Name: .....

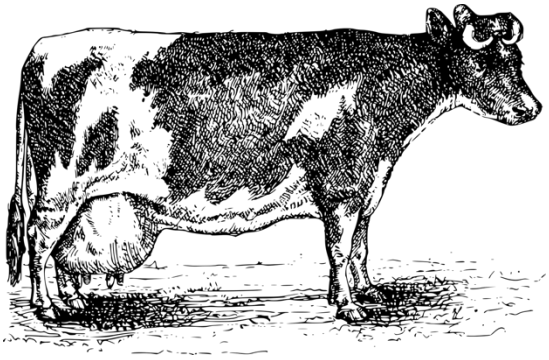
Date: .....

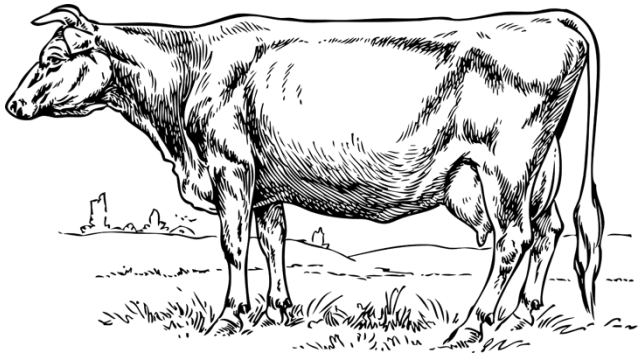
Class: .....

IGCSE BIOLOGY EDEXCEL 9-1

CHAPTER WORKBOOK

Selective Breeding





Selective Breeding in Plants

1. Charles Darwin first proposed the idea of *natural* selections. Selective breeding, however, is an example of *artificial* selection. Explain why selective breeding is described as *artificial* selection.

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.....

.....

2. Describe the term "yield" with reference to crops.

.....

.....

.....

3. Using the headings below, outline the features that a farmer would probably want from a food crop.

Yield

.....

.....

Disease

.....

.....

Insects/Pests

.....

.....

Hardiness

.....

.....

Nutrients

.....

.....

4. Read the sentences below. Some of them are steps in selectively breeding plants, but some of them are not. Add numbers to the steps to show the order they should be written in. Write an "x" next to the sentences that are not true/relevant for selective breeding.

	Number or "x"	**Stage**
A		Decide which characteristics are necessary
B		Repeat this over many generations
C		Cross pollinate those parents
D		Remove the genes for the required characteristics
E		Choose two parents that show the required characteristics
F		Take the best fruit from the plants and attached it to other plants with good fruit
G		Select the offspring with the best characteristics and cross pollinate those

Selective Breeding in Animals

1. Define *artificial insemination.*

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.....

.....

2. Using the headings, outline the characteristics that might be desirable in domestic animals.

Food produce

.....

.....

Fur

.....

.....

Offspring

.....

.....

Disease/Parasites

.....

.....

Triple Award

Micropropagation

1. The boxes below represent the stages of micropropagation in plants. Add diagrams and descriptions to each stage.

Explants: removed and sterilized	**Explants: Nutrients and hormones** ....
Cultured in rooting hormones/nutrient medium	**Transplanted to soil** ....

2. Using the headings, outline the advantages of micropropagation.

Number/quantity

.....

.....

Some species are difficult to grow from seed

.....

.....

Seasons

.....

.....

Can store large numbers of plants at low temperatures

.....

.....

Easy introduction of genetic modifications

.....

.....

.....

.....

Triple Award

Cloning

1. Define *clone*.

.....

.....

.....

.....

2. Complete the sentences to explain how cloned animals can be used to produce useful proteins. Use the words/phrases in the box.

genetically modify	cloned	medicinally	alpha-1-antitrypsin
milk	proteins	cystic fibrosis	

Some ..... can be used ..... to treat different diseases. One example is ..... which can be used to treat ..... . It is possible to ..... sheep to produce the protein in their ..... . Once the genetically modified sheep has been produced, it can be ..... to make more individuals that produce the protein.

Triple Award

2. In the space below draw a flow diagram to describe how the first cloned animal (Dolly the Sheep) was created. Include ALL of the words/phrases listed below.

unfertilised egg cell		enucleated cell
mammary gland	fertilisation	embryo
	surrogate	