

CHAPTER 5:

CROSSHAIRS AND PYTHON



THIS CHAPTER CONTAINS VERY VALUABLE INFORMATION, YET IT IS PROBABLY THE MOST DIFFICULT TO IMPLEMENT CORRECTLY. PYTHON SCRIPTS ARE COMPOSED OF BITS OF THE PYTHON CODING LANGUAGE THAT ADD FUNCTIONALITY TO OUR GAME. IF YOU ARE PROFICIENT IN PYTHON, YOU CAN USE THAT TO YOUR ADVANTAGE WHEN PROGRAMMING.

HOWEVER, YOU CAN MAKE A COMPLETE, FUNCTIONING GAME WITHOUT ANY PYTHON SCRIPTS. IT WILL BE MESSY AND HACKY, BUT IT IS POSSIBLE. SO DON'T THINK THAT YOU HAVE TO USE PYTHON SCRIPTS IN YOUR GAME. IF YOU DO LEARN HOW TO USE SCRIPTS THOUGH, YOU WILL BE ABLE TO MAKE GAMES MUCH MORE EFFICIENTLY.

IF YOU FOLLOW THIS CHAPTER CLOSELY, YOUR GAME WILL WORK FINE. I DID HAVE ONE CASE, HOWEVER, OF A KID WHO COULD NOT GET THEIR CROSSHAIRS TO WORK NO MATTER WHAT. I TRIED TO HELP HIM, BUT NO MATTER WHAT WE DID, THE STANDALONE PLAYER WOULD NOT PLAY HIS GAME. I GUESSED THAT IT WAS EITHER BLENDER OR THE COMPUTER HE WAS USING THAT WAS AT FAULT, BECAUSE I WENT THROUGH HIS ENTIRE PROJECT AND COULDN'T FIND THE MISTAKE. HE UNFORTUNATELY HAD TO START THE CHAPTER OVER. THAT WAS THE ONLY TIME THAT HAPPENED.

HERE IS A LIST OF BLENDER HOTKEYS:

SHIFT+A: ADD AN OBJECT TO SCENE

TAB: TOGGLE OBJECT AND EDIT MODE

A: SELECT/DESELECT ALL OBJECTS IN A SCENE

S: SCALE

R: ROTATE

G: MOVE

X: DELETE

F: MAKE A FACE

C: SELECT SMALL AREAS

B: SELECT A LARGE AREA

CTRL+R: ADD LOOP CUT

CTRL+Z: UNDO

5: TOGGLE PERSPECTIVE/ORTHO MODE

1 (NUM PAD): FRONT VIEW (CTRL+1=OPPOSITE)

3 (NUM PAD): SIDE VIEW (CTRL+3=OPPOSITE)

7 (NUM PAD): TOP VIEW (CTRL+7=OPPOSITE)

