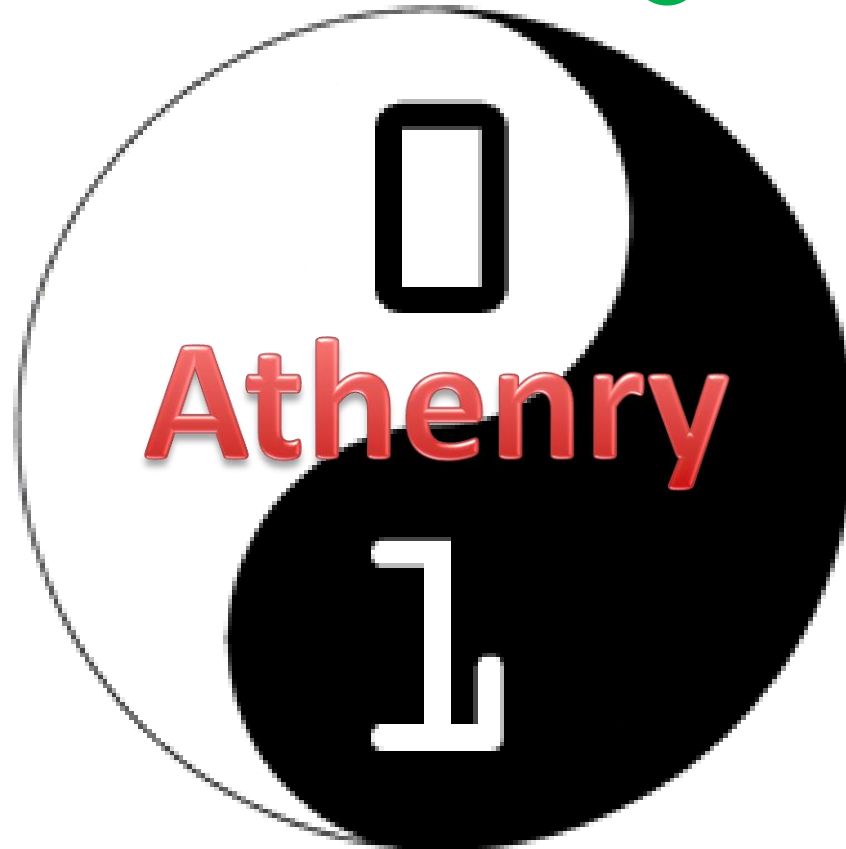


CoderDojo Athenry

SCRATCH Beginners



Code and notes by Martha Fahy, 2014

CoderDojo Athenry

"Above all, be cool"



Every week:

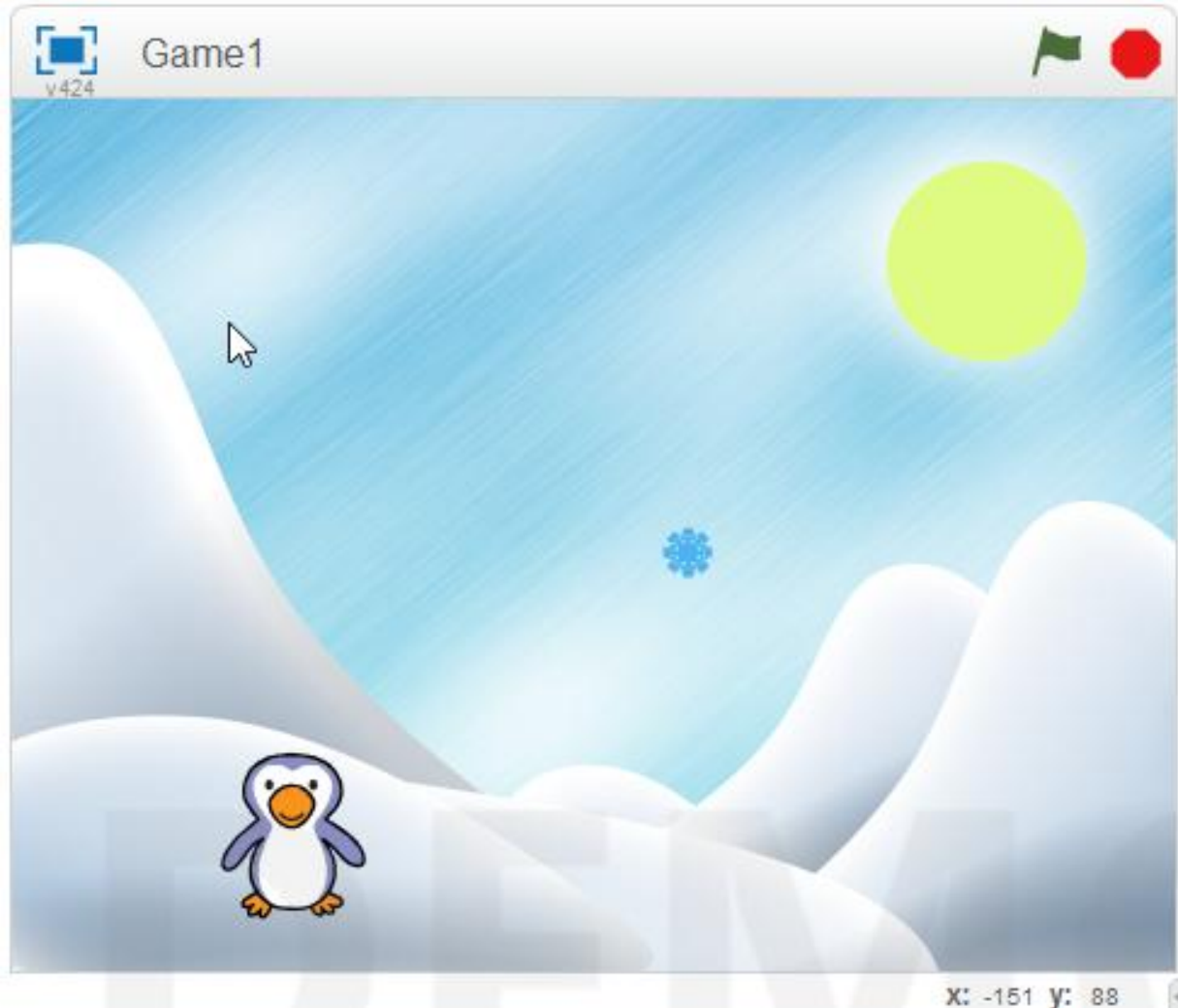
- ✓ Sign in at the door

If you are new:

- ✓ Fill in Registration Form
- ✓ Ask a Mentor how to get started

Make sure you are on the Athenry Parents/Kids Google Group: email coderdojoathenry@gmail.com

Today's Ninja Challenge: Write Your **First** Computer Game!



Today's Big Ideas

What is Coding?

Who Writes Code?

What is Scratch?

How Can We Write Code?



Programming Languages

- Tell computer how to perform tasks
- C, C++, Java, Visual Basic, Python, JavaScript, PHP, HTML5

```
public static void calcWages()
{
    double rate, hrs, wage, over, total;

    rate = askForNumber("Enter Hourly Rate:");
    hrs = askForNumber("Enter Hours Worked:");

    if (hrs <= 40) {
        wage = rate * hrs;
        over = 0;
    }
    else {
        wage = rate * 40;
        over = (hrs - 40) * 1.5 * rate;
    }
    total = wage + over;

    JOptionPane.showMessageDialog(null, "Total wages are " + total);
}
```

Some Java Code

Programming Languages

Input, Output & Store Data

- E.g. text, numbers

Operate on Data

- E.g. add numbers, change text

Loops

- Repeat commands several times

Decisions

- Do something IF something else is true

Scratch's Interface

The image shows the Scratch interface with several key components highlighted in green text:

- Stage:** The central workspace where the sprite is placed. It contains the Scratch cat sprite and a green flag icon.
- Sprite:** The bottom-left panel where the sprite is managed. It shows the Scratch cat sprite and a "New sprite" button.
- Palette of Commands:** The right-hand panel containing various command blocks for the sprite, such as "move 10 steps", "turn 15 degrees", "point in direction 90", "go to x: 0 y: 0", "glide 1 secs to x: 0 y: 0", "change x by 10", "set x to 0", "change y by 10", "set y to 0", "if on edge, bounce", and "set rotation style left-right".
- Script for Sprites:** A large, empty gray area on the right side of the interface, intended for writing scripts for the sprite.

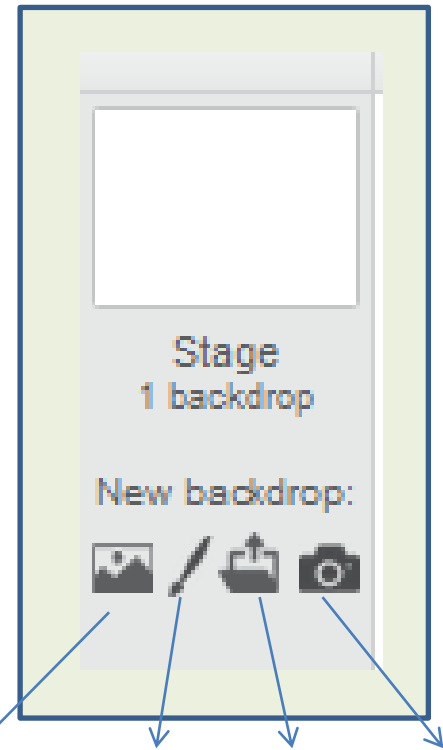
The interface also includes a top menu bar with "Scratch", "File", "Edit", and "Tips" options, and a status bar at the bottom right showing "Offline Editor" and a "Close" button.

