Virtual Creature Fest: Pillbugs

Whether they are scuttling about beneath a log on the forest floor, curling up into a ball under the curious gaze of a child, or munching on rotting leaves in a city park, pillbugs are always fascinating to observe!

These gentle little creatures fill an important role in our local food web as both prey for other animals and decomposers that help to keep our world from piling up with dead organic matter! They go by many names, such as rolly pollies, pillbugs, potato bugs, etc., and they offer a great way to engage young students with many scientific concepts ranging from trophic levels to anatomy to taxonomy and more. In this packet created for Duke Farms' Virtual Creature Fest, you will find a whole host of "edu-taining" material suitable for anyone interested in learning! For formal educators, these materials align with all current Next Generation Science Standards and offer a wonderful guide for exploring in the classroom with your students. For informal educators, caregivers, and families, this packet has been designed to lead exploration and learning in whatever environment where you live and work!

This packet was created as part of the first installment of the *I Spy a…* class series. Each of these short introductory programs act as a tool to get kids engaged with the material that will be later found in the activity packet. Be sure to check out the Duke Farms classes page for all our upcoming programs, so you don't miss any of the upcoming *I Spy a…* classes and much, much more!

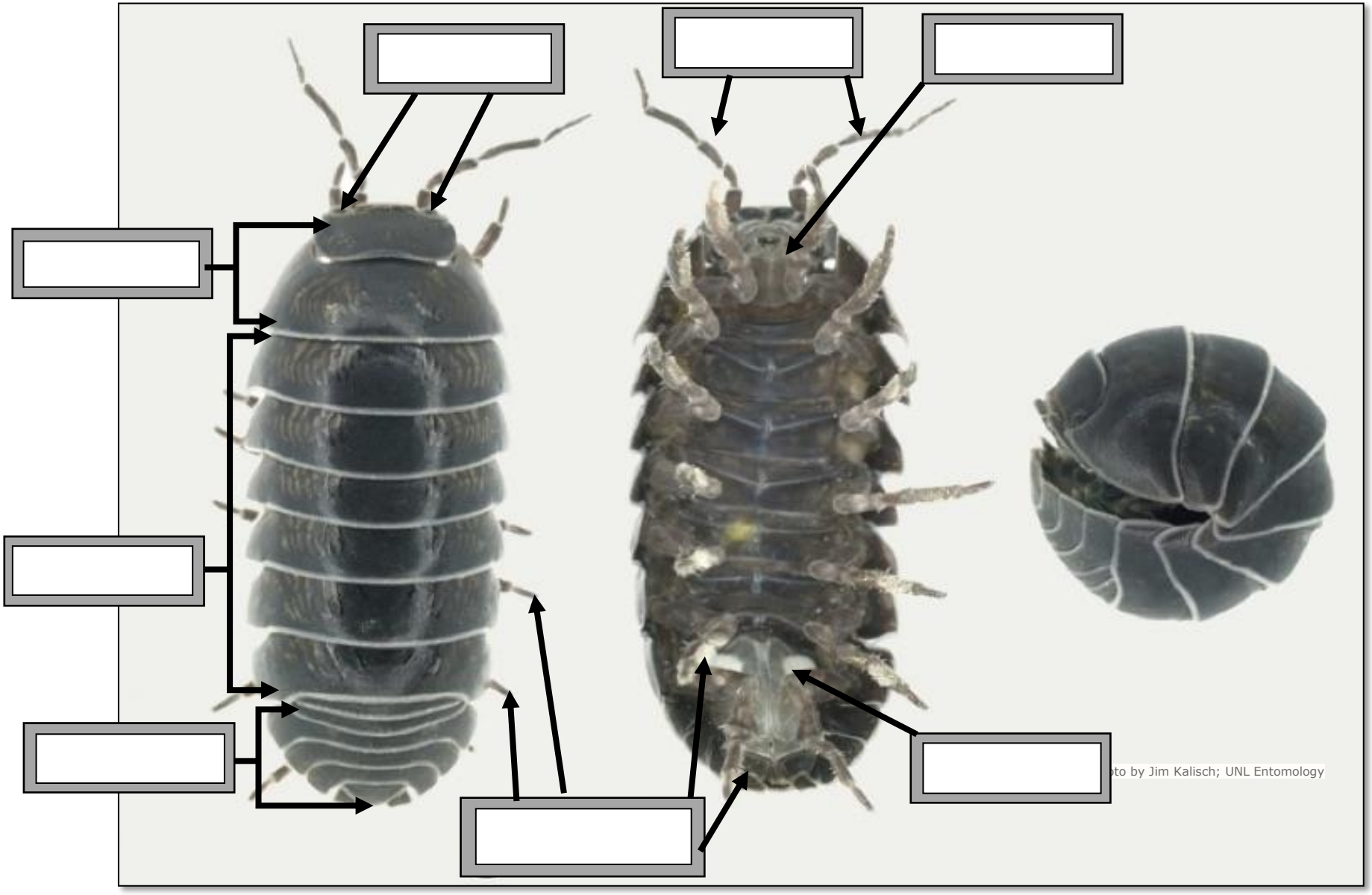
This packet includes:

