
MINECRAFT
RASPBERRY JAM
★WARWICKSHIRE★
MINECRAFT COMPETITIONS
MODDING
CREATIVE
#Hackpack Volume 2.1
Alpha version

It seems apt to say a big thank you to the following people for their contributions thus far:

- Dan Aldred for the consistent input, help and great programming ideas
- Ben Davies, Rob Jones-Cowley, Elton Lane for their great hacking contributions.
- Crazysqueak for proving that age is no barrier to be able to inspire others
- David Whale, Martin O'Hanlon for their continued advice and great book with excellent ideas
- Craig Richardson for his brilliant book
- Pipsta Printers for allowing us to have a pipsta printer to provide even more hacks going forward
- Raspberry Pi for inventing and providing a sense hat.
- Nicholas Chamberlaine School for providing the resources and support to host Raspberry Jams allow all this to happen ☺

Done, Now onwards. Let's hack ☺

List of hacks

Ads ☺

You can find out more info at:
http://www.pipsta.co.uk/

This first version will be added to and refined over the coming weeks and months. There are another 6-10 hacks more currently in the mix.... watch this space.....

Welcome

Hello and welcome to the hack pack volume 2. This has been created by teachers who use / experiment with Minecraft Pi at school to help students learn about computing / computational thinking.

Included in this 2nd edition are worksheets / ideas that you could use to help introduce Pi at school or as part of a jam / lunch club after school club. We hope you find these ideas helpful and make coding with Minecraft Pi a bit less daunting.

Contributors include: Chris Penn, Dan Aldred and Ben Davies, Elton Lane, Rob Jones-Cowley, Crazy sqeak and Sarah Zaman. We have included more complexity and variety in volume. Furthermore we have now evolved into Sonic Pi which is using coding to create music with a visual output possible via Minecraft(Its awesome). Two beginner's hacks have been kindly created to introduce you to Sonic Pi and Mcpi via Ben Davies.

For those of you who want to stretch beyond Minecraft then we will have a dedicated Pi hacks section with hacks that have no involvement with Minecraft. This will be updated as time goes by.

For those of you who are teachers who intend to use this or part of it for teaching programming concepts. Then there is a hack pack skills check sheet out in the next few weeks, so students can track their development over time.

List of Hacks with Minecraft and Python:

Computer Science Skills competencies checklist

Based on NC and @Craigarghs brilliant Python programming with Minecraft book checklist(Reproduced with his kind permission :))

Syntax

Variables		Changing Variables	
Data types		Statements	
Integers		Whitespace and Tabs	
		Single-lIne comments	
Floats		Multi-line Comments	
Boolean			

Maths Operations

Expressions and statements		Exponentials	
Maths operators		Modulo	
Addition		Operator order	
Subtraction		Interchanging variables and values	
Multiplication		Short hand operators	

Division			

String and console ouput

Strings		Placeholders	
Substrings		Console Input	
String functions -len() -lower() -upper() -str()		Date and Time	
Print			
Concatenation			

Comparators and Control Flow

Comparators including:		Greater than or equal to (>=)	
-Equal to (==)		Boolean Operators	
-Not equal to (!=)		If statements	

-Less than(<)		Else statements	
-Less than or equal to (<=)		Elif statements	
-Greater than (>)			

Functions

Creating and Calling Functions		Built in functions including:	
Returning a value		-max	
Arguments		-min	
Modules		-abs	
Importing modules		-type	

Lists and Dictionaries

Creating lists		Removing items	
Accessing index positions		For loop	
Adding items		Sorting a list	
List length		Combining lists	
Slicing		Defining a dictionary	
Searching a list		Changing / adding items	

		in a dictionary	
Inserting an item		Deleting items in a dictionary	

Functions and Lists

Lists as arguments		Splitting a string into a list	
Modifying ever list item		Multi-dimension lists	
Range Function		Joining two lists	
Converting a list into a string		Undefined number of lists	

Loops

While Loops		Strings as lists	
Boolean Operators with While Loops		Looping dictionaries	
Infinite Loops		Indexes and for loops	
Break		Zipping two lists	
While/else		For /else loops	
For Loops		For / else break	

File Input and Output

Opening a file		Reading a line	
Writing and closing a file		Automatically closing a file	
Reading a file		Closed attribute	

Classes and Object Orientated Programming

Creating classes		Creating objects	
-init-()		Accessing attributes	
Arguments		Class scope	
Creating methods		Overiding methods and attributes	
Multiple objects		Referencing superclass methods in a subclass	
Inheritance			

Programmer competencies

Reusing code		Working in team	
Decomposing a problem		Sharing knowledge	

Problem solving		Testing	
Persevering when a program doesn't work		Peer review and constructive feedback	
Systems thinking understanding how parts of a program relate to each other		Chosing the correct technology for the solution.	
Communication with others		Requirements analysis (understanding and prioritising the different needs of the system)	

Hack 1:

Steve's First Musical Steps

written by : ben.davies@computingatschool.org.uk @b3ndavi3s

In this activity you will write a program that plays notes and sets blocks

In your program you will need to λ get the player's position λ set a block λ post messages λ create loops λ use delays to sequence the events λ use variables	Open Minecraft Pi (menu - games- minecraft pi) and select Start Game Select an existing world or Create a New World Use the tab key to release the cursor from minecraft	Open Sonic Pi (menu - programming - sonic pi) You will need to use sonic pi 2.6 to get this type the following into the lx terminal - sudo apt-get update && sudo apt-get install sonic-pi Select a new workspace (buffer)

What are you trying to do?	Your pseudo-code

mc_message "Steve's First Musical Steps" loop do g = 60 use_synth :zawa 5.times do x, y, z = mc_location play g mc_set_block :glowing_obsidian, x, y, z g=g+2 sleep 0.5 end end #click on run to play your program	Posts message to screen creates a forever loop set variable g as 60 selects synth zawa repeat 5 times sets the player's current location as x, y, z plays note 60 sets block at player's current position to glowing obsidian increases variable g by 2 delays for 0.5 secs closes the repeat 5 times loop closes the forever loop

Challenges

- change the synth
- change the block
- change the numbers of times the loop repeats - what do you notice? can you explain why this happens?

