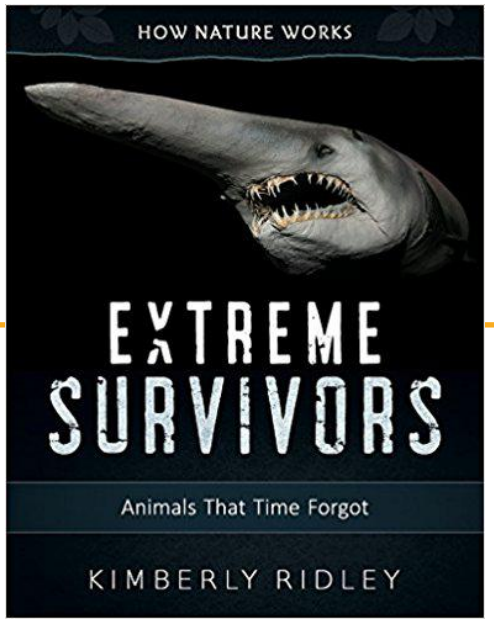
EXPLORE MORE BOOK GUIDE



Activities, tools & resources for learning with this book!

Meet the author

Kim Ridley is a science writer, editor, and author of the picture books The Secret Pool and The Secret Bay. Her passion is sharing her love of nature and writing with children and adults. A Maine native whose roots go back many generations, Kimberly is an avid birder and naturalist who loves exploring wetlands, beaches, woods, and other wild places around her home. She never leaves home without her binoculars and hand lens, green rubber boots, and a notebook.

Ask Kim

What are your favorite extreme survivors?

The four ancient creatures that live in Maine: horseshoe crabs,tardigrades, comb jellies, and sponges. If I had to pick one, it would be the tardigrade, also called the water bear or moss piglet. Tardigrades live on every continent in thin films of water on moss and lichen, and in oceans, lakes, and ponds. If a tardigrade's moss clump dries up, it goes into a dormant form called a tun."Tardigrade tuns can survive droughts, as well as being boiled, frozen, or sent into space without a spacesuit! Not only are tardigrades tough, they're cute. They look like chubby bears with no ears and eight legs. And they live right here in Maine. A few years ago, a scientist at Unity College discovered a new tardigrade species on a Maine island!

EXPLORE MORE BOOK GUIDE

LET'S BEGIN!

BEFORE READING THE BOOK

Use the Visual Thinking Strategy (VTS) questions below to orient readers, and to help guide a group discussion. Begin by taking a quiet moment to look closely at the book jacket, allowing time for observation and contemplation of the images.

- *What is going on in this picture?*
- *What do you see that makes you say that? (provide evidence)*
- *What more can we find?*

Watch this **VIDEO** for a quick VTS demo

HAVE QUESTIONS?

Please contact Alison Johnson at Island Readers & Writers, 207-460-6828 or ajohnson@islandreadersandwriters.org.

LET'S TALK! *Discussion Questions*

Why do estuaries form?

How does winter ice disturb an estuary?

Isn't mummichog a great name for a fish? If you discovered a new species of fish in your local waterway, what would you name it - and why?

How does trash affect the animals in an estuary?

STANDARDS

Covered throughout this Explore More Book Guide:

SL.1. Prepare for and participate in conversations across a range of topics, types, and forums, building on others' ideas and expressing their own.

SL.2. Integrate and evaluate information presented in diverse media and formats, including point of view, reasoning, and use of evidence and rhetoric.

SL.3 Present information and supporting evidence appropriate to task, purpose, and audience so listeners can follow the line of reasoning and incorporate multimedia when appropriate.

R.4. Read various texts closely to determine what each text explicitly says and to make logical inferences; cite specific textual evidence to support conclusions drawn from the texts.

R.5 Provide an accurate summary of various texts; determine the central idea(s) or theme(s) and analyze its development throughout each text.

R.6. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

R.8 Analyze the structure of various texts, including how the features and components relate to each other and the whole.

R.9. Assess how perspective or purpose shapes the content and style of various texts.