HOLD MMB+DRAG: ROTATE VIEWPORT

SCROLL MMB: ZOOM IN/OUT

HOLD SHIFT+MMB: SHIFT VIEWPORT

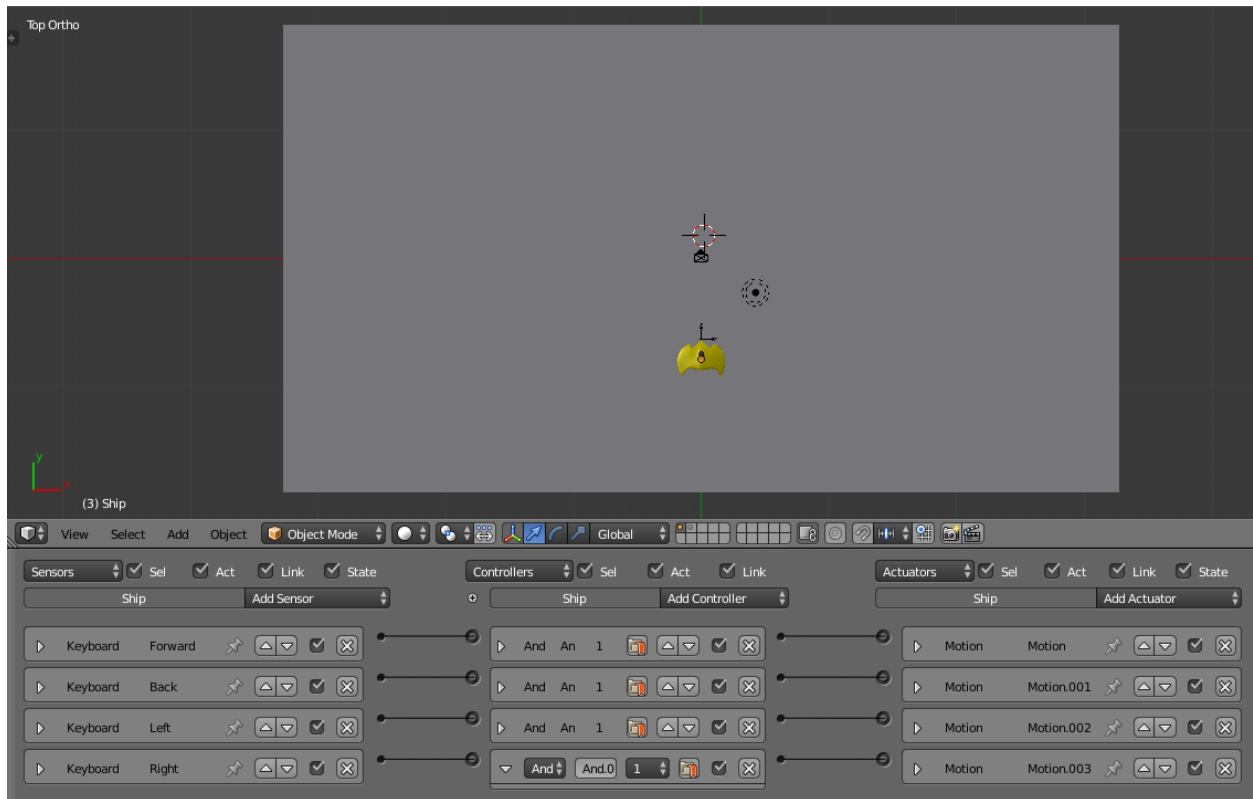
SHIFT+SPACEBAR: MAXIMIZE VIEWPORT

SHIFT+S: SET CURSOR

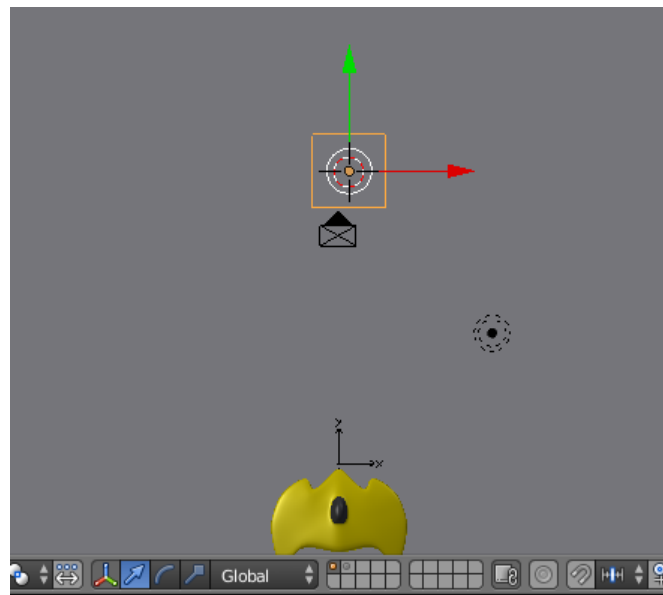
CTRL+J: JOIN MESHES

Z: TOGGLE WIREFRAME MODE

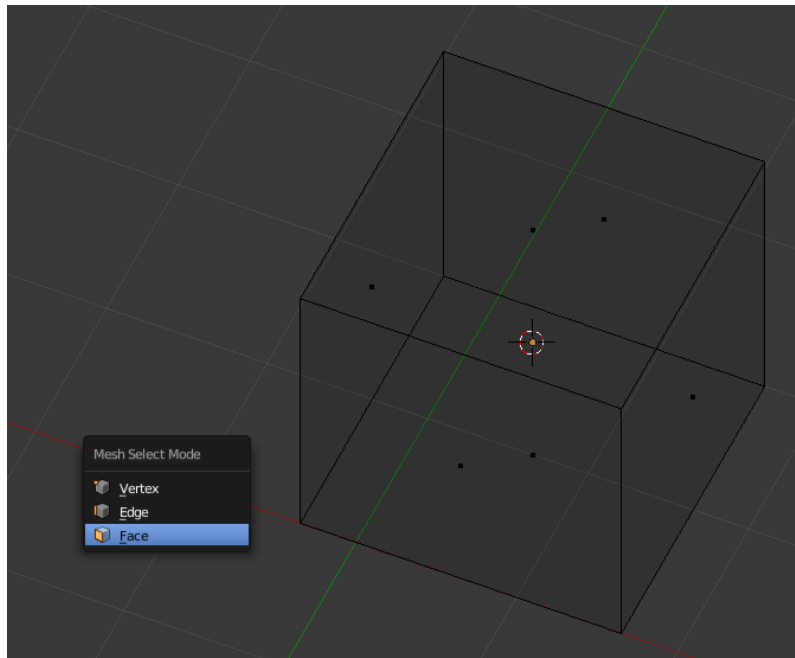
SHIFT+D: DUPLICATE



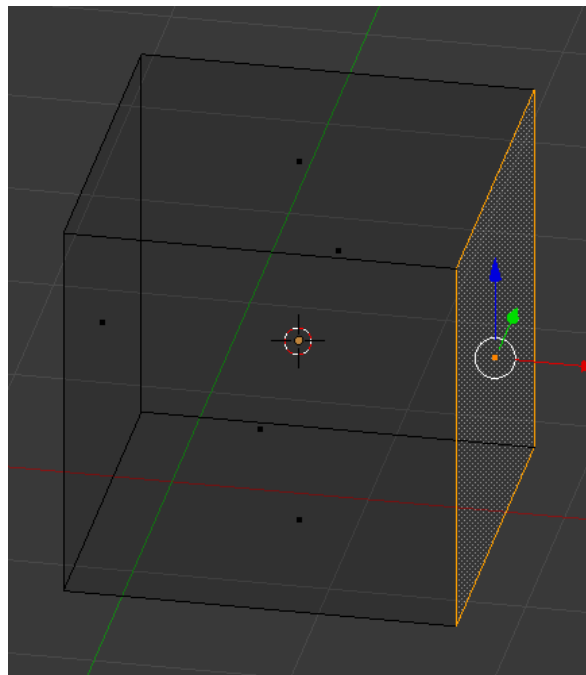
1) GO TO TOP VIEW BY PRESSING '7'.



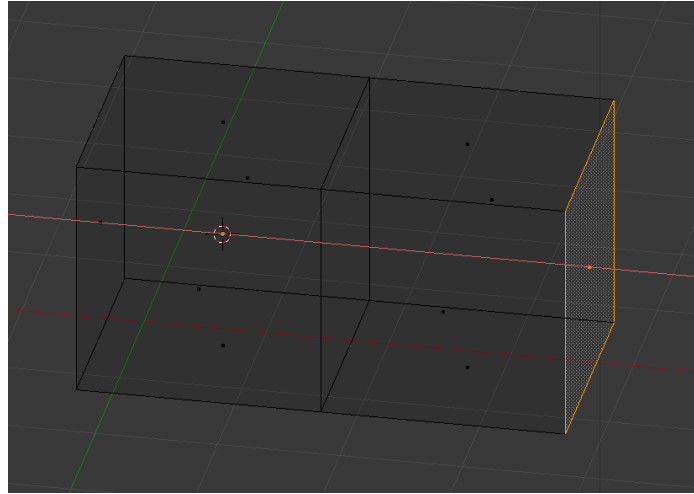
2) ADD A MESH CUBE BY PRESSING 'SHIFT+A'.



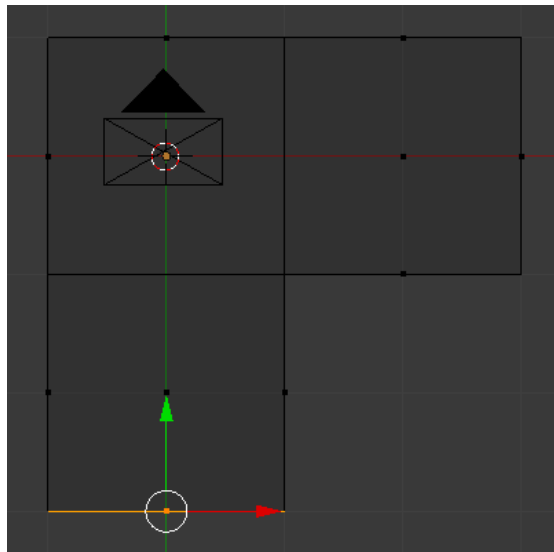
3) GO INTO EDIT MODE (TAB). PRESS CTRL+TAB AND ENTER FACE MODE.



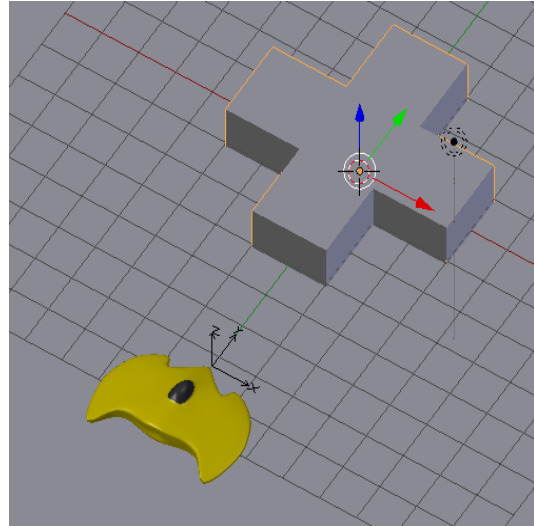
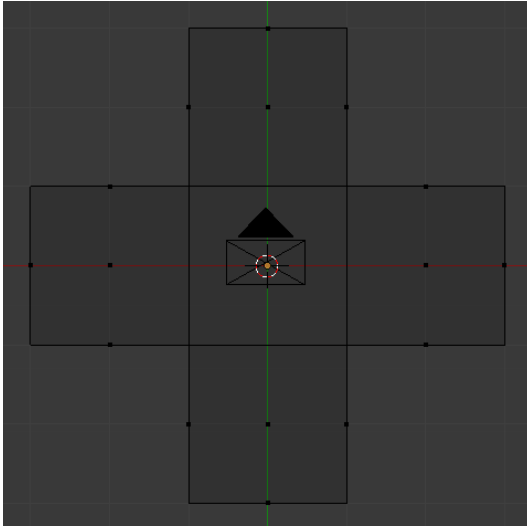
4) RIGHT-CLICK TO SELECT ONE OF THE SIDE FACES.



