



Scientific Storytelling

GSA Meeting - October 2024



Finding the story in your research

Crafting an engaging story is the foundation of science communication.

Stories are everywhere in science! You encounter stories every day.

Stories do not have to follow any particular format - they can be long or short, detailed or general.

Stories aim to tap into the emotions of the audience and elicit a response.

Why is scientific storytelling useful?

Jobs where science communication skills are important:

- Nonprofits with a science-related mission
- Government
- Industry and corporate communications
- Marketing agencies
- Education sector
- Academia
- Journalism



Hiring managers looking
for sci comm experience
in your resume

Where can we use storytelling skills?

Grant and Fellowship applications !!!!!

-> NSF-GRFP, Postdoc fellowships, etc.

Personal statements or job applications

-> For professional development opportunities (workshops, leadership, etc.)

Social Media, blogging, science writing

Advice, technology and tools

Work



Conservation scientist Aerin Jacob (right) conducts field work with a colleague in British Columbia, Canada, in 2018.

SECRETS TO WRITING A WINNING GRANT

Experienced scientists reveal how to avoid application pitfalls to submit successful proposals. By Emily Sohn

When Kylie Bell began a grant writing workshop, she often alludes to the funding success stories of others she has experienced in her career. "I say, 'I've attracted more than \$25 million in grant funding from foundations and competitive grants funded. But I've had probably twice as many rejected,'" she says. "A lot of early-career researchers feel like their applications really tough to take. But I actually think you learn so much from the rejected grants."

Granted, it's a残酷 reality for most research scientists who need to fund projects year after year. Most proposals end in rejection.

but mistakes give researchers a chance to learn how to find other opportunities, write better proposals and navigate the system. Taking advantage of the successes and failures of others can help to increase the chances of securing funds, says Bell, who runs workshops for students and postdocs at the University of British Columbia in Vancouver, Canada, and at Deakin University in Melbourne, Australia.

Do your research

Competition for grants has never been more intense. The European Commission's Horizon Europe programme, which distributes billions of euros in grants across the European Union, is the largest ever research and innovation programme, with nearly €80 billion

(US\$89 billion) in funding set aside between 2014 and 2020. It reported a 14% success rate for its first 100 calls for proposals, although the success rate for individual grants is lower, at around 10%. The US National Science Foundation (NSF) received 49,415 proposals and funded 14,472 in 2019, for a success rate of less than 30%. That's more than 10,000 rejections in a single year from the NSF alone.

Nature | Vol 577 | 2 January 2020 | 133

Freshwater Storytelling: Request for Proposals

The National Geographic Society, in partnership with the Conrad Hilton Foundation's Safe Water Initiative, invites proposals from storytellers to create and disseminate content that raises public awareness about sustainable freshwater use. This initiative seeks to illuminate global freshwater challenges, particularly in sub-Saharan Africa, North Africa, Western Asia, and the Middle East. Projects can take various forms, including photography, film, and data visualization. They should focus on issues faced by communities, such as last mile households, low-income households, women and girls, and children, in achieving equitable access to freshwater. Applications are also encouraged for projects that highlight specific solutions to these challenges, and elevate the voices of individuals, organizations and communities at the forefront.

The deadline for submission is April 22, 2025, at 11:59 p.m. ET.

LEARN MORE



Examples of telling stories: Successful GRFPs

<https://www.alexhunterlang.com/nsf-fellowship>

About a year ago, I received a stack of envelopes in the mail postmarked from Pleasantdale Elementary School in Chicago. Inside, I found letters written by fifteen curious and idealistic fifth graders. They recently discovered my conservation blog while doing an assignment for their science class and wanted to learn more about ecology, conservation, and their impact on the environment. Their letters were diverse; some included simple drawings of their favorite endangered species, while others asked thoughtful questions about coral bleaching and plastic pollution. But each wanted to know how they could make a difference.

I was once like these students. My desire to use science to solve challenges facing our environment arose from a young age, catalyzed by tidepool exploits, trips to the aquarium, and a healthy obsession with nature documentaries. The more I learned about the threats facing the biosphere, the greater my thirst for knowledge became. I reasoned that if I deeply understood the scientific drivers and underlying forces that threaten ecological systems, then maybe I could identify solutions. **This desire to develop solutions to conservation challenges continues to be my driving passion**, and has guided my choice of what to study and where to work.