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

Errors encountered and solutions?

How could you extend this script?

Hack 2:

The Man Who Fell To Earth (Ben Davies)

written by : ben.davies@computingatschool.org.uk @b3ndavi3s

In this activity you will write a program that creates a melody and teleports Steve

In your program you will need to λ get the player's position λ post messages λ create loops λ use delays to sequence the events λ use variables λ uses threads λ play a melody	Open Minecraft Pi (menu - games- minecraft pi) and select Start Game Select an existing world or Create a New World Use the tab key to release the cursor from minecraft	Open Sonic Pi (menu - programming - sonic pi) You will need to use sonic pi 2.6 to get this type the following into the lx terminal - sudo apt-get update && sudo apt-get install sonic-pi Select a new workspace (buffer)

What are you trying to do?	Your pseudo-code

Sonic Pi Code

mc_message "Time to teleport"	Posts message to screen
sleep 2	delays the program by 2 secs
in_thread do	creates a thread
3.times do	
use_synth :mod_dsaw	selects the synth to use
use_bpm 90	sets the bpm
3.times do	sets the notes to play and the length
play 69, release: 0.5	
sleep 0.5	
end	
play 67, release: 0.5	
sleep 1	
play 69, release: 0.33	
sleep 0.33	
play 70, release: 0.33	
sleep 0.33	
play 69, release: 0.33	
sleep 0.33	
play 67, release: 0.5	
sleep 0.5	
end	
end	
mc_teleport 27, 550, 12	teleports the player to the given coordinates
x = 10	sets the variable x to 10
10.times do	repeat 10 times
mc_message x	posts the value of variable x to screen
sleep 1	delays the program by 1 secs
x=x-1	decreases variable x by 1
end	closes the repetition indent
mc_message "Welcome back to the Ground	posts a message to screen

Challenges

- λ change the melody
- λ change the position to teleport to
- λ change the countdown
- λ change the messages posted to screen

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

Errors encountered and solutions?

How could you extend this script?

Hack 3:
Towers of Randomness (Ben Davies)

In this activity you will write a program that creates towers of random blocks

In your program you will need to • get the player's position • set a block • post messages • create loops • use delays to sequence the events • use variables • use selection	Open Minecraft Pi (menu - games-minecraft pi) and select Start Game Select an existing world or Create a New World Use the tab key to release the cursor from minecraft	Open Sonic Pi (menu - programming - sonic pi) You will need to use sonic pi 2.6 to get this type the following into the lx terminal - sudo apt-get update && sudo apt-get install sonic-pi Select a new workspace (buffer)

What are you trying to do?	Your pseudo-code

Sonic Pi Code

mc_message "Explore"	Posts message to screen
loop do	creates a forever loop
sleep 5	delays the program by 5 secs
x, y, z = mc_location	gets the player's current position
if one_in(3)	creates the probability of the following event
sample :ambi_dark_woosh	selects a sample to play
5.times do	repeat 5 times
mc_set_block :diamond_block , x, y, z+3	places the named-block in the given positions
mc_set_block :glowing_obsidian , x, y+1, z+3	
mc_set_block :glowstone_block , x, y+2, z+3	
mc_set_block :gold_block , x, y+3, z+3	
y=y+4	increases the value y by 4
end	closes the repetition loop
else	If the probability of the previous events isn't met
sample :ambi_haunted_hum	selects a sample to play
5.times do	repeat 5 times
mc_set_block :tnt , x, y, z+3	places the named-block in the given position
mc_set_block :lapis_lazuli_block , x, y+1, z+3	
mc_set_block :brick , x, y+2, z+3	
mc_set_block :redstone_ore , x, y+3, z+3	
y=y+4	increases the value y by 4
end	closes the repetition loop
end	closes the selection indentation
sleep 2	delays the program for 2 seconds
end	closes the forever loop

Challenges

- change the samples used
- change the height of the towers
- change the types of blocks in the towers
- change the probability of the if event occurring

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

Errors encountered and solutions?

How could you extend this script?

Hack 4:

'ForceField'

written by : (@piinthesky2015)

This hack is makes the most of the a while loop to help Steve put up a force field of air if he detects obstructions in front.

<u>This is a screen shot of the code in action</u>

<u>Here is the code used to create it:</u>

```
import mcpi.minecraft as minecraft
import time
from mcpi import block
mc=minecraft.Minecraft.create()

def forcefield():
    pos = mc.player.getPos()
    mc.setBlocks(pos.x-3, pos.y, pos.z-3, pos.x+3, pos.y+3, pos.z+3, block.AIR)

while True:

    pos = mc.player.getTilePos()
    air = mc.getBlock(pos.x+1, pos.y+1, pos.z+1)
    if air != block.AIR.id:
        mc.postToChat ("Forcefield Active")
        forcefield()
```

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

Errors encountered and solutions?

How could you extend this script?

