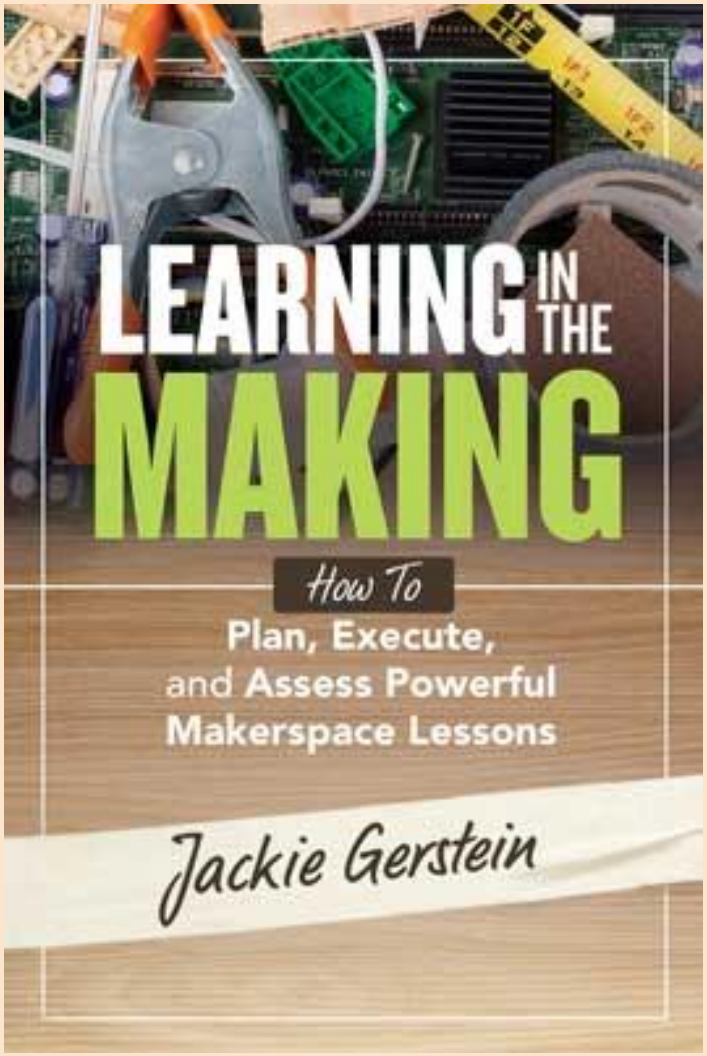
PBL, Student-Driven, Service-Oriented Lessons with Elementary Students

Dr. Jackie Gerstein



"I don't do teaching for a living, I live teaching as my doing."

I teach gifted kids at a title 1/bilingual schools in Santa Fe, NM. My mission for the kids is to help them develop the passion and skills so they are situated to be competitive with students of more privilege. I do so by creating classroom environments I wish I had as an elementary student.

@JackieGerstein

http://usergeneratededucation.wordpress.com/

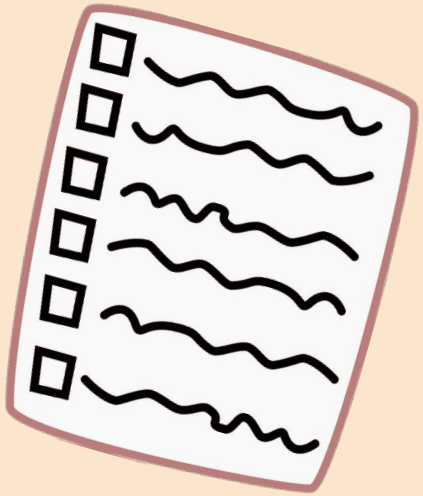
Agenda

- **Introduction**
  - Personal Introductions
  - Offering Electives to Elementary Students

