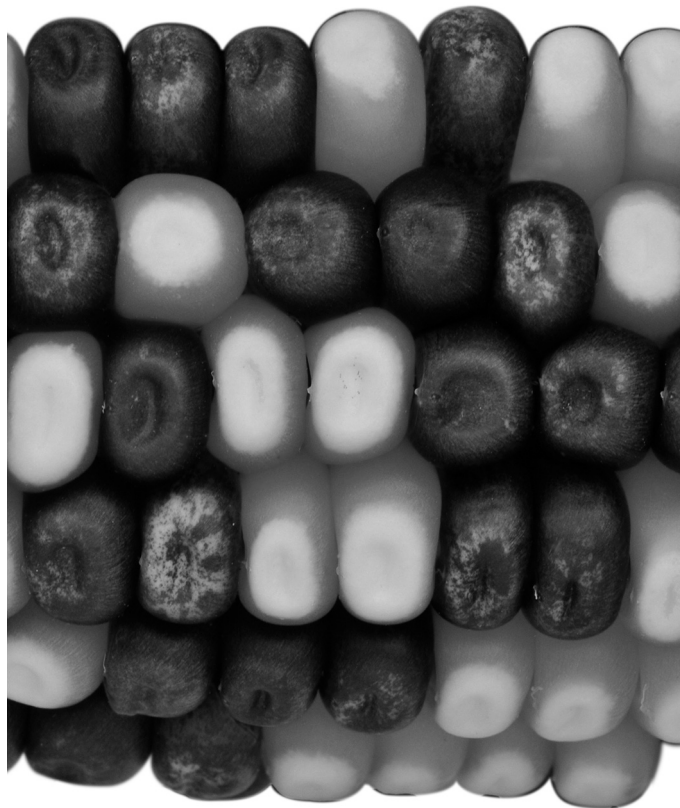


Fig. 2.2

- (a) (i) Complete Table 2.1 by counting the number of light and dark coloured grains.

Table 2.1

number of grains	
light	dark

[1]

- (ii) Use the data in Table 2.1 to suggest the phenotypic ratio of light to dark coloured grains.

..... [1]

- (iii) Describe **one** visible phenotypic difference, other than colour, between the grains shown in Fig. 2.2.

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..... [1]

Maize is used as a food source for humans and livestock. It contains mainly starch but also other nutrients including proteins and fat.

- (b) Describe how to test maize grains for the presence of protein and fat.

protein

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fat

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.....

[5]

Maize is a cereal. Cereals form a high proportion of the daily energy intake for many people.

The protein and fat content of maize and five other cereals is shown in Table 2.2.

Table 2.2

cereal	content per 100g of dried cereal/g	
	protein	fat
maize	9.	3.8
millet	10.4	5.0
oats	12.6	7.5
rice	7.1	1.8
sorghum	9.7	3.4
wheat	13.8	2.0

(c) Use Table 2.2 to identify the cereal that provides the largest energy content per 100g.

Explain your choice of cereal.

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..... [3]

[Total: 11]