*This is the **Higher Separate** version — includes all Higher Tier content (marked ★) and all Separate Science content.*

All living organisms are composed of cells. Edexcel requires knowledge of animal, plant, bacterial and fungal cell structures.

Required Practical: Using a microscope to examine and draw cells.

- Animal cells: nucleus, cell membrane, cytoplasm, mitochondria, ribosomes
- Plant cells additionally: cell wall (cellulose), chloroplasts, permanent vacuole
- Bacterial cells: no nucleus, circular DNA, plasmids, cell wall, ribosomes, sometimes flagellum
- Fungal cells: cell wall (chitin), nucleus, no chloroplasts
- Cells specialise through differentiation — genes switched on/off

★ **HT** SA:V ratio decreases as size increases — need specialised exchange surfaces

Key Terms

Eukaryotic	Cell with nucleus (animals, plants, fungi)
Prokaryotic	Cell without nucleus (bacteria)
SA:V ratio	Surface area to volume ratio — determines diffusion efficiency

■ **Exam Tip:** Know the differences for ALL four cell types: animal, plant, bacterial, fungal. Edexcel has asked about fungal cells — they have chitin cell walls, unlike plant cellulose walls.