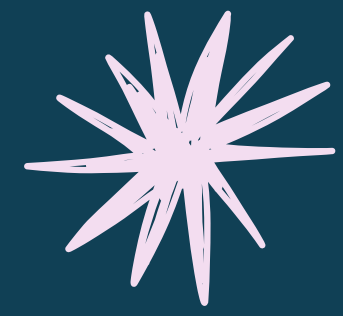
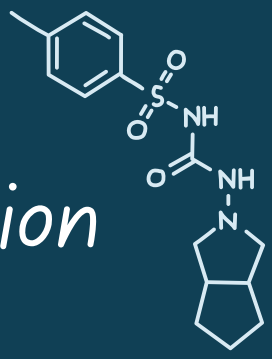
Making Science Make Sense

The Storytelling Translation Ladder



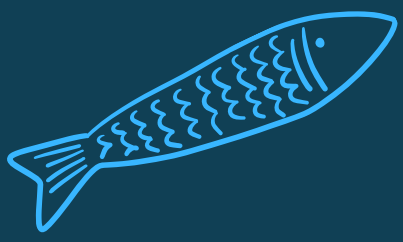











THEN

For centuries, communities have used stories to make sense of phenomena that were powerful, uncertain, or poorly understood.

In Scottish folklore, tales of the shapeshifting Selkie and the weather-shaping Cailleach gave coastal and highland communities a way to discuss and interpret the unpredictable forces of the natural world.

These stories did not reduce the complexity of the sea or the seasons. They provided a shared language to navigate them.

"We organize our experience and our memory of human happenings mainly in the form of narrative- stories, excuses, myths, reasons for doing and not doing, and so on."
(Bruner, 1991, p.4)

NOW

Today, science communicators face a similar challenge.

Concepts like gravitational waves, algorithmic bias, and public data systems can be invisible, abstract, and difficult to grasp.

Our first instinct is often to explain the mechanics.

This framework suggests a different starting point: *translation*.

Storytelling is not used here as simplification, but as a way of helping people move between technical information, lived experience, and shared meaning.

"Narratives represent a potentially useful format of communication for the communication of science to nonexpert audiences. Narratives are easier to process and generate more attention and engagement than traditional logical-scientific communication."
(Dahlstrom, 2014, p. 13617)

WHAT CONNECTS THEM

Both past and present use storytelling to:

- make the invisible visible
- connect knowledge to lived experience
- build shared understanding
- create space for discussion

Science communication is not only about transmitting facts, but about creating shared meaning through dialogue and interpretation. (Burns et al., 2003; Trench, 2008)

This resource builds on that tradition by using storytelling as a practical tool for science communication and public engagement.

