Scratch Programming

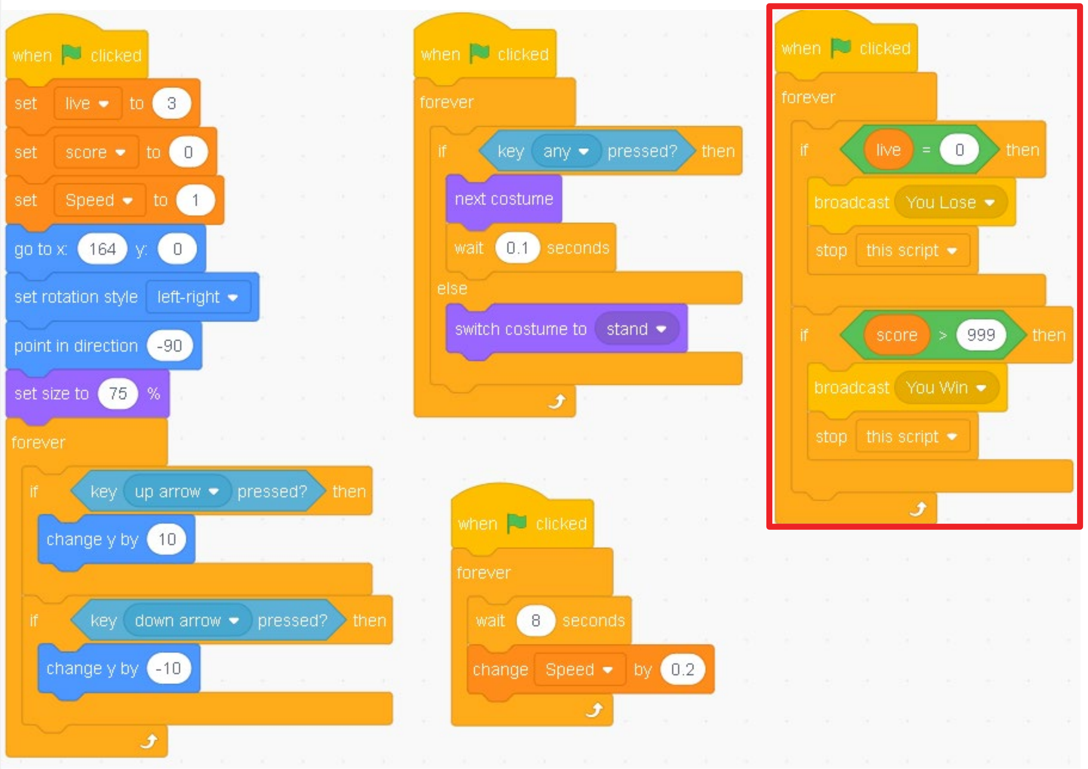
Lesson 2-1

Whack-a-mole Game

Presented by Advaspire Team

Review - Set Winning and Losing Condition

Script:



```
when [flag] clicked
set live to 3
set score to 0
set Speed to 1
go to x: 164 y: 0
set rotation style left-right
point in direction -90
set size to 75 %
forever
    if key up arrow pressed? then
        change y by 10
    if key down arrow pressed? then
        change y by -10

when [flag] clicked
forever
    if key any pressed? then
        next costume
        wait 0.1 seconds
    else
        switch costume to stand

when [flag] clicked
forever
    wait 8 seconds
    change Speed by 0.2

when [flag] clicked
forever
    if live = 0 then
        broadcast You Lose
        stop this script
    if score > 999 then
        broadcast You Win
        stop this script
```

Let's set the winning and losing conditions:

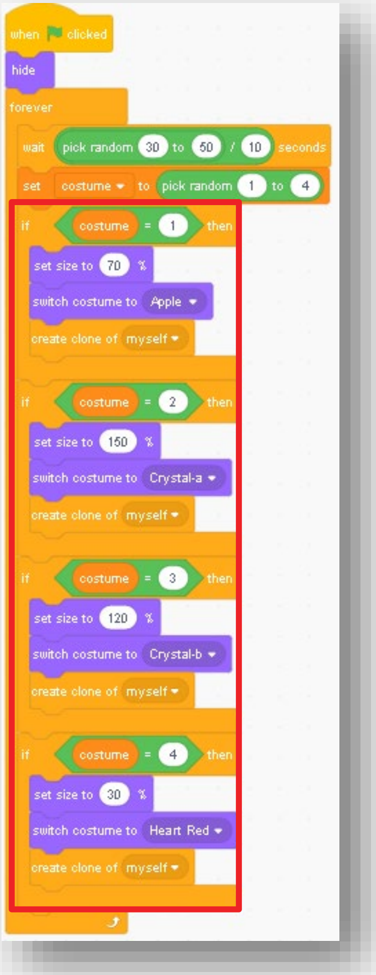
If Score > 999 (if you score more than 999 points):

You Win

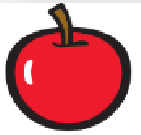
If live = 0 (if you have no more live):

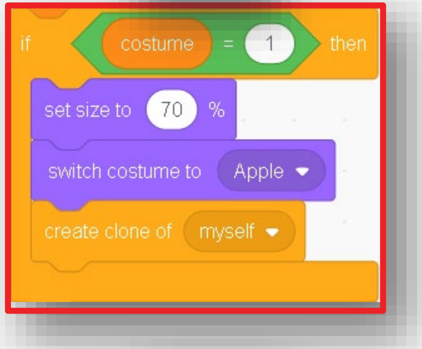
You Lose.

Review - Random Elements to be created

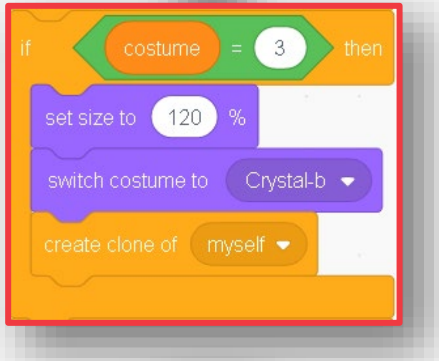


```
when 🏴 clicked
hide
forever
  wait (pick random 30 to 50) / 10 seconds
  set costume to pick random 1 to 4
  if costume = 1 then
    set size to 70 %
    switch costume to Apple
    create clone of myself
  if costume = 2 then
    set size to 150 %
    switch costume to Crystal-a
    create clone of myself
  if costume = 3 then
    set size to 120 %
    switch costume to Crystal-b
    create clone of myself
  if costume = 4 then
    set size to 30 %
    switch costume to Heart Red
    create clone of myself
```

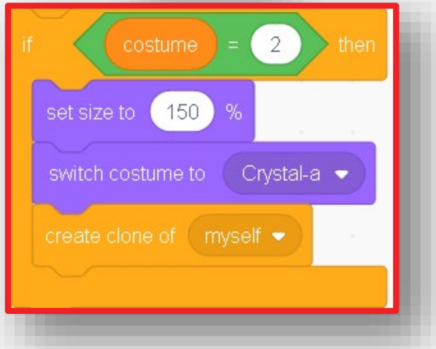




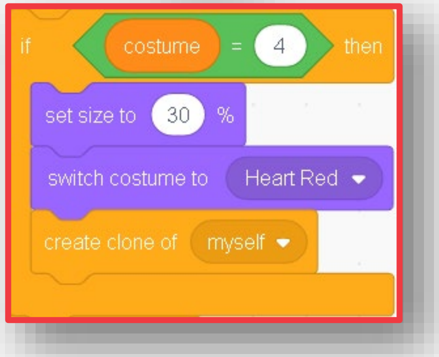
```
if costume = 1 then
  set size to 70 %
  switch costume to Apple
  create clone of myself
```



```
if costume = 3 then
  set size to 120 %
  switch costume to Crystal-b
  create clone of myself
```



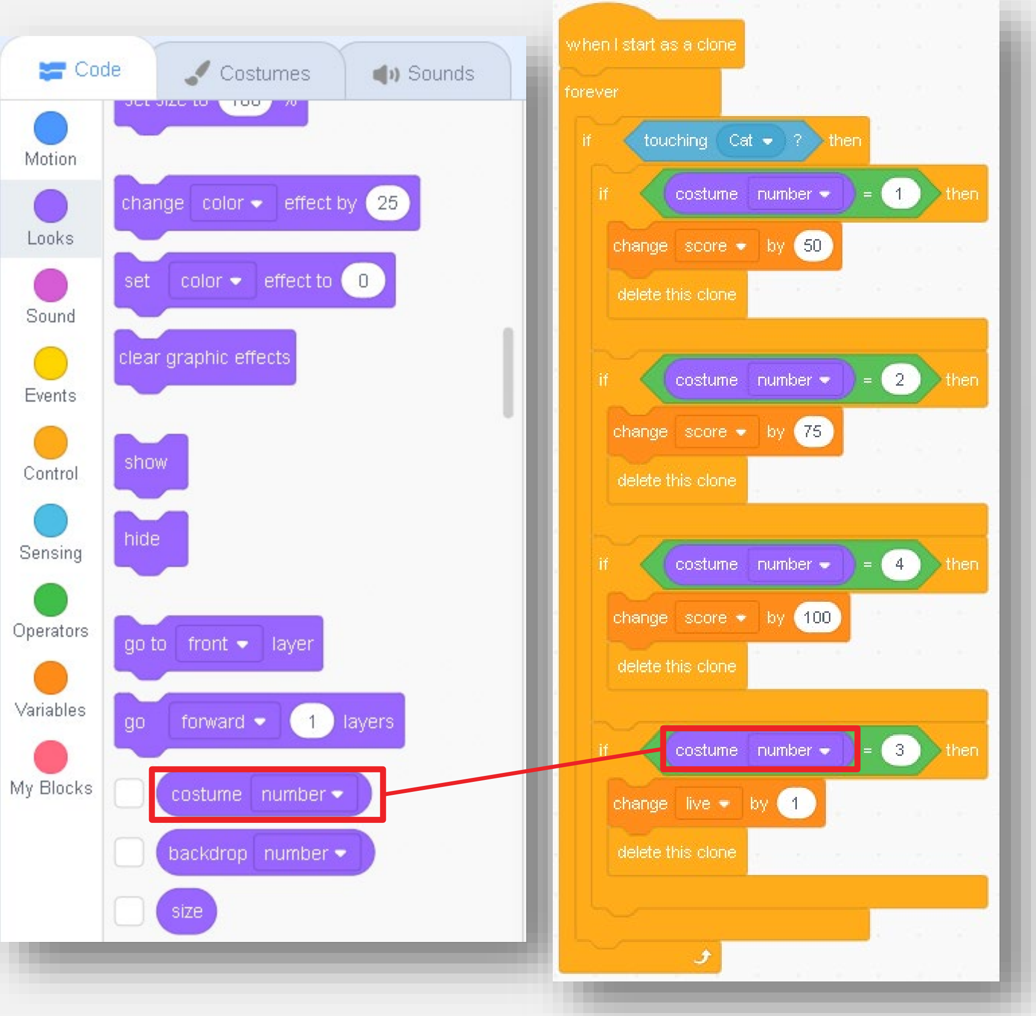
```
if costume = 2 then
  set size to 150 %
  switch costume to Crystal-a
  create clone of myself
```



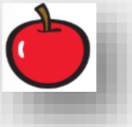
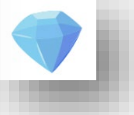
```
if costume = 4 then
  set size to 30 %
  switch costume to Heart Red
  create clone of myself
```

Then add if statement for other elements as well.

