

Guide to Finding **F**OSSILS

on The John Dickinson Campus
of Dickinson College

By Ivy Joan Gilbert '18

Dickinson

Shown above is the trilobite *Cryptolithus*—
its name translates to “Hidden Stone.”



Bring a pencil!

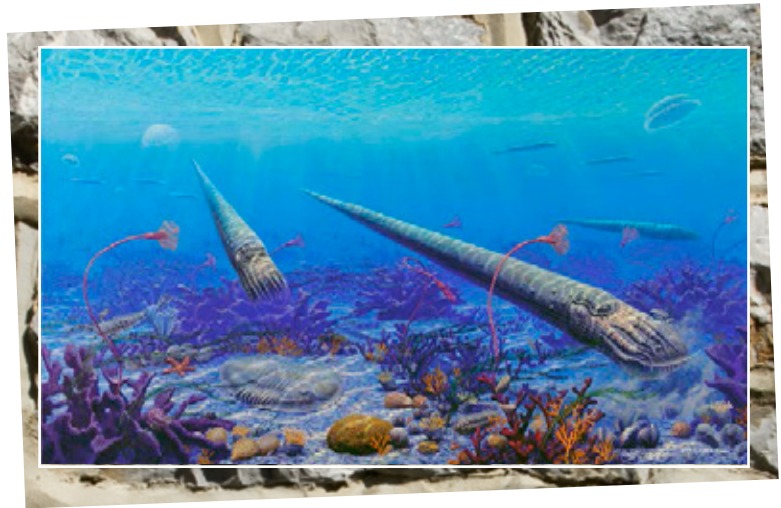
Welcome to Dickinson College. You have just picked up a fossil hunting guidebook and activity pack. This guide will help you gain a better understanding of the fossils located in Dickinson's iconic limestone. By the time you explore the sides of Althouse Hall you will be able to identify...

- ancient roly-polys (trilobites)
- lamp shells (brachiopods)
- ancient snails (gastropods)
- fake fossils
- geological features
- and so much more...

Make sure you bring a pencil so you can document your findings in the "Junior Paleontologist Field Log." In the log you can find a lot of fun activities and questions to help you remember your fossil hunt!

