Understanding

1. Complete the following paragraph using words from the word list.

   cell membrane  cytoplasm  endoplasmic reticulum  genetic material
   Golgi body  mitochondria  ribosomes

   All cells are surrounded by a thin a. _______________ that controls what enters and leaves the cell. They also contain information in b. _______________, that contains a set of instructions for controlling cell activities; and a jelly-like material called c. _______________, which holds the organelles. Other important organelles include d. _______________ – involved in energy release from food, e. _______________ – involved in making and transport of materials, f. _______________ – involved in packaging materials into vesicles, and g. _______________ where proteins are made.

2. Are the following statements true or false? Leave the true statements but rewrite the false statements to make them correct.

   a. Having a cell wall gives plant cells strength: _______________

   b. All plant cells contain chloroplasts: _______________

   c. Animal cells have centrioles that take part in cell division: _______________

   d. Animal cells sometimes have small vacuoles: _______________

   e. Plant, animal and bacterial cells contain a nucleus: _______________

Thinking

1. Some cells have many more mitochondria than others. What does this tell you about the cells that have many mitochondria?

2. What might happen to a cell if its genetic material was damaged?
Questions from pages 222, 223 of *ESA Study Guide Year 10 Science*

**Understanding**

1. Rewrite the following list of cells in order, from smallest to largest. Add the approximate size of each cell.
   - *Amoeba*
   - *E. coli* bacteria
   - *Paramecium*
   - plant and animal cells

2. What is a ‘zygote’, and how does a zygote form?

3. Describe the shape of four animal cells and four plant cells. Explain how the shape of each type of cell is related to the cell’s function.

   **Animal cells**

   ____________

   ____________

   ____________

   ____________

   **Plant cells**

   ____________

   ____________

   ____________

   ____________

**Thinking**

1. Why are there so many different shaped cells in a human body?

   ____________

   ____________

   ____________

2. Give two reasons why cells cannot get very big.

   ____________

   ____________

**Contributing**

Research one of the following groups of cells to find out about the cells’ shape and function:

- sensory cells
- smooth, skeletal and cardiac muscle cells
- blood cells.

Answer on your own paper. Include diagrams.

Answers (except for ‘Contributing’) are provided on page 326 of *ESA Study Guide Year 10 Science*
Questions from pages 224, 225 of *ESA Study Guide Year 10 Science*

**Understanding**

1. What is similar and what is different about photosynthesis and respiration?

2. When do plant cells carry out photosynthesis and respiration?

3. Why is ATP an important chemical for living things?

**Thinking**

1. Animal cells need glucose for respiration. Where does the glucose come from?

2. How does carbon dioxide get into a plant cell?

**Contributing**

Fermentation is a special type of respiration carried out by yeast cells. Find out the following.

- What is yeast?

- What happens during fermentation?

- How is fermentation used to make food such as bread and alcohol products such as beer?

Answers (except for ‘Contributing’) are provided on pages 326 and 327 of *ESA Study Guide Year 10 Science*
### Questions from page 226 of *ESA Study Guide Year 10 Science*

#### Understanding

1. What is a ‘tropism’?

2. Explain the advantage that phototropism gives the plant.

3. What changes occur in the leaf cells of the mimosa plant when the plant is touched?

#### Thinking

1. Explain an advantage that geotropism gives the plant.

2. Name a climbing plant in which thigmotropism occurs:

#### Contributing

Choose one of the following topics and create a labelled drawing to show your ideas.

- What plants might look like if they could move around, as animals do.
- What animals might look like if they had to stay in one place, as plants do.

Answers (except for ‘Contributing’) are provided on page 327 of *ESA Study Guide Year 10 Science*
Questions from page 228 of *ESA Study Guide Year 10 Science*

**Understanding**

1. What takes place in the apical meristem?

2. Explain how a plant gets taller.

3. What takes place in the vascular cambium?

4. Explain how a plant stem gets thicker.

**Thinking**

Plants that have their apical meristem damaged can still grow taller – how do you think this occurs?

**Contributing**

The best way to measure plant growth is to harvest the whole plant, wash off any soil, dry the plant in an oven at 27 °C, and weigh the plant. This method removes the water from the plant and gives a measure of the dry matter contained in the plant. Growth of plants can be calculated by comparing the average dry matter of a sample of 10 plants at the beginning of the investigation with the average dry matter of a second sample of plants at the end of the investigation.

Develop an investigation to test the effects of an environmental condition on the growth of a plant.

- Suitable plants include beans, peas, radish, cress, wheat.
- Environmental conditions include temperature, water, wind, music, salt, fertiliser, lime, soil.

Answers (except for ‘Contributing’) are provided on page 327 of *ESA Study Guide Year 10 Science*
Questions from page 230 of ESA Study Guide Year 10 Science

Understanding

1. Name the leaf cells that:
   a. are tightly packed, transparent, and protect the leaf above and below _______________________
   b. are the main photosynthetic cells in the leaf _______________________
   c. open and close stomata _______________________

2. What is the function of leaf veins?

Thinking

1. Leaf veins carry both water and food.
   • What type of cells carry water in the veins? _______________________
   • What type of cells carry food? _______________________

2. Why are air spaces inside a leaf moist? _______________________

3. Would more carbon dioxide or more oxygen leave a green plant during the night? Explain your answer.

Contributing

Research how plants living in dry places conserve water. Write a brief report.

Answers (except for ‘Contributing’) are provided on page 328 of ESA Study Guide Year 10 Science