Effects when touching Cat



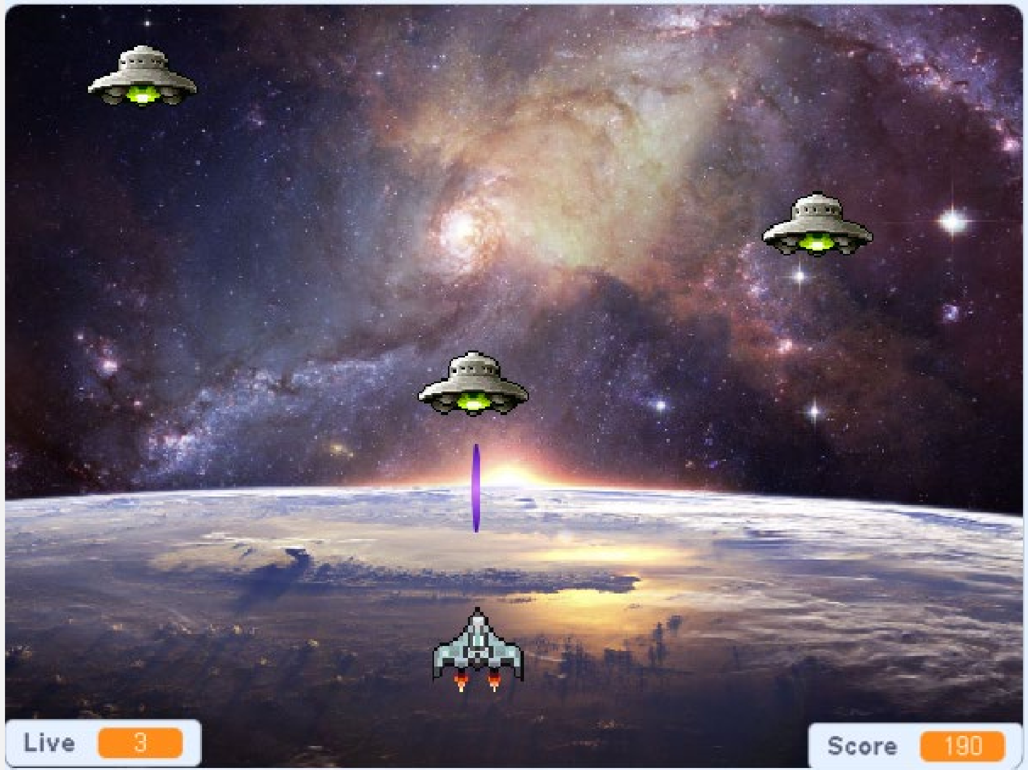
```
when I start as a clone
forever
    if touching Cat ? then
        if costume number = 1 then
            change score by 50
            delete this clone
        if costume number = 2 then
            change score by 75
            delete this clone
        if costume number = 4 then
            change score by 100
            delete this clone
        if costume number = 3 then
            change live by 1
            delete this clone
```

When touching cat, it's not just adding 50 points to the score only, it will depend on different element touched to give out different effects accordingly.

🍎	Apple: +50 points
💎	Crystal-a: +75 points
🔮	Crystal-b: +100 points
❤	Heart Red: +1 live

Lesson 1-12 - Mission



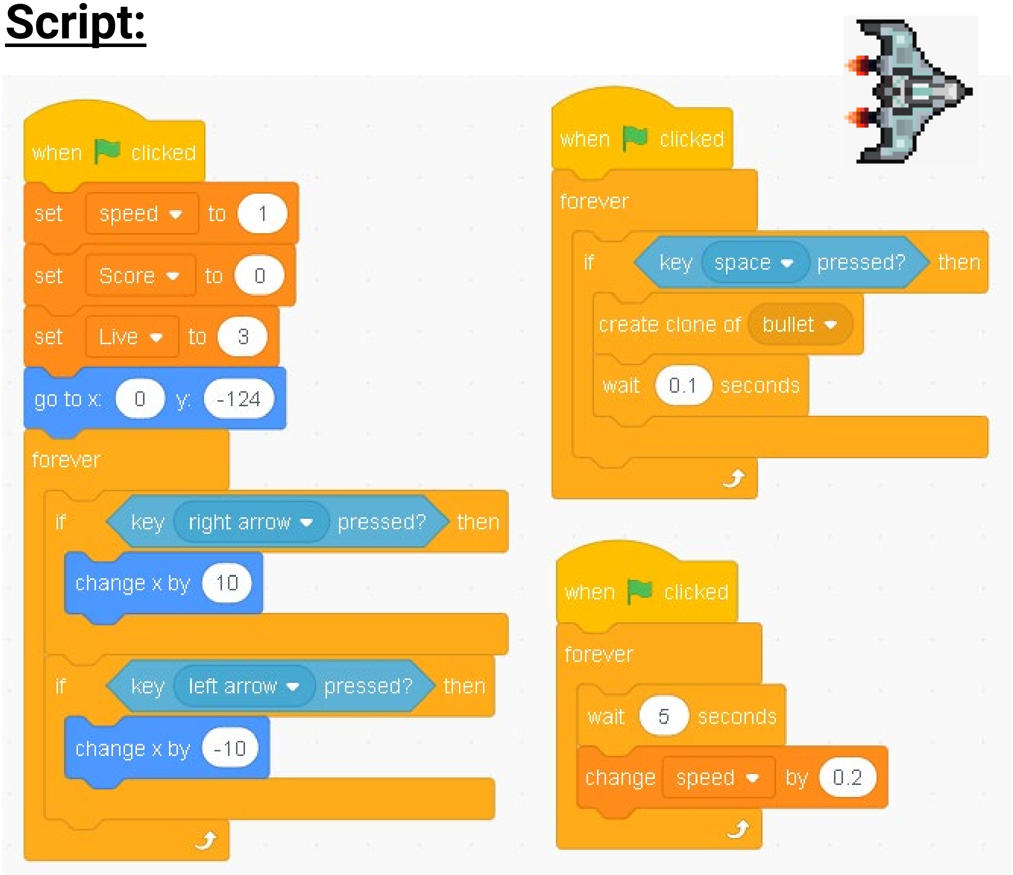
Create a space game that you have a spaceship that can shoot to defend the attack from alien.

You are able to shoot a bullet, and the only way to defend your earth is to clear all the UFO. You will have 3 lives at start and each UFO that goes through you will take 1 live from you.

The sprites can be downloaded.

Lesson 1-12 - Mission

Script:



```
when 🏴 clicked
set speed ▾ to 1
set Score ▾ to 0
set Live ▾ to 3
go to x: 0 y: -124
forever
    if key right arrow ▾ pressed? then
        change x by 10
    if key left arrow ▾ pressed? then
        change x by -10
```

```
when 🏴 clicked
forever
    if key space ▾ pressed? then
        create clone of bullet ▾
        wait 0.1 seconds
```

```
when 🏴 clicked
forever
    wait 5 seconds
    change speed ▾ by 0.2
```

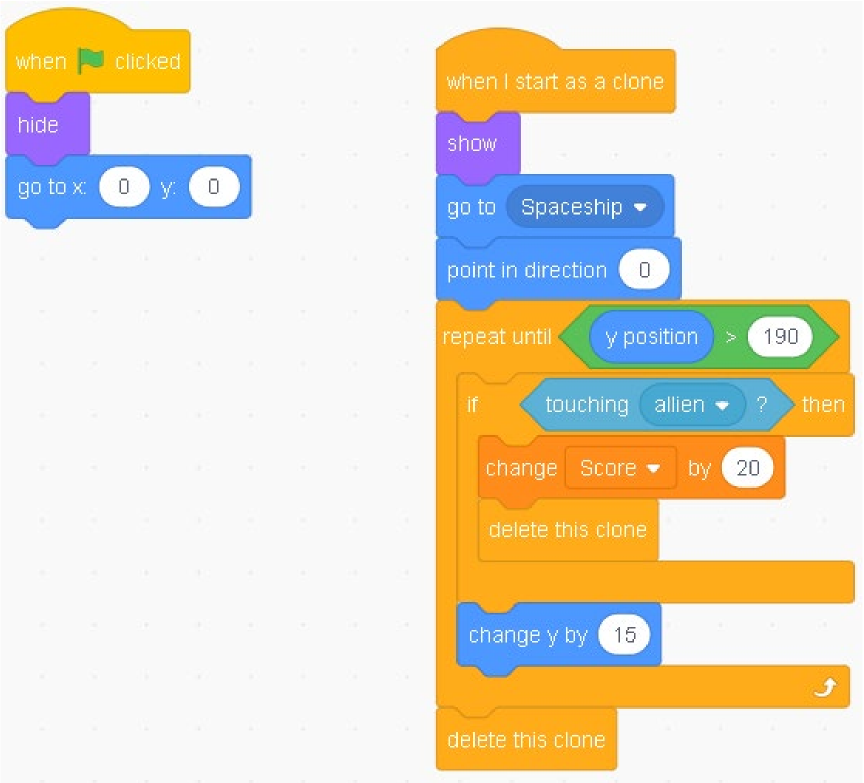
we only can control our spaceship to move left and right only, so no need to add up-down control.

And I don’t want my spaceship to continuously shoot the bullet, I will set the interval of 1 second to create the bullet, so the bullet will only be created after 0.1 second even the player is holding the <space> key all the time.

Therefore, we need to separate the control and make it in parallel program so it won’t interrupt our movement even when we are pressing <space> key.

Lesson 1-12 - Mission

Script:



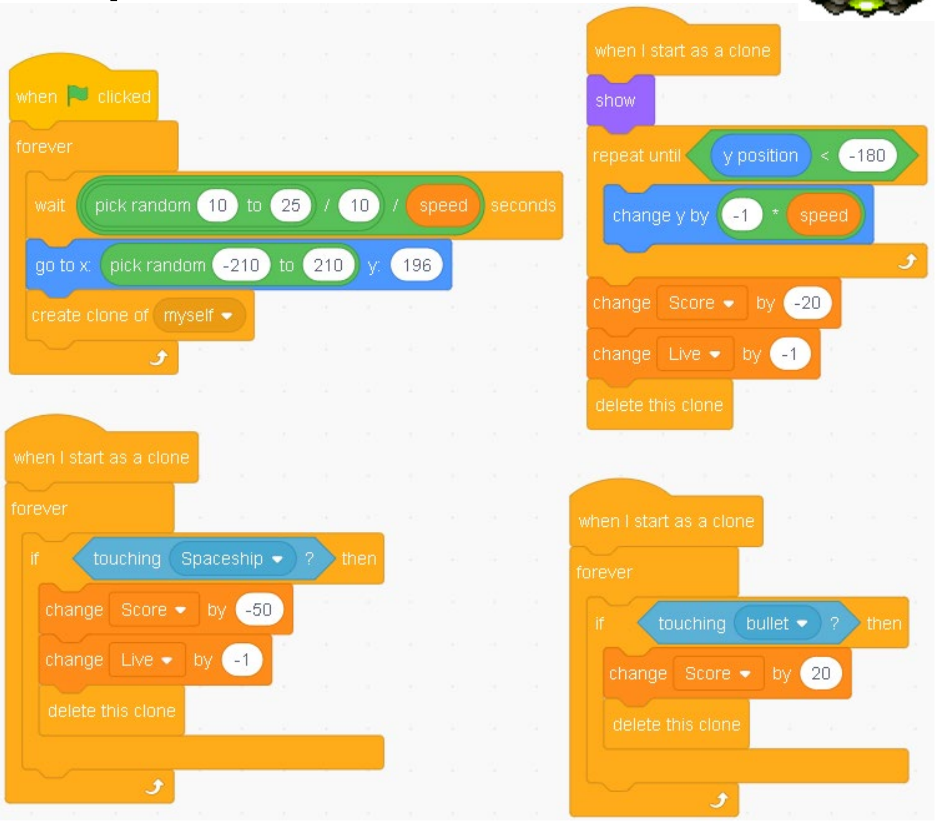
```
when 🏴 clicked
hide
go to x: 0 y: 0

when I start as a clone
show
go to Spaceship ▾
point in direction 0
repeat until < (y position) > 190 >
    if < touching allien ▾ ? > then
        change Score ▾ by 20
        delete this clone
    change y by 15
delete this clone
```

I drew my bullet that faces position to the right (90°), therefore when it starts as a clone, it will always go to the position of spaceship and point towards 0° (upward), then move upward until it's y position is more than 190 (like shooting upward).