In a Sea Before Fishes

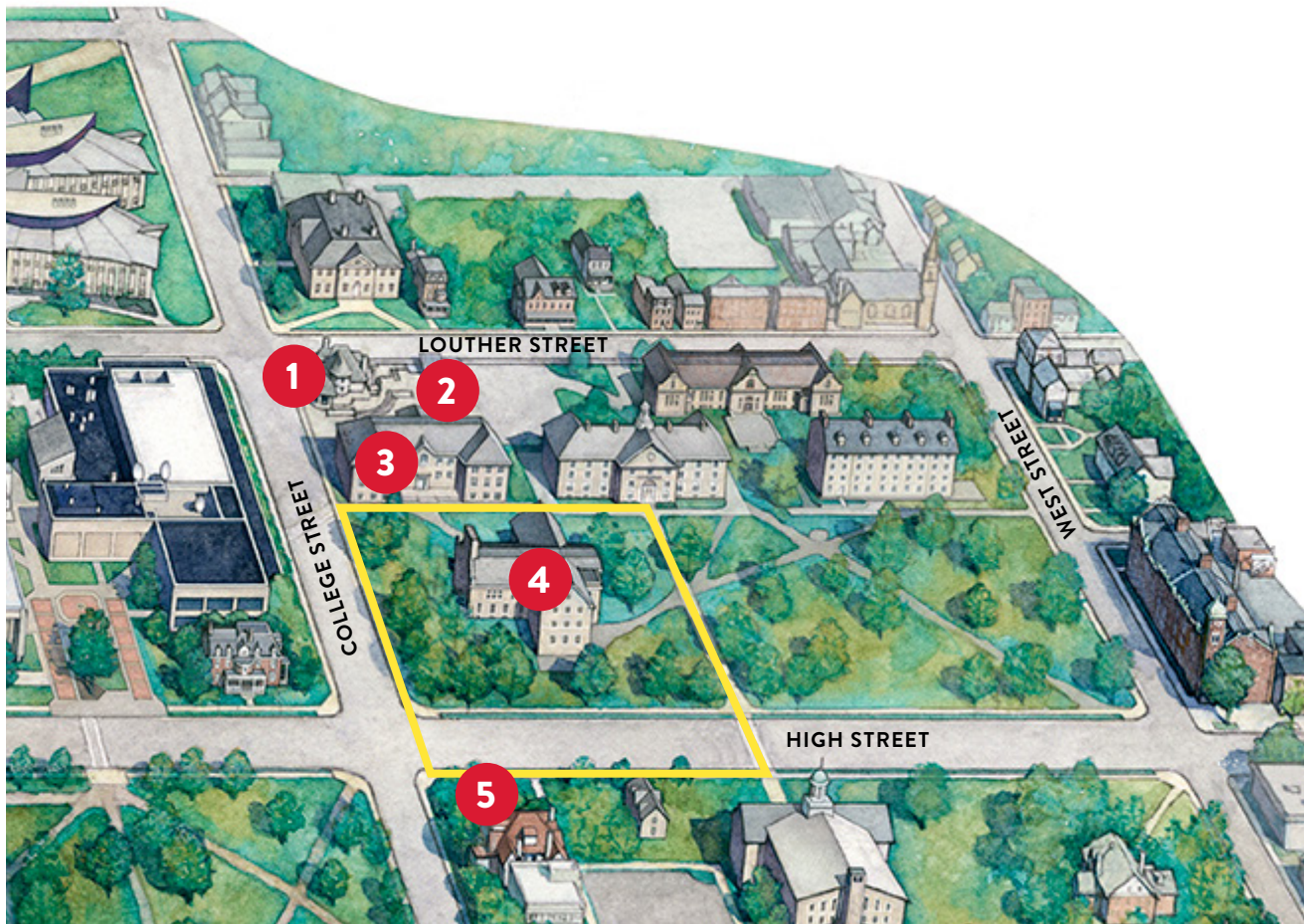
At one point in time (about 500 million years ago), the Appalachian Mountains did not surround Carlisle. Carlisle was on the sea floor of a tropical paradise. That means you would be underwater RIGHT NOW if you were alive when the fossilized creatures existed. The weather was similar to Florida's and a great ocean covered all of Pennsylvania, and most of the United States. There were no fish or dolphins—instead there were the distant ancestors of sea creatures today. Some swam through the water while others played in the lime that would one day turn them into fossils. This time period is known as the Ordovician.



What is a Fossil?

When prehistoric sea creatures die, their bodies fall to the sea floor. If the conditions are just right, lime will quickly cover the body, protecting the soon-to-be fossil from hungry scavengers. After many, many, many, many years, more lime would fall onto the creature. The lime would become so heavy that it would turn to stone (hence the name limestone!) and the animal shells would turn to into the fossils you find today. It is fossils that provide the evidence of ancient life.

Off to the fossil hunting hot spots on the walls of Althouse... Just follow the yellow line.