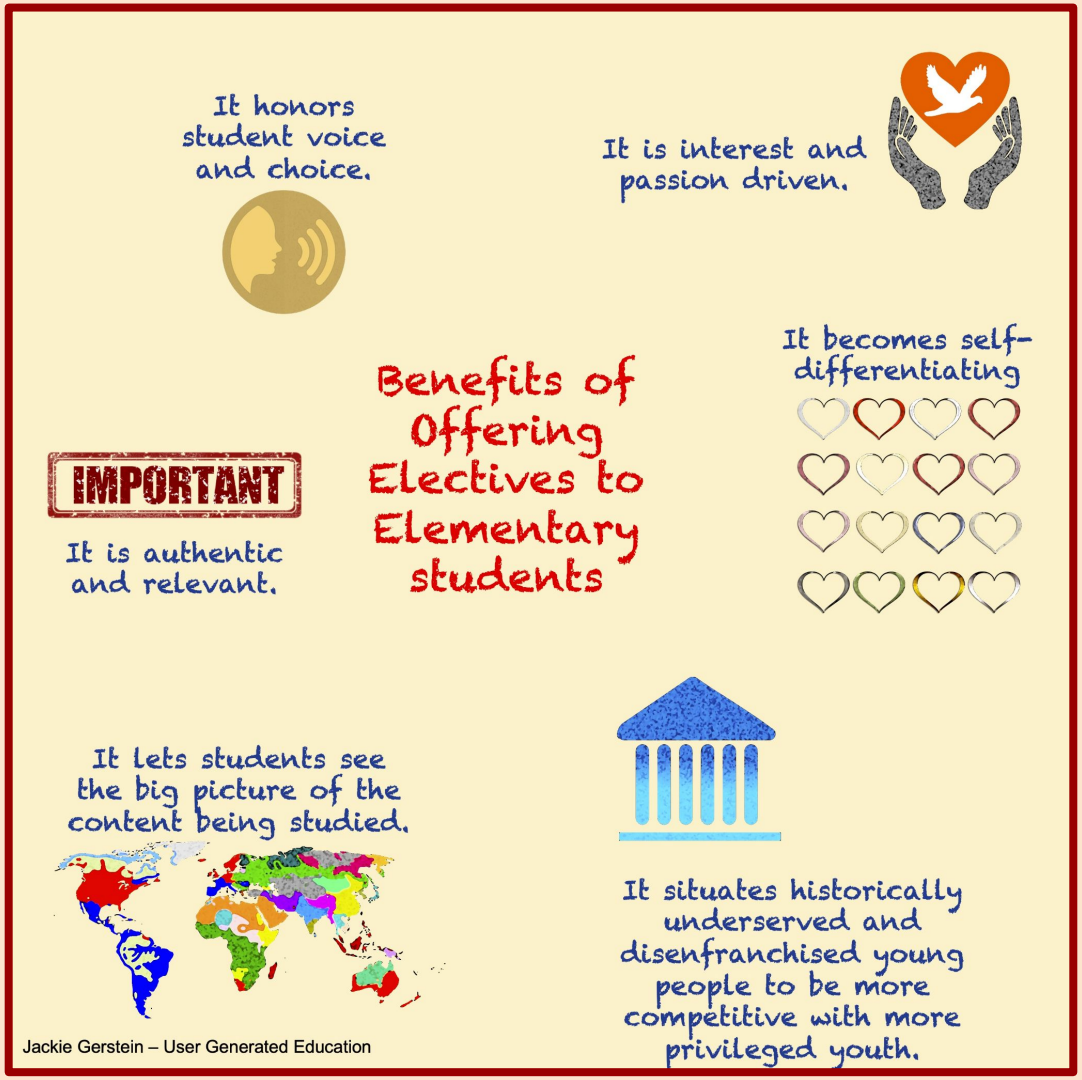
- **Project Reviews**
  - Social Entrepreneurship
  - The Monster Project
  - Sustainable Cities
  - Holiday Displays
  - Marble Runs
  - Space Explorations
  - Beartown Place
  - Gardening

- **Jamboard or Canva (3 m. brainstorm after each project review)**
  - Add observations, questions, applications