- ✓ **What Makes a Pillbug?** - Anatomy labeling activity, answer key, and self-lead exploration (Pages 2-4)
- ✓ **Where Are You Pillbugs? –** Habitat exploration activity (Pages 5-8) and object cutouts (Pages 9-12)
- ✓ **All in the Family –** Taxonomy introduction activity and answer key (Pages 13-14)

We thank you for taking part in our Virtual Creature Fest and wish you happy explorations!

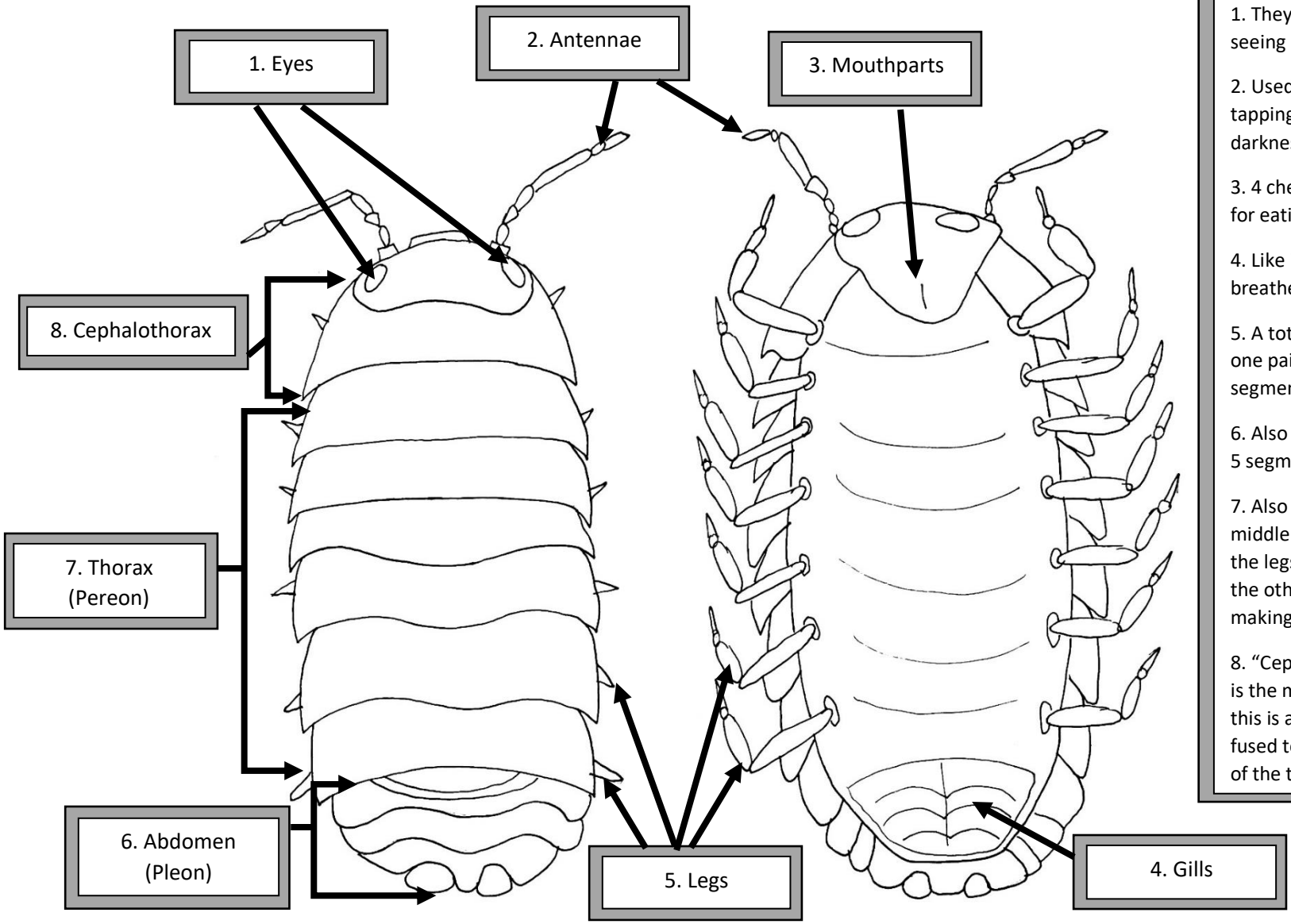
What Makes a Pillbug?

