

100

THIS  
AMAZING  
PLANET

BY SARAH NELSON

# 100 QUESTIONS

NOV 2019

When we think of hibernation we seem to fall into a story book image of hot chocolates, a warm blanket, and a fire in the fireplace while watching the snow fall.

While this is a beautiful adaptation of what 'surviving winter' can mean for humanity, hibernation means something very different for animals!

Hibernation is a survival technique for small species around the world to survive the extreme weather conditions. This survival mechanism is not just for winter! Some species hibernate to survive droughts and famines. Some will also use it as a form of protection. If a predator is near, they can slip into hibernation to be undetected!

True hibernators will slow their heart rate and metabolism to the point where they are barely recognizable. Their body temperatures will even resemble the actual outdoor winter temperatures around them. If you checked their pulse you would have to pay close attention and be patient or you would mistake them for being dead!

# HI BE R N A T I O N



# HIBERNATION

Hibernation is such an extreme accomplishment and requires so much energy, that many animals are too big to make it worth their while.

To come out of hibernation, species need lots of time and stored energy to regain their regular vital signs.

That is why hibernators are typically small warm blooded animals!

Because it is so taxing on the animals body, not all animals survive hibernation. For some, if the winter is too long or extreme their energy reserves won't last and they will not revive.

Many animals have been mistakenly associated with hibernation, like bears! Though they go into a deep sleep, what they actually experience is called Torpor.

Their body temperature and metabolism slow slightly, but not to the extreme extent that true hibernators do!