TWO APPROACHES TO SCIENCE COMMUNICATION

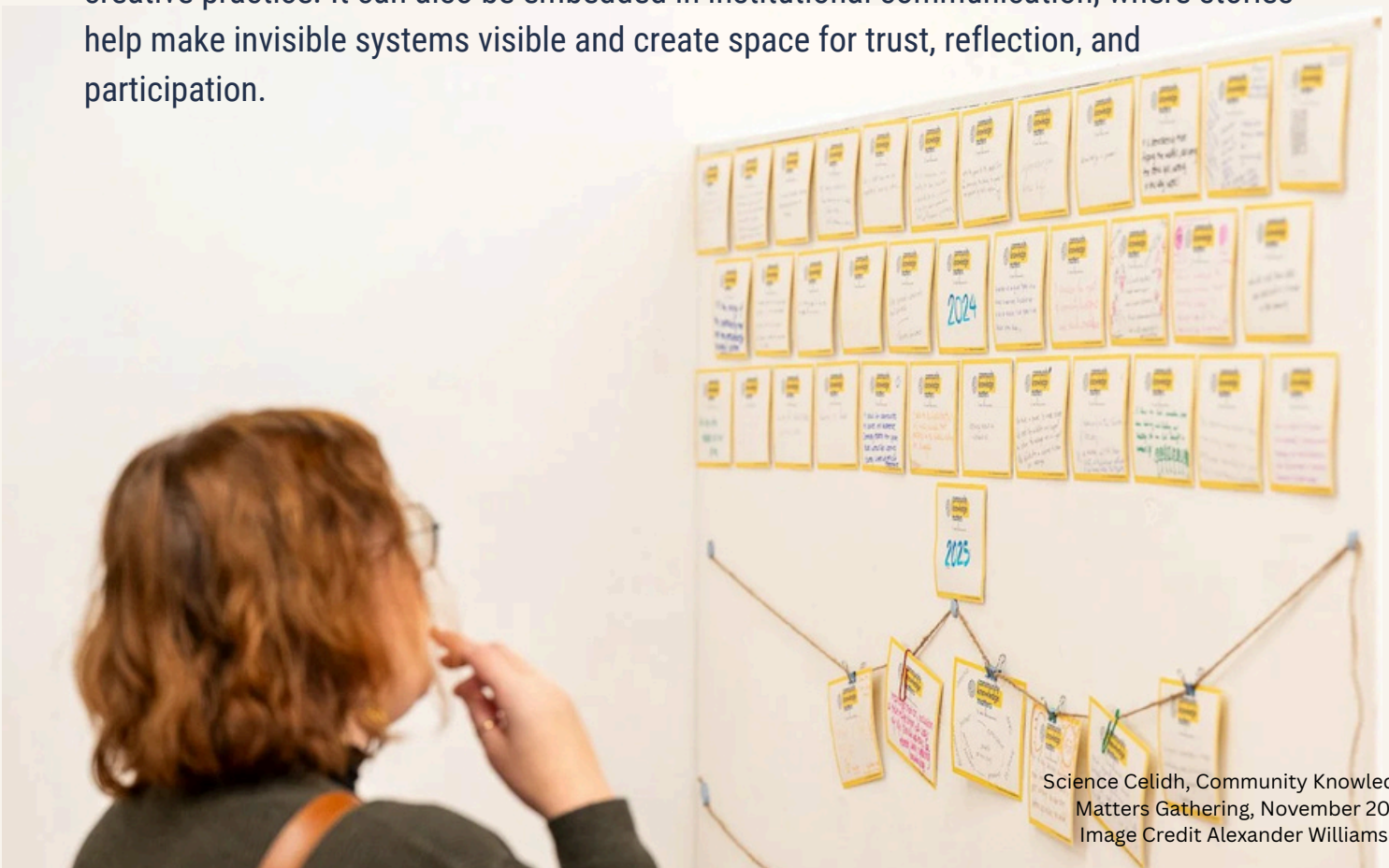
To illustrate how this framework can operate in different settings, this resource uses examples from two very different science communication environments: **Science Ceilidh** and **Research Data Scotland**.

Science Ceilidh represents a community-led model. Much like traditional storytelling, they use movement, performance, and co-creation to explore complex scientific ideas through shared physical experience.

Research Data Scotland represents an institutional model. Their work often focuses on topics like data governance, privacy, and public benefit, issues that can feel abstract, technical, or invisible to public audiences. To make these systems more understandable, they use explainers, case studies, and public dialogue to connect data practices to real people, real decisions, and real-world consequences.

While their methods look very different on the surface, both organisations face the same challenge: translating complexity into forms their audiences can understand, engage with, and question (Trench, 2008; Burns et al., 2003; Hudson et al., 2023).

Together, these examples show that storytelling is not limited to performance or creative practice. It can also be embedded in institutional communication, where stories help make invisible systems visible and create space for trust, reflection, and participation.



Science Celidh, Community Knowledge Matters Gathering, November 2025
Image Credit Alexander Williamson.

HOW THE LADDER WORKS

→ Case Study: Science Ceilidh
using movement + storytelling to communicate gravitational waves

This resource is a practical framework for building science stories that connect complex ideas to public understanding.

The Storytelling Translation Ladder helps communicators move from curiosity to reflection, using storytelling as a tool for explanation, participation, and meaning-making.

This workshop uses embodied storytelling to make abstract astrophysics tangible.

Use it to:

- plan workshops, talks, or activities
- test whether communication feels accessible
- identify where communication breaks down
- adapt ideas for different audiences

You do not need every step every time. The ladder is flexible.

The goal is not perfection. The goal is connection.

Before You Begin

Before building your story, ask:

- Who is this for?
- What do they already know?
- What do they care about?
- What might feel confusing, distant, or difficult?
- What kind of participation feels right here?