As I wrote responses to the Pleasantdale fifth graders, I thought carefully about how to convey the complexities of real world science and conservation challenges, as well as the importance of working across disciplines and interests to address these issues. Most of all, I wanted to convey my sense of hope and confidence that, by working together to develop solutions grounded in sound science, we can leave the planet better than we found it. Indeed, throughout my early research career I have already seen conservation problem-solving in action.

Personal Statement: Everywhere I go, I carry a 1.5-liter Nalgene water bottle with a green cap. When I first bought this bottle in high school, it was clear-colored. Now it is scratched, cloudy, and has a fatal crack in the bottom. One half of this water bottle is adorned with hackathon swag, programming puns, and the credo of any Python programmer: *import numpy as np*. The other half of this water bottle is covered in stickers from national parks. My favorite is from Mt. Rainier National Park – it marks the day I completed a 61-mile trek after training for a year.

I want to battle climate change with code. I have had the privilege to experience natural spaces recreationally. But, this privilege comes with the obligation to preserve natural resources for posterity. As a scientist, my goals are to write research software, to link ecosystem-level remote sensing research with Earth's climate, and to inspire responsible stewardship of the planet.

My research journey began in high school as a volunteer developer at the University of Washington (UW). There, I contributed code to yodapy, a Python API for a remote ocean sensor network. I wrote code independently and coordinated development with other team members on GitHub. **Despite not knowing Python at the start of the summer, my code was presented to oceanography experts at OceanHackWeek 2018 to demonstrate yodapy**. I met plenty of researchers who began their career in one field, like engineering, before turning their attention to remote sensing via yodapy. My team members were united by a common skillset in programming that formed the basis of our research. This experience showed me that research was an exciting way to turn my interest in science into a career and that programming is a useful tool in any research role.

Examples of telling stories - written: long format

— News



CLIMATE & ENVIRONMENT

How Death Valley National Park tries to keep visitors alive amid record heat

By Noah Haggerty
Photography by Brian van der Brug

July 11, 2024 3 AM PT

↗ Share

21

Examples of telling stories - written: infographic

DR. JOHN COLEY

Research Highlight: If we can reduce human exceptionalism, we may be able to increase the rate that people engage in pro-environmental behaviors.

THE CROSSOVER BETWEEN PSYCHOLOGY AND ENVIRONMENTAL SCIENCE

Dr. Coley's work has evolved over time. His work began through basic research in human cognition, and what leads to differences in how people think. These studies lead him to apply what he was learning about cognition to how people learn science, specifically biology. This evolved into studying how people understand the environment, climate change and their place in the ecological system.

DR. COLEY LARGELY ATTRIBUTES THE IDEA OF APPLYING THEIR WORK IN BIOLOGY EDUCATION TO HOW PEOPLE LOOK AT CLIMATE CHANGE TO A GRADUATE STUDENT HE WORKED WITH IN HIS LAB

Dr. Coley feels incredibly supported by his colleagues in this interdisciplinary effort. Together, they're trying to break the boundaries of siloed science.

I LOVE WHAT I DO

Something Dr. Coley is excited to continue studying is how people perceive themselves as a part of, or apart from, nature, and how that influences their decision making and perhaps whether or not they feel compelled to take care of the natural world. This spring Dr. Coley will be teaching a new course called Environmental Psychology that is an exciting addition to both departments!

JUST KEEP TRYING

The biggest challenge has been finding the resources and financial support to do the research. Because this work does not fit into a pigeon hole, it can be frustrating when trying to find support to do this research, as much of academia is siloed. Nevertheless, Dr. Coley emphasized that he and his colleagues believe in their work and will keep trying.

OUTSIDE OF THE LAB

Dr. Coley spends much of his time outside of work rehearsing and performing in his band! He is a father to two daughters and also enjoys traveling!

NICOLE PECKHAM

MARINE BIOLOGIST AND PHD CANDIDATE

Nicole has been a part of the Kimbro lab since 2015. She started as a lab technician evaluating predation risk effects in Florida oyster reefs. She has conducted field work in salt marsh and oyster reef ecosystems.