The Stage

Full Screen



Starts/Stop



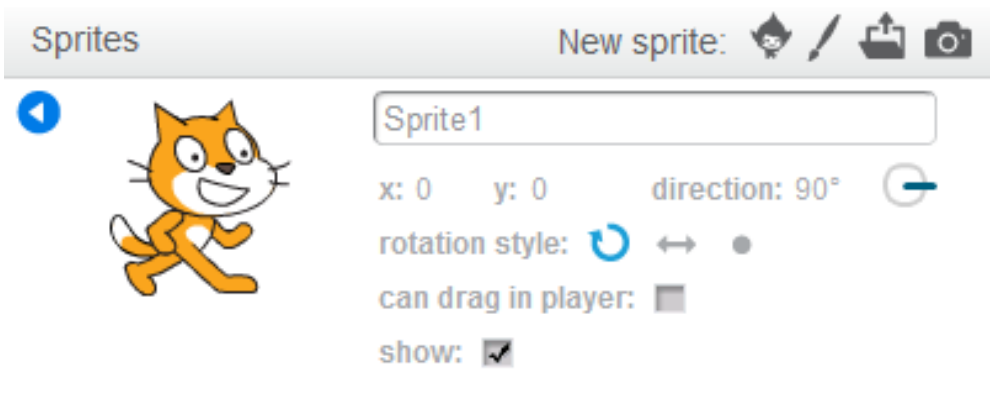
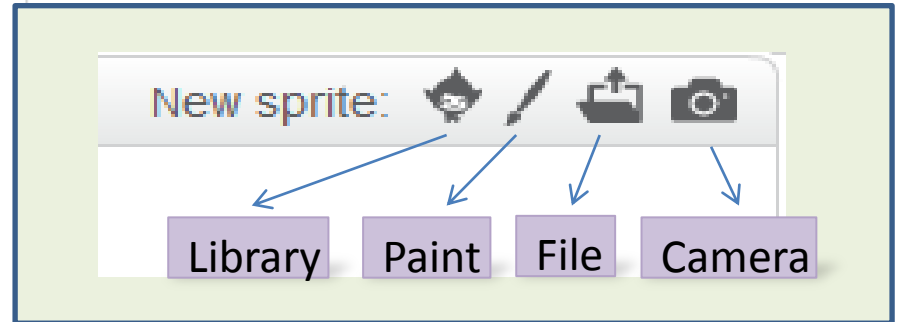
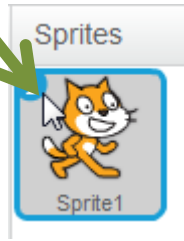
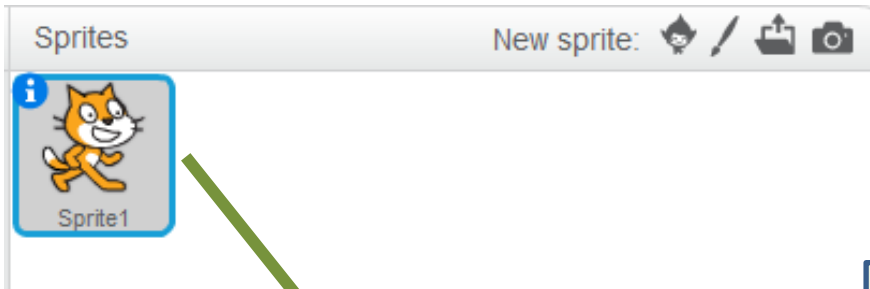
Library

Paint

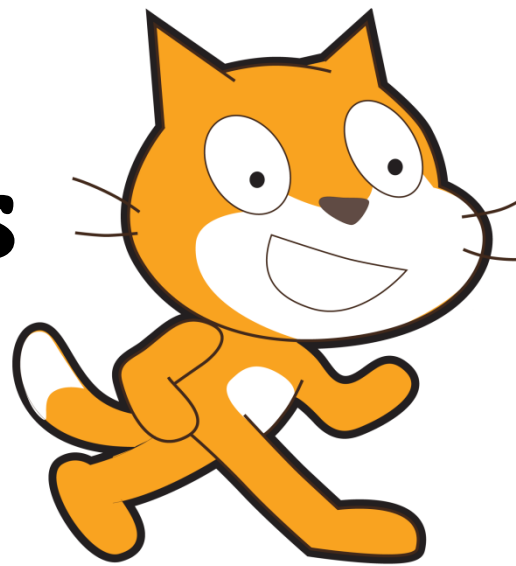
File

Camera

The Sprites (your characters)



