

# Creative Computing with Scratch

UON Computer Science 4 Schools

Introduction to Coding and Computational Thinking Workshop

Presented by Daniel Hickmott

# Before we Start

Please download the *Creative Computing Guide* by either:

- Entering this web address into your browser: [hckmd.com/scratch](https://hckmd.com/scratch)
- Or clicking the [Creative Computing Curriculum Guide](#) link on the *Creative Computing with Scratch* session's page

# What is Creative Computing?

- Yesterday's *Scratch* activity mostly involved step-by-step exercises
- You may want to allow students to be more self-directed when teaching them to code
- *Creative Computing* encourages students to use code to implement their own ideas and invent

# The Creative Computing Curriculum

- Developed by researchers and educators from the *Harvard Graduate School of Education*
- Is focused on using *Scratch* to teach computing, but also involves some *unplugged* activities
- Covers key *computational thinking concepts* and *computational thinking practices*

# The Creative Computing Curriculum

- Split into 7 themed units, e.g. *Stories and Games*
- The link to the full guide (as a PDF) is on the workshop website, on the *Creative Computing with Scratch* session page
- Editable Powerpoint version is also available for you

## WHAT IS CREATIVE COMPUTING?

### Creative computing is... creativity.

Computer science and computing-related fields have long been introduced to young people in a way that is disconnected from their interests and values – emphasizing technical detail over creative potential. Creative computing supports the development of personal connections to computing, by drawing upon creativity, imagination, and interests.

### Creative computing is... empowerment.

Many young people with access to computers participate as consumers, rather than designers or creators. Creative computing emphasizes the knowledge, practices, and fundamental literacies that young people need to create the types of dynamic and interactive computational media that they enjoy in their daily lives.

### Creative computing is... computing.

Engaging in the creation of computational artifacts prepares young people for more than careers as computer scientists or programmers. It supports young people's development as computational thinkers – individuals who can draw on computational concepts, practices, and perspectives in all aspects of their lives, across disciplines and contexts.

## Get Started!

Begin your creative computing experience  
by downloading the guide

The guide can be used in a variety of settings (classrooms, clubs, museums, libraries, and more) with a variety of learners (K-12, college, and beyond). No prior experience with computer programming is required, only a sense of adventure!

[Download](#)



when this sprite clicked

say Hello! for 2 secs

forever

change color effect by 25

move 10 steps

play drum 11 for 0.25 beats

move -10 steps

play drum 8 for 0.25 beats



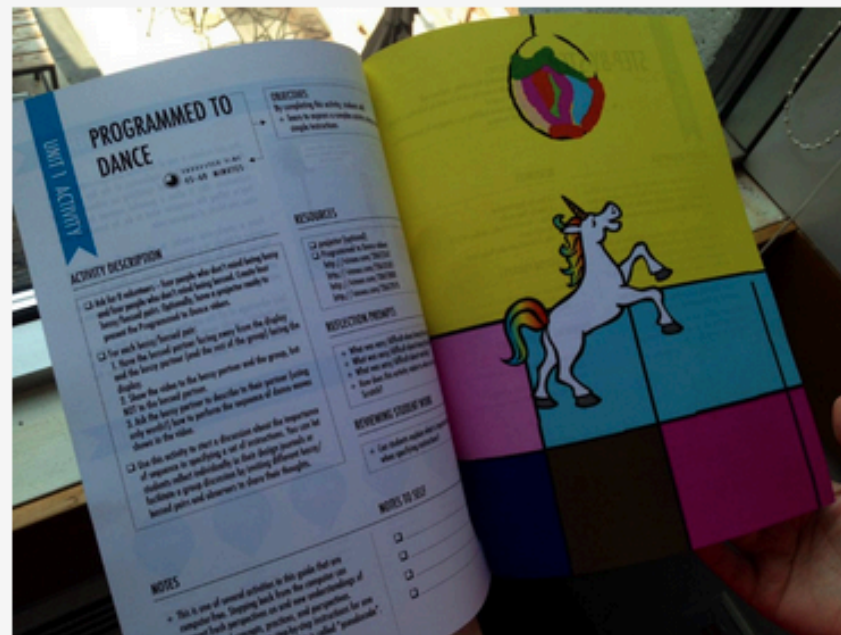
## DOWNLOAD

This guide was developed by members of the ScratchEd research team at the Harvard Graduate School of Education: Christan Balch, Michelle Chung, and Karen Brennan.