Good science communication starts with audience, not information.

The ladder helps shape the story. The audience shapes how you climb it.

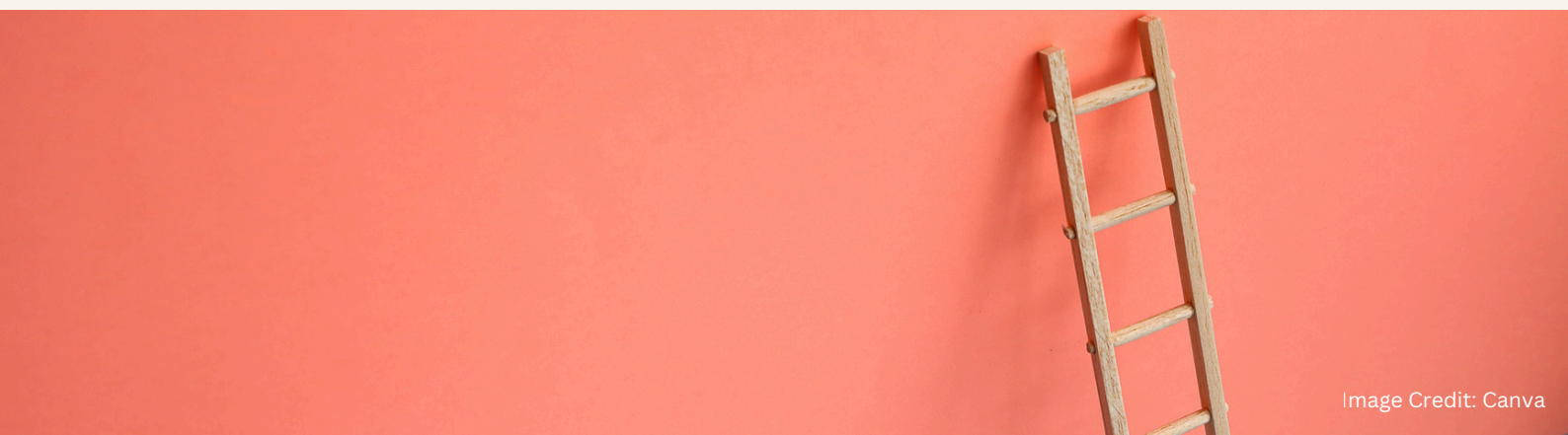


Image Credit: Canva

The Storytelling Translation Ladder

A flexible tool for planning, testing, and reflecting on science communication

How To Use It:

- Start with curiosity
- Work through each step
- Build your science story
- Test where understanding may breakdown
- Revisit and Revise

Why It Works:
Stories connect with people because they are:

- **Relevant** - to their lives & values
- **Relatable** - through Identities & emotions
- **Memorable** - as stories shape how we recall
- **Actionable** - when people feel Involved & empowered

6 Reflect & Reopen

What is missing?
What questions remain?

Science Ceilidh Example: What else creates gravatational waves? How are they detected? What else could explain movement?

Research Data Scotland Example: Who decides public benefits? Who gets left out? How transparent should data systems be?

5 Invite Participation

How can people contribute, question, or join in?

Science Ceilidh Example: Join the dance. Change the rhythm. Create a wave.

Research Data Scotland Example: Discuss trust, ethics, and access. Ask what matters most.

4 Translate the Complexity

How can this be made understandable?

Science Ceilidh Example: Dance becomes the metaphor. Movement makes Invisible science physical.

Research Data Scotland Example: A Safe Haven becomes a locked reading room where information can be used, but never removed.

3 Explain Why It Matters

Why should people care?
What changes because of this?

Science Ceilidh Example: Helps us understand how the universe changes.

Research Data Scotland Example: Shapes healthcare, policy, and public services.

2 Identify & Name the Science

What Is actually happening?
Define It clearl.

Science Ceilidh Example: Gravitational waves are ripples In spacetime caused by collisios.

Research Data Scotland Example: Data governance shapes how public data is accessed, protected, and used responsibly. Safe Havens are one way this happens.

1 Start with Curiosity

What is surprising, strange, urgent, or worth noticing?

Science Ceilidh Example: Start with movement, rhythm, and wonder.