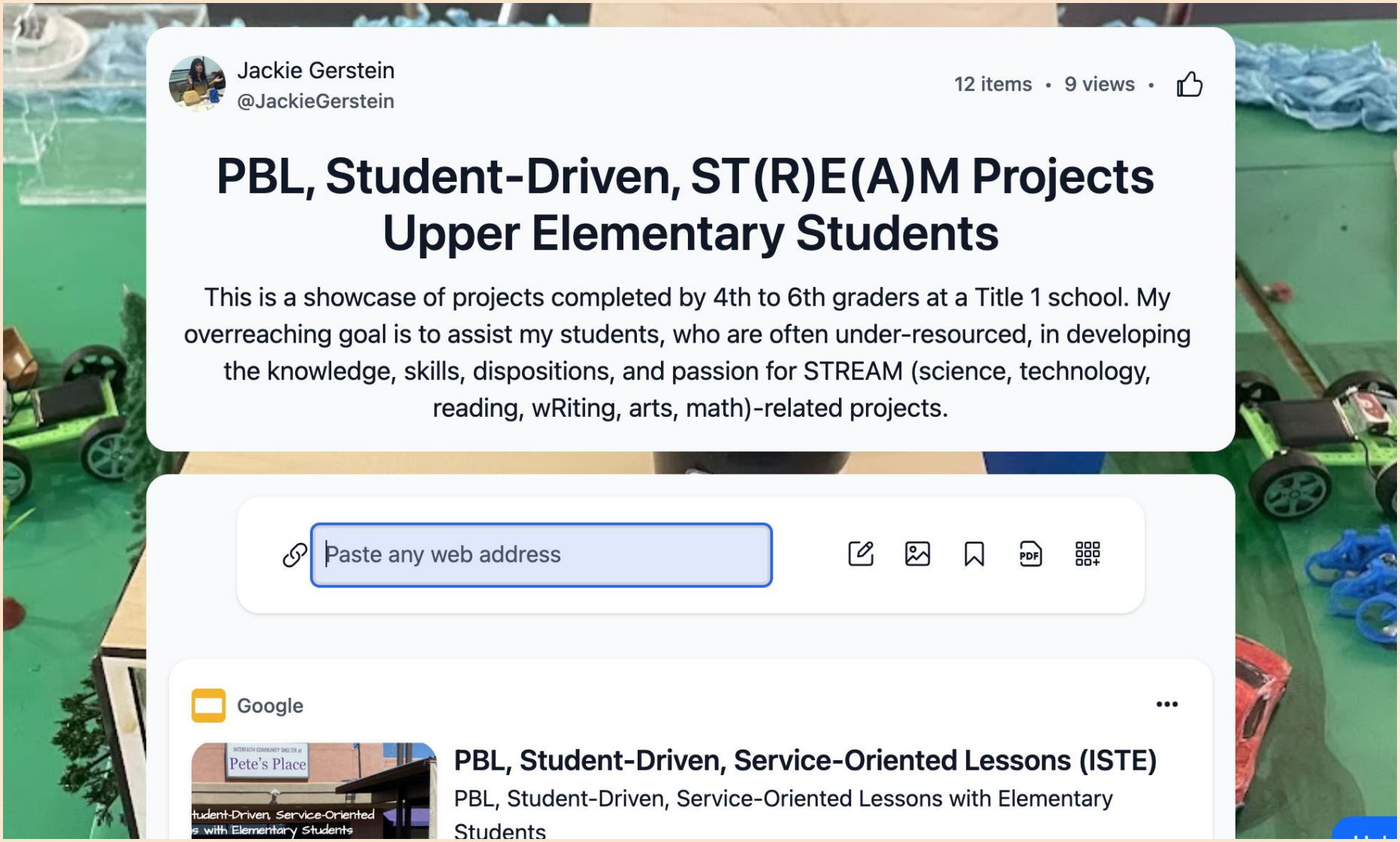
- **Closing**
  - Guiding Principles (In your classroom?)
    - Authentic Learning
    - Experiential Hands-On/Minds-On Learning
    - Interdisciplinary Learning
  - One Action Step



Electives for Upper Elementary Gifted Students



- Offering Electives to Elementary Students
  https://usergeneratededucation.wordpress.com/2021/08/09/offering-electives-to-elementary-students/



https://wakelet.com/wake/iSCTYicG7k68LCvS2xLr9

Social Entrepreneurship

Sage Social Entrpreneurs Market

S.S.E.M.

