

Good Morning!

One of the sections we would have covered would have been about regeneration. Read the following notes below. Also, there is information about stem cells below. Watch the youtube videos attached with this lesson. Complete the assignment below at the end of this lesson:

Regeneration

Regeneration is the ability to regrow a part of the body.

In humans, blood, bone and skin can regrow or regenerate. Bones that break can be repaired; broken skin (a cut) can heal. A human liver or kidney has some ability to regenerate.

We cannot regrow fingers, toes etc.....

Regeneration and Specialized Cells

Some animals have the ability to regenerate. These animals are the ones with little specialization. This means that they only have a few kinds of cells that do certain jobs. **Humans have many kinds of specialized cells like liver, brain, skin, blood and the list goes on.**

Some of these less complex animals can reproduce asexually through fragmentation. This means that the animal can reproduce when they are cut in half. If a sponge is cut in two pieces, each part will become a new organism.

A salamander is a more complex animal. It can regenerate legs, but cannot reproduce through fragmentation. (Remember fragmentation is a form of asexual reproduction)

Specialization and DNA

The nucleus of every cell had DNA. DNA is made up of the same materials.

Why do we have different kinds of cells?

Each cell uses different parts of their DNA. They are given orders by different genes.

One example: A nerve cell no longer needs information to make skin color. The genes that are not needed are turned off.

Stem Cells in Humans

Stem cells are cells with little specialization. They are able to divide many times and they specialize into something like a muscle or nerve cell.

Human skin, bone marrow, contains stem cells. This is why we can grow new skin cells, but not new nerve cells.

Research is being done now on stem cells. They are looking for ways to repair cells that cannot be replaced.

★ Axolotls are Masters of Regeneration

<https://www.youtube.com/watch?v=Eo50ctoOTWs>

★ Planarian Regeneration and Stem Cells | HHMI BioInteractive Video

<https://www.youtube.com/watch?v=roZeOBZAa2Q>

★ Stem Cells: Khan Academy

<https://www.youtube.com/watch?v=uUH5YI5dTOg>

★ How Do Animals Re-Grow Limbs (And Why Can't We?)

<https://www.youtube.com/watch?v=QFa6jP6WgzM>

★ Changing the future with stem cells | Crystal Ruff |

<https://www.youtube.com/watch?v=MvMUM-huMaI>

Assignment:

Write down five facts about **stem cells**. List **two** advantages and disadvantages about stem cells. What do you think is the **most interesting** fact about this topic?