

Objective : understand that organisms inherit characteristics from their parents through genetic material that is carried in cell nuclei

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Workbook page 90 / Question 1

1 Complete these sentences about inheritance using words from the box below.

We inherit some characteristics from each **parent** because we inherit **genes**
from them. Each egg and sperm cell contain **half** of each parent's genes – a random
selection – so each fertilised egg has a **unique** combination of genes. These genes
influence our growth and development by controlling our **cells** Some genes
are similar in everyone. Others give us unique **characteristics**

genes

cells

parent

characteristics

influence

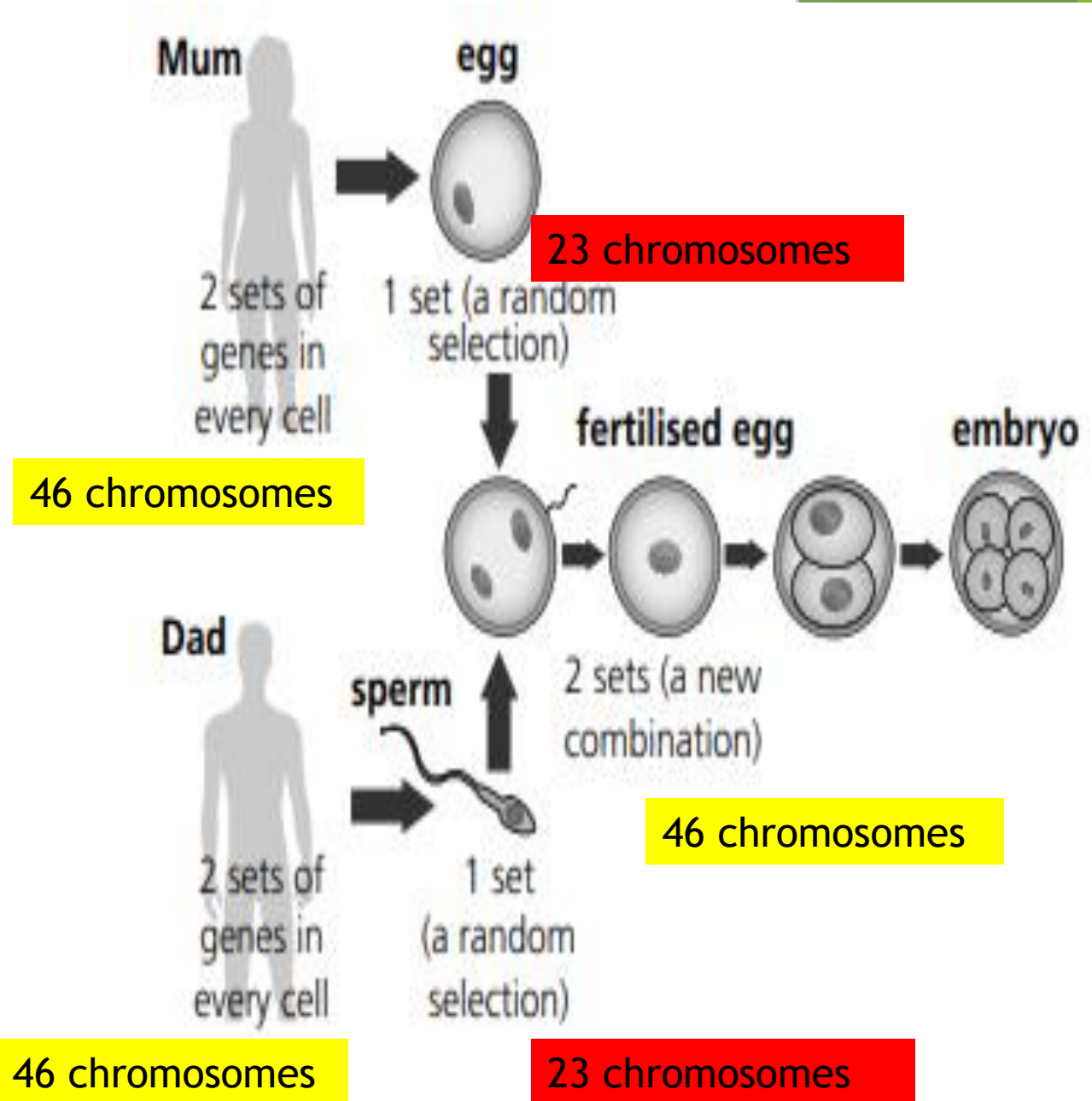
unique

half

Workbook page 90

Question 2 :