Hack 5:

CrazyTown library how to use (CrazySqueek)

Picture of library call scripts in action

Crazy Squeek is a 9 year old programming wonder who lives in the UK. He has developed a set of functions that create a series of buildings ranging from cottages to tower blocks. The purpose of this tutorial is not to write the code out but download and better understand the following:

- What libraries are ?
- How the are called ?
- Why they are useful ?
- How to use functions from libraries in your program
- You will also learn how to make effective comments. This kid is good :)

1. Step download the 3 python files needed from the below links
2.Open 'basicdemo.py'
3. Open minecraft create a new world.
4. Press f5 to run the program
5. Watch :)
6. Open Town.py choose one additional function that you can try and call in the basic demo file.
7. Try and call this in the 'basic demo.py file see if it compiles and then watch it build your additional building.
8. Now open 'flatsdemo.py' create a new world and repeat the process from tasks 6/7.

Challenge yourself

9. See if you can add in a loop to create multiple copies of the same building as used by crazysqueek.

You can now download all three python files from here https://goo.gl/Kj7pJ2 on the lesson 8 section.

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

Errors encountered and solutions?

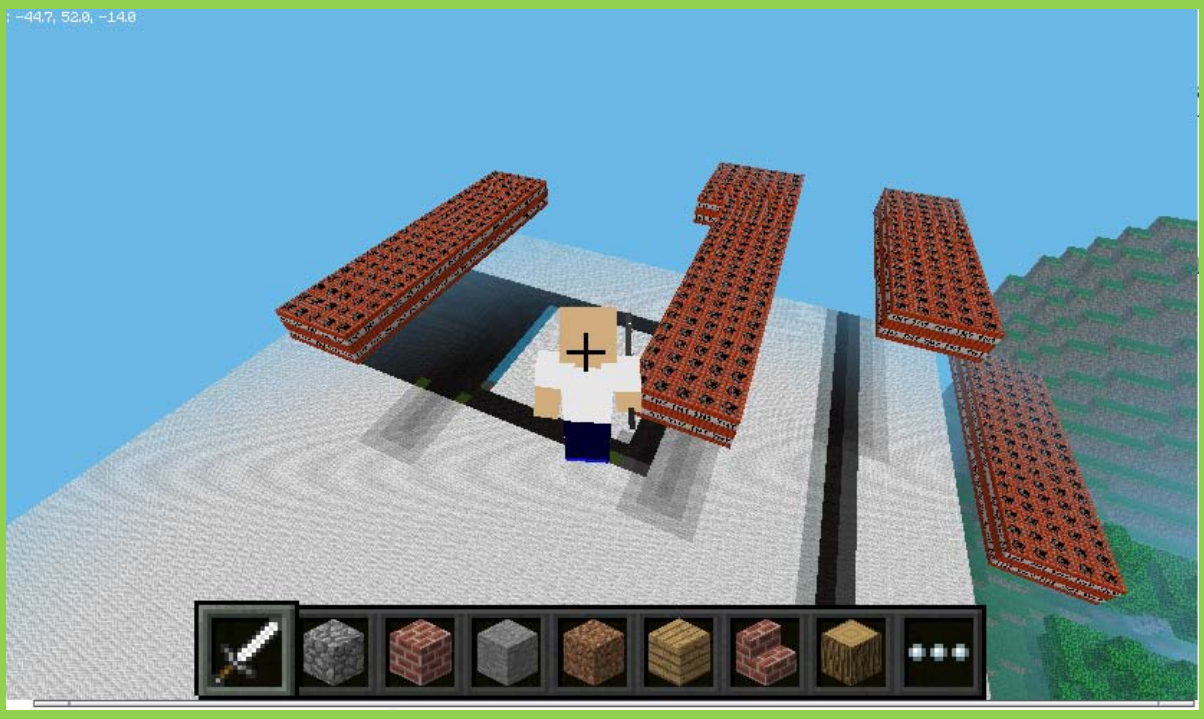
How could you extend this script?

Hack 6:

Building a skywars level with Code

written by : @ncscomputing

Pic1 of platforms



Instructions

1. Type the following code in python IDE
2. Open a new Minecraft world
3. Press f5 and compile the code to check for logic and sytax errors.
4. Ensure that steps() function call toward the bottom of the code is commented out you will need this in a bit.
5. To create the skywars type sky platforms you will need to walk run the code and walk around your map. Your program should create a platform every 8 seconds. The default height is set to ten bocks high. You should end up with something that resembles pic1.

Push yourself

Can you extend the code to randomly place platforms a different heights from 10-35 blocks?

6. In the main while loop comment out the platform() and uncomment the steps() to enable it to work.
7. This will create glass steps to help you get across from platform when playing the game. You should run the code and walk around linking the platforms together like pic2.

Pic 2 of platforms with added walk ways using second function

Code:

```
import mcpi.minecraft as minecraft
import mcpi.block as block
import random
import time

mc = minecraft.Minecraft.create()
Height = 10
def platform(Height):
    blockId = 46
    x,y,z = mc.player.getPos()
    y=y+Height
    mc.setBlocks(x,y,z,x+4,y+1,z+20,blockId)
    time.sleep(8)
```

