Interest-driven computer science education?

Jared O'Leary
BootUp PD

How to reach the resources and submit questions

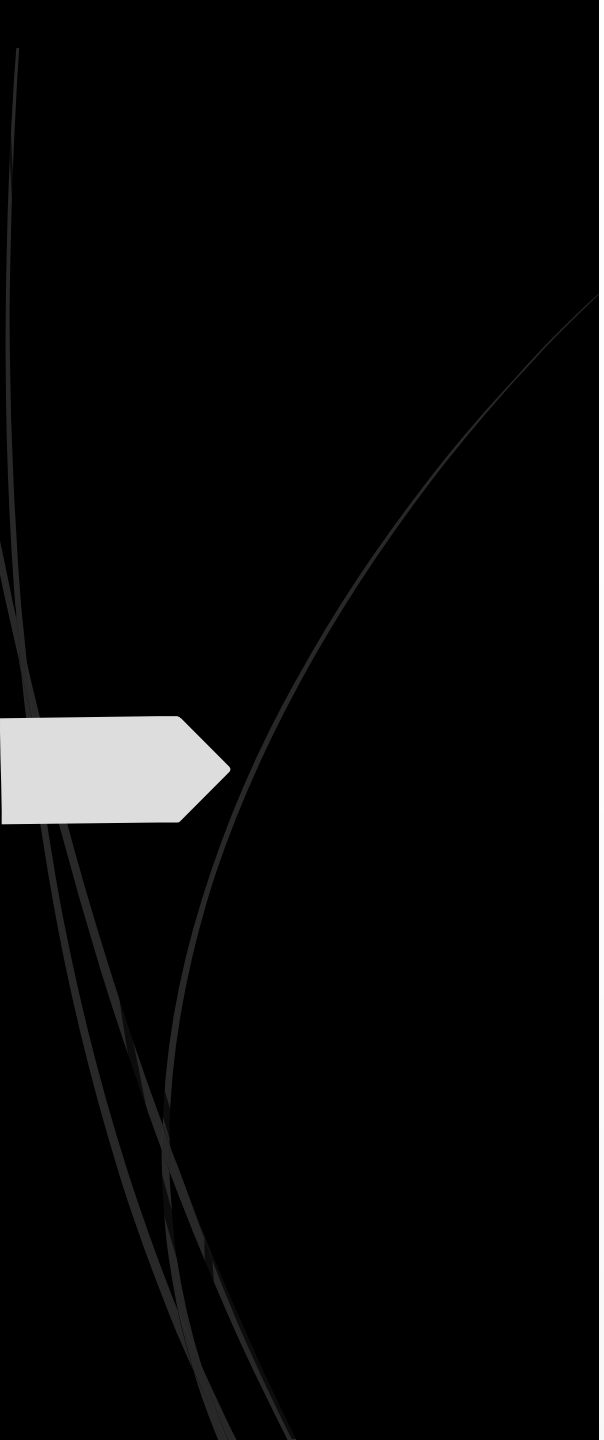
- www.JaredOLeary.com
  - Presentations
    - Interest-driven CS education?

What's the plan?

- Who am I?
- Why is interest-driven learning important?
- A continuum of interest-driven learning
- Facilitating interest-driven learning
- Planning for interest-driven learning
- Exploring resources for learning more
- Responding to submitted questions

Who am I?

Why is interest-driven learning important?



How do we differentiate for students who…

…are already pursuing a career path outside of CS?
…are required to attend and aren't interested in CS?
…have a wide range of CS experience?
…have varying access to devices/internet at home?
…have various accessibility needs/accommodations?
…have variegated identities and interests?
…want to impact the world in ways we haven't considered?

