B1 L7 Challenge worksheet: Stem cells

Name: _____ Class: _____

A. A new treatment for diabetes

Help: online screen 9 [5]

Some people with diabetes need to inject insulin every day. Scientists tested a new stem cell treatment. Table 1 shows their results.

Table 1 (example data, not real)

Group	Number of people	Number who needed fewer insulin injections after 1 year
Given the stem cell treatment	24	9
Not given the treatment	24	1

(a) Calculate the percentage of the treated group who needed fewer insulin injections. [2]

Working:

_____ %

(b) A newspaper headline says “Stem cells cure diabetes”. Use the data to explain why the headline is wrong. [2]

_____

_____

_____

(c) Suggest why the scientists also studied a group who were not given the treatment. [1]

_____

_____

B. How big is an early embryo?

Help: online screens 4 and 10 [3]

An early human embryo is a tiny ball of cells about 0.15 mm across. One of its cells is about 12 µm across.

1 mm = 1000 µm

(a) Convert 0.15 mm into micrometres (µm). [1]

_____ µm

(b) Calculate about how many cells, side by side, would fit across the embryo. [2]

Working:

_____ cells

C. Spare or cloned embryo?

Help: online screens 10 and 11 [4]

A patient needs new cells.

Embryonic stem cells could come from a spare embryo given by a couple after fertility treatment, or from an embryo produced by therapeutic cloning.

(a) Explain why stem cells from the spare embryo might be rejected by the patient's body, but stem cells from therapeutic cloning would not. [2]

_____

_____

(b) Give one ethical issue that applies to both sources. [1]

_____

(c) Give one practical risk that applies to both sources. [1]

_____

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D. Banana farms

Help: online screen 7 [3]

Almost all the bananas sold in UK shops come from one variety. The plants are clones, grown from pieces of plant that contain meristems. A fungus that kills this variety is spreading around the world.

(a) Give one reason why farmers grow bananas as clones. [1]

(b) Suggest what scientists could do to protect banana farms in the future. [2]

E. Extended response

Help: online screens 4, 6, 9, 10 and 11 [6]

Scientists can get stem cells from embryos or from adult bone marrow. Compare the two sources of stem cells for treating a patient. [6]

In your answer, compare what the cells can become, the risks and the ethical issues.