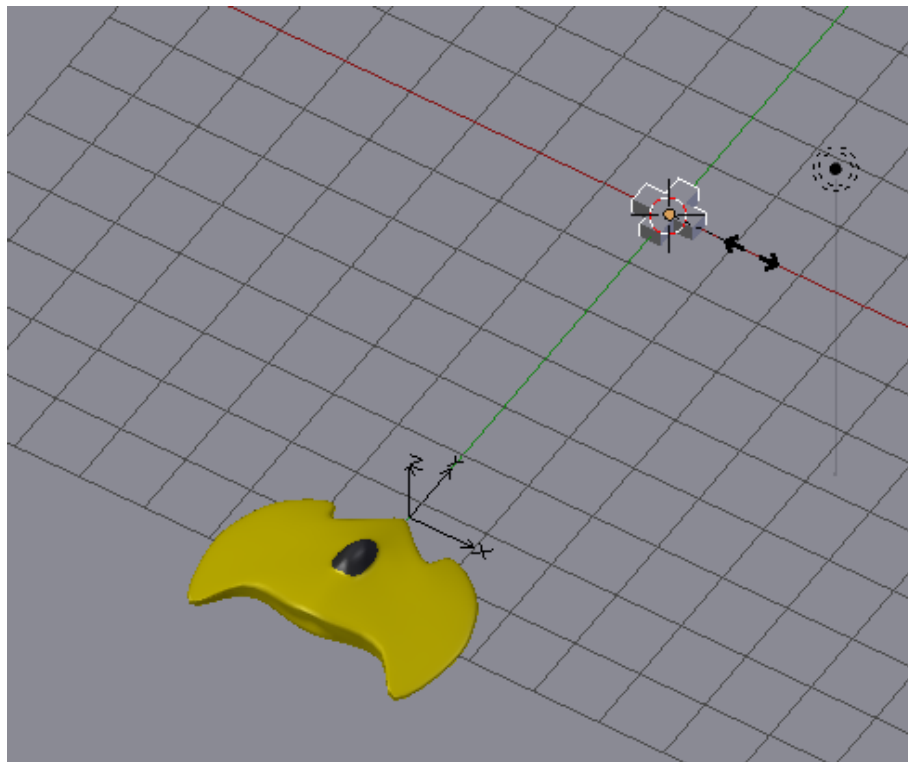
- 5) PRESS 'E' THEN 'X' TO EXTRUDE AND CONSTRAIN TO THE X-AXIS. LEFT-CLICK OR PRESS 'ENTER' TWICE TO SET THE LOCATION.



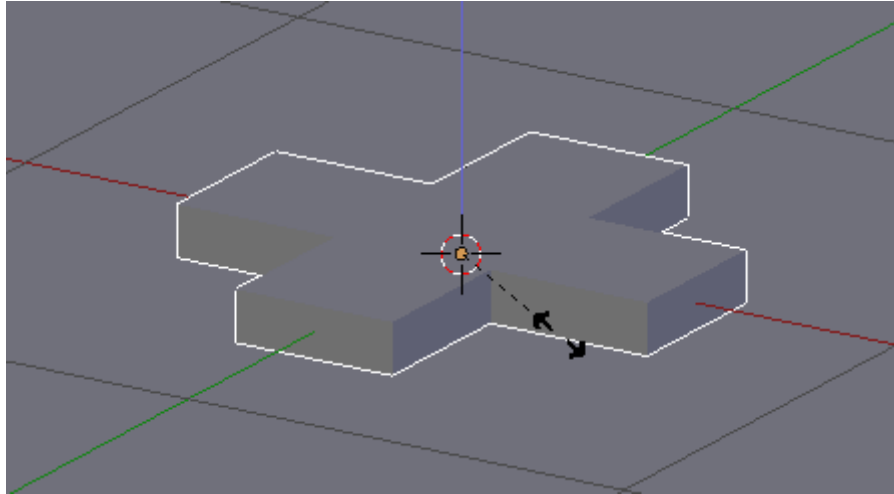
- 6) PRESS 'A' TO DESELECT THE FACE. USE RIGHT-CLICK TO SELECT ANOTHER SIDE-FACE (NOT THE TOP OR BOTTOM OF THE CUBE). USE 'E' AND THEN 'Y' TO EXTRUDE.



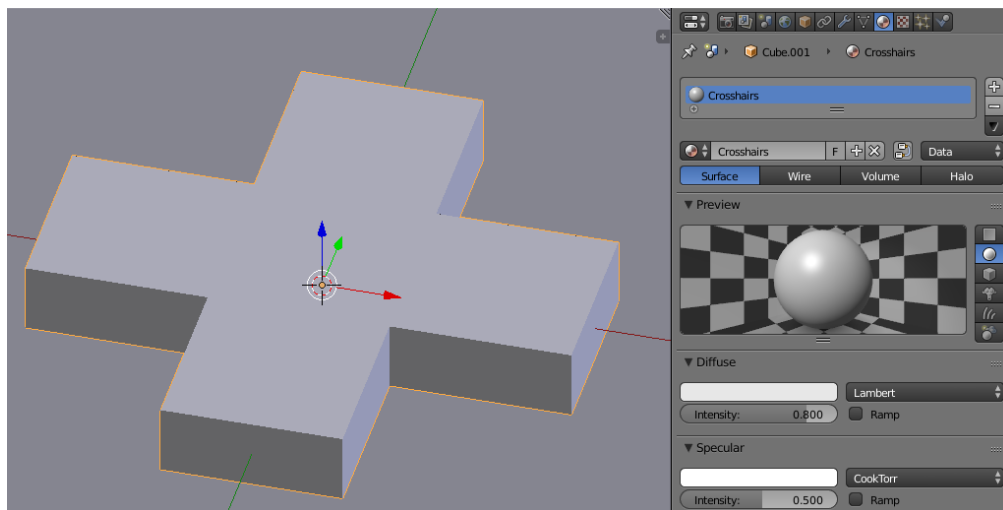
7) REPEAT THE PROCESS UNTIL YOU HAVE MADE YOUR CROSSHAIRS.



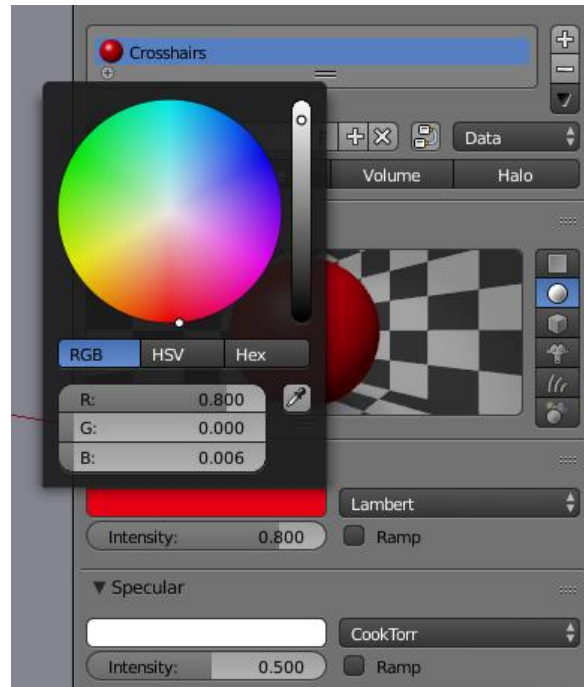
8) WITH THE CROSSHAIRS SELECTED (RIGHT-CLICK IF YOU HAVE NOT SELECTED THEM) PRESS 'S' TO ADJUST THE SIZE SMALLER. LEFT-CLICK TO SET.



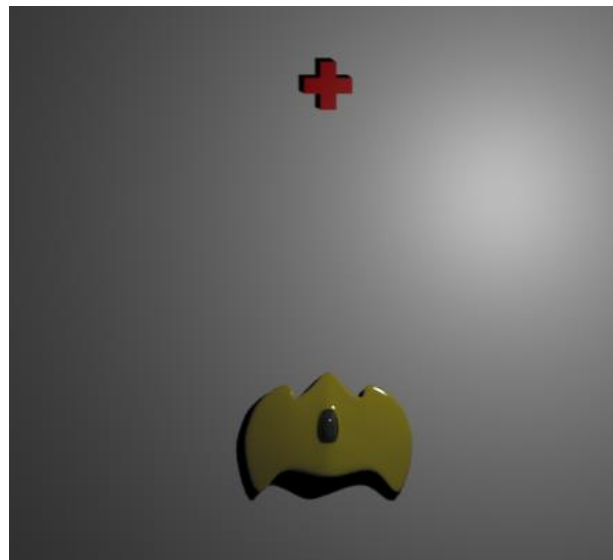
- 9) WITH THE CROSSHAIRS STILL SELECTED, PRESS 'S' AGAIN. PRESS 'Z' TO CONSTRAIN TO THE Z-AXIS. FLATTEN THE CROSSHAIRS. MAKE SURE YOUR CROSSHAIRS ARE FLOATING ABOVE YOUR GROUND AND NOT FALLING THROUGH IT.