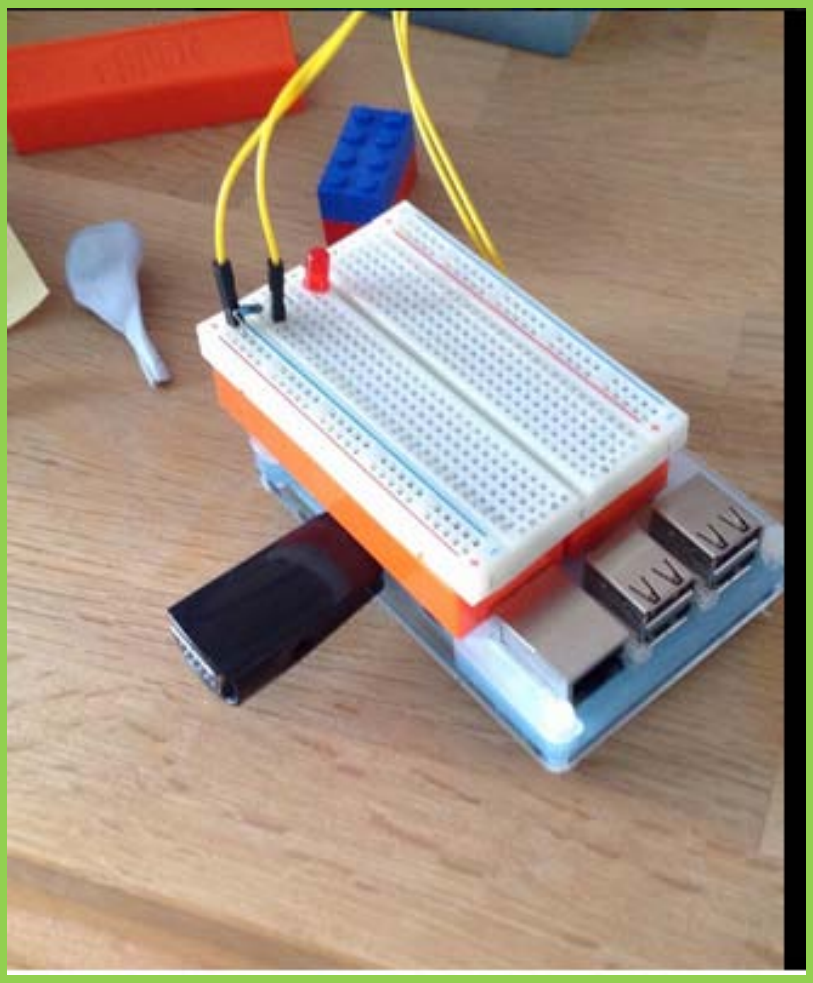
```
def steps():
    x,y,z = mc.player.getPos()
    mc.setBlock(x,y-1,z,20)
    time.sleep(0.2)


while True:
   platform(Height)
   #steps()
```

Hack 7 Whack a selfie with Raspi2png and Camjam Edukit 1 @ncscomputing

This hack has used the Cam Jam Edu kit one. Which is a available to buy from here: http://thepihut.com/products/camjam-edukit

It was my first real attempt at using breadboards. The basic concept of this hack is to do the following:

- Install 'raspi2png', which is a bit of software that has been created to allow you to take screenshots of minecraft pi
- Using the Cam Jam Edu Kit 1 breadboard to install an LED that lights up when you have taken a minecraft screen shot by whacking the TNT block.
- So when you place a TNT block you can use the whack a block code from volume one to allow Steve to whack the block and take a screen shot.
- This achieved by running something called 'shell script'. This is essentially running Linux LX terminal commands from within the python script.
- The basic set up is pictured below:



You will need to download the software by working through the blog post by Les Pounder, which can be found here.

The set up for the breadboard is a mirror of the 'LED' work sheet two described in the brilliant Cam Jam resource pack here is the link https://goo.gl/Dlrd0y. N.b. I have only used one LED, they use three ☺.

Once you have your breadboard set up and raspi2png set up(I had the software folder on my pi desktop) you will need to write the code below.

Finally you will need to save the py file in the same folder as raspi2png software and use LX terminal to run the script. This is to do with using the GPIO pins. This is covered very clearly in the Cam Jam resource. ☺ Now go snap yourself and what you create.

Code

import subprocess

import RPi.GPIO as GPIO

```
import time
import mcpi.minecraft as minecraft
import mcpi.block as block

mc = minecraft.Minecraft.create()

mc.postToChat("Whack a tnt block to take a selfie")
def On():
   GPIO.setmode(GPIO.BCM)
   GPIO.setwarnings(False)
   GPIO.setup(18,GPIO.OUT)
   print "Lights on"
   GPIO.output(18,GPIO.HIGH)

def Off():
   GPIO.setmode(GPIO.BCM)
   GPIO.setwarnings(False)
   GPIO.setup(18,GPIO.OUT)
   print "Lights off"
   GPIO.output(18,GPIO.LOW)
   GPIO.cleanup()

while True:
```

```
evs = mc.events.pollBlockHits()

for e in evs:
    pos = e.pos

    b = mc.getBlock(pos.x,pos.y,pos.z)

    if b == 46:
        mc.postToChat("Smile")
        On()
        time.sleep(3)
        a = subprocess.check_output('./raspi2png -d 3 -p "1.png"',shell=True)
        Off()
```

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

Errors encountered and solutions?

How could you extend this script?

Hack 8:

Steves Horizontal escalator @ncscomputing

Pic1 of code working

Instructions

Build a small square track of TNT and then write the following code. You should get Steve to move around the basic track.

Code so far:

```
import mcpi.minecraft as minecraft
import mcpi.block as block
import time

LineColour = 46
mc = minecraft.Minecraft.create()

def Main():
   x,y,z = mc.player.getPos()

   #get block -1
   CurrentBlock = mc.getBlock(x,y-1,z)
   #block2 == mc.getBlock(x+1,y-1,z)
   #Go straight ahead
   #if block -1 == 46 then
   if CurrentBlock == 46 & mc.getBlock(x,y-1,z-1)== 46:#1ststraight
      mc.player.setPos(x,y,z-1)
```

```
    elif CurrentBlock == 46 & mc.getBlock(x+1,y-1,z)== 46:#1strightcrnr
        mc.player.setPos(x+1,y,z)
            #ask is next block in frnt 46


    elif CurrentBlock == 2 & mc.getBlock(x,y-1,z+1)== 2:#2ndrightcrnr
        mc.player.setPos(x,y,z+1)

    elif CurrentBlock == 2 & mc.getBlock(x-1,y-1,z)== 2:#3ndrightcrnr
        mc.player.setPos(x-1,y,z)
while True:
    Main()
```

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

Errors encountered and solutions?

