

Smart Cells!

Cells are really tiny chemical factories! Genes tell the factory what chemicals to produce—to make muscle cells, skin cells, bone cells, stomach cells, or many other types of cells! **Busy, busy!**

How does a cell know what to do? While most cells have a complete set of genes, only some of the genes in a cell are "turned on." Genes are turned on and off at different times during development to make a bone cell look and act differently than a brain cell, for example. The process of turning genes on and off is called **gene regulation**.

How often do cells divide to create new cells? It depends on the type of cell! Hair and skin cells, for example, divide frequently to replace dead cells. Other cells are replaced slowly, like brain cells.



FAST FACT! If you put the genetic data in a single cell in a book, it would have half a million pages!

Write About It!

Pretend you are a cell. Decide what type of cell you want to be. A hair cell? A brain cell? A bone cell? Write a story about what type of cell you are, and why you like chose to be that type of cell!



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For Better or Worse

DNA sometimes makes mistakes when it makes copies of itself. When this happens, a mutation occurs. A **mutation** is a change in the DNA's genetic code. Mutations can be either good or bad, depending on the result. Some mutations help animals survive in a new environment. Other mutations can cause disease.

Mutations occur in cells in our bodies. Usually, the cells die, but sometimes they cause diseases. Mutations also happen in the sperm or egg cells—the cells that unite to make babies. When mutations happen in those cells, the mutation will be passed along to the child.



Some mutations occur because of the environment.

Certain chemicals and radiation can cause DNA to mutate. For humans, too much sunlight or cigarette smoke may cause mutations that lead to cancer.

Hidden Words! Find the following words in the word search.																
		W	Μ	V	Т	С	0	Ρ	У	Х	Ν	К	С	Т	С	Р
		Z	J	К	Т	J	I	U	Μ	Ν	D	0	D	н	E	У
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	WORD BANK	A	I	С	Ζ	Е	Α	R	Х	Ν	I	F	Ρ	G	Ε	Ν
	mutation	Ν	0	Ι	Т	Α	Т	U	Μ	С	Е	U	В	Α	S	V
	copy	0	L	Н	U	У	к	0	A	Х	В	G	S	Q	I	Ι
	DNA	V	D	G	A	V	Х	L	S	A	V	L	F	U	D	R
	environment	Т	J	R	Ζ	Μ	S	L	Н	R	У	G	J	L	В	0
	code	Т	Ν	Q	Т	У	L	I	В	В	Т	D	L	У	I	Ν
	disease	Α	V	0	D	Е	R	Ζ	D	U	Х	Ζ	Ν	Ρ	R	Μ
	chemicals	I	R	Ζ	С	0	В	S	Ι	Α	Е	X	С	F	J	Е
	cells	N	G	Ν	Ρ	Κ	V	F	V	F	Α	Х	Т	0	Ν	Ν
		К	Ι	Н	У	Ι	G	Т	С	Н	Н	С	U	F	D	Т
		S	J	L	D	Ν	Μ	V	С	R	Н	Ζ	F	Т	U	Е