**Curriculum structure of Heinemann Explore Science**

**Heinemann Explore Science Curriculum Matching Chart for Grade 5**

This chart shows where all of the topics and Learning Objectives specified in the Cambridge Primary Science Curriculum Framework are covered in the *Heinemann Explore Science* course.

<table>
<thead>
<tr>
<th>Learning Objectives</th>
<th>Student Book coverage</th>
<th>Supporting coverage in Teacher's Book or Workbook</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scientific enquiry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Scientific enquiry: Ideas and evidence</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Know that scientists have combined evidence with creative thinking to suggest new ideas and explanations for phenomena. | Unit 3: Life cycles  
- Fruits and seeds pp.28–9  
- Our solar system pp.66–7  
- Astronomers pp.72–3 | Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.90–107 |
| Use observation and measurement to test predictions and make links. | Unit 1: Microbes  
- Investigating microbes pp.4–5  
- Using microbes pp.6–7  
Unit 2: Keeping healthy  
- Investigating pulse rate pp.18–19  
Unit 3: Life cycles  
- Investigating seed shapes pp.30–1  
Unit 4: Light  
- Blackout blinds pp.40–1  
- Changing shadows pp.42–3  
Unit 5: Changing state  
- Investigating evaporation pp.54–5  
- Graphing evaporation pp.56–7  
- Investigating boiling and freezing pp.60–1  
Unit 6: The Earth and beyond  
- Our turning Earth pp.70–1 | Teacher's Book 5, pp.16–25  
Teacher's Book 5, pp.26–41  
Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.58–73  
Teacher's Book 5, pp.74–89  
Teacher's Book 5, pp.90–107 |
| **Scientific enquiry: Plan investigative work** |                        |                                                  |
| Make predictions of what will happen based on scientific knowledge and understanding, and suggest and communicate how to test these. | Unit 1: Microbes  
- Investigating microbes pp.4–5  
- Using microbes pp.6–7  
Unit 2: Keeping healthy  
- Investigating pulse rate pp.18–19  
Unit 3: Life cycles  
- Investigating seed shapes pp.30–1  
Unit 4: Light  
- Blackout blinds pp.40–1  
- Changing shadows pp.42–3  
- Sunlight and shadows pp.44–5  
Unit 5: Changing state  
- Investigating evaporation pp.54–5  
- Graphing evaporation pp.56–7  
- Investigating boiling and freezing pp.60–1  
Unit 6: The Earth and beyond  
- Our turning Earth pp.70–1 | Teacher's Book 5, pp.16–25  
Teacher's Book 5, pp.26–41  
Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.58–73  
Teacher's Book 5, pp.74–89  
Teacher's Book 5, pp.90–107 |
| Use knowledge and understanding to plan how to carry out a fair test. | Unit 3: Life cycles  
- Germinating seeds pp.32–3  
Unit 5: Changing state  
- Graphing evaporation pp.56–7 | Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.74–89 |
| Collect sufficient evidence to test an idea. | Unit 1: Microbes  
- Microbes and you pp.2–3  
Unit 3: Life cycles  
- Fruits and seeds pp.28–9  
- Investigating seed shapes pp.30–1  
Unit 5: Changing state  
- Graphing evaporation pp.56–7  
Unit 6: The Earth and beyond  
- Our solar system pp.66–7 | Teacher's Book 5, pp.16–25  
Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.74–89  
Teacher's Book 5, pp.90–107 |
### Curriculum structure of Heinemann Explore Science

