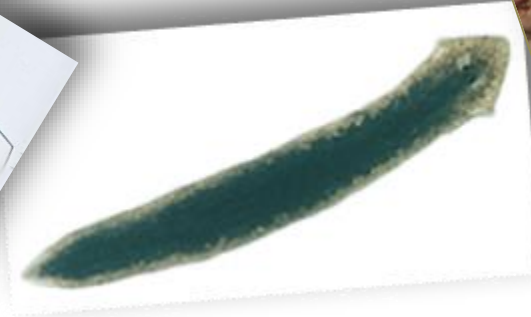


Carolina Biological Supply Company

Featured Creatures



#carolinaNSTA

Phenomenon



How do Organisms find food in order to survive?

DRIVING QUESTION

Session Objectives

- Investigate multiple ways that organisms find food
- Gain content knowledge and experience working with planaria, *Daphnia*, termites



Termites in the Classroom

Easy to maintain

- Live in rotting wood
- Keep in plastic container with vented lid
- Add layers of moist cardboard and paper towels
- Add small pieces of untreated rotting wood

Other observations

- Moderate in speed
- Non-threatening
- Will not eat furniture if they escape



Safety Issues

- **Personal Protective Equipment**
Gloves and safety glasses are available
- **Treatment of animals**
Treat all living organisms with care and respect

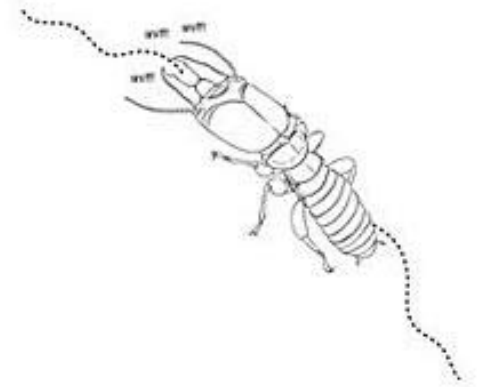


- ***Safety Tip***
Clear your work space of phones, papers, books, and other personal items.

Driving Question: How do termites find food?

Like ants, termite workers must go out from the nest to search for water or wood.

- Do workers simply wander and eventually get lost?
- What does a worker do if it finds a potential food source?
- How does a successful forager communicate the location of a food source (e.g., a log or house wall) so that the colony can mobilize to gather it?



Termite Kit Materials

Work in pairs

You will need:

- 5 to 7 termite workers
- 1 blank sheet of paper
- 3 writing implements
- 1 paintbrush



Observation

Take out this pen:

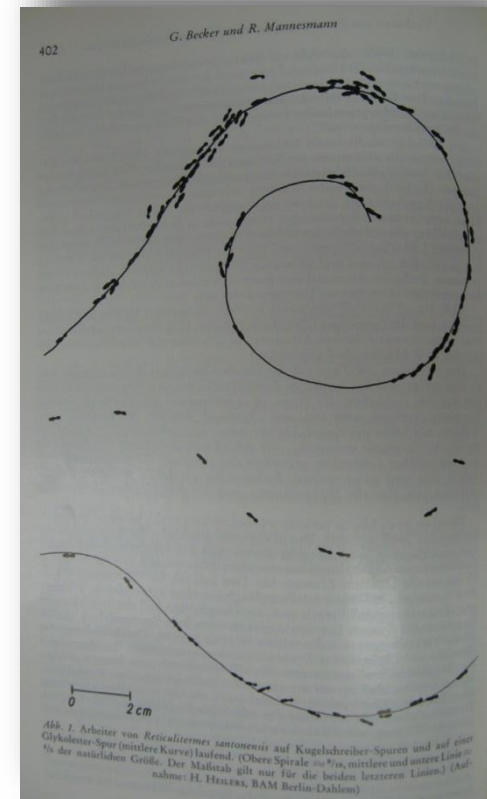
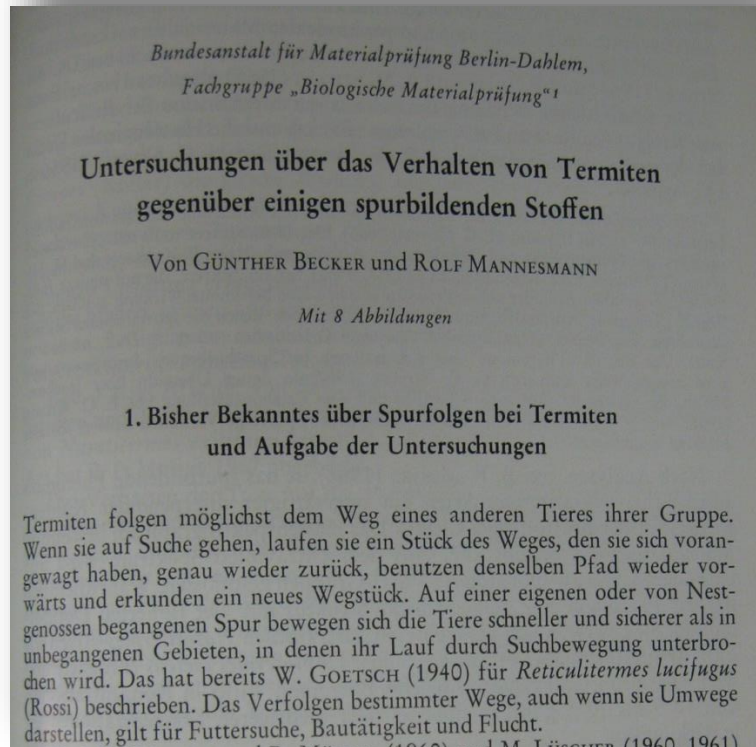
Draw a shape on your paper.

