



Prize Winner

Programming, Apps & Robotics

Year 3 - 4

Aiden Cheng

Trinity Gardens School



Motion

move 10 steps

turn 15 degrees

turn 15 degrees

go to random position

go to x: -73 y: -49

glide 1 secs to random position

glide 1 secs to x: -73 y: -49

point in direction 90

point towards mouse-pointer

change x by 10

set x to -73

change y by 10

set y to -49

go to x: -1 y: 36

hide

wait until mouse down?

show

forever

next costume

wait 0.5 seconds

when clicked

forever

if key space pressed? then

start sound Suction Cup

hide

when clicked

forever

if key up arrow pressed? then

start sound High Whoosh

change y by 5

if key down arrow pressed? then

start sound High Whoosh

change y by -5

if key right arrow pressed? then

start sound High Whoosh

change x by 5

if key left arrow pressed? then

start sound High Whoosh

change x by -5

The Lifecycle of a Butterfly

Stage 1
Where should a butterfly lay its eggs?
main predator?

In this stage, you are a butterfly and you have to choose a place to lay your eggs. If you have lay the egg in an unsafe space, a bird will come and eat your egg. If you lay the egg in a safe space, you can move to the next stage. You only have 10 seconds to choose.

happens
2.5 to 5cm in length

On a leaf

birds

flies

Note: This game must be played on a laptop or PC with a mouse and keyboard

Sprite Butterfly 1 x -1 y 36

Show Size 50 Direction 90

costume1 costume2 costume3 Sprite1 Butterfly 1

START Stage 1 info Egg Parrot leaf1

rock Egg2 Butterfly 3 caterpillar...

Stage

Backdrops 13

ENG
US12:51 PM
25/07/2026

The Lifecycle of a Butterfly Game

by Aiden C

Stage 1

In this stage, you are a butterfly and you have to find a safe place to lay your egg. To move the butterfly, use the arrow keys. To lay your egg, press the space bar. If you have lay the egg in an unsafe space, a bird will come and eat your egg. If you lay the egg in a safe place you will move to the next stage. You only need to lay one egg.

Note: This game must be played on a laptop or PC with a mouse and keyboard

START

The Lifecycle of a Butterfly – My Game and Project

by Aiden Cheng - ajcgenson@gmail.com

Aim:

The aim of this report and my game is to teach young kids about the lifecycle of a butterfly. The game is fun and interactive. By playing the game on the computer, it makes teaching about the lifecycle of a butterfly more engaging in the classroom.

Requirements:

To play the game you need a computer, a mouse and a keyboard, with an internet browser and the link to the game. The link to the game is:

<https://acsr-git.github.io/ButterflyLifecycleGame/>

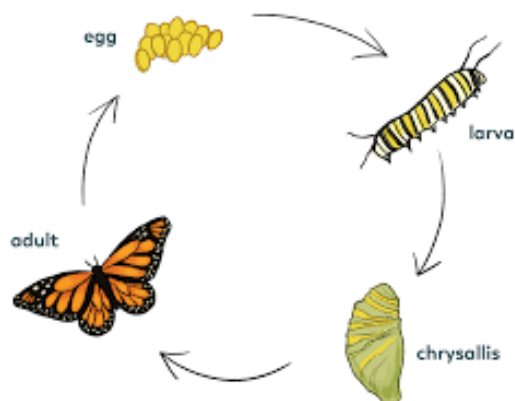
(I created the game, but my dad helped me convert my Scratch code game into a webpage game on GitHub because I had trouble uploading and sharing my Scratch project code on the Scratch website. On the Scratch website, my game would not save, and I could not share it online)

I also created a video, you can view it at: <https://youtu.be/ANbnjztnWIY>

Scientific Purpose:

The lifecycle of a butterfly includes five stages.

The first stage is when the egg is laid. The second stage is when the caterpillar (also known as the larva) comes out and eats to grow larger. The third stage is when the caterpillar is in its chrysalis and the last stage is when the butterfly comes out. The scientific purpose of the game is to teach people about each stage of the lifecycle of a butterfly.



For stage 1 of the lifecycle in the game, the player must move the butterfly and lay the egg in a safe place or else a predator will eat the egg. This teaches the player that butterflies must find a safe place to lay their eggs.

