

Importance of Cell Division

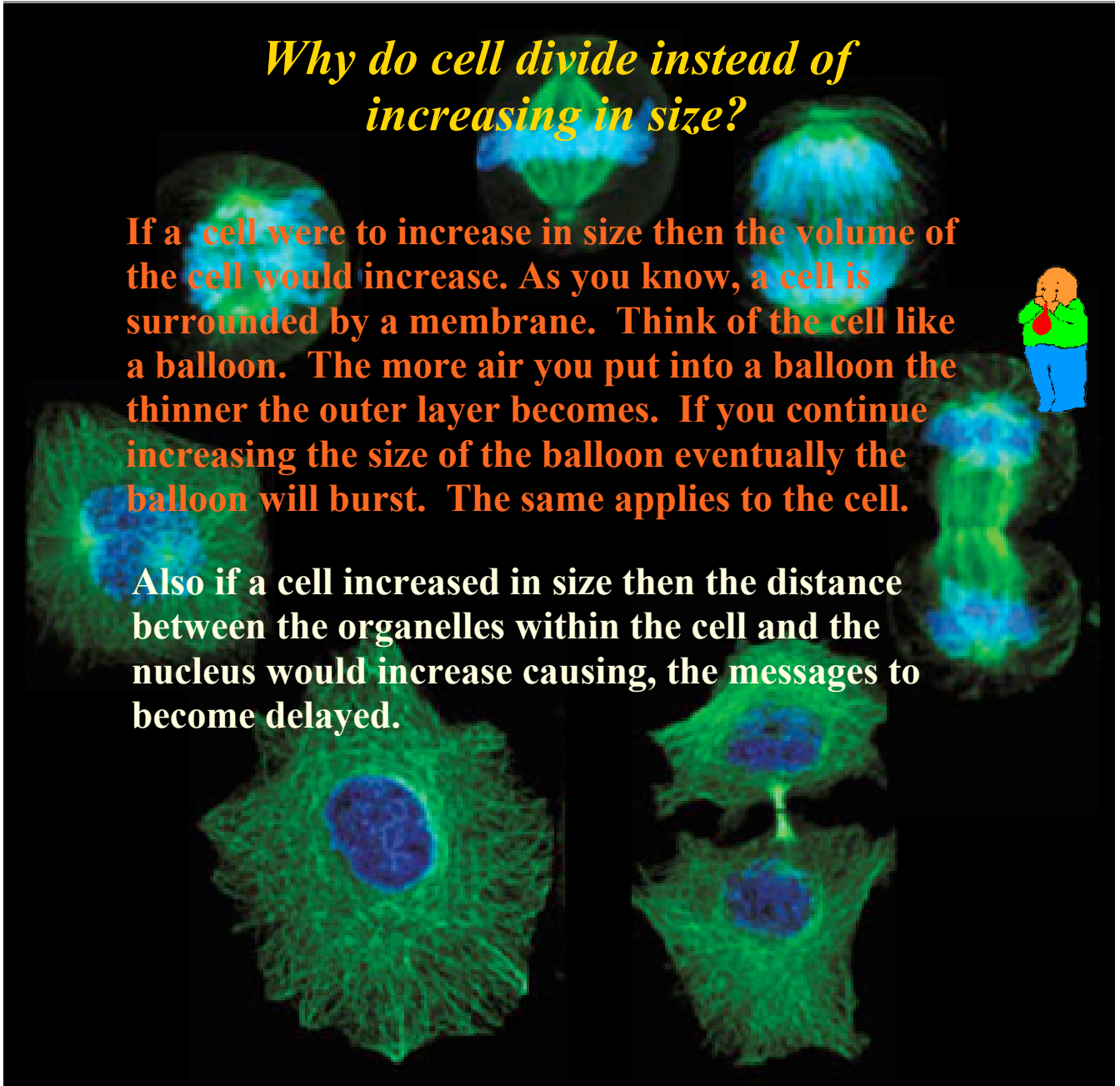
New cells need to be created to

- Replace old / dead cells
- Repair damaged tissues
- Allow organisms to grow

Why do cell divide instead of increasing in size?

If a cell were to increase in size then the volume of the cell would increase. As you know, a cell is surrounded by a membrane. Think of the cell like a balloon. The more air you put into a balloon the thinner the outer layer becomes. If you continue increasing the size of the balloon eventually the balloon will burst. The same applies to the cell.

Also if a cell increased in size then the distance between the organelles within the cell and the nucleus would increase causing, the messages to become delayed.