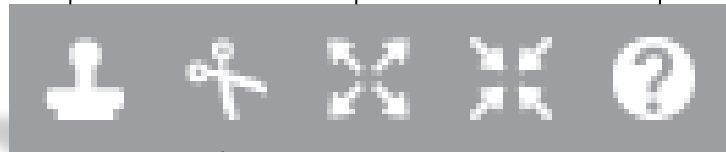
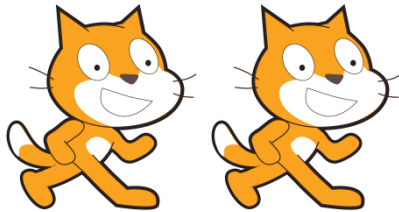
Cursor Tools



Duplicate

Grow

Tips



Delete

Shrink



Palette of Commands



Motion



```
move 10 steps
turn ↺ 15 degrees
turn ↻ 15 degrees

point in direction 90
point towards

go to x: 21 y: -62
go to mouse-pointer

glide 1 secs to x: 21 y: -62

change x by 10
set x to 0
change y by 10
set y to 0

if on edge, bounce

set rotation style left-right

 x position
 y position
 direction
```

Looks



say Hello! for 2 secs

say Hello!

think Hmm... for 2 secs

think Hmm...

show

hide

switch costume to costume2

next costume

switch backdrop to backdrop1

change color effect by 25

set color effect to 0

clear graphic effects

change size by 10

set size to 100 %

go to front

go back 1 layers

costume #

backdrop name

size

Sound



play sound meow ▾

play sound meow ▾ until done

stop all sounds

play drum 1 ▾ for 0.25 beats

rest for 0.25 beats

play note 60 ▾ for 0.5 beats

set instrument to 1 ▾

change volume by -10

set volume to 100 %

volume

change tempo by 20

set tempo to 60 bpm

tempo

Pen



clear

stamp

pen down

pen up

set pen color to 

change pen color by 10

set pen color to 0

change pen shade by 10

set pen shade to 50

change pen size by 1

set pen size to 1

Data

$$2x+1=7$$

Make a Variable

Make a List

New Variable

Variable name:

For all sprites For this sprite only

Event



when  clicked

when key pressed

when this sprite clicked

when backdrop switches to

when >

when I receive

broadcast

broadcast and wait

Control

Do that
10 times



wait 1 secs

repeat 10

forever

if then

if then

else

wait until

repeat until

stop all

when I start as a clone

create clone of myself

delete this clone

Sensing



- touching ?
- touching color ?
- color is touching ?
- distance to
- ask What's your name? and wait
- answer
- key space pressed?
- mouse down?
- mouse x
- mouse y
- loudness
- video motion on this sprite
- turn video on
- set video transparency to 50 %
- timer
- reset timer
- x position of Sprite1
- current minute
- days since 2000
- username