Check out this amazing photo of a real pillbug! You can study the top and bottom view up close, and even see what they look like rolled up! This labeling activity can be completed by comparing the body parts of this real pill bug to the drawn version on the next page. Can you find all the right parts? The next page also has a lot of interesting information about their anatomy.



Science & Art

A great way to study the natural world is to try and draw what you see. This nature study of the external anatomy of a pillbug allows us to get a better understanding of how all its body parts fit together and we can figure out how to label all the parts of the real bug on the previous page!



1. They have very poor eyesight, only seeing light vs. dark.

2. Used for communicating by tapping and for navigating in darkness.

3. 4 chewing mouthparts are used for eating rotting plant material.

4. Like in fish, these are used to breathe and must always be moist.

5. A total of 7 pairs of jointed legs, one pair is attached to each thorax segment.

6. Also called the *pleon*, it's made of 5 segments and contains the gills.

7. Also called the *pereon*, it's the middle section of the body, where all the legs attach and it's covered in the other 6 armored segments, making 7 segments in total.

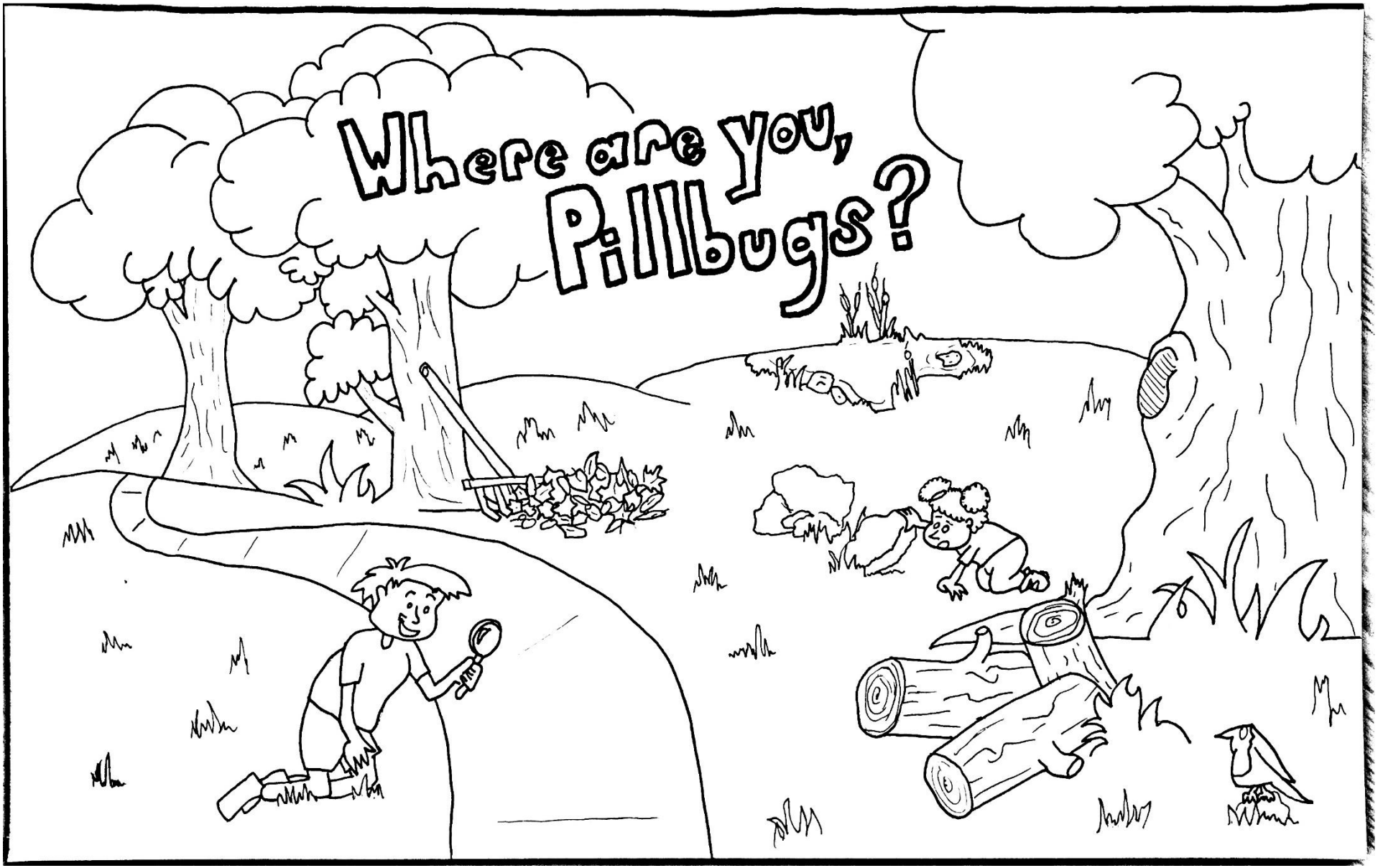
8. "Cephalo" means head and thorax is the middle part of the body, so this is a combination of the head fused to the first armored segment of the thorax.

Observe & Draw

Now that you are an expert in pill bug anatomy, try drawing one yourself! Go out and find a pill bug to study in its natural habitat and try bringing it to life on your page. Do you see any differences between the pill bug in the photo, the nature study drawing, and the one in front of you in real life? You are the science artist now, so try to record as many observations as you can!

“Where are you, Pillbugs?” - Decorate & Discover

Where do you find pillbugs? How do they behave when they feel safe or when they sense danger? Cut out the pillbug pictures on the last few pages of this packet, or draw them yourself in this habitat scene, then show us your creativity and decorate the page!