1 The Quarry

2 The Trellis

3 Althouse Hall

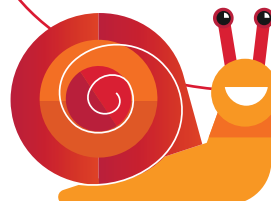
4 Bosler Hall

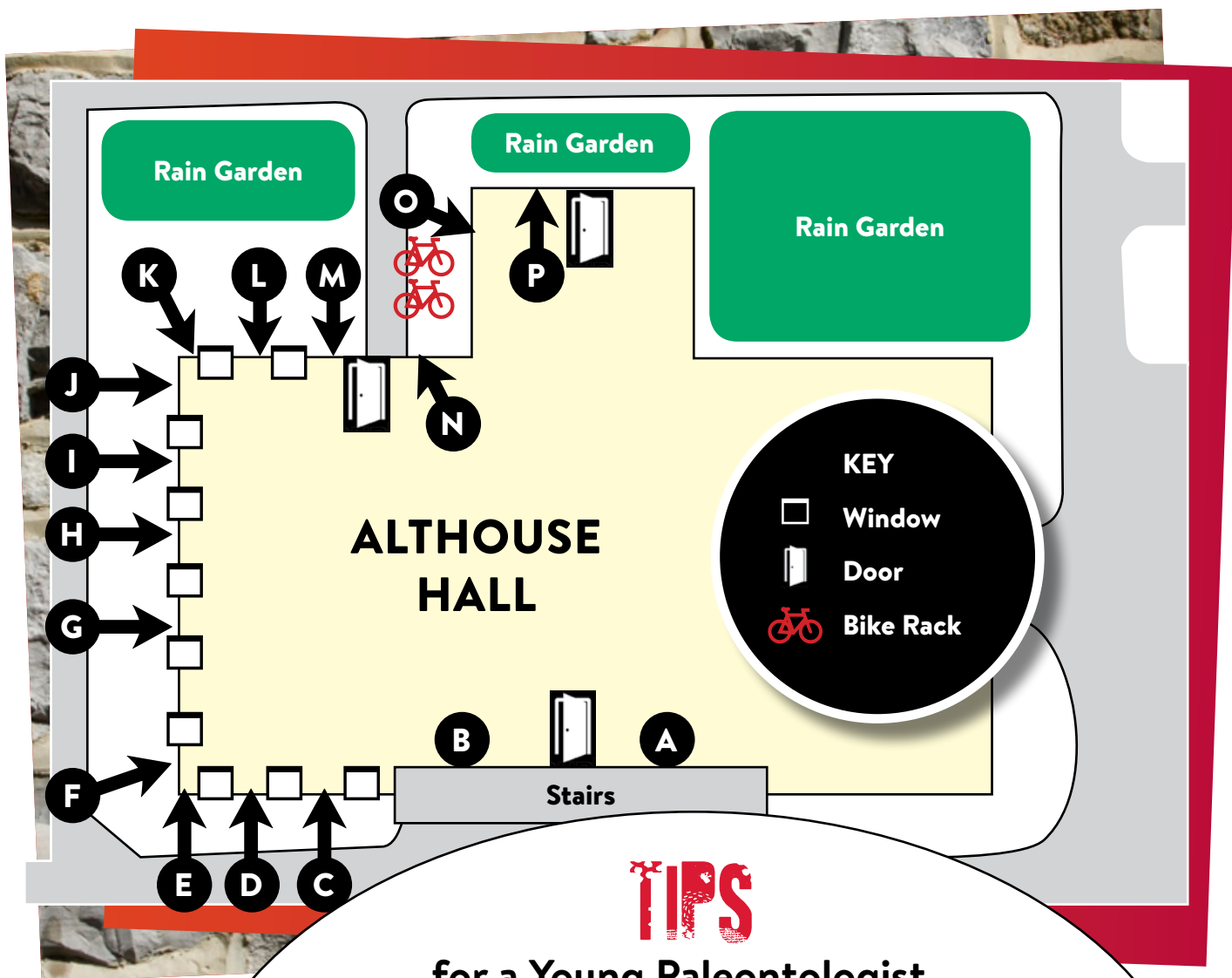
5 Waidner Admissions House

Be careful when crossing the street!



Hi, my name is **Gabby the Gastropod!** Look for my fun facts as you search for fossils in the limestone! Fun Fact: You can also find fossils on Bosler Hall!





TIPS

for a Young Paleontologist...

- ✓ Use the lettered "Hot Spots" to practice spotting fossils on the walls of Althouse, but don't limit yourself to just this building. Feel free to explore other Dickinson buildings.
- ✓ Look for speckles, circles, bumps and lumps.
- ✓ Keep your eyes out for different colors: whites, dark grays and oranges.
- ✓ Use your imagination. Remember you are going back in time!
- ✓ Have fun, and don't give up looking. Some fossils are low to the ground, while others are higher up.



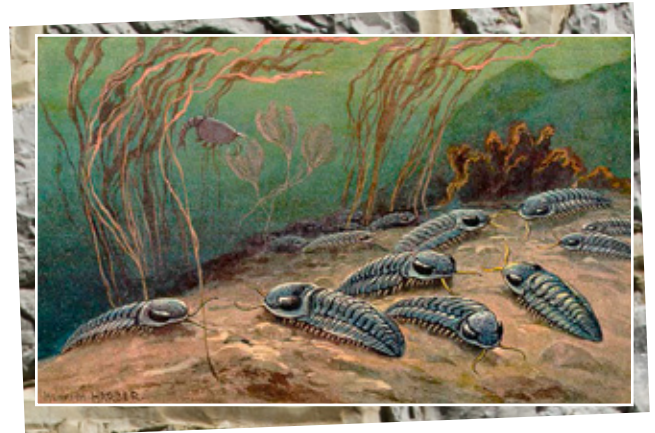
Fossil Hot Spots



Fossils Discovered To Date

Trilobites (Under Sea Roly-Polys)

- ✓ Two grooves on its back divide the creature into “threes.” This is how the TRI-lob-ite got its name.
- ✓ Related to modern day insects, spiders, lobsters and crabs.
- ✓ They crawled around on the ocean floor, some burrowing into the mud.
- ✓ The trilobite that has the “moustache” is called a *Cryptolithus* by paleontologists.