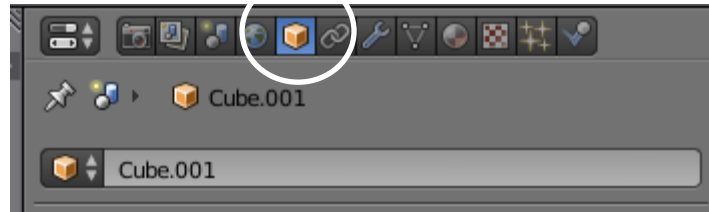
- 10) ADD A NEW MATERIAL TO YOUR CROSSHAIRS. NAME IT CROSSHAIRS.



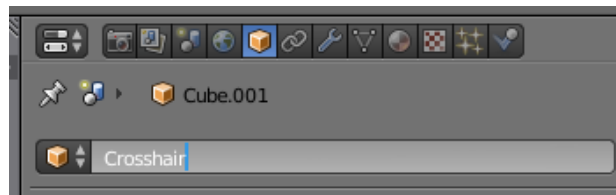
11) LEFT-CLICK ON THE WHITE BAR BENEATH 'DIFFUSE'. SELECT A COLOR FROM THE COLOR WHEEL.



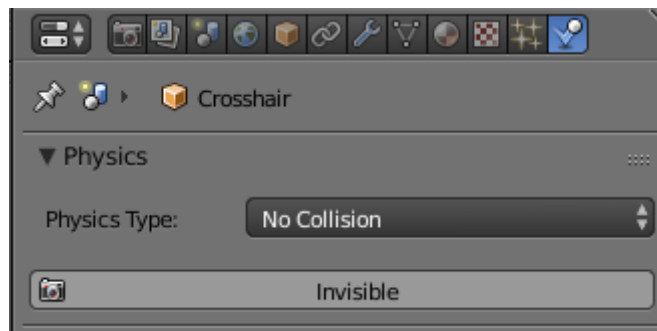
12) YOUR CROSSHAIR IS COMPLETE. NOW WE NEED TO ATTACH IT TO THE MOUSE CURSOR.



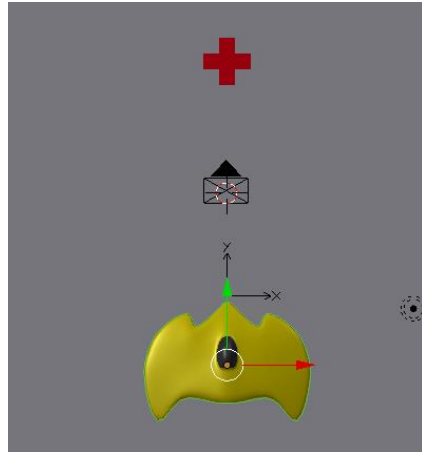
13) THIS STEP IS VERY IMPORTANT:
CLICK ON THE ORANGE CUBE IN THE
PROPERTIES PANEL.



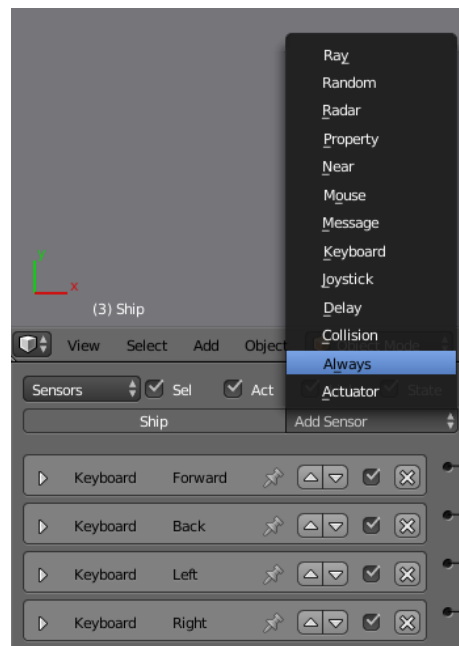
14) NAME YOUR CROSSHAIRS
'CROSSHAIR'. SAVE YOUR PROJECT.



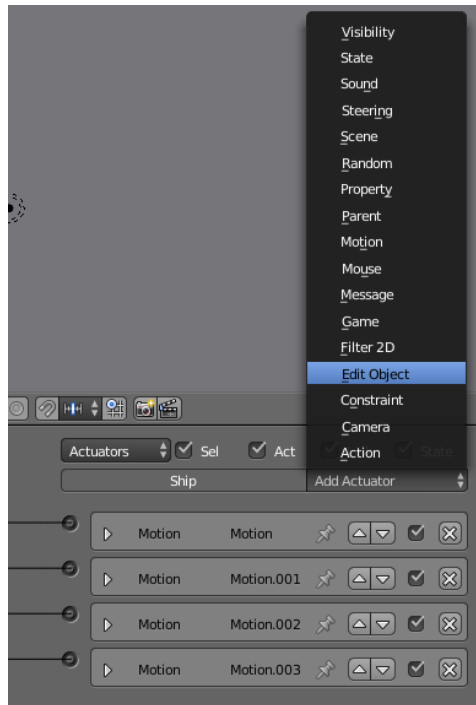
15) IN THE PHYSICS PANEL FOR THE
CROSSHAIRS, MAKE SURE ITS
PHYSICS ARE SET TO 'NO
COLLISION'.



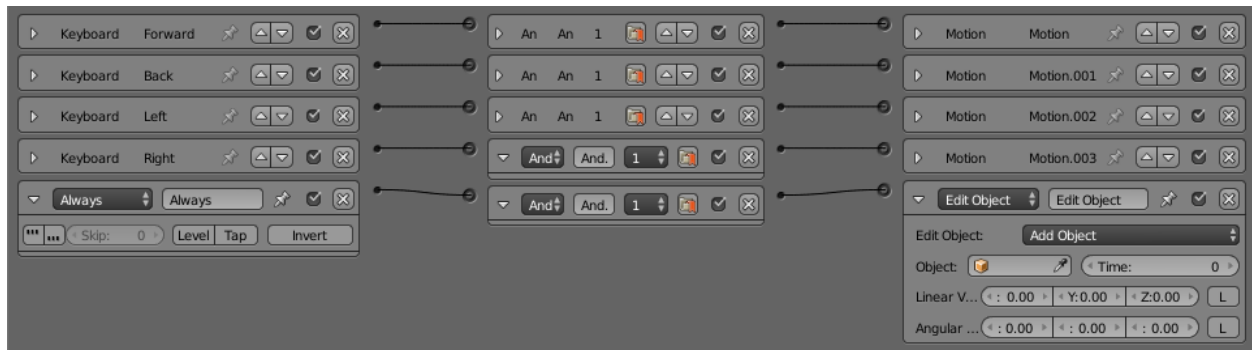
16) RIGHT-CLICK TO SELECT YOUR SHIP (OR YOU CAN SELECT YOUR EMPTY AND APPLY EVERYTHING THE SAME; THIS WILL HAVE THE EMPTY FOLLOW THE CURSOR AND SHOOT WHERE YOU AIM WHILE THE SHIP STAYS POINTING FORWARD).



17) ADD AN ALWAYS SENSOR.



