**Common Core/Next Generation Science Standards**

**and TERRIFIC TERMITES**

 ebook by Rebecca R. Knox

for Grades 3-8

**Third through Fifth Grades**

**Third Grade**

A relevant question from the standards is “How do organisms vary in

their traits?”

* TERRIFIC TERMITES compares and clarifies the commonly confused difference between ants and termites. It also adds specific enrichment to disciplinary core ideas in life sciences as noted below:

Disciplinary Core Ideas

**LS1.B: Growth and Development of Organisms.** Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)

 TERRIFIC TERMITES addresses reproduction, colony roles, and life cycles of termite populations in a fun-to-read way.

**LS3.B: Variation of Traits.** The environment also affects the traits that an organism develops. (3-LS3-2)

Termites around the world have diverse colonies and mounds, some varying traits, and have different purposes in the ecosystem of a geologic region.

***3rd Grade Inquiry questions:***

1. *How does the climate and specific environment affect the homes a termite creates?*
2. *How do termites reproduce and gain roles in the colony?*
3. *How can you best compare and contrast ants and termites in writing, using several points and specific illustrations?*

Third Grade Common Core State Standards Connections: ELA/LIteracy

* **RI.3.1** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS3-1),(3-LS3-2), (3-LS4-2)

TERRIFIC TERMITES is written in question and answer format. Students can create their own questions to pursue about termite life, purpose, and impact on ecosystems.

* **RI.3.7** Use information gained from illustrations and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). (3-LS1-1)

TERRIFIC TERMITES includes accurate student illustrations to support the text. It also has suggested activities to expand engagement with the topic.

* **W.3.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS3-1), (3-LS3-2),(3-LS4-2 (3-LS3-2),(3-LS4-2)

Summary, analysis, comparison/contrast and informational/research assignments can be included in writing assignments using the information in TERRIFIC TERMITES.

**Fourth Grade**

A relevant question to the standards is “How do internal and external structures support the survival, growth, behavior, and reproduction of plants and animals?” Fourth graders are expected to develop an understanding that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

* TERRIFIC TERMITES explains structures, behavior and reproduction of termites through questions and answers. It illustrates actions that benefit as well as detract from different environments. It also adds specific enrichment to a disciplinary core idea note below:

Disciplinary Core Idea

**ESS2.E: Biogeology: Living things affect the physical characteristics of their regions. (4-ESS2-1)**

*Fourth Grade Inquiry Questions*

1. *How do termites affect different environments for good and ill?*
2. *How are termites, their homes, their impacts in Africa, Australia, and other countries, similar and different? Why do you think this is?*
3. *On the other hand, how do different environments and regions also determine termite behavior and colony design?*

Fourth Grade Common Core State Standards Connections, ELA/Literacy –

**RI.4.1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. (4-ESS3-2)

TERRIFIC TERMITES encourages restatement, questioning, and inferring from the foundational information.

**RI.4.7** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. (4-ESS2-2)

Student illustrations contribute to understanding key concepts about termites, and encourage ongoing research online to discover more information about the insects and impacts on the environment.

**RI.4.9** Integrate information from two texts on the same topic in or der to write or speak about the subject knowledgeably. (4-ESS3-2)

Students use TERRIFIC TERMITES along with internet sources or another book on these insects to compare and contrast information in writing and speaking/discussions.

**W.4.7** Conduct short research projects that build knowledge through investigation of different aspects of a topic. (4-ESS1-1),(4-ESS2-2)

Students use foundational information in TERRIFIC TERMITES to come up with a research question to expand investigation of these insects.

**W.4.8** Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. (4-ESS1-1),(4-ESS2-1)

Students can categorize termites from different countries and regions, according to type, purpose, positive and negative impacts, and role in the colony, and from that information, expand knowledge using digital media to write an informational paper with references.

**Fifth Grade**

Relevant excerpts from the fifth grade standards note that students can describe the movement of matter among plants, animals, decomposers, and the environment…. Also, in the fifth grade performance expectations, students are expected to demonstrate grade-appropriate proficiency in … planning and carrying out investigations, analyzing and interpreting data, …engaging in argument from evidence, and obtaining, evaluating, and communicating information.

* TERRIFIC TERMITES contributes to the expectations in 5th grade by adding enrichment that can be built on with inquiry questions and further research about termite types, reproduction, environmental impacts, and comparisons to other insect species.

Disciplinary Core Idea

**LS2.A: Interdependent Relationships in Ecosystems.** …Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)

* Terrific Termites presents termite behavior as part of the web of life on earth and identifies needs, interdependencies, and contributions.

*Fifth Grade Inquiry Questions*

1. *What are some ways termites contribute to ecosystems?*
2. *What role do termites play as decomposers in an environment?*
3. *How are termites and ants distinct in their structure and contributions to an ecosystem?*

Fifth Grade Common Core State Standards Connections, ELA/Literacy –

**RI.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-ESS3-1)

Students reference information in the ebook TERRIFIC TERMITES, to support accurate summary or explanation.

**RI.5.9** Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.(5-ESS3-1)

Students research using digital resources and books to expand knowledge about termites, purposes, structures, design and impact on ecosystems.

**W.5.8** Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-ESS2-2),(5-ESS3-1)

 TERRIFIC TERMITES is a good foundation for continuing research

about insects in our world, and their associated interactions and potential on designs to help humans. Students formulate questions, seek answers to those questions, and participate in discussions and written research or informational papers about insects.

SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.(5-ESS2-1),(5-ESS2-2)

With graphic resources online, students can insert short videos about insects into their writing to enhance information sharing and learning.

**MIDDLE SCHOOL, Grades 6-8**

**Matter and Energy in Organisms and Ecosystems**

Disciplinary Core Ideas

**LS2.A: Interdependent Relationships in Ecosystems Organisms.** Populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1)

TERRIFIC TERMITES contributes to an understanding of the relationships in the diverse interactions of organisms of ecosystems.

