Sustainability Focus Design Thinking Challenge to Collect Plastic Storybook

Inclusive Robotics

Among you, there are many little fingers, a mighty heart and a creative mind.

Today I want to talk to you about uncaring about the environment affects others. Do you want to make a difference to keep PlanetEarth happy?

Our Planet Earth is drowning in Plastic. Plastic is one such material that we use everyday! Juice bottle, snack wrappers, straws and so many many more.

Plastic is also found in places where it's not meant to be. If it drops to the ground, it doesn't rot away - it sticks around for ever and takes years to degrade.

And guess what! If plastic found in the river can harm marine animals and the plants.

Plastic can take anywhere from 20 to 500 years to decompose, depending on the material's structure and environmental factors such as sunlight exposure.

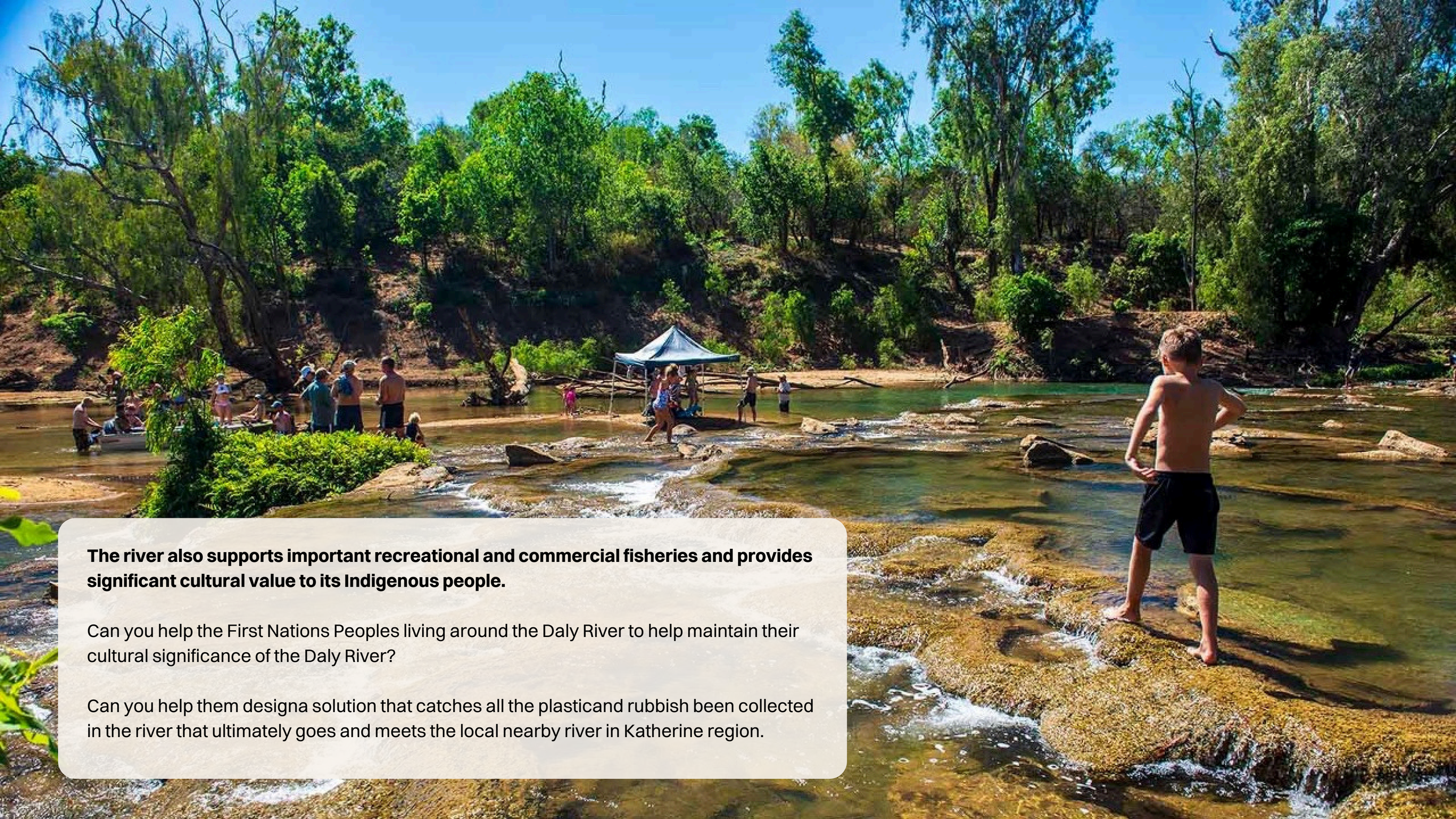
The Daly River, Northern Territory (NT), has been identified as an ‘exemplar’ of fishing and agriculture activities that happen in the region.

The people living in the area rely on fishing activities as their main source of jobs and make a living.

