Sparking STEAM Learning:
Merging Making, Robotics, Coding, and Wearables

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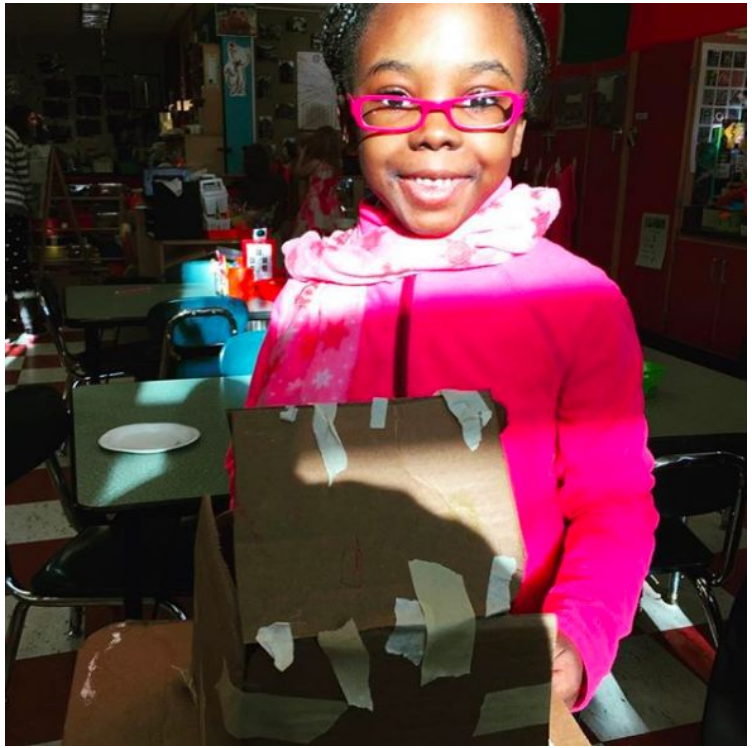
What Do We Do?

- Design “maker” experiences for undergraduate & graduate preservice teachers
- Partner with schools to support their adoption, integration, and infusion of “making” in education
- Community Outreach STEAM events

Making in an Education Content



Here is what we notice:

- Increase in students' ability to describe their thinking (metacognition)
- Increase in student engagement with a corresponding decrease in unwanted behavior
- Increase in student interpersonal & collaboration skills

Students Learn through Play & Tinkering

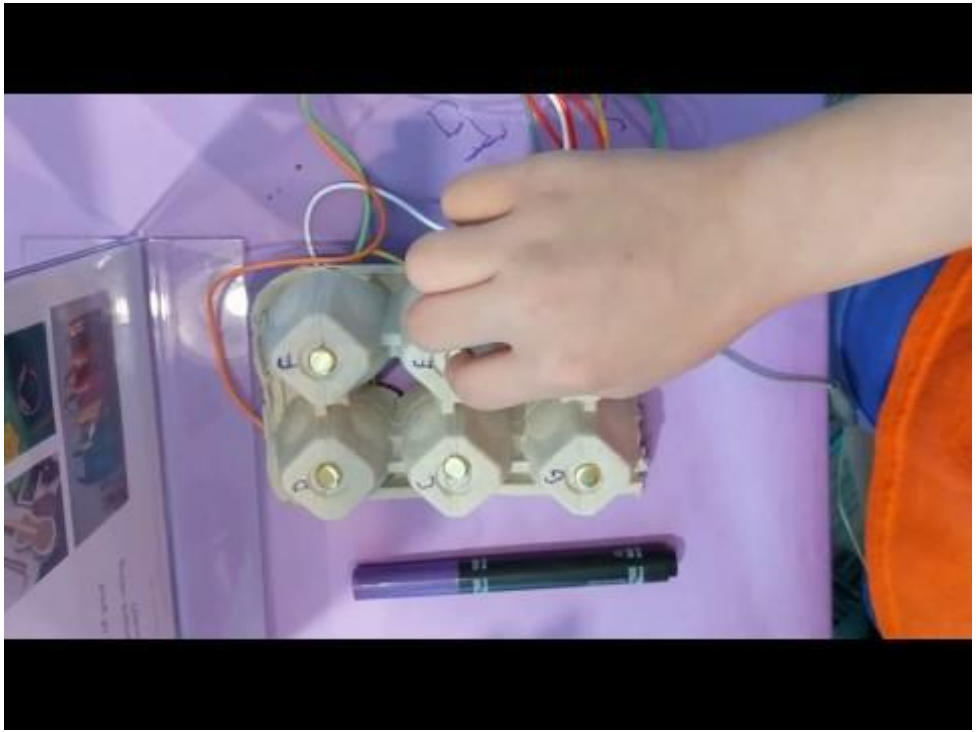
The role of the teacher is to create the conditions for invention rather than provide ready-made knowledge.