Look for spotted trilobite cheekbones, bumpy mounds and white/black colored shapes.



Full trilobite body. Found along the garden at **B**.



Cryptolithus “moustache,” or cheekbones. Found at **L**.



Trilobite mound. This is part of their head. Found at **K**.



Another set of trilobite cheekbones. Found at **N**.



Paleontologist



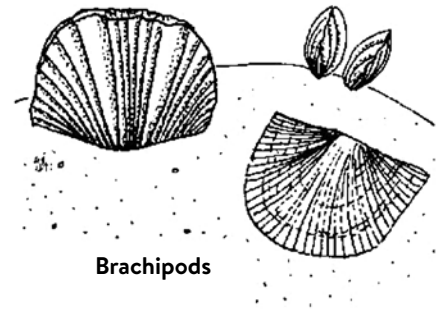
Trilobites could roll up, just like potatoes bugs/roly polys/pill bugs!



Find trilobites at hot spots:
B, E, F, H, I, J, K, L, M, N, O, P

Brachiopods (Lamp Shells)

- ✓ There are a LOT of these in the limestone of Althouse, so keep looking and see how many you can count.
- ✓ Most brachiopods have a “foot” that lets them live attached to the sea floor, while others could move around and even burrow deep into the mud!



Look for white shells that stand out against the limestone and that remind you of the beach.



Brachiopods at **B**.



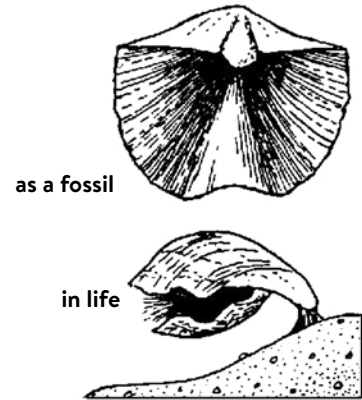
Large fan-shaped brachiopod at **L**.



Brachiopod with ridges at **H**.

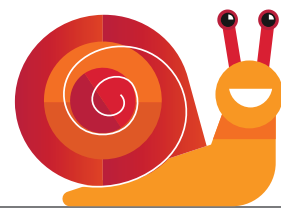


Large incomplete brachiopod at **E**.



as a fossil

in life



Paleontologist



Scientists use everyday objects (like a penny) to show how big things are. This is called a scale.

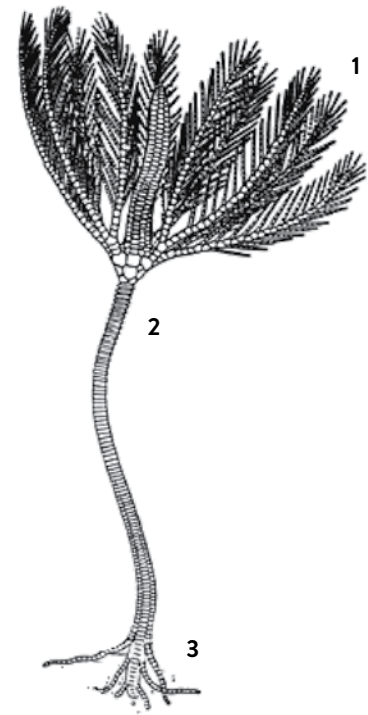


Find brachiopods at hot spots:

A, B, D, E, F, G, H, I, J, K, L, M, N, O, P

Crinoids (Sea Lilies)

- ✓ Has a stem that looks like a roll of Life Savers candies. These “life savers” are normally what paleontologists find when hunting for crinoid fossils.
- ✓ A crinoid has three parts: the stem (1), the crown (2) and the holdfast (3).
- ✓ Related to starfish, sea urchins and sand dollars.
- ✓ Crinoids are still alive today and can even swim!



Look for circles in the limestone that are smaller than your fingernail, circles with a very small five-pointed star.



The small crinoid stem resembles a Life Saver candy. Found at **B**.



