



Project-based Learning with Scratch

Jared O'Leary, [BootUp PD](#)

What's the plan?

- Project-based learning?
- Explore Scratch projects
- Q&A



How to reach the resources

- Direct link is in the chat
- www.JaredOLEary.com
 - Presentations
 - Project-based Learning with Scratch (CSTA 2021)



Project-based learning?

What is project-based learning?

- “Project-based learning is built on the idea that real-life problems capture student interest and provoke critical thinking and develop skills as they engage in and complete complex tasks that typically result in a realistic product, event, or presentation to an audience.” (p. 40)

Tobias, E. S., Campbell, M. R., & Greco, P. (2015). [Bringing Curriculum to Life: Enacting Project-Based Learning in Music Programs](#). *Music Educators Journal*, 102(2), 39–47

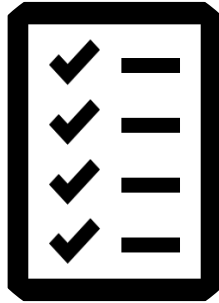


What is project-based learning?

1. Central to the curriculum
2. Organized around driving questions
3. Focused on a constructive investigation
4. Student-driven
5. Authentic

Tobias, E. S., Campbell, M. R., & Greco, P. (2015). [Bringing Curriculum to Life: Enacting Project-Based Learning in Music Programs](#). *Music Educators Journal*, 102(2), 39–47

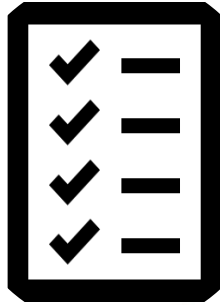




Fixed



Project continuum



Fixed



Open



Project continuum



Fixed



Open



Example: Fixed project criteria

- Game
- One player sprite
- Three enemy sprites
- At least two “if _ then” blocks
- At least one variable

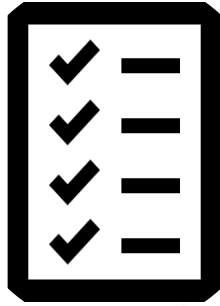


Example: Open project criteria

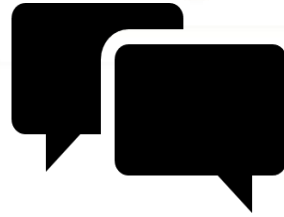
- Can you create a school appropriate project that...
 - ...helps someone?
 - ... is scary, funny, exciting, boring, musical, silly, relaxing, or colorful?
 - ... solves a problem you see in the world?
 - ... reminds you of a special event, story, or place?
 - ... you can give as a gift to someone else?
 - ... you can use for another class?

Example: Open project criteria

- Can you create a **school appropriate** project that...
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Fixed



Flexible



Open



Project continuum

Example: Flexible prompts with embedded criteria

- What type of project can you create that includes at least two “if _ then” blocks and at least one variable?
- How might you create a game that keeps track of a score?
- Storyboard and create a superhero(ine) project that uses several different “Events” blocks.

Example: Storyboard questions

- What sprite(s) will you use as superhero(ines)?
 - What kind of superpowers or technology will they have?
 - Will they transform into their superhero(ine) costume or always be a superhero(ine)?
 - If they are transforming, what will they look like normally? What will they look like when they are a superhero(ine)?
- Who will the superhero(ines) try and save?
 - What kind of danger are they in?
 - If it's another sprite, what kind of powers or technology will they use?
- How might your superhero(ine) save the day?
 - What algorithms can you create to do that?
- Will users be able to interact with your superhero(ine) project?
 - If so, what kind of code will you use to create that interaction?



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What is project-based learning?

1. Choose a worthy topic
2. Find a real-life context
3. Create generative questions
4. Develop critical thinking and cultivate dispositions
5. Decide the scope
6. Design the experience