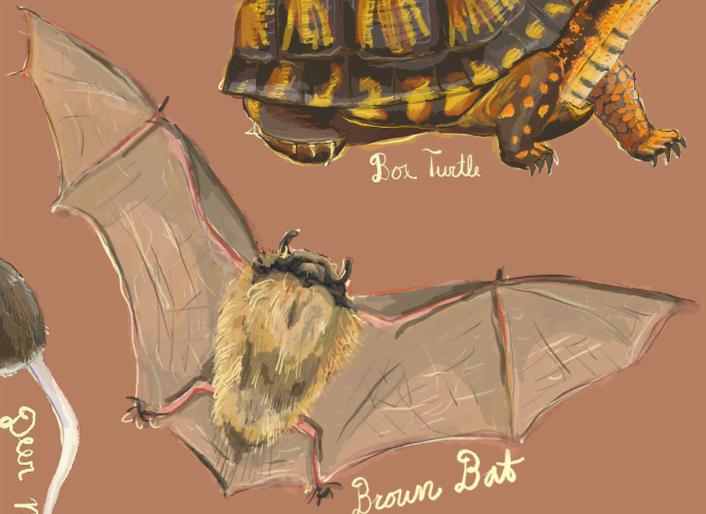
Chipmunk



Box Turtle



Deer Mouse



Brown Bat



Bumble Bee



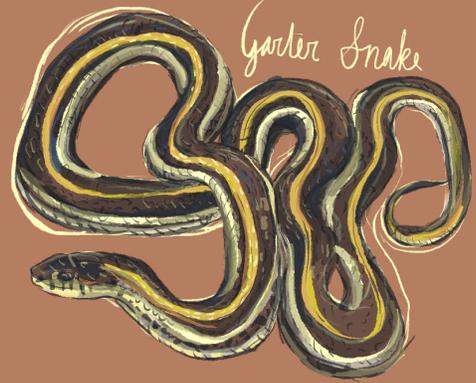
Wood Frog



Snail



Dwarf Lemur



Garden Snake



Common Poorwill



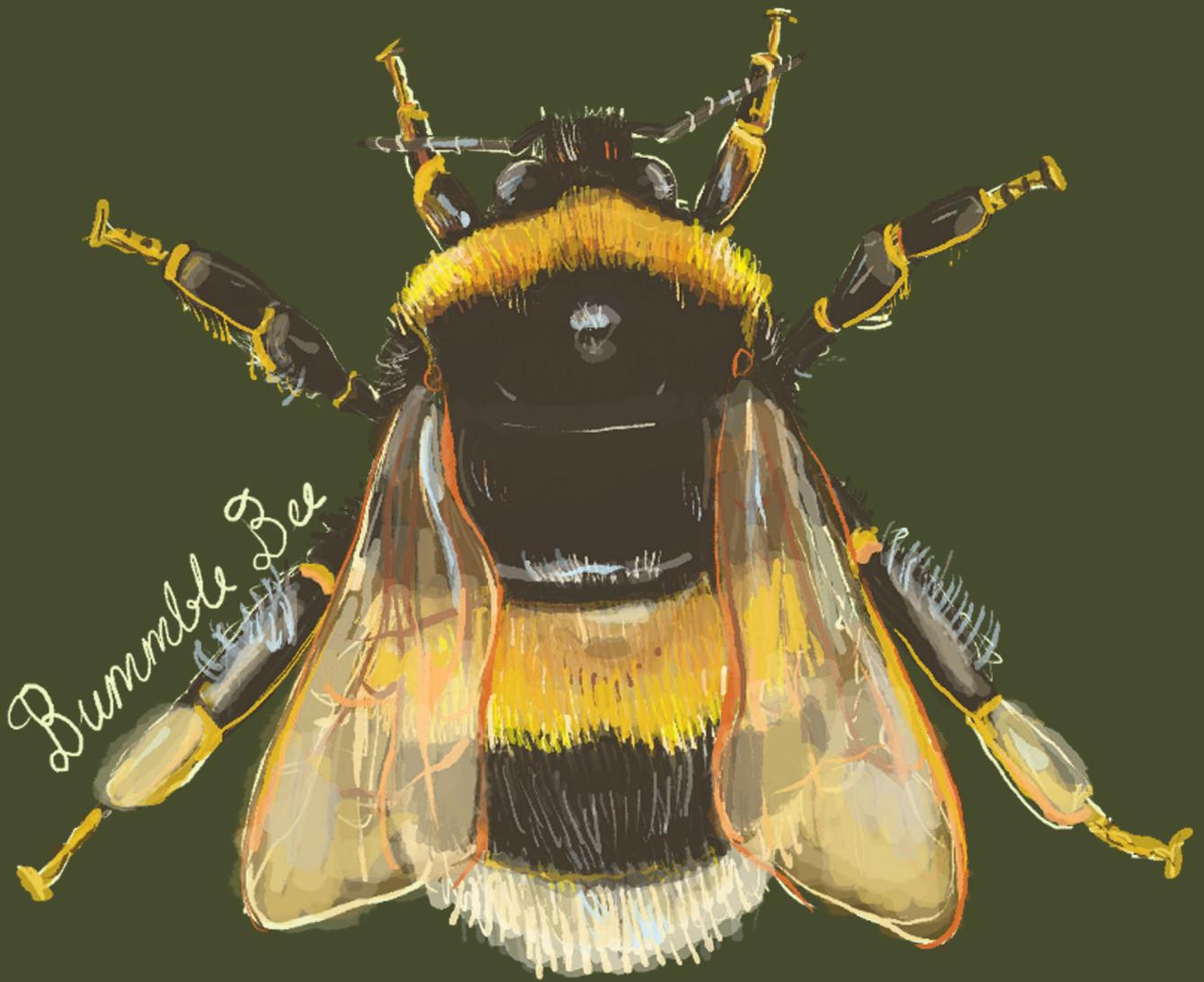
Marmot



Hedgehog

# WILDLIFE BINGO





Some insects hibernate too! Bumblebee Queens, Ladybugs, and Red Admiral Butterflies are a few of the insects that survive winter with hibernation!



Skunk



Squirrel



Raccoon



Polar Bear



Humming Bird



Black Bear



Grizzly Bear

# TORPOR

Torpor can be a sleep that lasts weeks, even months! Animals that slip into a state of Torpor will get up to eat, and some even give birth and care for their young during the winter!

It still allows the species to conserve energy during a long harsh season, but it does not change the way their body functions over all.

