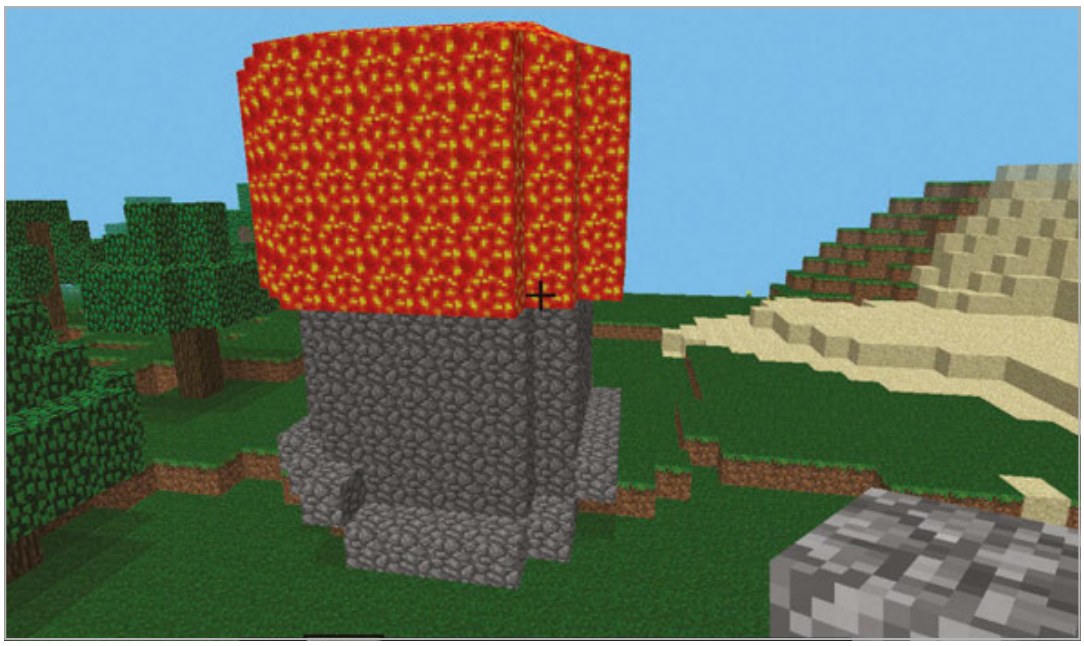
The MagPi ESSENTIALS

[CHAPTER SEVEN]

CREATE NATURAL DISASTERS IN MINECRAFT

Cause peril in your Minecraft world by adding catastrophes such as meteors and earthquakes



Right A volcano emerges, spewing out liquid hot magma. It's a good thing you're invincible!

"I've created natural disasters in Minecraft using Python," ten-year-old CrazySqueak writes on his blog. "It adds many disasters to your Minecraft that happen randomly, wherever you are in your world. The program randomly starts disasters on its own, so you should keep moving to avoid getting hit."

This excellent Python script for Minecraft does something very different from other hacks that require player interaction: it actually adds to the world in the way a normal PC game mod might. With earthquakes, sinkholes, meteors, geysers, and volcanic eruptions each acting differently and independently, a lot of work has gone into this program.

The code works by setting up the parameters of each disaster. Each type has individual timing for when it occurs, once triggered, and how long it works for. They all use the Minecraft Python API to create or remove blocks, such as creating lava for the eruption and meteor, or creating an empty space with the sinkhole and earthquake.

All the disasters are triggered at random in the code, and are based around your location in the game – that's why CrazySqueak suggests staying on the move! You can also trigger each function individually to see how it works, and some even come with sound clips to further add to the effect of the mod.

As well as creating natural disasters, CrazySqueak received a Highly Commended award for a submission to Astro Pi. We can't wait to see what other mashups he creates for Minecraft in the future.

natural_disasters.py

```
01. import mcpi.minecraft as minc
02. import mcpi.block as block
03. mc = minc.Minecraft.create()
04. import random, time, pygame
05. pygame.mixer.init()
06. earthSound = pygame.mixer.Sound('earthquake.ogg')
07. eruptSound = pygame.mixer.Sound('lava.ogg')
08. meteorSound = pygame.mixer.Sound('meteor.ogg')
09. def earthquake(x, z):
10.     mc.postToChat('Earthquake!')
11.     y = mc.getHeight(x, z)
12.     endtime = time.time() + 60
13.     nearthtime = time.time()
14.     while endtime > time.time():
15.         if time.time() > nearthtime:
16.             earthSound.play()
17.             nearthtime = time.time() + 5
18.         ppos = mc.player.getPos()
19.         if ppos.x < x+15 and ppos.x > x-15:
20.             if ppos.y < y+15 and ppos.y > -60:
21.                 if ppos.z < z+15 and ppos.z > z-15:
22.                     mc.player.setPos(ppos.x, ppos.y, ppos.z)
23.         bx = random.randint(x-15, x+15)
24.         by = y
25.         bz = random.randint(z-15, z+15)
26.         if mc.getHeight(bx, bz) > -50:
27.             by = mc.getHeight(bx, bz)
28.         if mc.getBlock(bx, by, bz) in [block.GLASS.id, block.GLASS_PANE.id]:
29.             mc.setBlock(bx, by, bz, block.AIR.id)
30.             continue
31.         mc.setBlock(bx, by, bz, block.GRAVEL.id)
32.         mc.setBlocks(bx, by-1, bz, bx, -60, bz, block.AIR.id)
33. def sinkhole(x, z):
34.     blks = []
35.     y = mc.getHeight(x, z)
36.     xdist = random.randint(1, 5)
37.     for bx in range(-xdist, xdist+1):
38.         zdist = random.randint(1, 5)
39.         for bz in range(-zdist, zdist+1):
```