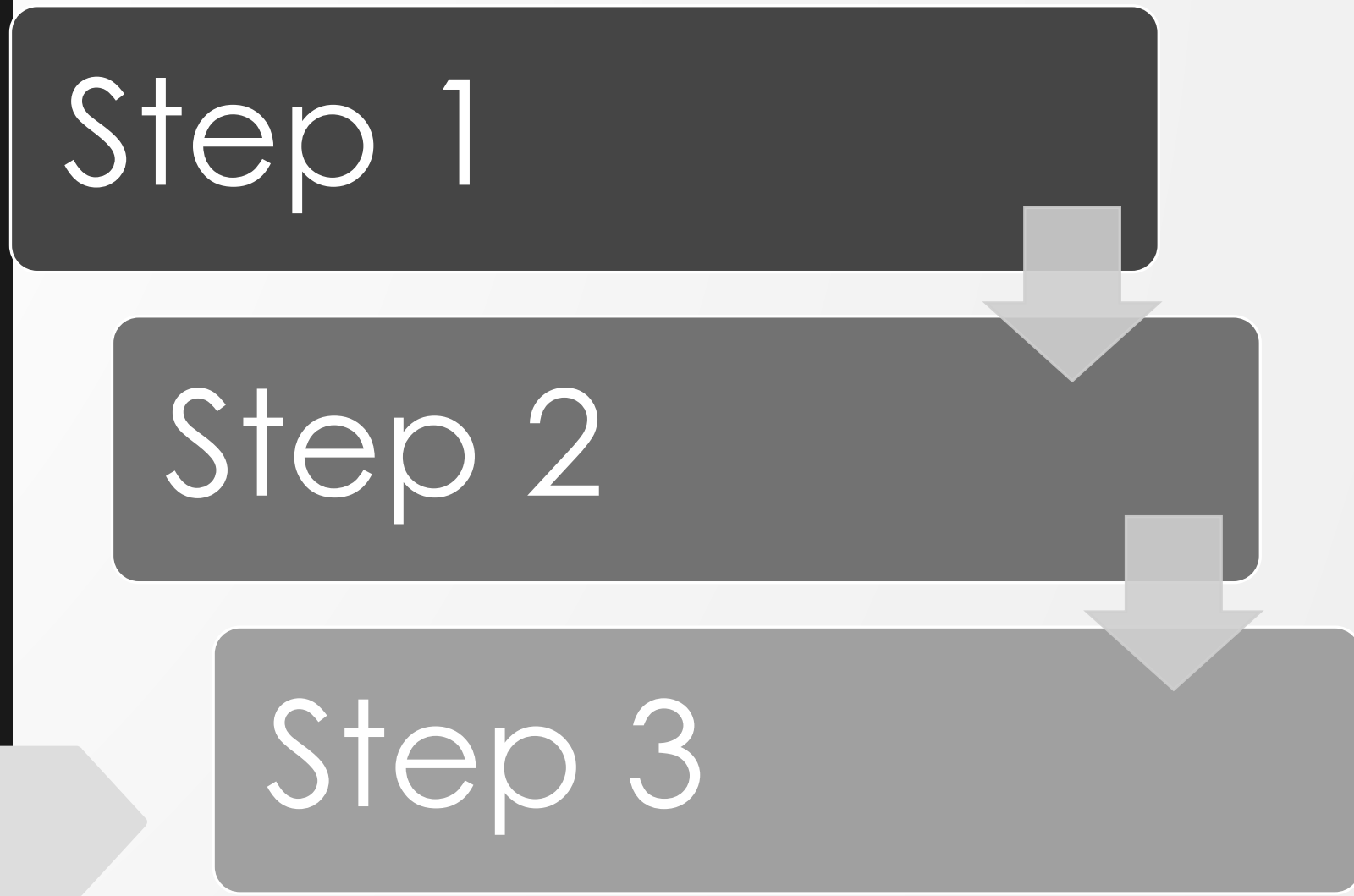
A continuum of interest-driven learning


This term in art, we have been practicing colour shading and blending through studying the inspirational imaginings of rainforests by the French artist Henri Rousseau.
Henri Rousseau
Evelyn
AJ
Rufus
Lawrence
Reuben
Daniel
Eva
Aimee