Seymour Papert (1928 - 2016)

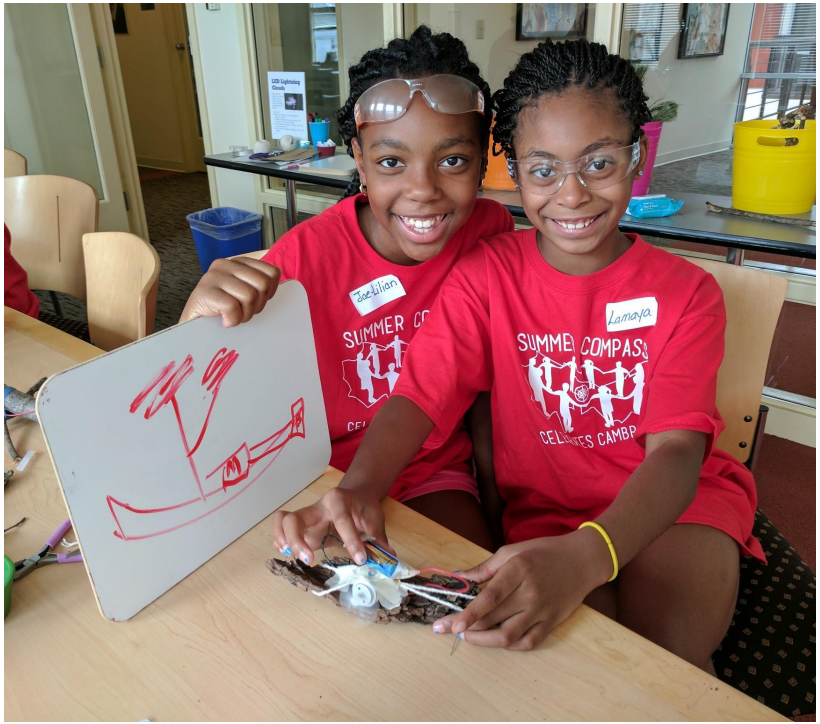
Students as Creators

Wolves Stop Motion - 3rd Grade Research Project
http://steam.lesley.edu/3-2-1-action/

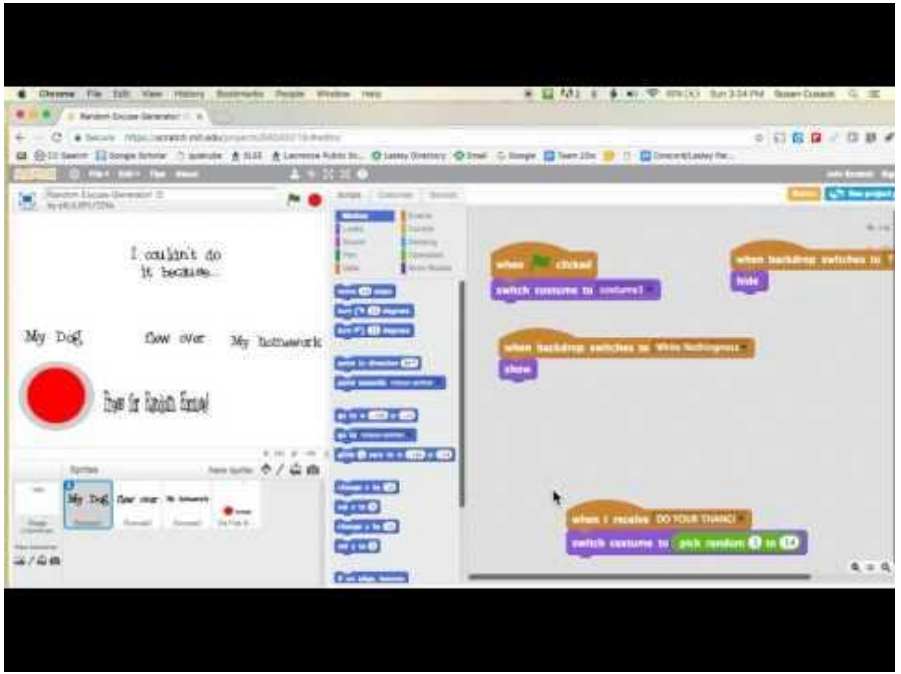
Making helps make critical thinking visible.



