

THE LIVING WORLD

THE CELL AND CELL DIVISION
DNA and genetic diversity

GUIDE	LES 18
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STUDENT BOOK	Ch. 5, pP. 126–131
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1. Match the structures in the left column to the function in the right column.

Cell structure	Function
a) Nucleus	1. Outlines and protects the cell.
b) Cell membrane	2. Dictates cell activity.
c) Cytoplasm	3. Contains and protects an individual's genetic information.
d) DNA	4. Forms the basis of a living organism.
e) Nuclear membrane	5. Environment conducive to cell activity
f) Cell	6. Allows exchanges between the nucleus and other parts of the cell.

2. Cross out the following nitrogen base pairs that are not compatible.

Adenine = A	Cytosine = C	Guanine = G	Thymine = T
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- ~~a) A-C~~ ~~b) G-A~~ c) C-G d) G-C
- ~~e) A-G~~ f) A-T ~~g) C-A~~ ~~h) T-G~~

3. True or false?

- a) The DNA of each individual contains a unique base pair sequence. True
- b) Reproduction within a small population increases genetic diversity. False
- c) The genome of each human contains about 1000 genes. False
- d) A diverse population is conducive to survival of the species. True
- e) Fraternal twins have the same genetic code. False
- f) Great genetic diversity helps to reduce the risk of contracting certain illnesses. True

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THE CELL AND CELL DIVISION (*continued*)

**Cell division:
mitosis and meiosis**

1. Circle each statement that applies. Cell division . . .

- a) allows cells to regenerate.
- b) is continuously occurring within the cell.
- c) enables the production of new cells.
- d) is preceded and followed by the interphase.
- e) is always a sexual reproduction.
- f) permits growth of the organism.
- g) helps to increase the size of cells.

2. For each of the following statements, place a check mark on the left if it refers to mitosis and on the right if it refers to meiosis. One statement refers to the two methods of division.

Mitosis

Meiosis

- | | | |
|-------------------------------------|--|-------------------------------------|
| <input checked="" type="checkbox"/> | I produce two identical daughter cells. | <input type="checkbox"/> |
| <input type="checkbox"/> | I occur in preparation of sexual reproduction. | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | I help to replace dead cells. | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | I correspond to asexual reproduction. | <input type="checkbox"/> |
| <input type="checkbox"/> | I end with half of the chromosomes in each cell. | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | My result is four haploid cells. | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | Chromosomes separate during my cycle. | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | I contain four phases. | <input type="checkbox"/> |
| <input type="checkbox"/> | I occur in two divisions. | <input checked="" type="checkbox"/> |

3. Answer the following questions with “yes” or “no.”

Does the mention of 23 chromosomes refer to . . .

- a) the total number of chromosomes in each cell? No
- b) the number of chromosome pairs of the human genome? Yes
- c) the number of chromosome pairs of a bacterium? No
- d) the number of chromosomes in the ovum? Yes
- e) the number of chromosome pairs in the daughter cells resulting from mitosis? Yes