

# HUNGRY FOR CHANGE



© Home Science Tools. All rights reserved.  
*Reproduction for personal or classroom use only.*

Contact us at: [www.homesciencetools.com/customer-service/](http://www.homesciencetools.com/customer-service/)

A Product of Homesciencetools.com



## TEACHER GUIDE





# PLANNING

Here's a suggested schedule for this kit! The activities should be completed in order, but you can choose when the lessons take place over time.

ACTIVITY INFORMATION	SECTION (S)	TIME REQUIRED	DAY/LESSON
Activity 1: Munching Mealworms	<input type="checkbox"/> Unusual Diet	30 minutes	Day 1
Discover an unusual animal that eats polystyrene!	<input type="checkbox"/> Mealworm Set Up	30 minutes	Day 2
Total time: 1 h			
Activity 2: Growing Up	<input type="checkbox"/> Darkling Beetles	45 minutes	Day 3
Learn about the life cycle stages of three animals.			
Total time: 2 h 15 min			
Activity 5: Paying Attention to Plastics	<input type="checkbox"/> Journaling: Day 1	30 minutes	Day 4
Study the diet of mealworms through a hands-on experiment.			
Total time: 4h			
Activity 2: Growing Up (continued)	<input type="checkbox"/> Birds and Mammals	60 minutes	Day 5
Activity 5: Paying Attention to Plastics (continued)	<input type="checkbox"/> Journaling: Day 2	30 minutes	Day 6
Activity 2: Growing Up (continued)	<input type="checkbox"/> Comparing Cycles	30 minutes	Day 7
Activity 5: Paying Attention to Plastics (continued)	<input type="checkbox"/> Journaling: Day 3	30 minutes	Day 8
Activity 3: All Together			
Understand how species and ecosystems fit together			
Total time: 2 h 15 min			

Full schedule  
available with  
purchase

**NOTES:** This suggested activity schedule is different from others within Science Unlocked.

For Activity 5, your student will be journaling about their mealworms for at least 3 weeks. To ensure that your student can complete the experiment effectively, it's important that this process isn't rushed.



# 1

## activity

# MUNCHING MEALWORMS

Plastic is a constant in our lives, with plastic waste invading all of our ecosystems. In this activity, your student will explore how those plastics break down, and they will discover an organism that actually eats it and breaks it down faster than the current methods.

## UNUSUAL DIET

**Question 1: What are two things you observed in the photo?**

**Answer:** Answers will vary.

**How to Help:** Your student may say they observed the beetles eating polystyrene foam, but this is an assumption based on the photo. Encourage your student to focus on what they can see happening, rather than what they assumed has happened. However, there are no wrong answers, so long as what your student says they observed is actually observable within the photo.

**Question 2: What are two questions you have about this photo?**

**Answer:** Answers will vary.

**How to Help:** Your student may wonder what the animals in the photo are or if they ate the foam. They might also wonder if other animals eat foam or how long it took the beetles to eat the foam. There are no wrong answers, but encourage your student to ask questions they couldn't answer themselves from looking at the photo.

## 2

## MEALWORM SET UP

### CONTENT

Your student will learn four vocabulary terms in this section:

Plastic  
Polyethylene  
Polypropylene  
Polystyrene

### ☒ PREPARATION AND SUPERVISION

**WARNING:** Mealworms are live animals and should be cared for with respect.



■ Because mealworms are live animals, it is important that students recognize they should be treated with respect and cared for appropriately as a part of this kit. If the mealworms aren't treated properly, they may die and no longer be used for their study.

■ Have students skip ahead to the first part of Activity 5 before moving on to Activity 2. In Activity 5, they will be journaling about the mealworms they set up in this section.

■ This kit is a bit different in structure from most of the other Science Unlocked kits when it comes to the timing of the activities. Plan for 8 days of journaling about mealworms over at least three weeks for students to monitor their mealworms.



## ☒ PREPARATION AND SUPERVISION

■ Students are asked to create ways of communicating the life cycles of a bird and mammal. They are to choose one of the three options provided in the Student Workbook.

■ Student communication methods need to be the same as for the darkling beetle life cycle. This is important so they can compare and contrast them in the next section.

