



KS3 Science

Inheritance

Question Paper

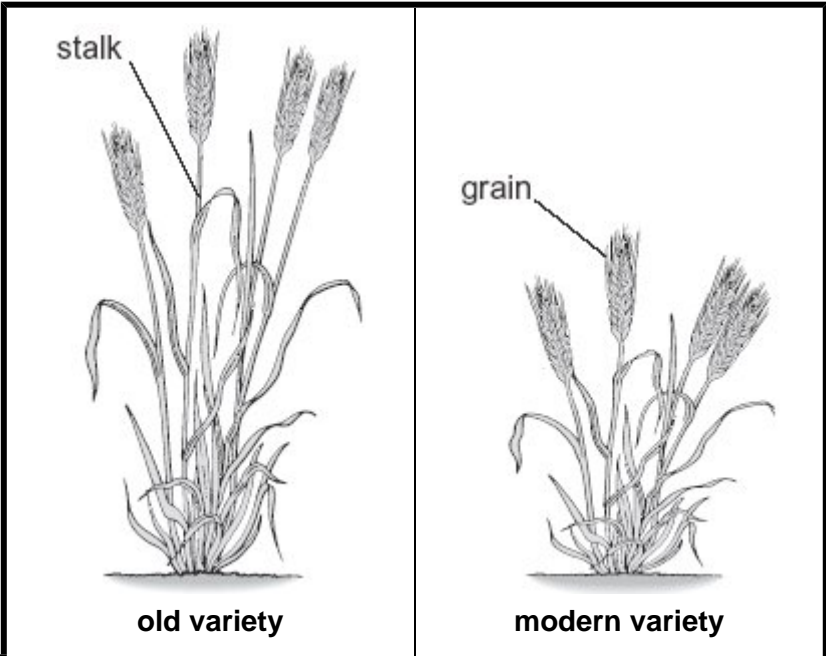
Time available: 24 minutes

Marks available: 33 marks

www.accesstuition.com

1.

(a) The drawings below show an old and a modern variety of wheat plant.



average mass of grain produced per m ² (kg)	0.5	0.8
average length of stalk (cm)	145	78

Glucose produced by the wheat plants is used:

- to provide energy for growth
- to make cell walls
- to make starch which is stored in the grain.

Give **one** reason why modern wheat plants with short stalks can store more starch in the grain. Use the drawings and information.

.....

.....

1 mark

(b) A plant breeder wants to use selective breeding to produce corn with short stalks and a high mass of grain. He could use the following varieties of corn:

variety A
long stalks
high mass of grain

variety B
short stalks
low mass of grain

variety C
long stalks
low mass of grain

- (i) What would the plant breeder need to do to make sure he always produced corn with short stalks and a high mass of grain?

Describe the three steps the breeder would use.

.....

.....

.....

.....

.....

.....

3 marks

- (ii) Suggest **one** other characteristic that farmers might like corn plants to have to increase the amount of corn produced.

.....

1 mark
maximum 5 marks

2.

The drawings show identical twins, Sara and Helen, and their parents.



father



mother



Sara



Helen

- (a) (i) Sara and Helen have blue eyes like their mother.

Describe how genetic information is passed on from a parent to a child.

.....
.....
.....
.....

2 marks

- (ii) Sara and Helen have brown hair like their father and blue eyes like their mother.

Why do children have characteristics of both parents?

.....
.....

1 mark

- (b) Sara and Helen are identical twins.

Why do they have identical characteristics?

.....
.....

1 mark

- (c) Sara now spends a lot of her time working outdoors in a hot country.
Helen now works in an office in England.

The table shows information about three human characteristics.

characteristic	Is it identical for Sara and Helen?
eye colour	yes
skin colour	no
weight	no

Explain why their eye colour is identical but their weight and skin colour are **not** identical.

.....

.....

