Coding

Dodgeball on the Moon
Create your own computer game!

- You are going to create a real computer program for a game.
- You are using “event driven” programming.
- You must tell the computer everything you want it to do, and your instructions must be exact.

Design your game

- Before you begin a game, plan the following:
  - The game’s characters
  - The setting (in space, underwater, etc)
  - The objective of the game (score, beat the clock, get through a maze, etc)
  - How do you want to control the action (arrow keys, mouse, etc.)

This game design is: Dodgeball on the moon

- Scratchy the cat is the character
- Scratchy eats fruit salad for energy and to win the game. When scratchy eats 5 fruit salads game is over. You Win!
- Scratchy has to avoid being hit by dodgeballs. Every time scratchy is hit, the cat loses energy. When energy goes to zero game is over. You Lose!

Let’s Begin!

Open Internet Browser
Go To: Scratch.mit.edu
1. Click on “create”.

Welcome to Scratch!

- Learn how to make a project in Scratch
- Try out starter projects
- Connect with other Scratchers

Featured Projects

- Aventura 3D do Fupica Fupicat
- Dream_Fern_
- The Art of Frills: A Tutu quail
- A Walking Taco Game MeTwo
- Seaview - Pen Art OnlyGragasOnlyGG

 Scratch News

- Update to Notes & Credits
- Scratch Video Update: Episode 18

Details sent from Scratch were not working Oct 4. If you need to verify your email, go to Account Settings and resend.
1. Click X to Close the tutorial pop-up screen.
   Then click on landscape icon to select background.
1. Click on "Space".

2. Double-Click on the backdrop **Moon**.
1. Click on “cat” sprite to begin.
2. Click “Code” (you will see 10 categories appear...Motion, Looks, Sound, Events, etc.)
3. Click “Events” and drag “When green flag clicked” into the open area to the right.
4. Click “Looks” and select “Show” and drag below “when green flag clicked” and connect the two. (See illustration above.)
1. Click “Motion” select “go to x: y:” and drag under “show”. Leave “x” and “y” at “0”
2. Click “Variables” select “Make a Variable” name it “energy”. Click “Ok”
3. From “Variables” again select “Make a variable” and name it “score”. Click “Ok”. (See illustration above)
1. From “Variables” select “set energy to” and drag under “go to x: 0 y: 0”. Change “0” to “100” by clicking number.
2. Select another “set energy to” and drag under the first “set energy to”. Change “Energy” to “Score” by clicking on small white triangle.
3. Click “Looks” select “set size to _%” and drag under “set score to 0”. Change value to “60%”. (See illustration above.)
1. Click “Control” select and drag “if then” loop.

2. Click “Sensing” select “key space pressed?” and drag it into open space between “If” and “then”.

3. Right click on orange portion of “if then” box to get drop down and select “Duplicate”.
   Note: With Mac, hold down “control” and click mouse and select Duplicate.

3. Now right click on orange portion of the “if then” box and select Duplicate. Connect this box to previous “if then” box.
4. Do this until that you have a total of 4 “if then” boxes.
1. In the first “key space pressed?” module, click the white triangle and set it to “right arrow”, set second one to “left arrow”, set third one to “up arrow”, and set fourth one to “down arrow”.

2. Click “Motion” select “change x by_” and drag it into open space in the “If then” loop. Do this for the first two “If then”.

3. From “Motion” select “change y by_” and drag it into open space in “If then” loop. Do this for the 3rd and 4th “If then”.

4. Change the value in the 2nd and 4th from “10” to “-10”. (See illustration above.)
1. Click “Looks” select “next costume” and drag it into open space in “If then” loop below “change by”. Do this for all four “if then” loops.
2. Click “Control” select “forever” loop, connect it to “set score to 0”. It will automatically go around all four of the “if then” loops. (See illustration above.)
3. Test Code.