Operator



+

-

*

/

pick random 1 to 10

<

=

>

and

or

not

join hello world

letter 1 of world

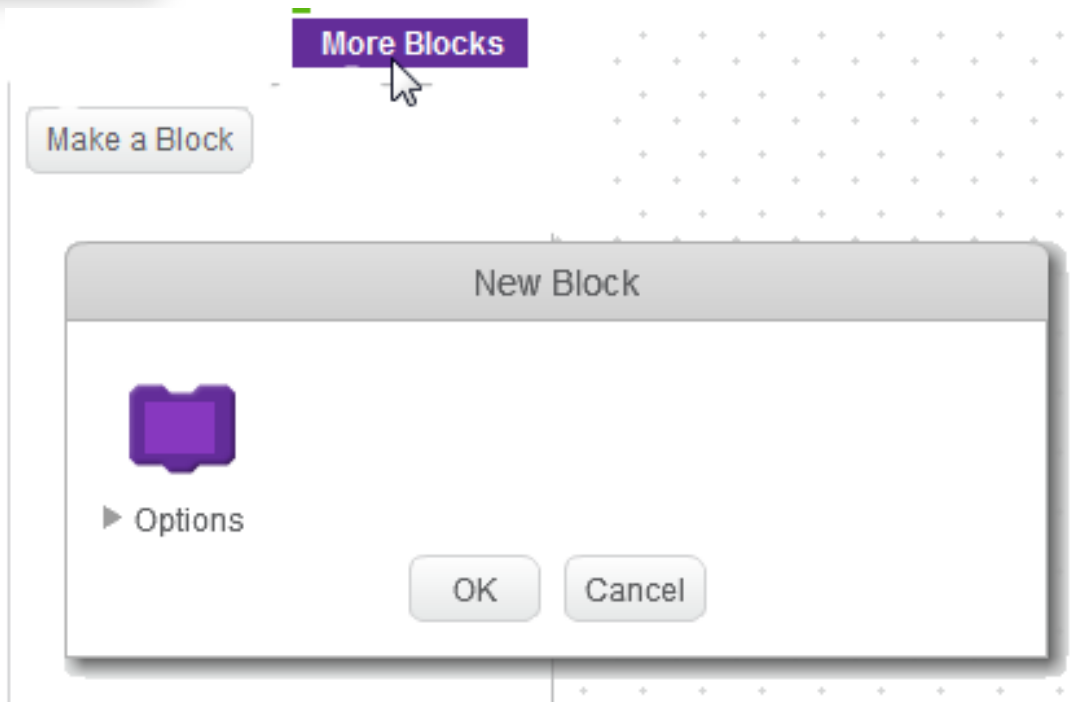
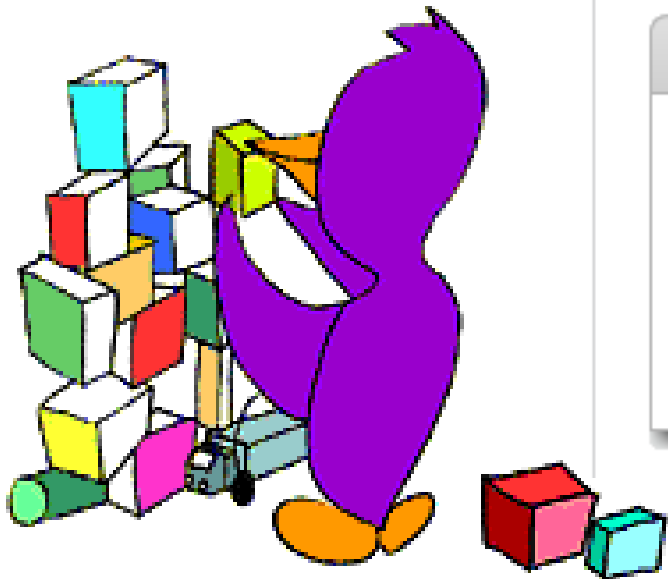
length of world

mod

round

sqrt of 9

More Blocks



How to Get Started

Plan the Design

- Think first!
- Start simple: add more later

Create First Character

- Design it: appearance & behaviours
- Write script (Code) to control its behaviours

Test It

- Any bugs? (Not working as expected)
- Debug and Improve

Extend It


- More Characters, More Behaviours, More Testing!

How to Make Progress


Our Creative Coding Rule:
There's More Than One Way to Do It!



Try things out and iterate
Save copies: go back if it doesn't work



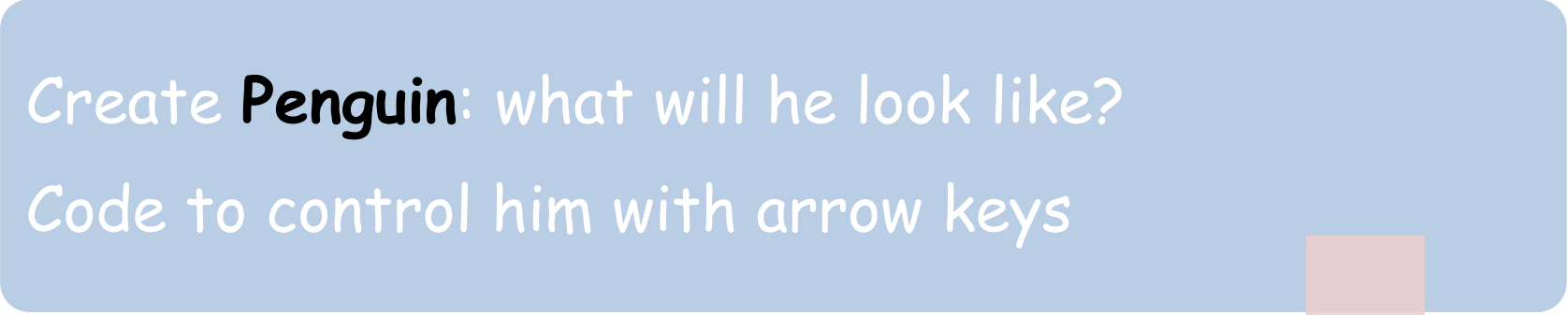
Talk to others, share ideas, learn from
their ideas, improve on their ideas!



