



Transcript for *At the Mountain's Base* by Traci Sorell (Kokila, an Imprint of Penguin Random House)

Introduction (approximately 0:00 – 4:03)

Hi everyone! It's Colleen from the KU Natural History Museum, and I'm so excited for today's Story Book Science. I can't wait to read the book *At the Mountain's Base*, but I do want to wait for some folks to join us.

So while we wait, I want to talk a little bit about the book and what we'll read about today. So today, we will be reading about a Cherokee family who is waiting for the safe return of one of their family members. And that family member is a pilot. So, what does a pilot do?

Well, a pilot flies planes and other aircraft. And we'll read about a pilot who's flying a plane in this book, and we'll also read about a real-life pilot. And before we do that, though, I want you to think. What does a pilot have to pay attention to? If they're flying a plane, what are the things that they have to notice?

Maybe you think a pilot has to pay attention to weather. Yeah? I think a pilot would have to pay attention to weather. It might be hard to fly a plane if there's a really bad thunderstorm.

What about other things that fly? I mean, there are birds that fly. There are also other airplanes that are flying in the sky. So I bet a pilot would have to pay attention to those things as well.

What other things can you think of that a pilot would need to pay attention to?

Alright! So keep thinking about that, and we'll read this book and talk a little bit more about it later. But it looks like folks have joined us, so let's go ahead and get started!

First and foremost, we need to go over our museum Story Book Science guidelines. We're not in the museum, but we are still going to follow museum rules. So what that means is if you have a question or you want to write a comment, you should feel free to do so. But you need to make sure to use kind and considerate words. Alright? Also, if you want to respond to someone's question or comment, you also need to make sure to use kind and considerate words. We're not in the museum, but we do want to make sure we follow those guidelines so that we can keep this space inclusive and welcoming for all. So can you use those kind and considerate words for me? Excellent! Thank you so much!

Alright! So welcome to today's Story Book Science. Today, I will be reading the book *At the Mountain's Base*. This book is written by Traci Sorell, and it's illustrated by Weshoyot Alvitre. And it is published by Kokila, which is an imprint of Penguin Random House. So thank you to them for the permission to read this book. I'm so excited to read this book! I've mentioned already that we're going to be reading about a Cherokee family who is waiting for the safe return of a family member. So we're going to be talking about a small community. And if you remember, earlier this month, we talked about citizens and how citizens are members of communities. And communities can be small, just like the family that we'll be reading about today.

Alright. So, just a couple other things. If you have a question or a comment, please feel free to write that in the comment section. But just know I may not be able to see it immediately, and I'll only be able to answer it if

there's time at the end. Also, if you need a partial transcript of this reading, that will be made available later. And you can find that on our website. And there's a link to that in the video description.

Alright. So I think we should go ahead and get started.

At the Mountain's Base.

Reading from *At the Mountain's Base* (approximately 4:04 – 7:38)

At the Mountain's Base includes copyrighted materials, and we do not have permission to include the written text of the book in this transcript.

Author's Note (approximately 7:39 – 9:42)

The end.

Now, I do want to read the author's note. So this is something that the author, Traci Sorell, wants us to know about this book. So let's read that note together.

*The author's note at the end of *At the Mountain's Base* includes copyrighted materials, and we do not have permission to include the written text of the author's note in this transcript.*

And I'm going to let you look at that photo, that beautiful illustration. Alright.

Conclusion (approximately 9:43 – 21:32)

So, in this book, we read about a community, a very small community. And in that community, in this family, there were many different women. And they were waiting for the safe return of one of their family members, so a citizen in that small community. And that family member was a pilot. So she flew planes. And when we read the author's note, we learned about another female pilot, Ola Mildred "Millie" Rexroat.

So, in that author's note, we learned that Ola Mildred Rexroat, she was an Oglala Lakota woman and the only Native woman to serve in the Women Airforce Service Pilots, or WASPs. So she was flying planes during World War II. And she continued to fly planes after the war with her work in the Air Force.

Now, earlier I asked you all to think about what a pilot needs to pay attention to. So, think about if you were flying a plane, or think about when Ola flew planes. What were the things that she would need to pay attention to? Now, earlier we said pilots would probably have to pay attention to weather. If they're flying a plane, it might be a little hard to fly a plane in a thunderstorm. And we also talked about how pilots would have to look out for other planes and other things that are flying, like birds. So there are all these things pilots have to pay attention to.

Not only that, but they have to pay attention to the plane and make sure that the plane is flying. And to understand how planes fly, we need to talk about force. What is force?

Well, force is a push or a pull. So, I'm going to put this word on the wall. So we have force. We know it's very important to understand. And we know that force, is a push or a pull. Now, let's see an example of that.

So I'm going to use this tool to help us understand force. So, this piece of paper is the object I'm going to apply a force to. And we know a force can be a push. So I can push this object, and the paper goes away from me. Or I could pull the object, so apply a force on the object and pull it. And we see that this object, this piece of paper returns to me. Alright?