Explore the Forest

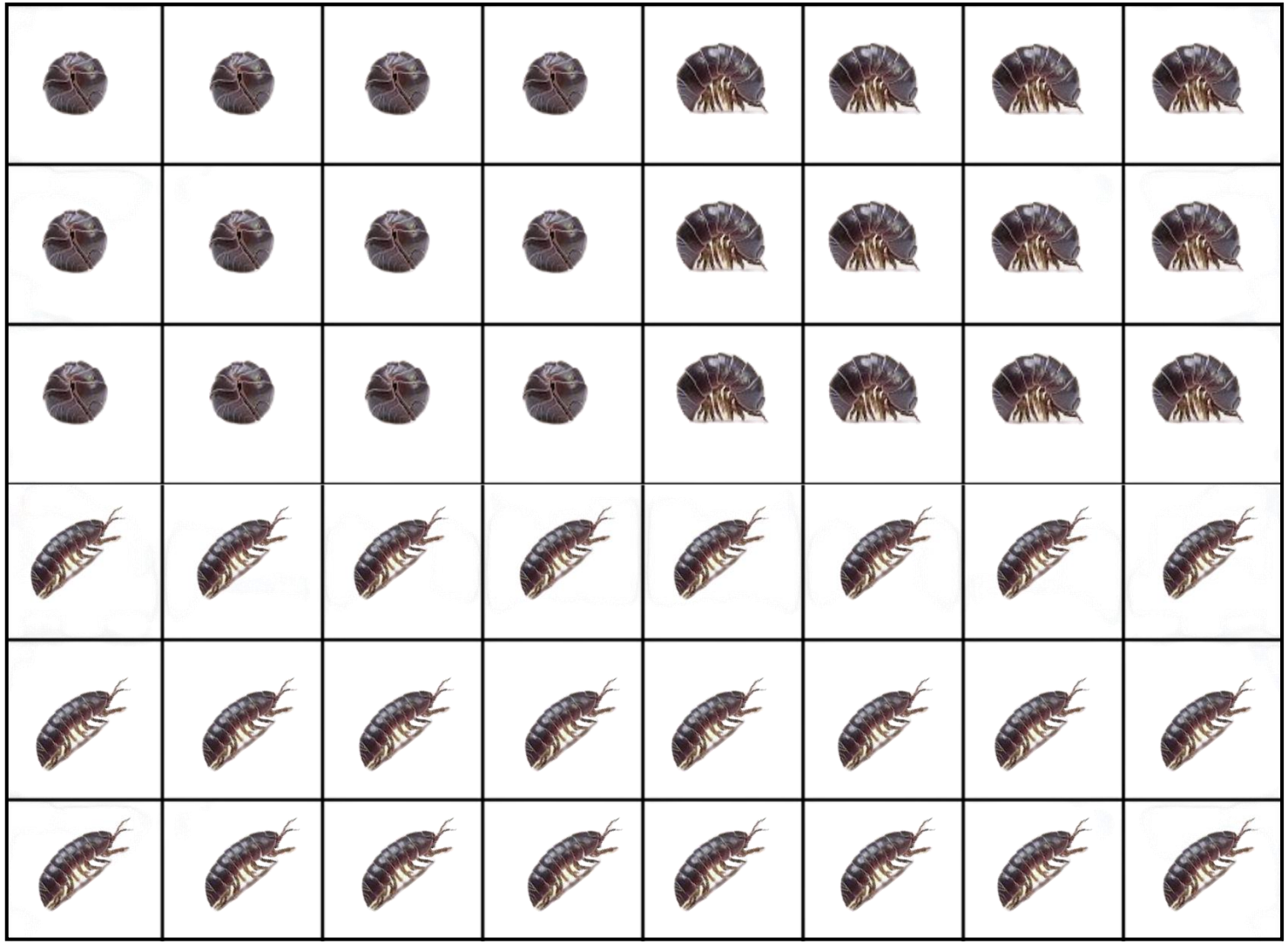
Think about where you would find pillbugs in this forest habitat! Where would they be hiding? Cut out the objects in the back of this packet that you would find in this setting and add some pillbugs where they would naturally like to live!