A2 Literary Texts- Students read fiction, nonfiction, drama, and poetry,within a grade appropriate span of text complexity.

Life Science

LET'S TALK CONTINUED

1. How would changes on a macro level impact plants and animals on a micro level? How are extreme survivors living links to the prehistoric past?

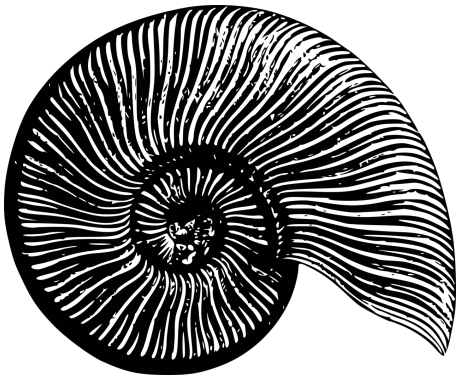
2. Which extreme survivors can be found in your region?

3. What is natural selection, and how does it work? How can humans impact the natural selection of other species?

4. Out of the numerous extreme survivors that Kim explores in her book, which is your favorite? Why?

5. What are some examples of species that haven't survived the test of time? What do you think might have led to their extinction?

6. What are some of the extreme survivors' survival secrets?



LET'S CREATE (AND DO)! Book-Inspired Art

Make a glacial model

Science: Collect different kinds of rocks and create an exhibit. Make sure you don't remove any rocks from any conservation areas. Research what kinds of rocks you've found, and write its name and identifying characteristics on an index card.

Literary: Write point-of-view stories from the perspectives of three different extreme survivors.

Historical: Make a Geographic Timescale to show just how much time has gone by since the first land plants, the first sharks, and more!

Social/Citizen: Write an opinion piece about whether you believe climate change will affect humans and other species, and if you think people should work to reduce human impact. Is there scientific evidence that strengthens your opinion?

Art: Write a comic strip featuring your favorite Extreme Survivor. What challenges do they face? How do they overcome them?

Hunt for tardigrades and observe them in the classroom!

Collect small clumps of moss and lichen and place them in bags or envelopes labeled with where they were gathered - i.e. from boulder, tree, bog, etc).

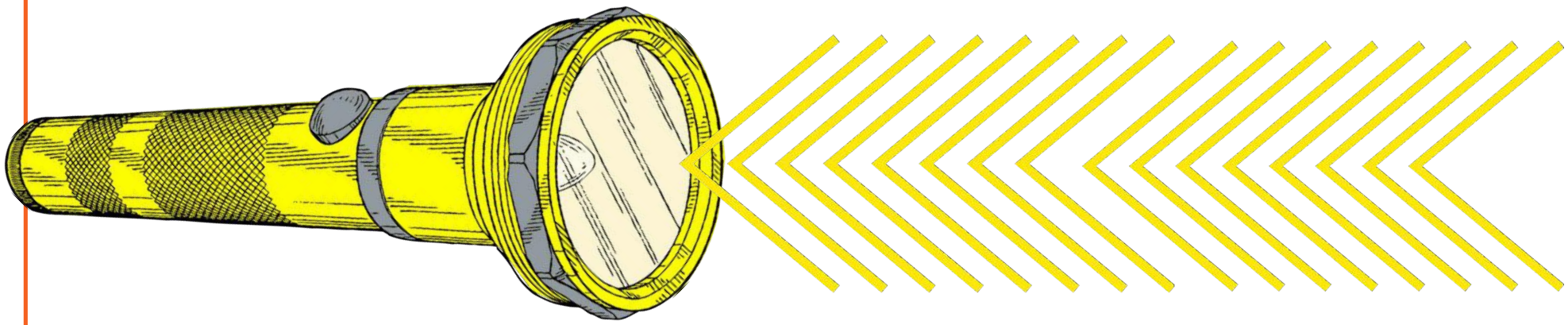
Soak the moss clumps in distilled water or bottled spring water overnight. Do not use tap water, which contains chlorine that could kill tardigrades.

Swish the moss around and pour the soaking water into a petri dish.

Place the petri dish on a piece of black paper under a dissecting microscope.