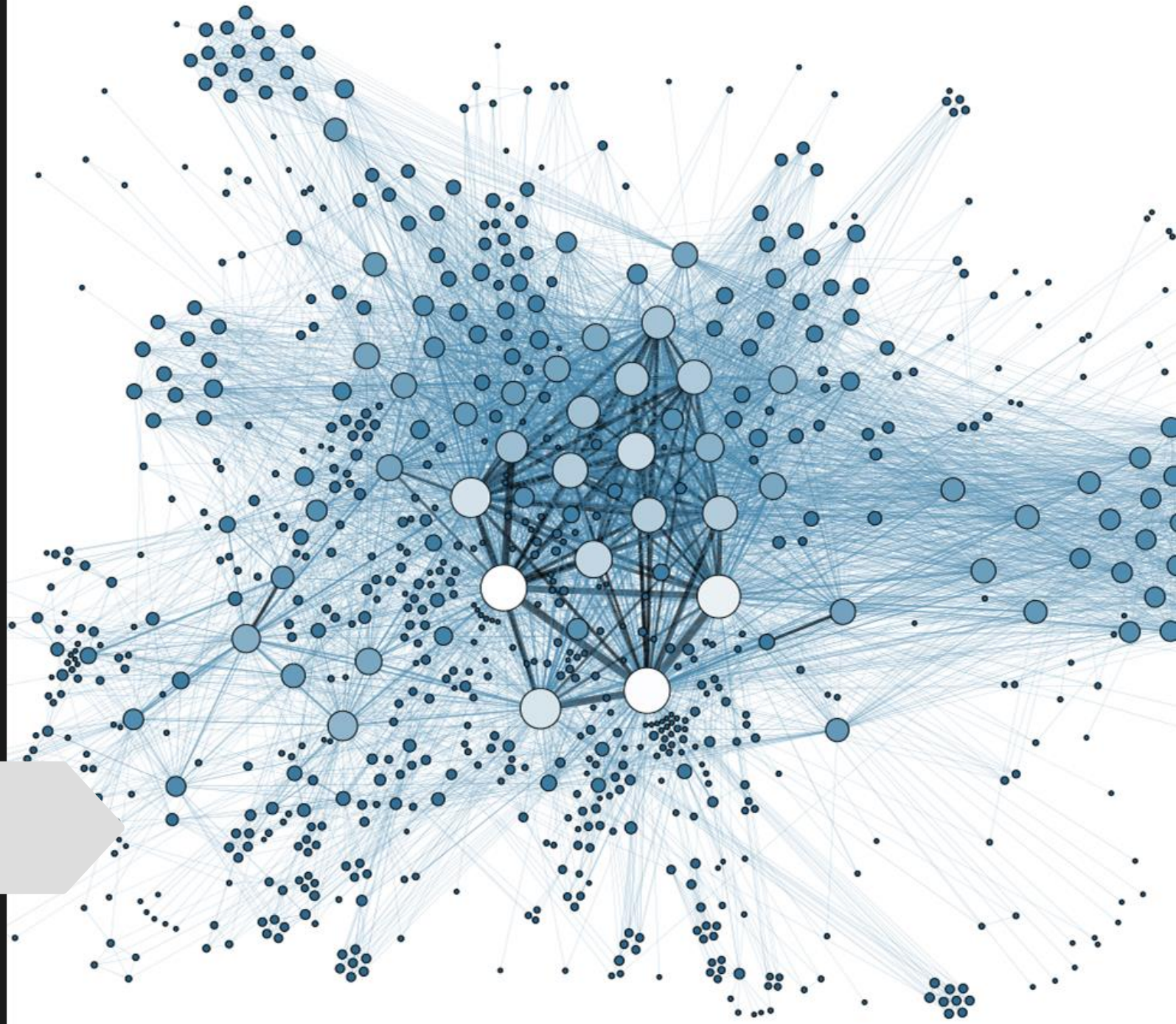

2nd Grade

Facilitating interest-driven learning

Sequential design



Rhizomatic design

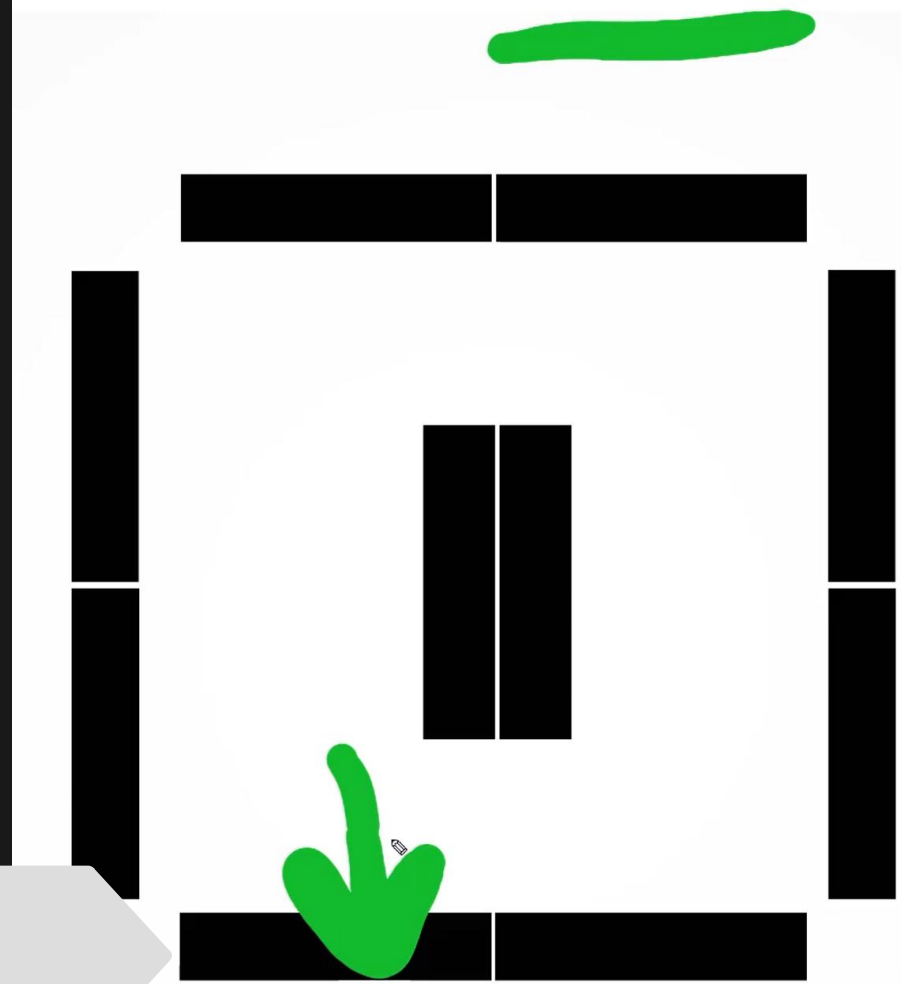


Affinity Space characteristics

1 - Affinity spaces share a common endeavor
2 - Affinity spaces are not segregated by age
3 - Affinity spaces are not segregated by experience
4 - Affinity spaces encourage, but do not require, active participation
5 - Interaction transforms content within an affinity space
6 - Affinity spaces encourage both intensive + extensive knowledge
7 - Affinity spaces encourage individual + distributed knowledge
8 - Affinity spaces encourage dispersed knowledge
9 - Affinity spaces encourage and honor tacit knowledge
10 - Affinity spaces encourage a multitude of engagement
11 - Affinity spaces have multiple routes to status
12 - Leadership is porous and leaders are resources

- Affinity spaces podcast episode
- Affinity spaces chapter

Room setups



Free lesson plans for interest-driven learning

Project Work (85+ minutes; 3+ classes)

Suggested sequence

4. Create levels (25+ minutes, or an entire class)

5+ minute demonstration

Click on the stage icon and open the Backdrops tab. Pick a starting location for our sprite, then demonstrate how to use various drawing tools to create a maze with one color. Think out loud how you want to make sure there is enough room for a sprite to move through the maze without touching a wall. Draw a "goal" by choosing a new color and drawing with it at the end of the first level (e.g., a square). Ask coders why all of our walls are one color and our goal is a different color. They may realize this makes it easier for users to figure out what the goal is in their level, and it will make it easier to code by allowing us to determine if our sprite touches a wall or a goal. Quickly demonstrate one more level, but point out you want to have the sprite start in the same location, so don't put a wall over the starting location.