But take note that if it touches alien, it will disappear and add the score by 20.

Lesson 1-12 - Mission

Script:



```
when [flag] clicked
forever
    wait ((((pick random (10) to (25)) / (10)) / (speed)) seconds
    go to x: (pick random (-210) to (210)) y: (196)
    create clone of [myself ▾]
end

when I start as a clone
forever
    if <touching [Spaceship ▾] ?> then
        change [Score ▾] by (-50)
        change [Live ▾] by (-1)
        delete this clone
    end
end

when I start as a clone
show
repeat until <(y position) < (-180)>
    change y by ((-1) * (speed))
end
change [Score ▾] by (-20)
change [Live ▾] by (-1)
delete this clone

when I start as a clone
forever
    if <touching [bullet ▾] ?> then
        change [Score ▾] by (20)
        delete this clone
    end
end
```

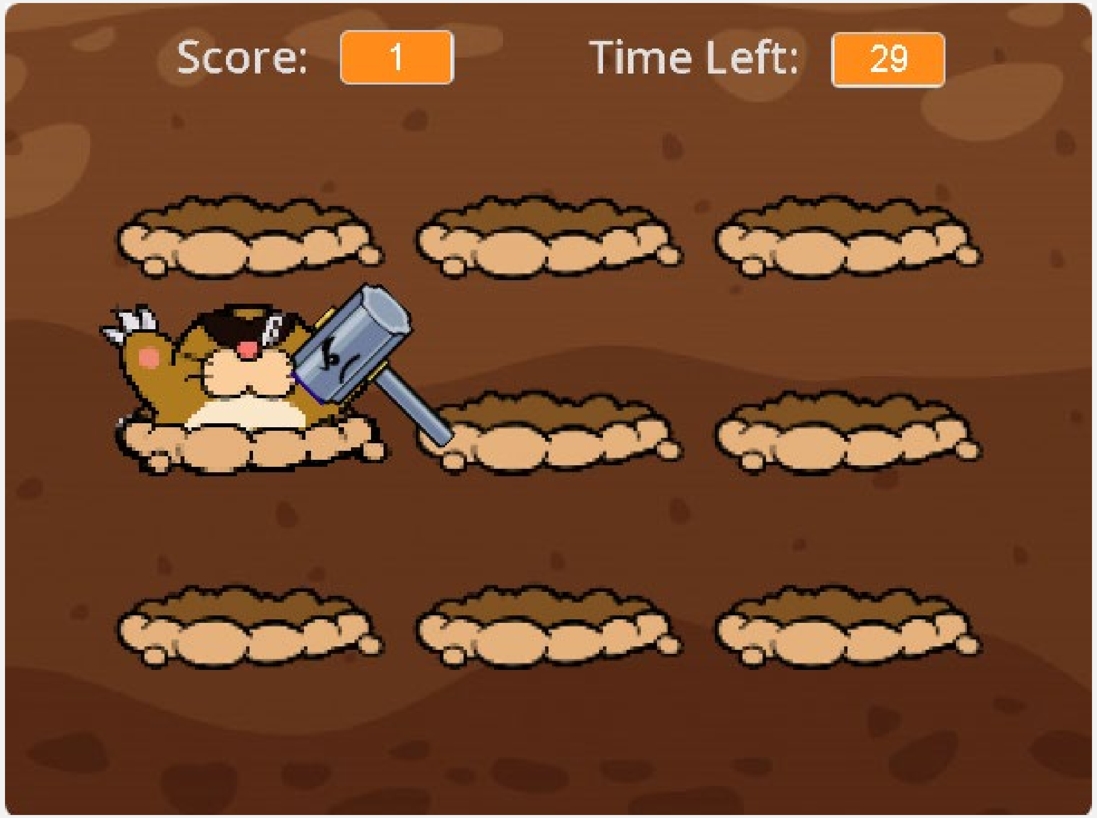
As the speed going faster throughout the time, you will see less UFO coming from the top but each speed are faster than before.

To make the number of UFO spawn to be consistent, I divide the waiting time to spawn by the speed, so the faster the speed, the shorter the time to spawn the UFO.

If the UFO touches spaceship or passes by it, it will reduce the live by 1 and deduct scores.

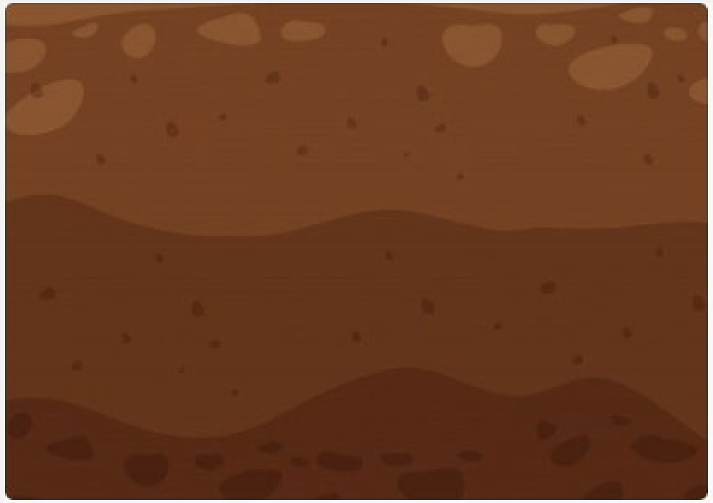
If the bullet successfully hit the UFO, it will destroy it and score 20 points.

Lesson 2-1 – Whack-a-Mole Game



Today we are going to build a “Whack-a-mole” game.

Lesson 2-1 – Whack-a-Mole Game

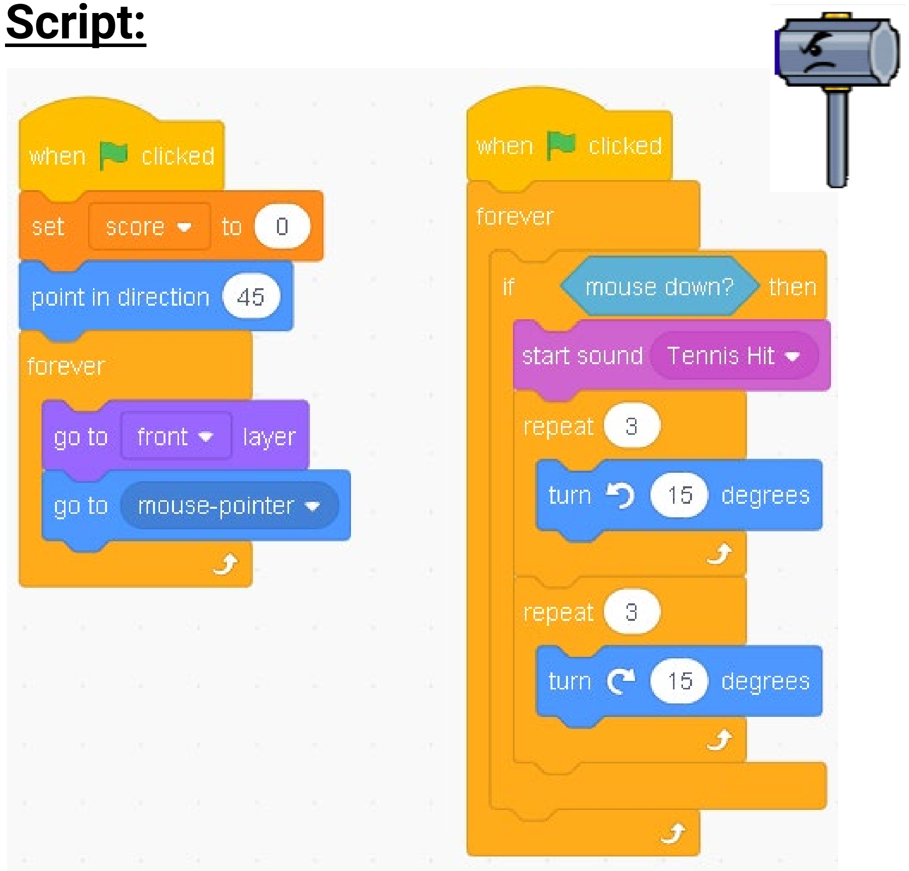


These are the sprites we are going to use for today.

You can download them from our Slack or you can google search with these keywords: 1. soil cartoon backdrop, 2. mole sprites, 3. hammer sprite

Lesson 2-1 – Program the Hammer

Script:



```
when 🏴 clicked
set score ▾ to 0
point in direction 45
forever
    go to front ▾ layer
    go to mouse-pointer ▾

when 🏴 clicked
forever
    if mouse down? then
        start sound Tennis Hit ▾
        repeat 3
            turn ↺ 15 degrees
        repeat 3
            turn ↻ 15 degrees
```

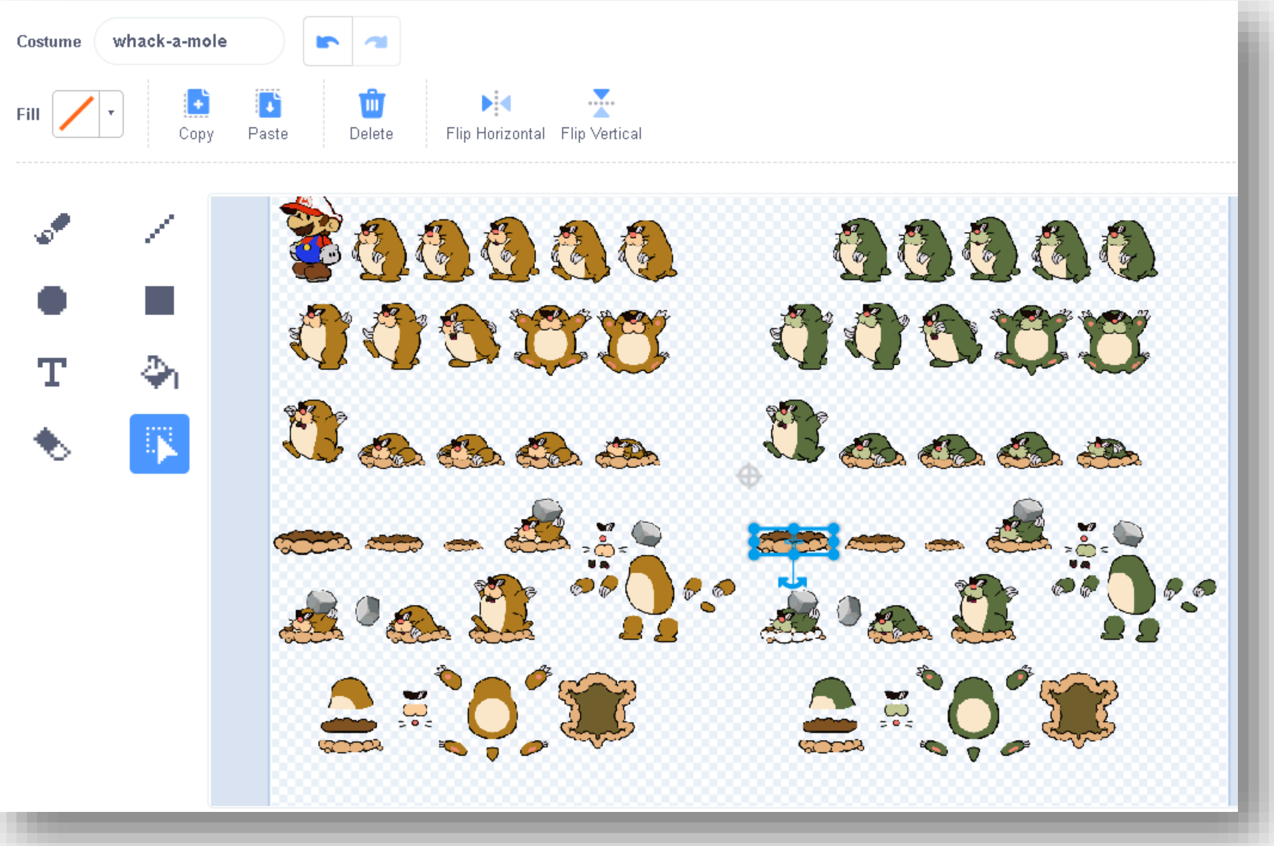
Let’s start with the score of 0.