Research Data Scotland Example: Start with questions about privacy, trust, or access.

THE STORYTELLING LADDER

STEP 1: START WITH CURIOSITY

Curiosity often begins with mystery!

People rarely begin by caring about the technical details of a scientific concept. They care because something is surprising, strange, urgent, or relevant to their own lives. Research suggests audiences engage more effectively when communication begins with an accessible entry point rather than abstract explanation (Burns et al., 2003; Dahlstrom, 2014).

Before explaining how something works, look for the tension, the mystery, or the wonder. Start with the thing that makes people stop and listen, not the thing that makes you sound clever.

What are gravitational waves?
- can space move?
- what happens when black holes collide?

Ask yourself:

- What is surprising about this topic?
- What would make someone stop and listen?
- Where is the tension, mystery, or wonder?
- What makes this feel immediate?

Science Ceilidh example: Gravitational waves are invisible and difficult to imagine, so workshops began with rhythm, movement, and dance to create curiosity before explanation.

Research Data Scotland example: Data governance can feel abstract, so public-facing communication often begins with human questions about privacy, access, and trust.

Lego activity conducted by Research Data Scotland at Dundee Science Festival
Image Credit: Research Data Scotland

THE STORYTELLING LADDER

STEP 2: IDENTIFY & NAME THE SCIENCE

Curiosity needs an anchor. Once you have attention, you have to identify what is actually happening before you start translating it.

Stories work best when they are built on a foundation of accurate information (Dahlstrom, 2014; Dahlstrom and Ho, 2012). This is where you introduce the core scientific idea as clearly as possible. Identify the phenomenon first, then name it. Work out what terms need explaining now, and what jargon can wait. You may need to briefly hint at why it matters in the next step to hold attention while you establish the facts.

If you cannot define the science in two clear sentences, you may need to refine your own understanding first.

Scientific concept = gravitational waves

ripples in spacetime caused by massive objects accelerating, such as when two black holes merge

Ask yourself:

- What is the core scientific idea?
- What must people understand first?
- What terms need explaining?
- What can wait until later?

Science Ceilidh example: Gravitational waves become ripples in spacetime caused by massive objects colliding.

Research Data Scotland example: Data governance shapes how public data is accessed, protected, and used. Safe Havens are one way this happens.

Image Credit: Canva

THE STORYTELLING LADDER

STEP 3: EXPLAIN WHY IT MATTERS

because it reveals hidden parts of space

Facts tell people what something is. Meaning tells them why they should care.

Science communication is ultimately about negotiating meaning (Burns et al., 2003).

People engage more deeply when they understand how a topic affects them, their communities, or the wider world (Downs, 2014; Jones and Crow, 2017).

You have to ask what problem this science actually helps solve, and whose lives it touches.

gravitational waves

Ask yourself:

- Why does this matter?
- Who is affected?
- What problem does this help solve?
- What changes because of this?

– they help scientists study invisible cosmic events. They tell us how the universe changes. Can detect what telescopes can't.

Science Ceilidh example: Gravitational waves are not just about physics. They help us understand how the universe changes and evolves.

Research Data Scotland example: Data systems are not just infrastructure. They shape healthcare research, public services, and public trust.

Image Credit: Canva

THE STORYTELLING LADDER

STEP 4: TRANSLATE THE COMPLEXITY

This is the hinge of the ladder. It is the pivot point where you move from establishing the facts to bringing the audience into the fold.

Translation is not simplification. It is adaptation.

It means finding the form that helps bridge the gap between specialist knowledge and public understanding. This might be a metaphor, image, movement, analogy, or familiar lived experience (Downs, 2014; Cash et al., 2003; Cvitanovic et al., 2016).

If your audience cannot picture it, they will struggle to understand it.

Ask yourself:

- What image fits this?
- Can this be shown instead of explained?
- What does this feel like?
- What familiar thing could help explain it?

Science Ceilidh example: Dance translated invisible waves into something physical and experienced.

Research Data Scotland example: Research Data Scotland example: Human case studies help translate abstract data systems into real-world stories of care, trust, and public benefit.

Image Credit: Canva

THE STORYTELLING LADDER

STEP 5: INVITE PARTICIPATION

Learning happens through doing!