5

## COMPARING CYCLES

### ? Question 1: What do the three life cycles have in common?

**Answer:** The three life cycles all have four stages: birth, growth, reproduction, and death.

**How to Help:** *If your student struggles with this question, encourage them to look back at “Darkling Beetles” to read about life cycles again.*

*You can also encourage them to look more closely at their own life cycles to find additional commonalities among just two of the life cycles.*

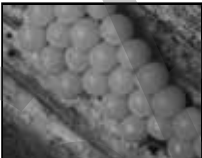



### ? Question 2: How are the three life cycles different?

**Answer:** The stages of the life cycles are different in how they look and what organisms eat at the different stages of growth. Additionally, darkling beetles undergo metamorphosis, while birds and mammals do not.

**How to Help:** *If your student is struggling, break the question down and encourage them to think first about the differences between darkling beetles and birds, then birds and mammals, and finally mammals and darkling beetles. Breaking the question down can more clearly show your student the differences among the different animals.*

### ? Question 3: Identify and label the growth stage of the life cycle shown in each photo below and write one sentence about that stage. Use your models (books, slideshows, etc.) to help.

a. Answer

	Egg At this stage, the caterpillar is in a protected case.
	Larvae or caterpillar This is a young form of a butterfly before it goes through metamorphosis.
	Pupa or chrysalis This is when the butterfly is undergoing metamorphosis to become an adult butterfly from a caterpillar.
	Butterfly This is the adult stage of the animal.

**How to Help:** Have your student read “Darkling Beetles” again to review the stages of an organism that undergoes metamorphosis.

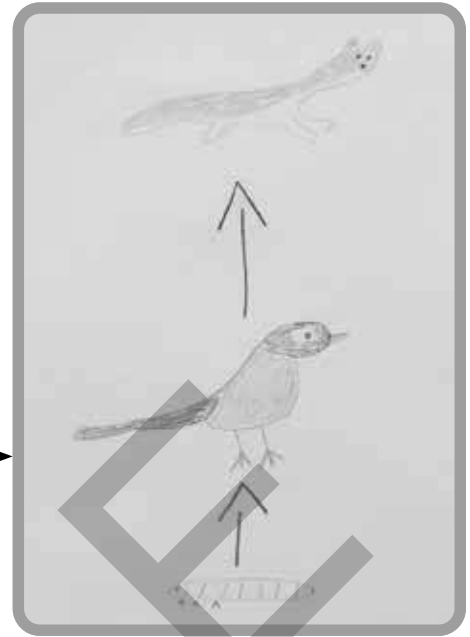


Some animals can be confusing to place on a trophic level because they can be in more than one based on the food chains created. If this becomes the case, encourage your student to either categorize them as being part of more than one trophic level, or to decide which level they fit into more closely.

- ? **Question:** Create a food web using one of the three birds, one of the three mammals, and one growth stage of the darkling beetle from Activity 2.

**Answer:** \_\_\_\_\_ →

**How to Help:** The image shown is if your student chose robin and weasel.



## 8

# FOOD WEB FORMATION

- ? **Question 1:** Could the darkling beetle, bird, and/or mammal you chose from Activity 2 be found in the ecosystem you mapped? Explain.

**Answer:** Answers will vary based on your student's ecosystem.

**How to Help:** Students may be unsure initially, and that is okay. You can encourage them to research the answer to find out.

- ? **Question 2:** If the darkling beetle, bird, and/or mammal from Activity 2 could be found in the ecosystem map you created, indicate where on your map they would most likely be seen.

**Answer:** Make sure students put the mammal and darkling beetle on the ground, as this is where they would be found. The bird has more versatility because it could be in flight.

- ? **Question 3:** Using your mapped ecosystem, including the species you added during the last question, create an ecosystem food web.

**Answer:** Answers will vary.

**How to Help:** Encourage your student to think through all of the interactions that could occur between species.

- ? **Question 4:** If darkling beetles no longer existed and you supplied birds with an unlimited plastic, what would be the outcome? Explain.

**Answer:** The birds would not be able to consume the plastic safely and they would die.

**How to Help:** Mealworms have gut bacteria that help them break down the polystyrene and absorb the energy from it. Since birds do not have these same gut bacteria, their bodies cannot break down plastic. Your student can review this material in "Darkling Beetles" from Activity 2.