Then we will have some functions for this hammer.

1. The hammer will always go to our mouse-pointer, and must always be in front of the moles and holes.
2. When we click on the screen, it will smash, we will use turn to make the smash action.
3. Remember to add a sound effect for the smash action.

Once done, you can press start to try your hammer and see if it’s working.

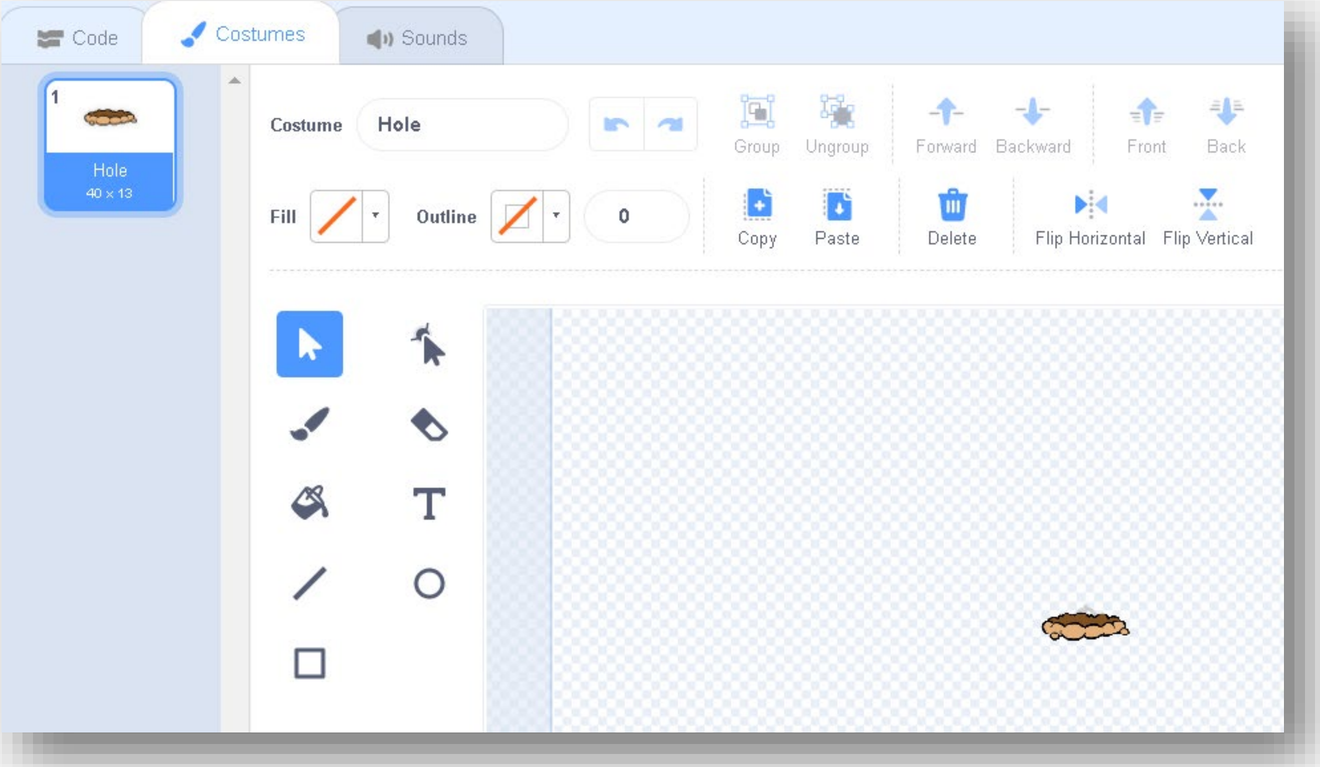
Lesson 2-1 – Import Holes



Now we need to add in 9 holes first.

And in the whack-a-mole sprite, we only need the hole, we will delete other things inside the sprites.

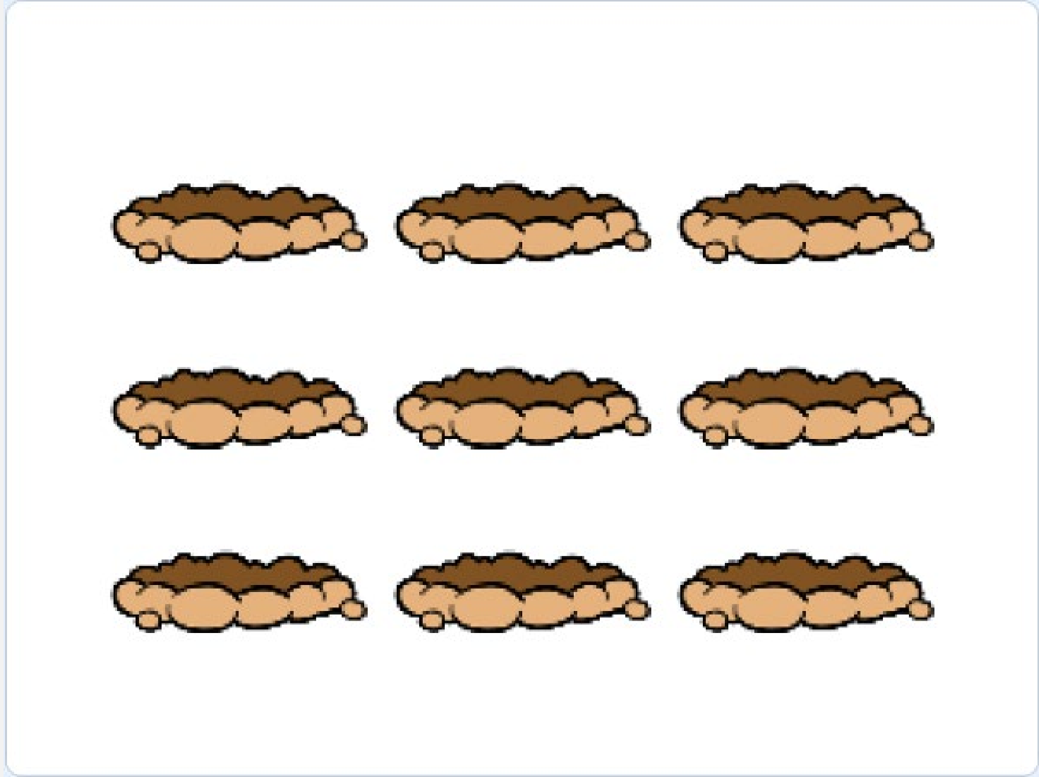
Lesson 2-1 – Holes



Just select other thing with the “select” tool (this process is done on the Bitmap, do not convert to vector before you delete other things) and press “delete” key to remove other thing.

Once you removed everything, you will have a hole left, and this is what we want.

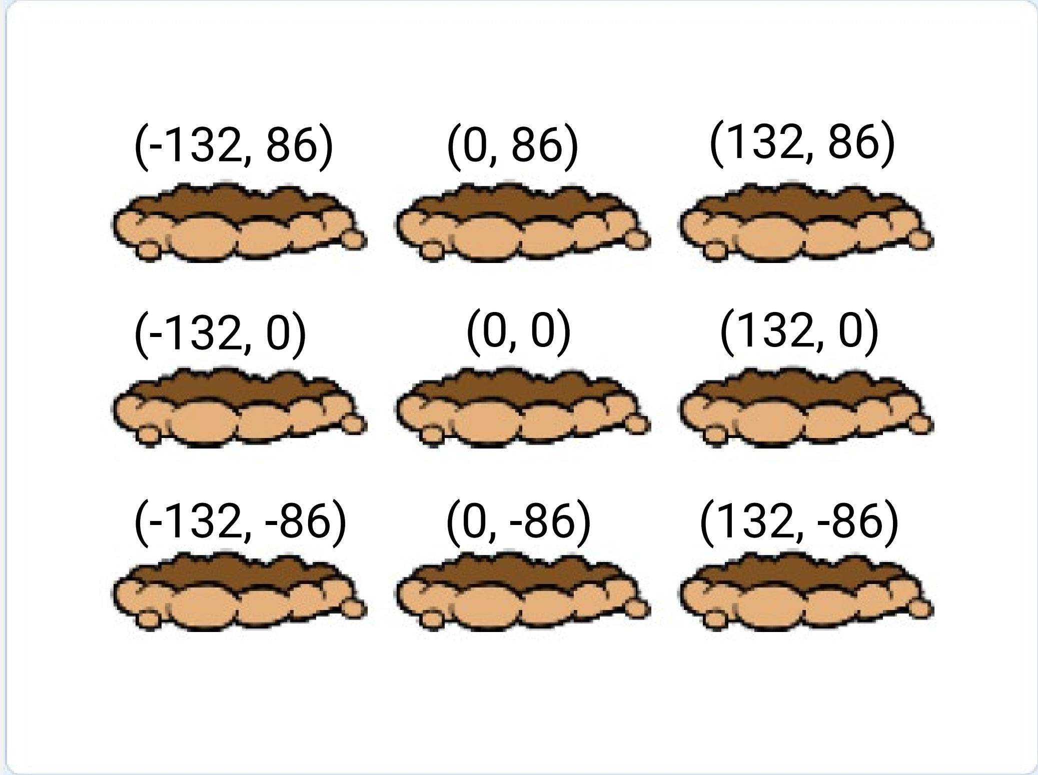
Lesson 2-1 – Program the Holes



Now we want to place our holes into these positions.

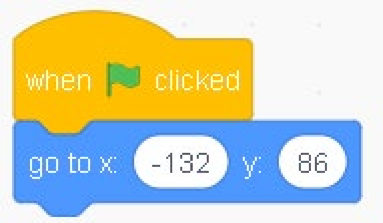
But the holes are too small, so we need to set the size to 300%.

Lesson 2-1 – Duplicate the Holes

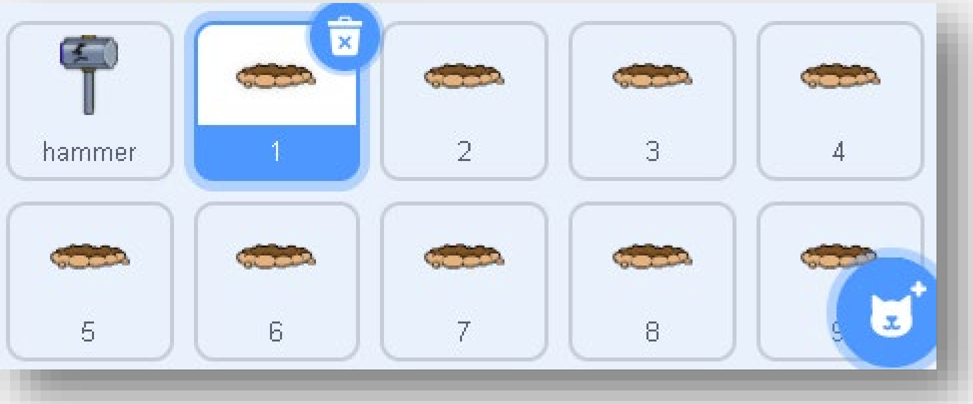


To make everything to align properly, we will set all the holes position to specific locations (as shown at left).

