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GUIDING QUESTION

What do beetles use their sense of smell for?

GRADES K-2

PEPPERMINT BEETLE

PRACTICES

DEVELOPING AND USING MODELS

Students participate in a simulation to model how beetles locate host trees using their sense of smell.

ANALYZING AND INTERPRETING DATA

Students use their own sense of smell in a simulation in which they search for trees that a “peppermint beetle” has visited.

CONCEPTS

STRUCTURE AND FUNCTION

Students learn that animals have different structures that detect odors.

INFORMATION PROCESSING

As students use their sense of smell to locate marked trees, they model how beetles obtain, process, and respond to odors.

PATTERNS

Students rely on patterns to tag just the trees that have a matching odor.

SCIENCE AND ENGINEERING PRACTICES

Developing and Using Models

Use a model to represent patterns in the natural world.

Analyzing and Interpreting Data

Use observations (firsthand) to describe patterns in the natural world in order to answer scientific questions.

DISCIPLINARY CORE IDEAS

LS1.A: Structure and Function

All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air.

LS1.D: Information Processing

Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive.

PERFORMANCE EXPECTATION

1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Note: Keep in mind that no single activity can fully meet a Performance Expectation.

CROSSCUTTING CONCEPTS

Patterns

Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.



NGSS CORRELATION



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GUIDING QUESTION: GROUNDED IN PHENOMENA

Phenomenon-based instruction is directly connected to students' homes, communities, and cultures, thus making teaching and learning more diverse, inclusive, and relevant. PLT identifies Guiding Questions that drive phenomenon-based, three-dimensional learning for each of the 50 *Explore Your Environment K-8 Activity Guide* activities.

CONNECTING PLT'S EXPLORE YOUR ENVIRONMENT K-8 ACTIVITY GUIDE TO NGSS

IN THE ACTIVITY

The left hand column details where science connections can be found in the PLT activity.

PRACTICES

ENGAGING IN THE PRACTICES

OF SCIENCE helps students understand how scientific knowledge develops. Students gain skill in the wide range of approaches that are used to investigate, model, and explain the world.

CONCEPTS

THESE CORE IDEAS HAVE BROAD IMPORTANCE across science disciplines, providing tools for understanding or investigating complex ideas and solving problems, and can be taught at progressive levels of depth and complexity.

Project Learning Tree is committed to supporting educators in providing instruction that helps students meet science education standards.

The Next Generation Science Standards (NGSS) define what students should know or be able to do at the end of instruction. To demonstrate learning, NGSS identifies Performance Expectations (PEs) that may be used to assess a student's knowledge and proficiency. To meet benchmarks, students engage in the three dimensions of science— Science & Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts—to explain a phenomenon or design a solution.

Activities in the *Explore Your Environment K-8 Activity Guide* provide students opportunities to explore the three dimensions of science to build knowledge and understanding. In addition, activities offer phenomenon-based learning, which involves exploring the real world through learner-centered, multidisciplinary investigations that promote inquiry and problem solving.

The NGSS Correlation pages for each activity include a guiding question, science connections found in the activity, and explicit NGSS correlations. Activities are organized around the three dimensions of science, making it useful for educators even if their state has not adopted NGSS.

FROM NGSS

The right hand column identifies correlations to specific NGSS standards, including references to the relevant PE for focus on the grade level band.

SCIENCE AND ENGINEERING PRACTICES

The practices are what students do to make sense of phenomena and reflect how scientists and engineers investigate the world and design solutions.

DISCIPLINARY CORE IDEAS

These foundational ideas of science are grouped into four domains: physical sciences; life sciences; Earth and space sciences; and engineering, technology and applications of science.

CROSSCUTTING CONCEPTS

These concepts hold true across the natural and engineered world. Students use them to make connections across disciplines, connect to prior experiences, and engage with material in other dimensions.

