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

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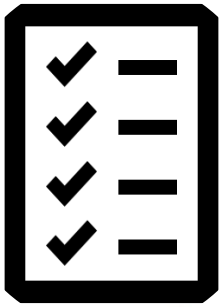

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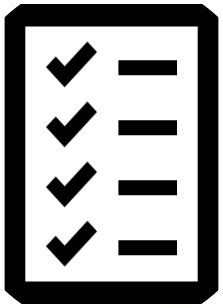

Fixed

Open

Project continuum

Fixed

Open

Project continuum

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…
  - …helps someone?
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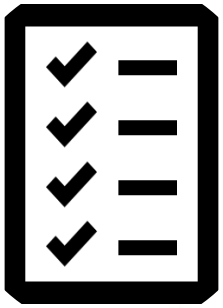

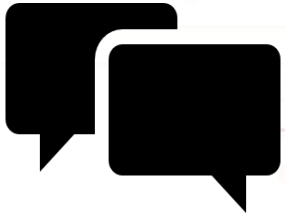

Fixed

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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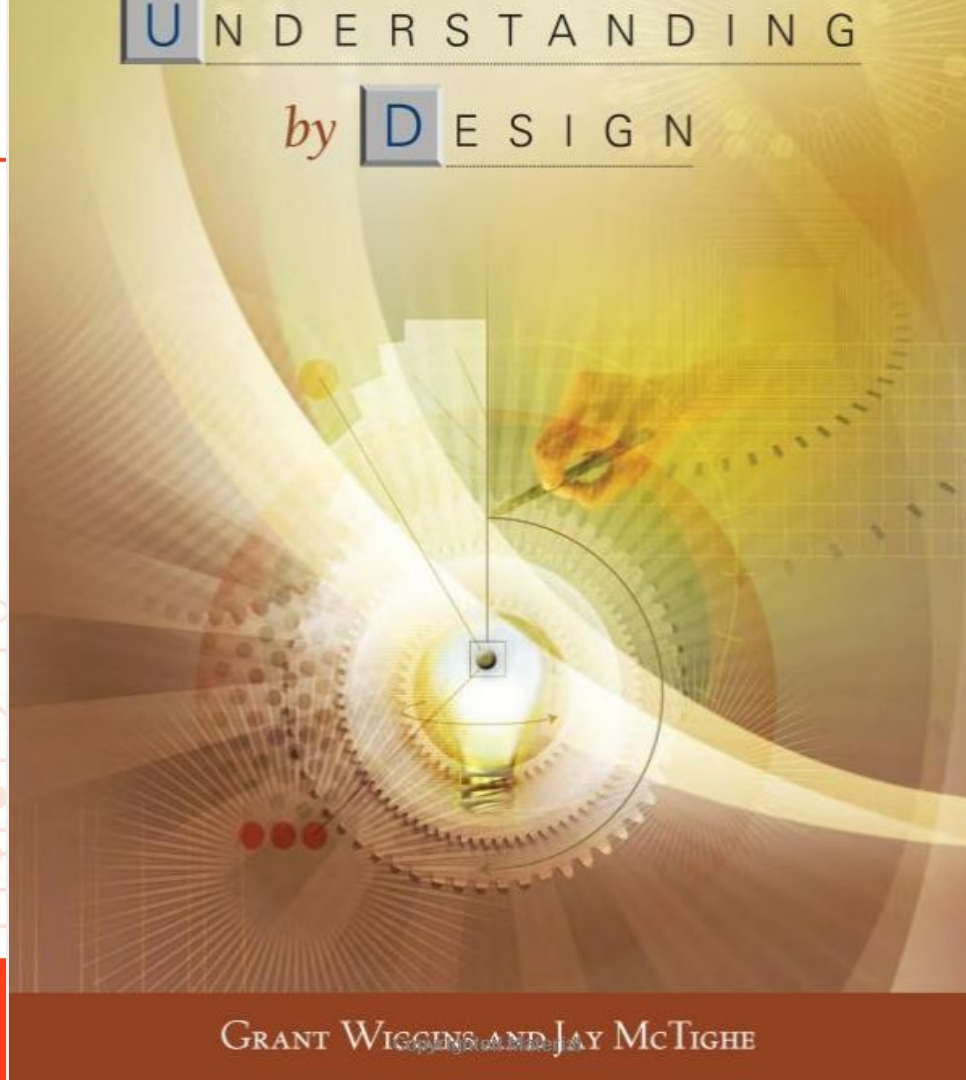
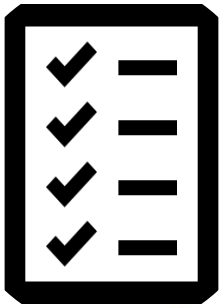
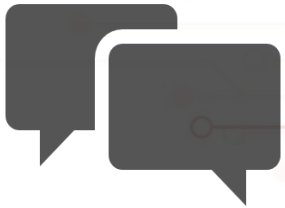
Backward design projects