20+ minutes to create custom levels and 1-on-1 facilitating

Give coders time to create at least three levels using the image editor tools. Encourage peer-to-peer assistance and facilitate 1-on-1 as needed. If coders finish their three levels early, urage them to add even more, assist others, or walk around deas by looking at other coders' levels.

Resources, suggestions, and connections

Practices reinforced:

Video: Create levels (4:38)
Quick Reference Guide: Click here
Video: Image editor: Bitmap mode (5:15)
Video: Image editor: Vector mode (5:00)
Facilitation tip: If you're not comfortable figuring take into account several wall or goal colors, rem this project they need one color for their walls an their goal. If it's not the same across every level, i coding a little more difficult (but, certainly possib encourage coders to keep the same starting loca level for the same reasons as above. We could ha starting locations for each level, but that makes it complicated.
Suggested questions:

- Where will you sprite's starting location be? the same location for each level)
- Where else might you put your goal?
- Will you make the levels get progressively ha
- What other shapes could you use to change levels look?

A note on using the "Coder Resources" with y
Young coders may need a demonstration (and ser friendly reminders) for how to navigate a browser tabs. The reason why is because kids will have at tabs open while working on a project: 1) a tab for tab for the Coder Resources walkthrough, and 3) video/visual walkthrough for each step in the Co document. Demonstrate how to navigate betwee

Wind River Reservation lesson plans for culturally-relevant learning

BootUp Professional Development™

Complete List of Wyoming RPP Resources

Watch this video for an overview of the resources below

Unit 1 Resources

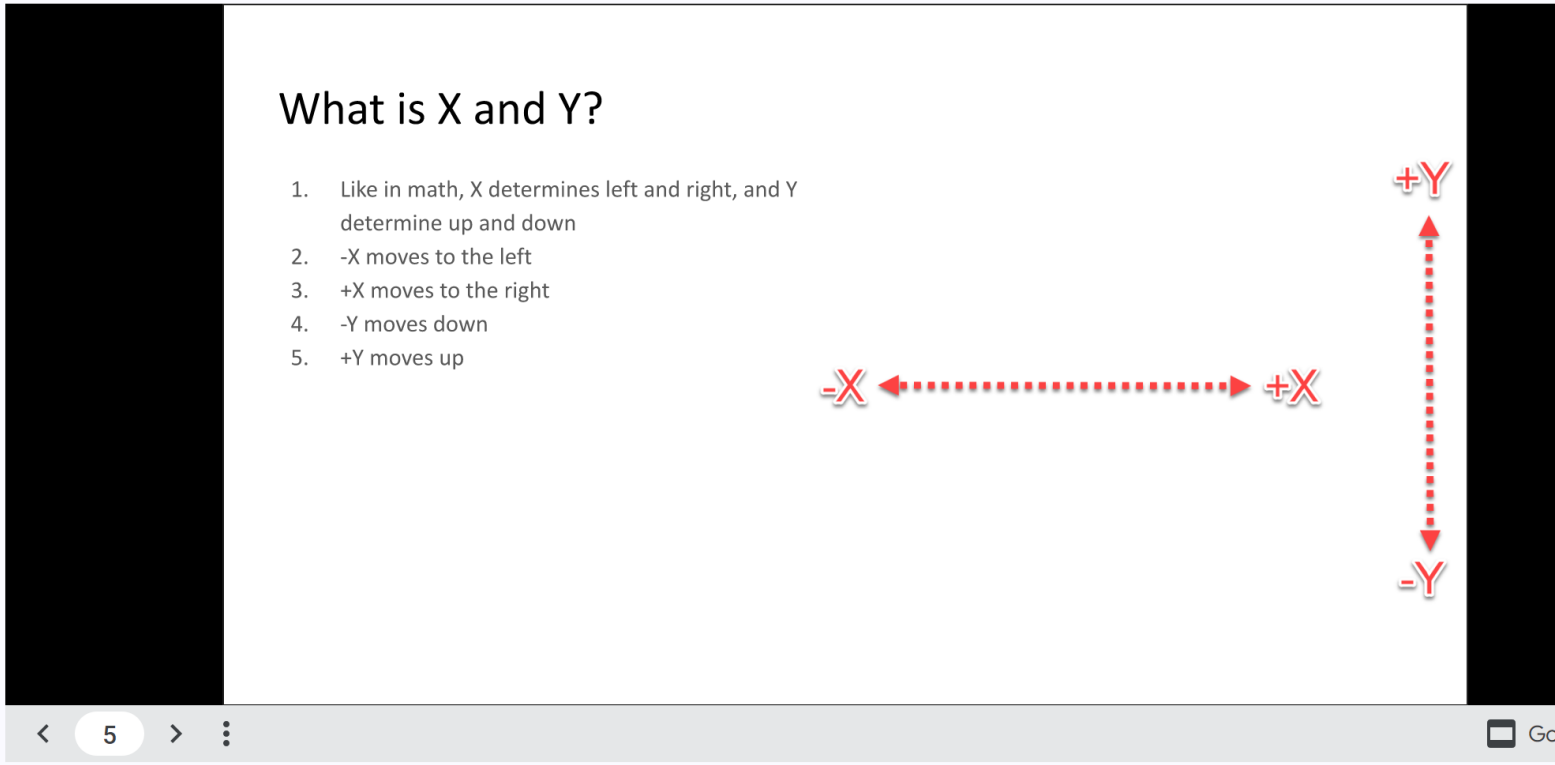
Lesson Plans (Teacher-facing resources)	Coder Resources (Student-facing resources)
1. Interactive collage	1. Interactive collage
2. Animated name/word	2. Animated name/word
3. Historical timeline remix	3. Historical timeline remix
4. Introducing a historical figure	4. Introducing a historical figure
5. Virtual museum	5. Virtual museum
6. Interactive digital artifact	6. Interactive digital artifact
7. Animated card (synthesis project)	7. Animated card
8. Historical story (synthesis project)	8. Historical story