- https://usergeneratededucation.wordpress.com/2022/04/22/social-entrepreneurship-with-elementary-students-a-perfect-steam-lesson/

Social Entrepreneurship

Standards Addressed

Framework for 21st Century Learning
Financial, Economic, Business, and Entrepreneurial Literacy

- Know how to make appropriate personal economic choices
- Understand the role of the economy in society
- Use entrepreneurial skills to enhance workplace productivity and career options

Common Core State Standards – Math (budgets and money management)

- Use place value understanding and properties of operations to perform multi-digit arithmetic.
- Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Common Core State Standards – ELA

- Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

ISTE Standards for Students

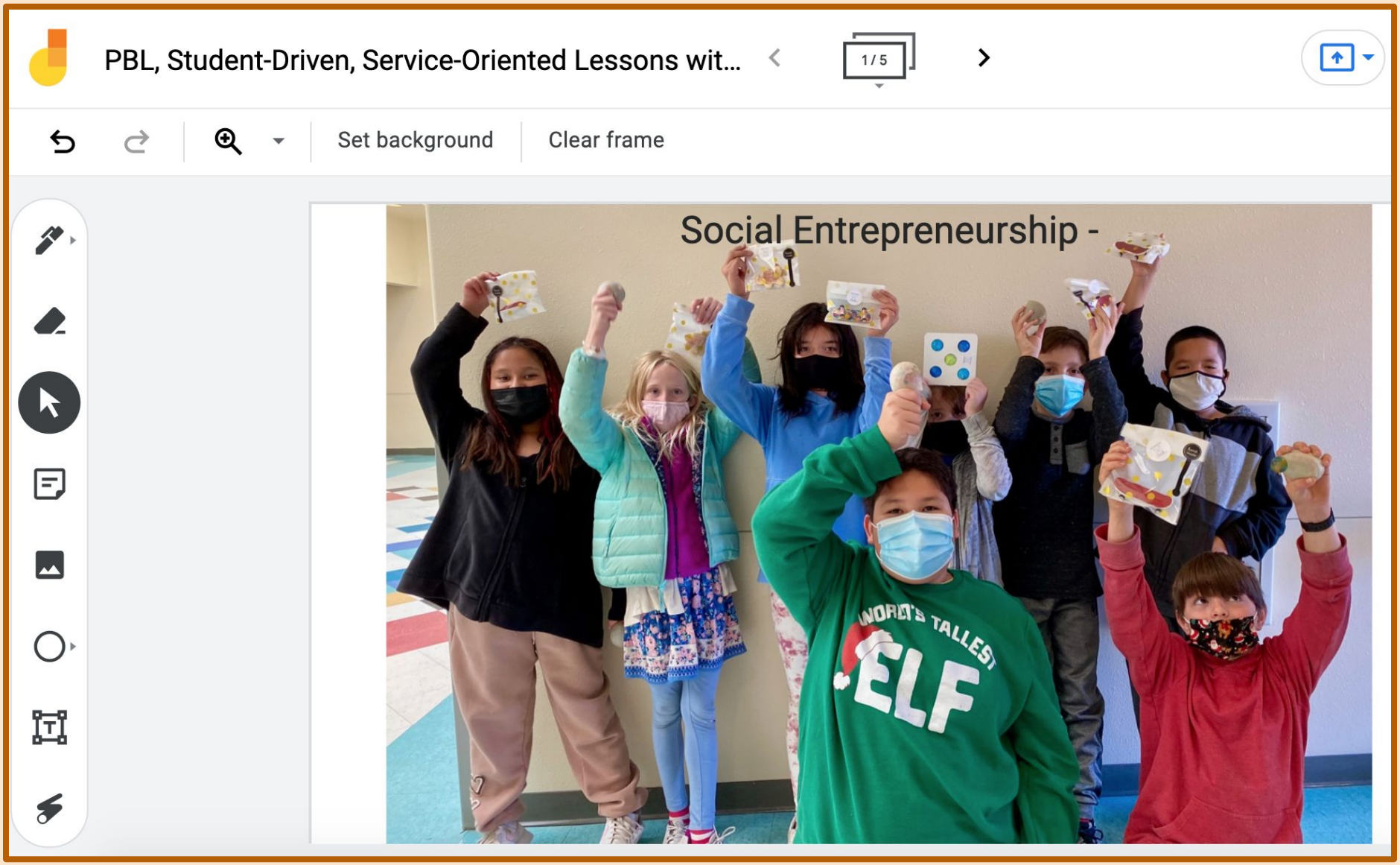
- Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.
- Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