Let’s test code.
1. Click on the green flag. This launches the program.
2. Use arrow keys on keyboard to move cat around the moon. Try all four arrows.
3. Press Red Stop sign to stop program.
Create Code for Winning Score

1. Click “Events” select “**when green flag clicked**” and drag it into open space separate from first program code.
2. Click “Control” select “if then” and drag below “when green flag clicked”.
3. From “Operators” select “__ = __” module and drag into the open space between “if” and “then”.
4. Click “Variables” select “score” and drag into the left box.
5. Enter “5” in the right box. (this is winning score)
6. Click “Looks” select “say Hello! for 2 seconds” and drag to open space in “If then” loop.
7. Change “Hello!” to “You Win!”.
8. Click “Control” select “stop all” and drag below “say You Win! for 2 seconds”. (See illustration above.)
Create Code for Game Over

1. From “Control” select “if then” and drag below the other “if then”.
2. Click “Operators” select “__ <  50” (less than) block and drag into the open space between “if” and “then”.
3. Click “Variables” select “energy” and drag to the left blank field.
4. Enter “1” to the right field. (this will mean you are out of energy)
5. Click “Looks” select “show” and drag into blank space in “if then” loop.
6. From “Looks” select “say Hello! for 2 seconds” and drag below “show”.
7. Change “Hello!” to “Game Over!”
8. Click “Control” select “stop all” and drag below “say Game Over! for 2 seconds”.
9. From “Control” select “forever” loop and place it over “when green flag clicked”. It will automatically go around both of the “if then” loops. (See Illustration above.)
Create Code to Make Balls Bounce and Cat to Lose Energy When Hit by Ball.

1. Next, create new sprite by clicking cat symbol “Choose A Sprite”.

https://scratch.mit.edu/projects/
2. Double-click on “Ball”.

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The diagram shows a sprite selection screen in Scratch. The highlighted sprite is labeled “Ball.” You are instructed to double-click on this image.
1. Click on “Ball” sprite.
2. Click “Events” select “when green flag clicked” and drag it into open space.
3. Click “Looks” select “hide” and drag below “when green flag clicked”.
4. Click “Control” select “wait 1 second” and drag below “hide”.
5. Change value to “7” seconds.
6. From “Control” select “repeat 10” loop and drag below “wait 7 seconds”.
7. Change value to “5”.
8. From “Control” select “create clone of myself” and place in the “repeat 5” loop.
9. From “Control” select “wait 1 second” and drag below “create clone of myself” and connect to it.
10. Change value to “5” seconds.
11. Click “Looks” select “next costume” and drag below “wait 5 seconds” and connect to it.

(See illustration above.)
1. Click “Control” select “when I start as a clone” and drag it into open space (don't connect to previous string of code).
2. Click “Motion” select “go to x:___ y:__” and drag below “when I start as a clone”.
3. Click “Operators” select and drag “pick random _ to _” and place in “x” field. Then select another “pick random __ to ___” and place in “y” field.
4. Change values to “-240” and “240” for “x”.
5. Change values to “-180” and “180” for “y”.
6. Click “Motion” select “point in direction ___” and drag below “go to x: ___ y: ___”.
7. Click “Operators” select and drag “pick random ___ to ___” and place in “point in direction” numerical field.
8. Change values to “-170” and “170”.
9. Click “Looks” select “show” and drag below “point in direction ___ to ___”.
10. From “Looks” select “set size to 100 %” and drag below “show”. (See illustration above.)
1. Click “Motion” select and drag “move 10 steps” and drag below “set size to 100%”.

2. From “Motion” select “if on edge, bounce” and drag below “move 10 steps”.

3. Click “Control” select “if then” loop and drag below “if on edge, bounce”.

4. Click “Sensing” select and drag “touching _?” and place in the open space between “if” and “then”.

5. Change value in “touching _?” to “Sprite1” by clicking the white triangle.

6. Click “Variables” select “change energy by _” and drag inside blank space in the “if then” loop.

7. Change by value to “-1”.

8. Click “Control,” select “forever” loop, connect it to “show”. The “forever” loop will automatically go around “move 10 steps” and the “if then” loop. (See illustration above.)


**Let’s test code.**

1. Click on the green flag. This launches the program.
2. Use arrow keys on keyboard to move the cat around the moon. Try to get scratchy to hit dodgeballs.
3. Watch energy score go down.
Create Code for Fruit Salad to Appear and Cat to Gain Energy Eating Fruit Salad.

