Chapter 19: Reproduction
Then and now

Questions from pages 260, 261 of ESA Study Guide Year 10 Science

Understanding
1. Which branch of science explores how characteristics are passed on from parent to offspring?

2. Suggest one desirable trait that an apple breeder might select for.

3. Give one word that means ‘creating an exact copy of a plant or animal’.

Thinking
1. What are two advantages of producing new plants by tissue culture?

2. What is one disadvantage of producing plants by tissue culture?

Contributing
Varieties of dogs, cats and birds are often produced by selective breeding. Choose one animal that is bred for a particular trait or set of traits. Give:
• the name of the animal
• the trait or traits that are bred for
• a picture of the animal.

Answers (except for ‘Contributing’) are provided on page 333 of ESA Study Guide Year 10 Science
Questions from page 262 of *ESA Study Guide Year 10 Science*

**Understanding**

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

   Asexual reproduction in plants is also known as a. ____________ reproduction. The two types of vegetative reproduction are b. ____________ vegetative reproduction, which occurs in nature and c. ____________ vegetative reproduction, which is brought about by human intervention. Potatoes reproduce vegetatively by forming d. ____________. Plant nurseries often grow plants by e. ____________ pieces off and growing them in containers. These methods of asexual reproduction result in all the offspring having the same genes as the f. ____________ and each other, so there is no g. ____________ variation.

2. Give an example of a plant that reproduces naturally with bulbs.

**Thinking**

1. Why do commercial nurseries make use of vegetative propagation?

2. What is a major disadvantage of vegetative propagation?

**Contributing**

Show, using a labelled diagram, how you could get the different fruits (e.g. apple and pear) to grow on one tree.

Answers (except for ‘Contributing’) are provided on page 333 of *ESA Study Guide Year 10 Science*
Questions from page 264 of *ESA Study Guide Year 10 Science*

**Understanding**

1. Describe two methods of asexual reproduction in animals.

2. Explain why asexual reproduction can be a disadvantage.

3. Why do some organisms reproduce asexually?

**Thinking**

1. What do you think is an advantage of budding as a means of reproduction?

2. If a bacterium can split in two every 20 minutes, how many bacteria could be produced in 12 hours?

**Contributing**

Research the word ‘parthenogenesis’ in relation to reproduction and explain, in your own words, what it means. Give an example.

Answers (except for ‘Contributing’) are provided on page 333 of *ESA Study Guide Year 10 Science*
Chapter 19: Reproduction
Sexual reproduction in plants

Questions from page 266 of ESA Study Guide Year 10 Science

Understanding

1. Describe sexual reproduction.

2. a. Using arrows on the following diagrams show how self-pollination and cross-pollination occur. One method of self-pollination has been done for you.
   
   b. On one of the diagrams, label the parts of one flower using the following labels: stigma, style, ovary, ovule, carpel, anther, filament and stamen.

   i. **Self-pollination**
      
      - Same flower.
      - Same plant.
      - Same species.

   ii. **Self-pollination**
      
      - Different flower.
      - Same plant.
      - Same species.

   iii. **Cross-pollination**
      
      - Different flowers.
      - Different plants.
      - Same species.

Thinking

1. Explain how sexual reproduction gives rise to plants that are different from each other and from their parents.

2. Explain why garden seeds do not germinate inside a seed packet.

Answers are provided on page 334 of ESA Study Guide Year 10 Science
Chapter 19: Reproduction
Sexual reproduction in animals

Questions from page 268 of ESA Study Guide Year 10 Science

Understanding

1. What is a ‘gamete’?

2. Name the two types of gamete produced for sexual reproduction:
   a. male gametes: ______________________
   b. female gametes: ______________________

3. Which part of a sperm carries the chromosomes?

4. Explain why terrestrial animals can produce fewer eggs than aquatic animals.

5. Describe two ways the embryo is protected in terrestrial animals.

Thinking

1. When paua spawn they release thousands of eggs into the water. What do you think happens to most of the eggs?

2. The following table shows the percentage of eggs from a black-footed paua that were fertilised at different sperm concentrations.

<table>
<thead>
<tr>
<th>Sperm concentration (sperm/mL)</th>
<th>100 million</th>
<th>10 million</th>
<th>1 million</th>
<th>100 000</th>
<th>10 000</th>
<th>1 000</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eggs fertilised (%)</td>
<td>53</td>
<td>72</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

   Source: MSc thesis, Leigh Marine Laboratory, University of Auckland

   a. Draw a graph using the data in the table.

   b. Which sperm concentration has the highest fertilisation rate?

Answers are provided on pages 334–5 of ESA Study Guide Year 10 Science
Reproduction in humans

Questions from page 273 of *ESA Study Guide Year 10 Science*

**Understanding**

1. What controls the changes that take place at puberty?

2. Label the following diagram of the male sex organs.

3. Describe the sequence of events in the female that leads to an embryo embedding in the wall of the uterus. Ensure you use the following key words: Fallopian tube, egg, ovary, ovulation, fertilisation, uterus, sperm, embryo.

**Thinking**

1. What is the function of the lining of the uterus?

2. What is ‘ovulation’, and approximately how often does ovulation happen?

3. People reach puberty at different times. What do you think determines these differences between individual people?

**Contributing**

Carry out research to find out how birth control pills can prevent a woman from getting pregnant.

Answers (except for ‘Contributing’) are provided on page 335 of *ESA Study Guide Year 10 Science*
Questions from page 275 of *ESA Study Guide Year 10 Science*

**Understanding**

1. Label the following diagram of the female sex organs, and use arrows to show the path sperm follow to reach an egg.

![Female sex organs diagram]

2. Describe fertilisation.

3. When does an ‘embryo’ become a ‘foetus’?

4. How many weeks (on average) are there between conception and birth?

5. Describe the three stages of birth in humans.

**Thinking**

1. a. Suggest two things that could harm an embryo or foetus while still in the uterus.

   b. Complete the mind-map to show the possible consequences of these things. One has been done as an example.

   - **Activity:** Smoking
     - **Consequences:** Miscarriage, Low birth weight

   - **Activity:** [Blank]
     - **Consequences:** [Blank]

   - **Activity:** [Blank]
     - **Consequences:** [Blank]

   - **Activity:** [Blank]
     - **Consequences:** [Blank]

2. What are the main functions of the placenta?

Answers are provided on pages 335 and 336 of *ESA Study Guide Year 10 Science*