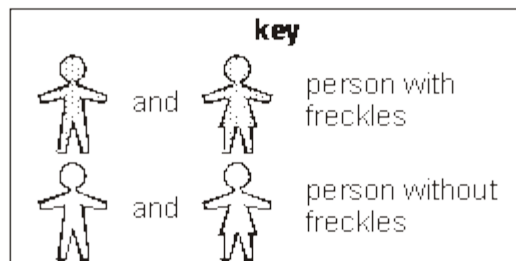
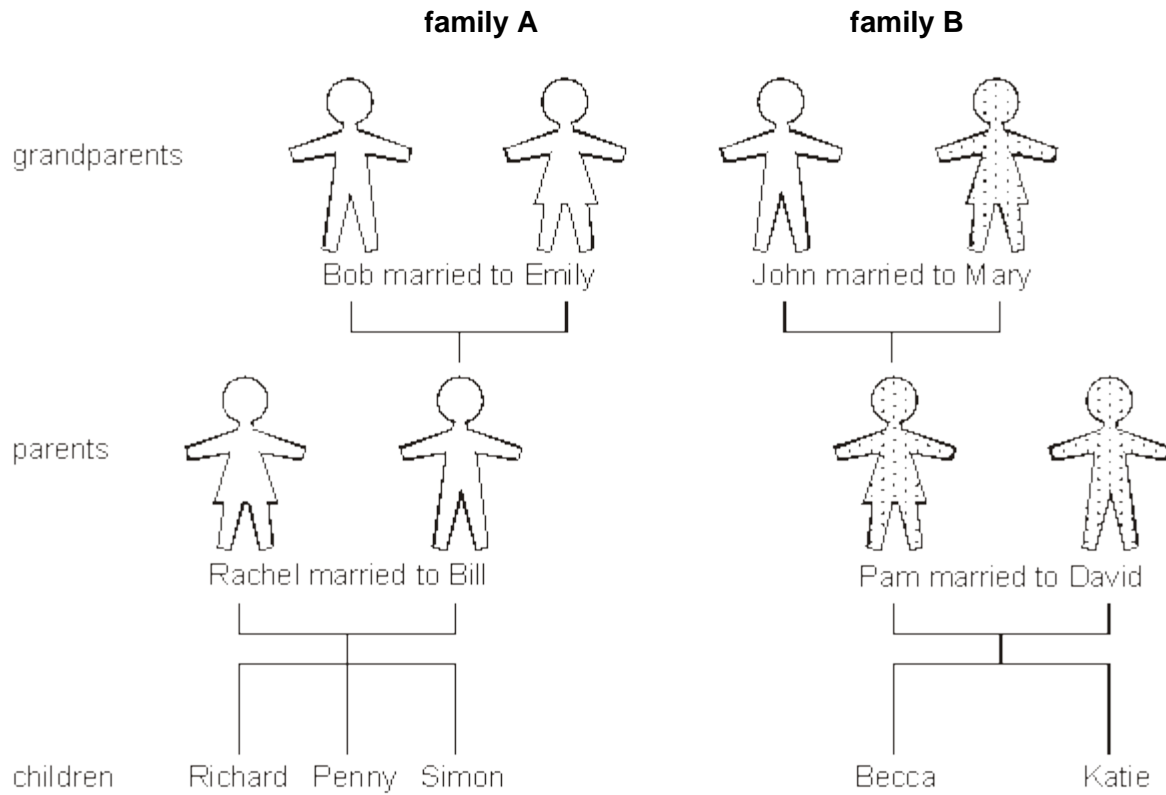
.....

.....

2 marks
maximum 6 marks

3.

The diagram shows two families. Some of the people in the diagram have freckles.



- (a) (i) Which children are most likely to have freckles?
Tick the correct boxes.

Richard	Simon	Katie	Penny	Becca
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 mark

- (ii) How did you decide?

.....

.....

1 mark

- (iii) Suggest why Bill does **not** have freckles.

.....

.....

1 mark

- (b) (i) Which **two** cells pass on information from parents to their children?
Tick the **two** correct boxes.

bone cell	<input type="checkbox"/>	cheek cell	<input type="checkbox"/>
egg cell	<input type="checkbox"/>	muscle cell	<input type="checkbox"/>
red blood cell	<input type="checkbox"/>	sperm cell	<input type="checkbox"/>

1 mark

- (ii) Which organ system produces these two cells?
Tick the correct box.

circulatory system	<input type="checkbox"/>
digestive system	<input type="checkbox"/>
reproductive system	<input type="checkbox"/>
respiratory system	<input type="checkbox"/>

1 mark
maximum 5 marks

4.

(a) The photograph below shows a team of dogs called huskies pulling a sledge across the ice.



Huskies need to survive in a cold climate. They must be able to pull a heavy sledge for a long time each day.

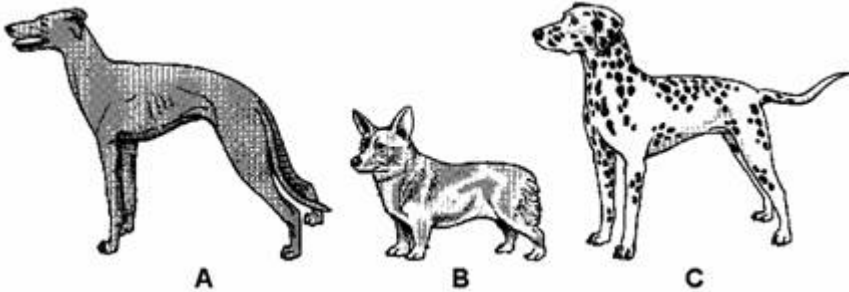
Which **two** features would a dog breeder look for when choosing huskies to breed from? Choose from the list of features below and give the reason for each choice.

blue eyes fierce nature long tail

thick fur short legs strong muscles

- 1. feature 1 mark
- reason
- 1 mark
- 2. feature 1 mark
- reason
- 1 mark

(b) The drawings below show three dogs. They all look different.



- (i) Which word describes the differences between these dogs?
Tick the correct box.

adaptation

reproduction

vaccination

variation

1 mark

- (ii) The drawing below shows a puppy. Dog C is the puppy's mother.



Why does the puppy look like his mother?
Tick the correct box.

Information passed from the mother in an egg.

Information passed from the mother in a sperm.

Information passed from the mother in milk.

