1. A chromosome is:

   ☐ a long carbohydrate chain in the nucleus

   ☐ a membrane-bound sac holding the genes

   ☐ a long DNA molecule wound around proteins called histones

   ☐ a single long protein coiled around RNA

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.

   ☐ 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 and chromosomes condense

   ☐ the centromeres split and sister chromatids are pulled to opposite poles

   ☐ the cytoplasm divides to make two daughter cells

   ☐ the spindle first forms and attaches to the chromosomes

10. Mitosis is the longest part of the cell cycle.

    ☐ True ☐ False

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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.

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