PITFALL TRAPPING - Teacher's Guide

ABSTRACT: Students use pitfall traps to investigate the types and numbers of ground arthropods in two different habitats in the schoolyard.

GRADE LEVEL(S): 3rd - 12th

OBJECTIVES: Students will:
Record and graph arthropod numbers during the school year.
Draw conclusions about the relationship between arthropod populations and habitats.

NATIONAL STANDARDS: See last section in binder.
NEW MEXICO or TEXAS STANDARDS: See last section in binder.

MATERIALS:
- Trowels
- 35 mm film canisters with lids
- Dish detergent
- Petri dishes
- Forceps
- Hand lenses
- Dissecting microscope
- Arthropod or insect identification books
- Colored pencils

BACKGROUND: Many arthropods are found around the schoolyard. The simplest tool to collect ground arthropods is a pitfall trap. This trap is buried in the ground to catch arthropods. It is a "pit" that insects walking along the ground "fall" into.

Some arthropods in your schoolyard may have very specific requirements that are found in some areas of the schoolyard and not in others. This could lead to different number of species living in different habitats. For example, a particular kind of beetle may be found near creosote bushes but not in the open or under any other kind of shrub. This activity will allow your students to examine these relationships.

TIPS FOR ENTIRE CLASS PARTICIPATION:
- Students can work individually or in pairs. Half of the students will place their pitfall traps in habitat #1, and half will place their traps in habitat #2.

PROCEDURES:
1) Have students make a hypothesis about two habitats in the schoolyard where different numbers of arthropods may be found (e.g., under shrubs versus in the open, near the buildings versus far from buildings).

2) Give each student (or pair of students) a film canister, and have them fill the canisters 3/4 full with water. Add two drops of dish detergent and replace the lid. The detergent reduces the surface tension of the water so the arthropods will sink to the bottom of the trap.

3) Have half of the students place their traps in habitat #1 and half place their traps in habitat #2. Traps should be at least 2 meters away from each other. To install the traps, have students dig a small hole that is large enough to hold the film canister. Place the film canister with the lid on into the hole and fill in soil around it. Now remove the lid and make sure that the top of the film canister is level with the soil surface, so any arthropod walking by can fall into the canister.

4) After 3 days, have students collect the pitfall traps. Mark or map the trap holes so you can locate them in future months.

5) Back inside the classroom, have students pour the contents of the pitfall trap into a clean petri dish, making sure all of the specimens are removed. Add water to the petri dish, if needed, to help separate them.

6) Have students use forceps to carefully separate the arthropods into groups of individuals that look alike. Remind them to look at their arthropods carefully while they sort them to make sure all individuals within a group are exactly the same.

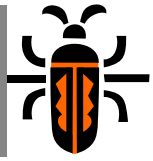
7) Have students record their findings on the Pitfall Trap Data Sheet. This will include making up a name for the species and counting the number of individuals of each species. With older students, you may want to have them use insect identification books to identify each species they collected.

8) Record the data from each student (or pair of students) on the Class Pitfall Trap Data Sheet. Have students calculate the average number of species found in traps in each habitat.

9) Graph the average number of species found in each habitat.

CONCLUSIONS: Allow students to draw conclusions from the graphs.
Do arthropods prefer one habitat over the other? If so, what are some reasons this might occur?
What else might affect the number of species found in each habitat?
Does the number of species in each habitat change over the course of the school year?

EXTENSIONS: A variation of this activity could involve using different types of bait (honey, sugar, ketchup, etc.) around the diameter of the canister. Do different baits attract different kinds of arthropods?