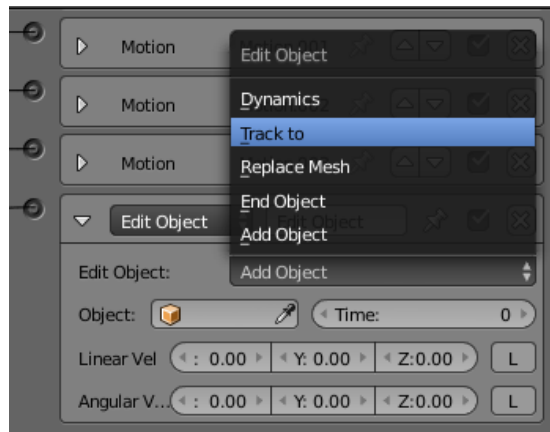
18) ADD AN 'EDIT OBJECT' ACTUATOR



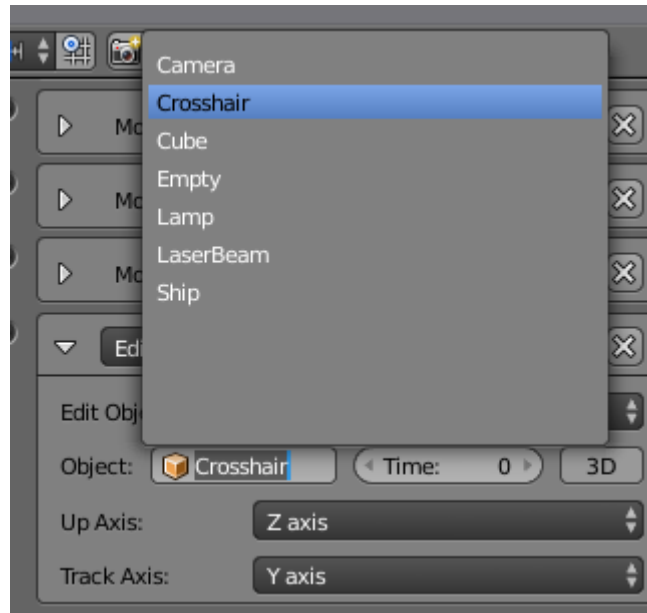
19) CONNECT THE TWO. AN 'AND' WILL APPEAR BETWEEN THEM.



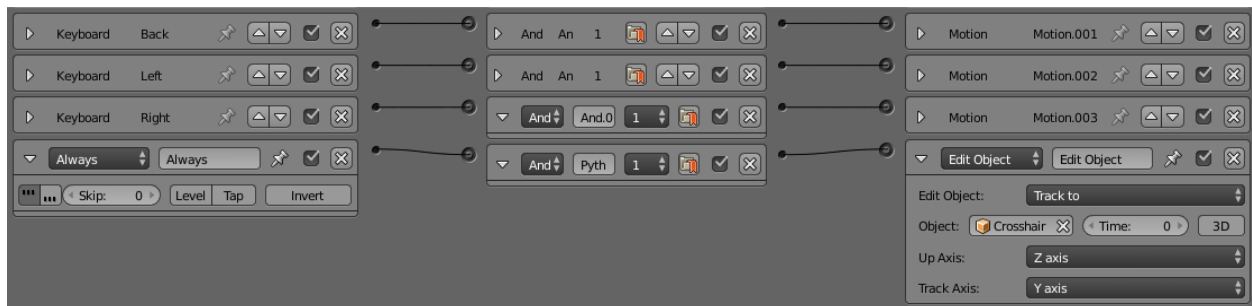
20) IN THE 'ALWAYS' BOX, LEFT-CLICK THE CIRCLED BOX WITH THREE MARKS. LABEL THE 'AND' BOX 'PYTHON'.



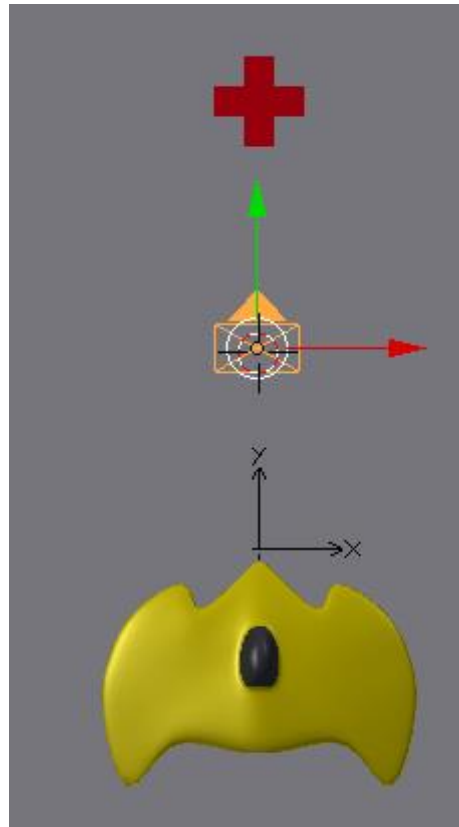
21) IN THE EDIT OBJECT ACTUATOR, CLICK THE 'ADD OBJECT' BOX AND SELECT 'TRACK TO'.



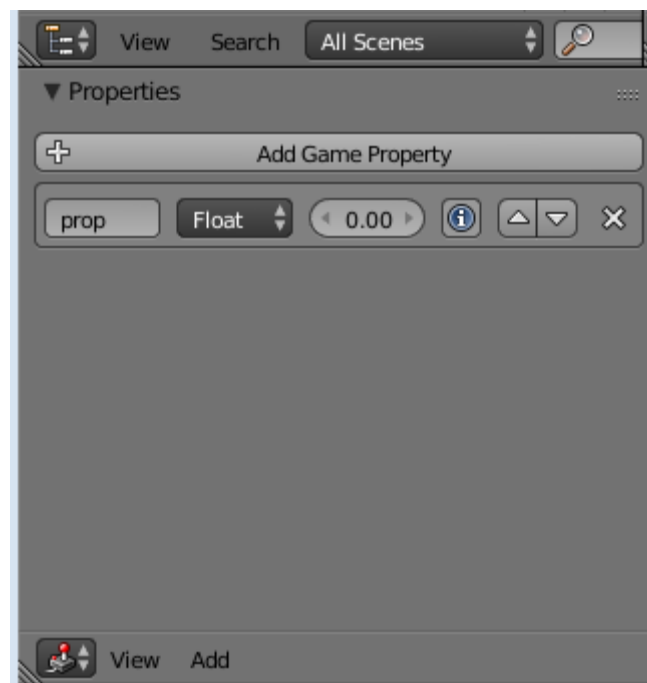
22) NEXT TO OBJECT, SELECT 'CROSSHAIR'.



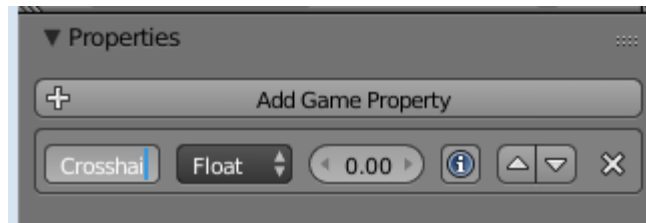
23) YOUR THREE BOXES SHOULD LOOK LIKE THE PICTURE ABOVE.



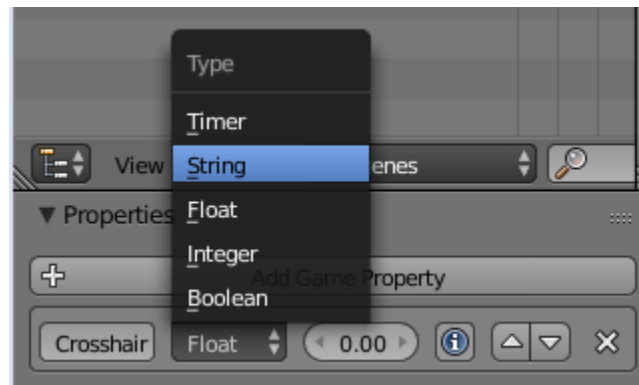
24) R-CLICK TO SELECT THE CAMERA.