The Daly River catchmentsupports highly significant environmental, economic and Indigenous culturalvalues too for their local community, children, parents/carers.

The river contains a highly diverse aquatic plants and animals, including two nationally threatened animals - freshwater turtle species in the NT and over 90 species of fish within its freshwater.

How can we care for these endangered animals and help them live and grow longer in their habitat – WATER!



The river also supports important recreational and commercial fisheries and provides significant cultural value to its Indigenous people.

Can you help the First Nations Peoples living around the Daly River to help maintain their cultural significance of the Daly River?

Can you help them designa solution that catches all the plasticand rubbish been collected in the river that ultimately goes and meets the local nearby river in Katherine region.

The Northern Territorygovernment needs your brilliant creativeideas and solutionsthat will help save the fishes and turtles from dying.

See picture of how a fresh water turtle was found injured and on the surgery table.

Robotics Engineers in Action

Role play that you are a Robotics-engineer, what will you like to do to clean the Daly river and eventually save the animals that live on Planet Earth?

Let’s begin our adventure!

Look at the types of plastic materials provided to you that you have to role play as cleaning up from the river.

List the top 3 things that made you think that this is a real problem for NT communities and, ultimately for our Planet Earth.

1

2

3

Robotics Engineers in Action

List the top 3 things that you made you wonder about why plastics are harmful for animals living in the river – pig-nosed turtles, fishes.

1

2

3

Robotics Engineers in Action

List top 3 things that you now believe that your robot or under water drone or boat or submarine design should have.

Think of how the robot will have smart intelligent features to detect plastic, any kind of rubbish that harms the fishes.

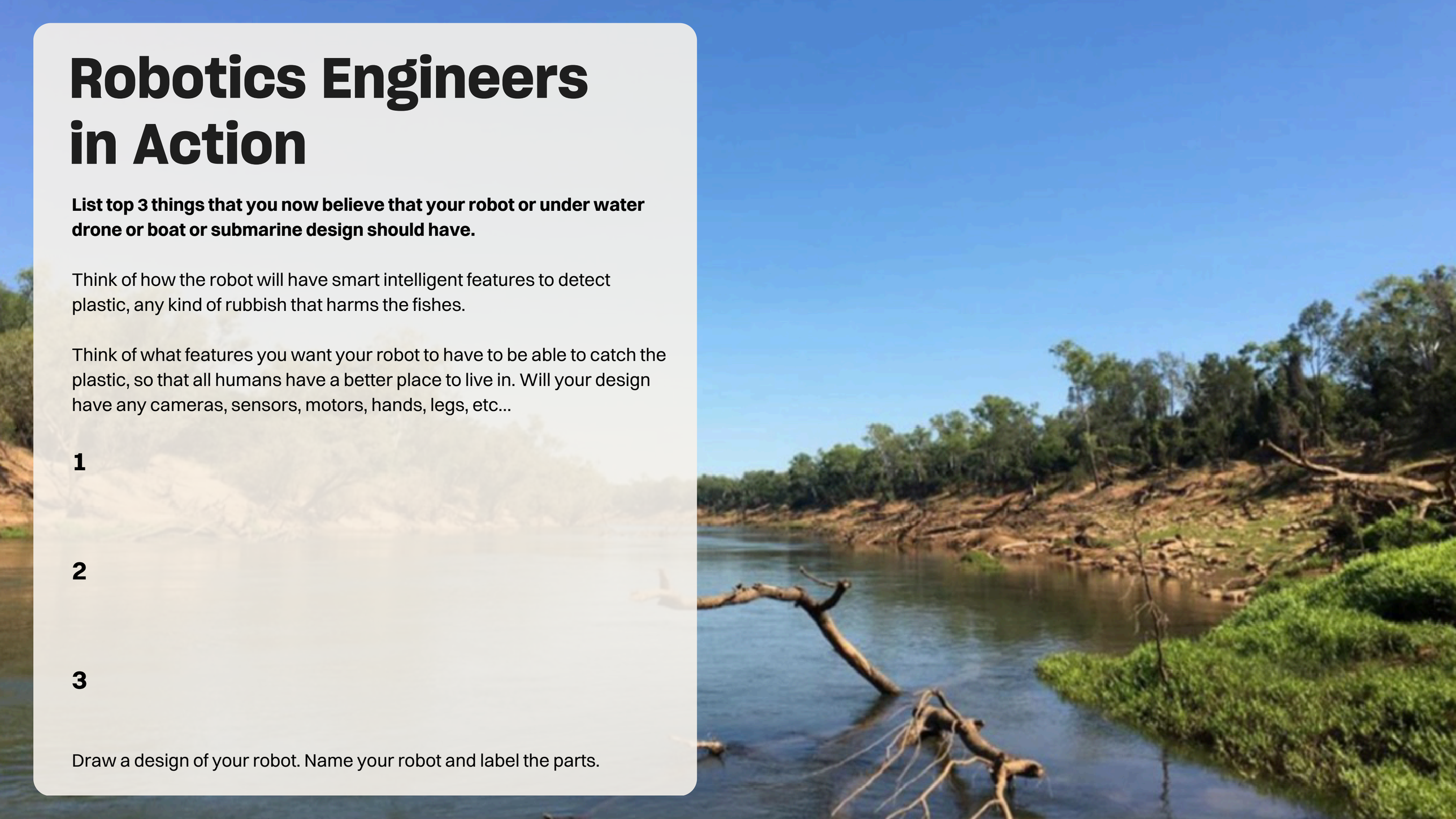
Think of what features you want your robot to have to be able to catch the plastic, so that all humans have a better place to live in. Will your design have any cameras, sensors, motors, hands, legs, etc...