MAJOR MILESTONES

Nicole was inspired by marine scientists at Northeastern University to pursue her degree in Marine Biology. She was exposed to field research early in her studies and was immediately motivated to pursue a career in science.

Nicole researches non-consumptive effects on predator-prey interactions in shallow marine and coastal ecosystems. In the field, she evaluated physiological responses of oysters in St. Augustine, Florida. Currently, she is researching behavioral responses of green urchins to Jonah crabs in tanks at the Marine Science Center in Nahant, MA. Northeastern University provides resources and funds for her research.

Nicole has overcome several challenges as a woman in the scientific community when working as a field technician in Florida. She values independent work and her positive relationship with her mentor, David Kimbro. She is a creative who loves to problem-solve and is motivated by small victories.

Angela Jones

MARINE BIOLOGIST
ENVIRONMENTAL EDUCATOR

Promote Accessibility

Uplift Others

Ask Questions

Drawing from her life experience into the marine sciences, Jone's recognizes the fundamental importance of creating opportunities for people of all backgrounds to engage in marine biology.

Education

While Jones did not grow up near the ocean, an early interest in zoology and access to a positive mentor guided her to Humboldt State University in Northern California where she would spend the next 10 years studying marine science. Her undergraduate and master's work focused on sea stars, throughout the Pacific Northwest. Looking at their disease die-off and spiral variations.

Imposter Syndrome

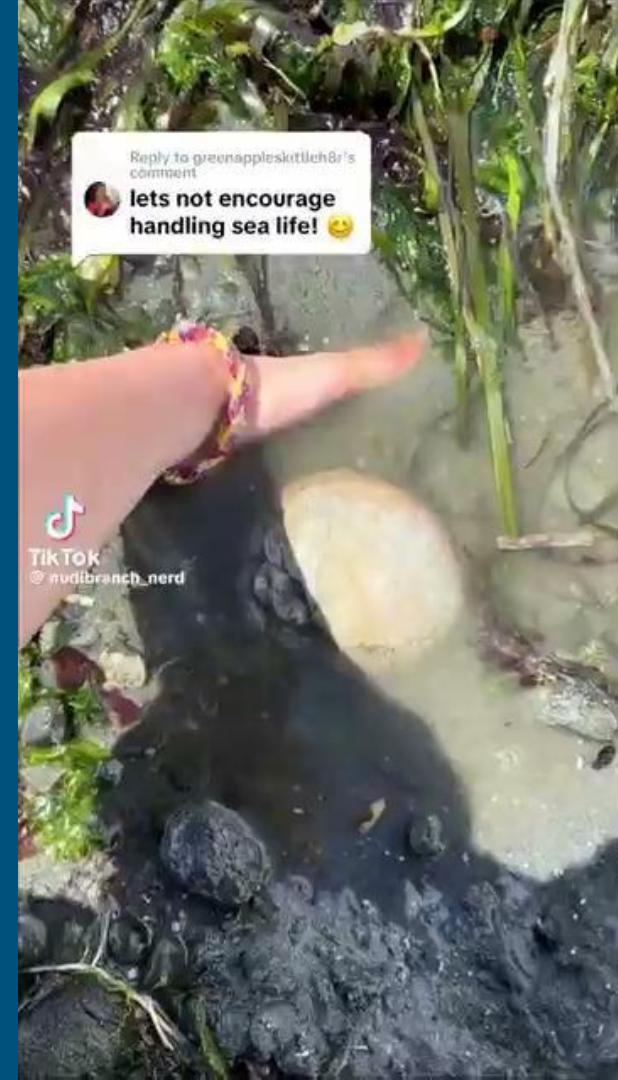
As a young Black woman in the marine science, Jones was not immune to imposter syndrome and others questioning her place in the field. Adopting resilience is a time-consuming process but is not without benefit. Moving into positions of leadership and teaching she aims to uplift the voices of those around her.

Currently, Jones is working with Helmuth Lab at Northeastern University's Marine Science Center. She is leading studies on elver grass and its benefits to the food chain. She aims to obtain her PhD and become a professor, with the hopes of providing accessibility to those in and outside the marine science field.

Angela's advice to students: "My best advice is to work hard, be kind, and have fun. You never know where these choices will lead you."

