DEADLY SCIENCE

ENGINEERING AND BIOLOGY

TESTING STRUCTURES TO SOLVE PROBLEMS

Participants are introduced to engineering concepts such as iterations. In other words, taking a few tries to solve problems in the most efficient way. In addition they learn about environmental sustainability and caring for Country.

CAREER PATH

Engineers work in places like construction projects of all sizes, in local councils and in communities helping to solve issues like transportation, safety and water quality, etc.

F1 LINK

F1 cars are at the forefront of engineering. Concepts of engineering have been used for thousands of years in Indigenous culture and communities to make our processes easier and more efficient, as well as solve problems. Similar to the way F1 cars are continuously refined.

THE ACTIVITY

STEP 1

The fish trap board will deliver marbles (or fish) to the river. Your task is to ONLY catch 50% of the medium sized marbles on the river part of the board. You will use the 3D printed magnetic rocks to catch the fish.

STEP 2

Place the magnetic 3D printed rocks on the board in a pattern that you think will catch the correct percentage of fish.

Predict: How do you think you will go? Ask learners to turn their estimate into the form of a hypothesis: If I change X, then Y will change. Here is a suggestion. If I place the rocks in a specific pattern, I will catch 50% of the fish. This statement is called a hypothesis and can be tested!

STEP 3

Do a trial run by pouring the fish into the top of the board. This is your test.

SCIENCE KNOWLEDGE

This experiment will use a Fish Trap model to explore the engineering behind the creation of Indigenous stonewall fish traps such as the 40,000 year old heritage listed fish trap in Brewarrina.

DEADLY CONNECTION

The experiment touches on the cultural sustainability innovations behind the set-up and the importance of capturing only half the fish. While engineering as a career is at the forefront of innovation, these engineering concepts have been around for thousands of years in Indigenous culture and communities to make our processes easier and more efficient, as well as solve problems.

STEP 4

Observe: How did you go? What percentage of medium fish did you collect? Change the rocks if you need to collect more or fewer marbles as necessary. This is called an iteration. Do you need to change your hypothesis? Can you address the hypothesis? Here is a suggestion: My hypothesis is confirmed (or not). I placed the rock in a specific pattern and I caught 50% of the medium fish.

STEP 5

Run the activity again for another iteration. Did you do better? Do as many iterations as you need to collect the right number of marbles.

STEP 6

Explain: Consider that the small marbles are juvenile fish, the medium marbles are breeding fish and the large marbles are non-breeding fish. Think about why your task is to collect only 50% of the medium fish. Why not the big, or small fish? What would you do with all the fish you caught? The answer is about sustainability.

WWW.DEADLYSCIENCE.ORG.AU/FORMULA-1/

For lesson plans, resources for the classroom and teacher guides to recreate this experiment for your deadly learners.