Making creates opportunities for discovery and wonder.



Learning is social.



Coding invites discovery, engagement & self-directed learning.

The kind of knowledge children most need is the knowledge that will help them get more knowledge.

Papert, 1993

A Pivot in Practice & Shift in School Culture

We notice greater capacity for:

- Interdisciplinary projects
- Teacher comfort in “digital making”
- Student peer-to-peer support
- Parent engagement in & after school
- School’s online STEAM presence

The Voice of Teachers

Lindsey Tosches

Science Teacher &
Makerspace Coordinator
Kennedy School (K-8)
Somerville Public Schools
Somerville, MA

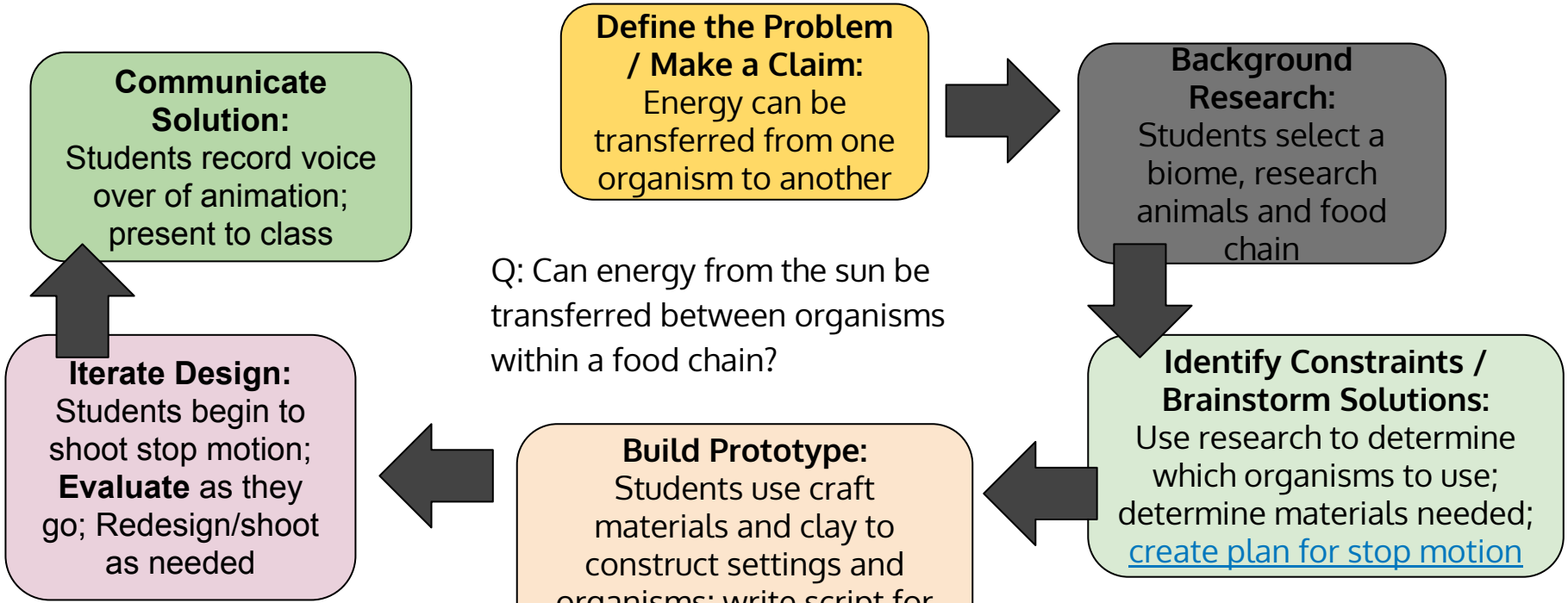
Connecting Concepts and Open Responses

Question: *Can energy from the sun be transferred between organisms within a food chain?*

Standards: LS2. Ecosystems: Interactions, Energy, and Dynamics 5-LS2-1. Develop a model to describe the movement of matter among producers, consumers, decomposers, and the air, water, and soil in the environment…

PS3. Energy 5-PS3-1. Use a model to describe that the food animals digest (a) contains energy that was once energy from the Sun, and (b) provides energy and nutrients for life processes, including body repair, growth, motion, body warmth, and reproduction.