Information passed from the mother in blood.

1 mark
Maximum 6 marks

5.

The quagga is an extinct animal that lived in Africa. Quaggas belonged to the same group as zebras.

The drawings below show a zebra and a quagga.



Zebra



Quagga

- (a) Zebras and quaggas used to breed with each other. The offspring contained a combination of both zebra and quagga genes (genetic information). How were zebra **and** quagga genes passed on from the parents to their offspring?

.....
.....

1 mark

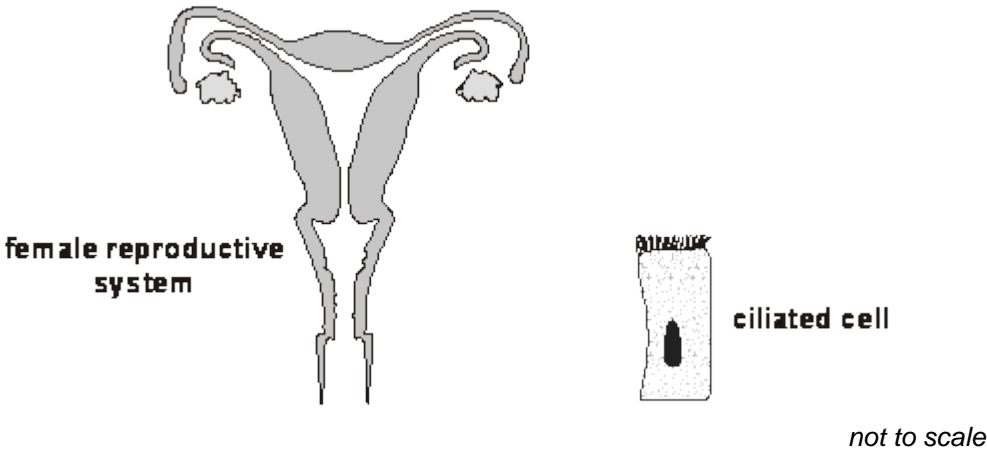
- (b) These days there are some zebras that still show some quagga features. Scientists are using zebras to try to produce quaggas by selective breeding. Describe the steps in this selective breeding process.

.....
.....
.....
.....

3 marks
Maximum 4 marks

6.

(a) The diagram below shows the female reproductive system and a ciliated cell.



Ciliated cells move an ovum along part of the reproductive system.

(i) In which part of the reproductive system are ciliated cells found?

.....

1 mark

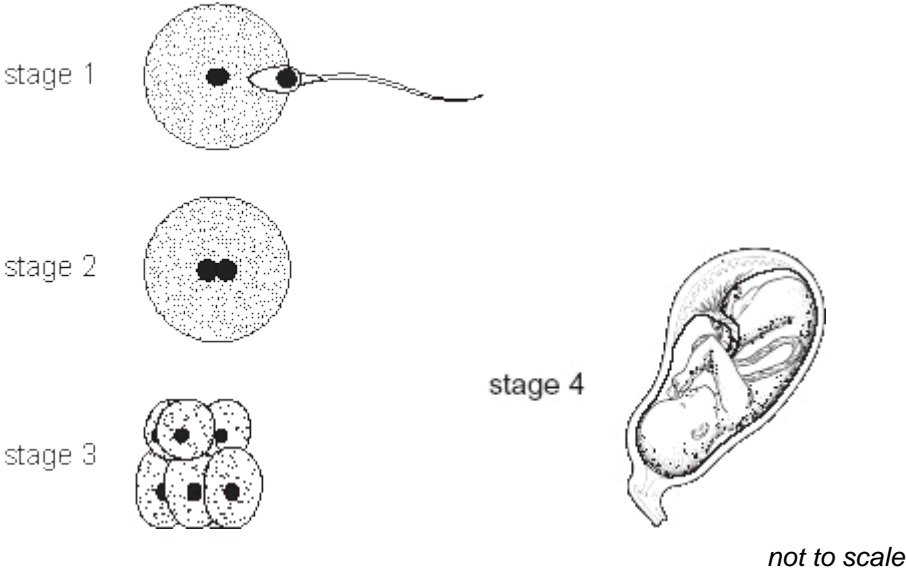
(ii) Describe how ciliated cells move an ovum along.

.....

.....

1 mark

(b) The diagrams below represent what happens at fertilisation and after fertilisation has taken place.



- (i) Some women find it difficult to become pregnant. Doctors have developed a technique in which an ovum is fertilised in a test-tube. An embryo is then implanted into the woman's reproductive system.

Which stage in part (b) shows an embryo and which stage shows a foetus?

embryo

foetus

1 mark

- (ii) Into which part of the woman's reproductive system is the embryo implanted?

.....

1 mark

- (c) (i) Explain why a child can look like both parents but is **not** identical to either of the parents.

.....

2 marks

- (ii) In the table below, tick **one** box by each human characteristic to show whether it is:

- inherited only
- inherited **and** affected by environmental conditions.

human characteristic	inherited only	inherited and affected by environmental conditions
eye colour		
skin colour		
weight		

1 mark
 maximum 7 marks