

Prevent Ozone Depletion – Part III

Hi Everyone! Nice to see you again!

Till now, we have finished designing the screen for the game, coding the car and coding our gas bubbles. We will now move to our next task of creating the ozone layer and coding it so that it gets affected by different gases.

Let us begin by hiding the multiple variables that are there on the screen. Go to each sprite, click on the variables section and uncheck the boxes in front of the variables.

Great, the screen looks relatively empty now. We will now create an ozone layer. Click on the cat icon to Create a new sprite and choose the paint option. Draw a simple narrow rectangle and type 'Ozone Layer' in the center of the rectangle. Change the font, colour and size of the text as per your choice. Adjust the position of the ozone layer so that it fits across the breadth of the screen. Don't forget to rename the sprite to ozone layer.

We are going to show different states of the ozone layer by changing its colours. Let us begin by setting the initial colour of the ozone layer to 'Green'. This colour will denote a healthy ozone layer. Rename the costume to Green. Select the rectangle and change the colour by using the colour bar.

Now let us create the other states of the ozone layer. Duplicate the ozone layer costume by right clicking on the costume and selecting duplicate. We are creating 6 states of the ozone layer and hence duplicating it 5 times. You can create as many layers as you want to.

Now that we created five more layers, let us edit them. Go one by one and change the colour and name.

State 2 will be Light Green, State 3 will be Yellow, State 4 will be Brown, State 5 will be Orange and State 6 will be Red.

Make sure that the costumes of the ozone layer sprite are completely overlapping and positioned at the same point.

The ozone layer is ready. It is time to code it now.

We need to change states of the ozone layer during the game. To accomplish this, create a new variable. Go to the variables section and make a variable called “CurrentOzoneState” for this sprite only.

Drag ‘When flag clicked’ block from the events section to the code editor. Attach ‘set variable to 0’ from the Variables Section. Select ‘CurrentOzoneState’ from the drop down. To set the state of the ozone layer to green when the game starts, change 0 to 1.

Drag ‘repeat until’ block from the control section and attach it to ‘set CurrentOzoneState to’ block. From the operators section, drag the ‘equal to’ condition inside the <hexagonal slot>. From the variables section, drag the ‘GameOver’ variable and place it on the left-hand side and Change the value on the right from 0 to 1.

Drag an ‘if then’ block from the control section and place it inside the repeat until loop. From the operators section, drag the ‘equal to’ condition inside the <hexagonal slot>. Go to the variables section, drag ‘CurrentOzoneState’ and place it on the left-hand side of the operator. Change the value on the right from 0 to 1. Drag ‘switch costume to...’ block from the looks section and place it inside the ‘if then’ condition. From the drop down, select green since it corresponds to the first state. This ensures that every time the game starts or when the value of the CurrentOzoneState variable becomes 1, the green state is used.

Duplicate this ‘if then’ code block for all the other colour costumes. Since we have 5 more layers, we will duplicate the code block 5 more times. Place them one after the other inside the repeat until block. Go one by one. Change the duplicated ‘if then’ code blocks for each ozone layer state. In the first duplicated block, change the variable to 2 and costume to ‘Light Green’ from the Drop down. In the next if then block, change the variable to 3 and costume to ‘Yellow

from the Drop down. For the next two if then blocks, we will select 4 and Pink and 5 and 'Orange' respectively. In the last block, we will select 6 for the variable and the colour red from the drop down.

As mentioned earlier, we want our game to end if the Ozone layer becomes "Red" in colour. To accomplish this, drag the 'set variable to 0' from the variables section to the last if then block which corresponds to the red colour. Select 'GameOver' from the drop down and change the value to 1. This implies that all loops that run until 'GameOver = 1' will stop automatically.

Now that the states of the ozone layer are ready, we need to make sure that they change when the gas bubbles that the player could not burst, touch the layer.