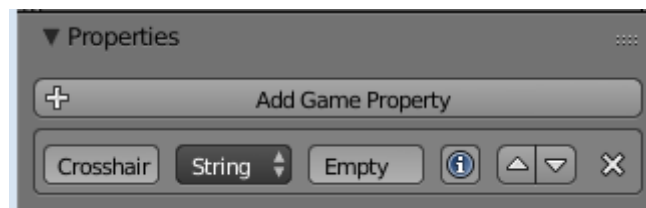
25) CLICK ON ADD GAME PROPERTY.



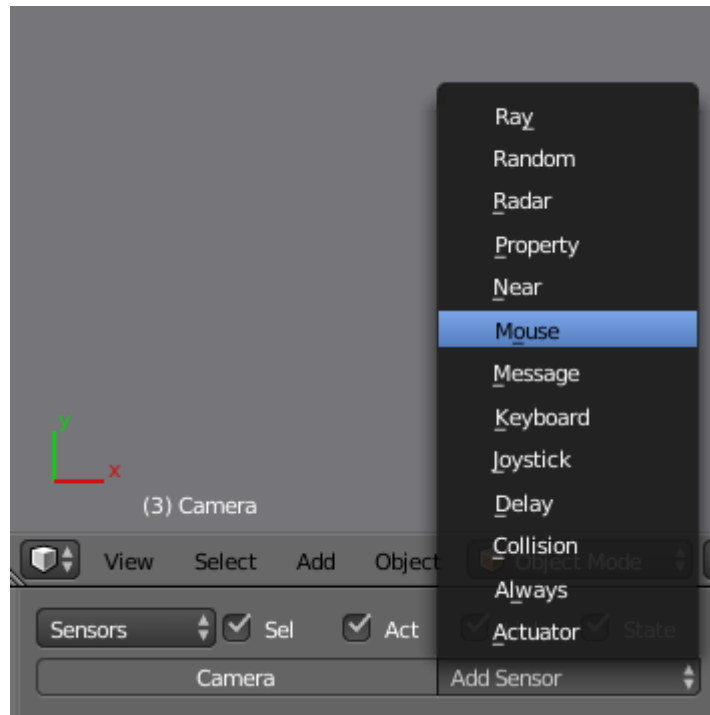
26) CHANGE THE NAME TO CROSSHAIR.



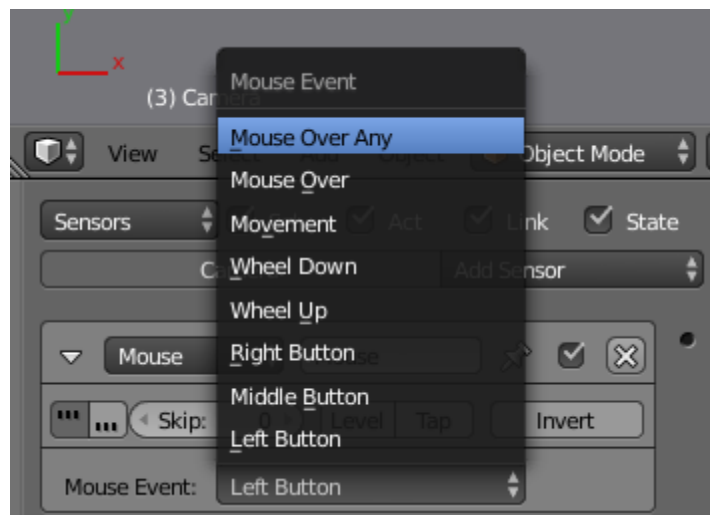
27) CHANGE THE PROPERTY FROM A FLOAT TO A STRING.



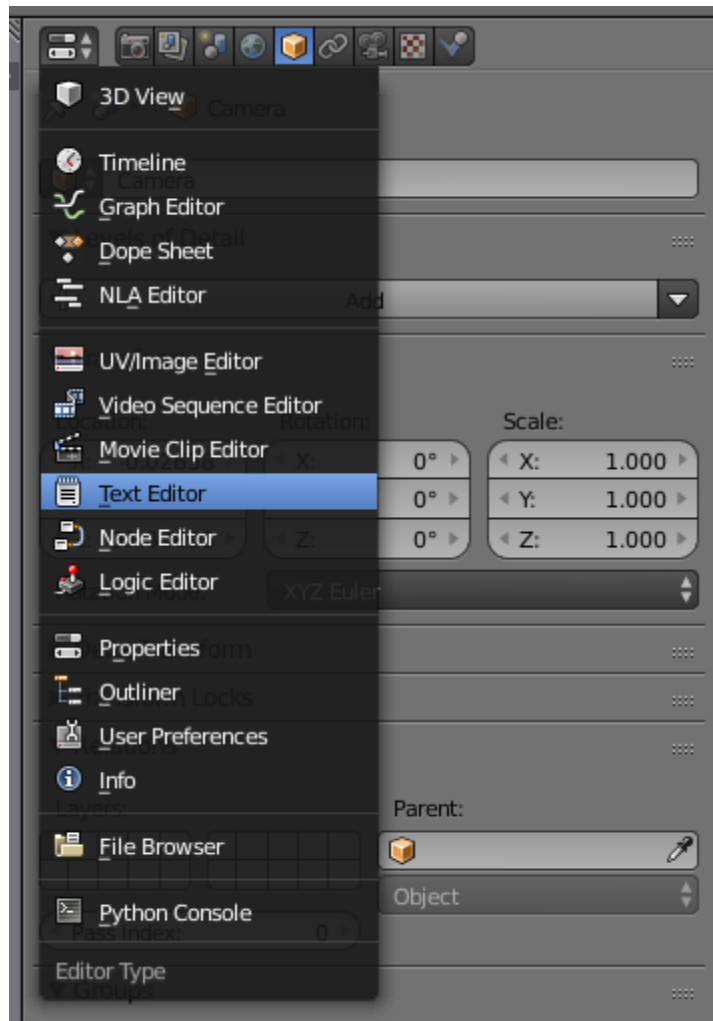
28) YOUR PROPERTY SHOULD LOOK LIKE THE PICTURE ABOVE.



29) WITH THE CAMERA STILL SELECTED, ADD A MOUSE SENSOR.



30) BE SURE TO CHECK THE BOX WITH THREE MARKS. CHANGE THE MOUSE EVENT TO MOUSE OVER ANY.



31) SAVE YOUR PROJECT. LET'S WRITE OUR PYTHON SCRIPT TO ADD AIMING FUNCTIONALITY TO THE CROSSHAIRS. IN YOUR PROPERTIES ICON, FIND THE TEXT EDITOR.


```
1 import bge
2
3
4 def main():
5
6     cont = bge.logic.getCurrentController()
7     own = cont.owner
8
9     sens = cont.sensors['mySensor']
10    actu = cont.actuators['myActuator']
11
12    if sens.positive:
13        cont.activate(actu)
14    else:
15        cont.deactivate(actu)
16
17 main()
18
```

33) YOU SHOULD SEE THIS IN THE TEXT EDITOR. RIGHT NOW, THERE IS NO VISIBLE CURSOR WHEN WE PLAY OUR GAME. WE WILL CHANGE THAT.

```
1 import bge
2
3
4 def main():
5
6     cont = bge.logic.getCurrentController()
7     own = cont.owner
8
9     sens = cont.sensors['mySensor']
10    actu = cont.actuators['myActuator']
```

```
sens = cont.sensors['Mouse']
actu = cont.actuators['myActuator']
```

34) FOLLOW THESE DIRECTIONS CLOSELY: SELECT THE WORDS 'MYSENSOR' AND CHANGE THEM TO 'MOUSE'.

```

1 import bge
2
3
4 def main():
5
6     cont = bge.logic.getCurrentController()
7     own = cont.owner
8
9     sens = cont.sensors['Mouse']
10    actu = cont.actuators['myActuator']
11
12    if sens.positive:
13        cont.activate(actu)
14    else:
15        cont.deactivate(actu)
16
17 main()
18

