

MICROSCOPIC MARVELS

NEMATODES AND ECOSYSTEM CONNECTIONS



Introduction to Microscopic Marvels

Nematodes' Ecological Role

Nematodes are vital for nutrient cycling and maintaining ecosystem health in the Nebraska Sandhills grassland.

Unique Nebraska Sandhills Ecosystem

The Nebraska Sandhills feature alkaline lakes and complex biological interactions unique to this grassland ecosystem.

Scientific Inquiry and Education

The podcast series promotes scientific inquiry by showcasing research and connecting real-world science to student learning.

Inspiring Curiosity

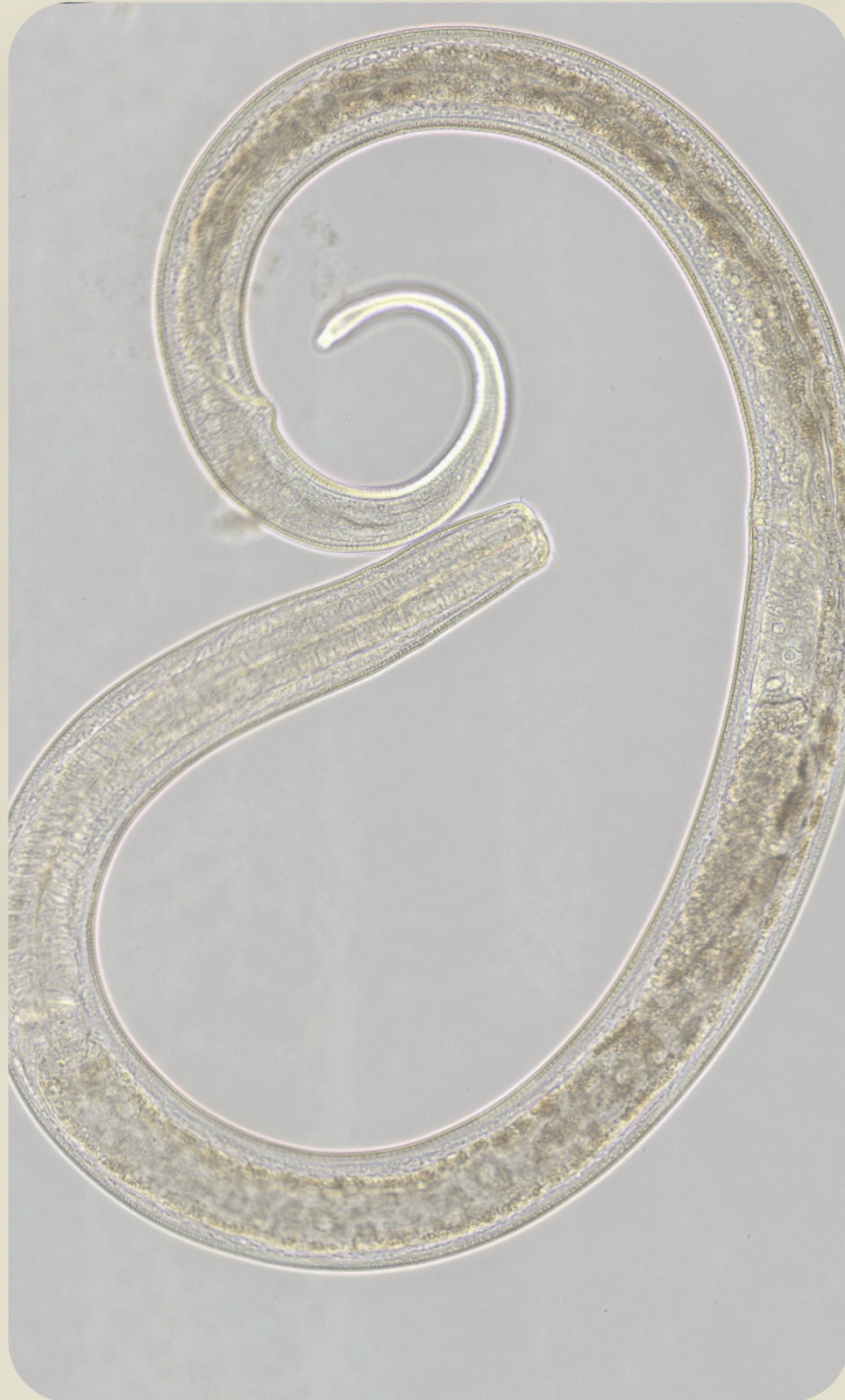
Microscopic Marvels aims to inspire curiosity and deepen ecological understanding among students through engaging podcasts.



