



**Transcript for *Grandmother Fish* written by Jonathan Tweet (Feiwel and Friends, an imprint of Macmillan)**

**Introduction (approximately 0:00 – 3:35)**

Hi everyone! It's Colleen from the KU Natural History Museum, and I'm so excited for today's Story Book Science where we'll be reading *Grandmother Fish*. Before we start reading the book, though, I do want to wait for more people to join us.

So while we wait, I want to go over one of the words that I talked about yesterday; one of the words that we'll be talking a lot about today as we read this book. And that word is variation. So variation. What that is, is it's the differences between traits or features of members of the same species. So humans, traits that we have, they include things like eye color, hair color, height. And the traits vary between one human and another. So for example, you probably have eyes just like I do. And even though you have those eyes, and we have that same trait. We have that same feature. They're probably a different color than my eyes. Same with hair. You probably have hair growing from the top of your head, but the hair is probably a different color than mine. Also you might have more hair or less hair. So variation is just the differences between traits or features in members of the same species. And the variation, that's good! It's exciting! Those differences are things that should be celebrated.

Alright. So I think I've given enough time for other people to join us. So let's go ahead and get started.

First, we are going to go over the guidelines and expectations for Story Book Science. Even though we are not in the museum, we are going to follow museum rules. So what that means is that you need to be kind and considerate and make sure that this virtual space is a welcoming environment. So if you write questions or you write comments, make sure that your words are kind and considerate. Also if you respond to questions or comments, I ask that you make sure your words are kind and considerate too. Again, we want to make sure that this is a welcoming environment and that everyone feels included.

Now today's story is *Grandmother Fish*. It's written by Jonathan Tweet and illustrated by Karen Lewis, and we'll be reading it with permission from Feiwel and Friends, which is an imprint of Macmillan. So thank you so much to Feiwel and Friends for the permission to read this book. I really like this book because it helps me understand how all things are related to one another. And it also helps me understand how to use a special tool – a phylogeny tree. Now I have an example of a phylogeny tree on the wall behind me, and we'll talk a little bit more about it later, after the reading. But I do want to let you know this phylogeny tree is going to help us understand those relationships, those evolutionary relationships between living things.

The last thing that I want to say is that if you need a partial transcript of this reading, it will be available on the museum's website later today, and you can find a link to that on our Facebook page in the description for this video.

So let's get started.

*Grandmother Fish.*

## Reading from *Grandmother Fish* (approximately 3:36 – 7:54)

*Grandmother Fish includes copyrighted materials, and we do not have permission to include the written text of the book in this transcript.*

## Conclusion (approximately 7:55 – 19:53)

The end.

Man, I love that story so much. I really enjoy it because it helps me understand how humans are related to all living things.

So one of the words that we've been talking a lot about is variation. Earlier today, and even yesterday, I talked about variation in humans, and how differences and traits or features of humans, those things make us unique. And those things should be celebrated. Now we can look at variation in humans, and we can also look at variation in other animals. So I have a couple of specimens I want to share with you today. I have house sparrows. I have cotton rats. And I have bluegills, which are a ray-finned fish. And we're going to look at those specimens, and we're going to make observations about variation in those specimens, specifically features of the specimens.

So first we're going to look at house sparrows. Let me just grab them. Alright. So I have two house sparrows, and I've put them in front of the camera. And these house sparrows, they are male house sparrows. The reason I know that is because male house sparrows, unlike females, have a black patch of feathers underneath their head. And you can see that in these specimens right here. Now male house sparrows, like I said, have this black patch of feathers. That is the trait or the feature that we're looking at, and we're going to make observations about the variation in this trait between these two house sparrows. So this one right here, I'm going to put it a little closer to the camera. There is its black patch of feathers. So make note of what you observe. And here's the other house sparrow, a little closer to the camera. Now when I look at these two house sparrows, I notice a lot of variation. So this house sparrow, I'm going to put it closer to the camera, it has more black feathers than the other one. So variation in this feature that both of these hou-, house sparrows have exist. This one has more black feathers. And this one has less black feathers. So there's variation between the two house sparrows. So I'm going to put this down. And I'm going to grab our next specimens that we're going to look at.

We are now going to look at cotton rats. Cotton rats, they are mammals. So they have fur or hair. Whichever word you want to use. And when you first see the cotton rats, you're going to notice that their fur kind of just looks brown. But we're going to make observations, and we're going to look for variation in the fur. So let me grab those specimens. Alright. Now these are two cotton rats. I'm going to try my best for both of them to be in the camera, but it may not work very well. Now these cotton rats, like I said, you can see their fur. And by first glance it probably just looks brown, but take some time and make an observation. What do you notice? Are there differences between the fur of the two cotton rats? I noticed some differences. This one at the bottom, it looks like it has more speckles of white and gray fur than the one on the top. Do you notice that? Now I'm going to put these down. But what we did when we looked at the cotton rats, is that we were looking at variation in the fur. So we were looking at differences in that trait that both cotton rats share.