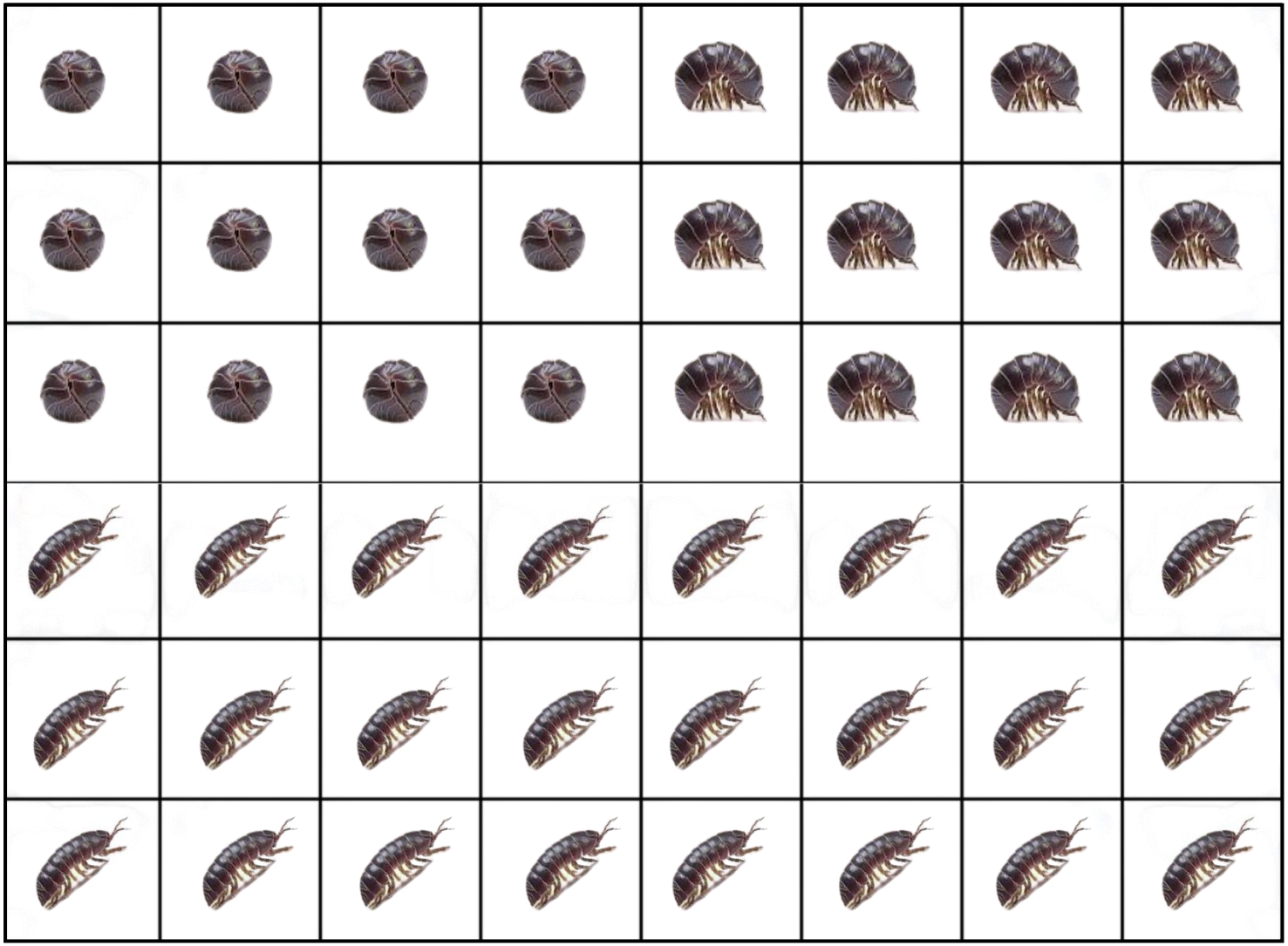
Explore the City

Just like people, pillbugs live in all kinds of environments! Where would you find pillbugs in this urban habitat? Like on the previous page, use the cut-out objects from the back pages to decorate and show where you would likely meet a pillbug!

Create a Habitat

Use everything you have discovered about pillbug habitat and behavior to create your own environment! Be creative and make it as fun and inviting for them as you can. Use the cutouts, draw your own, go wild!





All in the Family: What is Related to the Pillbug?