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

Page 149
Question 1-3

Page 149
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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



$A = b \times h$
 $= 1\text{mm} \times 1\text{mm}$
 $= 1\text{mm}^2$

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



$A = b \times h$
 2×2
 $= 4\text{mm}^2$

$SA = 6 \cdot A$
 $= 6 \cdot 4\text{mm}^2$
 $= 24\text{mm}^2$

(b) The volume

(c) The surface area divided by the volume ratio

$$\frac{6\text{mm}^2}{1\text{mm}^3} \quad \frac{24}{3}$$

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

$8 \times$

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

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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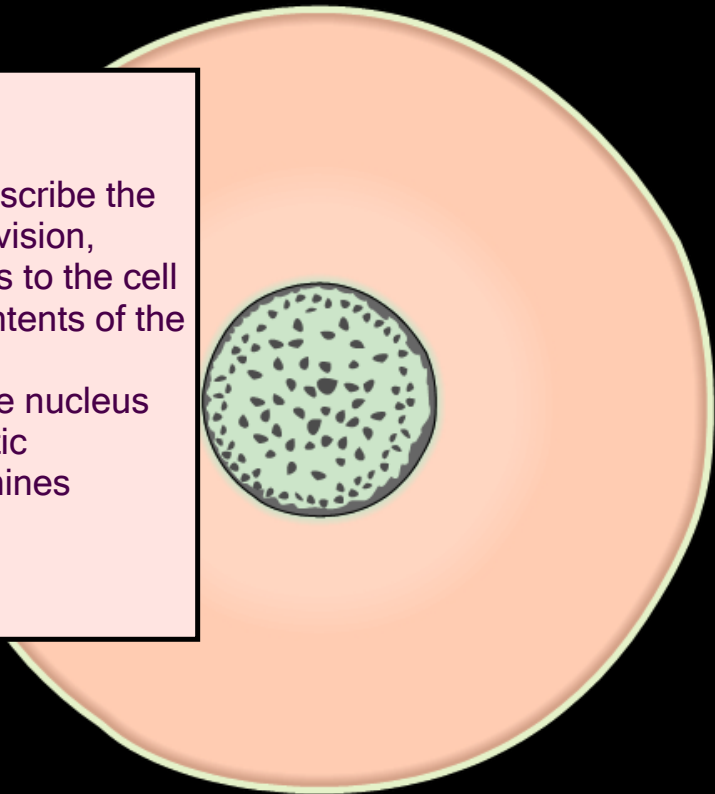
1/10th mm

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

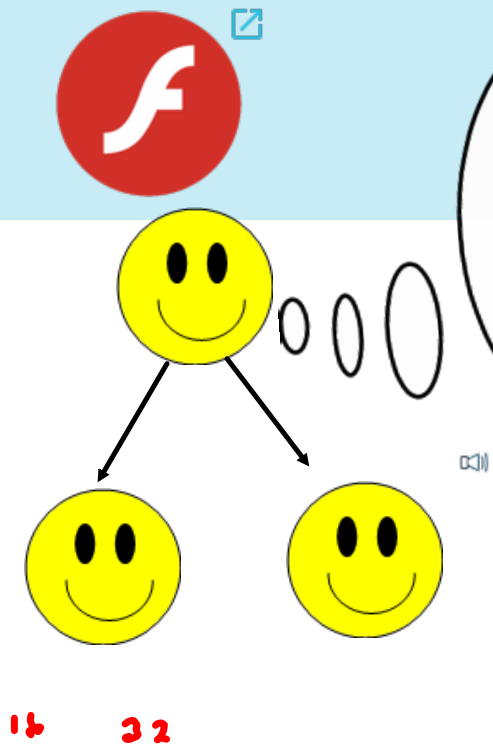
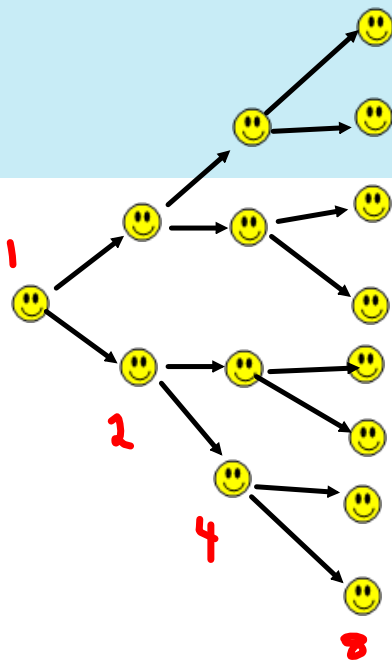
1
Cell



Today's Investigation
How did one cell become 100 trillion cells?