How could you extend this script?

Hack 9 Rainbow Road by @ncscomputing

Pic of hack working

Code so far:

```
import mcpi.minecraft as minecraft
import mcpi.block as block
import random
import time

mc = minecraft.Minecraft.create()
pos = mc.player.getPos()
def SetRoad():
    pos = mc.player.getPos()
    mc.setBlock(pos.x, pos.y-1, pos.z, 35,1)#orange
    mc.setBlock(pos.x-1, pos.y-1, pos.z, 35,2)#pinky purple
    mc.setBlock(pos.x-2, pos.y-1, pos.z, 35,3)#sky blue
    mc.setBlock(pos.x-3, pos.y-1, pos.z, 35,4)#yellow
    mc.setBlock(pos.x-4, pos.y-1, pos.z, 35,5)#green
    mc.setBlock(pos.x-5, pos.y-1, pos.z, 35,6)#pink
    mc.setBlock(pos.x-6, pos.y-1, pos.z, 35,7)#black
```

```
    mc.setBlock(pos.x-7, pos.y-1, pos.z, 35,8)#grey
    mc.setBlock(pos.x-8, pos.y-1, pos.z, 35,9)#blue
    mc.setBlock(pos.x-9, pos.y-1, pos.z, 35,10)#purple

#mc.postToChat("Watch out for disco blocks")


while True:

    SetRoad()
    time.sleep(0.05)
```

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

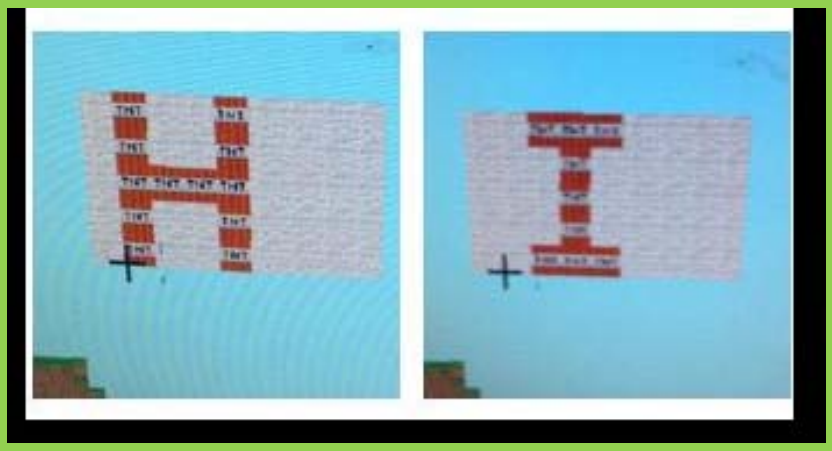
Errors encountered and solutions?

How could you extend this script?

Hack 10:
Text Messages V1
written by : @ncscomputing

This takes the concept of making a wall and displaying letters inside this wall. The key concepts covered are using multi dimensional lists and how to update them. It also covers functions and returning values with a function.

Pic1 of code working



Code

```
import mcpi.minecraft as minecraft

import mcpi.block as block

import random

import time



mc = minecraft.Minecraft.create()


def LetterI():


    row1 =[35,35,46,46,46,35,35]

    row2 = [35,35,35,46,35,35,35]
```

```
    row3 = [35,35,35,46,35,35,35]
    row4 = [35,35,35,46,35,35,35]
    row5 = [35,35,46,46,46,35,35]
    TempList = [row1,row2,row3,row4,row5]
    return TempList

def LetterH():

    row1 = [35,46,35,35,46,35,35]
    row2 = [35,46,35,35,46,35,35]
    row3 = [35,46,46,46,46,35,35]
    row4 = [35,46,35,35,46,35,35]
    row5 = [35,46,35,35,46,35,35]
    TempList = [row1,row2,row3,row4,row5]
    return TempList

def PrintWall(ImportedList):

    pos = mc.player.getTilePos()
    mc.player.setPos(pos.x,pos.y,pos.z)

    myList = ImportedList
```

```
    for row in range (0,5):
        for column in range (0,7):

            mc.setBlock(pos.x+column,pos.y+row,pos.z-20,myList[row][column])



while True:
    PrintWall(LetterI())
    time.sleep(2)
    PrintWall(LetterH())
    time.sleep(2)
```

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

Errors encountered and solutions?

How could you extend this script?