A beautiful star-shaped crinoid stem. Notice how small it is compared to the penny. Found at **N**.



A group of “life savers” stacked to make the stem. Found at **J**.

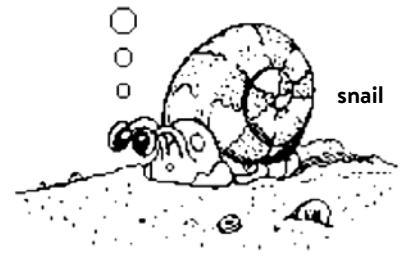
These are really hard to find! So, when you come across one, give someone a high five!



**Find crinoids at hot spots:
J, N, O**

Gastropods (Snails)

- ✓ Look like snails you would find in a creek or in your backyard.
- ✓ The snails lived and traveled in their shells that are now preserved in the stone.
- ✓ The best way to spot a gastropod is to look for their special spiral.



They are hard to find since their shells are so fragile!
Look for brown, white, orange, dark gray *spirals*.



Here you can see the gastropod's telling spiral. When you see this small black spiral in the limestone, you know you found an ancient snail. Found at **I**, look up high to find this fossil.



This cross-sectional view of a gastropod can be found at **D**.



This orange fossil sticks out of the wall and is another example of a gastropod. Found at **L**.



This cross-sectional view of a gastropod can be found at **O**.



Find gastropods at hot spots:
D, I, L, O

Bryozoans (Moss Animals)

- ✓ Actually a large group of very tiny animals that build “apartments” for their families on the ocean floor, like a coral.
- ✓ They grow their apartment into the shapes of twigs or domes.

Look for little twigs or lines.

Sometimes, bryozoans can grow to be MASSIVE, so don’t just limit yourself to the smaller ones in the limestone.



A forest of “twiggy” bryozoans. Look for the faint lines created by their bodies. Found at **P**.



This orange bryozoan colony sticks out of the wall and would be perfect for a rubbing. Found at **B**.



Here is a stem shape of a bryozoan apartment complex. Found at **N**.



This massive bryozoan is located higher up on the wall, and is perfect for seeing the “freckles.” Found at **G**.

Paleontologist



Bryozoans come in a wide range of shapes, colors and sizes. A good way to identify them is to look for their little “freckles.” These tiny dots are where the animal would stick its head outside of the apartment to catch food.



Find bryozoans at hot spots: A, B, D, E, F, G, H, I, J, K, M, O

Cephalopods (Squids)

- ✓ Related to octopi and cuttlefish.
- ✓ These creatures were predators and moved quickly by pushing water out of an opening called a siphon.
- ✓ They have a “Party Hat” where all their organs are stored!
- ✓ Cephalopods are incredibly smart. Modern day cephalopods can even solve puzzles.



We both
have cool
party hats!



Look for dark gray circles or ovals.



This is an example of a cephalopod fossil you can find in the limestone. Notice the shape and dark color. Found at **F**.



This dark gray circle is the cross-section of a squid's party hat! Found at **O**.

Why is it that you cannot find the tentacles of the cephalopods? That is because only the hard parts turn into fossils, so paleontologists must use their imagination to build the rest of the animal.

Paleontologist



When you find a cephalopod fossil, you are finding the outline of these chambers.



Find cephalopods at hot spots:
F, O

Fake Fossils (Pseudo-Fossils)

Don't be tricked by these! While they may look like an old shell or a possible fossil, these are actually fake fossils. Paleontologists call them "Pseudo-Fossils." While the ones you find on the limestone are human-made, they still are really interesting!

These fake fossils resemble clams or large brachiopods, but they are actually made by humans. These little cups were created when builders were shaping the limestone blocks for Althouse.

You may want to call this circular feature a large crinoid stem or maybe a sand dollar... but this is actually made by a human-powered drill!



**Find pseudo-fossils at hot spots:
E, F, I, O**

Geological Features



1. These large white stripes that you can see through the limestone are veins of **calcite**.
2. The crystals are also calcite. Why all the calcite? The seas in the Ordovician period were filled with **calcium carbonate**. Over time the calcium carbonate became these beautiful calcite features you can see today!
3. Occasionally, you will come across a dark block of limestone. The reason these are a different color is because they contain a higher level of organic materials compared to the gray limestone. You can flake away the layers with your hands.
4. The sparkly glitter in the limestone is called “**Fool’s Gold**.” While it may look like the precious mineral, this gold-looking substance is actually a mineral called **pyrite**. When pyrite is exposed to rain water, it goes through a process called oxidation.
5. **Oxidation** causes the pyrite to rust, leaving this orange trail down the limestone.