2 Label the diagram to show how genes from each parent get into all an embryo's cells.



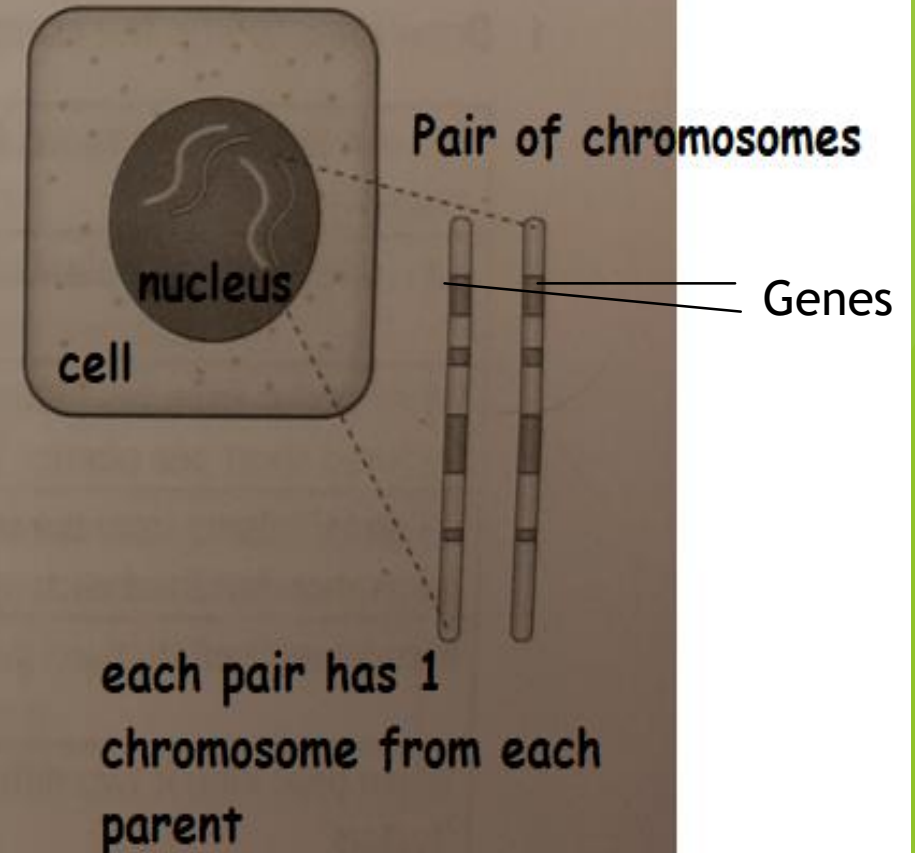
Workbook page 91 / Question 1

Extension: Variation and classification

17.3 Chromosomes

- 1 This diagram shows a human cell.
- a Add labels to the diagram to show where the genes are stored in a cell.
- b Describe two differences between the diagram and a real cell.
The nucleus in the diagram has two pairs of
chromosomes, but real human cells have 23 pairs.
The chromosomes in the diagram contain
four different genes, but real human chromosomes
contain up to 1000 genes.
- c How can you tell whether a cell is from a boy or a girl?
Females have two X chromosomes but males
have an X chromosome and a Y chromosome.

Chromosome number 23 - the sex chromosomes

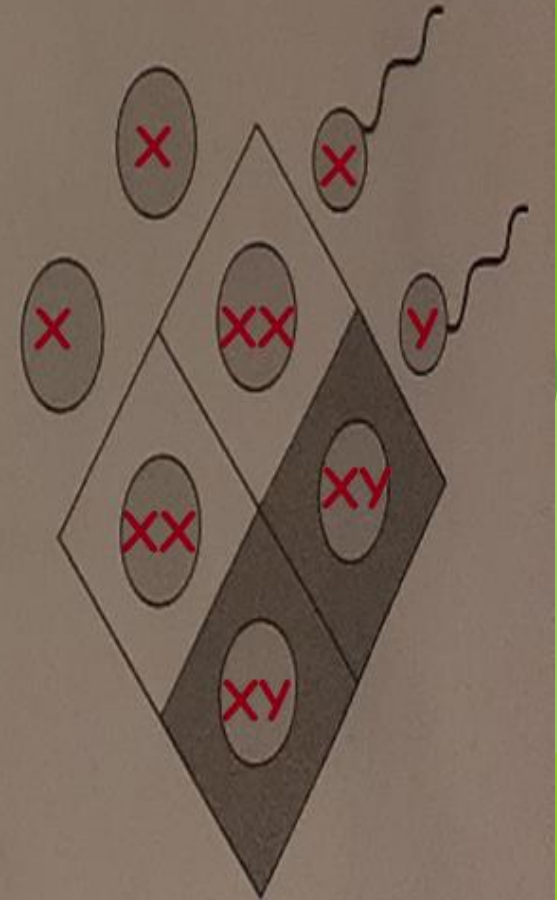


Workbook page 91 / Question 2

- 2 Decide whether these sentences are true for 'genes', 'chromosomes' or 'both'.
- | | |
|----------------------------------------|-----------------------|
| a Found in the nucleus | Both |
| b Inherited from our parents | Both |
| c Visible just before a cell divides | CHROMOSOMES |
| d Made from giant molecules called DNA | CHROMOSOMES |
| e Made from special sections of DNA | Genes |
| f There are thousands in each cell | Genes |
| g There are 23 pairs in each cell | chromosomes... |

Workbook page 91 / Question 3

3 Label the diagram on the right to show why fertilised eggs are equally likely to be male or female.



Workbook page 91 / Question 4

4 The diagram shows the chromosomes from a child with Down's syndrome. Children born with Down's syndrome have a range of physical features. These include wide, flat faces and a short neck. They grow more slowly than normal and tend to be short as adults.

a Is this child a boy or a girl?

... **A BOY**

b What is unusual about the child's chromosomes?

... **He has three copies of chromosome 21 instead of two**

c Older mothers are more likely to have children with Down's syndrome. Suggest how the child got this combination of chromosomes.

... **caused by abnormal cell division during the development of the egg cell Or the sperm cell**