Examples of telling stories - video

<https://www.wcvb.com/article/massachusetts-robotic-mussels-may-hold-key-to-saving-new-england-shoreline/45530026>



Examples of telling stories - Instagram



This summer I was working at Block Island Maritime Institute with Meghan Purcell; Meghan and I go out frequently to collect sea star data in the intertidal here on the island! I had posted a Sea Star with Wasting Disease. Angela Jones who is a PhD Student at Northeastern University studying the micromorphology in *Asterias* species, reached out to me to ask some questions about Sea Stars on Block Island. Along with Pooja Pednekar who is a recent Northeastern Masters student who has experience in the intertidal and subtidal all over from the Indian Ocean, Caribbean, Pacific, and now the North Atlantic! She now uses all of her experience for her sea star research and education, and Jen Nilsen a PhD student in climate education of high schoolers at Harvard! The conversation about Sea Stars, education and wasting disease brought us together. I really liked something Angela said when I met her, everyone has the tools to become a scientist they just need to know how to use them!

Sea Star Research & Collaboration

Angela is now studying the micromorphology in *Asterias* species in their spines and wreath organs which are very small structures that are often overlooked along with Pooja who is also helping with this research! While doing their research Sea Star Wasting was heavily prevalent. So, they are also interested in looking into the health of the sea stars (body shape and size, color and more). There is not much research on stars on the East Coast, especially on Block Island so this is where collaboration comes in on working together to look at the differences in these stars! Jen, who is studying education specifically about the environment is helping us do some amazing work on using stars to educate and bring people together in science! Which is so awesome to get people in the community involved, we are so excited to see where all of this will go!



Marine Educator:
Jasmine S.
@prjectfin



It's so inspiring to be surrounded by very smart and influential women in STEM! I am so grateful we all got to meet and now are collaborating!

Examples of telling stories - Twitter/X

Oklahoma Department of Wildlife Conserva  @OKWildlifeDe · Jun 3 ...
we are off on sundays

Rep. Forrest Bennett @ForrestBennett · Jun 2
@OKWildlifeDept I encountered this moderately sized caterpillar near our pollinator garden. Any idea what kind of butterfly it becomes?



78 1.1K 38K 999K

Madeline Eppley @MadelineGE... · 5/30/24 ...
Spent a lovely five days in SC with family and didn't work on anything PhD-related. Being mindful about rest has made me realize how important it is for being my best self & succeeding as a grad student.



Q 22 506

← Post

jeburnes (he/him) @jeburnes ...

What are some of the cool things we saw around the Boston Harbor Islands @YourIslandPark with our baited underwater video this summer? My amazing techs have made a highlight reel! youtube.com/watch?v=v1wnLM... @StoneLivingLab @BostonHarborNow @EnvSchool

YouTube



Summer 2024 BRUV Highlights
Some of the best and most exciting moments captured on our BRUVs during the Summer 2024 season!
Witness huge fishes, giant crabs, and fights over the

Examples of telling stories - multimodal

Blog + embedded video

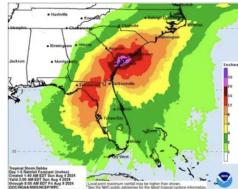
Field Stories: Coastal Resiliency in Georgia

8/26/2024

On a recent trip to Georgia, I found myself unexpectedly (and directly!) in the path of Tropical Storm Debby. The rainfall, flooding, and wind prevented me from visiting Sapelo Island, but I was still able to participate in a week long workshop about science communication and bioinformatics in Savannah with some fellow marine scientists.

While we experienced substantial rainfall in Savannah for several days, there was less flooding than initially forecasted. Given the circumstances, I was curious about the factors of coastal resiliency in Georgia that may have contributed to reducing the impact of flooding during Debby.

Having collected wild oysters from Georgia for my dissertation, I knew that there are expansive natural oyster reef structures along the coastlines in the greater Savannah area. Specifically, I know that native oyster reefs play a role in shielding the coast from storm surge and erosion.



Tropical Storm Debby was forecasted to bring close to 30 inches of rain to Savannah, GA, a record rainfall. Image credit: NOAA & Savannah Morning News



Some oysters live in intertidal areas where they are exposed to air during low tides. Some oysters occur deeper in the water column (subtidally) where they are fully covered by water. This reef is intertidal, where the oysters are exposed to air during low tides.