We will change our code for the Gas Bubbles sprite a bit. First, we will ensure that the bubbles should not move upwards forever but only until something happens to them. Replace the 'forever' block attached to the 'when I start as a clone' code section with 'repeat until' from the control section. Move the 'change by 2' block to the repeat until loop. Drag 'touching mouse pointer?' from the sensing section and place it inside the <hexagonal slot>. From the drop down, select the option, Ozone layer.

If a gas bubble touches the ozone layer, the colour of the layer should change based on the nature of the gas. If the bubble it is oxygen or ozone, the layer should get greener or in gaming terms, it should heal itself. If the bubble is carbon monoxide, carbon dioxide or nitrogen dioxide, then the ozone layer should become less green or in gaming terms, it should get damaged.

To accomplish this, we need to detect the gas bubble that touches the Ozone Layer. Go to the "Costumes" section of the gas bubble sprite and check the arrangement of the good and bad gases. If the "GasType" variable value is lesser than "3", then it is a good gas and will Repair the Ozone Layer. If the GasType" variable value is greater than or equal to "3", then it is a bad gas and will damage the Ozone layer.

In the code section for the gas bubbles sprite, drag an 'if then else' block from the control section and attach it after the repeat until block. Go to the operators section, drag the 'less than' operator and place it inside the <hexagonal slot> of the 'if then' loop. Drag 'GasType' block from the variable section in the left hand slot and change the value to 3 in the right-hand slot.

Based on the value of the Gas Type, we will broadcast messages which all other sprites will hear and follow. Drag 'broadcast message1' block from the events section and place it inside the if then condition. From the drop down, select 'new message' option and type 'Repair Ozone.' Drag another 'broadcast message1' block in the else loop. Select 'new message' option and type 'DamageOzone'. As a result, each time a good gas touches the ozone layer, it broadcasts the RepairOzone message and each time a bad gas touches the ozone layer, it broadcasts the DamageOzone message.

The bubbles should also delete themselves once they touch the ozone layer. Drag 'delete this clone' block from the control section and attach it outside the 'if then else' block.

Test your code. The gas bubbles are moving up and disappearing after touching the Ozone Layer but the colour of the ozone layer is not changing.

To accomplish this, go to the ozone Layer sprite code editor to listen to the 2 broadcast messages from the gas bubbles.

Drag 'when I receive message' from the events section to the code editor and select 'RepairOzone' from the drop down. As you know, we had created 6 ozone layers earlier with 1 being the best and 6 being the worst.

When we try to 'RepairOzone', we will need to decrease the value of the state. For this, drag an 'if then' block from the control section and attach to 'when I receive RepairOzone'. Then drag 'greater than' block from the operators section and place it inside the <hexagonal slot>. Drag 'CurrentOzoneState' variable from the variables section into the empty slot in the operator.



Change the value from 50 to 1. Place 'change CurrentOzoneState by 1' inside the 'if then' condition and change the value from 1 to -1.

On the other hand, when we try to 'DamageOzone', we will need to increase the value of the state. Drag 'when I receive message' from the events section to the code editor and select 'DamageOzone' from the drop down. Drag 'if then' block from the control section and attach to 'when I receive DamageOzone'. Then drag 'less than' block from the operators sections and place it inside the <hexagonal slot>. Drag 'CurrentOzoneState' variable from the variables section into the empty slot in the operator. Change the value from 50 to 1. Place 'change CurrentOzoneState by 1' inside the if then condition. The value will remain 1.

That was a lot of coding. Time to finally test our code!

It seems to be working fine. The Ozone Layer is getting damaged when the bad gases touch it and is getting repaired when the good gases touch it. To keep healing the ozone layer, we have to continuously pop the bad gas bubbles - Carbon dioxide, Nitrogen dioxide and Carbon monoxide. Remember, not to pop the Oxygen or Ozone bubbles! Once the ozone layer turns red, the game stops.

In the next and last video of this game, we will create the Welcome and Game over screens and bring all the elements of the game together.

Bye bye. See you again!