Find Pyrite at **A**

Find Oxidized Pyrite at **D**



Find geological features at hot spots:
G, I, M, N, O

Dear young paleontologist,

I hope you enjoyed this fossil hunt! You are now a paleontologist in training! Use your new knowledge of ancient sea creatures to transport yourself back in time when you come across strange features in the rock. Remember, always pay close attention to the details, and it is okay to be silly, passionate and excited.

Happy Fossil Hunting!



Ivy Gilbert

Paleontologist in training since age 5.

Earth sciences and English major at Dickinson College.

Did you find something cool not in this guide? Do you want more information? Email Dickinson's own paleontologist Marcus Key at key@dickinson.edu.

Websites to explore for kids AND parents:

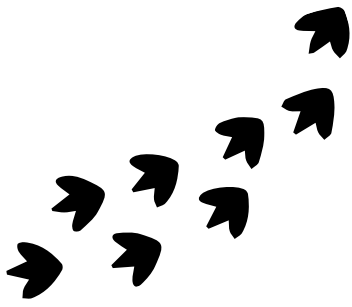
palaeos.com/paleozoic/ordovician/ordovician.htm

www.kidsdinos.com/paleontology

www.amnh.org/explore/ology/paleontology

www.parentingscience.com/dinosaurs-for-kids.html

www.youtube.com/watch?v=1FjyKmpmQzc



Junior Paleontologist Field Log

Name _____ Age _____ Date _____



Trilobites: _____

Brachiopods: _____

Gastropods: _____

Cephalopods: _____

Bryozoans: _____



Did you see anything strange? What did it look like?

What was your favorite part of the day?

What did the fossils remind you of?

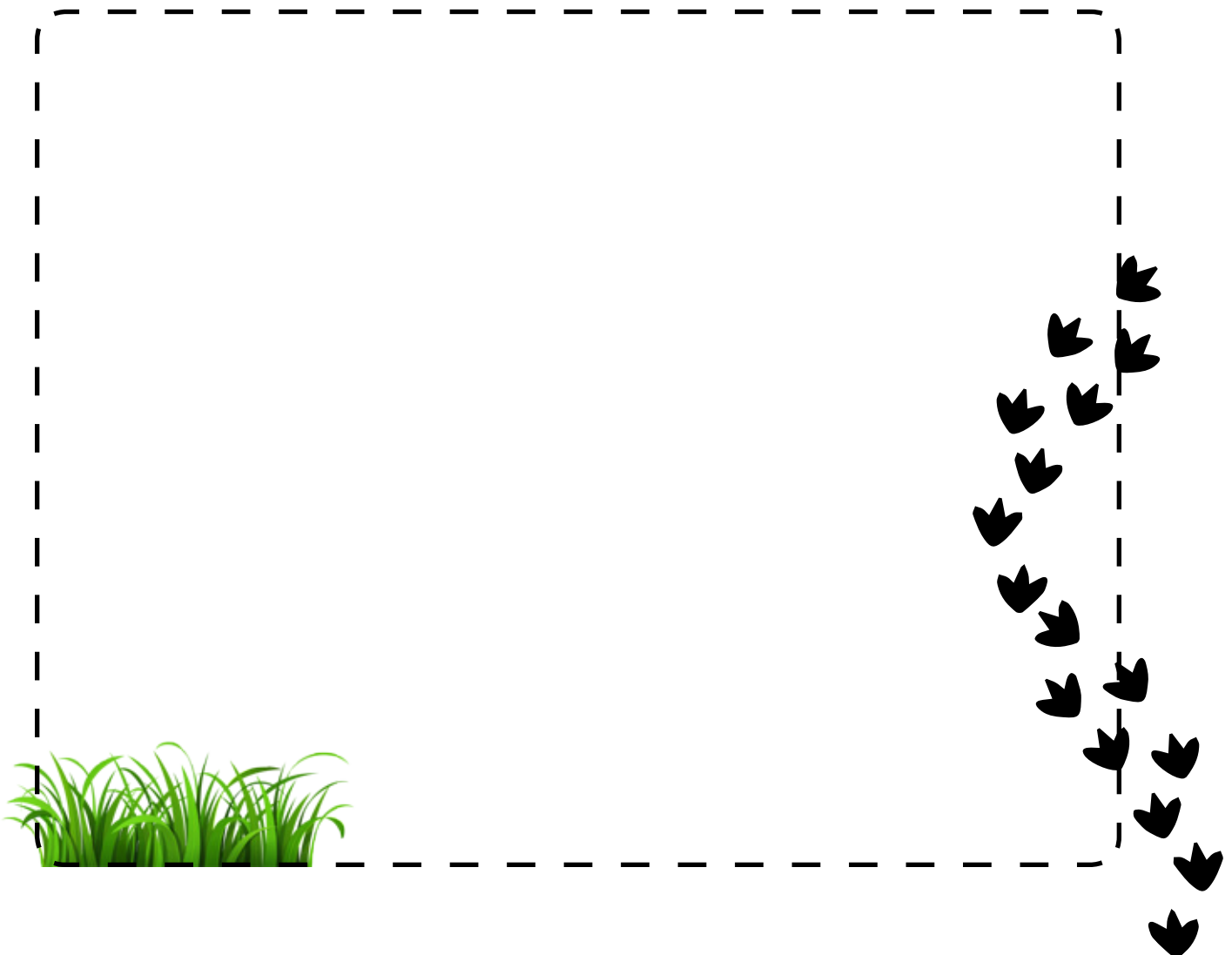
While I was exploring I learned...