Lesson 2-1 – Program the Holes



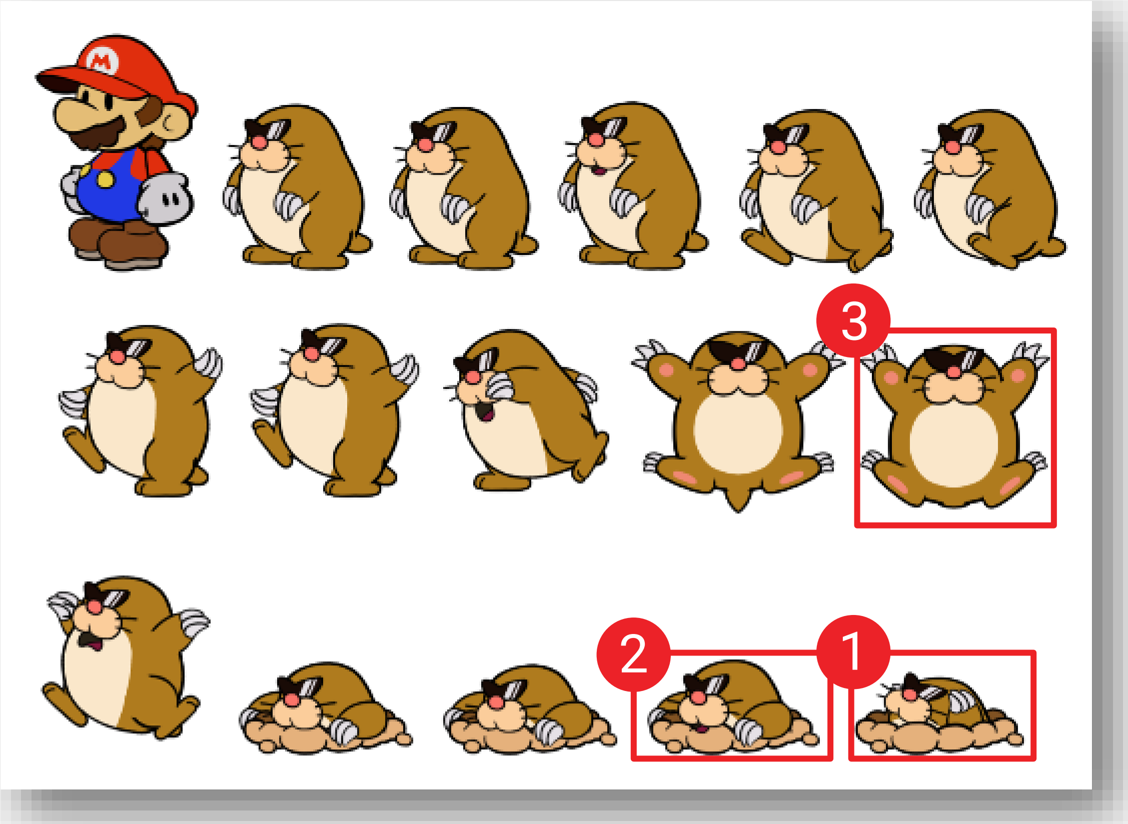
```
when 🏳 clicked
go to x: -132 y: 86
```



Let's duplicate another 8 holes and set the starting position (each of them) according to the previous slides.

Rename the hole to 1-9 number, as we are going to use it later.

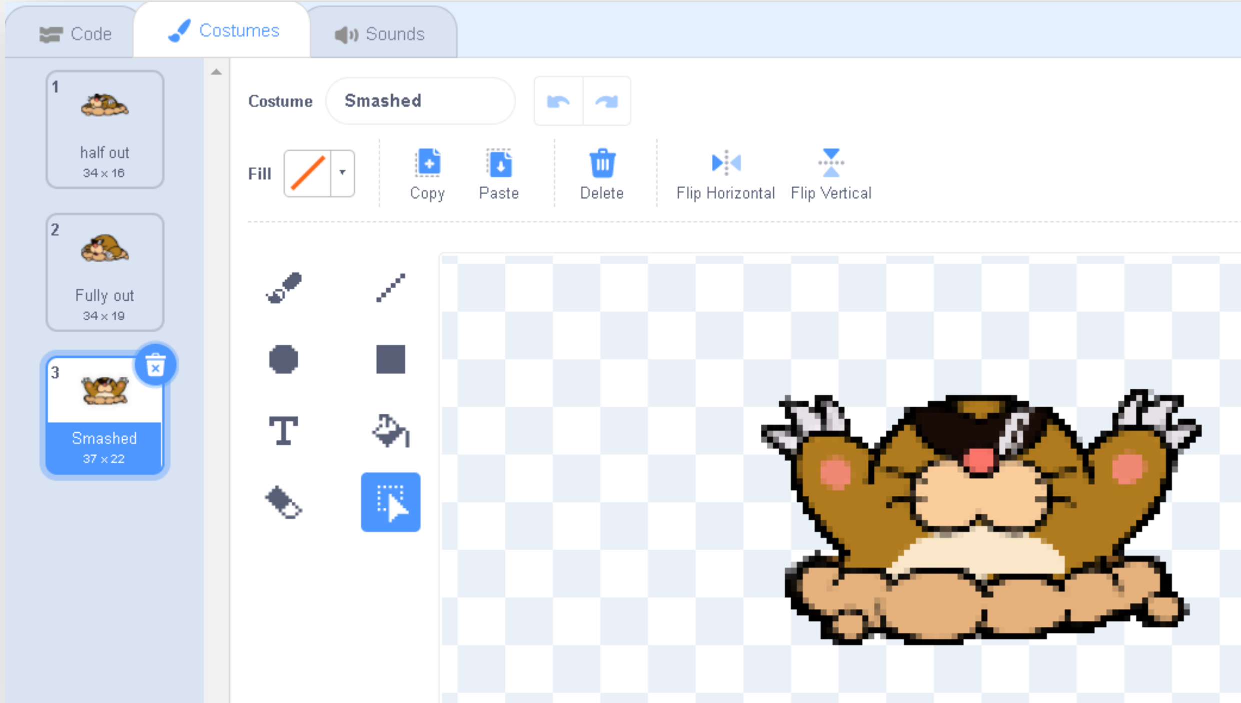
Lesson 2-1 – Add the Mole



We just need these 3 costumes:

1. **Half out**
2. **Fully out**
3. **Smashed by the hammer**

Lesson 2-1 – Edit the costumes (Mole)

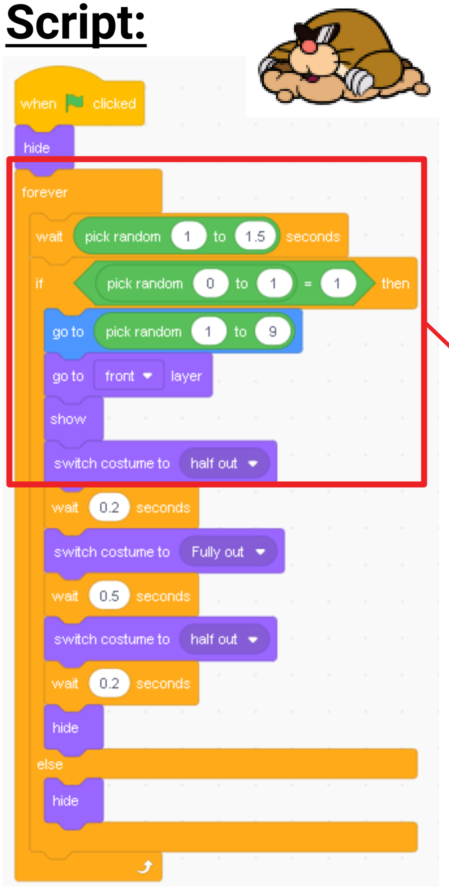


For first 2 costumes, just do like what we did to the hole, but for the costume 3 (smashed), we need to cut-off half body and add in the holes to it.

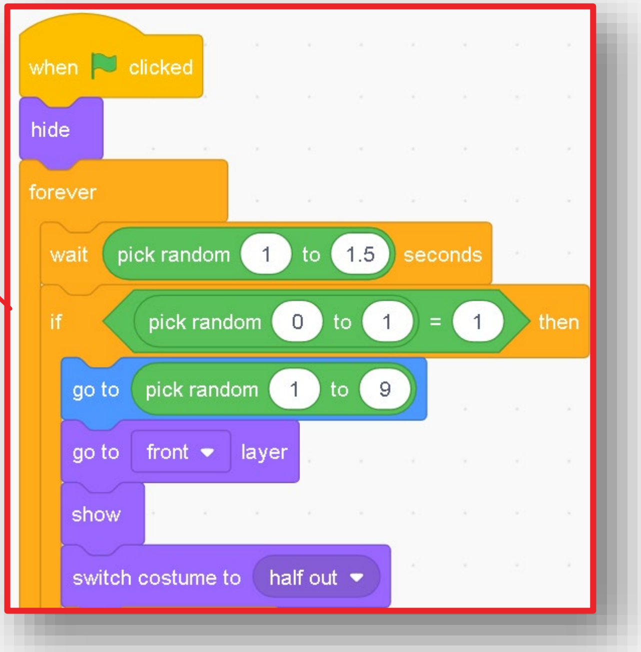
Everyone Can Be Robotic Master.

Lesson 2-1 – Program the mole

Script:



```
when ⚑ clicked
hide
forever
    wait pick random 1 to 1.5 seconds
    if pick random 0 to 1 = 1 then
        go to pick random 1 to 9
        go to front ▾ layer
        show
        switch costume to half out ▾
        wait 0.2 seconds
        switch costume to Fully out ▾
        wait 0.5 seconds
        switch costume to half out ▾
        wait 0.2 seconds
        hide
    else
        hide
```



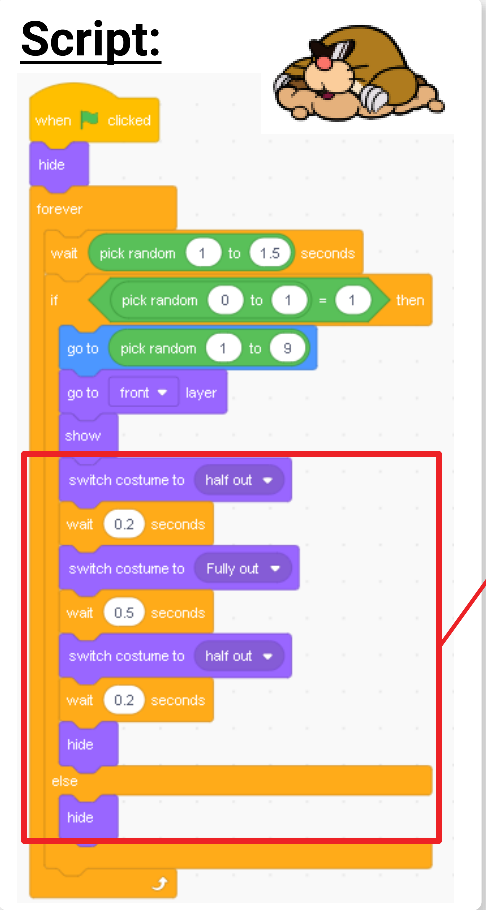
```
when ⚑ clicked
hide
forever
    wait pick random 1 to 1.5 seconds
    if pick random 0 to 1 = 1 then
        go to pick random 1 to 9
        go to front ▾ layer
        show
        switch costume to half out ▾
```

Let's do a wait for randomly (1 to 1.5 seconds) make the mole to come out from random holes 1-9 (use "go to position" block).