| Identify factors that need to be taken into account in different contexts. | Unit 1: Microbes  
- Investigating microbes pp.4–5  
- Investigating seed shapes pp.30–1  
- Germinating seeds pp.32–3  
Unit 4: Light  
- Sunlight and shadows pp.44–5  
Unit 5: Changing state  
- Investigating evaporation pp.54–5  
- Graphing evaporation pp.56–7  
Unit 6: The Earth and beyond  
- Our turning Earth pp.70–71 | Teacher's Book 5, pp.16–25  
Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89  
Teacher's Book 5, pp.90–107 |
| --- | --- | --- |
| **Scientific enquiry:** Obtain and present evidence | Make relevant observations.  
- Investigating microbes pp.4–5  
- Investigating seed shapes pp.30–1  
- Changing shadows pp.42–3  
- Sunlight and shadows pp.44–5 | Teacher's Book 5, pp.16–25  
Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89 |
|  | Unit 3: Life cycles  
- Investigating seed shapes pp.28–9  
- Investigating evaporation pp.54–5  
- Graphing evaporation pp.56–7  | Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89 |
|  | Unit 4: Light  
- Changing shadows pp.42–3  
- Sunlight and shadows pp.44–5  | Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.50–73  
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Teacher's Book 5, pp.26–41  
Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89 |
| Measure volume, temperature, time, length and force. | Unit 3: Life cycles  
- Investigating seed shapes pp.30–1  
- Changing shadows pp.42–3  
- Sunlight and shadows pp.44–5  | Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89 |
|  | Unit 4: Light  
- Changing shadows pp.42–3  
- Sunlight and shadows pp.44–5  | Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89 |
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Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89 |
|  | Unit 6: The Earth and beyond  
- Our turning Earth pp.70–71 | Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89 |
| **Scientific enquiry:** Consider evidence and approach | Present results in bar charts and line graphs.  
- Investigating microbes pp.4–5  
- Investigating pulse rate pp.18–19  
- Investigating seed shapes pp.30–1  
- Blackout blinds pp.40–1  
- Investigating boiling and freezing pp.60–1 | Teacher's Book 5, pp.16–25  
Teacher's Book 5, pp.26–41  
Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89 |
|  | Unit 2: Keeping healthy  
- Investigating pulse rate pp.18–19  
- Investigating seed shapes pp.30–1  
- Germinating seeds pp.32–3  
- Blackout blinds pp.40–41  
- Changing shadows pp.42–43  | Teacher's Book 5, pp.16–25  
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Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89 |
|  | Unit 3: Life cycles  
- Investigating pulse rate pp.18–19  
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Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89 |
|  | Unit 4: Light  
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Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89 |
|  | Unit 6: The Earth and beyond  
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Teacher's Book 5, pp.42–57  
Teacher's Book 5, pp.50–73  
Teacher's Book 5, pp.74–89 |
**Curriculum structure of Heinemann Explore Science**

### Biology

**Biology: Plants**

- Know that plants need energy from light for growth.  
  - Unit 3: Life cycles  
    - The Sun’s light pp.24–5  
    - Teacher’s Book 5, pp.42–57

- Know that plants reproduce.  
  - Unit 3: Life cycles  
    - New life pp.26–7  
    - Teacher’s Book 5, pp.42–57

- Observe how seeds can be dispersed in a variety of ways.  
  - Unit 3: Life cycles  
    - Fruits and seeds pp.28–9  
    - Teacher’s Book 5, pp.42–57

- Investigate how seeds need water and warmth for germination, but not light.  
  - Unit 3: Life cycles  
    - Germinating seeds pp.32–3  
    - Teacher’s Book 5, pp.42–57

- Know that insects pollinate some flowers.  
  - Unit 3: Life cycles  
    - New life pp.26–7  
    - Teacher’s Book 5, pp.42–57

- Observe that plants produce flowers which have male and female organs; seeds are formed when pollen from the male organ fertilizes the ovum (female).  
  - Unit 3: Life cycles  
    - New life pp.26–7  
    - Teacher’s Book 5, pp.42–57

- Recognize that flowering plants have a life cycle including pollination, fertilization, seed production, seed dispersal and germination.  
  - Unit 3: Life cycles  
    - Life cycles pp.34–5  
    - Workbook 5, p.9  
    - Teacher’s Book 5, pp.42–57

### Chemistry

**Chemistry: States of matter**

- Know that evaporation occurs when a liquid turns into a gas.  
  - Unit 5: Changing state  
    - Evaporation pp.52–3  
    - Investigating evaporation pp.54–5  
    - Graphing evaporation pp.56–7  
    - Teacher’s Book 5, pp.74–88  
    - Workbook 5, p.19