Pitfall Trap Data Sheet

Habitat Number: 2 **Habitat Description:** Under creosote bush

My Trap Number: 1 **My Location:** North side of building

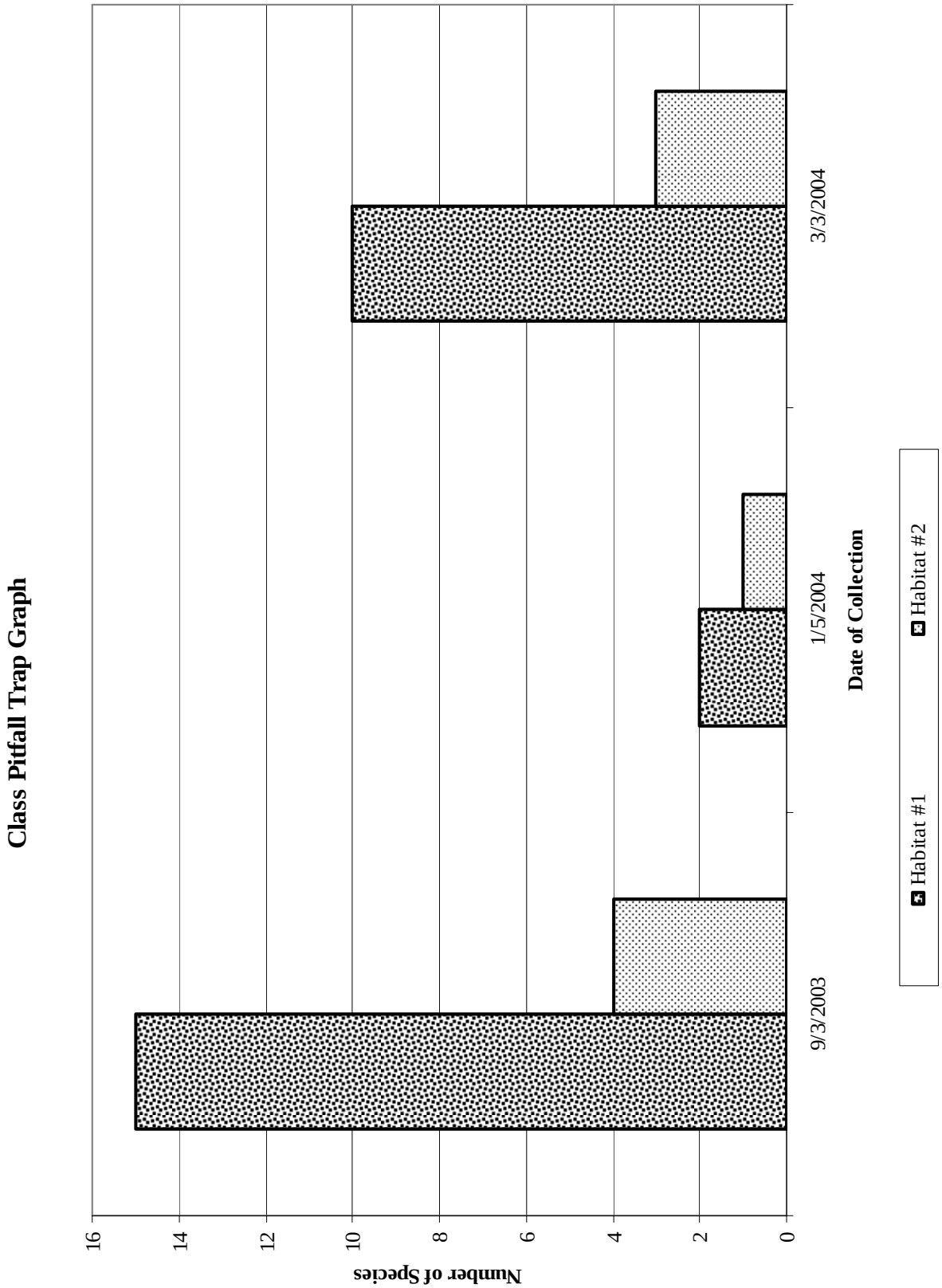
Date	My Name for the Species	Description of the Species	Number of Individuals
Mar 3, 2004	Long-legged ant	Black, medium sized, very long legs	4
Mar 3, 2004	Red and black ant	Large, red head, black abdomen, little hairs on body	7
Mar 3, 2004	Green ladybug	Round, green body, spots	1

Class Pitfall Trap Data Sheet

Date: March 3, 2004

Trap Number	Number of Species Habitat #1 In Open	Number of Species Habitat #2 Under Creosote Bush
1	11	3
2	9	7
3	10	0
4	6	2
5	14	3
Average	10	3

PITFALL TRAP - Samples



Student's Name: _____

Pitfall Trapping

Questions: Do different habitats have different numbers of arthropod species? Does the number of species in these habitats change during the year?

Materials:

- Trowels
- 35 mm film canisters with lids
- Dish detergent
- Petri dishes
- Forceps
- Hand lens
- Dissecting microscope
- Arthropod or insect identification books

My Hypothesis: _____

_____

Procedures:

1) Hypothesize about two habitats in the schoolyard where different numbers of arthropods may be found (e.g., under shrubs versus in the open, near the buildings versus far from buildings).

