B2.3 Cell specialization

What the Cell · DP Biology · note-taking sheet · SL statements B2.3.1–6

Name _____ **Date** _____

How to use this sheet: go through the slides and videos with it, then close them and write from memory. Use your own words and add page numbers from the book (pp. 256–264) where you want more detail.

Guiding questions. What do stem cells do in multicellular organisms? How do differentiated cells suit their specialized roles?

B2.3.1 Differentiation

How can cells with identical genes become different? What is the role of gradients in an embryo?

B2.3.2–3 Stem cells and niches

State the two properties of stem cells.

Niche	What the stem cells produce

B2.3.4 Potency

Type	Can become	Found in
Totipotent		
Pluripotent		
Multipotent		

B2.3.5 Cell size

For each cell, note its rough size and how this suits its role: red blood cell, white blood cell, sperm, egg, neuron, muscle fibre.

B2.3.6 Surface area-to-volume ratio

Side of cube	Surface area	Volume	Ratio
1			
2			
5			

Why does a low ratio limit how large a cell can become?

Before you finish

Tick the ones you can explain without notes. Circle anything to ask about.

- ☐ Differentiation
- ☐ Gradients
- ☐ Stem cell properties
- ☐ Bone marrow niche
- ☐ Hair follicle niche
- ☐ Three potencies
- ☐ Cell sizes
- ☐ SA:V calculation
- ☐ Limit on size