For stage 2, the player must make the caterpillar eat the leaves or else the caterpillar will not be able to go into its chrysalis stage. This stage teaches that a caterpillar must grow to a certain size before it goes into its chrysalis stage.

For stage 3, you must fly away from the predator and if the parrot catches the butterfly, the butterfly will not be able to reproduce. In my game, the predator is a bird. This teaches the player that butterflies has to stay away from predators or else they will not be able to reproduce, and the butterflies could be extinct in the wild.

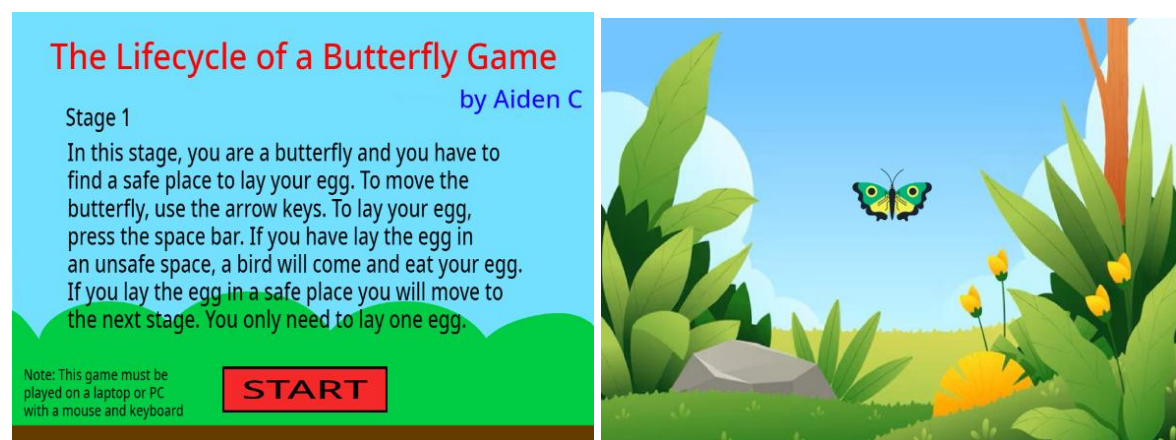
Instructions for the Game:

To start the game, press the green flag.

Each stage represents 1 or 2 stages of the lifecycle of a butterfly.

Stage 1:

Move the butterfly around using the arrow keys. When you want to lay the egg, press the space bar but check if it is in a safe place first e.g. a leaf or a tree.

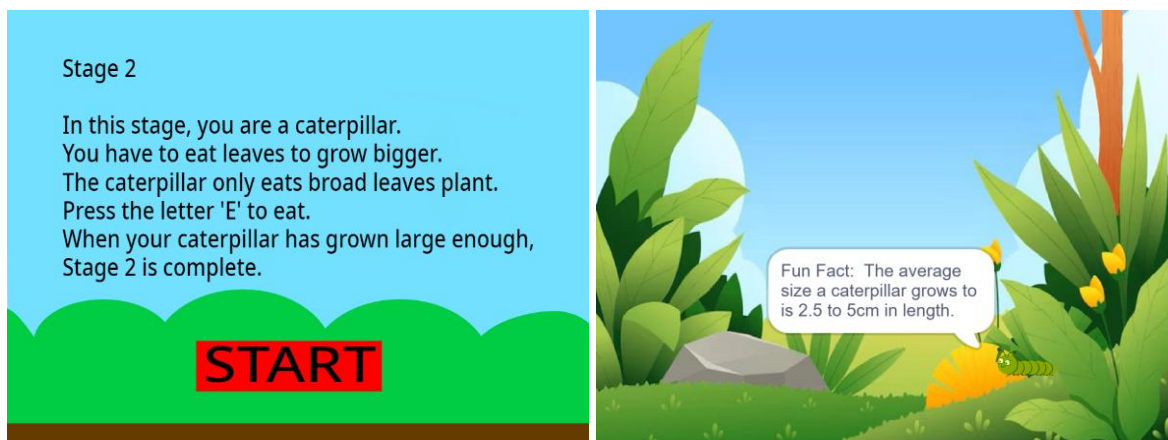


Stage 2:

Move the caterpillar around the screen onto a leaf. Press the button *E* on the keyboard to make the caterpillar eat and grow bigger (the caterpillar will not eat on some leaves so try another leaf if the caterpillar does not eat the leaf).