```

35) HIGHLIGHT THE ACTU = LINE (PICTURED). DELETE IT.

```

1 import bge
2
3
4 def main():
5
6     cont = bge.logic.getCurrentController()
7     own = cont.owner
8
9     sens = cont.sensors['Mouse']
10    if own['Crosshair']=="Empty":
11        scene=bge.logic.getCurrentScene()
12        own['Crosshair']=scene.objects['Crosshair']
13

```

36) TYPE IN LINES 10 - 12 AS YOU SEE THEM IN THE PICTURE.

```

1 import bge
2
3
4 def main():
5
6     cont = bge.logic.getCurrentController()
7     own = cont.owner
8
9     sens = cont.sensors['Mouse']
10    if own['Crosshair']=="Empty":
11        scene=bge.logic.getCurrentScene()
12        own['Crosshair']=scene.objects['Crosshair']
13
14    if sens.positive:
15        cont.activate(actu)
16    else:
17        cont.deactivate(actu)
18
19 main()
20

```

37) HIGHLIGHT LINES 15-17. DELETE THEM.

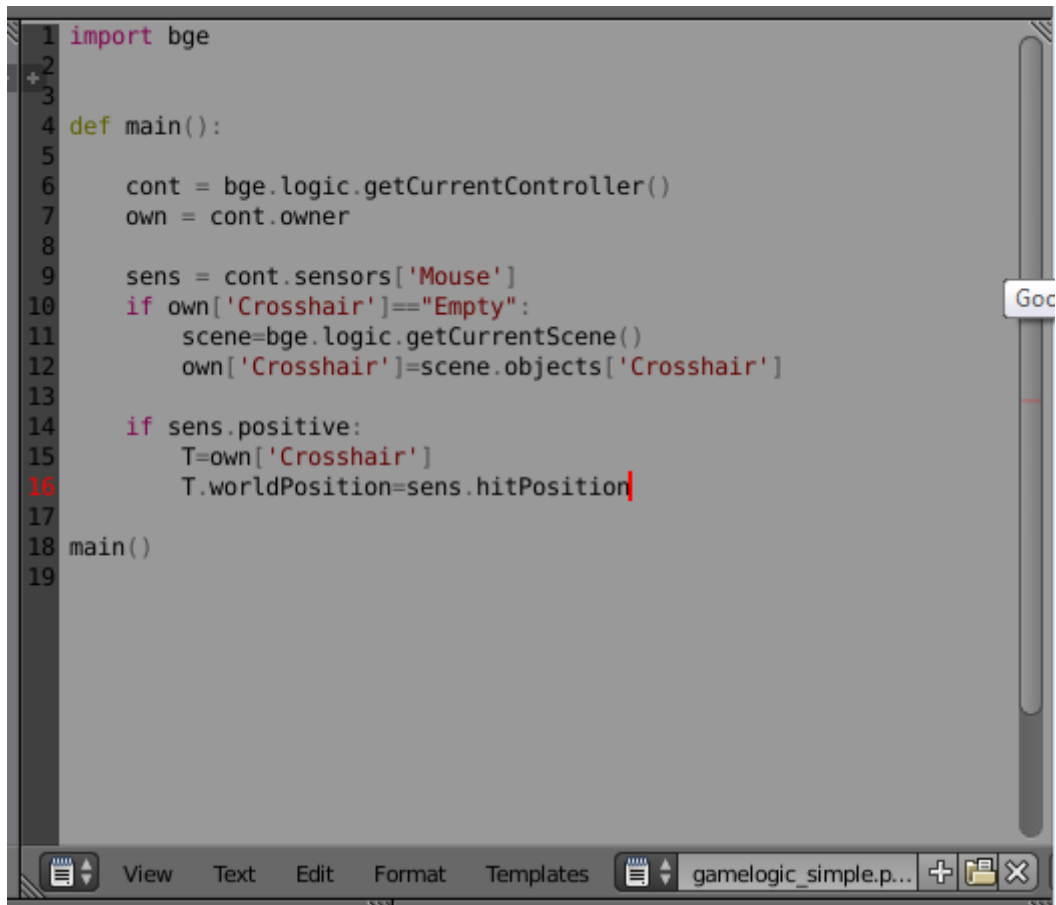
```

13
14    if sens.positive:
15        T=own['Crosshair']
16        T.worldPosition=sens.hitPosition
17

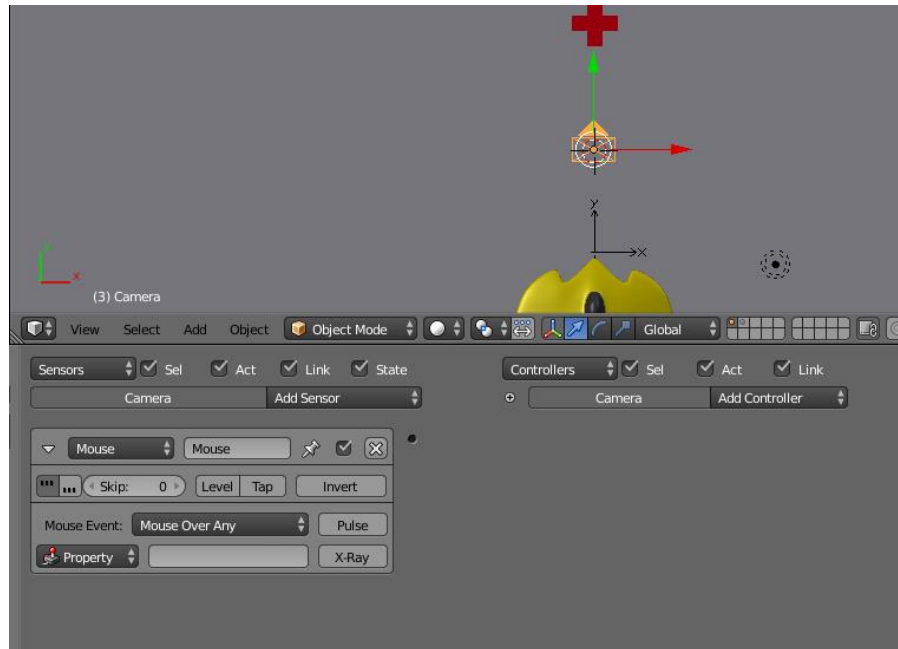
```

38) TYPE IN LINES 15 AND 16 AS PICTURED.

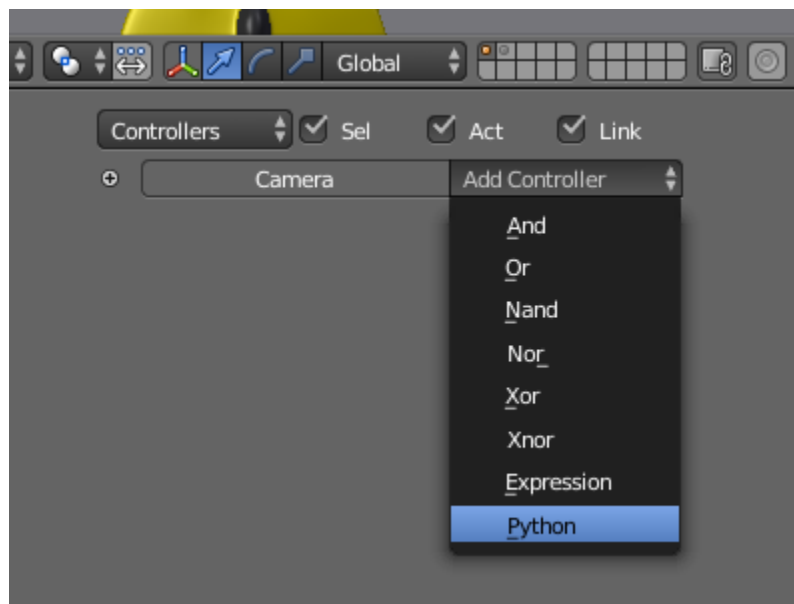
```
1 import bge
2
3
4 def main():
5
6     cont = bge.logic.getCurrentController()
7     own = cont.owner
8
9     sens = cont.sensors['Mouse']
10    if own['Crosshair']=="Empty":
11        scene=bge.logic.getCurrentScene()
12        own['Crosshair']=scene.objects['Crosshair']
13
14    if sens.positive:
15        T=own['Crosshair']
16        T.worldPosition=sens.hitPosition
17
18 main()
19
```



