5. The mitotic cell cycle

Starter Quiz ·

A-Level Biology Name: _____ Score: _____

1. A chromosome is:

   ☐ a type of carbohydrate

   ☐ a membrane

   ☐ a long DNA molecule wound around proteins called histones

   ☐ a single protein

2. The two daughter cells produced by mitosis are:

   ☐ genetically identical to each other and to the parent cell

   ☐ always specialised

   ☐ half the size forever

   ☐ genetically different from each other

3. In prophase:

   ☐ sister chromatids are pulled to the poles

   ☐ chromosomes condense, the nuclear envelope breaks down, and a spindle forms

   ☐ two new nuclei form

   ☐ chromosomes line up at the equator

4. After replication, a chromosome is two identical sister _____ joined at the centromere.

   _____

5. Mitosis produces genetically identical daughter cells, which is why it is used for growth and repair.

   ☐ True ☐ False

6. In _____, the chromosomes line up along the equator of the cell.

   _____

7. During which phase of interphase is the DNA copied?

   ☐ cytokinesis

   ☐ the S phase

   ☐ the G_2 phase

   ☐ the G_1 phase

8. Select **all** the roles of mitosis.

- ☐ asexual reproduction
- ☐ growth
- ☐ producing genetically varied gametes
- ☐ repair and replacement of cells
- ☐ making ATP

Tick every correct option.

9. Anaphase is the stage where:
   - ☐ the nuclear envelope breaks down
   - ☐ the centromeres split and sister chromatids are pulled to opposite poles
   - ☐ the cytoplasm divides
   - ☐ the spindle first forms
10. Mitosis is the longest part of the cell cycle.

    ☐ True ☐ False

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Answers ·

A-Level Biology

1. **a long DNA molecule wound around proteins called histones**

   Chromosomes are DNA wound tightly around histone proteins, packing a huge length into the nucleus.

2. **genetically identical to each other and to the parent cell**

   Mitosis produces genetically identical cells – they carry exactly the same genes as the parent.

3. **chromosomes condense, the nuclear envelope breaks down, and a spindle forms**

   Prophase: chromosomes coil up and become visible, the nuclear envelope breaks down, and the spindle forms.

4. **chromatids**

   Replication makes an identical copy; the two sister chromatids stay joined at the centromere until anaphase.

5. **True**

   Identical copies are exactly what growth, repair and asexual reproduction need.

6. **metaphase**

   In metaphase the chromosomes line up at the cell's equator and spindle fibres attach to each centromere.

7. **the S phase**

   DNA replication happens in the S (synthesis) phase, between G_1 and G_2.

8. **asexual reproduction; growth; repair and replacement of cells**

   Mitosis gives identical cells for growth, repair/replacement and asexual reproduction. Varied gametes come from meiosis; ATP comes from respiration.

9. **the centromeres split and sister chromatids are pulled to opposite poles**

   In anaphase the centromeres split and the spindle pulls the sister chromatids apart to the poles.

10. **False**

    False. Interphase (G_1, S, G_2) takes up most of the cycle; mitosis and cytokinesis are comparatively short.