

A person wearing a purple cap and a light-colored shirt is kayaking on a river. The kayak is blue and green. The background is filled with dense green trees and bushes. The text "MICROSCOPIC MARVELS" is overlaid in large white letters across the center of the image.

# 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.

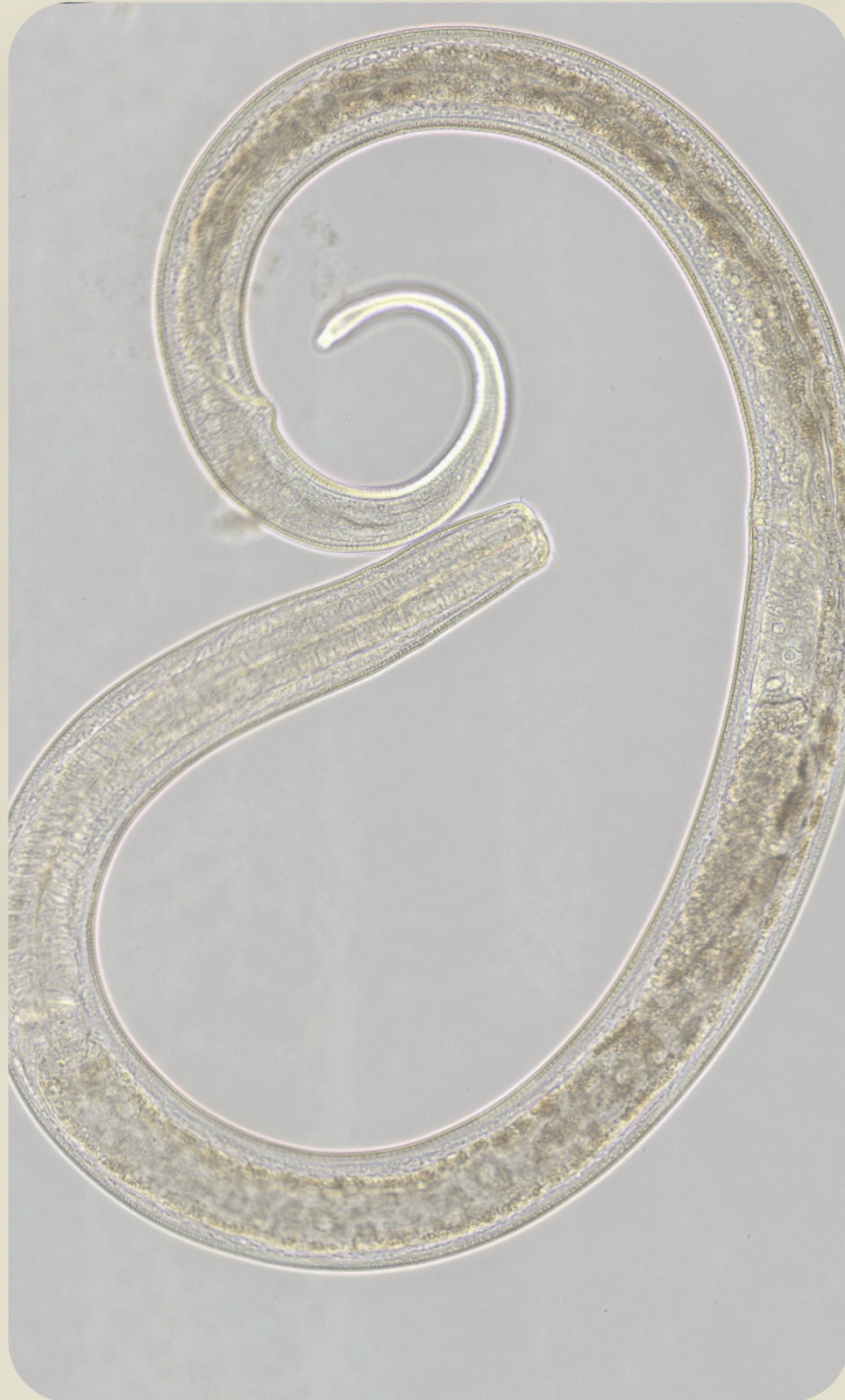


A person wearing grey waders, a blue long-sleeved shirt, and purple gloves is standing in a stream, holding a white bucket. The background is filled with tall green grasses. The text 'ECOLOGICAL CONTEXT' is overlaid in large white letters.