Fixed

Flexible

Open

Backward design

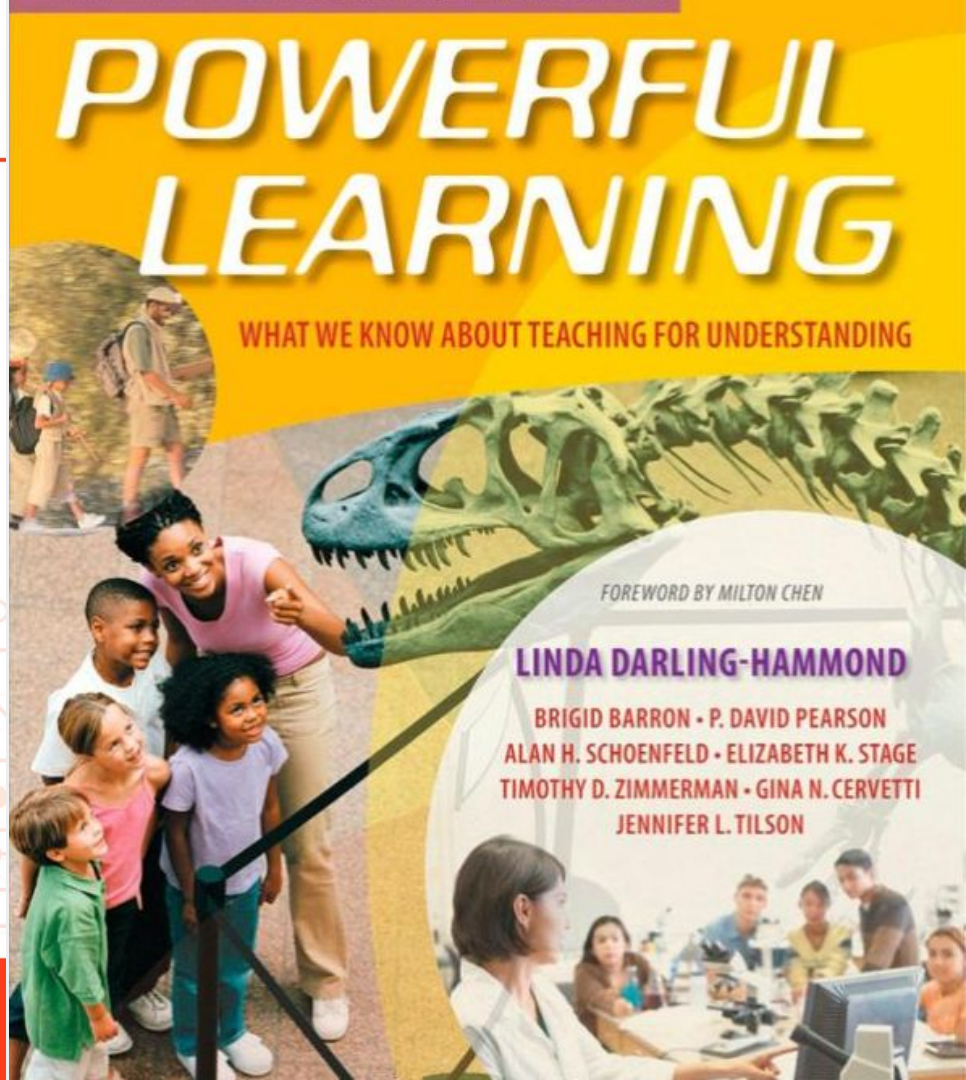
1. Identify the desired results
    a. Big ideas
    b. Enduring understandings
    c. Essential questions
2. Determine evidence
3. Plan learning experiences

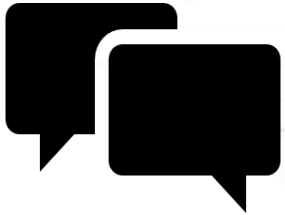
National Core Arts Standards

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

6th (MA:Pr6.1.6)	7th (MA:Pr6.1.7)	8th (MA:Pr6.1.8)	HS Profi (MA:Pr6
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 o collections of artworks, con combinations artworks, for and audience
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 ar implement improvement presenting m artworks, con personal and impacts, such benefits for s others.