Supplemental Resources

- Assessment Resources
- Resources to Learn More About Native Americans
- Resources to Learn More About Curriculum Integration
- Studio with all of the project examples

Student walkthroughs for rhizomatic learning

1. Sign in and create a new project
2. Create Levels
3. Create player controls



Create a restart function

ct the walls

reate a goooooaaaaalllllllll

7. Have some friends play test your game and give you feedback
    a. Make some adjustments based on the feedback
8. Add in comments

An approach I recently used

Friendly reminder to submit questions/comments

Planning for interest-driven learning

A resource for administrators

Presentation by Jared O'Leary and uses Creative Commons licensing Attribution-NonCommercial-ShareAlike (BY-NC-SA)

Coding TAP Crosswalk Document

File Edit View Tools Help

OUTLINE

Designing and Planning Instruction	*Exemplary (5)*	*Proficient (3)*	*Unsatisfact*
Instructional Plans Original	*Instructional plans include:* *1. measurable and explicit goals aligned to state content standards;* *2. activities, materials, and assessments that:* *a. are aligned to state standards.* *b. are sequenced from basic to complex.* *c. build on prior student knowledge, are relevant to students' lives, and integrate other disciplines.* *d. provide appropriate time for student work, student reflection, and lesson and unit closure;* *3. evidence that plan is appropriate for the age, knowledge, and interests of all learners and;* *4. evidence that the plan provides regular opportunities to accommodate individual student needs.*	*Instructional plans include:* *1. goals aligned to state content standards;* *2. activities, materials, and assessments that:* *a. are aligned to state standards* *b. are sequenced from basic to complex* *c. build on prior student knowledge* *d. provide appropriate time for student work, and lesson and unit closure* *3. evidence that plan is appropriate for the age, knowledge, and interests of most learners and;* *4. evidence that the plan provides some opportunities to accommodate individual student need*	*Instructional plans include:* *1. few goals aligned to sta* *2. activities, materials, an* *a. are rarely al standards.* *b. are rarely lo* *c. rarely build knowledge.* *d. inconsistent student wor closure;* *3. little evidence that plan age, knowledge, or inte and;* *4. little evidence that the opportunities to accom student needs.*
Instructional Plans Crosswalk	**Instructional plans or projects include:** **1. measurable goals aligned to the governing board adopted coding curriculum** **2. activities, puzzles, projects, materials, and assessments that:** **a. are aligned to the governing board adopted coding curriculum.** **b. are logically sequenced from basic to complex.** **c. build on prior student knowledge, are relevant to students' lives, and integrate other disciplines.** **d. provide appropriate time for student work, student reflection, and puzzle/project discussion;** **3. evidence that puzzles/projects are appropriate for the age, knowledge, or interests of the learners and;** **4. evidence that puzzles/projects provide regular opportunities to accommodate individual student needs.**	**Instructional plans or projects include:** **1. goals aligned to the governing board adopted coding curriculum** **2. activities, puzzles, projects, materials, and assessments that** **a. are aligned to the governing board adopted coding curriculum.** **b. are logically sequenced from basic to complex** **c. build on prior student knowledge** **d. provide appropriate time for student work, and puzzle/project discussion** **3. evidence that puzzles/projects are appropriate for the age, knowledge, or interests of the learners and;** **4. evidence that puzzles/projects provides some opportunities to accommodate individual student needs**	**Instructional plans or projec** **1. few goals aligned to th adopted coding curricu** **2. activities, puzzles, proj assessments that** **a. are rarely al board adop** **b. are rarely lo** **c. rarely build knowledge.** **d. inconsistent student wo discussion;** **3. little evidence that puz appropriate for the ag interests of the learne** **4. little evidence that puz some opportunities to individual student nee**