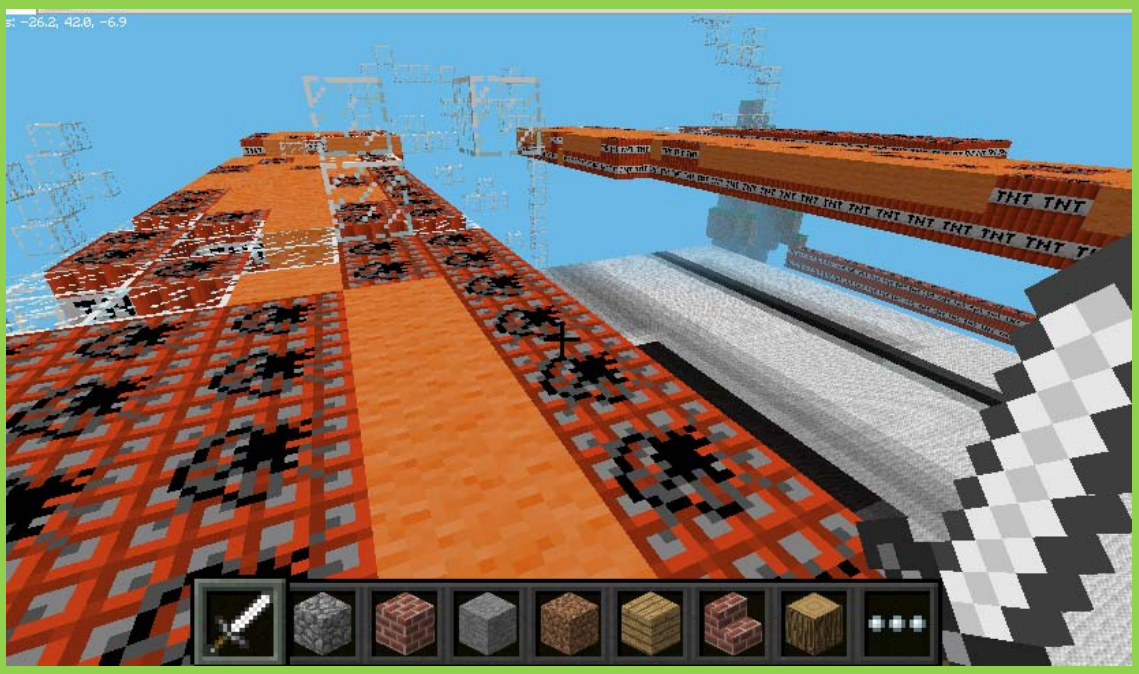
Hack 11:

Sky wars / splatoon 60 second painting game: Game logic

written by : @ncscomputing

Status : bugs with timer and point scoring, TO BE FIXED WHEN POSSIBLE

Pic1 of platforms which have been changed orange by the player walking over them.(The aim of the game is to colour as many TNT blocks orange as possible in 1 minute)



Code so far

```
import mcpi.minecraft as minecraft
import mcpi.block as block
import random
import time


Score = 0
TeamColour = 5#Green
count = 0
mc = minecraft.Minecraft.create()
Height = 10
```

```
def Timer():
    now = time.localtime(time.time())
    return now[5]


def platform(Height):
    blockId = 46
    x,y,z = mc.player.getPos()
    y=y+Height
    mc.setBlocks(x,y,z,x+4,y+1,z+20,blockId)
    time.sleep(8)


def steps():
    x,y,z = mc.player.getPos()
    mc.setBlock(x,y-1,z,20)
    time.sleep(0.2)

def BasicGameLogic(Score):

    x,y,z = mc.player.getPos()
    block = mc.getBlock(x,y-1,z)
    if block == 46:
        mc.setBlock(x,y-1,z,35,1)#Orange Wool
        Score = Score+1
        print "score:",Score
        #mc.postToChat("Tnt")


#mc.player.setPos(pos.x,pos.y,pos.z)
#mc.camera.setPos(pos.x,pos.y,pos.z)
#mc.camera.setFollow()
CurrentSec = 0
while CurrentSec <=60:

   # platform(Height)

    #steps()
```

```
BasicGameLogic(Score)
CurrentSec = Timer()
print CurrentSec
if CurrentSec == 59:
    print "Time over, your Score is: ", Score
    break
```

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

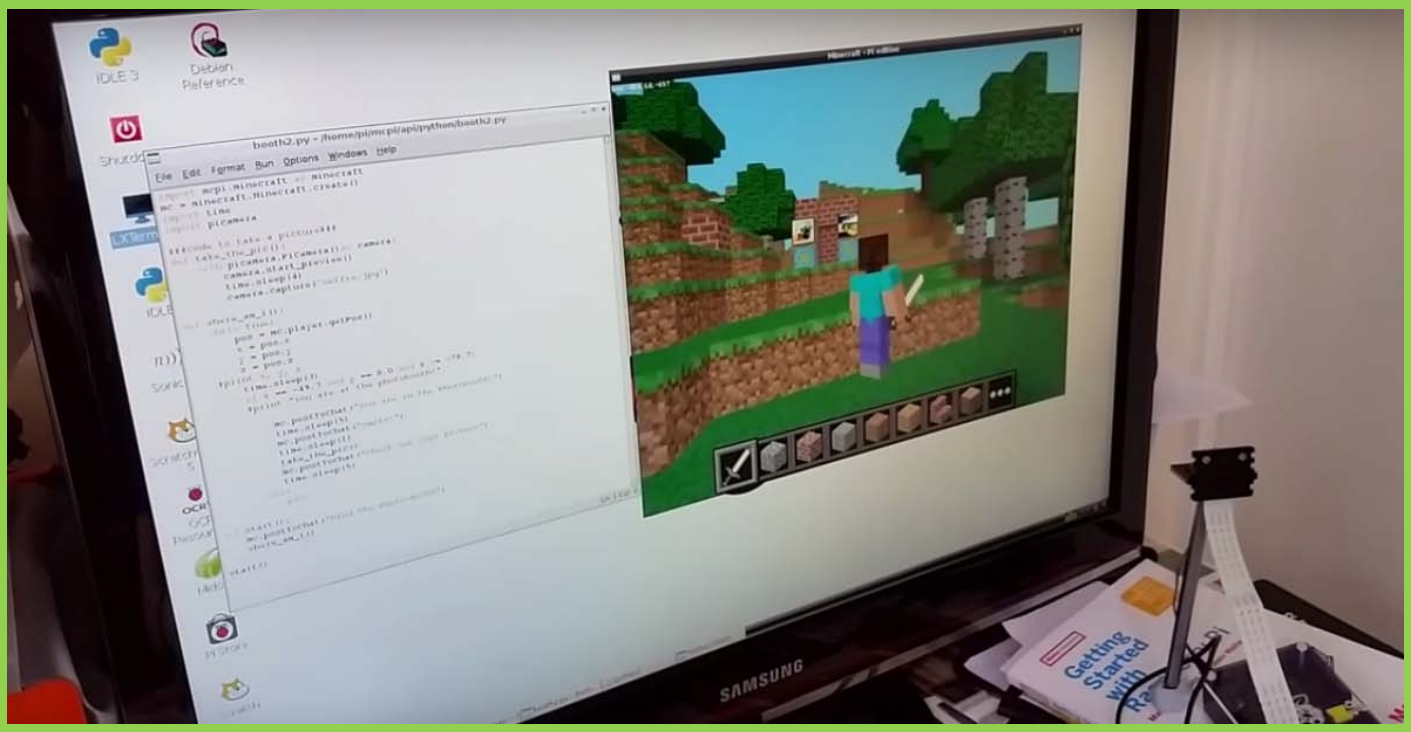
What role do they perform in the script?