Their body temperature and heart rate do not lower dramatically.

Hummingbirds cycle into this form of energy conservation every day! They have an extremely high metabolism, so when it is time for them to rest, this form of deep sleep allows them to conserve their few remaining calories and begin their activity again after resting.

# DENNING

Denning is another form of animal survival during harsh winter conditions.

Bears are the most well known for this behavior!

The difference between hibernation and denning, is that the bear will actually lose MORE body mass than a true hibernator would, but these animals do not stay asleep, or lower their body temperature or heart rate.

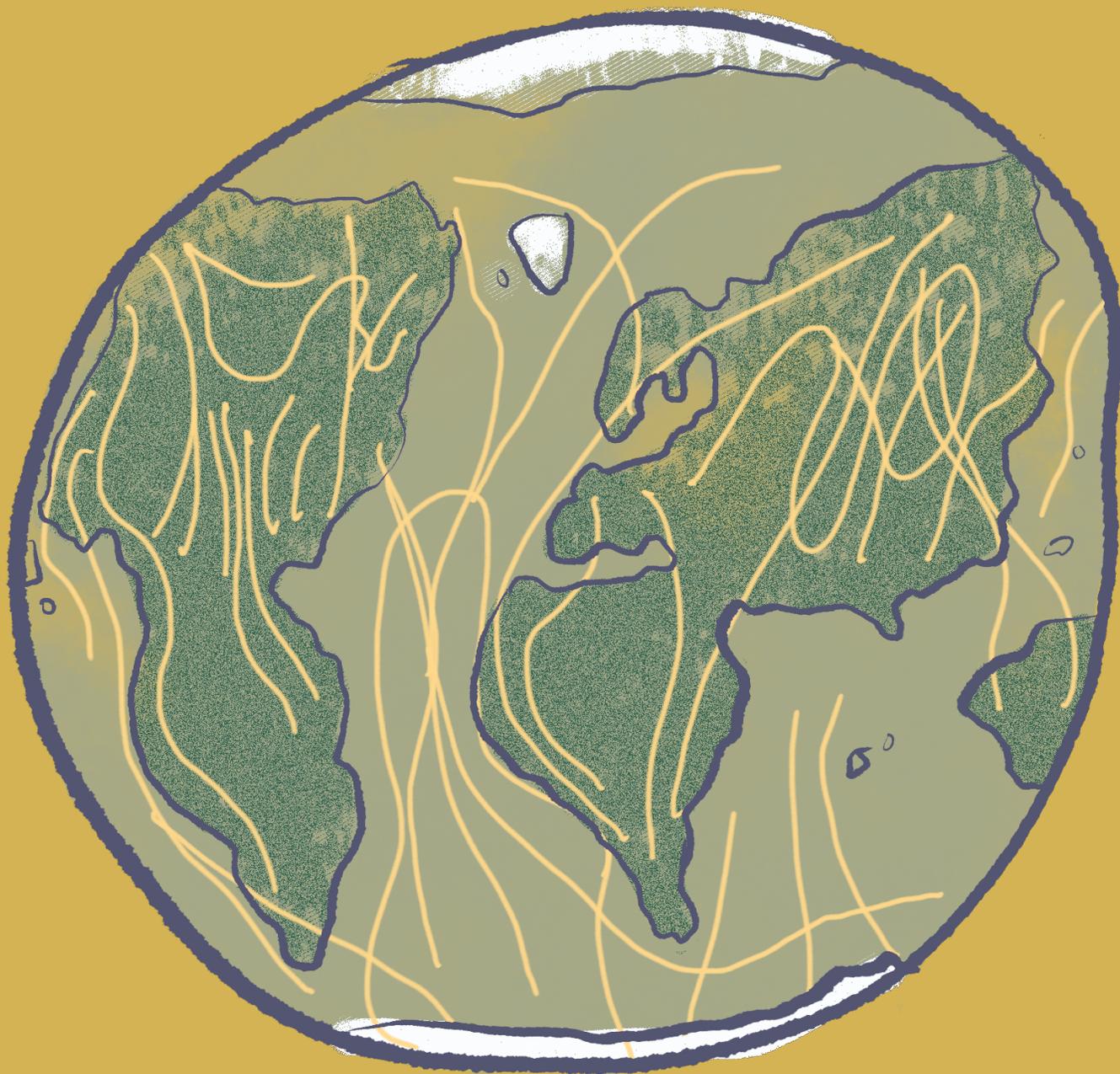
To prepare for denning they stock up on food and generate a fat reserve to help them survive the winter. Bears are busy in their denning grogginess giving birth and raising young cubs!