NAGC Standards

- Students with gifts and talents demonstrate their potential or level of achievement in their domain(s) of talent and/or areas of interest.
- Students with gifts and talents develop knowledge and skills for living in and contributing to a diverse and global society.
- Students with gifts and talents demonstrate personal and social responsibility.
- Students with gifts and talents develop competence in interpersonal and technical communication skills. They demonstrate advanced oral and written skills and creative expression. They display fluency with technologies that support effective communication and are competent consumers of media and technology.

https://usergeneratededucation.wordpress.com/2022/04/22/social-entrepreneurship-with-elementary-students-a-perfect-steam-lesson/

Add Observations, Questions, School Applications to Jamboard



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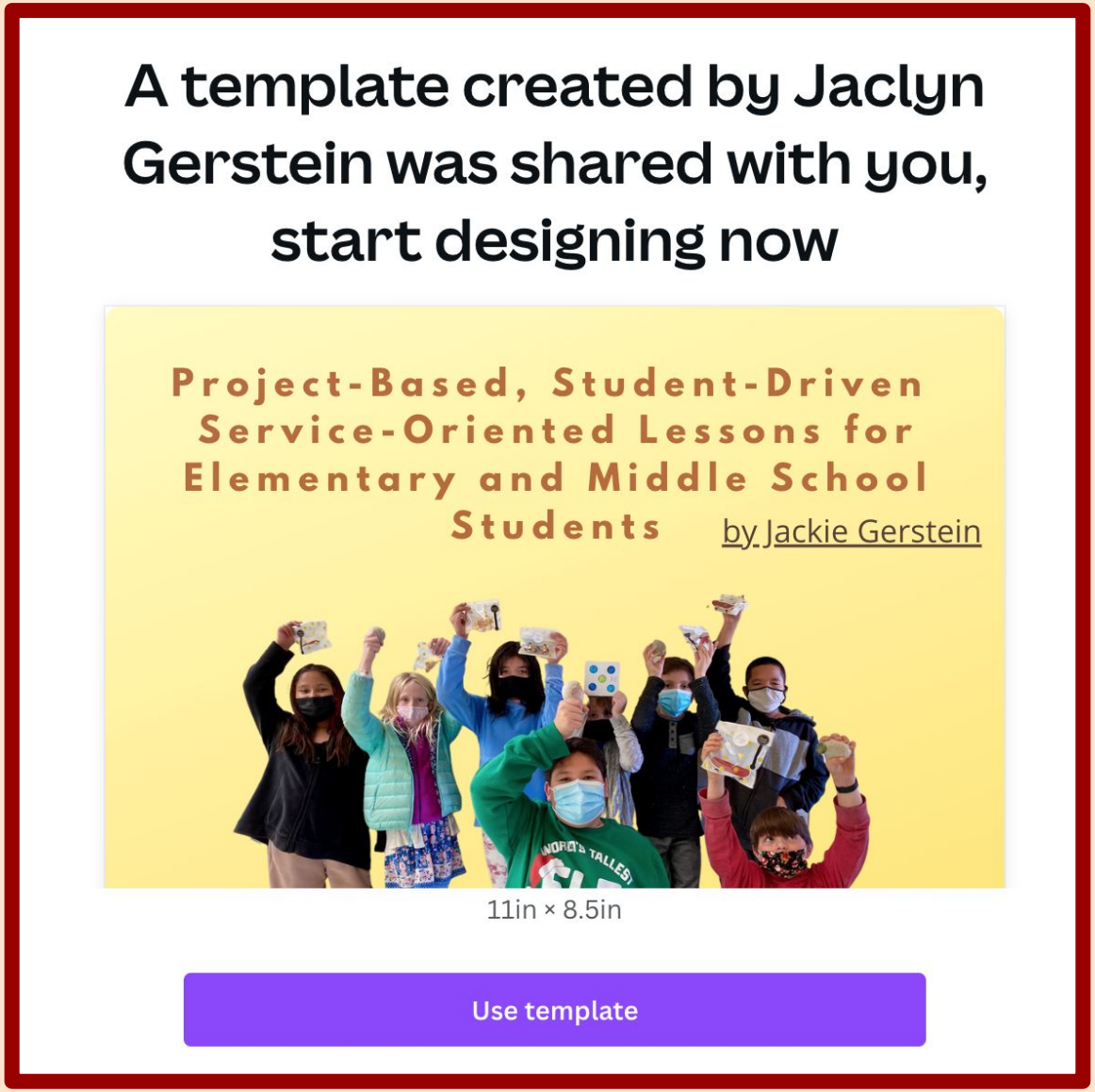
OR Add Observations, Questions, Applications to a Canva Template



