



# Coding with Scratch

## Information Package

### August 2017

# Why teach computer programming to young kids?



## Our core beliefs

Children learn best by doing, and from tangible outcomes

Learning complex and challenging skills leads to confidence and success

Programming develops and encourages creativity

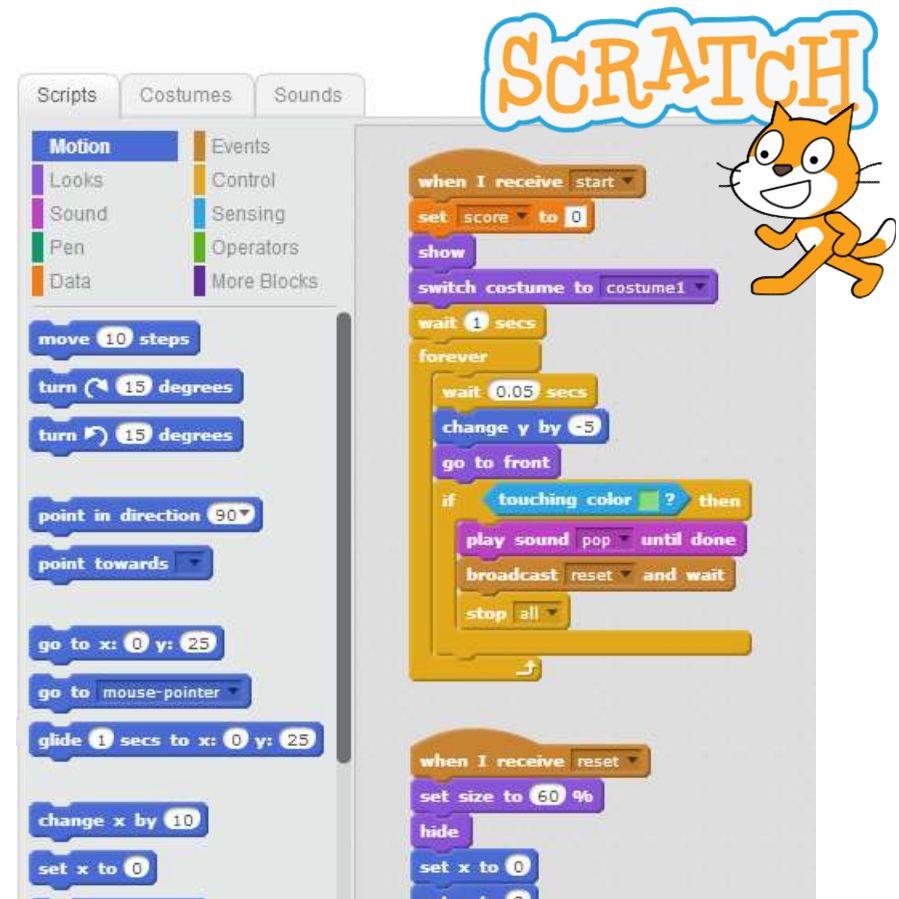
Understanding programming basics will be a foundational skill in most 21st century professional jobs (and already is in many)

Technology – in the hands of people who care – has great power to change society for the better

# Class uses MIT's Scratch programming language – designed for young learners



- Scratch is a visual programming language created by MIT Media Lab
  - Code built with colorful blocks which snap together like Lego
  - No keywords and syntax to memorize
  - Code will always "work" (compile)
- Provides tools for creativity: graphics, animation, sounds / music
- Designed specifically to be fun, educational and accessible for kids
- For more info, please visit <http://scratch.mit.edu/about> and <http://scratchmit.edu/parents>



# Proposed class design and structure: Coding With Scratch



## Who it is for?

- Kids in grades 2-3
- No previous experience required (Fall session, Level A)
- Maximum of 10 students per class, minimum of 4

## How long?

- 60 minutes, once per week for 9-11 weeks

## Where can it be held?

- Room with tables and chairs for 10 kids
- Computers with modern browser (Chromebooks work well. May be optionally supplied by Power Up if school computers are not available)
- Internet connectivity (critical – all activities require this)
- Television or projector for teaching

# Beginner computer coding classes cover real world skills, but at a basic level



## Programming building blocks

- Conditionals
- Loops
- Input/output
- Variables
- Functions
- Logical/math operators

## Introductory graphics and sound

- Movement, animation
- Vector drawing principles
- Coordinate system
- Music loops
- Sound effects

## Software development cycle

- Structured approach to problem solving:
  - Design
  - Build
  - Test
  - Debug

## Community behaviors

- Collaboration
- Giving and receiving feedback
- Remixing, giving credit to sources

## Specific topics as needed

- Geometry
- Physics
- Data
- Algorithms

# How we teach computer programming: Instructional approaches / philosophy



- Hands-on, working projects from Day One
- Experimentation and "surprises" encouraged
- Lots of individual attention via small classes and 5:1 or better student-teacher ratio
- Creativity and originality in each project, including exploration of visual design, sound design and story / character design
- Structured process (design, build, test, debug) built into every project
- "Demo Day" for parents in last class of session

# By the end of the class, students will have increased skills and knowledge



## What students will learn

- What an algorithm is, and how computers follow them
- Concepts of conditionals, looping, events, variables
- Increased confidence from creating tangible, working projects
- How to participate in a programming community respectfully, safely and effectively

## What students will be able to do

- Read code in Scratch and be able to predict what it will do using logical thinking
- Assemble code blocks to achieve a desired action/outcome
- Recognize reusable patterns that build into larger projects
- Analyze and decompose a large project into smaller parts
- Design and create working programs in Scratch
  - Approximately 4 to 5 programs in 10 weeks

# About Power Up Tech Academy



*"I am passionate about teaching and learning, and excited to share my programming knowledge with the next generation."  
Tamasin Ford, Founder*

- Operating since April 2015 in Chicago
- Hundreds of kids have learned to code with us
- Partnered with several organizations, including:
  - Park District of Oak Park
  - Francis W Parker School
  - Menomonee Boys and Girls Club
  - Alphonsus Academy
  - Hyde Park Neighborhood Club
  - Lincolnwood Public Library
- Custom curriculum for ages 6-13 spans 5 levels and 6 languages
- Instructors are all coders themselves



# Contact information



For more information, or to start a class at your location, please contact us:



Tamasin Ford, Founder  
(773) 382-0778  
[tamasin@powerupta.com](mailto:tamasin@powerupta.com)