A story told at someone is a lecture. A story built with someone is a conversation.

Dialogue and participation deepen understanding and build trust (Burns et al., 2003; Trench, 2008; Escobar, 2011). This means leaving room for audiences to ask questions, contribute, or interpret the science themselves.

People understand concepts more deeply when they help build meaning.

Participants join the dance they create collisions & waves together

Ask yourself:

- Can people ask questions?
- Can they contribute?
- Can they interpret the science themselves?
- Can they build part of the story?

Science Ceilidh example: Young people physically became part of the scientific explanation.

Research Data Scotland example: Public engagement activities invite people to question and discuss how data is used.

Science Celidh, Community Knowledge Matters Gathering, November 2025
Image Credit Alexander Williamson.

THE STORYTELLING LADDER

STEP 6: REFLECT & REOPEN

Reflection opens new questions!

The biggest danger of a good story is that it feels too neat.

Science is rarely neat. Good communication must leave room for uncertainty, critique, and ongoing discussion (Dahlstrom, 2014; Fischhoff, 2013).

Before you finish, ask what has been missed. Whose perspective is absent? What uncertainty remains? What questions are still open?

A good science story does not end with certainty. It ends by reopening curiosity.

Ask yourself:

- What uncertainty remains?
- Who is missing from this story?
- What perspectives are absent?
- What questions should remain open?

what did movement explain well?
what was missing?
how do scientists detect waves in real life?

Science Ceilidh example: Participants often continued the discussion and developed their own interpretations.

Research Data Scotland example: Questions of privacy, ethics, and public trust remain ongoing conversations.

Image Credit: Canva

QUICK CHECK BEFORE YOU SHARE

BEFORE COMMUNICATING, ASK:

- Is this accurate?
- Is this understandable?
- Is this relevant?
- Is this meaningful?
- Is this participatory?
- Is this honest about uncertainty?

If the answer is no to any of these, step back down the ladder to find where the connection broke.

Good science communication is rarely finished in one draft (Besley and Dudo, 2022). This framework is designed as a reflective tool, not a fixed formula. Different audiences, topics, and contexts may require different routes up the ladder (Trench, 2008; Besley and Dudo, 2022).

Image Credit: Canva

REFERENCES

Besley, J.C. and Dudo, A. (2022) Strategic science communication: a guide to setting the right objectives for more effective public engagement. Baltimore: Johns Hopkins University Press.

Burns, T.W., O'Connor, D.J. and Stocklmayer, S.M. (2003) 'Science communication: a contemporary definition', Public Understanding of Science, 12(2), pp. 183-202. Available at: https://doi.org/10.1177/09636625030122004..

Cash, D.W., Clark, W.C., Alcock, F., Dickson, N.M., Eckley, N., Guston, D.H., Jäger, J. and Mitchell, R.B. (2003) 'Knowledge systems for sustainable development', Proceedings of the National Academy of Sciences, 100(14), pp. 8086-8091. Available at: https://doi.org/10.1073/pnas.1231332100

Cvitanovic, C., McDonald, J. and Hobday, A.J. (2016) 'From science to action: principles for undertaking environmental research that enables knowledge exchange and evidence-based decision-making', Journal of Environmental Management, 183, pp. 864-874. Available at: https://doi.org/10.1016/j.jenvman.2016.09.038

Dahlstrom, M.F. (2014) 'Using narratives and storytelling to communicate science with nonexpert audiences', Proceedings of the National Academy of Sciences, 111(Suppl. 4), pp. 13614-13620. Available at: https://doi.org/10.1073/pnas.1320645111

Dahlstrom, M.F. and Ho, S.S. (2012) 'Ethical considerations of using narrative to communicate science', Science Communication, 34(5), pp. 592-617. Available at: https://doi.org/10.1177/1075547012454597

Downs, J.S. (2014) 'Prescriptive scientific narratives for communicating usable science', Proceedings of the National Academy of Sciences, 111(Suppl. 4), pp. 13627-13633. Available at: https://doi.org/10.1073/pnas.1317502111

Escobar, O. (2011) Public dialogue and deliberation: a communication perspective for public engagement practitioners. Edinburgh: Edinburgh Beltane. Available at: https://www.ed.ac.uk/files/atoms/files/public_dialogue_and_deliberation.pdf