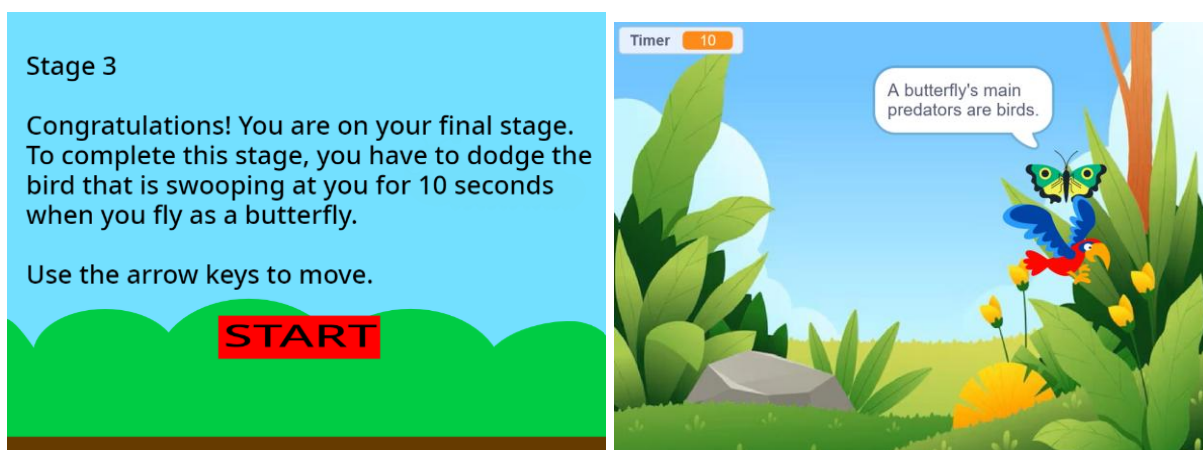
Caterpillars like to eat certain leaves, in our game, it is broad leaves.

FUN FACT: Their first meal is usually their own leftover eggshell, followed by the leaves of the host plant. Laying the eggs on leaves in the previous stage allows the hatched caterpillar to eat leaves straight away.



Stage 3:

You now need to run away from a predator for 10 seconds or else the butterfly will not be able to reproduce, and you will lose the game. Use the arrow keys to move the butterfly around.



Aim of quiz:

The aim of the quiz is to see if the player learnt something or just played the game.

Quiz Part 1:

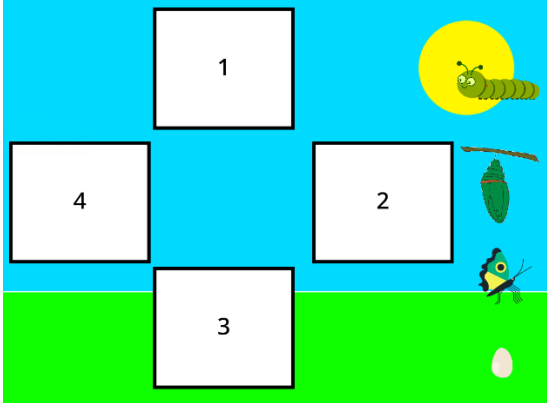
Drag the pictures of the egg, caterpillar, chrysalis, and butterfly into the right order on the butterfly lifecycle.

QUIZ TIME!

You will now answer questions about the life cycle of a butterfly.

First, you have to drag the icons on the right into the correct boxes showing the order of the butterfly lifecycle.

START



Quiz part 2:

The second part of the quiz asks questions about each stage of the butterfly lifecycle. Click on the answer to the multi-choice questions.

Quiz - Part 2

To complete the game, click on the right answer to the questions.

There is a question about each stage of the butterfly lifecycle.

START

What is the average size of a caterpillar before it goes into its chrysalis?

- 2.5 to 5cm in length
- 2 to 3 cm in length
- 3 to 6cm in length
- 2.5 to 4cm in length

Main Code:

My game is very long and has a lot of code, so I have chosen the main blocks of code to explain in this report.