ECOLOGICAL CONTEXT



Role of Nematodes in Ecosystems



NUTRIENT CYCLING AND DECOMPOSITION

Nematodes break down organic matter, playing a crucial role in nutrient cycling and soil decomposition.

REGULATING MICROBIAL POPULATIONS

They help regulate microbial populations, maintaining a balanced soil ecosystem important for plant health.

INDICATORS OF SOIL HEALTH

Nematode presence indicates soil biodiversity and health, aiding ecological research and conservation efforts.

ECOSYSTEM RESILIENCE & CONSERVATION

Understanding nematode functions helps develop strategies to enhance ecosystem resilience and conservation.

Alkaline Lakes and Sandhills Ecology

Unique Geological Formations

The Sandhills region features distinctive geological formations that shape its alkaline lakes and surrounding habitats.

Specialized Alkaline Lake Ecosystems

Alkaline lakes in the region host adapted organisms like nematodes thriving in high pH conditions.

Ecological Research and Conservation

Scientists study these environments to understand ecosystem interactions and promote biodiversity conservation.





SCIENTIFIC INQUIRY



Nature of Science & Research Methods

Scientific Inquiry Process

Scientific inquiry includes asking questions, collecting data, and drawing evidence-based conclusions to build knowledge.

Fieldwork and Laboratory Techniques

Researchers use fieldwork and laboratory analysis to study ecological systems like nematodes in the Sandhills environment.

Iterative Nature of Science

Science is an ongoing process where knowledge is refined through repeated observations and critical thinking.

Importance of Curiosity and Observation

Curiosity and careful observation are essential traits that drive ecological research and scientific advancement.





CAREER EXPLORATION



Career Spotlight

Diverse STEM Careers

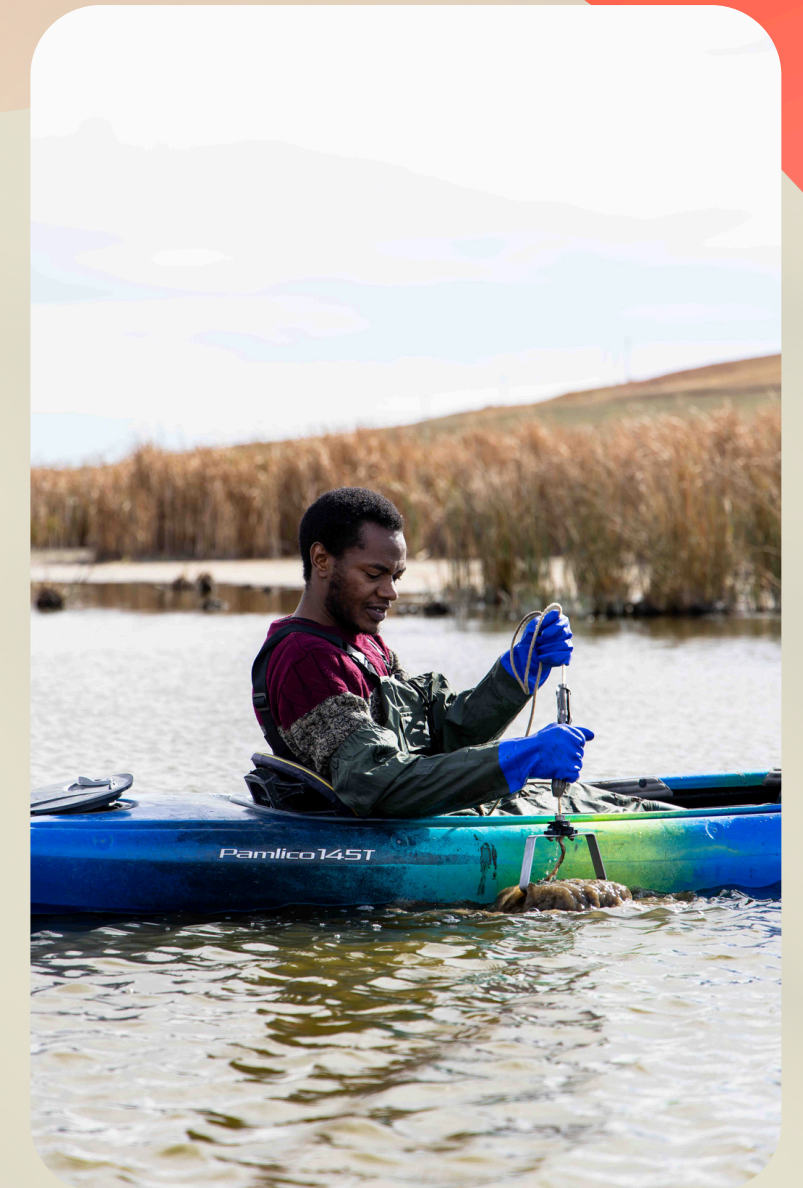
Careers in ecology, microbiology, and science communication offer dynamic and collaborative opportunities in STEM.