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Monster Project Enhanced with Scratch and Makey Makeys

https://usergeneratededucation.wordpress.com/2023/03/04/monster-project-using-makey-makeys-and-scratch/

Monster Project Enhanced with Scratch and Makey Makeys

Standards Addressed

Common Core State Standards – ELA

- Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, orissue under study.

National Core Arts Standards

- Students will generate and conceptualize artistic ideas and work.

CSTA Standards

- Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
- Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.

ISTE Standards for Students

- Students create original works or responsibly repurpose or remix digital resources into new creations.
- Students publish or present content that customizes the message and medium for their intended audiences.

https://usergeneratededucation.wordpress.com/2023/03/04/monster-project-using-makey-makeys-and-scratch/

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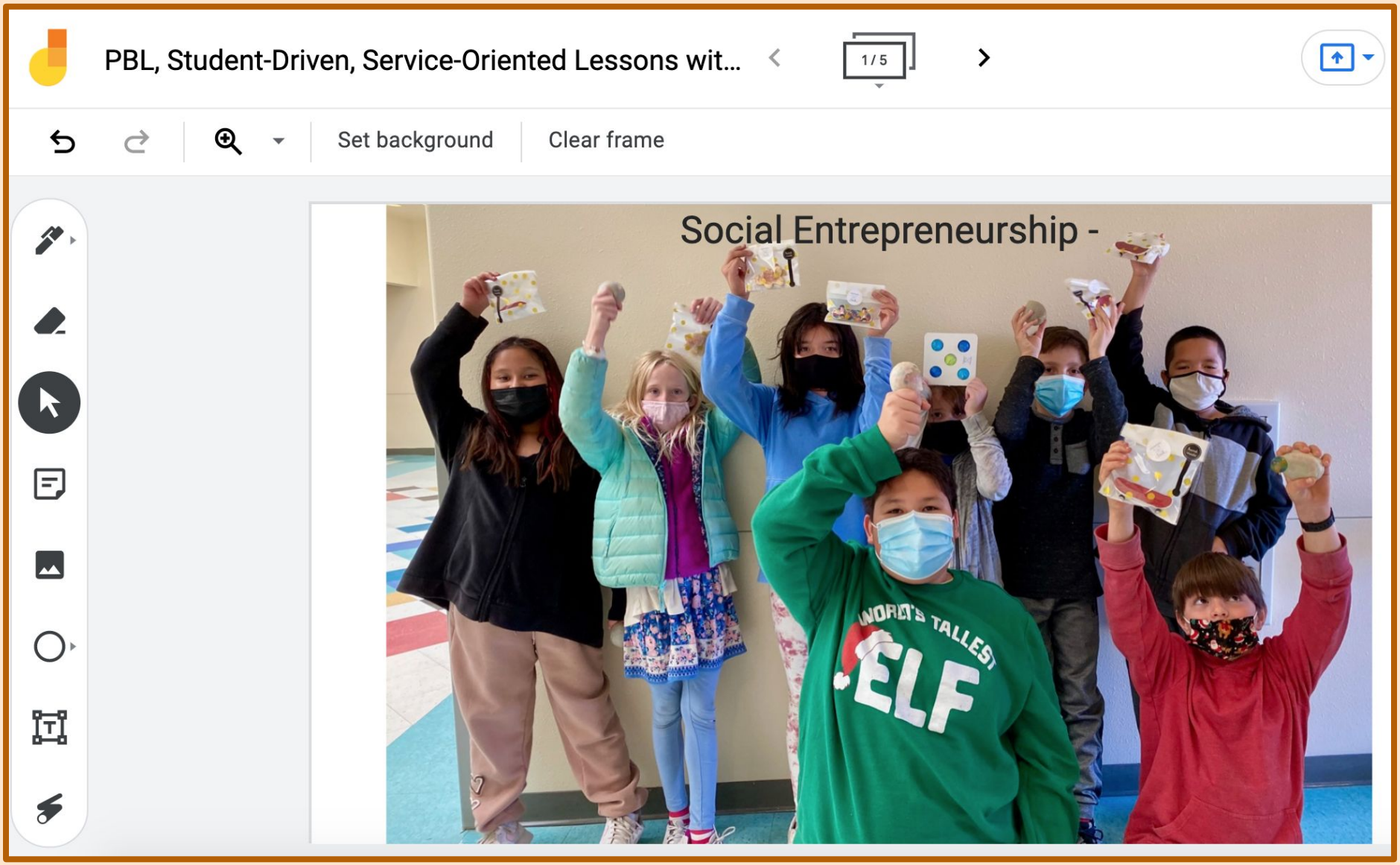

