

Cell division allows an organism to grow, while maintaining the cells size that keeps the organism healthy.

Read 148-149



**Page 149**  
**Question 1-3**

Cube

$$\begin{aligned} \#3 \quad SA &= A_{\text{base}} \times \# \text{ of sides} \\ &= l \times w \times 6 \\ &= \end{aligned}$$

$$\begin{aligned} \text{Volume} &= A_{\text{base}} \times H \\ &= l \times w \times H \\ &= \end{aligned}$$

Page 149  
Question 1-3

1) Why is cell division important?


Cell division permits single cells to develop into multicellular organisms. It also permits the replacement of damaged cells. Few cells live for the adult life span of a multicellular organism.

2) Provide evidence that suggested that not all cells in your body divide at the same rate.

Cells from a sunburn are replaced quickly while those in the brain have very limited reproduction capacity. Prior to 1998, scientists generally believed that in the adult brain were not capable of cell division.

3) Imagine two cubic cells, one with sides of 1mm, and one with sides of 2mm. For each cell, calculate

(a) The total surface area



$$A = b \times h$$

$$= 1\text{mm} \times 1\text{mm}$$


$$= 1\text{mm}^2$$

↙ 6 equal faces on a cube

$$SA = 6 \cdot A$$

$$= 6 \cdot 1\text{mm}^2$$

$$= 6\text{mm}^2$$



$$A = b \times h$$

$$= 2 \times 2$$

$$= 4\text{mm}^2$$

$$SA = 6 \cdot A$$

$$= 6 \cdot 4\text{mm}^2$$

$$= 24\text{mm}^2$$

(b) The volume

$$\text{Volume} = A_{\text{base}} \times H$$

$$= 1\text{mm} \times 1\text{mm} \times 1\text{mm}$$

$$= 1\text{mm}^3$$

$$V = 2\text{mm} \times 2\text{mm} \times 2\text{mm}$$

$$= 8\text{mm}^3$$

(c) The surface area divided by the volume ratio

$$\frac{6\text{mm}^2}{1\text{mm}^3} = \frac{48\text{mm}^2}{8\text{mm}^3}$$

↙ x8

$$\frac{24\text{mm}^2}{8\text{mm}^3} = \frac{3}{1}$$

↙ x8

Using these results, explain why cells have to divide as an organism grows.

on test → As a cell grows, volume increases at a greater rate than surface area. This means that amount of cytoplasm (volume) increases at greater rate than the cell membrane (surface area) needed to exchange nutrients and wastes.

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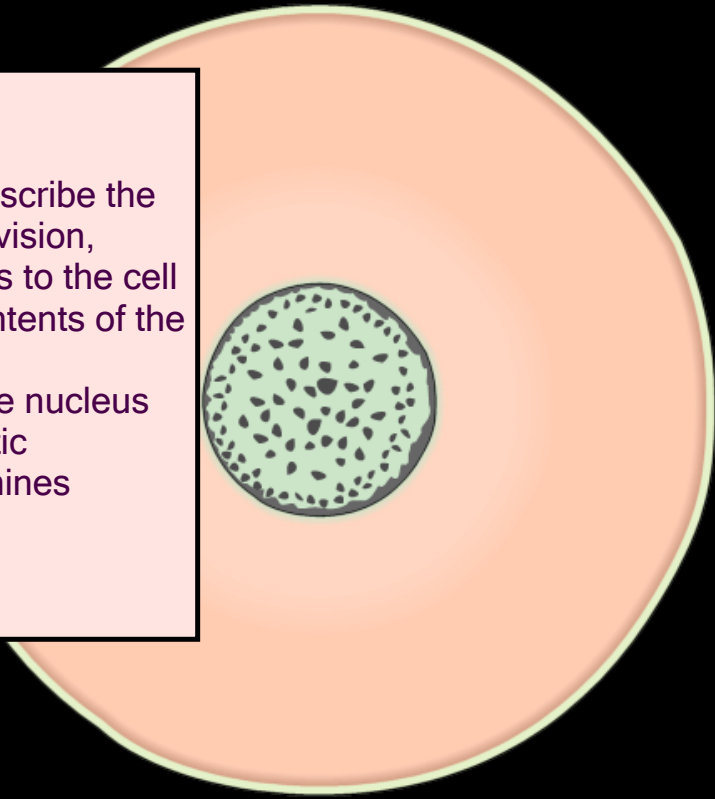
1/10th mm

BHS  
Grade 9 Science

**304-11** illustrate and describe the basic process of cell division, including what happens to the cell membrane and the contents of the nucleus

**305-1** recognize that the nucleus of a cell contains genetic information and determines cellular processes

Please press the show all links option before starting the lesson. It can be found under view of the drop down menu.