We encourage you to use as much or as little of the guide as you like, to design new activities, and to remix the included activities. No matter your prior experience or expertise, we think of every educator as a co-designer of the Creative Computing experience. We would love to learn about what you're doing, so we encourage you to document and share your experiences with us and with other educators via the ScratchEd community at <http://scratched.gse.harvard.edu>

We are releasing this guide under a [Creative Commons Attribution-ShareAlike license](#), which means that you are completely free to use, change, and share this work, as long as you provide appropriate attribution and give others access to any derivative works.

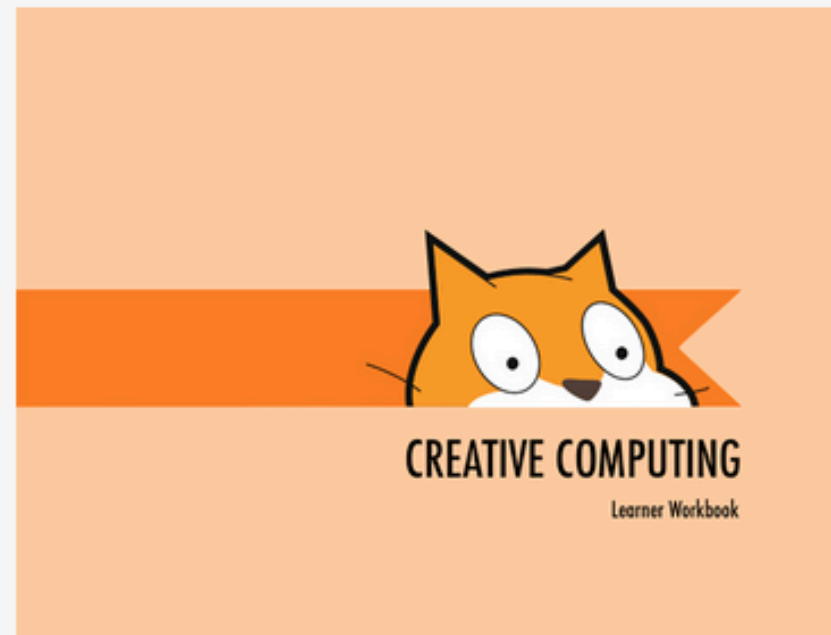
This work was made possible with support from the National Science Foundation through grant DRL-1019396, the Google CS4HS program, and the Code-to-Learn Foundation.



### The original guide, for educators

154 pages of plans, activities, and strategies for introducing Creative Computing in your learning environment.

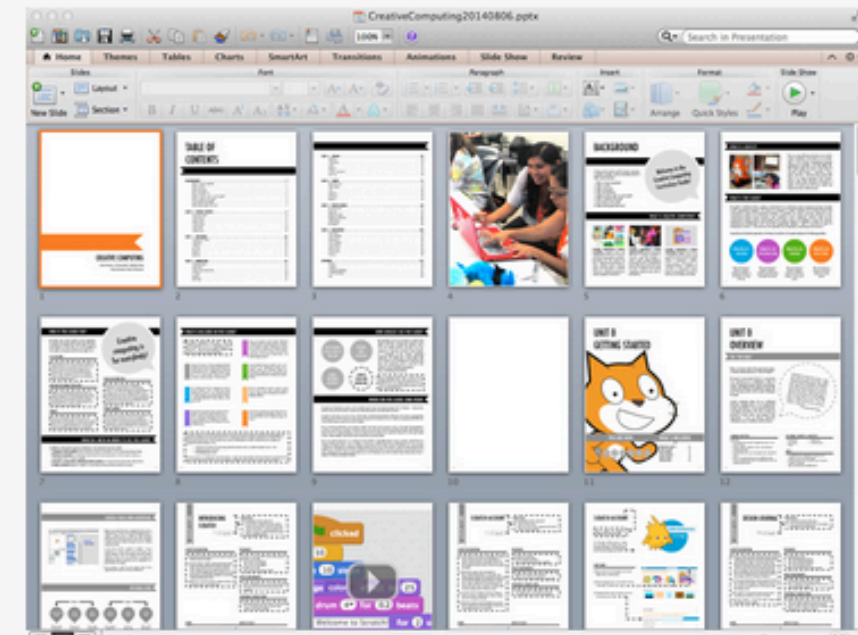
[Guide as PDF](#)



### A workbook version, for learners

A learner-focused version of the guide, including all of the student activity pages and reflection question templates.