Inquiry-based projects





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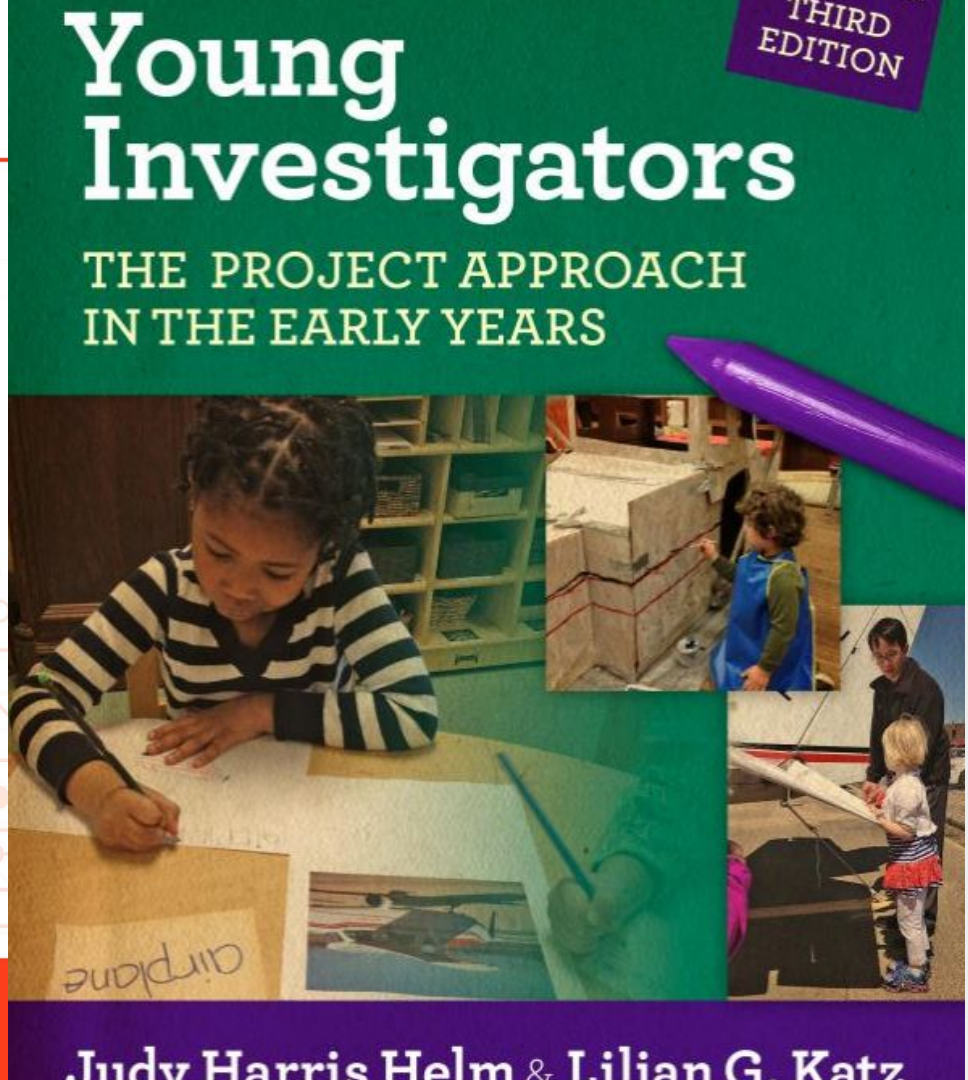
Flexible