1. Next, select new sprite by clicking cat symbol, “Choose Sprite“.

2. Select “Food” category. Then double-click on “Fruit Salad“. Do NOT click Fruit Platter.
1. Click on the “Fruit Salad” sprite.
2. Click “Events” select “when green flag clicked” and drag it into open space.
3. Click “Looks” select “hide” and drag below “when green flag clicked”.
4. From “Looks” select “set size to 100 %” and drag below “hide”.
5. Change value to “75%”.
6. Click Motion select “go to x:_ y:_” and drag below “set size to 75%.
7. Click “Operators” select “pick random _ to _” and place in “x” field. Select another and place in “y” field.
8. Change values for “x” to “-200” and “200”.
9. Change values for “y” to “-150” and “150”.
10. Click “Control” select “wait 1 seconds” and drag below “go to x:_ y:_”.
11. Change value to “7” seconds.
12. Click “Looks” select “show” and drag below “wait 7 seconds”.
13. Click “Sound” select “play sound ___ until done” and drag below “show”.
14. Click “Control” select “wait 1 seconds” and drag below “play sound until done”.
15. Change value to “4” seconds.
16. Click “Looks” select “hide” and drag below “wait 4 seconds”.
17. Click “Motion” select “go to x:_ y:_” and drag below “hide”.
18. Click “Operators” select “pick random _ to _” and place in “x” field and then select another and place in “y” field.
19. Change values for “x” to “-200” and “200”.
20. Change values for “y” to “-150” and “150”.
21. Click “Control” select “wait 1 seconds” and drag below “go to x:_ y:_”.
22. Change value to “3” seconds.
23. From “Control” select “forever” loop, connect it to “go to x: pick random -200 to 200 y: pick random 1-150- to 150”. The “forever” loop will automatically go around “show” and “wait 3 seconds”. (See illustration at upper left corner.)
1. Click “Events” select 
“\textit{when green flag clicked}” and drag into open space (don’t connect to previous string of code).
2. Click “Control” select “\textit{wait until _}” and drag below “when green flag clicked”.
3. Click “Sensing” select “\textit{touching _?}” and place in “wait until _” space 
4. Change value to “Sprite1”.
5. Click “Looks” select “\textit{hide}” and drag below “wait until touching Sprite1”.
6. Click “Variables” drag out two “\textit{change Energy by _}” blocks and place below “hide”.
7. In first block, “\textit{change Energy by _}” change by value to “10”.
8. In second block, change “Energy” to “\textit{Score}” by clicking white triangle and then by value should be “1”.
9. Click “Events” select “\textit{broadcast message1}” and drag below “\textit{change score by 1}”.
10. Click “Control” select “\textit{forever}” loop and place it over “\textit{when green flag clicked}”. It will automatically go around “\textit{wait until touching Sprite1}” and “\textit{broadcast message1}”. 
(See illustration above).
Create Code to Make Meow Sound

1. Click on “cat” sprite.
2. Click “Events” select and drag “when I receive message1” place in an open space. (Don’t connect to previous string of code.)
3. Click “Sounds” select “play sound meow until done” and drag below “when I receive message1”.
4. Click on the Score display in upper left of moon screen and drag it to the right.
5. Test Code.

Let’s test code.
1. Click on the green flag. This launches the program.
2. Use arrow keys to move cat around. Try to get scratchy NOT to hit any dodgeballs.
3. Watch energy score go down.
4. Scratchy to eat Fruit Salad for extra energy. Must eat 5 Fruit Salads to win game.
Extended Lesson

You can add some Comments at the beginning of the game to explain to players how the game works. Just slide down code and add these instructions.

1. Go back into Cat Sprite code and separate string of code after “Set score to 0” then insert the following:
2. From “Looks” select and drag three “say Hello! for 2 seconds” blocks.
3. From “Looks” select and drag “set size to 100%”.
4. Change “set size” to “60%”.
5. In the first “say Hello!” change time to “1” seconds.
6. In the second “Say Hello” change “Hello” to say “Eat the fruit to score and don’t get hit by the dodge ball” and change time to “3” seconds.
7. In the third “Say Hello” change “Hello” to say “Use the arrow keys to control scratchy. Eat 5 fruits to win” and change time to “3” seconds.
8. Reconnect the string of code. (See illustration to left.)
Join Scratch to Save Your Game

1. To save your project, you must join Scratch.
2. Click “Join Scratch” at upper right of screen.
3. Create a Scratch User Name. (Don’t use your real name)
4. Choose a password
5. Confirm password
6. Write down your Scratch User name and Password on paper provided.
7. Click “next”

1. Answer three questions
2. Click “next”
3. Then SAVE game. Now, you can Sign in from home and finish this code or create a new project.
Program developed by Thomas Hachten

www.Coderkids.net