Errors encountered and solutions?

How could you extend this script

Hack 12 :
Minecraft Photo Booth (Dan Aldred)
written by :@dan_aldred

This hack creates a photobooth in Minecraft which when you the player walk in, it triggers the Pi Camera and takes your picture, awesome!



Add your Pi Camera and boot up your Pi, load Python and also Minecraft.

```
import mcpi.minecraft as minecraft
mc = minecraft.Minecraft.create()
import time
import picamera

###Code to take a picture###
###@TeCoEd###
def take_the_pic():
   with picamera.PiCamera()as camera:
      #camera.resolution = (150, 100)
      camera.start_preview()
      time.sleep(2)
```

```
    camera.capture('selfie.jpg')


def where_am_I():
  while True:
    pos = mc.player.getPos()
    x = pos.x
    y = pos.y
    z = pos.z
  #print x, y, z
    time.sleep(3)
    if x >= 10.5 and y == 9.0 and z == -44.3:
    #print "You are at the photobooth!"

      mc.postToChat("You are in the Photobooth!")
      time.sleep(1)
      mc.postToChat("Smile!")
      time.sleep(1)
      take_the_pic()
      mc.postToChat("Check out your picture")
      time.sleep(5)
    else:
      pass

def start():
  mc.postToChat("Find the Photo-Booth")
  where_am_I()

start()
```

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

Errors encountered and solutions?

How could you extend this script?

Hack 13 :
Minecraft Mine-Sweeper (Dan Aldred)
written by :@dan_aldred

You may remember or have even played the classic Minesweeper game which dates back to the 1960's as one of the earliest mainframe computer games. Over the years it has been bundled with most operating systems and even featured as a mini game variation on the New Super Mario Bros. In this hack you will ceate a simple version in Minecraft, yes a Minecraft Mine-Sweeper!

###TeCoEd###
###MineCraft Sweeper###

```
import random
import time
from mcpi import minecraft
mc = minecraft.Minecraft.create()

###Creates the Board###
```

```
mc.postToChat("Welcome to Minecraft MineSweeper")
x, y, z = mc.player.getPos()
mc.setBlocks(x, y-1, z, x+20, y-1, z+20, 58)

global mine
mine = random.randrange(0, 11, 1)
print mine

###Places the mine###
mine_x = int(x+mine)
mine_y = int(y-1)
mine_z = int(z+mine)

print mine_x, mine_y, mine_z ###test
mc.setBlock(mine_x, mine_y, mine_z,58)

score = 0

mc.postToChat("Score is "+str(score))
#test = mc.setBlock(x + mine, y-1, z + mine, 46,1)
time.sleep(10)
while True:  ###TEST IF YOU STAND ON THE BLOCK

   x1, y1, z1 = mc.player.getTilePos()
   #print x1, y1, z1 ###test
   time.sleep(0.1)
   score = score + 1
   if (x1, y1-1, z1) == (mine_x, mine_y, mine_z):
      mc.setBlocks(x-5, y+1, z-5, x+5, y+2, z+5, 10) ##CHANGE TO WATER?
      print "GAME OVER"
      mc.postToChat("G A M E  O V E R")
      mc.postToChat("Score is "+str(score))
      break
   else:
      mc.setBlock(x1, y1-1, z1, 41)
```

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

Errors encountered and solutions?

How could you extend this script?

Hack 14:
Unicorn HAT Element Finder
(TeCoEd)
written by : @dan_aldred

Stand on a block, the Unicorn responds with the relevant colour

```
 #!/usr/bin/env python

import unicornhat as UH
import time
import sys
from mcpi import minecraft
mc = minecraft.Minecraft.create()

UH.brightness(0.10)

def water():
 for y in range(8):
  for x in range(8):
   UH.set_pixel(x,y, 0, 0, 255)
   UH.show()
   time.sleep(0.02)

def air():
 for y in range(8):
```

```
   for x in range(8):
     UH.set_pixel(x,y, 0, 0, 0)
     UH.show()
     time.sleep(0.02)

def TNT():
  for y in range(8):
    for x in range(8):
      UH.set_pixel(x,y, 255, 0, 100)
      UH.show()
      time.sleep(0.02)


def dirt():
  for y in range(8):
    for x in range(8):
      UH.set_pixel(x,y, 0, 255, 0)
      UH.show()
      time.sleep(0.02)

def sand():
  for y in range(8):
    for x in range(8):
      UH.set_pixel(x,y, 148, 0, 211)
      UH.show()
      time.sleep(0.02)



while True:
  x,y,z = mc.player.getPos()

  blockID =  mc.getBlock(x, y-1, z)
  print blockID

  time.sleep(0.1)

  if blockID == 9:
     water()
  elif blockID == 0:
     air()
  elif blockID == 2:
     dirt()
```

```
elif blockID ==12:
    sand()
```

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

Errors encountered and solutions?