1: _____

2: _____

3: _____

Draw your favorite fossil and its habitat. What is it?



FOSSIL FIND

H L B O S L E R A X L L G O A
E L S I L R A C L I I I B C E
R F Z D L Y S R C L E S R E S
S V L L I Q B N Y T G S Y A A
O D E B U C E B I E C O O N S
X H O I D P K B A A L F Z M E
S D D P U I O I L G A L O K N
T S I G O L O T N O E L A P O
P E N N I I H N Q S D R N W B
N I A R O O H N I U O K W T K
E D T V U J B C M R A N D K E
S L M S I Q M Z A A C R K V E
I E E L I A N S H R F Q R Y H
L I M E S T O N E U B K B Y C
T F P Y V M S V U R O C K E K

ALTHOUSE

BOSLER

BRACHIOPODS

BRYOZOAN

CARLISLE

CHEEKBONES

CRINOID

DICKINSON

DINO

FIELD

FOSSIL

GABBY

LILY

LIMESTONE

MUD

OCEAN

PALEONTOLOGIST

PEN

PENCIL

QUARRY

RAIN

ROCK

SEA

SHELL

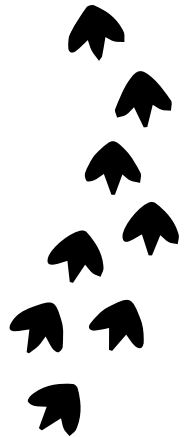
SILT

SNAIL

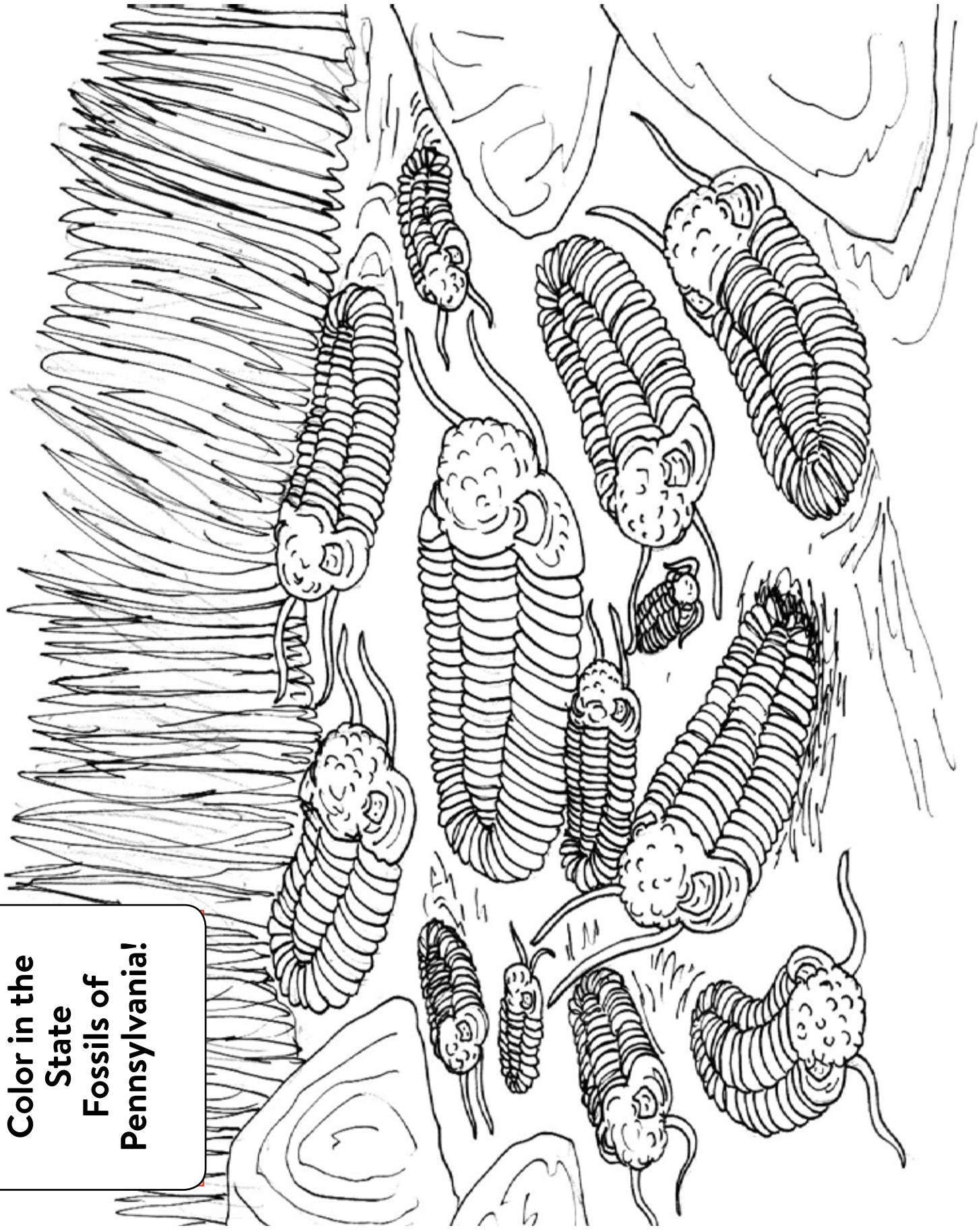
SQUID

TRILOBITE

WALL



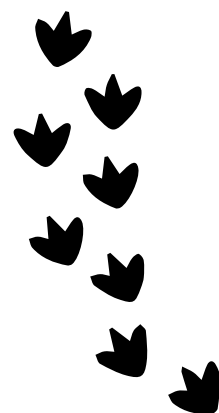
**Color in the
State
Fossils of
Pennsylvania!**



A solid black circle containing white text.

Share photos
from your fossil
hunt with us at
[admissions@
dickinson.edu!](mailto:admissions@dickinson.edu)

Use the space below to do a rubbing of the fossils on the Dickinson limestone! Place the paper against the fossil on the limestone and rub the edge of the pencil over the paper.





The facts about Dickinson.

Dickinson is a premier four-year residential liberal-arts institution chartered in 1783 and widely recognized as a leader in sustainability and global education. We prepare our graduates to face the world's challenges so they are always equipped and eager to collaborate with others to make an impact.

CAMPUS & FACILITIES

- 144-acre campus in Carlisle, Pa.
- 61 general and special-interest housing facilities
- 5 LEED-gold-certified buildings
- 180-acre College Farm with 50 acres producing more than 100,000 pounds of USDA-certified organic produce annually

ACADEMIC FEATURES

- 9:1 student-faculty ratio
- 15 student average class size
- 43 majors plus minors, certificate programs, independent research
- Army ROTC
- Pre-professional programs and articulation agreements in business, engineering, health and law

ENROLLMENT

- 2,300 full-time students
- 44 states and territories plus the District of Columbia and 46 foreign countries

AID

- \$45.9 million in grants awarded in '15-'16
- 75% of students receive merit or need-based aid

ADMISSION & AID DEADLINES

- Early Decision I – Nov. 15
- Early Action – Dec. 1
- Early Decision II – Jan. 15
- Regular Decision – Feb. 1



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