*Black Bear*

*Grizzly Bear*

*Polar Bear*



# MIGRATION MAP



If you cannot adapt, hibernate, or slip into a state of torpor, migration is your only alternative for survival: find someplace warmer.

That is not the only reason animals migrate, but it is a big one.

Some of the most well known migratory species are birds, whales, and monarch butterflies.

More on migration in a future edition!

# MIGRATION



Adaptation is also a form of seasonal survival!  
You will find adaptive behaviors primarily in the Northern Hemisphere!

Animals will grow a second coat of fur or grow extra fur to survive extremely cold temperatures.

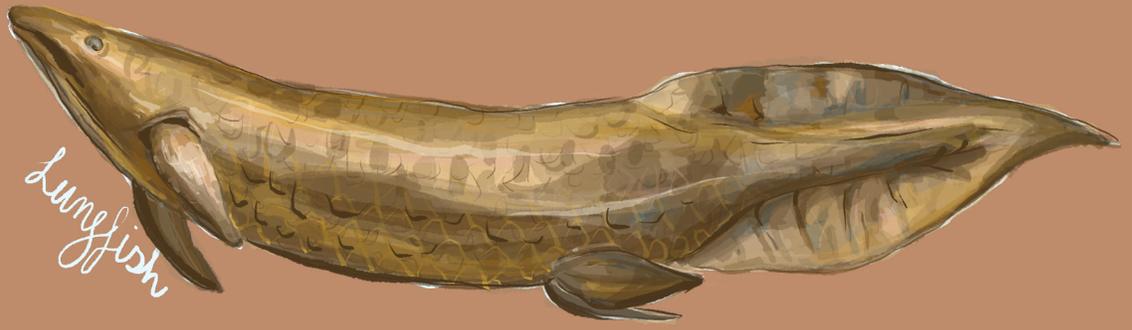
Some, like the snowshoe hare, will even grow a white fur to blend in with the snow and shed it for a darker fur in the summer months.

There are many forms of adaptation, and it is pretty remarkable to witness how complex and instinctual our world can be.