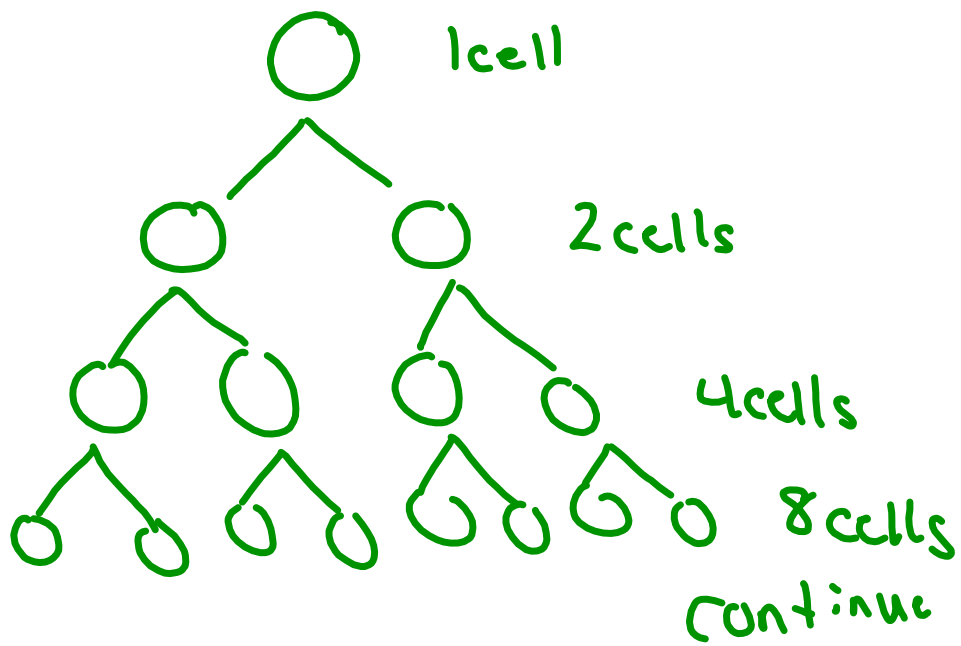
Cell Division

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



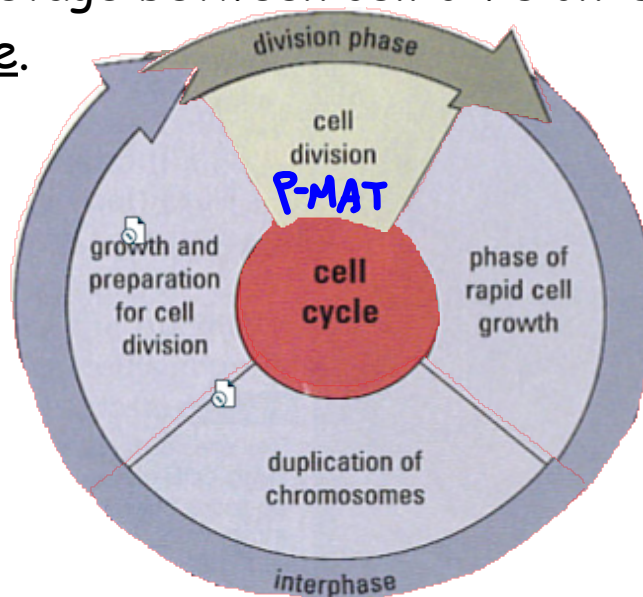
I am the mother cell. I divided into two identical daughter cells.

Cell Divide

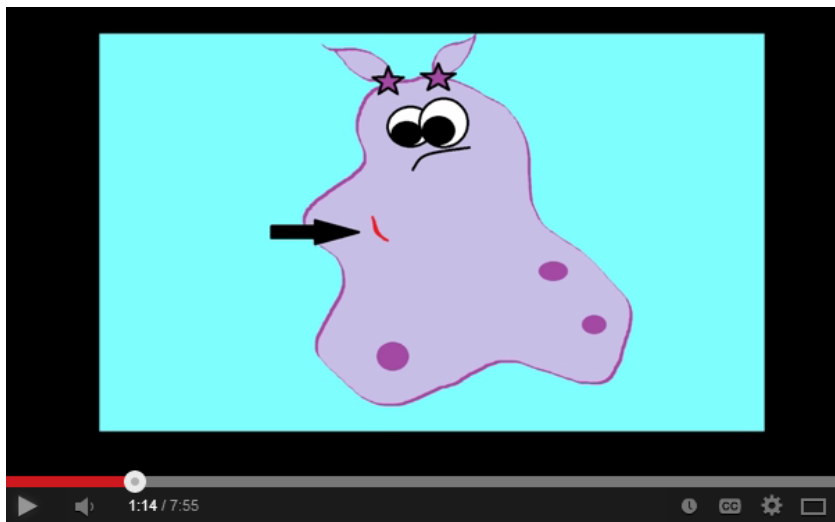


The Cell Cycle → PMAT

Cells divide and rest. The sequence of event from one division to the next is called the cell cycle. For most cells, cell division is a small part of the cells life. The stage between cell division is called interphase.



<http://www.youtube.com/watch?v=gwcwSZIfKIM>



Mitosis: The Amazing Cell Process that Uses Division to Multiply!