# 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 CONCEPTS

# The Science Beneath The Surface

## **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.



A person wearing a dark blue jacket and a matching hat is seen from behind, looking out over a vast green field. In the distance, another person in a light blue shirt stands with their hands on their hips. The scene is set against a clear sky. The text 'CAREER EXPLORATION' is overlaid in large white letters, with an orange bar below it.

# CAREER EXPLORATION

# Career Spotlight

## Diverse STEM Careers

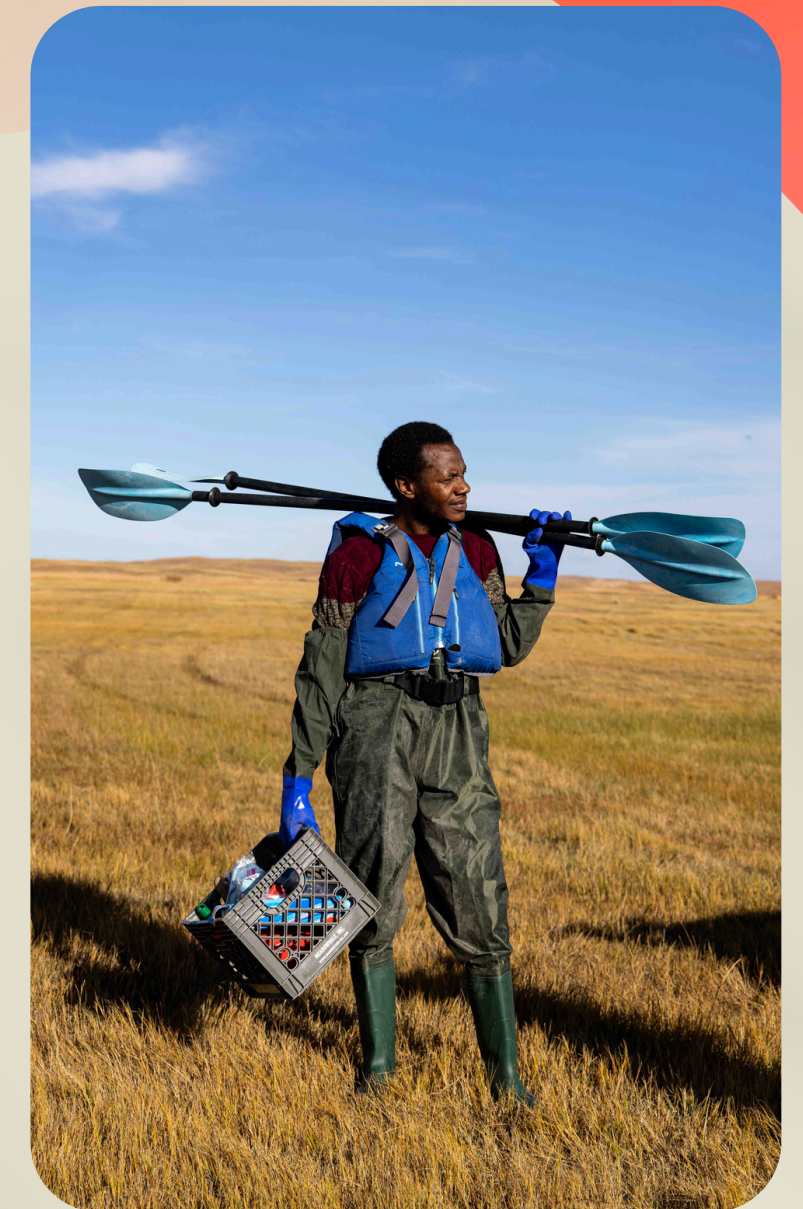
Careers in ecology, microbiology, and science communication offer dynamic and collaborative opportunities in STEM.

## 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

# 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.

# PODCAST ENGAGEMENT



# Podcast Listening 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 person wearing a grey cap and glasses is sitting outdoors, writing in a notebook. The notebook is open on a blue surface. The person is holding a red pen. The background is slightly blurred, showing some outdoor equipment and a green object. The overall scene suggests a field study or research activity.

# REFLECTION & DISCUSSION



# 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](mailto: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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