Examine other people's code on the
Scratch website & upload your code

Steps To Make Our Game

Create **Penguin**: what will he look like?
Code to control him with arrow keys



Change the Stage:
Choose a background



Create **Snowflake**
Code to make him move randomly

Create a Sprite



New Sprite:
Select from
existing designs

Tip:
Default size is big
relative to stage:
this shrinks it



Sprite Library





Category

- All
- Animals
- Fantasy
- Letters
- People
- Things
- Transportation

Theme


- Castle
- City
- Flying
- Holiday
- Music and Dance
- Space
- Sports
- Underwater
- Walking

Fish3
Fox
Lion
Lioness
Parrot
Penguin1

Sprites New sprite:    

Harold

x: -124 y: -123 direction: 90°

rotation style: 

can drag in player:

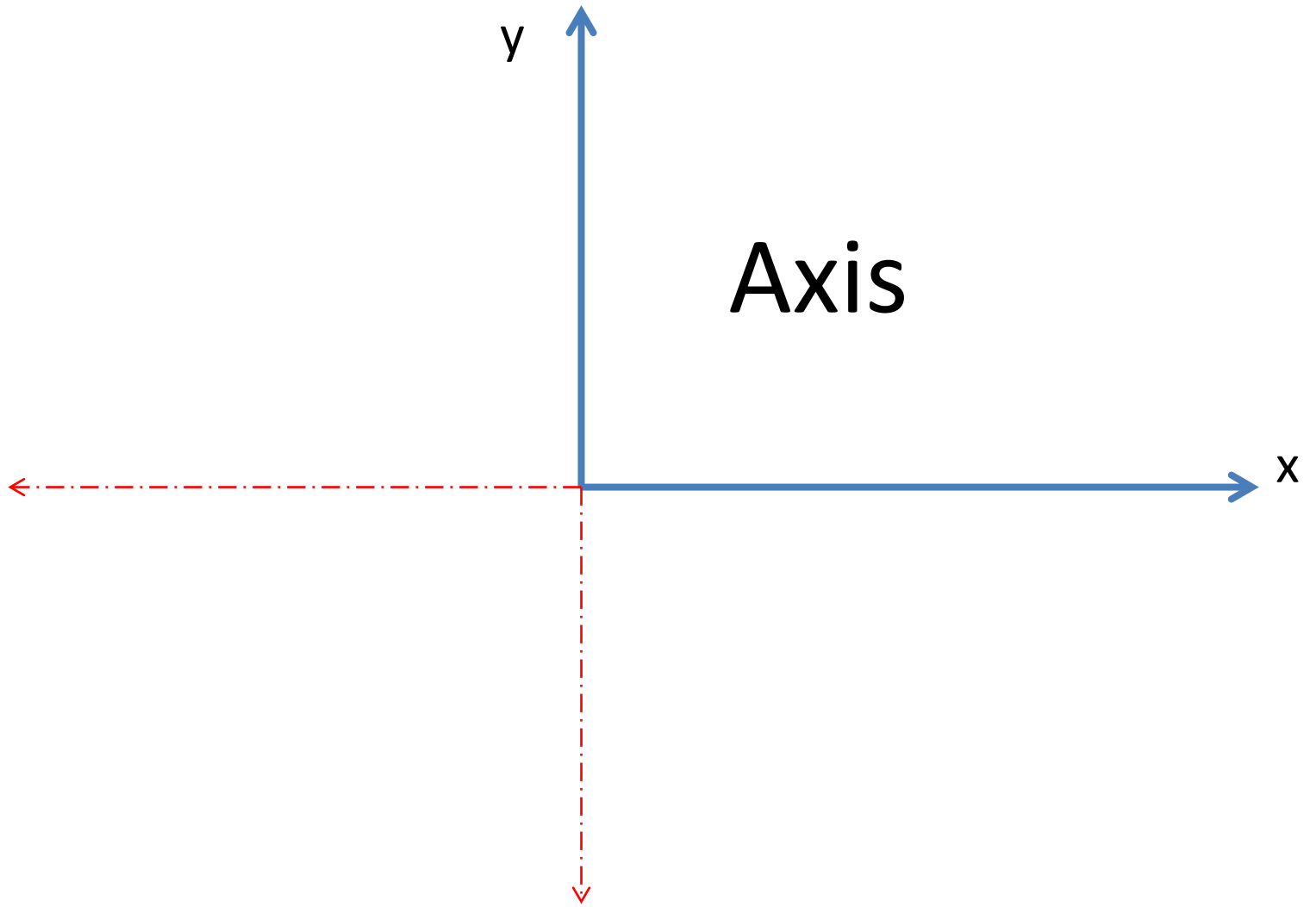
show:

Name him:

Make it Move Under Your Control



Make it Move Under Your Control



Make it Move Under Your Control



Moves 10 Steps to the Right

Make it Move Under Your Control

```
when right arrow key pressed  
change x by 10
```

Moves 10 Steps to the Right

```
when left arrow key pressed  
change x by -10
```