[Workbook as PDF](#)



### Editable versions, for teachers and translators

The guide and workbook are available as PowerPoint files. Remixing and translating encouraged!

[Guide as PPT](#) | [Workbook as PPT](#)

# Balancing Structure & Agency

- Research by Dr Karen Brennan (from Harvard) influenced the design of the curriculum materials
- Brennan<sup>1</sup> investigated the balancing learners' *agency* and *structure* when teaching computing, both inside and outside of schools
- Argued that "we should begin to think about agency and structure not as separate, but as mutually-reinforcing

---

<sup>1</sup> Brennan, K. Best of both worlds: Issues of structure and agency in computational creation, in and out of school. Dissertation. Massachusetts Institute of Technology, 2013.



# Four Principles of the Curriculum



**PRINCIPLE #1:  
CREATING**

Offer opportunities for learners to engage in designing and making, not just listening, observing, and using.



**PRINCIPLE #2:  
PERSONALIZING**

Offer opportunities for learners to engage in activities that are personally meaningful and relevant.



**PRINCIPLE #3:  
SHARING**

Offer opportunities for learners to engage in interactions with others as audience, coaches, and co-creators.



**PRINCIPLE #4:  
REFLECTING**

Offer opportunities for learners to review and rethink their creative practices.

# Today's Session: Units 0 and 1

## UNIT 0 - GETTING STARTED

Prepare for the culture of creative computing by exploring possibilities and setting up technical infrastructure (e.g., creating Scratch accounts, starting design journals) and social infrastructure (e.g., establishing critique groups). Dive into an initial creative experience by making something “surprising” happen to a Scratch character.

## UNIT 1 - EXPLORING

Get comfortable with the key computational concept of sequence through a series of activities that provide varying levels of structure – from a step-by-step tutorial, to a creative challenge using a limited number of blocks, to open-ended explorations through making a project about yourself.

# Teacher Accounts

- We highly recommend getting a *Teacher Account* for managing your classes
- *Creative Computing Curriculum* guide was written before Teacher Accounts were made available
- We will give some examples of how the *Creative Computing Curriculum Guide's* activities can be used with *Teacher Accounts* in this session

# Log in as a Student Account

- Please login with the account details I sent you through email
- Create a new *Scratch* program and share it
- Let's look at the *Activity* tab

# Unit 0: Getting Started

- *Unit 0 (Getting Started)* is a preparatory unit focused on getting students to set up *Scratch* accounts and other administrative tasks
- Assumes you are using the online version of *Scratch* and that your school has access to the *Scratch* website

# Unit 0: Getting Started

We will look at these activities from *Unit 0* today:

- Design Journals
- Scratch Surprise
- Scratch Studios

# Design Journals

- Refer to *Design Journal* activity in *Creative Computing Curriculum Guide* (p. 14)
- <http://bit.ly/designjournal-blog> has example of a journal in blog form

# Scratch Surprise

- Refer to *Scratch Surprise* activity in *Creative Computing Curriculum Guide* (p. 16)
- Take 10 minutes to explore some *Scratch* blocks and sections that you haven't explored yet
- Try and make the Cat do something surprising!
- Share your project



# Scratch Studios

- Refer to *Scratch Studios* activity in *Creative Computing Curriculum Guide* (p. 18)
- I'll create a Scratch Studio for our *Scratch Surprise* programs and send the link to this through email
- Try and add your *Scratch Surprise* project to this new *Scratch Studio*

# Unit 1: Exploring

- As mentioned earlier, the design of the *Creative Computing Curriculum* has been influenced by research about balancing learners' *structure* and *agency*
- *Unit 1 (Exploring)* is focused on activities that encourage students to explore the *Scratch* interface and different blocks
- One of the important points of this Unit's overview (p. 24) is that educators don't necessarily have to know every block and part of *Scratch's* interface

# Unit 1: Exploring

We will look at these activities from Unit 1:

- 10 Blocks
- My Studio

# 10 Blocks

- Refer to *10 Blocks* activity in the *Creative Computing Curriculum Guide* (p. 30)
- Take 10 minutes to complete this activity
- You have to use each of the blocks shown on p. 30 at least once but you can also use them multiple times
- Add to the *10 Blocks* studio if you would like to share your program

# My Studio (Remixing)

- In this activity, we will remix an existing Scratch program instead of the activity in the *Creative Computing Curriculum Guide*
- Take 10 minutes to find a program that you'd like to remix and make some change to it
- We'll also briefly look at remix trees and discuss potential issues with students remixing projects