CoderDOJO Athenry Platform game tutorial

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These are the instructions for a basic platform engine. This engine can be used to do all sorts of games – examples of famous platform games including Mario, Doodle-Jump and many many others! It's a fantastic type of game to be able to do.

1. Gravity



Gravity reduces your "Y". However this gravity isn't realistic as with real gravity, things get faster and faster as they fall. This is called acceleration!

2. Add acceleration

```
when clicked

set speed_y v to 0

forever

change y by speed_y

change speed_y v by -1
```

This way, we are continuously getting faster. Your speed keeps increasing forever.. we need a ground!

First we draw a ground:



Next we write a script that makes him "come out" of the ground after he hits it. Remember, the faster he is falling, the deeper he will be into the ground when he hits it.

```
when clicked

set speed_y to 0

forever

change y by speed_y

change speed_y by -1

if touching ground ? then

set speed_y to 0

change y by 1
```

This works great, but you can see him come up out of the ground which is weird!. Custom blocks are the answer!

3. Fix the ground slide bug

Let's convert this code to a block so we can come out of the ground without screen refreshes. Your computer is so fast that this will appear instant.

```
when clicked

set speed y to 0

forever

change speed y by 1

stay above ground

define stay above ground

repeat until not touching ground ?

set speed y to 0

change y by 1
```

Remember to click "run without screen refresh!"

4. movement – left and right

```
when clicked

set speed_y to 0

set rotation style left-right

forever

if key a pressed? then

point in direction -90

change x by -5

if key d pressed? then

point in direction 90

change x by 5
```

This does the trick, but we pretty much have the same code in two places. Remember the coding rule?

D.R.Y = DON'T REPEAT YOURSELF

Anywhere you see code like this, it's a good idea to create a custom block.

5. Custom Block for Walking:

```
when clicked

set speed_y to 0

set rotation style left-right

forever

if key a pressed? then

walk -90 -5

if key d pressed? then

walk 90 5

define walk direction speed

change y by speed_y

change speed_y by -1

stay above ground
```

This means that as we add more checks in walking, it will be really easy to put it in one place. We are about to do that below to solve the "popping up on top of a pillar" problem.

6. Maximum height for walls

```
define walk direction speed

point in direction direction

change x by speed

set slope to 0

repeat until slope = 15 or not touching ground 2

change y by 1

change slope by 1

if slope = 15 then

change x by 0 - speed

change y by 0 - slope
```

7. Jumping

Easy way!

```
when w key pressed
set speed_y to 15
```

Better.. to avoid the double hops create a variable called "height above ground" that gets bigger when I'm not touching the ground. Only let the jump button work if this is small enough that you might be touching the ground. This makes sense right, you can't jump when you're in the air?

```
if key w pressed? and height above ground < 1 then

set speed_y to 10

change y by speed_y

change speed_y by -1

change height above ground by 1

stay above ground

define
```

```
define stay above ground

repeat until not touching ground ?

change y by 1

set apect 7 to 0

set height above ground * to 0
```

8. Ceilings

Ceilings – this is a tough one! We do the same as we do for falling, except we move the other way. Add a "Boolean" input to the block – for some reason this speed y > 0 check doesn't work from within the custom block – haven't quite figured out why yet!!

```
define stay above ground up?

repeat until not touching ground ?

if up? then

change y by -1

else

change y by 1

set height above ground to 0

set speed y to 0

stay above ground speed y > 0
```

9. Add a hitbox

Another problem you might have noticed is that your cat gets caught on his whiskers, etc on ledges. Let's fix that by using a simple hitbox.





Full Script for week 1:

```
when / clicked
set size to 50 %
set speed_y to 0
set max slope to 15
  switch costume to hitbox
  if key a pressed? then
   walk -90 -5
  if key d pressed? then
   walk 90 5
  if key w pressed? and height above ground < 1 then
   set speed_y to 15
 change y by speed_y
  change speed_y by -1
  change height above ground by 1
  stay above ground speed y > 0
                                         define walk direction speed
  switch costume to costume1
                                         point in direction direction
                                         change x by speed
define stay above ground up?
                                         set slope to 0
                                         repeat until slope = max slope or not touching ground ??
repeat until not touching ground ??
                                          change y by 1
    up? then
                                          change slope by 1
  change y by -1
                                         if slope = max slope then
                                          change x by 0 - speed
   set height above ground * to 0
                                          change y by 0 - slope
  set speed y to 0
```