

# **Ants Go Marching**

## **Grade 1: Temperature Probe**

**Aligned with National Standards**

# overview

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In this inquiry based activity, students will observe and record the effects of temperature on the behavior of ants. They will learn that ants behave differently in warm environments than they do in cold environments. This activity is set-up in one 15-25 minute lesson with an extension activity that can easily be adapted.

This activity uses the WARD's Single Temperature Probe to collect data, allowing students to focus on the science discovery and leaving more time for learning and developing higher level thinking skills. If you prefer, a simple thermometer can be used in this activity.

## time requirement:

This activity can be completed in one session of 15-25 minutes.

## materials required for the activity:

thermometer	chart paper (2 pieces)
ice or refrigerator	ant terrarium
2 pieces of apple (one frozen)	timer/stopwatch
Ants Go Marching worksheet (page 10)	pencil
Instructions (this booklet): Teacher's Guide and Student worksheet if needed.	

## safety precautions

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### general safety:

- Caution! Ants can bite and/or sting. Be very careful when conducting experiments and science projects with ants. Do not touch them! Adult supervision is required.
- Wash hands after this activity.
- Consider establishing a safety contract that students and their parents must read and sign. This is a good opportunity to identify students with allergies (e.g., latex) so that you (and they) will be reminded of specific lab materials that may pose risks to individuals.
- Remind students to read all instructions before starting the lab activities, and to ask questions about safety and safe laboratory procedures. For the early grades that may not be proficient in reading yet, review the safety and lab procedures together with your students.
- Have students wash their hands after completing this and all lab activities.



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## framework for K-12 science education © 2012

<b>DIMENSION 1</b> Science and Engineering Practices	×	Asking questions (for science) and defining problems (for engineering)		Use mathematics and computational thinking
	×	Developing and using models	×	Constructing explanations (for science) and designing solutions (for engineering)
	×	Planning and carrying out investigations		Engaging in argument from evidence
	×	Analyzing and interpreting data		Obtaining, evaluating, and communicating information
<b>DIMENSION 2</b> Cross Cutting Concepts		Patterns		Energy and matter: Flows, cycles, and conservation
	×	Cause and effect: Mechanism and explanation		Structure and function
	×	Scale, proportion, and quantity		Stability and change
		Systems and system models		
<b>DIMENSION 3</b> Core Concepts	Discipline		Core Idea Focus	
		Life Sciences		LS1.D: Information Processing

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**NGSS  
STANDARDS**

Elementary School Standards Covered	
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	

## national science education standards © 1996

Content Standards (K-12)			
	Systems, order, and organization		Evolution and equilibrium
×	Evidence, models, and explanation	×	Form and Function
×	Constancy, change, and measurement		
Life Science Standards Elementary School			
×	Organisms and their Environments		

× Indicates standards covered in activity

# prior to class

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- You may want to set-up a specific area to place the terrarium which allows for easy observation.
- Follow the recommended directions that came with your terrarium for set up.
- Label one piece of chart paper “Warm Environment” and the other “Cold Environment”.
- Make copies of worksheets if desired.
- Freeze an apple the night before the activity.
- Review basic information about how to use and read a thermometer and/or the WARD’s Single Temperature Probe.

# objective

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Students will understand how temperature affects the behavior of ants.

Students will be able to make observations, collect, analyze and interpret data.

# background

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## **Ants Go Marching**

Animals have body parts that capture and convey information from their environment that is needed for growth and survival. Animals respond to these environmental stimuli with behaviors that help them survive. Insects are cold-blooded animals, meaning that their body temperature is similar to that of their surroundings. They do not maintain an independent body temperature in the same way as mammals and birds.

## build upon prior knowledge:

- Ask students to look at the picture of people having a picnic on the grass in a warm, sunny place- (Photo 1). Have them describe what they see. Using chart paper titled “Warm Environment”, make a list of the student’s responses. Now ask students to imagine what would happen if the people having a picnic left their food out on the blanket. *(Student responses may include bugs would come.)*
- Show students the picture of people having a picnic in a snowy, cold place (Photo 2 on next page). Have them describe what they see. Using chart paper titled “Cold Environment”, make a list of the student’s responses. Now ask students if bugs or insects would come if the people having a picnic in the snow left their food out on the blanket? *(Student response should be no.)*
- Ask why bugs or insects would not bother the food of the people having the picnic in the snow? *(Student response may include because it is too cold for bugs or insects.)*