And it will move to that specific position and go to front layer, then show itself.

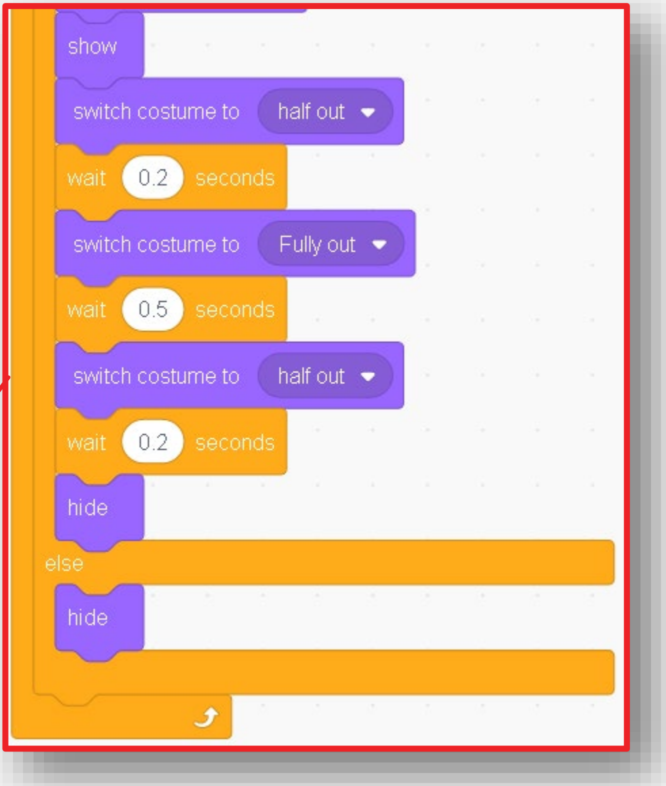
You will notice that I have put an if statement that if <pick random 0 to 1> equals to 1, only the mole will come out, otherwise it remains hidden.

Lesson 2-1 – Program the mole



Script:

```
when 🏁 clicked
hide
forever
    wait (pick random 1 to 1.5) seconds
    if <(pick random 0 to 1) = 1> then
        go to (pick random 1 to 9)
        go to front layer
        show
        switch costume to half out
        wait 0.2 seconds
        switch costume to Fully out
        wait 0.5 seconds
        switch costume to half out
        wait 0.2 seconds
        hide
    else
        hide
```



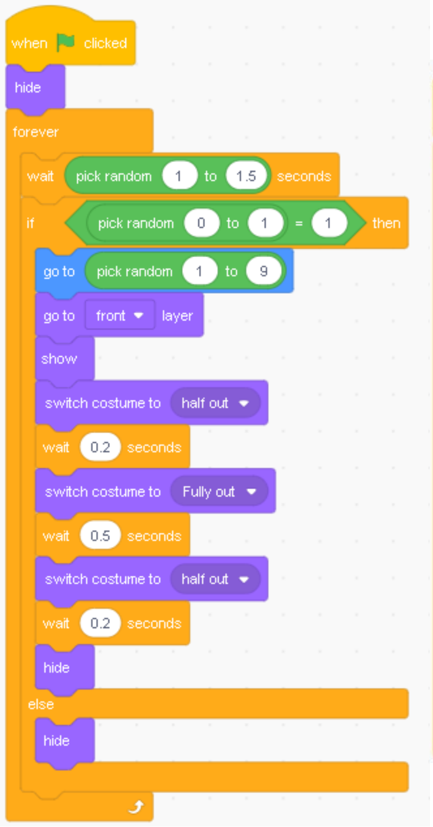
```
        show
        switch costume to half out
        wait 0.2 seconds
        switch costume to Fully out
        wait 0.5 seconds
        switch costume to half out
        wait 0.2 seconds
        hide
    else
        hide
```

Then we make an animation to make the mole to come out from the hole, then wait for 0.5 seconds, then move back to the hole.

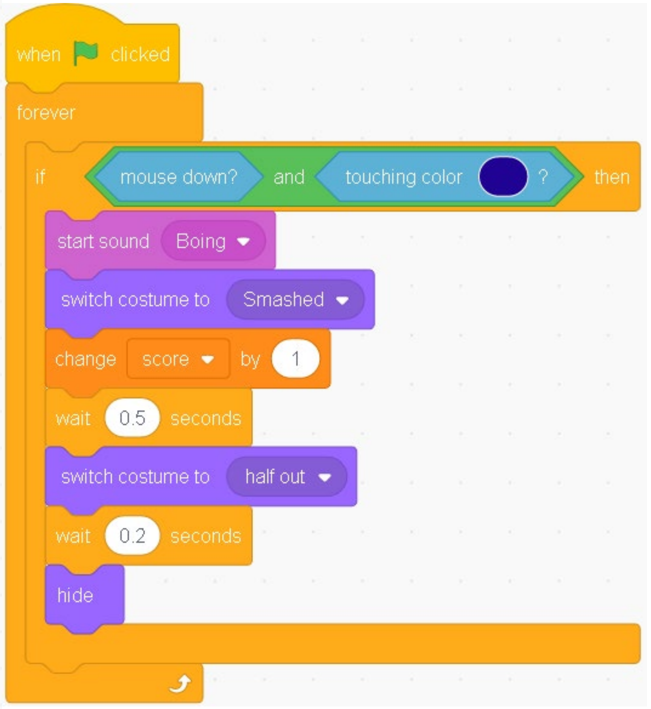
And the mole has 50% of possibility to come out, it has another 50% remain hidden underground.

Lesson 2-1 – Program the mole (Smashed)

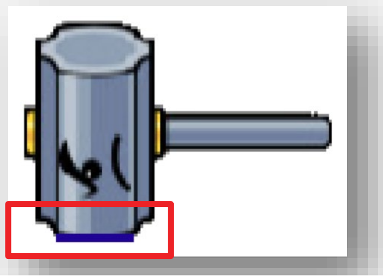
Script:



```
when ⚑ clicked
hide
forever
    wait (pick random 1 to 1.5) seconds
    if <(pick random 0 to 1) = 1> then
        go to (pick random 1 to 9)
        go to front ▾ layer
        show
        switch costume to half out ▾
        wait 0.2 seconds
        switch costume to Fully out ▾
        wait 0.5 seconds
        switch costume to half out ▾
        wait 0.2 seconds
        hide
    else
        hide
```



```
when ⚑ clicked
forever
    if <<mouse down?> and <touching color ● ?>> then
        start sound Boing ▾
        switch costume to Smashed ▾
        change score ▾ by 1
        wait 0.5 seconds
        switch costume to half out ▾
        wait 0.2 seconds
        hide
```

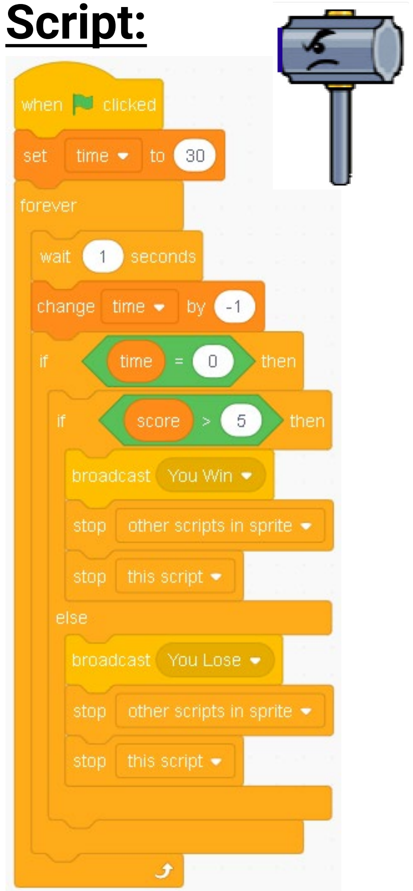


I have made the front of the hammer dark blue color. Only if the player uses the hammer to smash on the mole, it will score.

Once the mole gets smashed, it will change to 3rd costume (smashed), and go back into the hole. I add in the sound effect when it gets hit.

Lesson 2-1 – Add timer to Hammer

Script:



```
when 🏳 clicked
set time ▾ to 30
forever
    wait 1 seconds
    change time ▾ by -1
    if time = 0 then
        if score > 5 then
            broadcast You Win ▾
            stop other scripts in sprite ▾
            stop this script ▾
        else
            broadcast You Lose ▾
            stop other scripts in sprite ▾
            stop this script ▾
```

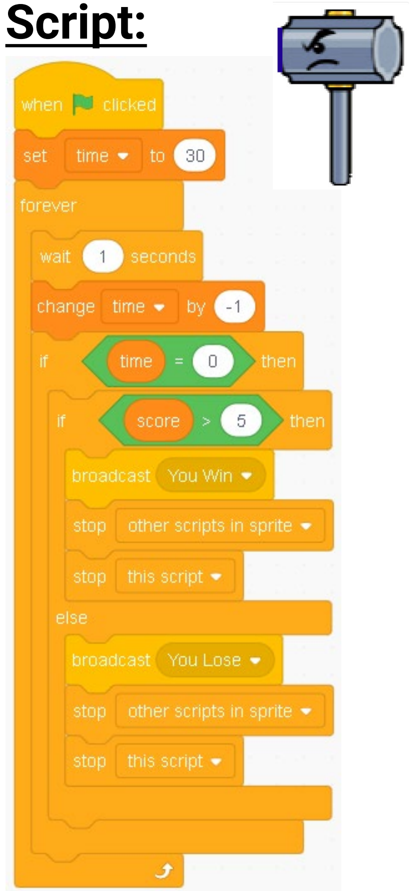
Let's set the game play time to 30 seconds.

And the game rules are:

1. **Your game play only last for 30 seconds.**
2. **Once 30 seconds have passed, it will check the score to determine if you win or lose.**
3. **If you score more than 5 (each success smash will earn you 1 point), you will win the game, you lose otherwise.**

Lesson 2-1 – Variable

Script:



```
when 🏳 clicked
set time ▾ to 30
forever
    wait 1 seconds
    change time ▾ by -1
    if time = 0 then
        if score > 5 then
            broadcast You Win ▾
            stop other scripts in sprite ▾
            stop this script ▾
        else
            broadcast You Lose ▾
            stop other scripts in sprite ▾
            stop this script ▾
```

So now you will have 2 variables:

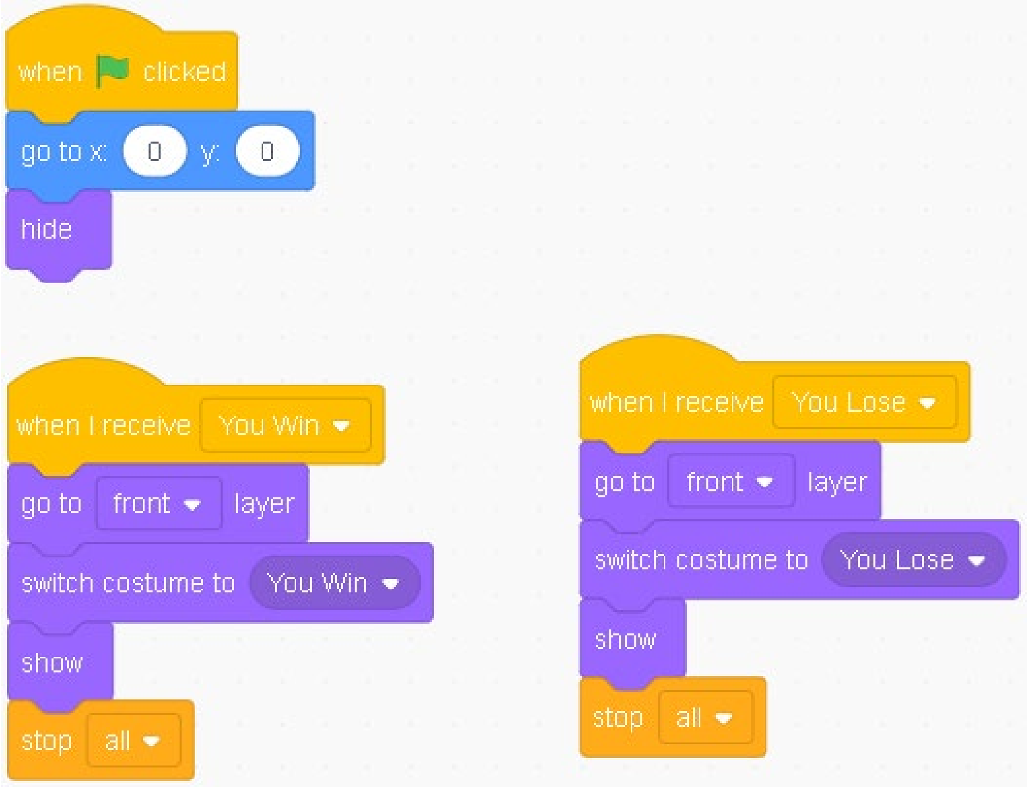
1. **Time = 30 seconds**
2. **Score = 0 (On start)**

Add the broadcast for "You Win" & "You Lose" at the end of 30 seconds.