https://jamboard.google.com/d/11TNZ3kHuPighaTM-tZt25ku0i6RPYC0of7PUMy_8YZo/edit?usp=sharing

Sustainable City

- https://sites.google.com/view/the-sustainable-city/home?authuser=0
- https://usergeneratededucation.wordpress.com/2023/02/12/creating-a-sustainable-city-sdg-11-the-beginnings-of-a-collaboration/

Sustainable City

Standards Addressed

Education for Sustainability Standards and Performance Indicators

- **Responsible Local & Global Citizenship**. The rights, responsibilities, and actions associated with leadership and participation toward healthy and sustainable communities. Students will know and understand these rights and responsibilities and assume their roles of leadership and participation.
- **Healthy Commons**. Healthy Commons are that upon which we all depend and for which we are all responsible (i.e., air, trust, biodiversity, climate regulation, our collective future, water, libraries, public health, heritage sites, top soil, etc.). Students will be able to recognize and value the vital importance of the Commons in our lives and for our future. They will assume the rights, responsibilities, and actions to care for the Commons.
- **Inventing & Affecting The Future**. The vital role of vision, imagination, and intention in creating the desired future. Students will design, implement, and assess actions in the service of their individual and collective visions. (https://cloudinstitute.org/cloud-efs-standards)

Common Core English Standards

CCSS.ELA-LITERACY.CCRA.W.7
Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

Next Generation Science Standards (Science and Engineering)

- Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved (https://www.nextgenscience.org/topic-arrangement/msengineering-design).

★ https://sites.google.com/view/the-sustainable-city/home?authuser=0
★ https://usergeneratededucation.wordpress.com/2023/02/12/creating-a-sustainable-city-sdg-11-the-beginnings-of-a-collaboration/