- Know that condensation occurs when a gas turns into a liquid and that it is the reverse of evaporation.  
  - Unit 5: Changing state  
    - Condensation pp.56–9  
    - Teacher’s Book 5, pp.74–88  
    - Workbook 5, p.19

- Know that air contains water vapour and when this meets a cold surface it may condense.  
  - Unit 5: Changing state  
    - Evaporation pp.52–3  
    - Condensation pp.56–9  
    - Teacher’s Book 5, pp.74–88

- Know that the boiling point of water is 100°C and the melting point of ice is 0°C.  
  - Unit 5: Changing state  
    - Evaporation pp.52–3  
    - Teacher’s Book 5, pp.74–88

- Know that when a liquid evaporates from a solution the solid is left behind.  
  - Unit 5: Changing state  
    - Evaporation pp.52–3  
    - Teacher’s Book 5, pp.74–88
### Physics: Light

<table>
<thead>
<tr>
<th>Task</th>
<th>Pages</th>
<th>Teacher Book</th>
<th>Workbook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observe that shadows are formed when light travelling from a source is blocked.</td>
<td>Unit 4: Light</td>
<td>Teacher's Book 5, pp.58–73</td>
<td>Workbook 5, p.13</td>
</tr>
<tr>
<td>Investigate how the size of a shadow is affected by the position of the object.</td>
<td>Unit 4: Light</td>
<td>Teacher's Book 5, pp.58–73</td>
<td>Workbook 5, p.14</td>
</tr>
<tr>
<td>Observe that shadows change in length and position throughout the day.</td>
<td>Unit 4: Light</td>
<td>Teacher's Book 5, pp.58–73</td>
<td>Workbook 5, p.13</td>
</tr>
<tr>
<td>Know that light intensity can be measured.</td>
<td>Unit 4: Light</td>
<td>Teacher's Book 5, pp.58–73</td>
<td>Workbook 5, p.13</td>
</tr>
<tr>
<td>Explore how opaque materials do not let light through and transparent materials let a lot of light through.</td>
<td>Unit 4: Light</td>
<td>Teacher's Book 5, pp.58–73</td>
<td>Workbook 5, p.13</td>
</tr>
<tr>
<td>Know that we see light sources because light from the source enters our eyes.</td>
<td>Unit 4: Light</td>
<td>Teacher's Book 5, pp.58–73</td>
<td>Workbook 5, p.13</td>
</tr>
<tr>
<td>Know that beams/rays of light can be reflected by surfaces including mirrors, and when reflected light enters our eyes we see the object.</td>
<td>Unit 4: Light</td>
<td>Teacher's Book 5, pp.58–73</td>
<td>Workbook 5, p.13</td>
</tr>
<tr>
<td>Explore why a beam of light changes direction when it is reflected from a surface.</td>
<td>Unit 4: Light</td>
<td>Teacher's Book 5, pp.58–73</td>
<td>Workbook 5, p.13</td>
</tr>
</tbody>
</table>

### Physics: The Earth and beyond

<table>
<thead>
<tr>
<th>Task</th>
<th>Pages</th>
<th>Teacher Book</th>
<th>Workbook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore, through modelling, that the sun does not move; its apparent movement is caused by the Earth spinning on its axis.</td>
<td>Unit 6: The Earth and beyond</td>
<td>Teacher's Book 5, pp.90–107</td>
<td>Workbook 5, p.23,24</td>
</tr>
<tr>
<td>Know that the Earth spins on its axis once in every 24 hours.</td>
<td>Unit 6: The Earth and beyond</td>
<td>Teacher's Book 5, pp.90–107</td>
<td>Workbook 5, p.23,24</td>
</tr>
<tr>
<td>Know that the Earth takes a year to orbit the sun, spinning as it goes.</td>
<td>Unit 6: The Earth and beyond</td>
<td>Teacher's Book 5, pp.90–107</td>
<td>Workbook 5, p.23,24</td>
</tr>
<tr>
<td>Research the lives and discoveries of scientists who explored the solar system and stars.</td>
<td>Unit 6: The Earth and beyond</td>
<td>Teacher's Book 5, pp.90–107</td>
<td>Workbook 5, p.23,24</td>
</tr>
</tbody>
</table>