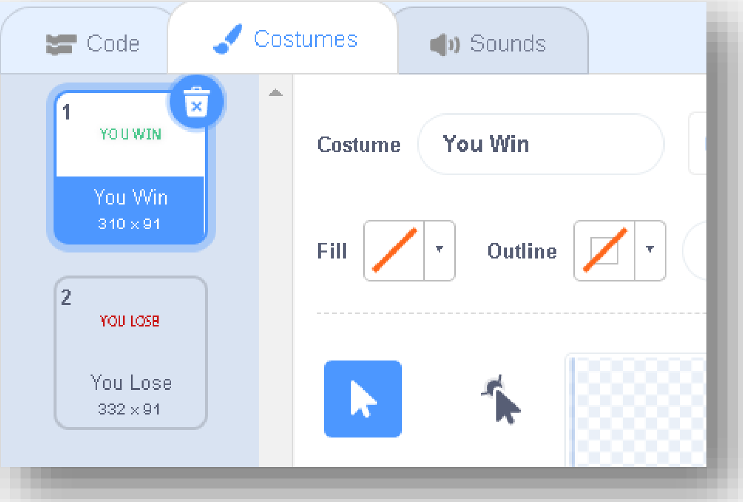
Remember to stop other scripts and this script at the end.

Lesson 2-1 – Broadcast You Win & You Lose

Script:



```
when 🏁 clicked
go to x: 0 y: 0
hide

when I receive [You Win ▾]
go to [front ▾] layer
switch costume to [You Win ▾]
show
stop [all ▾]

when I receive [You Lose ▾]
go to [front ▾] layer
switch costume to [You Lose ▾]
show
stop [all ▾]
```



1 YOU WIN
You Win
310 x 91

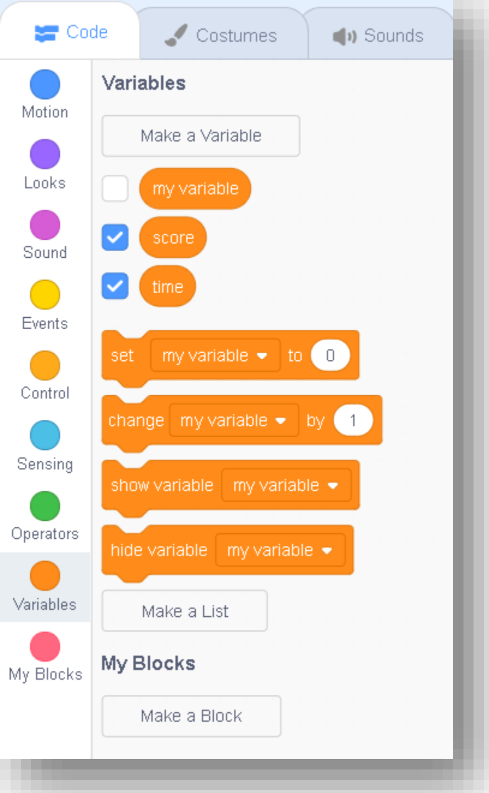
2 YOU LOSE
You Lose
332 x 91

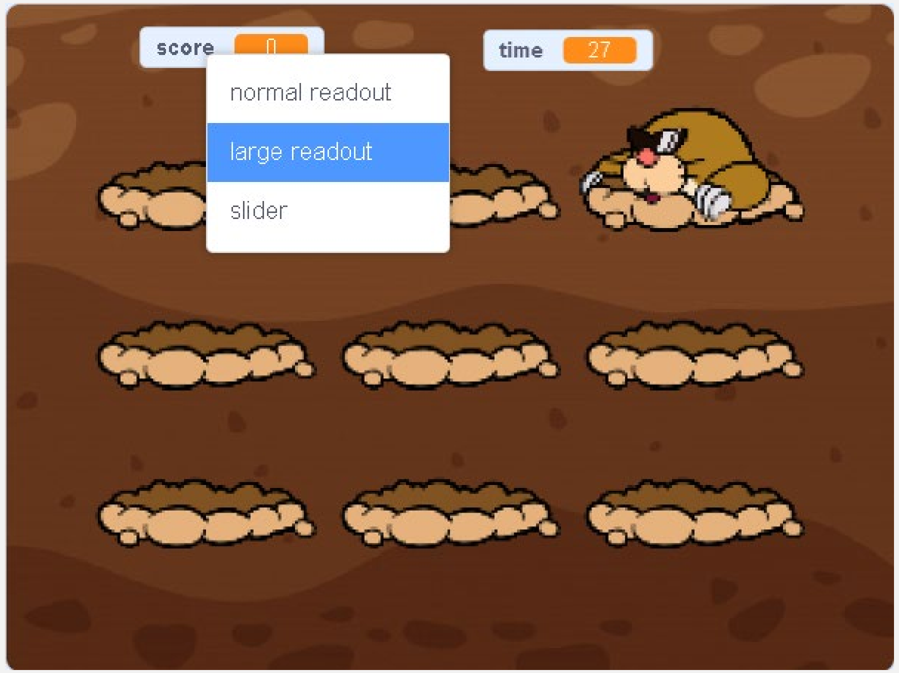
Costume: You Win

Create a sprite to show the words of "You Win" & "You Lose".

Make sure to make it go to front layer before you show.

Lesson 2-1 – Set up the Game view

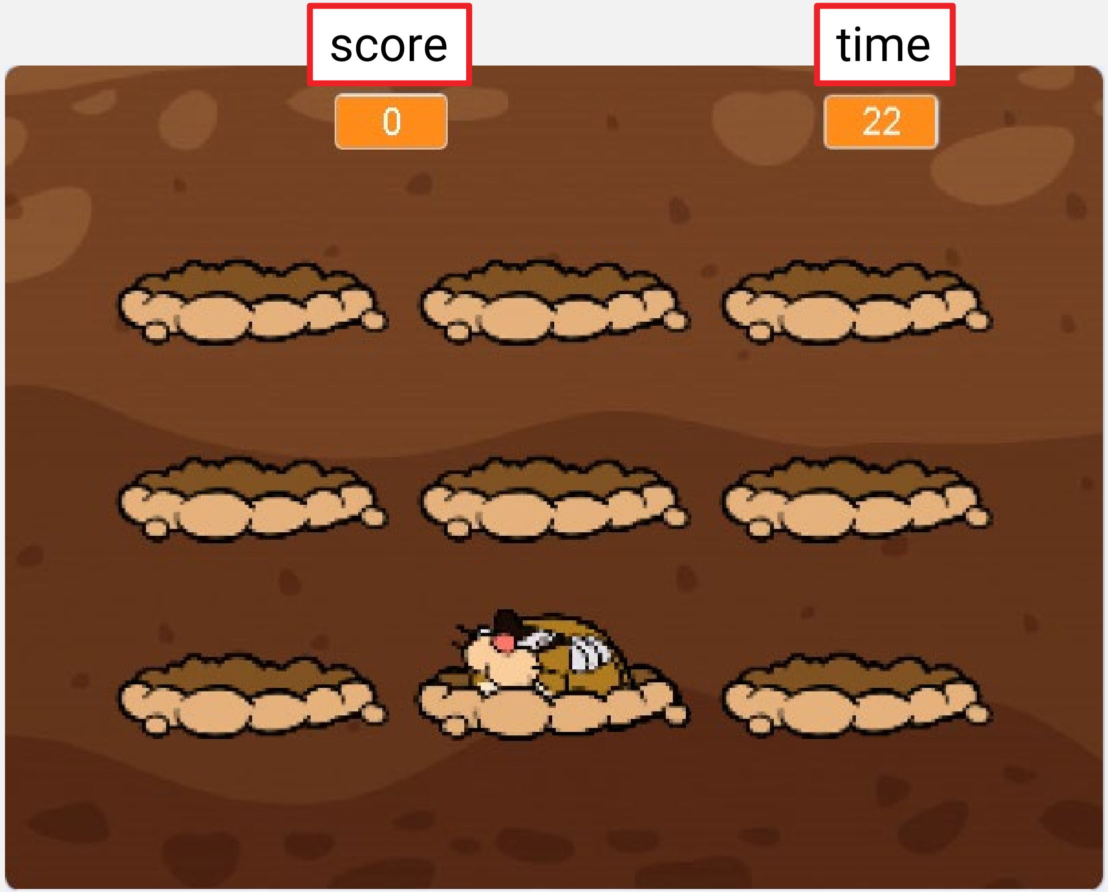




Show your variable.

And right click on your variable, change it to large readout.

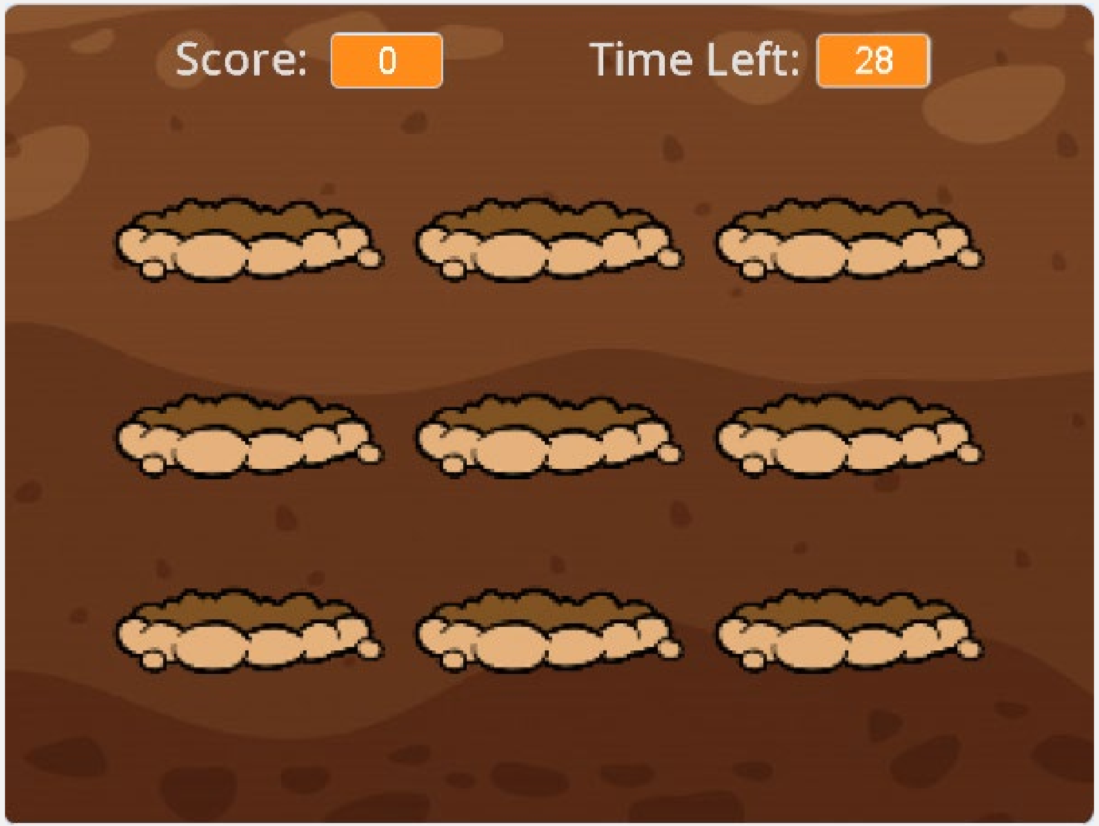
Lesson 2-1 – Set up the Game view



Then arrange the score and time variable like this (as left picture).