2) Fill a film canister 3/4 full with water and two drops of dish detergent. Replace the lid.

3) Half of the students will place their traps in habitat #1 and half will place them in habitat #2. Traps should be at least 2 meters away from each other. To install the traps, dig a small hole that is large enough to hold the film canister. Place the film canisters with the lid on into the hole and fill in soil around it. Now remove the lid and make sure that the top of the film canister is level with the soil surface, so any arthropod walking by can fall into the canister.

4) After 3 days, collect the pitfall traps. Mark or map the trap holes so you can locate them in future months.

5) Pour the contents of the pitfall trap into a petri dish, making sure all of the specimens are removed. Add water to the petri dish, if needed, to help separate them.

6) Use forceps to carefully separate the arthropods into groups of individuals that look alike. Look at your arthropods carefully while you sort them.

7) Record your findings on the Pitfall Trap Data Sheet. Create a name for each group of arthropods in your trap and write a full description of each group. Finally, count the number of individuals of each group.

8) Record the data from your trap and your classmates' traps on the Class Pitfall Trap Data Sheet. Calculate the average number of species found in each habitat.

9) Graph the average number of species found in each habitat.

Results: See your graph.

Conclusions:

Nombre del Estudiante: _____

Pitfall Trapping

Preguntas: ¿Tienen los habitates diferentes números diferentes de especies de artrópodos? ¿Cambia el número de especies durante el año?

Materiales:

- Paletas
- Latas de película 35 mm con tapas
- Detergente para platos
- Platos petri
- Pinzas
- Lentes a mano
- Micróscopo para disectar
- Libros para identificar los artrópodos o los insectos

Mi Hipótesis: _____

_____

Métodos:

1) Haz una hipótesis acerca de dos habitates en el terreno de la escuela donde se pueden encontrar diferentes artrópodos (p.ej.: debajo de los arbustos contra los en espacio abierto, cerca de los edificios contra lejos de los edificios).

2) Llena una lata de película hasta la 3/4 con agua y dos gotas del detergente para platos. Repon la tapa.

3) La mitad de los estudiantes deben poner sus trampas en hábitat #1, y la otra mitad en hábitat #2. Las trampas deben estar a lo menos a los 2 metros la una a la otra. Para instalar las trampas, cava un hoyo pequeño con la paleta, pero suficiente grande para tener una lata de película. Pon la lata con la tapa en posición en el hoyo, y llena alrededor de la lata con el suelo. Ahora quita la tapa y asegúrate que la parte más alta de la lata está a un nivel con el superficie del suelo, para que cualquier artrópodo que pasa puede caerse en la lata.

4) Después de 3 días, colecciona las trampas. Marca o pon en un mapa donde había los hoyos para identificarlos en los meses que vienen.

5) Echa los contenidos de las trampas en un plato petri, asegurándote quitar todos los especimenes. Echa agua al plato petri, si es necesario, para separalos.

6) Usa las pinzas con cuidado para separar los artrópodos en grupos de individuos que se parecen. Mira con cuidado a los artrópodos mientras los pones en grupos.

7) Anota los datos en la Hoja de Datos: Pitfall Trap. Crea un nombre para cada grupo de atrópodos en tu trampa y escribe una descripción completa de cada grupo. Por fin, cuenta el número de individuales en cada grupo.

8) Anota el número de especies de tu trampa y de las trampas de tus compañeros de clase en la Hoja de Datos de Clase: Pitfall Trap. Calcula el promedio del número de especies encontrado en cada hábitat.

9) Pon en forma gráfica el número promedio de especies encontrados en cada hábitat.

Resultos: Ve la tabla.

Conclusiones:

Student's Name: _____

Pitfall Trap Data Sheet

Habitat Number: ____ Habitat Description:_____

Date	My Name for the Species	Description of the Species	Number of Individuals

Nombre del Estudiante: _____

Hoja de Datos: Pitfall Trap

Número de Hábitat: ____

Descripción :_____

Fecha	Mi Nombre por el Especie	Descripción del Especie	Número de Individuales

Student's Name: _____

Class Pitfall Trap Data Sheet

Date: _____

Trap Number	Number of Species Habitat #1 _____	Number of Species Habitat #2 _____
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Average		

Student's Name: _____