Now the last specimen that I have to show you are two bluegills, and those are ray-finned fish. I'm going to do exactly what I've done before. I'm going to hold both of them up to the camera, and I want you to make observations. I want you to look at the bluegill fish, and I want you to observe variation. I want you to do is, observe differences between those two specimens. So I'm just grabbing them. One moment please. Alright. So

let me move my fingers just a little bit. So here is the first specimen, and below is the second. So these are both bluegills. And when I look at these specimens, and I look at the features or the traits that they have, one thing that I notice, and one thing I observe is that this bluegill is much bigger than the other bluegill. So there's a difference in size. Also I noticed that they both have fins on their back. Do you see those fins? They look pretty similar, but they're not perfectly identical. So there is a variation in the bluegill and that their fins on their back, they look the same, but there's variation in their shape and also their size. So I'm gonna put this down – whoops.

So variation is something that we can look at when we are examining and studying specimens from the same species. But we can also look at variation when we are looking at a phylogeny tree. So we talked a lot about these different grandmothers who lived very long time ago. So for example, Grandmother Fish. She lived a long time ago and she had many, many, many grandchildren. Now those grandchildren, they have some similarities. All of them had jaws that can chomp, but there was also variation. All of her grandchildren, they don't all look the same. They also don't look exactly the same as Grandmother Fish. So this is where the phylogeny tree is really helpful in understanding these relationships.

So the phylogeny tree. If you look right here at the top, all along the top, there are pictures – they're a little hard to see – but they're pictures of organisms that are alive right now. So we have a squirrel, a human, a bird, even have a ray-finned fish. And like I said those represent organisms that are alive right now. Now if we go all the way at the bottom of the tree, right here. This represents organisms that lived a really, really, really long time ago. So that includes Grandmother Fish who we talked about in the story. Now when we read this tree, we know that down here, this is a long, long, long time ago. But if we follow the arrow and we go up, we get closer and closer to the current time. So right now, right in this moment. And that's how we can read this tree.

So going back to Grandmother Fish. We know she lived a long, long, long time ago. You can see that based on where she is on the tree. And we also know that she had many, many, many grandchildren. So if we look where Grandmother Fish is, and we follow these branches, and we go up the tree and get closer to the current time, we'll see all of her descendants. And all of her descendants have those jaws that can chomp. So we're going to take jaws, and we're going to put it right under Grandmother Fish. Because jaws are a shared character of all of Grandmother Fish's descendants. Now, although there is a lot of variation between those descendants, they do have that shared character, that similarity of jaws that can chomp.

Now let's look at Grandmother Reptile. The shared character that all descendants of Grandmother Reptile have are four limbs. So here's Grandmother Reptile on our phylogeny tree. And we follow those branches, and we get closer to those organisms that are living right now at the moment. And we see that birds, squirrels, humans, they have four limbs. There's a lot of variation between squirrels, humans, and birds, but they have those four limbs. So that's the shared character. Now you'll also see there's a snake right there! And snakes, although they crawl on their belly, they don't have four limbs in the way that we normally think of it. They just lost them over time. Because remember, variation is a thing. So there are differences in those descendants.

Alright. Grandmother Mammal who we read about in the story. Grandmother Mammal, all of her descendants have a shared character of that they feed their babies milk. So we're going to put that right below Grandmother Mammal.

Then we have Grandmother Ape. You might remember from the story that her descendants, they have grabbing hands. So we're going to put that shared character below Grandmother Ape: grabbing hands.

And, lastly, we want to talk about Grandmother Human. In the story, Grandmother Human, she was able to walk and talk, and she's able to tell stories; but the shared character that all the descendants of Grandmother

Human have are that those descendants stand on two legs. So we're gonna put that right next to Grandmother Human.

So when we look at this phylogeny tree we can better understand evolutionary relationships and how we're all related. And we can understand the shared characters that we have with common ancestors. So I'm so glad that I got to share this with you while reading *Grandmother Fish*. I really enjoy that story, and I'm glad I got to talk with you about it.

I will be on Facebook Live next week reading another story. Next week we're going to be reading *We Are Water Protectors*. I'm really excited about this book because we've been talking a lot about how we're all related and the importance of water. But this book specifically looks at many indigenous-led movements across North America, where these movements have been fighting for and working to protect water resources and the importance of those water resources. So I hope you join me next week for *We Are Water Protectors* here on Facebook Live at 10 o'clock AM. I'll see you then! Bye!