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Some wild local oysters near Savannah, GA. Some oysters reefs occur deeper in the water column (subtidally) where they are fully covered by water. This reef is intertidal, where the oysters are exposed to air during low tides.

With a growing number of people living in coastal areas along the Atlantic and Gulf coasts of the US, it's imperative to better understand coastal mitigation strategies in the face of rapidly intensifying storms and climate change events. Natural oyster reefs are ecosystem engineers that provide a physical barrier which mitigates storm surges and prevents successive erosion. Beyond physical factors, filter-feeding oysters also clear bacteria that enters the water through storm drainage and runoff. Oyster reefs also provide valuable structural habitat for many marine species. This habitat is the foundation for biodiverse ecosystems coastal and healthy fisheries that remain resilient to extreme climatic events (Chowdhury et al 2021).



We encountered strong winds & rain on Tybee Island from Tropical Storm Debby!

COASTAL
RESILIENCE



ON TYBEE
ISLAND, GA

Finding the story in your everyday science

We always have new days ... these new experiences = new content!

Ways to find the story every day:

- Journal prompts
- Write down what you notice around you
- Challenge yourself to describe your day using random adjectives
- Remember that any small moment can spark inspiration for a story

Finding the story in your research

1 sentence: What is a current project that you're working on? (Or, what is one class you've taken?)

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1 sentence: What action would you want a stranger to take after hearing about your project?

1 sentence: What did you do at work during your most recent workday?

Know your Audience (101)

- **Public:** everyone (including scientists!)
- **Non-scientist:** anyone who is not a scientist
- **Non-specialist:** any scientist who is not in your field of study*
- **Specialist:** a scientist who is in your field of study*

Audience groups can include multiple of the above types. Know your audience!

* **Grant and fellowship** applications will likely have reviewers that are a combination of specialists and non-specialists - read the grant solicitation!

Deeper dive into storytelling for grant/fellowship applications: how do I tell MY story?

A huge part of storytelling is understanding yourself and your core values.

The way you convey your core values elicits feelings and sets the stage *before* anyone gets to know your research. This gets you ahead in social interactions, networking, *and being remembered in a stack of 100+ grant applications.*

ID your core values, then use those to underlie the emotional resonance of your science storytelling approach, message, and delivery strategy.

Your core values

Your core values are what drives you. These root beliefs influence how you interact with everyone else, and how you perceive the world.

Shared humanity = shared core values

Acceptance	Courage	Genius	Optimism	Smart
Accomplishment	Courtesy	Giving	Order	Solitude
Accountability	Creation	Goodness	Organization	Spirit
Accuracy	Creativity	Grace	Originality	Spirituality
Achievement	Credibility	Gratitude	Passion	Spontaneous
Adaptability	Curiosity	Greatness	Patience	Stability
Alertness	Decisive	Growth	Peace	Status
Altruism	Decisiveness	Happiness	Performance	Stewardship
Ambition	Dedication	Hard work	Persistence	Strength
Amusement	Dependability	Harmony	Playfulness	Structure
Assertiveness	Determination	Health	Poise	Success
Attentive	Development	Honesty	Potential	Support
Awareness	Devotion	Honor	Power	Surprise
Balance	Dignity	Hope	Present	Sustainability
Beauty	Discipline	Humility	Productivity	Talent
Boldness	Discovery	Imagination	Professionalism	Teamwork
Bravery	Drive	Improvement	Prosperity	Temperance
Brilliance	Effectiveness	Independence	Purpose	Thankful
Calm	Efficiency	Individuality	Quality	Thorough
Candor	Empathy	Innovation	Realistic	Thoughtful
Capable	Empower	Inquisitive	Reason	Timeliness
Careful	Endurance	Insightful	Recognition	Tolerance
Certainty	Energy	Inspiring	Recreation	Toughness
Challenge	Enjoyment	Integrity	Reflective	Traditional
Charity	Enthusiasm	Intelligence	Respect	Tranquility
Cleanliness	Equality	Intensity	Responsibility	Transparency
Clear	Ethical	Intuitive	Restraint	Trust
Clever	Excellence	Irreverent	Results-oriented	Trustworthy
Comfort	Experience	Joy	Reverence	Truth
Commitment	Exploration	Justice	Rigor	Understanding
Common sense	Expressive	Kindness	Risk	Uniqueness
Communication	Fairness	Knowledge	Satisfaction	Unity
Community	Family	Lawful	Security	Valor
Compassion	Famous	Leadership	Self-reliance	Victory
Competence	Fearless	Learning	Selfless	Vigor
Concentration	Feelings	Liberty	Sensitivity	Vision
Confidence	Ferocious	Logic	Serenity	Vitality
Connection	Fidelity	Love	Service	Wealth
Consciousness	Focus	Loyalty	Sharing	Welcoming
Consistency	Foresight	Mastery	Significance	Winning
Contentment	Fortitude	Maturity	Silence	Wisdom
Contribution	Freedom	Meaning	Simplicity	Wonder
Control	Friendship	Moderation	Sincerity	
Conviction	Fun	Motivation	Skill	
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Grant applications - using core values in your story