Open

Inquiry-based project stages

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

Emergent projects



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Flexible

Open

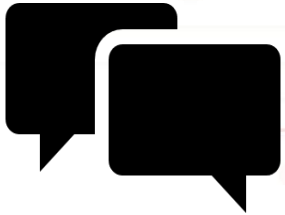
The project approach phases

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



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Coder resources

Nyan Simulator
by BootUp

Pumpkin Carver
by BootUp

What Can You Create? ...
by BootUp

Carve a Pumpkin with ...
by BootUp

Let's Dance
by BootUp

Character Builder
by BootUp

An Amazing Maze Game
by BootUp

Scenic Walk
by BootUp

Music Player
by BootUp

Sprite Catcher
by BootUp

Animate a Joke
by BootUp

Interactive Store Display
by BootUp

Award Acceptance Spe...
by BootUp

Coder Interview
by BootUp

Animate Your Name
by BootUp

Interactive Collage
by BootUp

Superhero(ine) Project
by BootUp

Photo Editor
by BootUp

Photo Booth
by BootUp

Beatbox Machine
by BootUp

Jump Scare Slideshow
by BootUp

Knock, Knock
by BootUp

Animated Card
by BootUp

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

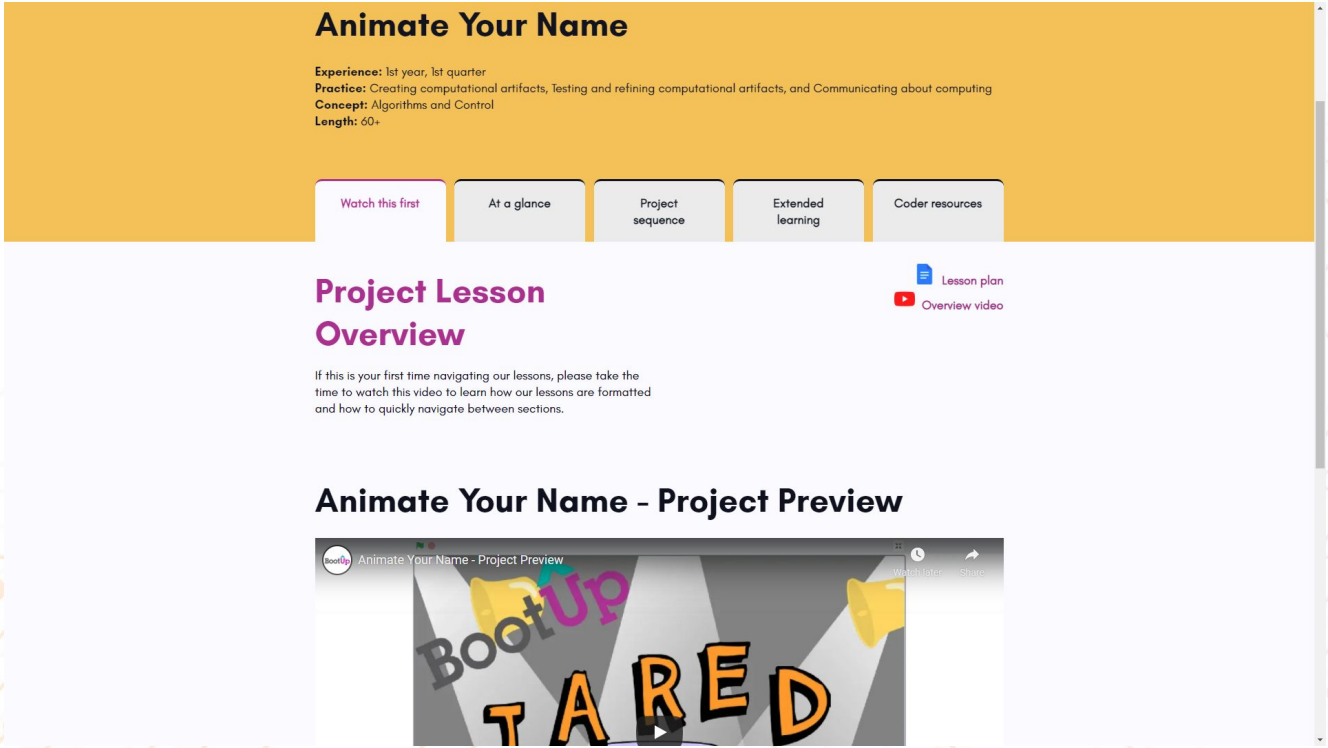
(complete each step before moving to the next)

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



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

Subscribe to the #CSK8 Podcast

Q&A

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