

New Frontiers

Project 4.2.4. Pitching an expedition to somewhere nobody has properly looked

Find a place on Earth that is genuinely unexplored, work out what is there worth studying, and build a visual product convincing enough that Innovation, Inc. funds the trip. The product has to speak for itself, because you are not presenting it.

WORTH 7 POINTS

DOES NOT HELP ON THE WEBXAM

RESEARCH AND A VISUAL PRODUCT

ABOUT 2 HOURS

What this is and why it is worth doing

A 2018 NOAA estimate says more than 80 percent of the ocean is unmapped, unobserved and unexplored. The ocean covers more than 70 percent of the planet. There is a great deal of Earth nobody has looked at.

Some regions are inaccessible for political or cultural reasons. Others are simply hostile: Antarctica and its network of subglacial lakes, the largely uninhabited Namibian desert, ice-covered Greenland, submerged caves, the deepest ocean trenches.

WHAT ONE EXPEDITION FOUND

In 2004 Dr. J. Craig Venter and his team sailed 32,000 miles collecting marine microbes and sequencing their DNA. The *Sorcerer II* expedition discovered six million new genes and thousands of new proteins. They also studied the microbes colonising ocean plastic pollution, and bacteria have since been found that produce enzymes which degrade plastic. That is what an expedition can turn up, and it is the argument you are making.

DOES THIS HELP ON THE WEBXAM? NO

WebXam 072110 weighs handling, preparation, storage and disposal, and biotechnology research and experiments. This is a research and communication product. There is no method in it.

It is worth doing because building something that persuades without you standing next to it is a genuinely different skill from presenting, and almost nothing else in school assesses it. Your product is graded on whether it works alone.

How long it takes and what you need first

- **About 2 hours**, plus build time depending on how ambitious your product is.
- **Slide, presentation or design software.** A story map, a slide deck, or anything similar.
- The **Project 4.2.4 Rubric** from Mr. Mendoza. Read it before you start.
- **Research access** and a way to record APA citations as you go, not afterwards.
- A team is assumed. Alone is allowed. Say which.

Esri's five principles, which you are graded against

PRINCIPLE	WHAT IT MEANS IN PRACTICE
Connect with your audience	Decide who is reading before you build. Assemble text, maps and content to suit them, and avoid jargon, meaning words a particular profession uses that others will not follow.
Interest your viewers	Open with an exciting image. Make the title active and descriptive: <i>A Day at the Park</i> is acceptable, <i>Discover the Wonders of Yosemite Park</i> is better. Make the location unmistakable. Put your core concepts at the beginning rather than the end. Keep outbound links out of the introduction, where they send people away before they have started.
Select an appropriate template	Choose a layout that fits the story and does not compete with it. The content is supposed to be the focus.
Make maps easy to read	As simple and clear as they can be while carrying the detail your project needs. Cut unnecessary detail. A plain grey background map often beats satellite imagery. Think about which pop-ups, legends and symbols actually carry your message.
Keep it simple	Every element you remove makes the rest communicate better. Shorten the text and simplify the maps, then go back and do it again. Someone should grasp the concept and the mission quickly.

The steps

- 1 Spend a few minutes exploring the story map *The Map of Biodiversity Importance: Top 10*. Scroll through it. Then evaluate it against all five Esri principles: where does it succeed, where does it not, and are the maps inside it effective?

Done when: a written evaluation exists that criticises something, not just praises.

- 2 Read the Project 4.2.4 Rubric so you know how this is assessed.

Done when: you have read it.

- 3 Write down what you believe is essential to include in your product, and separately what is optional but would strengthen it if you have time. Decide how your team will divide the work.

Done when: two lists exist and the work is divided in writing.

- 4 **Individually**, look at online maps or do research and identify one region that is likely unexplored or under-explored. Then share with your team and reach consensus on one region.

Done when: each person brought a candidate and one was chosen by agreement.

- 5 Research the region thoroughly using credible sources. Record what organisms live there and what scientific research is currently happening there.

Done when: notes exist on both, with sources.

- 6 **Document every source in APA style as you go.** Doing this at the end is how citations get lost.

Done when: every claim you plan to use has a citation attached to it in your notes.

- 7 Brainstorm what an investigation there could open up. Have the organisms been studied properly, or is there room to study them further with innovation in mind? Could existing research be expanded? Why is this region a priority for Innovation, Inc.? What problems could exploration here help solve?

Done when: all four questions have written answers.

- 8 Outline your product's sections. Think hard about the cover, which is the first thing anyone sees, and which has to introduce the problem and pull the reader in.

Done when: a section outline exists with a planned cover.

- 9 For each section, decide what carries it: a map, an image, video, text, links, or something interactive. Divide the content among the team and build it.

Done when: the product exists and every section has its intended content.

- 10 Save your work, then share it two ways: send or hand the product to Mr. Mendoza, and give a viewable copy to whichever team is reviewing you in the next step.