Shake out 2-3 termites onto your paper and observe.

What happened?



Original German Published Work on Ink Pen Attraction (1968)



What do you want to know?

What causes trail following?

- **Develop hypotheses and design experiments**

What cues do termites respond to?

- **Consider the types of sensory input (vision, touch, hearing, smell, etc.)**

Experimental procedures:

- **Select a variable to be manipulated**
- **Measure the number of followers per trail**

Develop a hypothesis about what lead to termite trail-following behavior.

How will you test your hypothesis?

Termite Line Following = Many Possible Exploration Questions

- Is marker **color** important? (red, blue, black, etc.)
- Does marker **type** matter? (ballpoint, gel, felt, etc.)
- Does **brand** matter? (Papermate®, BIC®, Pilot®, Pentel®, etc.)



What's different in different pens?

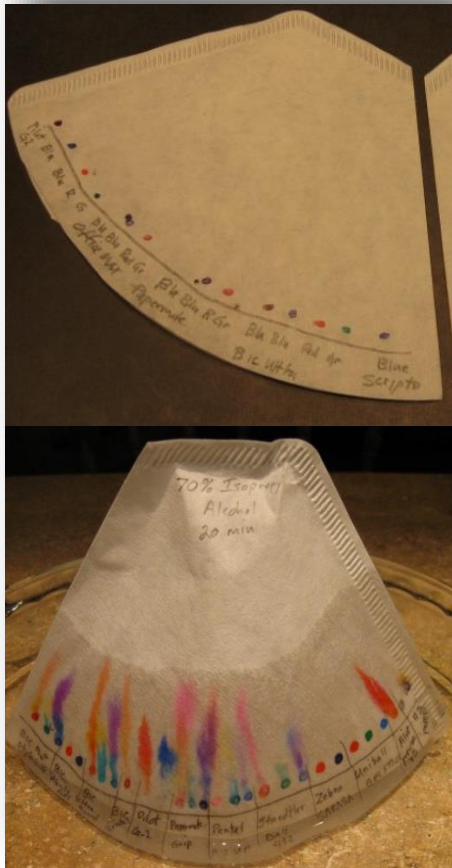
Most inks are formulated with either water or petrochemical solvents.

- **Colorants are either dyes or pigments:**
 - Dyes are soluble in water
 - Pigments are insoluble
- **Inks also contain various additives:**
 - Buffering agents to adjust pH levels
 - Resin for resilience
 - Humectants to prevent evaporation

Try Simple Paper Chromatography to Compare Inks



Spot inks on coffee filters to compare.
Chromatography of different brands and types of pens reveals similar ink migration profiles for those that elicit trail following.



— Inks followed

Discussion: How do Organisms find food in order to survive?

How does this behavior help termites survive?		
Claim	Evidence	Reasoning

- Now that you know _____, (*Fill in the blank with the claim*) what do you want to find out next?