How could you extend this script? Try adding your own blocks and colours

Hack 15:

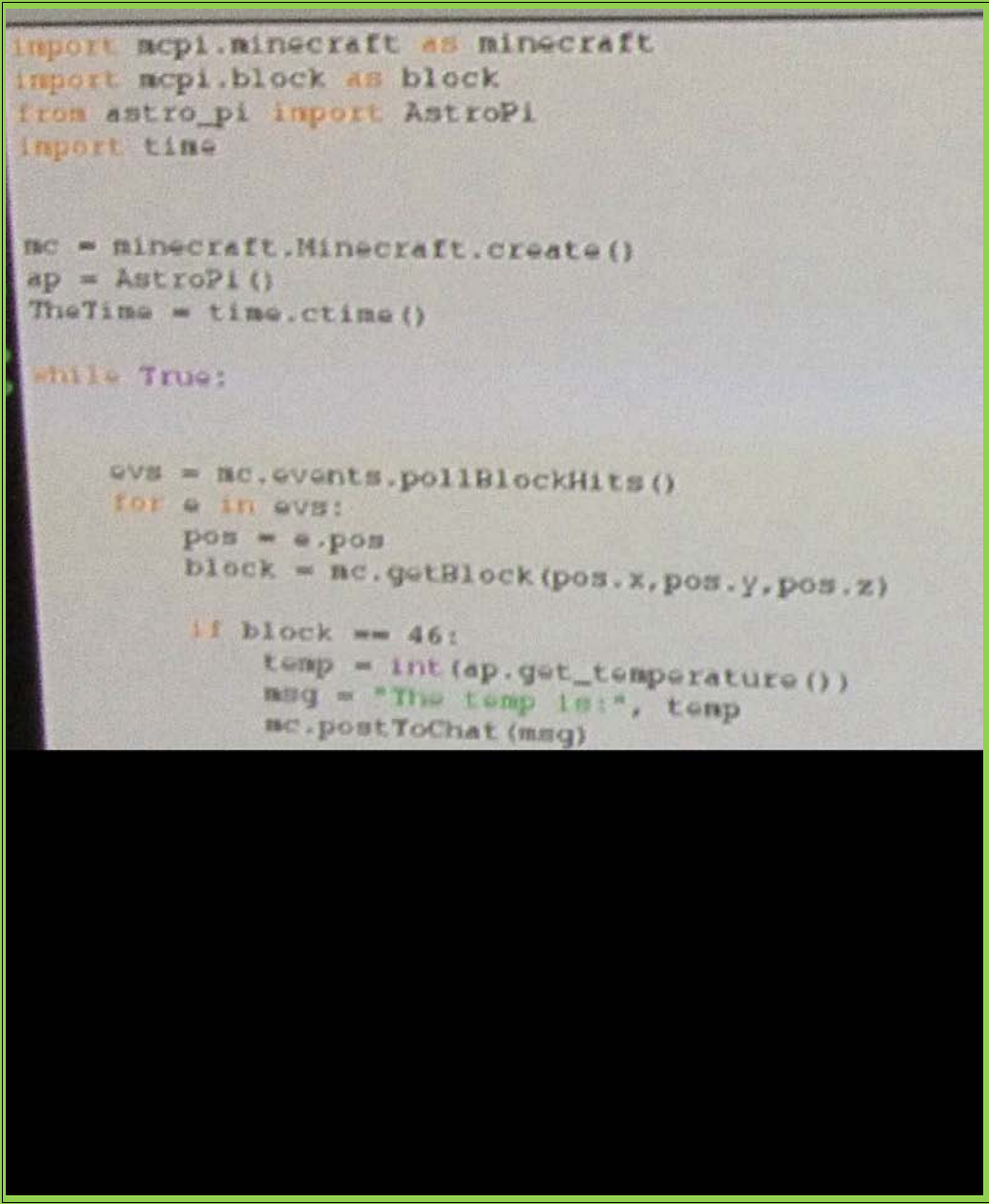
Sense Hat Interactive House V1

written by : @ncscomputing

This hack uses the Astro Pi hat or Sense hat to introduce how to interact Minecraft with Physical data such as Temperature.

Pics

Code



```
import mcpi.minecraft as minecraft
import mcpi.block as block
from astro_pi import AstroPi
import time


mc = minecraft.Minecraft.create()
ap = AstroPi()
TheTime = time.ctime()

while True:


    evs = mc.events.pollBlockHits()
    for e in evs:
        pos = e.pos
        block = mc.getBlock(pos.x,pos.y,pos.z)

        if block == 46:
            temp = int(ap.get_temperature())
            msg = "The temp is:", temp
            mc.postToChat(msg)
```

Questions to answer about what you have coded and reflect on what you have learned:

Code concepts used?

What role do they perform in the script?

Errors encountered and solutions?

How could you extend this script?

Hack 16:

A flat map download for Raspberry Pi Minecraft by Wizard Keen

This is a flat map that you can download and load into your worlds on the Raspberry Pi. Click / type in the shortened link below to download from his dropbox.

https://goo.gl/KzKI0N