

Getting Started with MakerEd (Makerspaces)

Lindsey Own & Lina Rose
The Evergreen School, Shoreline, WA

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Teacher Talk

iNACOL
International Association for K-12 Online Learning



Lina Rose & Lindsey Own

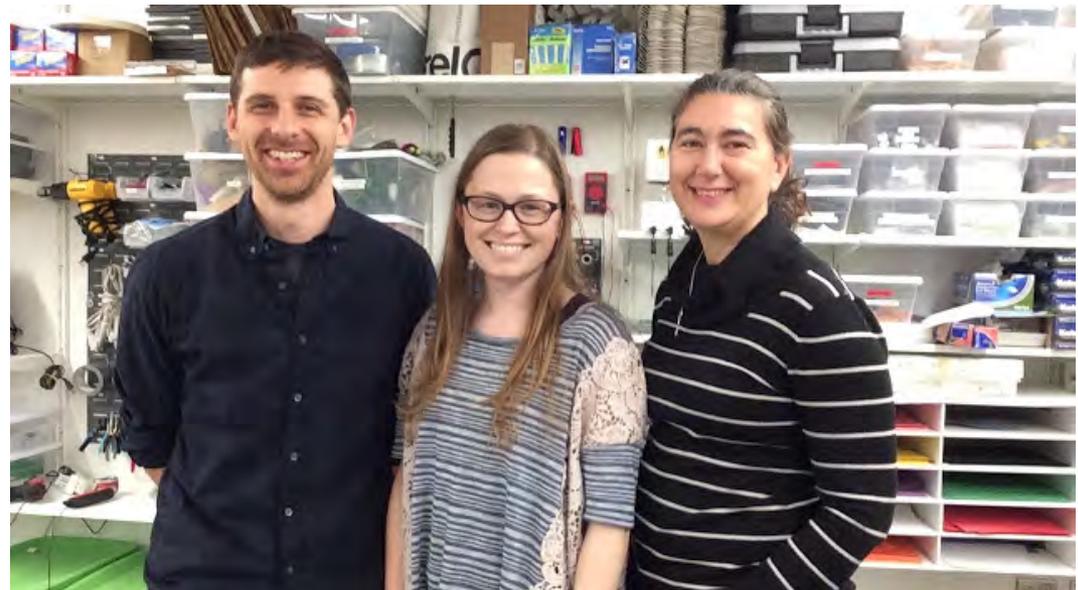
Lindsey (center)

- Makerspace coordinator
- Middle school science teacher prior
- 10 years at The Evergreen School
- @LindseyOwn

Lina (right)

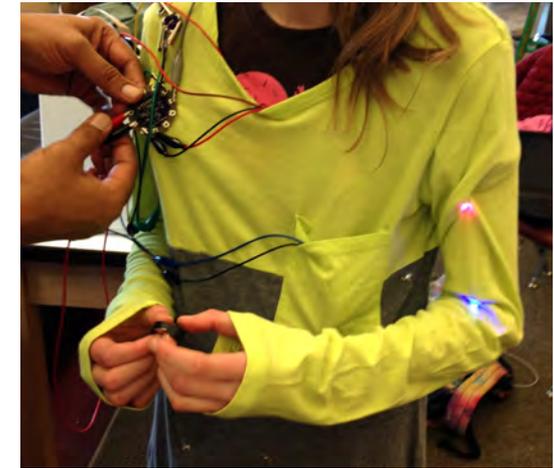
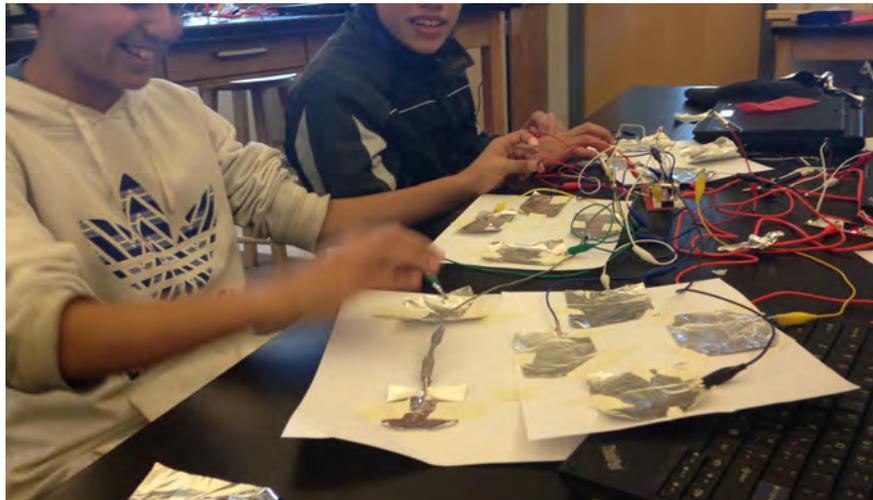
- 5th grade teacher, student activities coordinator
- 13 years at The Evergreen School
- hates social media

Colin (left) is awesome, too, but is not on this webinar today.

