

A LEVEL BIOLOGY A

Lesson Element

Cell Division

Instructions and answers for teachers

These instructions should accompany the OCR resource 'Cell Division' activity which supports OCR A Level Biology A.

The screenshot shows a lesson element page titled 'A LEVEL BIOLOGY A'. It includes the following text: 'Lesson Element', 'Cell Division', and 'Task 1 The Cell Cycle'. Below this is a circular diagram of the cell cycle with phases labeled G₁, S, and M. The M phase is further divided into sub-phases. Below the diagram is a task instruction: '1. Explain what is meant by the term "The Cell Cycle", describing what is taking place in each of the phases shown.' There is a large empty rectangular box for the student's answer. At the bottom left of the page is 'Version 2' and at the bottom right is the OCR logo.

The Activity:

This resource comprises of 4 tasks.

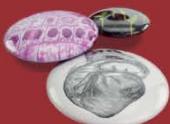
This activity is designed to be used after the content relating to cell division has been taught. Each task could be completed as a written exercise or a discussion in small groups. The activity could be split up and used as each section of content is completed. The checklist of items that should have been covered could also be used for peer assessment.

Associated materials:

'Cell Division' Lesson Element learner activity sheet

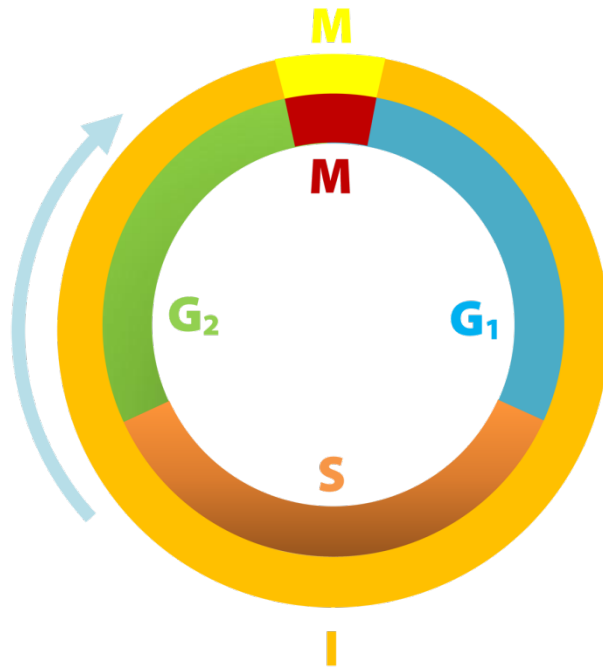


This activity offers an opportunity for English skills development.



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Task 1 The Cell Cycle – Teacher Guidance on answers



The diagram above shows the cell cycle.

1. Explain what is meant by the term “The Cell Cycle”; describing what is taking place in each of the phases shown.

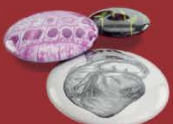
Checklist: have students

- Given a definition of the cell cycle?
- Described what happens in G₁, S, G₂ and M?

2. Outline the controls that regulate the cell cycle.

Checklist: have students

- Outlined what the checks are?
- Described what would occur if the checks were not successful?



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Task 2 Cell Division Vocabulary

Produce a set of flash cards of the technical terms used in cell division. For each term provide a definition and one or two sentences stating the role of the term in cell division.

Checklist: have students included all the following terms?

Anaphase, Bivalent, Centriole, Centromere, Chiasmata, Chromosome, Chromatid, Diploid, Haploid, Homologous pair, Interphase, Metaphase, Prophase, Spindle fibres, Telophase,

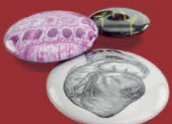
Task 3 Mitosis and Meiosis

Design and complete a table showing similarities and differences between mitosis and meiosis. It should include:

- The number of divisions
- The products
- The chromosome number
- The formation of bivalents and chiasma
- Role in the body

Checklist: does the table produced look something like this?

	Mitosis	Meiosis
The number of divisions		
The products		
The chromosome number		
The formation of bivalents and chiasma		
Role in the body		



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Task 4 Importance of Mitosis and Meiosis

Plant breeders use both sexual and asexual reproduction to produce commercial quantities of new varieties of a plant.



Runner with daughter plant developing

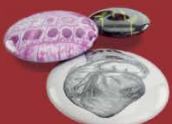
Strawberries can reproduce sexually by producing gametes in flowers and asexually by producing new plants at the end of runners. Modern strawberry plants have been bred so that the fruit is much larger than in original the wild varieties. In order to produce plants that bear larger fruit the breeder will take pollen (male gamete) from one plant and artificially transfer this to the female sexual organs in the flower so that fertilisation can occur. If the breeder is lucky then one or more of the offspring will produce larger fruit. This strawberry plant is prevented from reproducing sexually and maintained in conditions that encourage the productions of runners.

The daughter plants are then separated from the parent plant and the process of producing runners repeated until sufficient are available for commercial use.

1. Explain the role of meiosis and mitosis in the production of commercial quantities of strawberry plants with the desired characteristics.

Checklist: have students included:

- Which stages involve meiosis and mitosis?
- Why sexual reproduction is needed to produce plants with characteristics different to the parent plant?
- Why asexual reproduction is used to produce daughter plants from the plant with the desired characteristic?



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2. Discuss why growers should only use plants produced from runners not use plants produced from sexual reproduction.

Checklist: have students included:

- What kind of cell division is involved in producing runners?
- What the offspring from runners will be like compared to each other and the parent plant?
- Why is this important to a grower?

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Version 2

