

Bryna B

SCIENCE TRANSLATOR

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Bryna B's Tips for Great Science Translation!

We have the coolest planet, but so many people haven't noticed! I want everyone to love our planet and fight for our future on it. This resource is for anyone who talks to people about nature and science, formally or not. I hope you can use these tricks to help you make science more accessible and relatable to any audience, regardless of their technical knowledge. I define Science Translation as the rendering of scientific concepts into everyday language; by translating science, instead of just communicating it, we connect with wider and more diverse audiences.

The Earth is struggling to meet the demands of humans, so we need to make some serious changes, fast! We can't afford to wait for the next generation to "save the planet." Our communications need to target adults of all backgrounds, on top of the standard kids programs. Adults are the consumers, they vote, they share information with each other, they have the power to make real change now! But so much valuable knowledge is currently locked away from average people in academic publications that they can't access, written in what often feels like another language. Science literacy is a privilege that is not made available to most people; understanding how our planet works should not be a privilege. Let's work together to share knowledge with everyone!

The Goal of Science Translation- Help facilitate the development of a deeper interest and connection between the audience and the topic

Don't get hung up on hitting all the curriculum points, changing someone's mind, or the number of facts you share. Whether I'm giving a student group a formal tour of the Monteverde Butterfly Gardens, explaining climate change to a family member, or showing a frog I spotted to a random passerby while on a hike, my goal is always the same; that they leave our interaction with more interest in learning about science and our planet. I try to build new connections between them and our planet. I don't gauge a program's success by the amount of information I shared. Almost no one you talk to is going to have a test on what you just told them, so leave the lists of facts behind, and try to make people fall in love with our incredible world. When someone leaves your program and says "I don't want to kill spiders any more" or "I want to

learn more about that” you know you created curiosity, empathy and connection in that person that didn't exist before. You changed the way they think, and hopefully, the way they interact with our planet.

Tips for Effective Translation:

1. Read your audience- *Communication is most effective when you are speaking the same language.*

Science communicators disseminate knowledge that non-scientists don't have access to. We read the journals, talk to the researchers, and then share what we learned. Communication is complicated, beyond just English or French, there is vocabulary and vernacular specific to age, education level, culture and so on. Communication is most effective when you are speaking the same language.

To effectively share knowledge, we can't just communicate science, we need to translate it. You should never do the same program twice, you need to adapt your program to the audience you have. To assess who you are working with, chat informally with the audience as you get ready to start.

Example:

Translate:

2. Use yourself as the conduit to make an initial connection

Make it seem informal, chat to people the way you would about non science topics. Familiarity dissolves the stereotypes people have about scientists. People do not always connect with the topic you are talking about, when this happens try to get them to relate to you. Frame the information in the context of a personal observation or experience.

Example:

Translate: Tarantulas are defensive because they are fragile and use urticating hairs as a defence

I had the craziest experience the other day! I answered the phone and it's my neighbour screaming at me "Bug lady, there's a tarantula in my washing machine!

So I went over to try and get the tarantula out. The washer was full of dirty laundry... And the poor Tarantula had each leg in a different hole in the washing machine barrel, it's holding on for dear life! They are really fragile and falling could rupture her abdomen. Nothing ruins your day like your butt exploding!

I'm trying to get all her legs free one by one, and every time I do, she slips it right back in a different hole! AH! It was the most frustrating experience ever- and I have a toddler!

I've been tugging on her legs, so she thinks I'm a predator and gets defensive. When tarantulas get scared they rub their hind legs, that i had just gotten free, on their abdomen and fling their butt hairs in your face. How rude is that?!

I am now half in a washing machine full of dirty laundry and have a face full of butt hairs.

When the hairs get in your skin they make you itchy. That's it. Tarantulas have never caused a human death, as long as you don't count a heart attack!

The listeners who aren't initially interested in tarantulas will hopefully connect to your personal story since it is such a novel experience. You were able to sneak in facts about tarantulas that they will remember by translating them into a compelling personal anecdote.

3. Cool the Obsession with Technical Accuracy (Mostly)

Science may depend on extreme accuracy, but translating science is not doing science, and your audience won't be doing critical experiments based on what you tell them. Letting some of the specific technical bits go, while remaining accurate, will ensure that people understand the general concept and you will be a more effective communicator. If at a party people are speaking a language you don't, usually you just stop listening, you don't ask them to translate everything they just said. Being too technical in your programs is the same, people will tune out and you will exclude part of your audience. Those who are not scientifically literate or don't understand the specific technical language will rarely ask for clarification. Find a different way to accurately explain a concept while leaving out the technical jargon. If you really want to share a fancy term, explain the concept *before* you drop the big word.

Translate: Snakes undergo Ecdysis

The snake will rub its head against something rough, like a rock to get the skin around its mouth to peel back. It'll creep forward keeping pressure on the rock until all its old skin has come off. The fancy science term for that is- ecdysis, if any of you were interested.

By describing the act of a snake shedding its skin, your entire audience understands. Often you will have people who are insecure about their lack of science literacy. By adding the technical terminology at the end instead of the beginning you avoid anyone tuning out because they don't understand.