Crosswalk explanation	***How might instructional plans differ?*** Instructional plans may include very little large group direct instruction. Instead, plans might include an opening sequence or directive, a s time for working on a multitude of individual or group puzzles/projects, and a closure that allows for reflecting and sharing learning, debu inquiries, or unresolved debugging challenges. Instructional plans might also include projects that last for one or more lessons, or even th of several projects designed by the teacher or other students in the district. Rather than a pre sequenced lesson that explains how a proje be explored rhizomatically by embedding direct instruction into the project itself or through supplemental resources that assist with debu elaborating on concepts. This is possible because coding projects can include comments within the blocks or text that explains how a parti program works, as well as use questions to ask how else the student could change the coding (e.g., a project Jared designed). Or, instructi include using a sequenced, self-paced coding platform where the role of the teacher is to facilitate by providing additional resources or gu questioning techniques.		
	Assignments require students to: *1. organize, interpret, analyze, synthesize, and evaluate information rather than reproduce it;*	*Assignments require students to:* *1. interpret information rather than reproduce it* *2. draw conclusions and support them through writing and;*	*Assignments require student* *1. mostly reproduce infor* *2. rarely draw conclusions through writing and;*

Types of integration

- Crossdisciplinary
- Interdisciplinary
- Interdiscipline
- Integrated
- Metadisciplinary
- Multidisciplinary
- Pluridisciplinary
- Transdisciplinary

Types of integration relationships

- Affective integration
- Co-equal integration
- Social integration
- Subservient integration

Images of curriculum

- Curriculum as content or subject matter
- Curriculum as a program of planned activities
- Curriculum as intended learning outcomes
- Curriculum as cultural reproduction
- Curriculum as experience
- Curriculum as discrete tasks and concepts
- Curriculum as an agenda for social reconstruction
- Curriculum as currere

Curricular venues

- Intended curriculum
- Taught curriculum
- Experienced curriculum
- Hidden curriculum
- Tested curriculum
- Null curriculum

Some podcasts on integration

Integration miniseries *(I'd listen in the following order)*

1. The Subservient, Co-equal, Affective, and Social Integration Styles and Their Implications for [Computer Science]
2. Images of Curriculum
3. Contemporary Venues of Curriculum Inquiry

Music integration episodes

- Intersections of Popular Musicianship and Computer Science Practices
- Reconceptualizing "Music Making:" Music Technology and Freedom in the Age of Neoliberalism

Whose interests are being served and why?


JAWS
Campbells

What this might look like

Technology Classes at Desert Thunder

Jared O'Leary
Arizona State University
Avondale Elementary School District

Final friendly reminder to submit questions/comments

Exploring resources for learning more

How to reach the resources

- www.JaredOLeary.com
  - Presentations
    - Interest-driven CS education?