My dad helped me upload the code because I had trouble sharing my code on the Scratch website. The code of my game is uploaded at:

Scratch Game Code

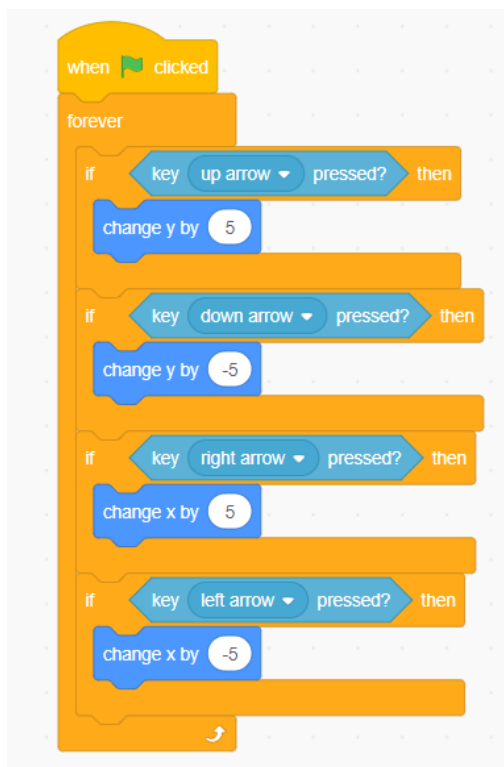
Download the raw “**The life cycle of a butterfly v21.sb3**” Scratch file and load this file in Scratch to view the code.

All files about my project and game are at:

<https://github.com/acsr-git/ButterflyLifecycleGame>

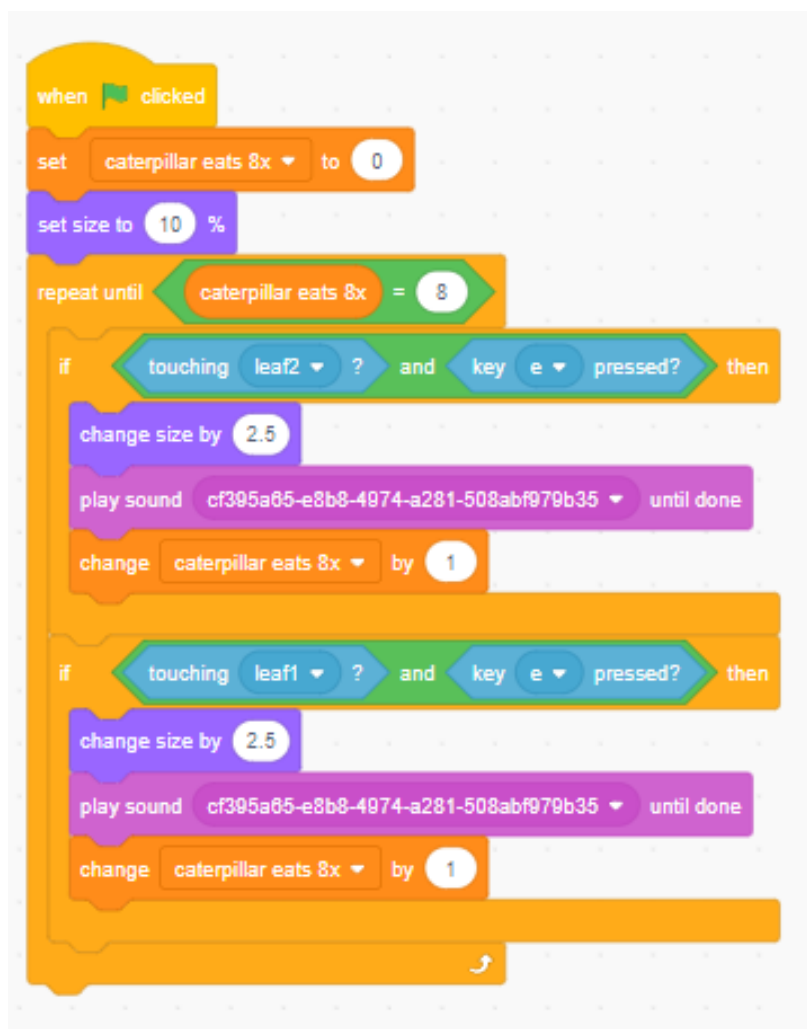
Movement:

I coded the movement of my sprites (butterflies and caterpillar) by checking if the arrow keys were pressed. If the arrow keys were pressed would change the sprite's x or y direction by 5 or -5.