Photo 1



<http://101thingstodosw.com/orangecounty/picnic-in-the-park>

*(continued on next page)*

Photo 2



<http://speechinmotion.com/blog/page/2/>

*(continued on next page)*

## procedure

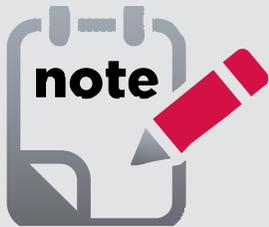
1. Tell students they are going to observe ants to help them understand the effects of temperature on the behavior of the ants. Show students the terrarium and the piece of apple. Have students think about the pictures of the picnics. Tell them they are going to experiment to find out how ants behave in warm temperatures and in cold temperatures.
2. Have students make a prediction about how the ants will behave when given an apple in a warm environment. Write the prediction on the “Warm Environment” chart. Have students make a prediction about how the ants will behave when given a frozen apple in a cold environment. Write the prediction on the “Cold Environment” chart. (ELA Literacy connection SL.K.3 – write a sentence as a group or individual)
3. Data Collection – Warm Environment. Place the terrarium in the sun or a heat source. Take and record the temperature on the chart. Place the piece of unfrozen apple at one end of the terrarium. Record the starting time on the chart. Observe the behavior of the ants for 2 – 3 minutes. If possible count the number of ants on the apple at 1, 2 and 3 minute intervals. Record the data on the chart.
4. Carefully remove the piece of apple and record students’ observations on the “Warm Environment” chart. (ELA Literacy connection SL.K.3 – write a sentence as a group or individual)
5. Data Collection – Cold Environment. Remove the terrarium from the heat source. Allow the terrarium to return to room temperature. Place the terrarium in a refrigerator for about 10 minutes or add several ice cubes at one end of the terrarium. Put the frozen apple in one end of the terrarium or on top of the ice. Take and record the temperature on the chart. Record the starting time on the chart. Observe the behavior of the ants for 2 – 3 minutes. If possible count the number of ants on the apple at 1, 2 and 3 minute intervals. Record the data on the chart. (CCSS.Math.Content.1.NBT.A.1 - Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.)

*(continued on next page)*



## guiding questions

- ✦ What do you think will happen? (Hypothesis)
- ✦ What do you expect to learn?
- ✦ What tools are needed?
- ✦ How can we record our findings?



## teacher notes

- ✦ Review basic information about how to use and read a thermometer.
- ✦ This activity uses the Ward's Single Probe to collect data allowing students to focus on the science discovery, leaving more time for learning and developing higher level thinking skills.

6. Remove the ice and piece of frozen apple and record students' observations on the "Cold Environment" chart. (ELA Literacy connection SL.K.3 – write a sentence as a group or individual)
7. Interpret and analyze the data comparing the student predictions. Ask students to compare the behavior of the ants in warm and cold environments. Look back at the predictions made in Step 2. Discuss. (CCSS.Math.Content.1.MD.C.4 - Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.)
8. Use the time interval data collected to make a bar graph. (see sample graph on next page)
9. Students can draw their observations on the Ants Go Marching worksheet and write a sentence describing their observations. (ELA Literacy connection SL.K.3 – write a sentence as a group or individual)

