STEM The Flow Workshop 4

Evaluation and Reporting
Agenda

Introduction

Evaluation
- Typical Project Lifecycle
- The Brief and Project Planning
- STEM The Flow Poster Template
- How to Evaluate Your Project

Reporting
- What is a Scientific Poster?
- How to design a Scientific Poster?
- Questions to Ask Yourselves
- First Steps - Orientation, Size, Layout, Style
- Writing Clearly & Concisely
- DOs, DON'Ts + Tips & Tricks
- Examples

Questions
Project Life Cycle

Initiation
- Brief
- Goals

Planning
- Roles
- Schedule
- Stages

Execution
- Delivering Project
- Outputs

Evaluation
- Testing
- Feedback
- Review of goals

Reflection
- What did we Learn?
- What could be improved?
STEM The Flow – The Brief

- Go back to ‘the brief’ to make sure you are focussed on the task as per instructions:

- 80% of marine litter comes from land; it makes its way into waterways and eventually to the sea. We must stop this cycle of litter and prevent it from entering the sea in the first place.

- **investigate [1 - research] and design solutions [2 - develop own ideas] to tackle marine litter**

- Your task is to come up with a way of either:
  - collecting litter that is already in the waterway [ A ], or
  - preventing litter from getting into waterways in the first place [ B ].

- Submission: 8th December - **scientific poster** and **supporting evidence** for an online showcase
STEM The Flow – Project Planning

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Week 1

Decide team roles and project/team name. Create a project plan and timeline as a team, begin discussing initial ideas and start to conduct research.

From your initial research, decide as a team the areas which you are going to focus on.

Start your investigation: How does litter get into your chosen watercourse? Where are the main problem areas? What is the pathway from your chosen area to the sea?

Week 2

Use the evidence from your investigation to start discussions on your ideas: What are the main objectives of your solution? Are you focussing on reducing litter already in the river or preventing getting to the river? Will it be aesthetically pleasing, hidden from view or have a secondary purpose?

Start to research materials and designs, remember to use sustainable resources where you can.

Week 3

Carry out experiments on your design ideas: Begin to test some of your material choices. Look at aspects such as stress, strain, durability and water resistance.

If you still have multiple concepts, decide on one to take forward in the project.

Week 4

Build a model: Use physical resources, such as cardboard or create it digitally, using CAD software. Break it down (maybe not literally!) to look at what works and what could be improved for your final design/model.

Don’t be afraid to alter your design as you go. This is all part of the learning process.

Week 5

Create your scientific poster and continue to work on the model. Be sure to include your whole project journey, any issues you have faced and how you overcame these as a team.

Week 6

Finalise your submission and ensure it is sent in by Friday 8th December 2023. Include a PDF version of your Scientific Poster and up to two other supporting photos. Make sure you have completed a photo permissions form if you are including any photos of people in your submission.

Ask your teacher to check it before you submit it, to make sure you’ve included everything.
Building a prototype or model

As well as being useful for your final submission, a prototype or model will help you with the design and construction process of your solution.

Using everyday materials such as cardboard is very common when making a model, even by professionals.

For your submission you will be able to include a photo or drawing of your model/ final design, to be included in the online exhibition.
STEM The Flow - Scientific Poster Template

- Tell the story of everything you did and not just your final concept
- Break this down into sections, as shown in the template
- Make sure it’s easy to read (try testing it on someone!)
STEM The Flow – Evaluate Your Project

• What did you aim to achieve with your STEM the Flow solution?

• How did you decide to measure the success of your solution?

• Did you test your design?

• Is the description of your team's solution easy for others to understand?

• Have you explained how and why you think your solution will work?

• What are the strengths and weaknesses of your solution?

• Did you get any feedback on your solution? What changes were made as a result of feedback?

• What did you learn from the project?

• What went well? What could have been improved?

• What actions will you take forward?
What is a Scientific Poster?

- A visually engaging summary of your project
- Tool for reporting your research findings and solution ideas

**Visual & Perception**

90% of information transmitted to the brain is visual.

40% of people will respond better to visual information than plain text.

96.7% believe that visual content engages best on social media.