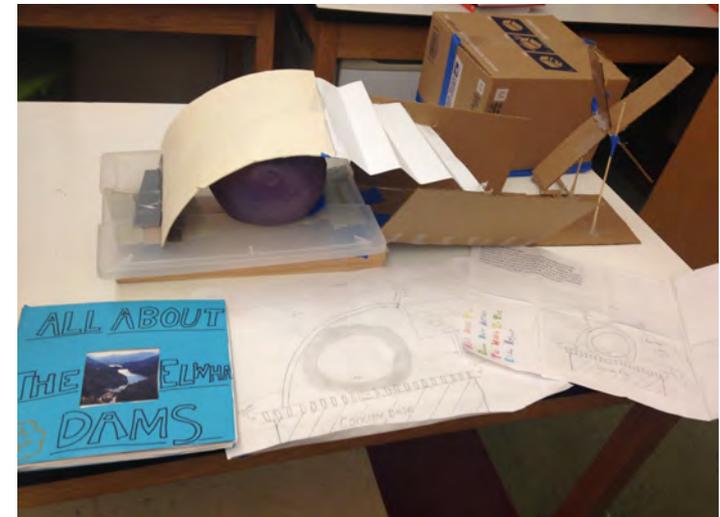
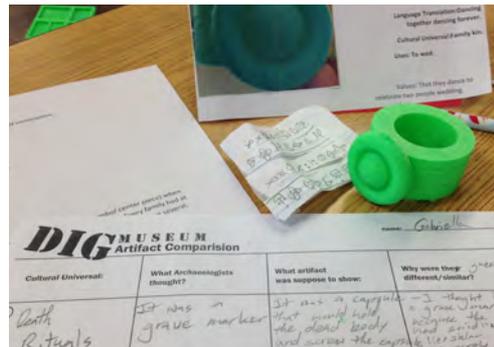




Before a dedicated space...



- Tinkering-to-learn mindset
- Experimenting with tools
- Adventure Days since 2013