Engineering and Design Process

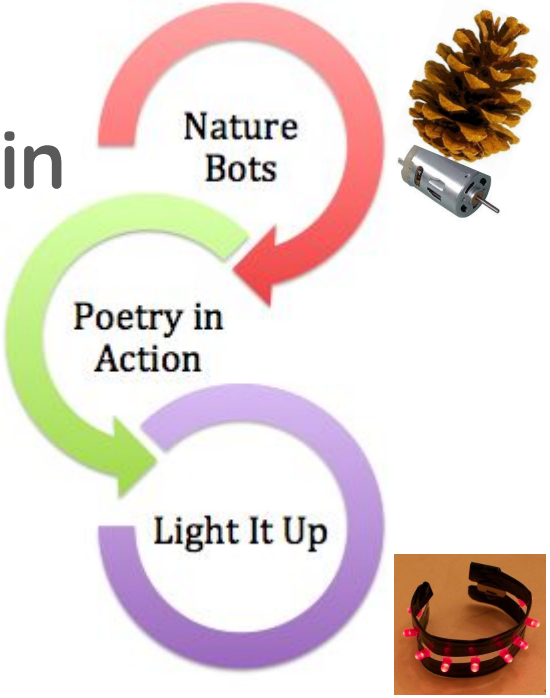


Link to E&D Process and Writing Connection

Final Product: Stop Motion

Experiencing the Maker Mindset

Round Robin



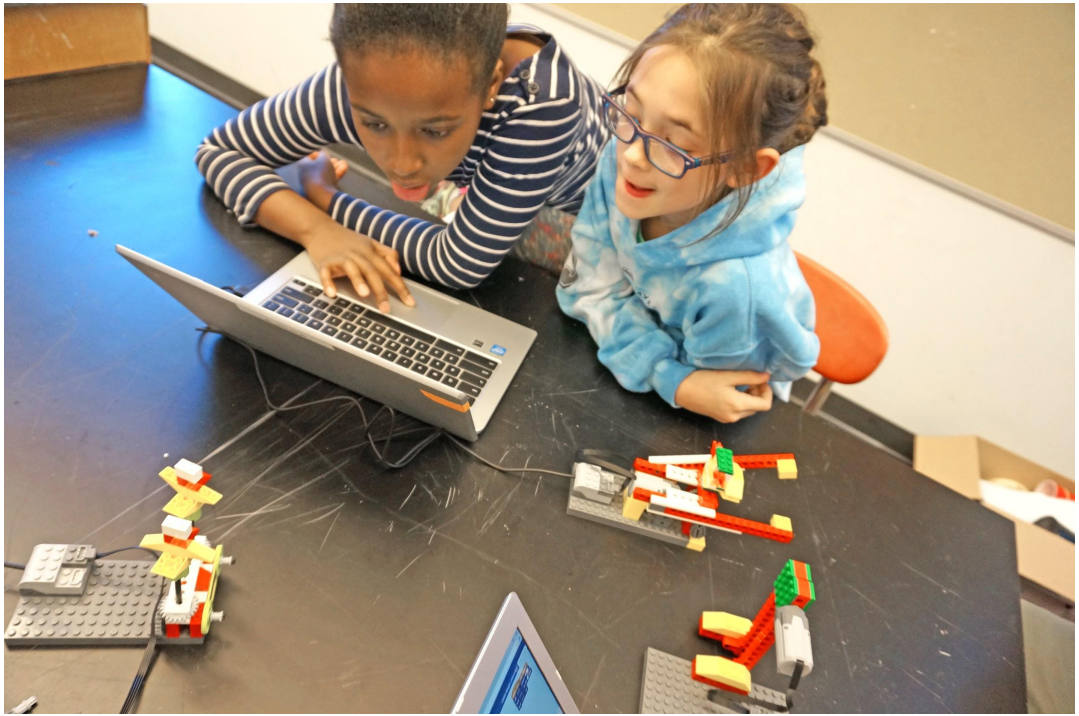
Independent Stations

Area & Perimeter with BeeBots

Sound & Music with MaKeyMaKey

Mars Rover with LEGO WeDO 2.0

Share & Debrief



Resources

Kennedy School Makerspace and Innovation Lab
https://kennedymakerspace.com

Lesley STEAM Learning Lab:
http://steam.lesley.edu/

Twitter: @kndymakerspace @LesleySTEAM
Instagram: @kennedymakerspace @LesleySTEAM