*Sources: JMC Organization and Zabriske*
Assessing the Impacts of Environmental Contaminants on the Olifants River, Kruger National Park: from Sediments to Crocodiles

Calum Ramage¹, Matthew Johnson², Liz Bailey³, Kerstin Baiker¹, Chris Vanre³ and Lisa Yorl¹
¹ School of Veterinary Medicine and Science, ² School of Geography and ³ School of Biosciences, University of Nottingham, ⁴ British Geographical Survey, Keyworth, Nottingham NG12 5GG

1. Introduction: Kruger National Park (KNP), South Africa, is one of the largest and most biodiverse game reserves in Africa and is home to hundreds of species of great conservation importance. However, its geographic location downstream of the Olifants River, one of the most polluted rivers in Southern Africa, presents many threats to the wildlife.

The Olifants flows through intensive mining, agricultural and industrial landscapes before reaching KNP, acquiring on the way a diverse cocktail of highly toxic and persistent trace elements (e.g. Pb and Hg), industrial persistent organic pollutants and numerous toxic pesticides (e.g. DDT) (1).

2.1. Problem: Several large-scale fish and crocodile mass mortalities have occurred since 2007 (2). Disease, infections and ill-health are also commonly observed amongst the aquatic wildlife.

Toxic contaminants are accumulating in the sediments and aquatic organisms of the Olifants. These toxicants can ultimately threaten survival, population viabilities and ecosystem function (3,4). Very few studies have investigated the relationship between environmental contaminants and wildlife health in the Olifants.

Environmental monitoring has also fallen short: regular sediment monitoring is not conducted, and hundreds of potentially toxic pesticides and chemicals have rarely or never been measured in the Lower Olifants River.

2.2. Main objectives:
- Assess the current state of environmental contamination of the Lower Olifants River leading into KNP, focusing on trace elements and pesticides.
- Determine the health implications of exposure to contaminants for the aquatic organisms of the Lower Olifants River.

3. Methods: An integrated and holistic environmental assessment of the Lower Olifants River, Kruger National Park

References:
How to Design a Scientific Poster?

- First of all, think about your audience

- Try to make your project easily to navigate and understand for the viewer
Before You Start

Answer these questions:

1. What is the most important/interesting finding from your research?

2. What do you aim to achieve with your solution?

3. How will you measure the success of your solution?

4. How can you visually share your idea with others?
First Steps - Orientation

- Landscape (horizontal) or Portrait (vertical)?
First Steps – Size

- A0 size (841 mm by 1189 mm)?

- Remember: it’s usually easy to make something smaller, but it’s more complicated to make images larger while still looking good.
First Steps - Layout

- make three to four rough sketches of possible layout
- include small blocks of text and images
- ensure your poster is clear and engaging
First Steps - Style

- choose a limited colour palette
- choose font(s)
- use text hierarchy to allow the eye to move fluidly
- ensure good contrast for easy reading
- ensure your poster is clear and engaging
Content - Writing Clearly & Concisely

- Stick to your message
- Get to the point
- Don’t repeat yourself
- Avoid unnecessary extra words
- Use clear and straightforward language
- Write in active voice
- Ask people for feedback and embrace constructive criticism (a fresh pair of eyes is invaluable!)
- **Note:** Although contractions (e.g. “can’t”) make your writing more concise, they are not appropriate in academic style work

- Correct: I have noticed many weeds growing around the building.
- Incorrect: It has come to my attention that there is a vast proliferation of undesirable vegetation surrounding the periphery of this facility.
**DOs**

- DO use arrows
- DO use bullets
- DO use subheadings
- DO leave some ‘negative space’ (empty space not filled with stuff)
- DO ensure your poster is clear, informative and engaging
Top Tips for Poster Design

1. Keep margins/padding consistent
   Equal spacing between sections helps reduce clutter and improve readability of the content.

2. Arrange sections in a grid
   Grid organization helps the audience quickly locate information on a poster. Information should flow from left to right, top to bottom.

3. Pick 1 section to highlight (TL;DR format)
   What is one key area of your research that you want the audience to focus on? Draw attention to that section by giving it a different colored background or section header.

4. Apply text hierarchy
   Highlight section titles or key information by bolding or increasing the font size. Ensure the text is large enough to read at a distance.

5. Format figures specifically for posters
   Look at all figures as a whole; the colors, labels, arrows should all be consistent from one figure to another. Make sure the figures are high resolution so they look nice and clear when printed.