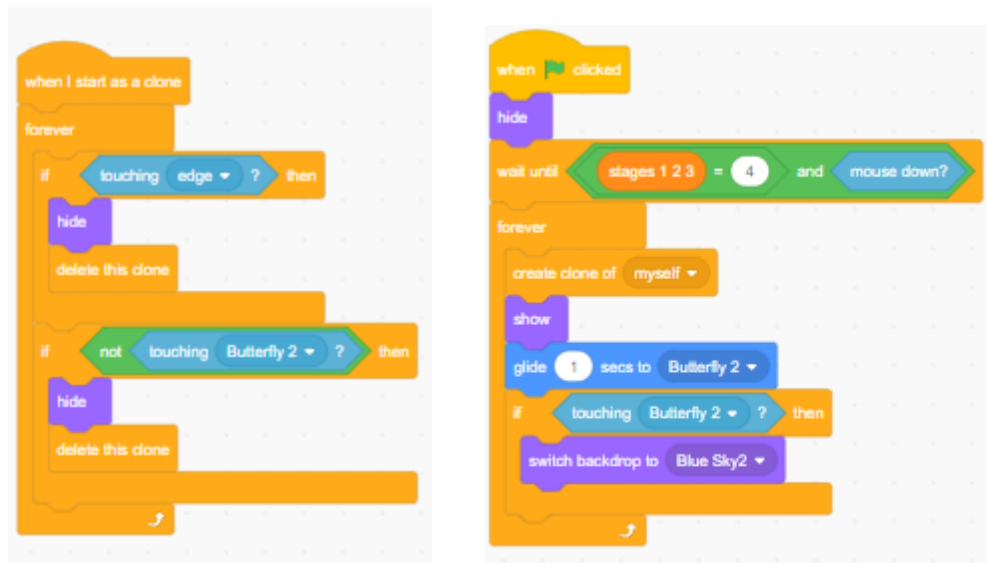
Caterpillar Eating:

I made the caterpillar eat by checking if the caterpillar was touching the right ghost sprites, for example, a leaf. If the key *E* were pressed, the caterpillar would eat the leaves, and the size of the caterpillar would change by 2.5. When the caterpillar's size equals thirty, I made the caterpillar glide to the chrysalis that is hidden. The chrysalis would then show and show a fun fact, and the caterpillar would hide behind the chrysalis.



Predators (bird) chasing the butterfly:

I made the predator chase the butterfly by coding a clone of it and coding it to follow/chase the butterfly for 10 seconds.



Programming the quiz questions

I created part one of the quiz by coding the program to check if the sprites (egg, caterpillar, chrysalis, and the butterfly) were in the right order of the lifecycle.



I created part 2 of the quiz by coding the program to check if the mouse clicked on the right answer to the questions.

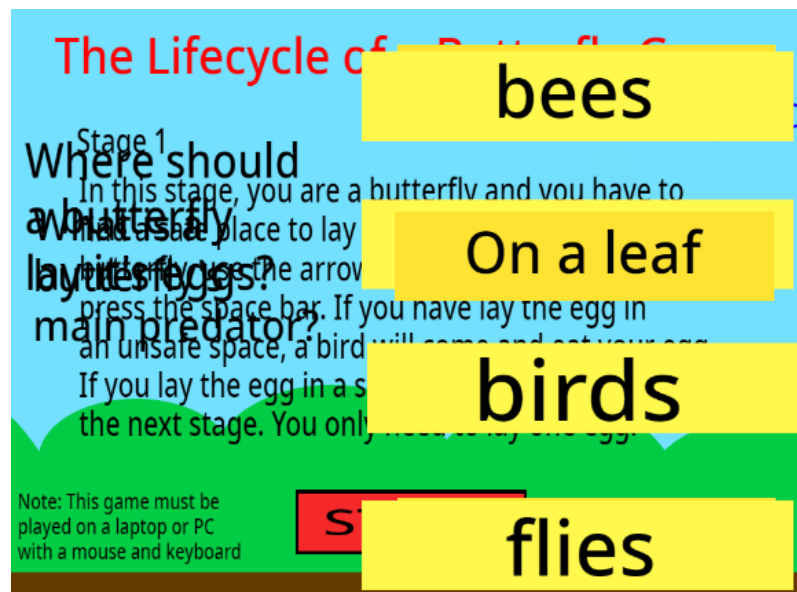


Bugs in the code

The bugs are:

1. Sometimes, sprites and game icon/figures show and do not hide at start of game.
 - To fix this bug, reload the page using the browser refresh button 
 - Or if playing in Scratch press the red stop button and then the green flag.





