



Prize Winner

**Programming, Apps &
Robotics
Year 7-8**

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COMBATTING OCEAN POLLUTION – COMPUTER PROGRAMMING

Saheli Dissanayake – Seymour College, Year 8

AIM OF ENTRY

Ocean pollution is a prevalent issue in today's world. Every year, over 8 tons of plastic is dumped into the ocean and by 2025, this number is expected to double. While studies show that one million seabirds and 100,000 marine mammals die every year from plastic ingestion, even the food we eat contain microplastic which is having significant impacts on people's health. With the problem of plastic pollution at an all-time high, with much of it ending up in our oceans, marine life is facing detrimental effects from microplastics in the ocean.

The aim of the entry is to raise awareness of this problem and long term effects of plastic pollution, maximize interventions and provide an interactive way to encourage everyone to play their part to reduce the impact of plastic pollution.

SCIENTIFIC PURPOSE

The scientific purpose of my entry is to explain the scientific process of what happens to plastics and modelling ways to end plastic pollution.

POTENTIAL APPLICATIONS

Potential applications for this program are to use as a gamification tool to build awareness and to encourage action to prevent ocean pollution.

TYPE OF DEVICE REQUIRED TO RUN THE PROGRAM

To run the program all that is needed is to follow this link on a browser connected to the internet –

INSTRUCTIONS TO USE THE PROGRAM

1. Follow the link- <https://scratch.mit.edu/projects/861015564>
2. Press the green flag to start the program
3. Follow the instructions in the description

PROGRAM EXPLANATION

The program was created using Scratch SP3.

```

when backdrop switches to main screen
hide

when backdrop switches to facts 3
hide

when backdrop switches to beach
show
go to x: -158 y: 107
glide 3 secs to x: -143 y: -14

when backdrop switches to north atlantic
show
go to x: 63 y: 173
glide 1 secs to random position
if on edge, bounce

when backdrop switches to indian ocean
show
go to x: 63 y: 173
glide 1 secs to random position
if on edge, bounce

when backdrop switches to great pacific
show
go to x: 63 y: 173
glide 2 secs to random position
if on edge, bounce

when backdrop switches to north atlantic
forever
if touching pingpong? then
broadcast plastic bag
if touching plastic bottle? then
broadcast plastic bottle
if touching fishing net? then
broadcast net
if touching straw? then
broadcast straw
if touching fishy small? then
broadcast fishy small

when backdrop switches to great pacific
forever
if touching pingpong? then
broadcast plastic bag
if touching plastic bottle? then
broadcast plastic bottle
if touching fishing net? then
broadcast net
if touching straw? then
broadcast straw
if touching fishy small? then
broadcast fishy small

when backdrop switches to indian ocean
forever
if touching pingpong? then
broadcast plastic bag
if touching plastic bottle? then
broadcast plastic bottle
if touching fishing net? then
broadcast net
if touching straw? then
broadcast straw
if touching fishy small? then
broadcast fishy small

when backdrop switches to main screen
forever
if key up arrow pressed? then
change y by -5
if key right arrow pressed? then
change x by 5
if key left arrow pressed? then
change x by -5

when backdrop switches to main screen
forever
if touching edge? then
go to x: -169 y: -113

when backdrop switches to north atlantic
hide variable SCORE
show

when backdrop switches to indian ocean
hide variable SCORE
show

when space key pressed
switch backdrop to main screen

when I receive game over
go to x: -24 y: -79
think Oh no, I have eaten so much plastic...this will all go into my digestive system, not my food...(press the green flag to continue) for 2 seconds

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when backdrop switches to quiz
show
go to x: -169 y: -113
wait 1 seconds
say Have you gone to the facts section and learnt everything you need to know about the problem and impact of ocean pollution? for 7 seconds

when backdrop switches to great pacific
hide variable SCORE
show

when I receive made to start quiz
set SCORE to 0
say Fantastic! Let's get started! for 3 seconds
show variable SCORE
glide 1 secs to x: -173 y: -137
ask True or false: more than 100,000 animals have died from plastic waste and eat
if correct then
change SCORE by 1
say That's correct! for 2 seconds
else
say Oops, incorrect! Nice try, but the answer was TRUE. for 2 seconds
ask How many pieces of plastic end up in our oceans? and eat
if correct then
change SCORE by 1
say That's correct! for 2 seconds
else
say Oops, incorrect! Nice try, but the answer was 5.35 billion. for 2 seconds

```

```

ask True or false: microbeads are in some beauty products and wait
if answer = True then
  change SCORE by 1
  say That's correct! for 2 seconds
else
  say Oops, incorrect! Nice try, but the answer was FALSE for 3 seconds
ask Do plastics take 20-50 years to decompose? Yes or no... and wait
if answer = No then
  change SCORE by 1
  say That's correct! for 2 seconds
else
  say Oops, incorrect! Nice try, but the answer was NO. In fact, plastic takes hundreds or thousands of years to decompose for 3 seconds
ask What percent of fish that we eat have been found to have microplastics in them? Do not include the percent sign in your answer... and wait
if answer = 75 then
  change SCORE by 1
  say That's correct! for 2 seconds
if SCORE = 6 then
  say That's all for the quiz...fantastic job! for 2 seconds
  switch backdrop to main screen
if SCORE = 7 then
  say That's all for the quiz...fantastic job! Perfect score! for 2 seconds
  switch backdrop to main screen
when backdrop switches to main screen
  set size to 100 %
when backdrop switches to beach
  set size to 70 %