Avoid these:
- Rounded corners to box sections
- Gradients or patterns as background
- Using too many fonts (try to limit to ≤2 fonts)
- Drop shadows and word art
- Logos with non-transparent background or poor contrast with backdrop
DON'Ts

- Rounded corners to box sections
- Gradients or patterns as background
- Using too many fonts (try to limit to ≤2 fonts)
- Drop shadows and word art
- Logos with non-transparent background or poor contrast with backdrop
DON’Ts

- DON’T try to write everything in detail – try to be succinct [brief, clear, to the point]

- DON’T use too many colours or jarring colours

- DON’T make your poster too busy
More Tips & Tricks

ACADEMIC POSTER TIPS & TRICKS

TREAT YOUR POSTER LIKE YOU WOULD AN ESSAY, BUT A LOT SHORTER.

Content

Purpose
- The purpose of your poster is to graphically show the main points of your research
- Think of your poster like a movie trailer - highlight the best parts and encourage people to want to find out more
- Don’t try to include everything, leave out minor details, focus on your main points - what is important and/or interesting about your work?
- Make sure all images and text are relevant, and enhance your work by using graphs, diagrams and images.

IMPORTANT!
Avoid using too much technical detail or using excessive jargon.

Layout

- Keep your poster layout simple. Reduce clutter and retain lots of white space.
- At the beginning, the Introduction should let the reader know what the subject it and what your main points will be. The Middle should include information providing evidence for your argument or main point. The Conclusion should show how the evidence leads you to your main point or argument.

Design

- Set the size of the page to the one you will be printing in before you start.
- Organize your work and emphasize certain points using placement and size.
- Repeat elements in your design, including fonts, colours, shapes and more.
- Use 2-3 colours, and black, to create a unified theme.

Software & Templates
There are several software tools and templates available - do some research to see which will best suit your work.
- MS PowerPoint
- Adobe InDesign
- Canva
- Bulldozer

Images

Images are used to support your points. They should fit the design well - but most importantly they should be relevant.
- Use images with high resolution - most images found online have low resolution.
- What looks good on screen may not look good in print - images in your poster should be 300-500 pixels per inch

Write a caption that will clearly explain what this graph is about and how it relates to the study.

Graphs are great in helping make numbers easier to understand.

Text

Font
Clarity is essential when choosing your font. Sans serif fonts are generally best in graphic design as they are more legible.
- Arial
- Calibri
- Helvetica
- Verdana
- Tahoma

Size
Suggested font sizes for A0 Poster
- Title: 72
- Subtitles: 54
- Text: 36
- Subtext: 24

Highlight important words and phrases.

CHECK YOUR WORK

Check your poster thoroughly before you hand it in, e.g., look for problems with grammar, references, typos.

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Implications of Coral Reef Degradation for Fisheries

Mark Hamilton
Supervisors: Prof Nick Graham, Prof Christina Hicks, Associate Prof Aaron MacNeill

Background
Tropical coral reefs are diverse marine ecosystems that provide humans with a wide range of benefits, including fisheries, coastal protection and tourism. The degradation of reefs is a global issue, caused primarily by the effects of climate change (e.g., rising sea temperatures causing coral bleaching events). As reef habitats are degraded, the services they provide to people are also negatively affected.

My research focuses on how various aspects of small-scale fisheries, such as:
1. Fisheries productivity
2. Catches
3. Fishing patterns
4. Fishing communities are affected by coral reef degradation.

Coral reef degradation (before bleaching)

Recovery
Regime-shift

How are fish growth metrics affected by reef degradation?

○ Will be looking at how biomass, productivity (growth rates) and turnover differ between fish on recovering reefs and those on degraded reefs using reef survey data from the Seychelles.

○ How will reef degradation affect these metrics by fish species commonly targeted by local fisheries?

How does reef degradation influence catches in small-scale fisheries?

○ By analyzing catch data from small-scale fisheries, I will investigate how fishing yields differ from reefs with varying degrees of degradation.

○ Specifically, I will focus on how factors such as catch-per-unit effort (CPUE), e.g., kg per transect and catch composition (catch species and what species vary with reef degradation, and how variables trends are across different types of fishing gear e.g., fish traps, nets, spearfishing).

Coral-dominated
Reef dominated
Savannah-dominated

How are relationships between reefs and fishing communities affected by reef degradation?

○ In addition to gaining information on reef condition and fish populations to social information on lifestyle choices and livelihoods within fishing communities to produce an assessment of how reef degradation has affected the diversity of ecosystems and fish harvesting and consumption.