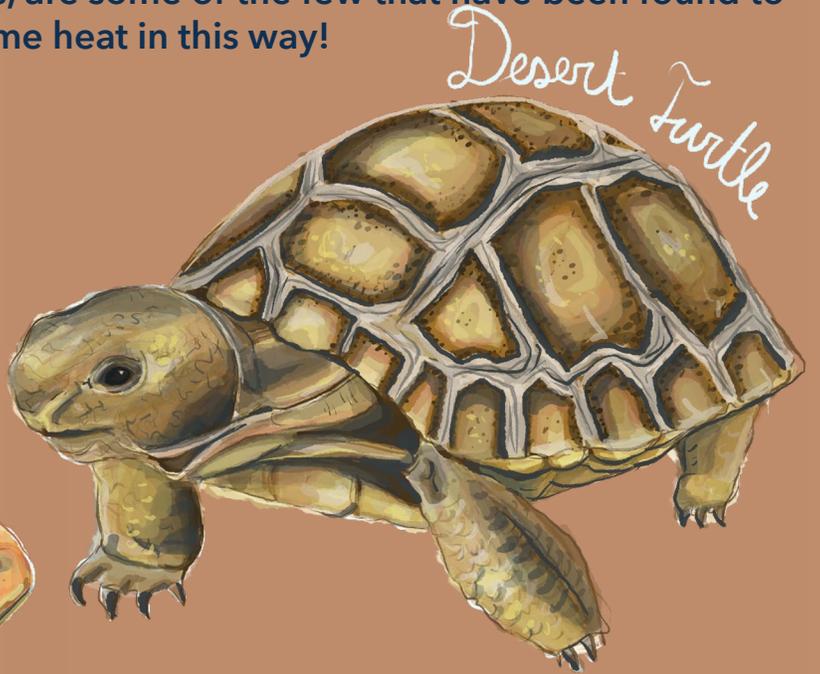
# ADAPTATION

# AESTIVATION



*Lungfish*

Aestivation is the warm weather version of hibernation. Crocodiles, Desert Turtles, Lungfish, Spotted Salamanders, Western Swamp Turtles, Cane Toads, and California Red Legged Frogs, are some of the few that have been found to survive extreme heat in this way!



*Desert Turtle*



*Cane Toad*



*Spotted Salamander*

# WORKS CITED

Barcus, Christy Ullrich. "Before and After: See Animals Change Their Coats for Winter." National Geographic, National Geographic, 6 Feb. 2016, [www.nationalgeographic.com/news/2016/02/160206-animals-arctic-winter-science-coats-seasons/#targetText=During%20winter%2C%20Arctic%20foxes%20grow,which%20act%20as%20insulating%20snowshoes.](http://www.nationalgeographic.com/news/2016/02/160206-animals-arctic-winter-science-coats-seasons/#targetText=During%20winter%2C%20Arctic%20foxes%20grow,which%20act%20as%20insulating%20snowshoes.)

The Editors of Encyclopaedia Britannica. "Torpor." Encyclopædia Britannica, Encyclopædia Britannica, Inc., 15 Nov. 2018, [www.britannica.com/science/torpor](http://www.britannica.com/science/torpor).

"Hibernation." Edited by The Editors of Encyclopaedia Britannica, Encyclopædia Britannica, Encyclopædia Britannica, Inc., 12 Feb. 2019, [www.britannica.com/science/hibernation](http://www.britannica.com/science/hibernation).

"How Do Animals Survive the Winter? Hibernation, Migration and Adaptation." Animals in Winter - Hibernation, Migration and Adaptation, Science Made Simple, 2019, [www.sciencemadesimple.com/animals.html](http://www.sciencemadesimple.com/animals.html).

Mayer, William Vernon. "Dormancy, Hibernation, and Estivation in Warm-Blooded Vertebrates." Encyclopædia Britannica, Encyclopædia Britannica, Inc., 17 May 2016, [www.britannica.com/science/dormancy/Dormancy-hibernation-and-estivation-in-warm-blooded-vertebrates#ref497387](http://www.britannica.com/science/dormancy/Dormancy-hibernation-and-estivation-in-warm-blooded-vertebrates#ref497387).

Price, Jo. "What Is Hibernation?" Discover Wildlife, Immediate Media Company Limited, 2019, [www.discoverwildlife.com/animal-facts/what-is-hibernation/](http://www.discoverwildlife.com/animal-facts/what-is-hibernation/).

Sartore, Joel, et al. "Some Animals Don't Actually Sleep for the Winter, and Other Surprises About Hibernation." Animals Don't Actually Sleep for the Winter and Other Surprises About the Science of Hibernation, National Geographic, 14 Oct. 2017, [www.nationalgeographic.com/news/2017/10/animals-hibernation-science-nature-biology-sleep/](http://www.nationalgeographic.com/news/2017/10/animals-hibernation-science-nature-biology-sleep/).

Biel, Mark J., and Kerry A Gunther. "Denning and Hibernation Behavior." National Parks Service, U.S. Department of the Interior, Mar. 2006, [www.nps.gov/yell/learn/nature/denning.htm](http://www.nps.gov/yell/learn/nature/denning.htm).

THIS  
AMAZING  
PLANET

# HOW BEEF ON NEAR

ILLUSTRATED, WRITTEN,  
RESEARCHED, AND DESIGNED  
BY SARAH NELSON