1

2

3

Draw a design of your robot. Name your robot and label the parts.



Did you know that there are crocodiles in the Daly River too!

What if the crocodile eats away or attacks the robot that you have designed while it is collecting plastic rubbish from the River?

Can you design a robot or drone that has sensors and cameras for detecting a crocodile in the river.

Please include a net that collects the plastic rubbish if the robot doesn't go in the water.

It may use a boomerang which is an aerodynamic tool - falls in the water with force where the net is attached to the boomerang. Otherwise, think of how else can you use a boomerang for cleaning plastic from the Daly river.

Draw a design of your robot. Name your robot and label the parts.

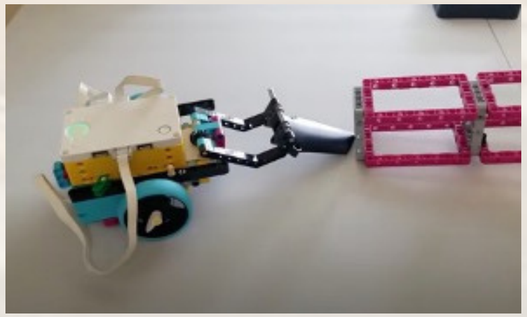
Examples of robots that children can design or build

The websites below have designed a robotic boat system to catch plastic, a fishing net that damages marine animals – it can be used throughout the story for children to draw inspiration from and empathise further with real-world issues.

https://www.weforum.org/agenda/2021/07/ai-robot-cleaning-litter-beach/

https://www.cleanseasolutions.no/product-aquadrone

https://youtu.be/21_B_M-Rdg4?feature=shared – this teacher has designed a boat!



EYLF 2022 Links to Learning

Outcome1: children have a strong sense of identity

- Children learn to interact in relation to others with care, empathy and respect

Outcome 2: children are connected with and contribute to their world

- Children develop a sense of connectedness to groups and communities and an understanding of their reciprocal rights and responsibilities as active and informed citizens
- Children become socially responsible and show respect for the environment

Outcome 3: children have a strong sense of wellbeing

- Children become strong in their physical learning and well-being

Outcome 4: children are confident and involved learners

- Children develop a growth mindset and learning dispositions such as curiosity, cooperation, confidence, creativity, commitment, enthusiasm, persistence, imagination and reflexivity
- Children develop a range of learning and thinking skills and processes such as problem solving, inquiry, experimentation, hypothesising, researching and investigating

Outcome 5: Children are effective communicators

- Children begin to understand how symbols and pattern systems work

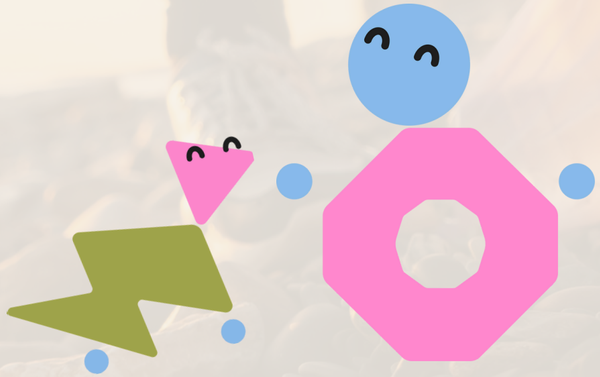
Primary links to years 3-4

- The ways First Nations Australians in different parts of Australia are interconnected with Country/Place (AC9HS3K04)
- The diversity of First Nations Australians, their social organisation and their continuous connection to Country/Place (AC9HS4K01)
- Define problems with given design criteria and by co-creating user stories (AC9TDI4P01)
- The importance of environments, including natural vegetation and water sources, to people and animals in Australia and on other continents (AC9HS4K05)
- Sustainable use and management of renewable and non-renewable resources, including the custodial responsibility First Nations Australians have for Country/Place (AC9HS4K06)

References

https://nesplandscapes.edu.au/wp-content/uploads/2022/04/Environmental-water-needs-of-the-Daly-River-final-report.pdf

https://www.twinkl.com.au/resource/a-place-for-plastic-ocean-pollution-story-ebook-t-tp-2550305



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