```

```

if answer = 75 then
  change SCORE by 1
  say That's correct! for 2 seconds
else
  say Oops, incorrect! Nice try, but the answer was 75% for 5 seconds
if SCORE = 1 then
  say That's all for the quiz...good try! for 2 seconds
  switch backdrop to main screen
if SCORE = 2 then
  say That's all for the quiz...good try! for 2 seconds
  switch backdrop to main screen
if SCORE = 3 then
  say That's all for the quiz...good job! for 2 seconds
  switch backdrop to main screen
if SCORE = 4 then
  when backdrop switches to facts 3
    delete this clone
  when backdrop switches to facts 2
    hide
  when backdrop switches to beach
    show
    go to x -121 y 85
    glide 5 secs to x -121 y -41
  when I receive plastic bag
    hide
  when backdrop switches to indian ocean
    show
    go to x 63 y 173
    forever
      glide 3 secs to random position
      if on edge, bounce
  when backdrop switches to beach
    show
    go to x -121 y 85
    glide 5 secs to x -121 y -41
  when backdrop switches to main screen
    hide
  when backdrop switches to facts 3
    hide
  when backdrop switches to facts 2
    hide
  when backdrop switches to beach
    show
    go to x -121 y 85
    glide 5 secs to x -121 y -41
  when I receive plastic bag
    hide
  when backdrop switches to beach
    show
    go to x -121 y 85
    glide 5 secs to x -121 y -41
  when I start as a clone
    switch costume to fish-a
    go to x -11 y -139
  when backdrop switches to beach
    switch costume to fish-d
    show
    set size to 70 %
    create clone of myself
  when backdrop switches to beach
    hide
    switch costume to fish-d
    show
    set size to 70 %
    create clone of myself

```

```

when backdrop switches to north atlantic
  show
  go to x: 63 y: 173
  forever
    glide 3 secs to random position
    if on edge, bounce

when backdrop switches to great pacific
  show
  go to x: 63 y: 173
  forever
    glide 3 secs to random position
    if on edge, bounce

when backdrop switches to main screen
  show

when backdrop switches to facts
  hide

when backdrop switches to facts 1
  hide

when backdrop switches to quiz
  hide

when backdrop switches to selection
  hide

when this sprite clicked
  switch backdrop to selection

when backdrop switches to Underwater game
  hide

when backdrop switches to go
  hide

when backdrop switches to facts
  hide

when backdrop switches to selection
  hide

when backdrop switches to facts 1
  hide

when backdrop switches to beach
  hide

when backdrop switches to main screen
  show
  
```

```

when I receive beach over
  switch backdrop to facts 3
  speak The problem with microplastics is that - like items of any size - they do not rapidly break down into harmless molecules.
  speak Plastics can take hundreds of thousands of years to decompose- and in the meantime, create very bad effects on the environment
  switch backdrop to facts 4
  speak On beaches, microplastics are visible as tiny, multicoloured plastic bits in sand. In the ocean,
  speak microplastic pollution is often consumed by marine animals and stick around inside their systems!
  switch backdrop to facts 5
  speak Marine life such as seabirds, whales, fish and turtles mistake plastic waste for prey.
  speak most die from starvation as their stomachs become filled with plastic.
  speak They also suffer from lacerations, infections, reduced ability to swim, and internal injuries.
  switch backdrop to facts 6
  speak When microplastics eventually dissolve - over a period of atleast around 400 years,
  speak toxins are released in most cases, further - polluting the sea

when backdrop switches to facts 3
  hide

when backdrop switches to indian ocean
  show
  go to x: 63 y: 173
  forever
    glide 1 secs to random position
    if on edge, bounce

when backdrop switches to north atlantic
  show
  go to x: 63 y: 173
  forever
    glide 1 secs to random position
    if on edge, bounce

when backdrop switches to main screen
  show
  go to x: 63 y: 173
  forever
    glide 1 secs to random position
    if on edge, bounce

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  go to x: 63 y: 173
  forever
    glide 1 secs to random position
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when backdrop switches to north atlantic
  show
  go to x: 63 y: 173
  forever
    glide 1 secs to random position
    if on edge, bounce

when backdrop switches to indian ocean
  show
  go to x: 63 y: 173
  forever
    glide 1 secs to random position
    if on edge, bounce

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  forever
    glide 1 secs to random position
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when backdrop switches to main screen
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  go to x: 63 y: 173
  forever
    glide 1 secs to random position
    if on edge, bounce

when backdrop switches to great pacific
  show
  go to x: 63 y: 173
  forever
    glide 1 secs to random position
    if on edge, bounce

when backdrop switches to north atlantic
  show
  go to x: 63 y: 173
  forever
    glide 1 secs to random position
    if on edge, bounce

when backdrop switches to main screen
  show
  go to x: 63 y: 173
  forever
    glide 1 secs to random position
    if on edge, bounce
  
```

ACKNOWLEDGEMENTS

My mum helped me with testing the program to ensure it was robust and handles incorrect input as appropriate.

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