Curiosity, communication, hope, confidence

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I was once like these students. My desire to use science to solve challenges facing our environment arose from a young age, catalyzed by tidepool exploits, trips to the aquarium, and a healthy obsession with nature documentaries. The more I learned about the threats facing the biosphere, the greater my thirst for knowledge became. I reasoned that if I deeply understood the scientific drivers and underlying forces that threaten ecological systems, then maybe I could identify solutions. **This desire to develop solutions to conservation challenges continues to be my driving passion**, and has guided my choice of what to study and where to work.

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<https://www.alexhunterlang.com/nsf-fellowship>

Recreation, stewardship, playfulness, drive

Personal Statement: Everywhere I go, I carry a 1.5-liter Nalgene water bottle with a green cap. When I first bought this bottle in high school, it was clear-colored. Now it is scratched, cloudy, and has a fatal crack in the bottom. One half of this water bottle is adorned with hackathon swag, programming puns, and the credo of any Python programmer: `import numpy as np`. The other half of this water bottle is covered in stickers from national parks. My favorite is from Mt. Rainier National Park – it marks the day I completed a 61-mile trek after training for a year.

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Spend 2-3 minutes looking over the list of core values. Write down 5-8 that you like.

Turn to the person next to you and share your top 2-3 out loud. Reflect on how it feels, do they sound right to you?



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Boldness	Discovery	Imagination	Professionalism	Teamwork
Bravery	Drive	Improvement	Prosperity	Temperance
Brilliance	Effectiveness	Independence	Purpose	Thankful
Calm	Efficiency	Individuality	Quality	Thorough
Candor	Empathy	Innovation	Realistic	Thoughtful
Capable	Empower	Inquisitive	Reason	Timeliness
Careful	Endurance	Insightful	Recognition	Tolerance
Certainty	Energy	Inspiring	Recreation	Toughness
Challenge	Enjoyment	Integrity	Reflective	Traditional
Charity	Enthusiasm	Intelligence	Respect	Tranquility
Cleanliness	Equality	Intensity	Responsibility	Transparency
Clear	Ethical	Intuitive	Restraint	Trust
Clever	Excellence	Irreverent	Results-oriented	Trustworthy
Comfort	Experience	Joy	Reverence	Truth
Commitment	Exploration	Justice	Rigor	Understanding
Common sense	Expressive	Kindness	Risk	Uniqueness
Communication	Fairness	Knowledge	Satisfaction	Unity
Community	Family	Lawful	Security	Valor
Compassion	Famous	Leadership	Self-reliance	Victory
Competence	Fearless	Learning	Selfless	Vigor
Concentration	Feelings	Liberty	Sensitivity	Vision
Confidence	Ferocious	Logic	Serenity	Vitality
Connection	Fidelity	Love	Service	Wealth
Consciousness	Focus	Loyalty	Sharing	Welcoming
Consistency	Foresight	Mastery	Significance	Winning
Contentment	Fortitude	Maturity	Silence	Wisdom
Contribution	Freedom	Meaning	Simplicity	Wonder
Control	Friendship	Moderation	Sincerity	
Conviction	Fun	Motivation	Skill	
Cooperation	Generosity	Openness	Skillfulness	

Let's practice crafting a story!