Pillbugs, rolly pollies, woodlice… whatever name you give them, these cute little animals are members of a huge and diverse group of animals called *Arthropods* (animals with an exoskeleton instead of bones, segmented bodies, and jointed legs in pairs), which includes animals like insects, arachnids, and crustaceans. Pillbugs are *crustaceans*, which means they can shed their exoskeleton throughout their life to grow bigger, they have legs with 2 segments, and they begin their lives as larvae. Can you circle the animals that are also crustaceans? See the Answer Key on the next page!

Hint: You know an animal is an *insect* because they have 6 legs and *arachnids* have 8!

All in the Family: Answer Key

How did you do? The crustaceans are circled here, and you can learn more about each animal!

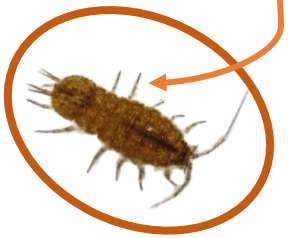
I am an eastern box turtle! I am not a crustacean, I am a reptile. I have bones, a shell, and only 4 legs.

I am an ant! I am not a crustacean, I am an insect. I have 6 legs and 3 body segments.

I am a monarch butterfly caterpillar! I am not a crustacean, I am an insect. I look like I have 16 legs, but only the first 6 are real, the others are "pseudo", or fake!

I am a spider! I am not a crustacean, I am an arachnid. I have 8 legs and 2 body segments.

I am a sowbug! I am a crustacean! I am sometimes confused with my cousin, the pillbug, but I can't roll up like they can.



I am a crab! I am a crustacean! I have 10 legs, 2 of which have evolved to become pinching claws!

I am an armadillo! I am not a crustacean, I am a mammal. I have bones, I don't lay eggs, and I have hair, but I also have hard armor like pillbugs and I can roll up into a ball like they do!

I am a bumblebee! I am not a crustacean, I am an insect. I fly through the sky with my wings and spend my days pollinating plants!

I am a lobster! I am a crustacean! I also evolved pinching claws, and my large, powerful tail helps me swim along the ocean floor.

I am a frog! I am not a crustacean, I am an amphibian. I have smooth, wet skin, I lay eggs, and I have bones. Like pillbugs, I also need a moist habitat!

To Learn More…

At Duke Farms, we enjoy using the National Science Teachers Association book series created by Emily Morgan. The book is introduced in this way by NSTA and the organization offers additional resources for exploration: Chances are that just under a nearby rock, you'll spot a roly-poly pill bug. Encourage a child to take a close look and introduce a fascinating creature. Gently pick it up and watch as it rolls into a ball and unrolls to take a walk. This cousin to lobsters and crabs sheds its crusty skin and will tickle your hand with its 14 (count 'em!) wiggly legs. Awaken a sense of wonder in a child with the Next Time You See series from NSTA Kids. The books will inspire elementary-age children to experience the enchantment of everyday phenomena, such as pill bugs, fireflies, seashells, and sunsets. Free supplementary activities are available on the NSTA website. Especially designed to be experienced with an adult—be it a parent, teacher, or friend—Next Time You See books serve as a reminder that you don't have to look far to find something remarkable in nature.

Click here to experience author Emily Morgan's read aloud of her book.

Climate Change

Just like any other organism, pill bug may be affected by climate change. To learn more about how to include this topic in the discussion about climate change with your students or family, please contact Kate Reilly, Manager of Education, Duke Farms at Kreilly@dukefarms.org

Adopted 2020 New Jersey Student Learning Standards (NJSLS) - Climate Change

New Jersey is the first state in the country to require climate change curriculum across all content areas and at a K-12 level.
As stated by the NJDOE: On June 3, 2020, the State Board of Education adopted the 2020 NJSLS in the following content areas:

- Career Readiness, Life Literacies, and Key Skills;
- Comprehensive Health and Physical Education;
- Computer Science & Design Thinking;
- Science;
- Social Studies;
- Visual and Performing Arts;
- and World Languages.