

**Unit 8:** Year Group - Years 3 and 4

## Earthworms and Darwin



### Introduction to the unit:

In this unit pupils are introduced to some key ideas in the science and religion debate, linked together through an ecological theme:

- i) Do science and religion explain creation in different but equally valid ways?
- ii) Is nature really 'red in tooth and claw'?
- iii) Has the universe been 'finely tuned' by an intelligent creator with the purpose of producing life – or is it all chance?
- iv) Are there some things which can't be measured or categorised?
- v) What are human relationships with the natural world?

In **Lesson 1** pupils consider the ecological value of earthworms and are introduced to the terms symbiosis and interdependence. They take part in a Community of Enquiry activity considering whether clever necessarily implies more important.

In **Lesson 2** pupils compare the Biblical story of Adam and Eve with scientific evidence from the scientific record. They sort statements into 'scientific' and 'religious' categories.

In **Lesson 3** pupils investigate the so-called 'Goldilocks effect' where conditions in the universe are said to be 'just right' for life. They reflect on three different explanations for the apparent fine tuning of the constants (laws) of nature. They consider the environmental impact of humans on our atmosphere (which is 'just right' for life on Earth, and some of the moral dilemmas we face.

In the **End of Unit Activity** pupils identify some ways in which humans use scientific knowledge wisely and unwisely.

### Links to the RE NSNF

#### 1.1 Belief and teachings (what people believe)

1.2 Practices and lifestyle (what people do)

#### 1.3 Expression and language (how people express themselves)

2.1 Identity and experience (making sense of who we are)

#### 2.2 Meaning and purpose (making sense of life)

#### 2.3 Values and commitments (making sense of right and wrong)

### Unit Aim:

**To explore key science and religion issues through an ecological theme.**

### Unit Objectives / Learning outcomes

- (1) To consider the inter-relatedness of all life.
- (2) To compare a religious and a scientific interpretation of creation.
- (3) To investigate the Goldilocks effect, where conditions for life in the universe are said to be 'just right' for life.

### Key Questions

- (1) Wonderful worms?
- (2) Fossils in the garden of Eden?
- (3) The Goldilocks effect?

### Prior Knowledge

This unit links well to QCA science Year 3 unit Rocks and Soils.

Basic knowledge of food chains and webs would be useful but not essential.

Links to the Science NC	Key Quotes	Teacher Resources
<p>Sc1.1 <b>Ideas and evidence in science</b>            Sc1.2 <b>Investigative skills</b></p> <p>Sc2.1 Life processes            Sc2.2 Humans and other animals            Sc2.3 <b>Green Plants</b>            Sc2.4 Variation and classification            Sc2.5 <b>Living things in their environment: ecology, food chains.</b></p> <p><b>Sc3.1 Grouping and classifying materials: rocks and soils</b>            Sc3.2 Changing materials            Sc3.3 Separating mixtures of materials</p> <p>Sc4.1 Electricity            Sc4.2 Forces and motion            Sc4.3 Light and sound            Sc4.4 The Earth and beyond</p>	<p><b>Key Quotes</b></p> <p>Are God and Nature then at strife,            That Nature lends such evil dreams?            So careful of the type she seems,            So careless of the single life.  <i>Alfred Lord Tennyson 1833</i>  <i>Most people were very shocked by Darwin's theories of evolution.</i></p> <p>There is grandeur in this view of life having been originally breathed by the Creator into a few forms or into one; and that, while this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been and are being evolved. <i>Charles Darwin, The Origin of Species.</i></p> <p>The Biblical creation narratives must not be used as a scientific account. They are concerned with theological truths. This is not to impute inaccuracy, but to insist upon the purpose of the passages.  <i>Sam Berry, Professor of Genetics, quoted in 'A Guide to Science and Belief' by Michael Poole.</i></p> <p>The material imagery has never been taken literally by anyone who had reached the stage when he could understand what 'taking it literally' meant.  <i>Professor C.S. Lewis</i></p> <p>Maybe there are an infinite number of universes, each with a different composition. It just so happens that we might have the right mix.  <i>Dr Peter Atkins, Oxford University.</i></p> <p>The hypothesis that God exists makes a very neat explanation of those coincidences.  <i>Professor Jocelyn Bell, Open University</i></p> <p>'Any coincidence' said Miss Marple to herself, 'is always worth noticing. You can throw it away later if it is only a coincidence.'  <i>Agatha Christie, quoted in 'Rebuilding the Matrix' by Denis Alexander.</i></p>	<p><b>Teacher Resources</b></p> <p><b>Recommended background reading:</b>  <i>Deep Simplicity (Penguin 2004) by John Gribbin</i>  <i>Evolution as a Religion (Routledge Classics) by Mary Midgley</i>  <i>The Evolution of Cooperation (Basic Books New York 1984) by Robert Alexrod</i></p> <p><b>Classroom Resources</b></p> <p>Lesson 1: pictures of earthworms if possible.            Lesson 2: children's version of Old Testament, fossils and fossil-bearing rocks if available; digital microscope if available plus hand lenses, cut-up copy of Activity 3.            Lesson 3: story of Goldilocks and Three Bears, three flash cards reading INGREDIENTS, QUANTITIES, CONDITIONS, Recipe book, cake-making ingredients and utensils (optional).</p> <p><b>ICT opportunities</b></p> <p>Lesson 1: Extract information from a website about how Wendell the Worm eats his lunch. Use the RSPCA website for more information on earthworms.</p> <p>Lesson 2: Use a digital microscope to study fossils and fossil-bearing rocks.</p> <p>Lesson 3: Use given website to read story of Goldilocks and Three Bears.</p>

<p><b>Links to other parts of the NC</b></p> <p><b>Speaking and Listening</b>  Literacy  Numeracy  <b>Foundation subjects : Geography; The impact of human activity on the environment.</b>  <b>Thinking Skills</b>  <b>Creativity</b>  <b>SMSC: Citizenship; How do rules and laws affect me? How do we know what is right and wrong?</b></p>	<p><b>Learning Styles / Intelligences</b></p> <p><b>Visual / Auditory / Kinaesthetic</b>  <b>Linguistic intelligence ("word smart"):</b>  <b>Logical-mathematical intelligence ("number/reasoning smart")</b>  <b>Spatial intelligence ("picture smart")</b>  <b>Bodily-Kinaesthetic intelligence ("body smart")</b>  Musical intelligence ("music smart")  <b>Interpersonal intelligence ("people smart")</b>  <b>Intrapersonal intelligence ("self smart")</b>  <i><b>Naturalist intelligence ("nature smart")</b></i></p>	
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