Moon snails are one of the largest snail groups in the world and known for having large, round shells that look like the moon

- Large bodies that stick out of the shell
- However, the snail can bring the entire body back into the shell
 - So the snail doesn't dry out (desiccate) during low tide periods
 - Also to protect the body from predators!
- They live on the sandy bottom of the seafloor



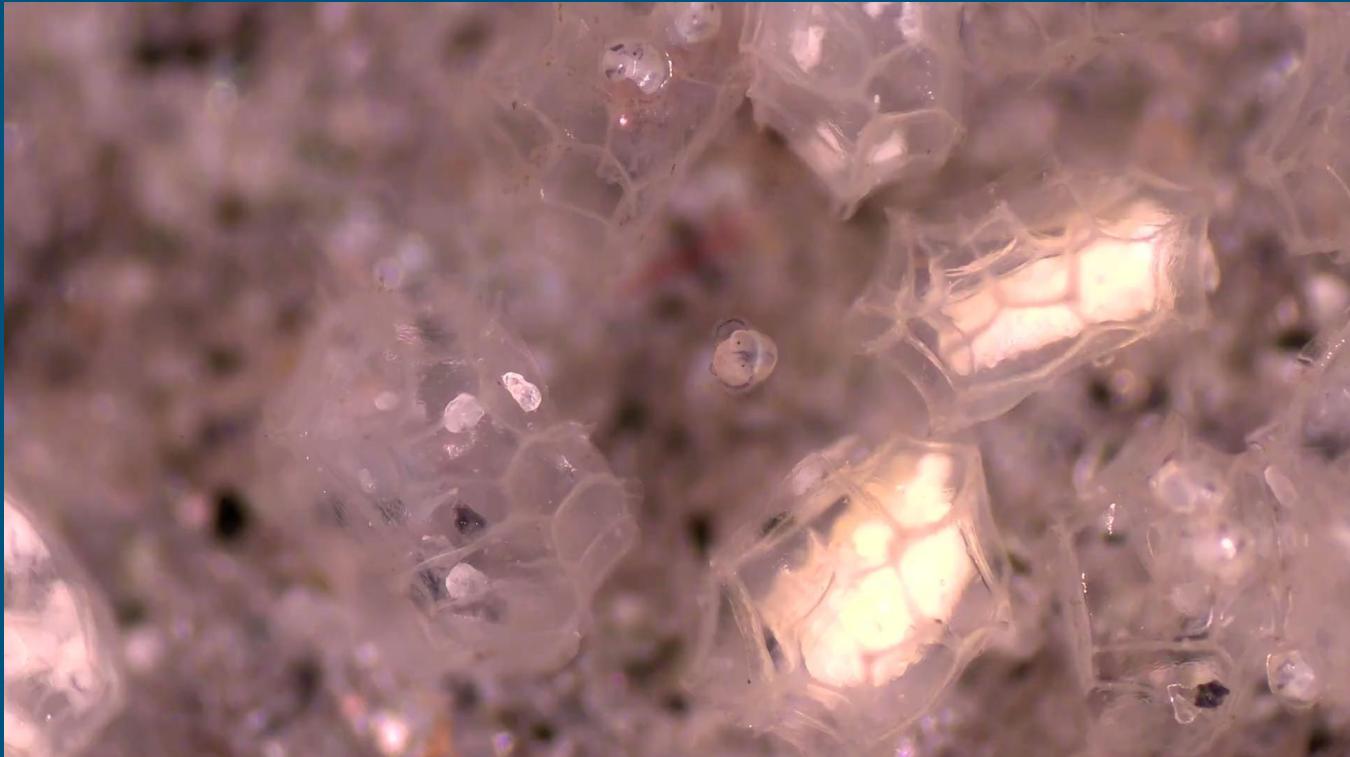
Group Storytelling: Moon Snail Example

- Moon snail sand collar
- How do they reproduce?



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Group Storytelling: Moon Snail Example



Group Storytelling: Moon Snail

Now what story do we tell?

- Who is our audience?
 - Let's say we're targeting the public
- Who are we and what are our values?
 - Let's say we are scientists who value stewardship
- Is there a conservation initiative that we want people to take action on?
- How can we translate complex ecology in a simple way to achieve our goal?

Let's take a look at an example ->