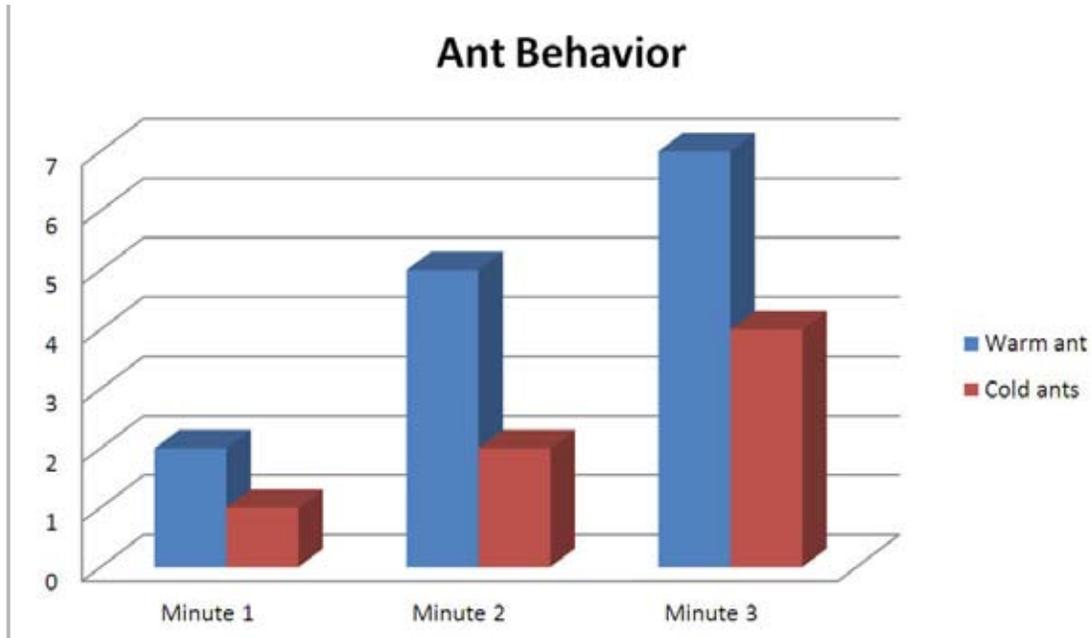
## summarize

Ask students what they have learned about the effect of temperature on the behavior of ants. (*Student responses may include: The warmer it is the more active the ants.*)

## extension

Have students think about other conditions in which the behavior of the ants may change. Make a list of those conditions. The list may include light and darkness, wet and dry, or even different types of food. Conduct inquiries for these conditions following a similar procedure as this activity.

Sample Bar Graph (step 8)

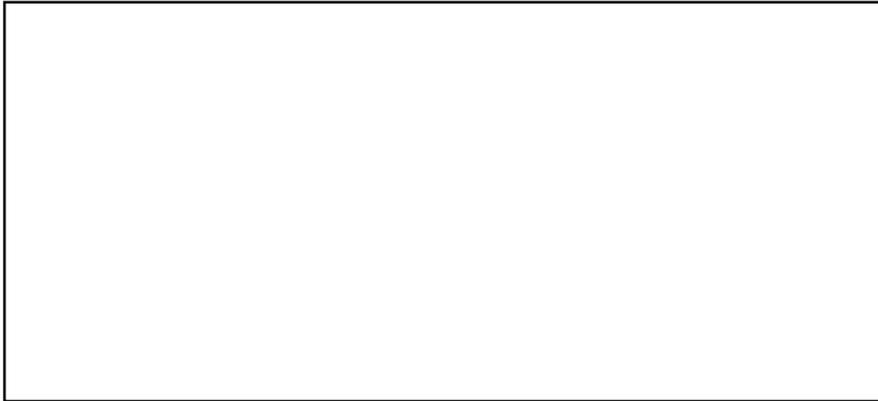


# Worksheet

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Name: \_\_\_\_\_

Draw your observation of the ants in the Warm Environment.

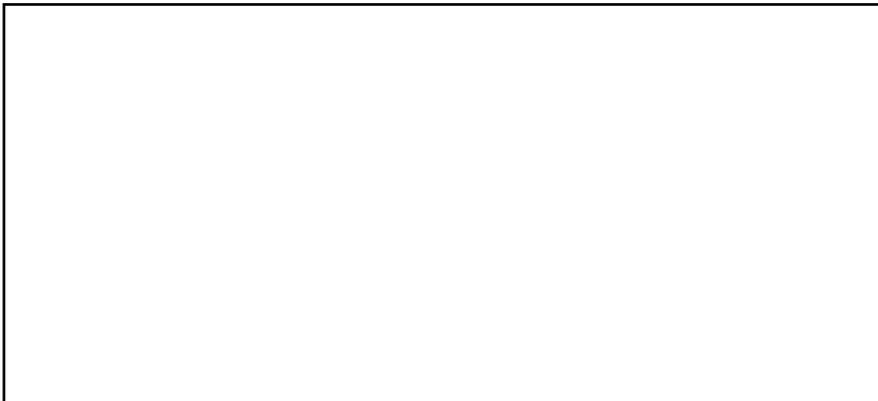


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Draw your observation of the ants in the Cold Environment.



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