Moves 10 Steps to the Left

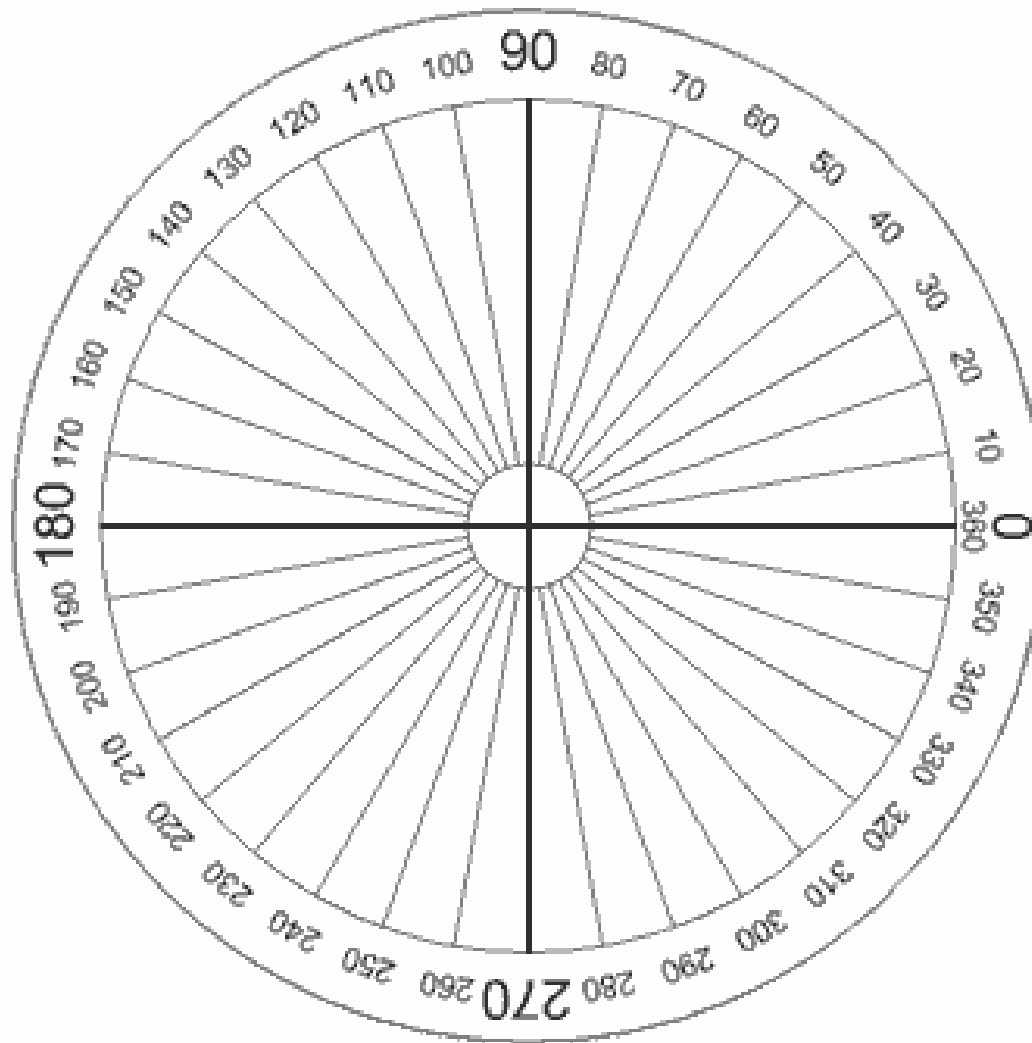
```
when up arrow key pressed  
change y by 10
```

Moves 10 Steps Up

Moves 10 Steps down

```
when down arrow key pressed  
change y by -10
```

Degrees - Full Circle

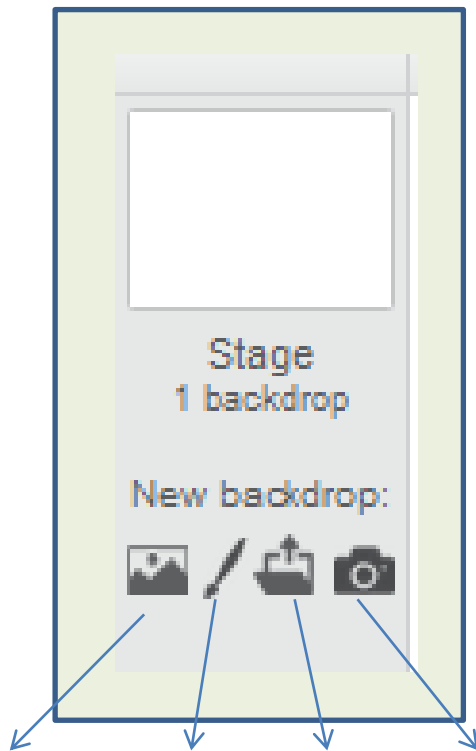


Create Another Sprite that Moves at Random



```
when clicked
  forever
    turn pick random 1 to 360 degrees
    move pick random 10 to 100 steps
    if on edge, bounce
    wait 0.2 secs
```

Change the Background



















Backdrop Library

Category

- All
- Indoors
- Outdoors**
- Other

Theme

- Castle
- City
- Flying
- Holiday
- Music and Dance
- Nature
- Space
- Sports
- Underwater

 atom playground	 bench with view	 berkeley mural	 boardwalk
 building at mit	 castle5	 city with water	 city with water2
 hay field	 houses	 metro1	 night city with street
 route66	 school1	 school2	 slopes

Library Paint File Camera

At the End ...