Fall 2015: The B.I.G. Lab Build Imagine Grow





Examples of Integration

Preschool - 8th Grade

Science to World Language to SEL

Guided Tinkering - Open Invention



Teacher Talk





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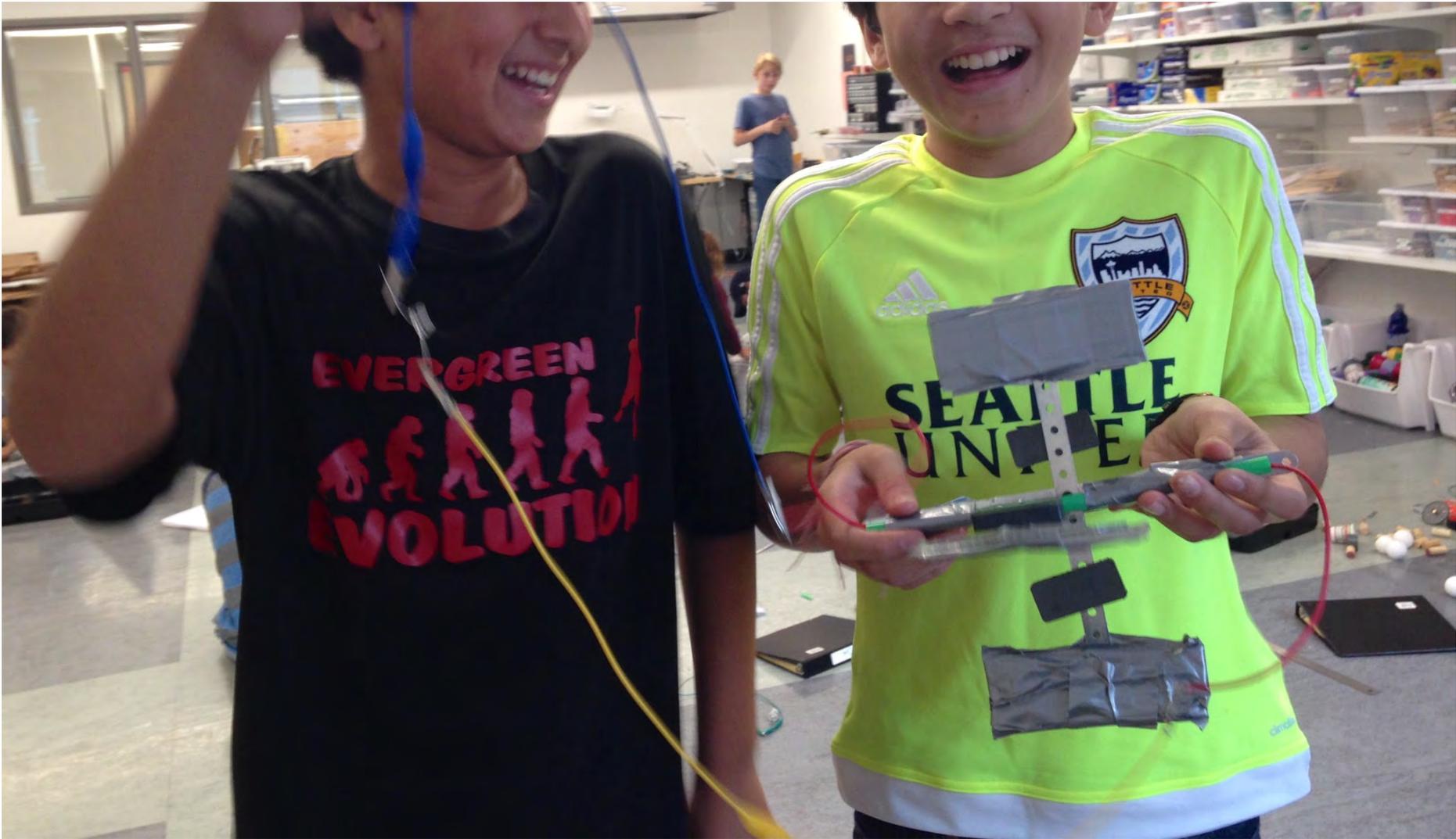
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How to Design These Learning Experiences?

- **Define:** What's the root learning objective?
- **Ideate:** Brainstorm through learning pathways.
- **Prototype:** Plan for maximizing “core elements” of innovative learning.
- **Iterate:** Adjust on the fly, take notes for future years.



Learning Pathways:

Some categories of contexts for addressing the learning objectives

visualization (static or interactive, literal or metaphorical)
comparison to other example
create a hypothetical example based on criteria
debate / take a position (self or other perspective)
“What If?” / one change
problem / solution, invention
place-based analysis
community service / public awareness



Learning Pathways - Ideation Examples

	3rd gr solar system	5th gr ancient civilizations	7th gr botany / seed dispersal
visualization (static or interactive) (literal or metaphorical)	<i>Create model of the planet, labeled with key features</i>	interactive model of specific civilization's city, labeled with key features	<i>Draw diagram of different types of seed dispersal, with examples</i>
comparison to other example	<i>Create model of two planets, comparing key features & why</i>	<i>compare different ancient civilizations</i>	<i>Draw diagram comparing seed dispersal in similar habitats/niches around the world</i>
create a hypothetical example based on criteria		create a hypothetical ancient civ in an environment with (x characteristics)	invent seed dispersal mechanism for plant in environment with (x characteristics)
debate / take a position (self or other perspective)	<i>Answer: What planet should be the first that we visit and study? (after Mars)</i>	<i>Answer: The development of what technology had the greatest impact on a civilization's success?</i>	
“What If?” / one change		<i>how would (x civilization) have been different with (x difference in local environment)?</i>	<i>how would (x plant's) seed dispersal mechanism have adapted differently if (x env characteristic) were different?</i>
problem/solution, invention (hypothetical or real)	Design a human habitat for survival on the planet	<i>invent a technology that would have saved (x ancient civilization) from its demise</i>	<i>invent a tool to prevent seed dispersal of (x invasive species plant)</i>
place-based analysis		<i>analyze local ancient civ and how it gave rise to features of local modern community</i>	<i>compare/contrast seed dispersal mechanisms of local native plants</i>
community service / public awareness			<i>create public awareness campaign for understanding seed dispersal mechanisms to prevent invasives / encourage natives</i>