1

Your life began as a single cell, the fertilized egg (zygote). Nine months later, when you were born, approximately 100 trillion made your body

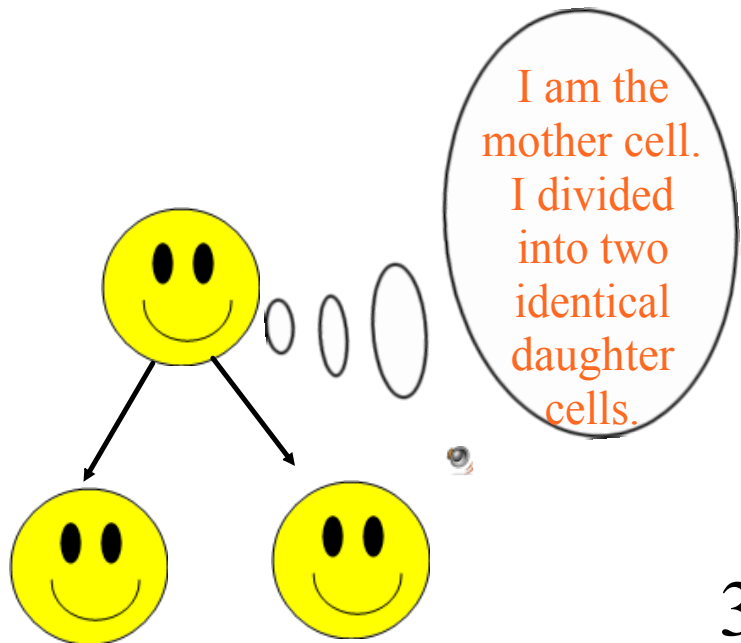
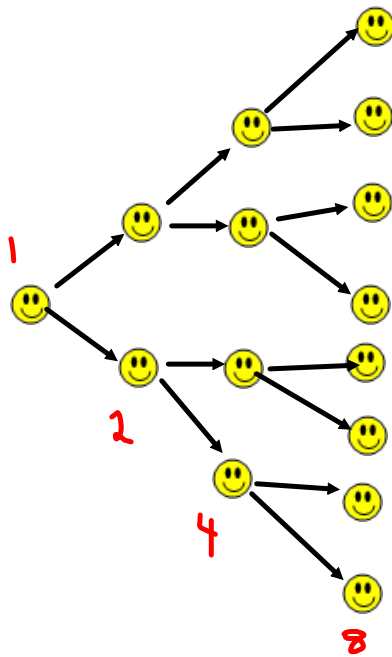


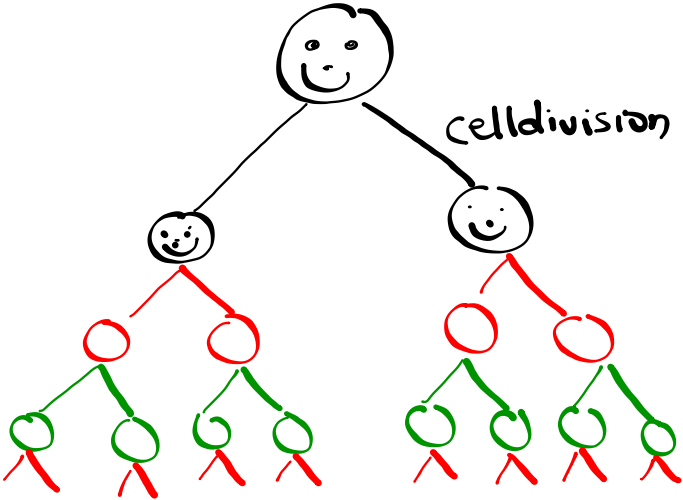
**Today's Investigation**

How did one cell become 100 trillion cells?

### Cell Division

All cells come from preexisting cells through cell division.  
Cells divide into two, then each into another two cells.





- 1
- 2
- 4
- 8
- 16
- 32
- 64