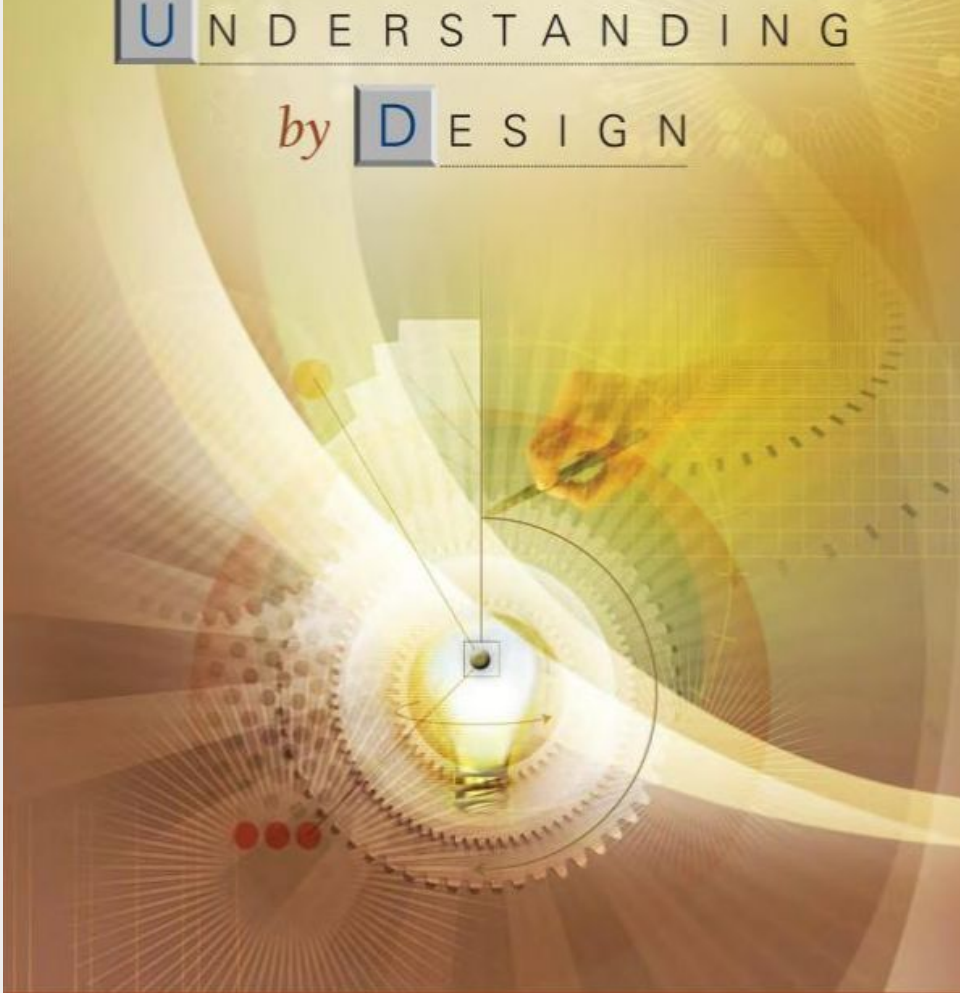
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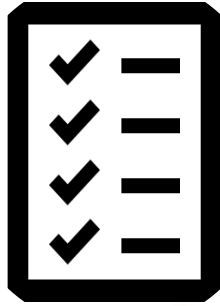
Backward design projects



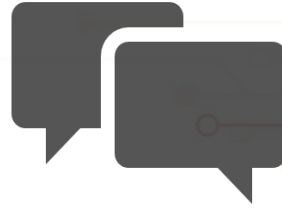
U N D E R S T A N D I N G
by D E S I G N



GRANT WIGGINS AND JAY MCTIGHE



Fixed



Flexible



Open



Backward design

1. Identify the desired results
 - a. Big ideas
 - b. Enduring understandings
 - c. Essential questions
2. Determine evidence
3. Plan learning experiences



National Core Arts Standards

Media artworks in a public format help a media artist learn and grow?

6 th (MA:Pr6.1.6)	7 th (MA:Pr6.1.7)	8 th (MA:Pr6.1.8)	HS Profic (MA:Pr6
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a. Analyze various presentation formats and fulfill various tasks and defined processes in the presentation and/or distribution of media artworks.	a. Evaluate various presentation formats in order to fulfill various tasks and defined processes in the presentation and/or distribution of media artworks.	a. Design the presentation and distribution of media artworks through multiple formats and/or contexts.	a. Design the presentation distribution of collections of artworks, combinations artworks, form and audience
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b. Analyze results of and improvements for presenting media artworks.	b. Evaluate the results of and improvements for presenting media artworks, considering impacts on personal growth.	b. Evaluate the results of and implement improvements for presenting media artworks, considering impacts on personal growth and external effects.	b. Evaluate a implement improvement presenting m artworks, con personal and impacts, such benefits for s others.
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Inquiry-based projects

POWERFUL LEARNING

WHAT WE KNOW ABOUT TEACHING FOR UNDERSTANDING

FOREWORD BY MILTON CHEN

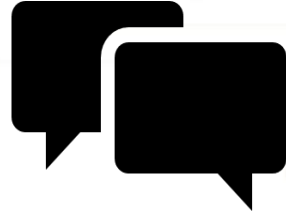
LINDA DARLING-HAMMOND

BRIGID BARRON • P. DAVID PEARSON
ALAN H. SCHOENFELD • ELIZABETH K. STAGE
TIMOTHY D. ZIMMERMAN • GINA N. CERVETTI
JENNIFER L. TILSON





Fixed



Flexible



Open



Inquiry-based project stages

1. Vision
2. Inquiry
3. Build
4. Showtime
5. Transition



Emergent projects

Young Investigators

THIRD EDITION

THE PROJECT APPROACH
IN THE EARLY YEARS



Judy Harris Helm & Lilian G. Katz



Fixed

Flexible

Open



The project approach phases

1. Determine a topic
2. Plan and investigate the topic
3. Culminating event/activities and assessment

If using a sequential curriculum...