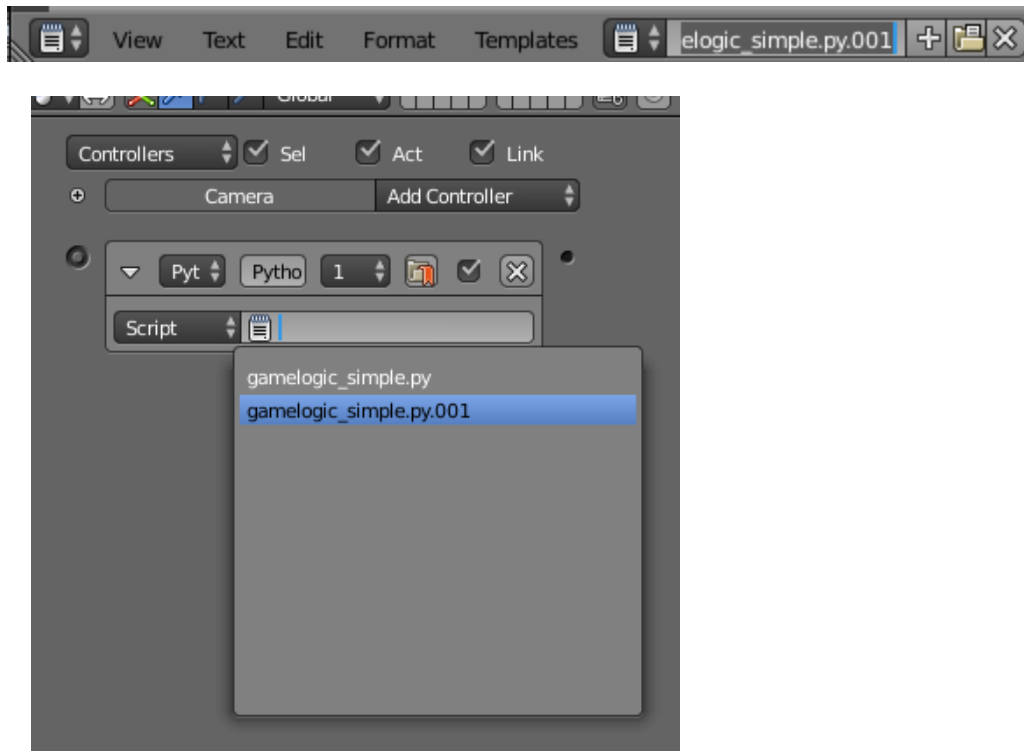
39) YOUR COMPLETED SCRIPT SHOULD LOOK LIKE THE ONE ABOVE. PYTHON IS A VERY PARTICULAR LANGUAGE, SO IF YOU HAVE ANY ERRORS YOUR PROGRAM WILL NOT RUN CORRECTLY.



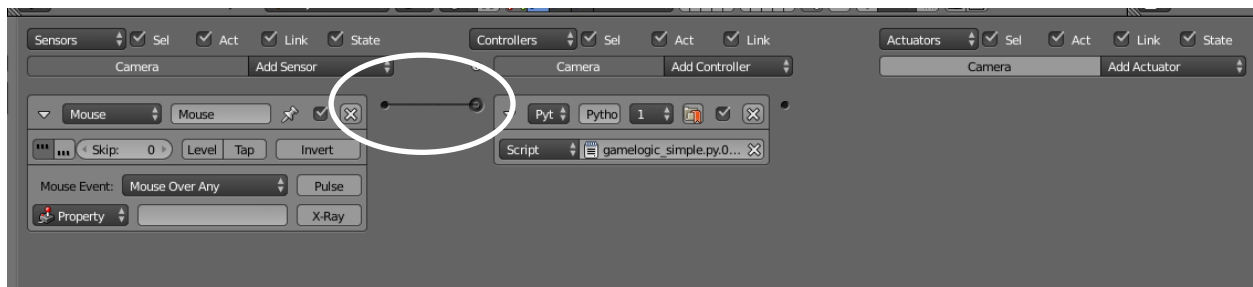
40) YOUR CAMERA SHOULD STILL BE SELECTED.



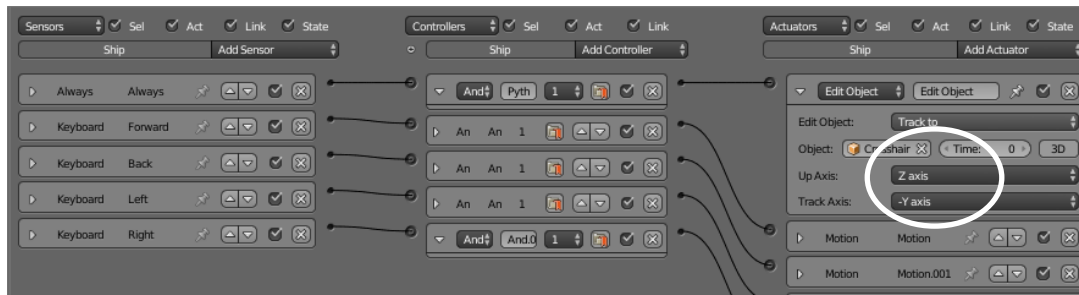
41) ADD A PYTHON CONTROLLER.



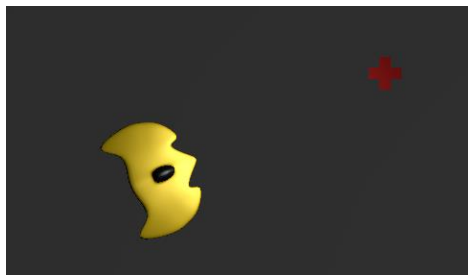
42) CLICK ON THE NOTEPAD NEXT TO SCRIPT. SELECT THE GAMELOGIC_SIMPLE SCRIPT YOU JUST WROTE. IN THIS CASE, I FORGOT TO RENAME MINE, SO I SELECTED THE ONE ENDING .001 (IT'S THE ONE WE JUST FINISHED WRITING).



43) CONNECT THE TWO BOXES. WE WON'T BE ADDING AN ACTUATOR.



44) WHEN I TESTED MY GAME, MY SHIP WAS FACING THE WRONG DIRECTION. WITH THE SHIP SELECTED, I CHANGED THE TRACK AXIS (UNDER EDIT OBJECT) TO -Y. IT WORKED JUST FINE.



45) NOW, YOUR SHIP SHOULD TRACK TO THE CROSSHAIRS. YOU MIGHT NOTICE THAT IT IS VERY DIFFICULT TO AIM WITH THE MOUSE, STEER WITH THE ARROWS, AND FIRE WITH THE SPACEBAR. WE WILL ADDRESS THAT PROBLEM IN THE NEXT CHAPTER.

46) YOU HAVE SUCCESSFULLY WRITTEN YOUR FIRST SCRIPT!! WELL DONE!!

[illegible]

This image shows a full page of blank handwriting practice paper. It features multiple sets of horizontal lines across the entire page. Each set consists of three lines: a solid top line, a dashed middle line, and a solid bottom line. These sets are repeated vertically down the page, providing a guide for letter height and placement. The background is white, and the lines are black. There is no text or other markings on the page.