Science Communication

Science communicators create educational content to effectively share scientific findings with the public, making science accessible.

Essential STEM Skills

Key skills for these careers include data analysis, critical thinking, and storytelling to convey complex scientific concepts.



Career Inspiration

Exploring these roles inspires you to consider diverse STEM pathways and their potential contributions in science and outreach.



PARTNERSHIPS

The image features a woman in the center, smiling broadly. She is wearing a dark grey or black zip-up jacket with two logos: "EnviroSmart Beef" on the left chest and "FLYING DIAMOND" on the right chest. She is also wearing a dark baseball cap with sunglasses perched on top. To her right, the back of a man's head and shoulder is visible; he is wearing a tan jacket. The background is dark and out of focus, suggesting an indoor setting. A large, bold, white text "PARTNERSHIPS" is overlaid across the middle of the image. Below the text is a thick, horizontal orange bar with rounded ends.

Ecosystem Stewardship



Sustainable Land Management

Ranchers use sustainable grazing techniques to protect soil health and maintain grassland ecosystems.



Collaboration with Scientists

Partnerships between ranchers and scientists help monitor soil and water resources effectively.



Balancing Productivity and Ecology

Efforts focus on balancing agricultural productivity with ecological integrity and conservation goals.

Collaborative Conservation Strategies



Stakeholder Collaboration

Conservation success depends on scientists, ranchers, policymakers, and educators working together towards shared goals.



Habitat Restoration

Restoring habitats is a key strategy to preserve the unique ecosystems of the Sandhills region.



Monitoring Indicator Species

Monitoring species like nematodes helps assess ecosystem health and guide conservation efforts.



Educational Outreach & Civic Engagement

Education promotes understanding that conservation is social, encouraging civic engagement and sustainability awareness.



VIDEO

ENGAGEMENT

Video Viewing Guide



Active Listening & Critical Thinking

The guide prompts you to identify main research questions and surprising scientific facts to deepen understanding.



Reflection on Ecological Roles

You will reflect on the ecological roles of nematodes and alkaline lakes, enhancing environmental awareness.



Science Communication Insights

Analysis of scientists' communication strategies introduces you to effective science storytelling techniques.

A photograph of three people sitting in a field of tall, dry grass. In the background, there are several vehicles, including a white SUV and a red pickup truck. The person on the left is a woman wearing a purple shirt, a white visor, and sunglasses. The person in the middle is a woman with long hair, wearing a blue and white plaid shirt and sunglasses, looking down at a notebook. The person on the right is a man with a white beard, wearing a tan shirt, a dark cap, sunglasses, and blue gloves. A red thermos is on the ground to the left. The text 'REFLECTION & DISCUSSION' is overlaid in large white letters across the center of the image. Below the text is a solid orange horizontal bar.

REFLECTION & DISCUSSION

A young man with a joyful expression is kayaking on a river. He is wearing a blue long-sleeved shirt and dark pants, and is holding a black paddle. The kayak is teal. The background is filled with dense green foliage and trees under a grey, overcast sky. The text 'SCIENCE COMMUNICATION PROJECT' is overlaid in large white letters across the middle of the image.

SCIENCE COMMUNICATION PROJECT



Science Communication Project Guide



TASK

Your task is to create a science communication project that explains what nematodes are, why they matter to ecosystems, and how scientific research helps us understand ecosystem health, particularly in the Nebraska Sandhills. You will decide how to present this information and who you want to communicate with.

AUDIENCE

As part of this project, you will select an audience for your work, such as students your age, ranchers or land managers, policymakers or community stakeholders, or members of the general public. The language, tone, and overall design of your project should be tailored to the audience you choose.

FORMAT

You may create a short podcast script or audio piece lasting one to three minutes, design an infographic, or write a short blog post or article of approximately 300 to 500 words. If you have another creative idea, your teacher may approve it as long as it clearly communicates scientific ideas.

SHARING

If you would like your project to be featured on Streaming Science, you are welcome to submit it for possible publication. You can email your project to streamingscience1@gmail.com. In your message, include your name or names, your school and grade level, the title and format of your project, and a short note explaining who your audience is. Selected projects may be shared as part of Streaming Science's efforts to highlight student voices in science communication.



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