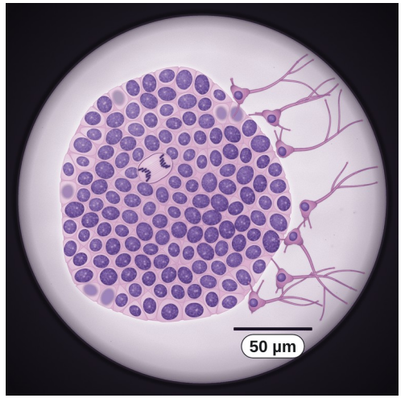
B1 L7 Alternative worksheet: Stem cells

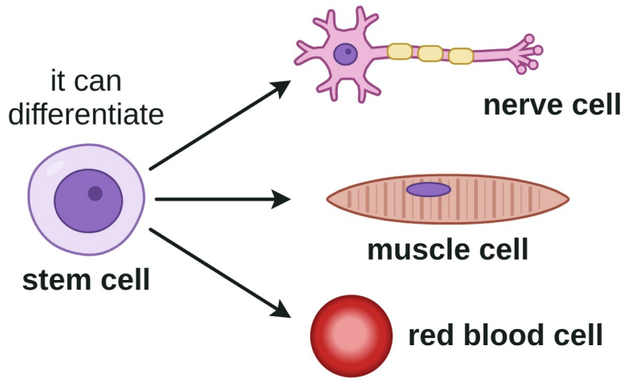
Name: _____ Class: _____

Key facts

- A **stem cell** is not specialised yet. It can **divide** to make more cells.
- It can become other types of cell. This is called **differentiation**.
- Stem cells look plain: they have not yet developed the structures of a specialised cell.
- **Embryos** have stem cells that can become **most** types of human cell.
- Adult **bone marrow** has stem cells that make **blood cells**.
- Plants have stem cells in **meristems**, at the tips of roots and shoots.
- Plants can be cloned from meristems. **Clones** are genetically identical.
- Stem cells may be able to help people with **diabetes** or **paralysis**.
- A **risk**: a virus could be passed on with the cells.
- Some people object to using embryos, for ethical or religious reasons.



Real stem cells
A painting based on a light micrograph. Stains colour the cells.



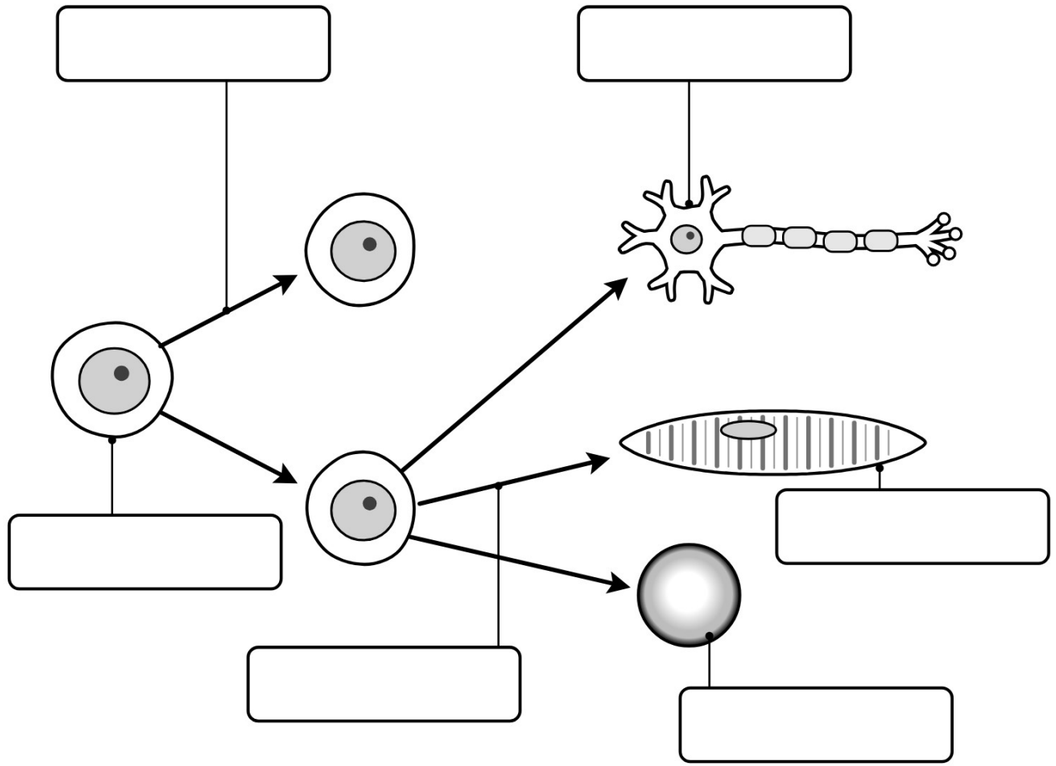
A diagram
A stem cell can become other types of cell.

A. Label the diagram

Help: online screen 3 [7]

1. Use words from the box to label the diagram. [6]
2. Colour **all** the stem cells in the diagram the same colour. [1]

stem cell	**nerve cell**	**muscle cell**
red blood cell	**divide**	**differentiate**



B1 L7 Alternative worksheet: Stem cells

Name: _____ Class: _____

B. Match the word to its meaning

Help: online screens 1, 4 and 7 [5]

Draw a line from each word to its meaning.

stem cell	●	● the soft tissue inside some bones, where blood cells are made.
undifferentiated	●	● an undifferentiated cell that can divide to make many more cells of the same type, and can differentiate into certain other types of cell.
meristem	●	● a genetically identical copy of a cell or an organism.
bone marrow	●	● not yet specialised for a particular job.
clone	●	● tissue at the growing tips of shoots and roots, where cells divide to make new cells.

C. Fill the gaps

Help: online screens 4, 6, 7, 10 and 11 [6]

Use the words in the box. Use each word once.

embryo	**blood**	**tips**	**identical**	**same**	**virus**

1. An early _____ is a tiny ball of cells.
2. Stem cells in bone marrow make new _____ cells.
3. Meristems are found at the _____ of roots and shoots.
4. Clones are genetically _____.
5. In therapeutic cloning, the embryo has the _____ genes as the patient.
6. A _____ could be passed to a patient with the stem cells.

D. True or false?

Help: online screens 1, 3, 4, 9 and 10 [6]

Circle True or False.

1. A stem cell is already specialised.	**True**	**False**
2. Stem cells can divide to make more stem cells.	**True**	**False**
3. Embryonic stem cells can become most types of human cell.	**True**	**False**
4. Meristem cells can only become leaf cells.	**True**	**False**
5. Therapeutic cloning makes a baby.	**True**	**False**
6. Stem cells may be able to help people with paralysis.	**True**	**False**

E. Benefit, risk or view?

Help: online screen 11 [6]

Write B (benefit), R (risk) or V (view) in each box.

1. Stem cells may help people with diabetes. ☐
2. A virus could be passed on with the stem cells. ☐
3. Some people believe an embryo should not be destroyed. ☐
4. Cells from therapeutic cloning are not rejected. ☐
5. The new cells might divide out of control. ☐
6. Some religious groups object to using embryos. ☐