

**Objective:** Understand what a stem cell is

(Scottish curriculum: S1-3, Biological Systems SCN 4-13a – explain the role of cell division in the body)

## What are stem cells?

Use these words to fill in the gaps:

differentiation

skin

self-renewal

specialized

egg

Cells are the building blocks of all living things. Your body is made up of 210 different kinds of cells – blood cells, **a.** cells, muscle cells, nerve cells and many more. Stem cells are one of the most amazing types of cell in your body. You can't survive without them. In fact, you would never have developed from a fertilized **b.** into a baby if it weren't for stem cells. Stem cells are special because they can do two things:

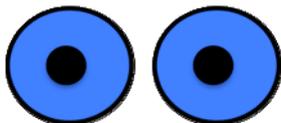
1. Make copies of themselves. We call this process **self-renewal**.
2. Make other types of cells that do particular jobs in the body, e.g. skin cells, nerve cells or blood cells. We call this process **differentiation**. The new cells are known as 'differentiated', or **c.** cells. That's because they can only do the particular job they were made for – they are specialists at their jobs.

Stem cell



**d.**

(= copying)



Identical stem cells

Stem cell



**e.**

(= specializing)



Specialized cells

**Objective:** Explain the roles of stem cells in the body, both in growth and repair.  
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## Why do we need stem cells?

Use the words below to fill in the gaps. One of them belongs in the diagram.

fertilization

stem cells

blood

divide

damaged

We need stem cells all our lives. They replace cells in our bodies that die, get **a.** or are used up. For example, right now, inside your bone marrow, stem cells are busy making the 100, 000, 000, 000 (1 billion) new blood cells you need every single day! At the same time, they are making copies of themselves. This makes sure you never run out of stem cells. You will need your stem cells to make more new **b.** cells tomorrow, after all.

Even before you were born, you already needed stem cells to develop from a fertilized egg into a baby. A fertilized egg divides to make two cells, then those cells **c.** so there are four cells, and so on. After about 5 days, an embryo with about 100 cells has developed. It contains **d.** that can make all the different kinds of cell that go on to form the tissues and organs of your body.