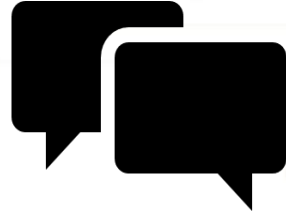
- Create a base project idea or theme
- Layer in new concepts and understandings
- Revisit throughout the year

Explore Scratch projects





Fixed



Flexible



Open



Coder resources



Nyan Simulator

Nyan Simulator
by BootUp



Pumpkin Carver

Pumpkin Carver
by BootUp



What Can You Create? Drawing

What Can You Create? ...
by BootUp



Carve a Pumpkin with Code

Carve a Pumpkin with ...
by BootUp



Let's Dance

Let's Dance
by BootUp



Character Builder

Character Builder
by BootUp



An Amazing Maze Game

An Amazing Maze Game
by BootUp



Scenic Walk

Scenic Walk
by BootUp



Music Player

Music Player
by BootUp



Sprite Catcher

Sprite Catcher
by BootUp



Animate a Joke

Animate a Joke
by BootUp



Interactive Store Display

Interactive Store Display
by BootUp



Award Acceptance Speech

Award Acceptance Spe...
by BootUp



Coder Interview

Coder Interview
by BootUp



Animate Your Name

Animate Your Name
by BootUp



Interactive Collage

Interactive Collage
by BootUp



Superhero(ine) Project

Superhero(ine) Project
by BootUp



Photo Editor

Photo Editor
by BootUp



Photo Booth

Photo Booth
by BootUp



Beatbox Machine

Beatbox Machine
by BootUp



Jump Scare Slideshow

Jump Scare Slideshow
by BootUp



Knock, Knock

Knock, Knock
by BootUp



Animated Card

Animated Card
by BootUp



A Friend of Mine

A Friend of Mine
by BootUp

1. Look at the project options linked to in the chat
2. Click on a project that looks interesting
3. Follow the steps under “project sequence”
4. Post questions in the chat or ask to share your audio/video

Project Sequence

(complete each step before moving to the next)

1. [Sign in and remix this project](#)

▼ 2. Turn a sprite into button



▶ 3. Make a sprite talk

▶ 4. Create hidden sprites

▶ 5. Add in comments



Project Extensions

Free Scratch lesson plans

Animate Your Name

Experience: 1st year, 1st quarter

Practice: Creating computational artifacts, Testing and refining computational artifacts, and Communicating about computing

Concept: Algorithms and Control

Length: 60+

Watch this first

At a glance

Project
sequence

Extended
learning

Coder resources

Project Lesson Overview

 Lesson plan
 Overview video

If this is your first time navigating our lessons, please take the time to watch this video to learn how our lessons are formatted and how to quickly navigate between sections.

Animate Your Name - Project Preview



Free ScratchJr lesson plans



#1 Dancing Alone

Experience: 1st year, 1st quarter

In this introductory lesson, coders create a silly dance for Scratch Cat using motion blocks. The purpose of this lesson is to introduce young coders to creating algorithmic sequences in ScratchJr.



#2 Can't Stop Dancing

Experience: 1st year, 1st quarter

Coders use the repeat block to repeat a silly dance for Scratch Cat using motion blocks. The purpose of this project is to introduce young coders to repeating algorithmic sequences in ScratchJr.



#3 Dance Party

Experience: 1st year, 1st quarter

Coders use the start on green flag block to create a silly dance party using motion blocks. The purpose of this project is to introduce young coders to adding sprites in code and triggering algorithms with the green flag in ScratchJr.



#4 Starry Night

Experience: 1st year, 1st quarter

Coders learn how to use repeat forever blocks with looks and con-



#5 Under the Sea

Experience: 1st year, 1st quarter

Coders review how to use repeat forever blocks with looks and con-



#6 Fidget Spinner

Experience: 1st year, 1st quarter

Coders create their own fidget spinner sprite using the paint editor

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#CSK8 Podcast

with
Jared O'Leary



Q&A

- Direct link is in the chat
- www.JaredOLEary.com
 - Presentations
 - Project-based Learning with Scratch (CSTA 2021)