Score at the left, time at the right.

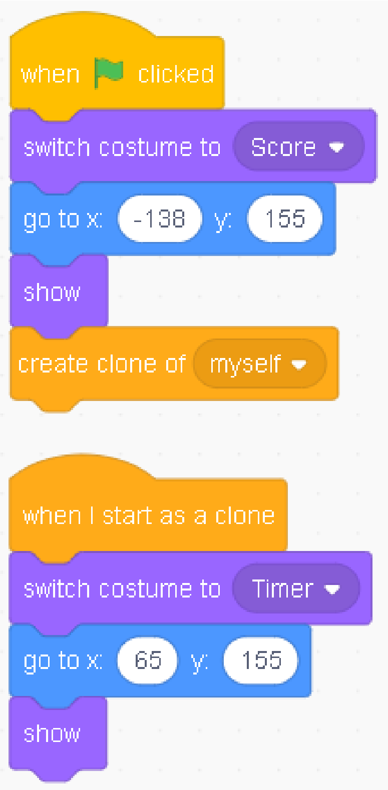
Lesson 2-1 – Set up the Game view (Title)



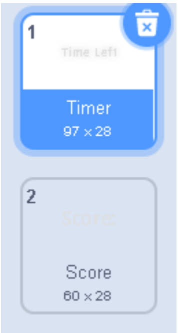
Let’s create a sprite called “title”, then we will have 2 costumes with “Score: ” and “Time Left: ” words.

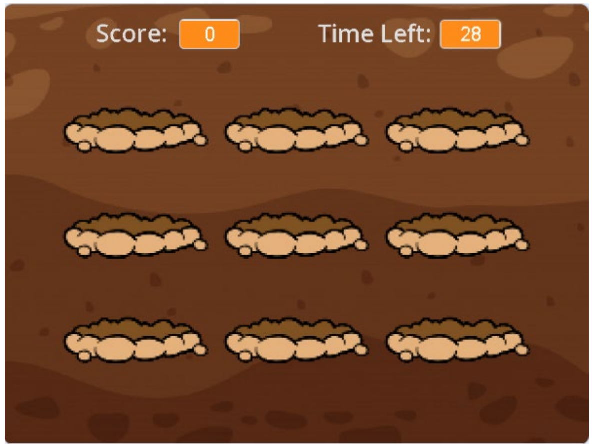
Lesson 2-1 – Set up the Game view (Title)

Script:



```
when 🏁 clicked
switch costume to Score ▾
go to x: -138 y: 155
show
create clone of myself ▾

when I start as a clone
switch costume to Timer ▾
go to x: 65 y: 155
show
```

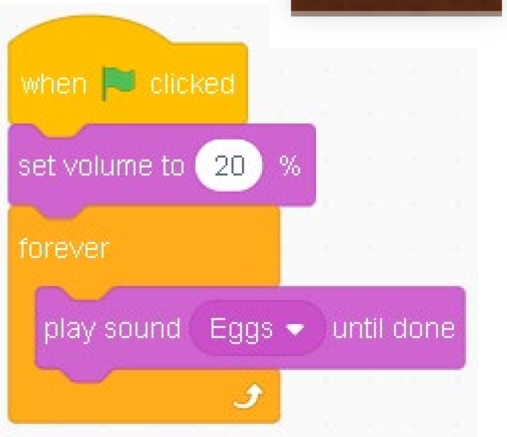




The real body will show the "Score: " word where "Time Left: " will be shown as clone.

Lesson 2-1 – Background Music

Script:

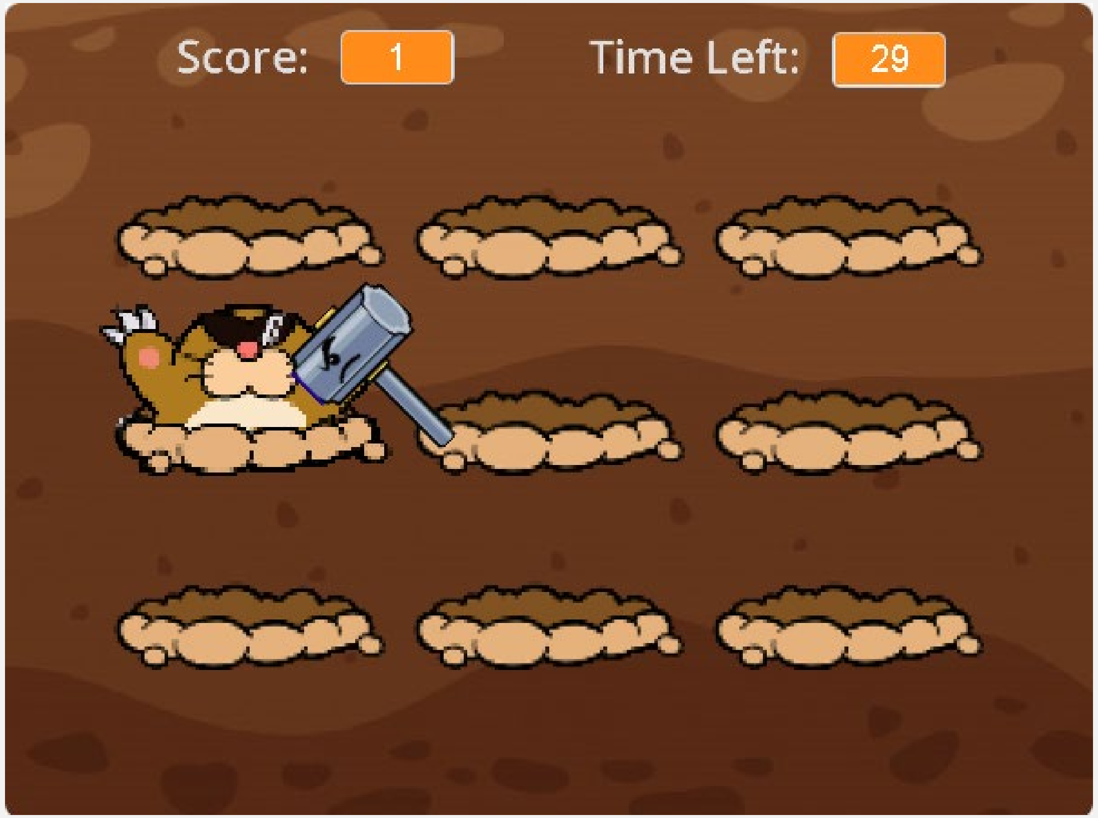


```
when 🏁 clicked
set volume to (20) %
forever
    play sound (Eggs ▾) until done
↺
```

Let's add background music to the game (I will add it into the backdrop there).

My volume will be set at 20%.

Lesson 2-1 – Run the game



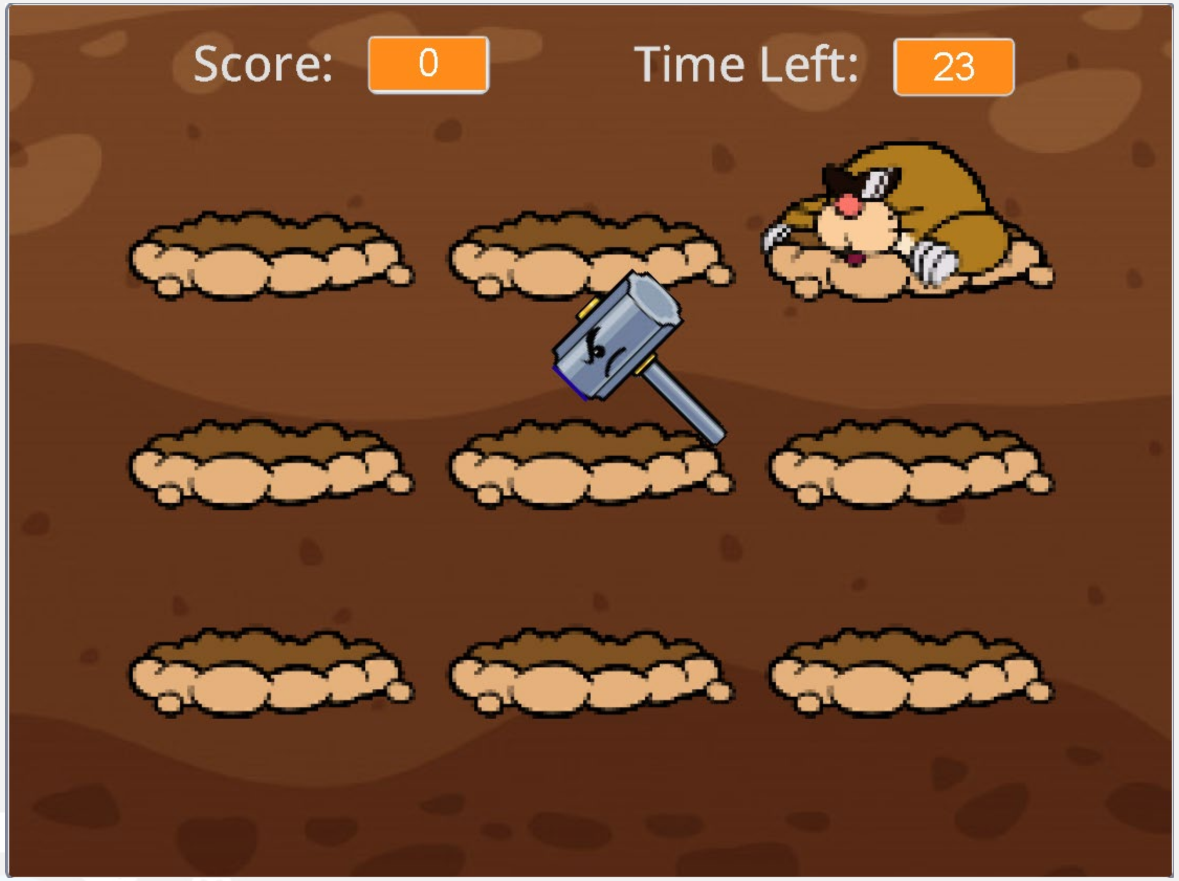
Now you can run the game and try it out yourself.

Try to make it more interesting and make it more challenging.

Can you make more than 1 mole comes out at once?

ASSIGNMENT *for*

Lesson 2-1



L2-1 – Mission

Create a whack-a-mole game which has 9 holes in total.

The player needs to use the hammer to hit the mole which comes out from the hole to score 1 point.

Player needs to get at least 9 points within 30 seconds of play time.

Please use create clones for the holes.

You can direct message your teacher and ask your question through **Slack Robotene Community** or arrange a **One-to-One Consultation** with your teacher.

Q&A Any Questions?

Thank you ;)