STEM@CGI
SCIENCE - TECHNOLOGY - ENGINEERING - MATHEMATICS

LEARNING LINKS FOUNDATION

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STEM from Home

Marine Remediation

Introduction:

Think about the last time you went for a nature walk near a river/ ocean/ beach or a lake. What sorts of things did you see? You might have seen sand, shells, rocks, fishes, other water animals and sadly plastic bottles, bags, food wrapper, cans, etc. too. Rivers and streams carries this trash all the way to the sea.

Would you ever dive in a pool filled with filth and toxic wastes? I am sure nobody would. Think about the life below water who accidently consumes this trash dumped by human activities in oceans.

Oceans are our planet's life support and regulate the global climate system. Release of chemicals from industries and dumping of solid wastes into the ocean has been the root cause of marine pollution. It is adversely affecting the health of aquatic plants and animals and resulting in long lasting damage to our ecosystem and biodiversity.

The drastic reduction in human activity observed during the COVID 19 pandemic can be seen as an opportunity to revive and remediate our marine life. Solutions for marine pollution include prevention and clean-up.

In this STEM Pack, you will learn to design a game to understand the problem caused by marine pollution using scratch platform. In the Bonus Activity you will design a prototype to clean marine waste. The Challenge Activity gets you to build a multi-level game on "Marine Remediation" owing to SDG-14.

Main Activity: **Catch the Bottle**

Introduction

We must act soon before it is too late to save our beautiful aquatic life. In this activity,

you will learn to code and design a single player game: "Catch the Bottle" on Scratch

addressing the problem of marine pollution caused by plastic.

Click here to access the guidelines for the Activity

What You Will Need

Hardware:
A computer capable of running Scratch software (either online or offline).

Software:
Scratch application either online using https://scratch.mit.edu/ or offline i.e. download version https://scratch.mit.edu/download.

What you will learn

You will be able to

1. Insert desirable backdrop, sprite and costumes.
2. define and use variables.
3. design a simple scoring game
4. Examine ways technology can be used to solve real-world problems like coastal pollution
5. Collaborate and communicate effectively with peers.

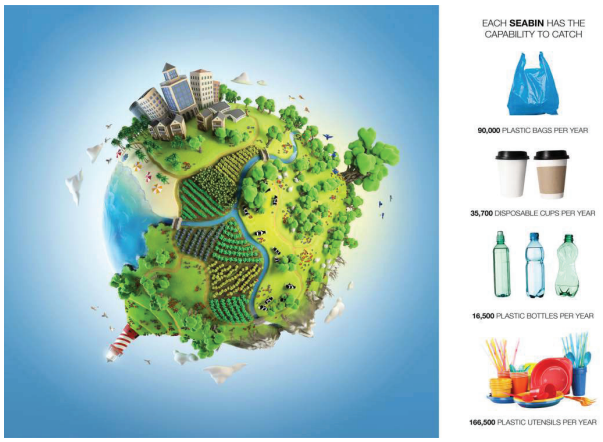
Bonus Activities

Activity 1: Sea Trash Sucker

Introduction

No problem is unsolvable if we use our creativity and innovation. As an effort to decrease the amount of plastic and other trash pilling up in the oceans and beaches, in this STEM activity, you will build a prototype machine:“Sea Trash Sucker” designed to collect solid waste from marine environments.

Read more about the Seabin Project Watch video



What You Will Need

1. Waste plastic bottle / waste plastic bucket
2. Scissors / Cutter
3. Fabric /Mosquito net/ Mesh
4. Styrofoam Sheet
5. Submersible pump (3-9 V)
6. Batteries to power pump (9 V)
7. Switch
8. Connecting Wires
9. Connecting rubber tube/ Hose pipe
10. Hot Glue Gun
11. Adhesives

What You Will Learn

1. Reusing waste material
2. Innovative way to combat marine pollution.
3. Building a Prototype
4. Testing and Evaluating the Design.

Access the activity sheet from here

Challenge Activity: Marine Remediation

Smith cares deeply about the environment, but, for him, the appeal of cleaning the oceans is also about solving a puzzle. He wishes to clean the beach and make it safe for sea creatures. Now your task is to help Smith navigate different locations of the beach and clean it with a strategy and win reward.

Design a single player 2D /3D game with 2 or more levels on the theme "**Marine Remediation**" using any game designing platform: **Scratch, Unity, Unreal, Game Maker, Kodu, etc**. You are free to choose any destination and character picture. Wear your thinking cap and create your own game. Remember writing a code for a game is just like preparing a recipe. Sequence of each and every step from starting to the ending of the game matters. Make sure Smith is rewarded for every act towards marine remediation.

What You Will Need

Knowledge of any game designing platform.

What You Will Need

1. PowerPoint presentation containing Game link, details of platform used, how you addressed the challenge?
2. Source Code
3. Game Demo Video Clip

Resources

https://www.un.org/sustainabledevelopment/oceans/

TED's video, The surprising solution to ocean plastic

TEDEd's video, What really happens to the plastic you throw away?

Tutorial for designing a multi-level game using scratch: https://www.youtube.com/watch?v=78XvQ3DbcK4