Shine a flashlight sideways across the dish.

Tardigrades and other organisms will glow against the black background.



The *Macro View* – the Ice Ages that have shaped our world and the *Micro View* – what we can still find today in our own backyard

Consider the Macro View - Ice Ages and Their Affects on the Landscape

Surficial Geologic History of Maine

Glacial Map of Maine

Downeast Ice Age Trail. Via that link, download an IOS app for offline use

Be a geological Private Eye / Indiana Jones!

Visit these local points on the Downeast Ice Age Trail map:
30, 33, 36, 37, 38, 39, 40, 41

When you visit those sites:

What do you notice?
Similarities and differences between rocks, landscapes, plants?
Can you tell what characteristics of the Ice Age timeline each site exhibits?
What impact has the ice age had on that site or your region? Agriculture, shoreline, temperature etc?

Consider the Micro View - The Organisms that have survived Macro Changes

Enter the Extreme Survivors! In the book, Kimberly reveals the secrets of ten strange extreme survivor creatures, including: goblin shark, sponge, comb jelly, horseshoe crab, tardigrade, tuatara, tadpole shrimp, lungfish, velvet worm, and chambered nautilus.

What do you know about these incredible species and their survival? How do they survive an ice age? Or the vacuum of space?

LET'S DIVE DEEPER! Explore More

Earth's age

Glacial Periods in Earth's History

Explore the wonderful world of glaciers! Rock Paper Glacier!

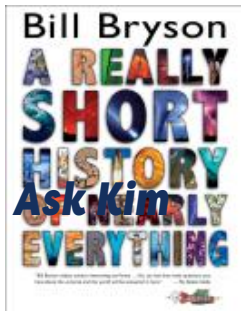
Info on glaciers and ice sheets

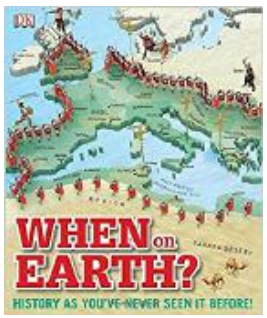
Watch this video to learn more about Extreme Survivors

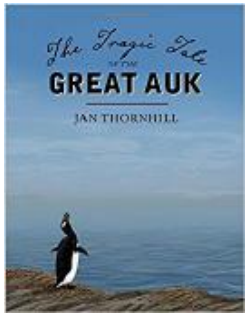
Meet the Tardigrade.

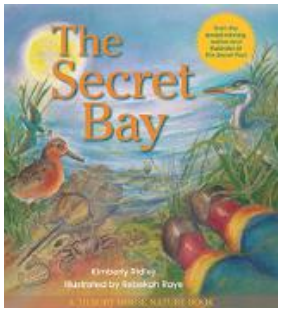
Meet the Goblin Shark.

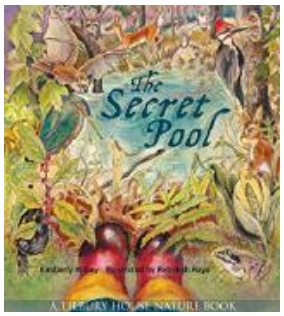
LET'S READ MORE! Text to Text Connections

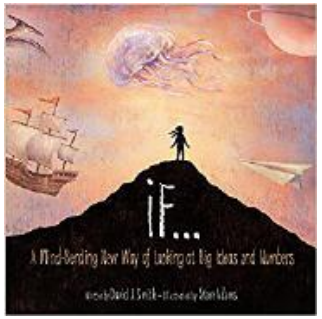












Ask Kim

Have you had a close encounter with any of the extreme survivors in your book? I had a close encounter with an extreme survivor a few years ago when I was swimming in Penobscot Bay. Clear, oval creatures shimmering with bands of rainbow colors drifted in the water all around me. Each was about the size of a walnut. At first I was worried that they were jellyfish, or sea jellies, and that I would get stung, but I didn't. A biologist friend staying on the island told me they were comb jellies, and that they don't sting. I became fascinated with them, but didn't know they would star in one of my books or that scientists would go on to discover that comb jellies can grow new brains