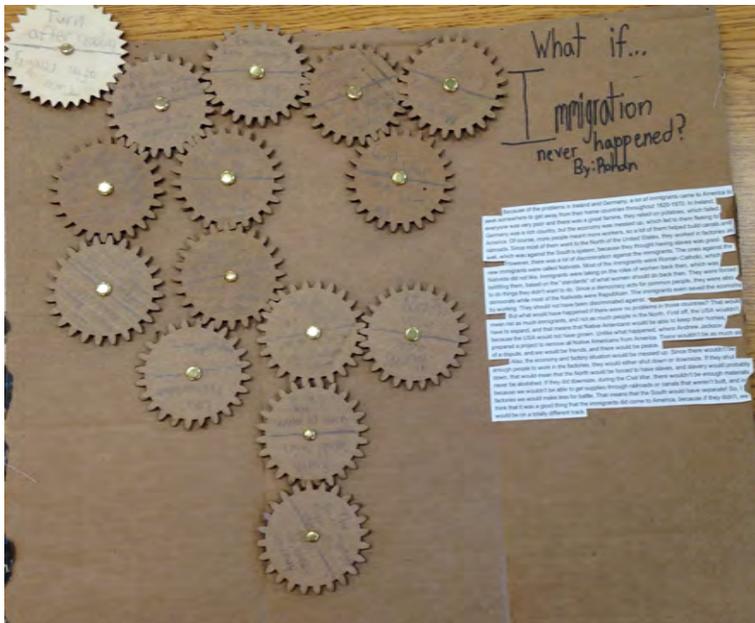


Example 1: Kindergarten Wind Measuring Tools





Example 2: 7th grade “What if?” Alternative History Timelines





Master list of *FALL* 2015-2016 School Year projects from our makerspace

PS - made simple circuits

PK - made LED-lit crowns, built and tested boats, made bat ears, built towers

K - built DoodleBots, invented and tested wind measurers

1 - built DoodleBots, experimented with paper circuits

2 - "hacked" journals with LEDs, built model playgrounds with simple machines, made robotic dioramas

3 - wired "Hummingbird" robotics kits, built models of human habitats on other planets and moons, built set pieces for A Midsummer Night's Dream

4 - made LED-lit maps of the US, greenscreened themselves into locations around the US

5 - laser cut labels for their new classrooms, built models of hypothetical ancient civilizations

6 - made original Casino games, videoed reading personal narratives, laser cut periodic table boxes

7 - made turbine to produce electricity, prototyped and produced carnival games for Halloween, made and tested seed dispersal mechanisms

8 - made physical representations of personal core values, prototyped and produced all Halloween Carnival prizes

World Language

Spanish: Los Dia De Los Muertos candles (1)

French: greenscreened postcards (5), "Build Your Dreamhouse" video games (7)

Mandarin: laser cut book covers for books written in class (3/4), gear-driven daily routine cycles (6), weather report videos (8)



Master list of *SPRING* 2015-2016 School Year projects from our makerspace

PS - experimented with Van de Graaff generator to demonstrate lightning
PK - made cars with working wheel/axle
K - tested different construction materials for building towers, built bridges, built arches, made working "function machines" w cardboard and marbles, built bugs and frogs for a frog board game,
1 - invented new musical instruments that could change pitch and volume, greenscreened selves into own illustrations, designed playgrounds to include children with specific disabilities
2 - used MaKey MaKey to incorporate sound bytes into community murals
3 - 3D-designed house pole segments and Oregon Trail wagon provisions, built working models of Oregon Trail wagons
4 - built models of personal inventions, BreakoutEDU
5 - constructed scale models of ancient buildings, created museum exhibits about ancient civilizations, 3D designed and printed artifacts from invented civilizations, BreakoutEDU
6 - built illuminated 3D constellation models to demonstrate parallax, laser cut home models using volume / surface area math
7 - created "alternative history" timelines for pre-civil war US, created museum exhibits about paleontology, laser cut and wired electronics for illuminated poetry/quotes
8 - invented and prototyped wearable technologies,

World Language

Spanish: fast/slow animal statues (2), used MaKey MaKey to incorporate sound bytes into rainforest dioramas (3), made jewelry for a market (7)

French: "hobbies in different seasons" cardboard pull-tab boards (5), phone conversations in different rooms on greenscreen (6)

Mandarin: cardboard illustrated weather cycles (5), "directions through a house" video game (6), paper dolls with costumes (6)

Middle School **"Adventure Days"**, including building bike-powered generator, laser cut acrylic turtle lamp, laser cut home design, building quadcopter, building mechanical clocks, building bike-driven "tank," more



What are our next steps?

- Do you have a community where learning is driven by students asking questions and tinkering?
- Do you have a dedicated space and/or a dedicated staff member to support tinkering across the curriculum?
- What can we problem-solve today?



Q&A

Please ask your questions in the chat box.

Thank you for attending.

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Attend the iNACOL Symposium: <http://www.inacol.org/symposium/>