2. If the egg is laid and touching both leaves and unsafe rock/ground, the program will think that the location of the egg is in both a safe and unsafe spot.
3. Sometimes, if the mouse button is pressed for too long or too many times, the program will not run properly and will crash, or the wrong quiz answers will be selected accidentally.

I ran out of time to fix these bugs before submission, but I will try to fix them in the future.

Future Work

- I would add more fun facts during the game. For example, after the chrysalis stage, once the chrysalis hatches and the butterfly wings are strong enough, the butterfly flies to search for nectar and to mate, so the lifecycle can begin again.
- I would fix up the bugs in the code.
- I would make the game longer by adding more stages of the butterfly lifecycle.

Acknowledgements

- I downloaded sounds for my game from the website named sound button, at <https://soundbuttonsworld.com/>
- I also used the Internet to find facts about the lifecycle of a butterfly. For example, the average size a caterpillar grows before it goes into its chrysalis is 2.5 to 5 centimetre in length.
- I acknowledge my dad who helped me debug the code by showing me how to use variables to trace which block of code was wrong. He helped me upload the game onto the Internet because I had trouble sharing my Scratch project on the Scratch website. He helped insert some sounds into the game. He helped give ideas what to write in this report.

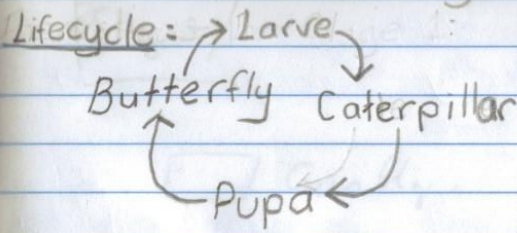
If you have any questions about my project or game, please email me:

ajcgenson@gmail.com

Appendix

The appendix is about the planning that I did for my game and my report. I did not follow all the plans that I thought of, but I followed majority of them. I may program my other ideas in my plan next year.

The Life Cycle Of A Butterfly



Stages:

- 1: Larve
- 2: Caterpillar
- 3: Pupa
- 4: Butterfly

Purpose:

To teach kids the life cycle of a butterfly and what happens in each stage of the cycle.

Characters:

- Larve
- Caterpillar
- Pupa
- Butterfly
- Birds/Spiders
- Humans

Instructions:

Stage 1: The Larve:

In this stage you are a butterfly and you have to find a safe space place on a leaf. When you are ready, press the space bar and a bird will swoop down looking for

Stage 2: The Caterpillar.

In this stage, you are a caterpillar. You have to eat leaves to grow bigger. You will also have to dodge predators like birds and spiders. When your caterpillar grow to 5 cm wide and 1cm tall, you have complete stage 2.

The eggs, if it finds the eggs you lose if it does

Stage 4: The butterfly
Congratulations! You are now a butterfly. To complete the game you have to collect nectar from 5 flowers, but watch out for your predators.

Report

Aim/Purpose: To teach young children about the lifecycle of a butterfly through a fun way which is a game.

Requirements: A computer with an internet browser, the link to the game. and

Instructions: Press the green flag in the top right corner. Part 1: Lay the egg in a safe place by using the ~~egg~~ arrow keys to move the butterfly then press the space bar to lay the egg. Part 2: Use the arrow keys to move onto a leaf then press the E key to eat. then the caterpillar will go into its chrysalis. Part 3: Now you have to run away from a bird for 30 seconds using the arrow keys to move. Quiz part 1: Now you have to drag the pictures into the right order to make a lifecycle. Quiz part 2: Now you have to answer multi-choice questions by clicking on the answer.

stage 1
Code: I coded the movement ^{of the butterfly and caterpillar} by using sensing blocks that if any arrow key was pressed, it would change the sprite's x/y by -5 or 5. I coded how the egg was laid by making ghost sprites and sensing if the egg was on the right sprite.

Stage 2: I coded how the caterpillar ate by if the caterpillar was touching the right ghost sprite and the ~~key button~~ (E) is pressed, the caterpillar will change in size by 2.5. When the caterpillar's size ≥ 30 it will go to its chrysalis.

Stage 3: I made the parrot chase the butterfly by making it go to the butterfly and then continue doing it for 30 seconds.

Acknowledgments: My dad for helping me to fix glitches in the code. Sound button which I go 3 sounds from.