Upload your project to the Scratch Website

user: **cdathenry**

password: **xxxxxxx**

Access it
from home



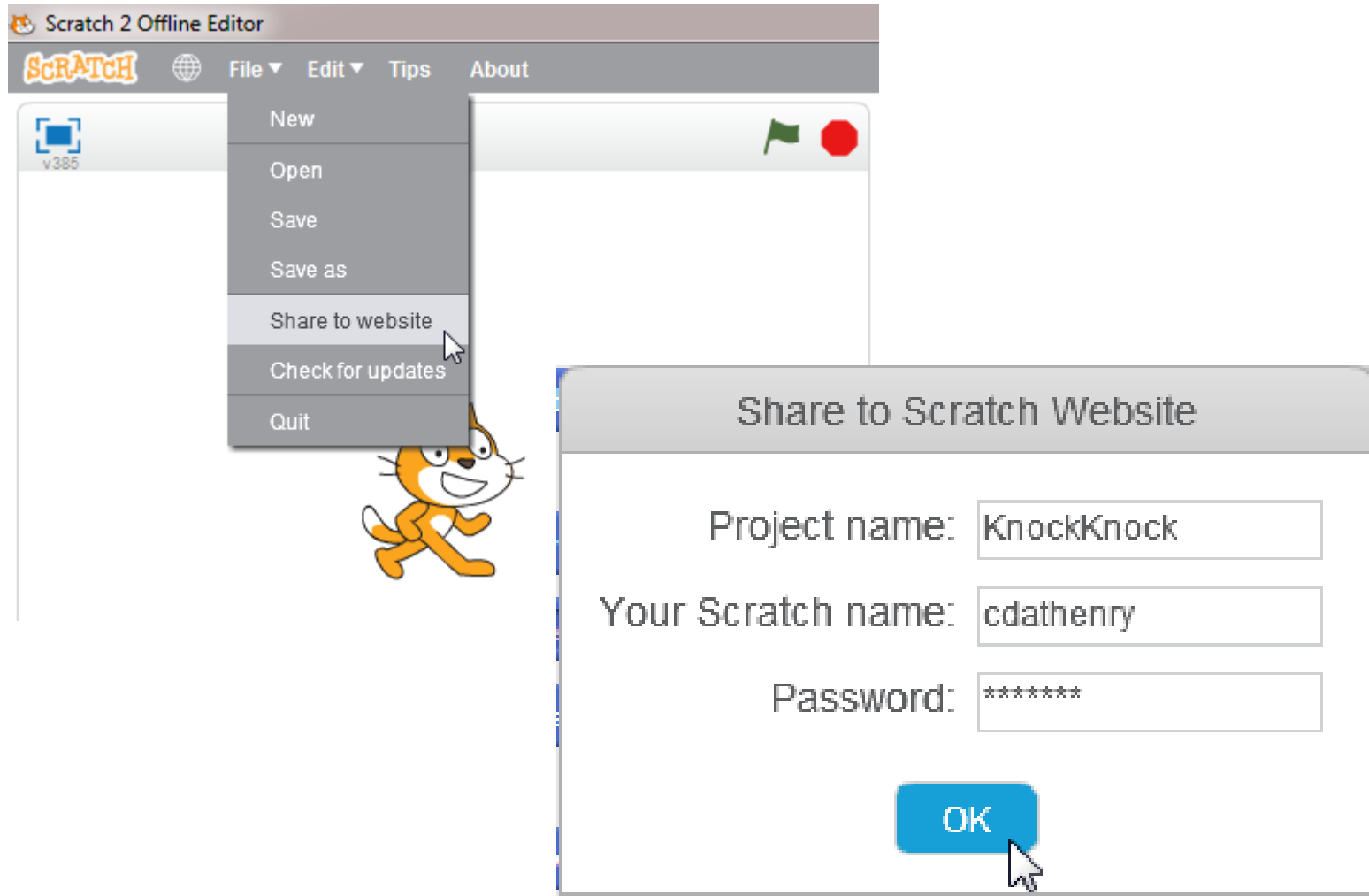
Improve it



Show your
friends!



Uploading to Scratch Website



Keep In Touch!

coderdojoathenry@gmail.com

[@coderdojoathenr](#)

zen.coderdojo.com/dojo/53