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```
            blks.append([x+bx, z+bz])
    earthSound.play()
    for blk in blks:
        mc.setBlocks(
blk[0], mc.getHeight(blk[0], blk[1]), blk[1], blk[0],-60, blk[1], block.AIR.id)
        mc.setBlocks(blk[0], -55, blk[1], blk[0], -60, blk[1], block.LAVA.id)
    for blk in blks:
        mc.setBlock(blk[0], y, blk[1], block.GRAVEL.id)
def geyser(x, z):
    y = mc.getHeight(x, z)
    mc.setBlocks(x-2, y+5, z-2, x+2, -60, z+2, block.WATER.id)
    time.sleep(25)
    mc.setBlocks(x-2, y+5, z-2, x+2, -60, z+2, block.AIR.id)
def eruption(x, z):
    y = mc.getHeight(x, z)
    for i in range(3):
        eruptSound.play()
        mc.setBlocks(x-2, y+9, z-2, x+2, y+9, z+2, block.LAVA.id)
        eruptSound.play()
        for i in range(15):
            time.sleep(1)
            eruptSound.play()
        eruptSound.play()
        mc.setBlocks(x-2, y+10, z-2, x+2, y+10, z+2, block.WATER.id)
        eruptSound.play()
        for i in range(5):
            time.sleep(1)
            eruptSound.play()
        eruptSound.play()
        mc.setBlocks(x-2, y+10, z-2, x+2, y+10, z+2, block.AIR.id)
        eruptSound.play()
        for i in range(5):
            time.sleep(1)
            eruptSound.play()
        eruptSound.play()
        y += 1
        eruptSound.play()
def meteor(x, z):
    mc.postToChat('Meteor approaching!')
    y = 64
    h = mc.getHeight(x, z)
    x -= (64 - h)
```

```
81.     meteorSound.play()
82.     while y > h:
83.         y -= 1
84.         x += 1
85.         mc.setBlocks(x-2, y-2, z-2, x+2, y+2, z+2, block.OBSIDIAN.id)
            time.sleep(0.05)
86.         mc.setBlocks(x-2, y-2, z-2, x+2, y+2, z+2, block.AIR.id)
87.     mc.setBlocks(x-2, y-2, z-2, x+2, y+2, z+2, block.LAVA.id)
88.     mc.setBlocks(x-1, y-1, z-1, x+1, y+1, z+1, block.OBSIDIAN.id)
89. def meteor_shower(x, z):
90.     for i in range(10):
91.         mx = random.randint(x-15, x+15)
92.         mz = random.randint(z-15, z+15)
93.         meteor(mx, mz)
94. def heatwave(x, z):
95.     y = mc.getHeight(x, z)
96.     endtime = time.time() + random.randint(50, 90)
97.     while time.time() < endtime:
98.         blkid = block.AIR.id
99.         while blkid == block.AIR.id:
100.            bx = random.randint(x-10, x+10)
101.            by = random.randint(y, y+10)
102.            bz = random.randint(z-10, z+10)
103.            blkid = mc.getBlockWithData(bx, by, bz).id
104.        blk = blkid
105.        blkd = mc.getBlockWithData(bx, by, bz).data
106.        if blkid == block.GRASS.id:
107.            blk = block.DIRT.id
108.            blkd = 0
109.        elif blkid in [
110. block.WATER.id, block.WATER_FLOWING.id, block.WATER_STATIONARY.id]:
                blk = block.WATER.id
111.            blkd = 1
112.        elif blkid == block.LEAVES.id:
113.            blk = block.COBWEB.id
114.            blkd = 0
115.        elif blkid == block.WOOD.id:
116.            blk = block.LAVA_STATIONARY.id
117.            blkd = 1
118.        mc.setBlock(bx, by, bz, blk, blkd)
119. def tsunami(x, z):
120.
```

```
    tend = time.time() + 15
    tx = x
    while time.time() < tend:
        h = mc.getHeight(tx, z)
        mc.setBlocks(tx, h-5, z-5, tx, h+5, z+5, block.WATER_STATIONARY.id)
        time.sleep(0.1)
        mc.setBlocks(tx, h-5, z-5, tx, h+5, z+5, block.AIR.id)
        time.sleep(0.1)
        tx += 1
    hm = 5
    while hm > -1:
        h = mc.getHeight(tx, z)
        mc.setBlocks(
tx, h-int(hm), z-5, tx, h+int(hm), z+5, block.WATER_STATIONARY.id)
        time.sleep(0.1)
        mc.setBlocks(tx, h-int(hm), z-5, tx, h+int(hm), z+5, block.AIR.id)
        time.sleep(0.1)
        tx += 1
        hm -= 0.2
disasters = [
tsunami, heatwave, meteor, meteor_shower, geyser, earthquake, sinkhole]
def main(disasters, mc):
    baseed = random.randint(1, 10000)
    while True:
        t = random.randint(15, 180)
        t = 15
        time.sleep(t)
        random.seed(baseed + t)
        baseed = random.randint(1, 10000)
        random.shuffle(disasters)
        disaster = random.choice(disasters)
        ppos = mc.player.getTilePos()
        # mc.postToChat(str(disaster) + ' in')
        # for c in range(3, 0, -1):
        #    mc.postToChat(str(c))
        #    time.sleep(0.33)
        disaster(ppos.x, ppos.z)
try:
    import _thread as thread
except ImportError:
    import thread
thread.start_new_thread(main, (disasters, mc))
```