○ How does reef degradation affect local diets? And have changes in local diets preferences or sustainability, certain species are harvested?

Regime-shift

Coral-dominated
Reef dominated
Savannah-dominated

Have fishers’ use of fishing grounds changed in response to reef degradation?

○ Working with local reef fishers, I aim to gather information regarding how fishing activity has been affected by reef degradation.

○ By conducting fishing ground mapping activities and interviews with local fishers. I hope to find out if reef degradation has caused spatial and temporal changes in fishing activity.

○ Do fishers travel farther to reach healthier areas of reefs habitat, or different habitats altogether, such as seagrass beds or mangroves?

○ Do fishers use different fishing grounds caused fishers to change the type of fishing gear they use? 
Scientific Poster Example

Prevalence of Radio Emission in LoBALS Showing Disturbed Morphologies in the Optical
Maya Davidson (University of Northern Colorado), Mariana Lazarova (University of Northern Colorado)

ABSTRACT
We present results from an archival investigation of radio sources in the Herbig-Lurgo (Her) Survey (v5.0.0) of short-term samples of early type stars (LoBALS: Lord of the (Ultra) Black Holes) at a resolution of 10 µarcsec. These surveys are interesting because of their multi-wavelength electromagnetic bands. In this poster, we present results of statistical studies on the distribution of radio sources. We use the HiLiT database, which contains data on more than 1,000,000 objects. The database is updated regularly to include new observations. We find that the distribution of radio sources is not uniform across the sky, with some regions having a higher density of radio sources than others. This suggests that there may be different mechanisms responsible for the production of radio emission in these regions. Further studies are needed to understand the underlying processes.
Landscape Architecture Poster Example
Like diamonds, plastics are forever.

Every piece of plastic we have ever used is still on the planet today. That means, like diamonds, plastics are forever. The lifecycle of plastic is a dangerous one. It starts in our homes, reaches our oceans, harms our ocean wildlife and enters the food chain – our food chain. The good news is that we can break this cycle. We can all make our lives and our oceans less plastic.

We can break the cycle!
- Do a conscious consumer! Shop and think about what you buy and try to use disposables, single use, unnecessary items.
- Say no to bottled water and plastic bags! Like reusable water bottles and bags.
- Why not use reusable food containers, or dine at the restaurant instead?
- Pick up litter – rubbish trends above the storm drain and into the sea.
- Every little bit makes a difference.
- Support and buy from and consumer from businesses who are trying to make a change.
- Spread the word!

As plastics move up the food chain, what will this mean for us?

Millions of tonnes of rubbish enter the ocean every year. Australians use over 150 million plastic bags a day.

Every piece of plastic we have ever used is still around today.

Plastics enter the food chain. Plastics enter the bottom of the food chain through consumption (small drifting animals), which mistake micro plastic for food. These are then eaten by larger animals. In some areas of the ocean, plastic now makes up 50% of the diet of certain wildlife. There have been found in seabirds, fish and other flatfish, seals, turtles and whales.

Plastics can never truly go away – they break down into smaller pieces.

Animals get entangled and eat plastics in the ocean.

Around 1900, dead seagulls became tangled in plastic and up to 80% of all plastic in the ocean comes from plastic waste from land.

Plastics absorb toxic chemicals like PCBs, mercury and pesticides as well as heavy metals, toxic chemicals that in surrounding waters. When ingested, plastics have toxic bands to break toxic chemicals into available.

Animals eat entangled and eat plastics in the ocean.

Around 70% of dead turtles and seabirds are now eaten by the plastic waste from land.
Other Poster Examples
Other Poster Examples
Other Poster Examples

Why Do Marshmallows Grow in the Microwave?

1. Place two marshmallows on a microwaveable plate and put them in the microwave.
2. Set the timer for one minute (60 seconds).
3. Stand back and watch the marshmallows expand.
4. When you take it out it will澶€"

What's Going On?

Marshmallows are basically just sugar and water wrapped around loads of tiny air bubbles. It's
dessert today made of sugar and it will very soft and squishy.

At the microwave warms up the sugar and water, which become soft, squishy, and expand. When you take them out, the sugar and air bubbles

Did You Know That Marshmallows Grow in the Microwave?
Other Poster Examples
Other Poster Examples
Other Poster Examples
Other Poster Examples
Other Poster Examples
Other Poster Examples
Questions?