Translate: How humans create and store Antibodies

Antibodies 101:

- 1. Your body needs to make Antibodies in order to fight off viruses.*
- 2. When you catch a virus, your body's defense systems get to work creating specialized warships made to seek and destroy that specific virus.*
- 3. When you get a vaccine, the same thing happens! The vaccine makes your body think it has caught the virus, so it gets to work making warships! You get the protection without the danger of actually catching the virus!*
- 4. A vaccine is just the blueprints of a virus! You get handed the plans to the Death star and your body's rebel force prepares to take it down!*
- 5. After your childhood vaccines, and the viruses you caught, you can have a hangar full of over a dozen different warships ready for battle!*
- 6. If you have contact with a virus for a second time, while the warships are active, and there are a lot of them, they'll destroy the virus at first contact with the body, before it settles in and starts multiplying.*

7. *It takes a lot of energy to keep producing huge numbers of each type of warship, so once the threat is gone, manufacturing slows, and the remaining fleet gets put into hangars until they may be needed again.*
8. *If in the future, you catch the same virus, or a virus you have been vaccinated against, your body can pull the warships out of the hangars and begin manufacturing. This leads to a faster response and keeps you healthier!*
9. *Sometimes your body accidentally destroys an entire fleet you had in safe keeping, this is why we need a booster!*
10. *Some viruses are really crafty and can hide in our body waiting for the manufacturing to stop and can pop back out months or even years later, when the body's guard is down.*
11. *We don't always know how well our body will respond to a future infection.*
12. *Variants happen when gradual changes in a virus's DNA accumulate to change the way it interacts with our body. The more that a virus is able to reproduce, the faster that variants are able to take over.*

By relating viruses and antibodies to Starwars you create understanding and emotional connection. You were not too technical without being inaccurate. Finding a relatable example is a great tool for sharing ideas.

4. Tell a story- Narratives are retained

Think of the first movie you ever saw in the theater, now think of your last high school science lecture. Do you remember the details of the movie better, most people do? Stories have been used to share knowledge for as long as language has existed, so why did we switch to facts and definitions? Not only are people going to remember a story, they are going to take it with them and share it with other people.

Translate: Some Dung Beetles can roll over a thousand times their body weight and males compete for feces and mates by creating a narrative about a dung beetle.

A dung beetle has a shovel shaped head because the poor guy has to shovel poop with his face. Not a little bit of poop, up to a thousand times his body weight in poop, using his face! So this guy gets to the fresh poo pile, shapes himself an incredible ball, and now has to roll through town to be judged by the neighbourhood ladies. Eventually one of the ladies says "that poo ball is perfect!" She jumps on the ball and now the poor guy is rolling 1000 times his body weight in poo and his girlfriend - up a hill!

That's when the rivaling males show up, because why would you make your own poo ball when you can steal someone else's? A male flies in and is all like "give me your poo ball and your Girlfriend!" They start fighting, and the poo ball rolls back down the hill. He goes down there, gets it and has to roll it all the way back up, with his back legs!

By telling people Dung Beetles are really strong as a narrative, the audience created a connection with the beetle and hopefully developed empathy over his struggles, instead of just hearing an impressive fact.

13. Use humour unabashedly

Laughing makes people feel good! Humor has the power to change the way people feel in a way facts can't. Jokes break down barriers, undo stereotypes, and make lasting impressions. It can also help the presenter feel more comfortable. When we get scared about talking in public or insecure about our knowledge, hearing people laugh brings our confidence up!

Translate: various facts using humor

Keel Billed Toucans have a call that sounds like a frog croaking. With a bill like that, you don't have to be a singer!

Stickbugs look like sticks- they must be the most frustrated males on the planet! They are surrounded by things that look like lovely ladies, but are actually just sticks.

Male scorpions approach females doing a little dance to woo her. If he is not smooth enough on the dance floor, she may eat him. And you thought dating was rough!

Try to come up with a funny way to make the facts more relatable to your audience.

14. Ditch the Doom and Gloom, instead Provide a Call to Action

Everyone knows the planet is screwed. People's inability to come to terms with this is a huge part of what has driven them away from nature and science. If every time you interact with a scientist, science, or nature, you are told terrible things about our future or were blamed for the current state of affairs, you are gonna avoid those interactions in the future. Focus on the goal, connect people to the planet, don't use blame as a motivator. Give them a reason to care, and a way to make change.

Translate: Turtle populations around the world are in decline in part because they are run over by cars.

The other day I got to see a new species! I was headed to work and noticed a blanding's turtle on the road, so I pulled over to check her out. It can be strange to see a turtle out of the water, but they are out a lot right now because it's egg laying season for turtles. She was trucking along trying to get back to the place she likes to lay her eggs each year. Turtles know where they are going, so just carefully moving them across the street in the direction they are headed is enough to help them on their way! She will be really frustrated if she gets chucked back in the pond- she will have to start the whole mission over again!

When it's safe, stopping to help a turtle cross the road makes you a turtle superhero! It not just helps that turtle, but all the eggs she is about to lay!

By telling a positive story instead of one where you found a dead turtle, people feel there is hope and also learn how to help turtles in the future!

After the fact:

Keep doing it. Get out there. Share our planet with everyone. Take any chance you can find to share with people. Use Social Media, tell your family a story, be "that" party guest. Don't be worried about being perfect, be relatable and authentic. We don't need another David Attenborough, we need diversity in science education to make the most impact. Everyone who

cares and knows about our planet should create representation for others to make change. That only happens if all the people who care get involved in sharing science! Be your authentic self while sharing accurate, compelling information about our planet.