Planaria in the Classroom

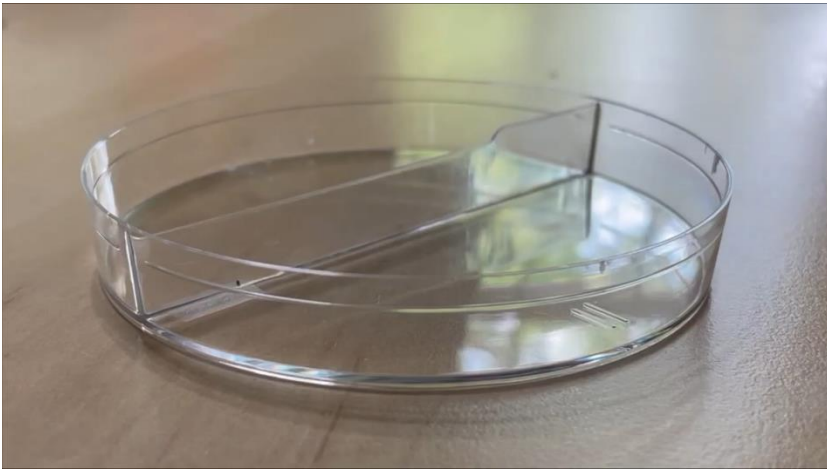
Easy to maintain

- Keep in a glass or plastic dish with spring water or treated tap water
- Regular water changes needed
- Feed once a week, plenty of options for food
- Prefer room temperature (70 to 73° F)



Activity

Observe the interactions between planaria and *Daphnia* for 10 minutes.



Tips:

When adding water to the petri dish, break the surface tension by dragging a pipette across the barrier.

Place a piece of blank paper under the petri dish for better viewing.

Discussion: How do Organisms find food in order to survive?

What behaviors did planaria exhibit to find food?		
Claim	Evidence	Reasoning

- Now that you know _____, (*Fill in the blank with the claim*) what do you want to find out next?

Session Wrap-Up

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. Plants also respond to some external inputs.

LS2.D: Social Interactions and Group Behavior

Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size (Note: Moved from K–2).

LS2.A: Interdependent Relationships in Ecosystems

Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1)

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)



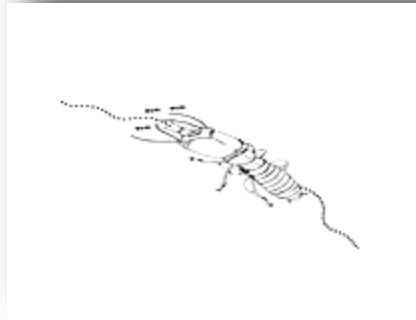
Kits and Materials from Carolina



Daphnia magna Culture
Item #142330



Planaria Culture
Item #132950



Termite Behavioral Investigation:
Follow That Trail! Classroom Kit
Item #143722

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with new kits and free lessons!**



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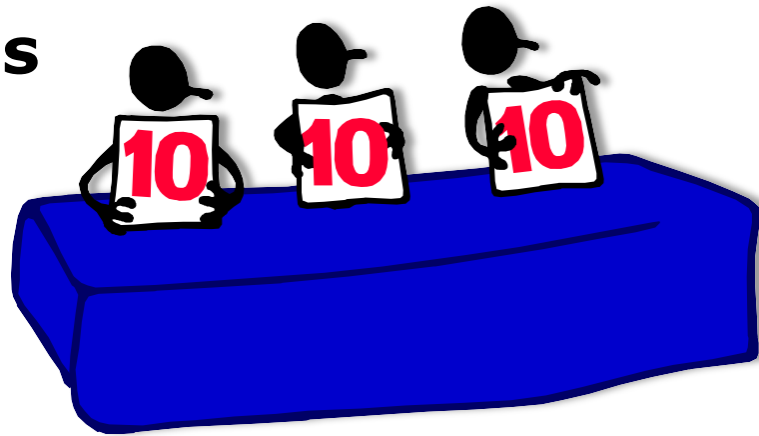
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**We are striving to
make our workshops
great!**



**Please evaluate this session and presenter
on a scale from 0 to 10. (10 = best)**

Please help us reset the room by gathering your belongings and exiting between sessions.

THANK YOU!



Carolina_Workshop_Materials

**And remember:
You can access all
Carolina workshop
materials later.**