So we have a force that's a push. And we have a force that's a pull. Alright.

Now, when I was applying a force to this object, whether it was a push or a pull, what did you notice about the movement? If I push it, it goes one direction. And if I pull it, it goes another direction. So, a push or pull, they're opposite directions, or opposite movements.

Now, with that information, I want you to think for a second. What would happen if I did a push and a pull at the same time, so there were these two forces acting on this object at the same time. What do you think would happen? Well, let's find out!

So the first thing that we're going to do is we're going to see what happens if you have a really big push and a tiny pull. So if you have a really big push, it would start moving away from me. But a pull, even a little tiny one, it's not doing much. The piece of paper is still going away from me. And one way to think about what's happening is that when you have a really, really big push and a really, really small pull, these opposite movements, because the push is so much bigger, it's going to keep moving the object away from us. Because the push is bigger than the pull.

Now what if the pull is much bigger than the push? What do you think's going to happen?

So if we had a really, really big pull, what do you think would happen if there's just a little tiny push at the same time?

Well, we would take those arrows, and we would just flip them. So we have a really, really big pull that would move the object back towards me and a really small push that would move the object away from me. And because that pull is so big, the object still moves towards me even though there's that small tiny push. Alright?

Now, what if you had two forces that were opposite but equal, so the same amount of push and the same amount of pull on an object?

So, this is me pushing and pulling on the object at the same time. What do you notice? Nothing. The object isn't moving. So when you have a push and a pull, these opposite forces, but equal in their amount, what you have are two forces that cancel each other out. So the object that those forces are acting on, it doesn't move. And we call that balanced forces.

Alright. So we understand forces now. And because of that we can talk about the forces you'd need to think about when you're flying a plane. And there are four forces of flight that we'll be talking about.

So, the first force related to flight is gravity. And gravity, that is a downward force. So gravity pulls the plane down.

And then we have lift. And lift, you can think of as the opposite of gravity. Instead of a downward force like gravity, lift is an upward force that's acting on the plane.

Then we have drag. And drag acts on the plane. And it happens because the plane is moving through air. So the air is pushing against the plane, and it makes it difficult for the plane to move forward.

But we still have one more force we need to talk about and that is thrust. And thrust is a force. It's opposite of drag. And instead of pushing against the plane, it pulls the plane forward. So it's the opposite of drag.

Now, to help us visualize this a little better, we're going to put the arrows that represent those forces, the four forces of flight, on this image of a plane. So the first one we talked about is gravity. And when we look at gravity we know it's a downward force. So, gravity, it is acting on the plane, and it, pulls the plane down towards the ground. But we have lift! and lift is an upward force. So, while gravity pulls the plane down, lift pushes the plane up. Alright?

Then we have to talk about drag. So drag, impacts the plane because the plane is moving through the air. And the air pushes against the plane, and that can make it difficult for the plane to move forward. So, we have that one final force we have to talk about, which is thrust. And thrust, pushes the plane forward. So it's acting in the opposite direction of drag. And thrust, which is caused by the plane's engine, moves the plane forward. Alright?

Now, we have all of these forces acting on the plane. But what we need to remember is that in order for the plane to fly, you have to really pay attention to those forces. If you want the plane to stay up, the lift has to be greater than the force of gravity. So the lift has to be really, really big. And then if you want the plane to go forward, the thrust, or the force that's coming from the engine, has to be greater than the drag, which is that force that's pushing against the plane caused by the plane's movement in air. So you have to consider all of these things in order for the plane to fly.

Now, the one thing I want to ask you is if gravity is equal in amount to lift, knowing that they're opposite forces but thinking if they're equal, so they're the same; and drag and thrust are also the same amount, so opposite forces that are the same in their size, what would happen to the plane? Nothing.

If all of those forces, the gravity and lift, if those are opposite and equal, and drag and thrust, if those are opposite and equal; those forces are balanced, and the plane's not going to get off the ground. Alright? So these are things that pilots have to think about when they're flying a plane. Now, I'm going to put this down.

And, I want to say thank you for joining me today for Story Book Science. I had so much fun reading *At the Mountain's Base*, and also getting to talk with you all about female pilots like Ola Mildred Rexroat. And getting to talk to you all about forces and forces of flight and the things that pilots need to pay attention to was really fun. So I'm so glad you could join me.

Next week, Kestrel is going to do a STEM Challenge based on this book, so she'll have some challenges for you related to flight, and how to build a paper airplane model and test and use that to better understand these forces we talked about. And then next month, I'll be back, as well as the Public Education team, for new stories and STEM Challenges all about winter and different animals that you can find in the winter time. So I hope you join Kestrel next week, and then join all of us next month for Story Book Science. I'll see you then! Bye!