**LS2.B: Cycle of Matter and Energy Transfer in Ecosystems.** …Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3)

Termites, being part of decomposition cycles, contribute to this standard which can also be expanded through research across life science topics.

**LS2.C: Ecosystem Dynamics, Functioning, and Resilience.** Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. (MS-LS2-4)

Insects are part of all ecosystems. Study of individual species and comparisons between species, increases understanding of ecosystem dynamics, functioning, and resilience.

*Inquiry Questions*

1. *How does the termite population in a defined region, affect the ecosystem in that region?*
2. *In what way are termites critical to the decomposition actions in an ecosystem, between living and nonliving parts of that ecosystem?*
3. *Where are there examples in a chosen area of the world of a shift in insect population due to disruptions in another part of the ecosystem? What other impacts occurred due to this shift?*

MS Common Core State Standards Connections, ELA/Literacy –

**RST.6-8.2** Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. (MS-LS1-6)

Students can summarize information about termites, compare with other readings about insects, and identify prior opinions about termites, determining accuracy or inaccuracy.

**RST.6-8.7** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-LS2-1)

Students expand on the questions and answers in TERRIFIC TERMITES to determine an area of study wherein to gather and analyze data (for instance population variances) from several sources, and then to express that knowledge in a text with visual illustrations.

**WHST.6-8.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-LS1-6)

TERRIFIC TERMITES is a resource to get students engaged in the subject so they will examine and present relevant information about termites and insects accurately, and continue to research more deeply on a topic using other digital and book content.

**WHST.6-8.9** Draw evidence from informational texts to support analysis, reflection, and research. (MS-LS1-6),(MS-LS2-4)

TERRIFIC TERMITES is a good foundation for continuing research about insects in our world, and their associated interactions and potential on designs to help humans. Students read widely about a species, formulate questions, seek answers to those questions, and participate in discussions and written research or informational papers about insects.

SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-LS1-7),(MS-LS2-3)

With graphic resources online, students can insert short videos about insects into their writing to enhance information sharing and learning.

**MS. Interdependent Relationships in Ecosystems**

Disciplinary Core Ideas

**LS2.A: Interdependent Relationships in Ecosystems.** … predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the

other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. (MS-LS2-2)

 The insect world is full of predatory reliances and interdependent survival mechanisms. TERRIFIC TERMITES is a book to gain student interest that can then be used to expand that interest with other texts and digital sources.

**LS2.C: Ecosystem Dynamics, Functioning, and Resilience.** Biodiversity describes the variety of species found in Earth’s terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem’s biodiversity is often used as a measure of its health. (MS-LS2-5)

To meet this standard, students need to gain a wide view of the interrelatedness, complexity, and contributions of diverse organisms. To this end, studying about termites and insects contributes to understanding the active world beneath our feet, which is an important part of land-based ecosystems.

**LS4.D: Biodiversity and Humans**

Changes in biodiversity can influence humans’ resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. (secondary to MS-LS2-5)

TERRIFIC TERMITES can encourage students to do further study on ways termites and insects can contribute to human resources including new sources of food new medicines, and new ways of recycling.

**ETS1.B: Developing Possible Solutions.** There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (secondary to MS-LS2-5)

TERRIFIC TERMITES promotes further study of existing human problems (such as in architecture in hot countries), to discover natural air conditioning methods such as is evidenced in the design of termite mounds, recycling methods, or increasing food sources for the world.

*Inquiry Questions*

1. *How do termites contribute beneficially to biodiversity?*
2. *In what ways have termite structures and designs become part of human architectural design? What problems have they solved?*
3. *What benefits for humans have accrued from researching termites?*

MS Common Core State Standards Connections, ELA/Literacy –

**RST.6-8.1** Cite specific textual evidence to support analysis of science and technical texts. (MS-LS2-2)

TERRIFIC TERMITES is not a textbook. It uses categorized sections for questions and answers, which can then be expanded to compare and contrast text structures in other science books.

**RST.6-8.8** Distinguish among facts, reasoned judgment based on research findings, and speculation in a text. (MS-LS2-5)

There is much misinformation about insects and their value to the world, which is a good foundation for finding out facts and distinguishing them from opinion or speculation.

**WHST.6-8.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-LS2-2)

Using the various questions in TERRIFIC TERMITES, students choose an area to research and employ varied resources to summarize, analyze, or present organized information to an audience. With graphic resources online, students can insert short videos about insects into their writing to enhance information sharing and learning.

**WHST.6-8.9** Draw evidence from literary or informational texts to support analysis, reflection, and research. (MS-LS2-2)

 Same comments as above in WHST.6-8.2

**SL.8.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others’ ideas and expressing their own clearly. (MS-LS2-2)

Students choose several texts or digital resources to expand the questions and answers in TERRIFIC TERMITES, then engage in various discussion groups using the inquiry questions in this document.

**Growth, Development, and Reproduction of Organisms**

Disciplinary Core Ideas

**LS1.B: Growth and Development of Organisms.** Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (secondary to MS-LS3-2).

Animals engage in characteristic behaviors that increase the odds of reproduction. (MS-LS1-4)

 The insect world is full of behaviors to ensure survival. TERRIFIC TERMITES answers questions about colony behavior, termite roles and reproduction.

Students can enhance learning via discussions and standards-based writing assignments including:

**WHST.6-8.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-LS1-5)

**WHST.6-8.8** Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources. (MS-LS4-5)

**WHST.6-8.9** Draw evidence from informational texts to support analysis, reflection, and research. (MS-LS1-5)

**SL.8.5** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

(MS-LS3-1),(MS-LS3-2)