Done when: the product is saved somewhere it will not be lost and two other people can open it.

- 11 Review another team's product using the rubric and the Providing Peer Feedback resource, and give them feedback.

Done when: you have given written feedback on someone else's work.

- 12 Read the feedback your own product received and decide what to change before submitting the final version. Then pick one comment that gave you something actionable and write why it was effective.

Done when: changes are made or a reason for not changing is written, and the reflection exists.

WHAT THE PRODUCT MUST DO. ALL FOUR ARE GRADED

- Identify an **unexplored or marginally explored** geographic region, and its geographic scope.
- Investigate **one** of these while answering what problems exploration could help solve: what living things there could inspire new innovations, *or* what research is currently happening there that Innovation, Inc. could build on.
- **Ethically justify** the need for the exploration and describe the impacts it may have. Also justify the effort and the cost.
- Pitch a comprehensive plan with a strong rationale, showing creativity and critical thinking.

Your product has to speak for itself. You will not be delivering a presentation unless you are asked to. Everything the argument needs has to be inside the artefact.

WORKED EXAMPLE OF THE ETHICAL JUSTIFICATION, WHICH IS THE PART MOST PEOPLE SKIP

Weak version. "Exploring this region is important because we might discover new species and new medicines." That is a benefit statement, not an ethical justification. It names only the upside and only for us.

Stronger version. "Two groups have a stake in this region and they are not the same group. The first is everyone who might benefit from a therapeutic found here, which is a diffuse global benefit that arrives years later if at all. The second is the people who live nearest to it and the ecosystem itself, which carry the costs now and locally: vessel traffic, sampling damage, and the precedent that a region is open for extraction.

The deep-sea corals and sponges in this class of habitat are slow growing and vulnerable to damage from fishing gear and from oil and gas exploration, so a sampling expedition is not a neutral visit. We would justify the trip on three conditions: sampling limited to the minimum quantity a screen requires rather than the maximum a permit allows, a published data set so that nobody has to repeat the disturbance to check our work, and a benefit-sharing agreement with the nearest coastal nation written before the vessel leaves rather than after something valuable is found.

We would not proceed if the region turned out to hold a habitat that cannot be sampled without destroying it. That is a real possibility here, and saying which conditions would make us *not* go is the part that makes the rest of this a justification rather than an advertisement."

Where people get stuck

Picking a region that is actually well explored.

Somewhere that feels remote to you is not the same as somewhere science has not been. Check what research already exists there before you commit. If you find a lot, that is a finding, and you either switch regions or reframe the pitch as building on the existing work.

Treating the ethical justification as a sentence about benefits.

It is graded separately from the rationale. Name who bears the cost, not only who gets the benefit, and say what would make you not go.

Collecting citations at the end.

You will not be able to find where half your facts came from. Cite as you write, in APA.

Too much text.

Keep it simple is an actual grading principle here. Write it, then cut it, then cut it again.

A generic cover.

It is the first thing anyone sees and it has to introduce the problem. A title over a stock photo of an ocean does not.

Links in the introduction.

They send the reader away before they have started. Put them at the end.

Building for a presentation you are not giving.

Slides with three words on them work when you are talking over them and fail completely when you are not. Your product is read, not narrated.

Peer feedback that is only compliments.

You are graded on the feedback you give as well as the product you make. Say one specific thing that would make theirs better.

How to submit and how it is credited

THIS ITEM IS WORTH 7 POINTS

A visual product, a research record with APA citations, peer feedback given, and a reflection. About two hours of work puts it above the single session items. Remember the 20 point per semester cap across all extra credit.

- **Where it goes.** The same place as everything else. Your class form on the portal, or handed to Mr. Mendoza in person. Nothing about extra credit needs a different route.

- **What to hand in.** Photographs of your work where the handout asks for them, plus your written pages. Photographs of handwritten pages are fine. A photograph you cannot read is not.
 - **Put your name and period on every page and every photograph filename.** Unlabelled work cannot be credited and it is the single most common way points get lost.
 - **When.** Any day after the pack opens, right up to the last week of the semester. There is no deadline inside that window and no penalty for going slowly.
 - **Feedback.** You get it back with a note. If a piece is short of full credit you may fix the named thing and resubmit once.
-

Words this activity uses

Story map

A presentation format combining text, maps and other media into a single scrolling argument.

Jargon

Words or phrases used by a particular profession or group that others find hard to follow.

Basemap

The background map that other layers sit on top of.

Symbology

The choices about how features are drawn on a map: shape, size, colour.

Legend

The key explaining what the symbols on a map mean.

APA style

The American Psychological Association citation format, used across the sciences.

Credible source

One whose author, publication and evidence you can check. The Effective Research resource covers how to tell.

Marginally explored

Somewhere science has visited but not thoroughly. It counts for this project, but you have to say what was already done.

Subglacial lake

A lake underneath an ice sheet, sealed from the surface, sometimes for a very long time.