REFERENCES

Fischhoff, B. (2013) 'The sciences of science communication', Proceedings of the National Academy of Sciences, 110(Suppl. 3), pp. 14033-14039. Available at: https://doi.org/10.1073/pnas.1213273110

Hudson, C.G., Knight, E., Close, S.L., Landrum, J.P., Bednarek, A. and Shouse, B. (2023) 'Telling stories to understand research impact: narratives from the Lenfest Ocean Program', ICES Journal of Marine Science, 80(2), pp. 394-400. Available at: https://doi.org/10.1093/icesjms/fsad005

Jones, M.D. and Crow, D.A. (2017) 'How can we use the "science of stories" to produce persuasive scientific stories?', Palgrave Communications, 3(1), pp. 1-9. Available at: https://doi.org/10.1057/s41599-017-0047-7
Research Data Scotland (no date) Data explainers. Available at: https://www.researchdata.scot/engage-and-learn/data-explainers/

Research Data Scotland (2024) New animations launched to explain data topics. Available at: https://www.researchdata.scot/news-and-insights/new-animations-launched-to-explain-data-topics/

Rice, C. and Mündel, I. (2019) 'Multimedia storytelling methodology: notes on access and inclusion in neoliberal times', Canadian Journal of Disability Studies, 8(4), pp. 118-151. Available at: https://doi.org/10.15353/cjds.v8i4.509

Science Ceilidh (no date) Curiosity in Action toolkit. Available at: https://www.scienceceilidh.com/curiosity-in-action-toolkit

Science Ceilidh (no date) Gravitational waves. Available at: https://www.scienceceilidh.com/gravitational-waves

Trench, B. (2008) 'Towards an analytical framework of science communication models', in Cheng, D. et al. (eds.) Communicating science in social contexts. Dordrecht: Springer, pp. 119-135.

SUGGESTED FURTHER READING

Baron, N. (2010) Escape from the ivory tower: a guide to making your science matter. Washington, DC: Island Press.

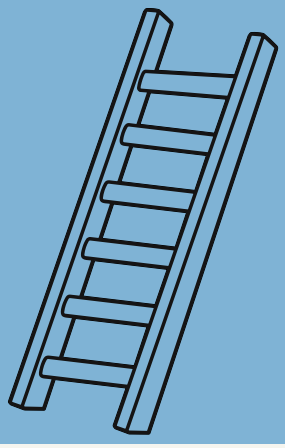
Bruner, J. (1991) 'The narrative construction of reality', Critical Inquiry, 18(1), pp. 1-21. Available at: https://web.english.upenn.edu/~cavitch/pdf-library/Bruner_Narrative.pdf

Olson, R. (2015) Houston, we have a narrative: why science needs story. Chicago: University of Chicago Press.

Ripple, K.J., Hudson, C.G., Knight, E., Landrum, J.P., Bell, V. and Close, S.L. (2024) 'Enabling usable science takes a community: using our roles as funders to catalyze change', PLoS Biology, 22(5), e3002675. Available at: https://doi.org/10.1371/journal.pbio.3002675

The Open Notebook (2023) Using the ladder of abstraction to elevate science stories. Available at: https://www.theopennotebook.com/2023/05/30/using-the-ladder-of-abstraction-to-elevate-science-stories/

Image Credit: Canva



"WE TELL OURSELVES STORIES IN ORDER TO LIVE."

– Joan Didion

Storytelling does not replace science. It helps people approach it.

This resource was developed as part of a dissertation exploring storytelling as a practical tool for science communication and public engagement. Its purpose is to support reflection, experimentation, and conversation when communicating complex scientific ideas.

The Storytelling Translation Ladder is not intended as a fixed method, but as a flexible guide for adapting science communication across different audiences, contexts, and forms of participation.

Acknowledgements

Special thanks to Science Ceilidh and Research Data Scotland for providing publicly accessible examples of science communication practice that informed this resource.

These organisations were used as illustrative case studies only and had no role in the design, analysis, or production of this resource.

Good science stories do not end with answers. They leave better questions behind.

Dissertation Resource Supplement
Exam Number: B287167
University of Edinburgh
2026

Image Credit: Canva