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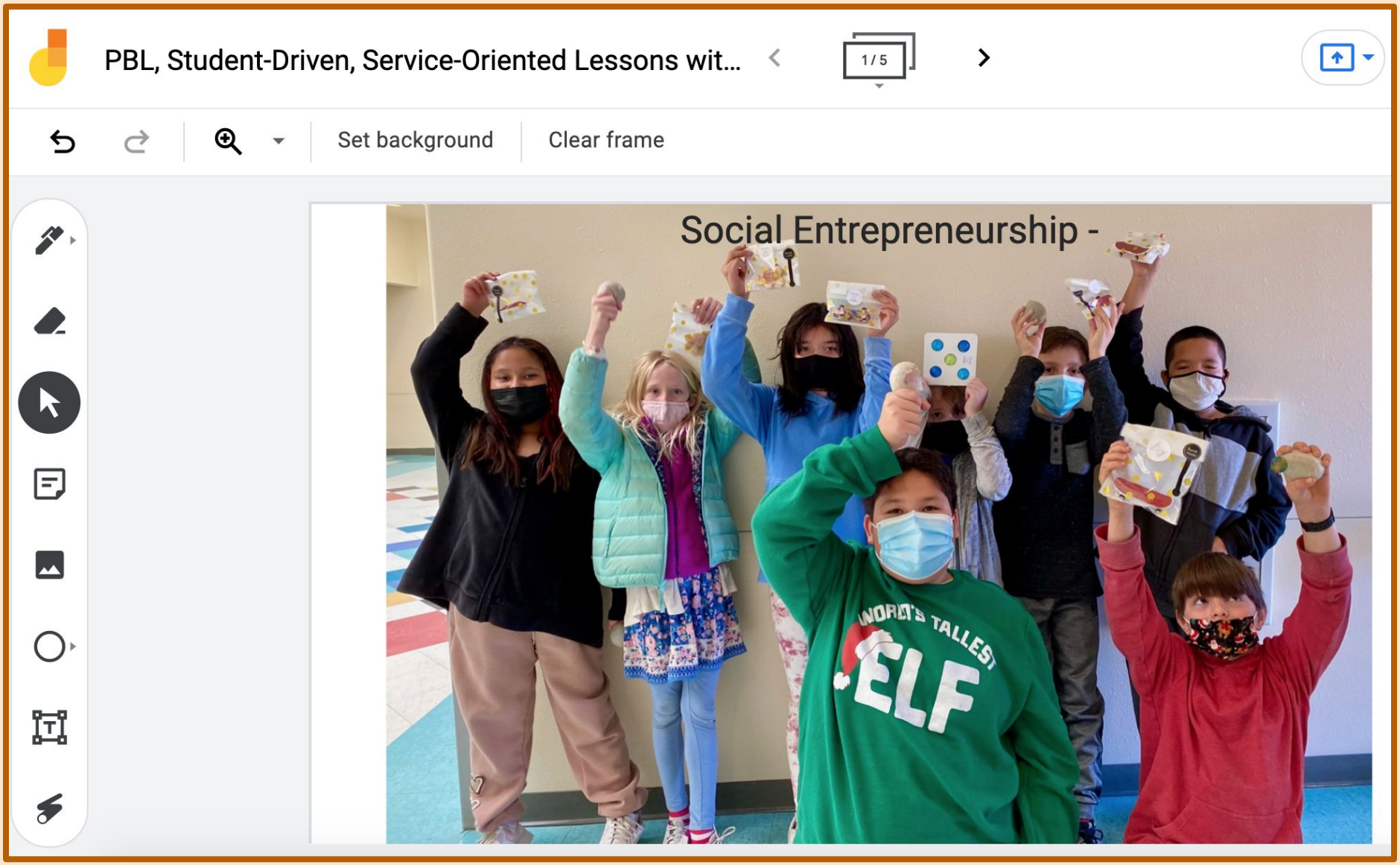

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Holiday Displays

- https://usergeneratededucation.wordpress.com/2022/10/31/dia-de-los-muertos-halloween-displays-a-meow-wolf-ish-stream-project/
- https://usergeneratededucation.wordpress.com/2022/12/12/winter-holiday-display-a-great-stream-project/

Holiday Displays

Standards Addressed

Due to the project's cross disciplinary nature, standards were addressed from several disciplines:

Common Core State Standards – ELA

- CCSS.ELA-LITERACY.W.5.3 – Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
- CCSS.ELA-LITERACY.W.5.6 – With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others.
- CCSS.ELA-LITERACY.W.5.10 – Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Science Standard

- NGSS: **4-PS3-2.** Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

GSS Engineering Standards

- 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and
- constraints on materials, time, or cost.
- 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

ISTE Standards for Students

- Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- Develop, test and refine prototypes as part of a cyclical design process.
- Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
- Create original works or responsibly repurpose or remix digital resources into new creations.

National Core Arts Standards

- Anchor Standard #1. Generate and conceptualize artistic ideas and work.
- Anchor Standard #2. Organize and develop artistic ideas and work.
- Anchor Standard #3. Refine and complete artistic work.

National Standards in Gifted and Talented Education

- **1.1. Self-Understanding.** Students with gifts and talents recognize their interests, strengths, and needs in cognitive, creative, social, emotional, and psychological areas.

★ https://usergeneratededucation.wordpress.com/2022/10/31/dia-de-los-muertos-halloween-displays-a-meow-wolf-ish-stream-project/
★ https://usergeneratededucation.wordpress.com/2022/12/12/winter-holiday-display-a-great-stream-project/

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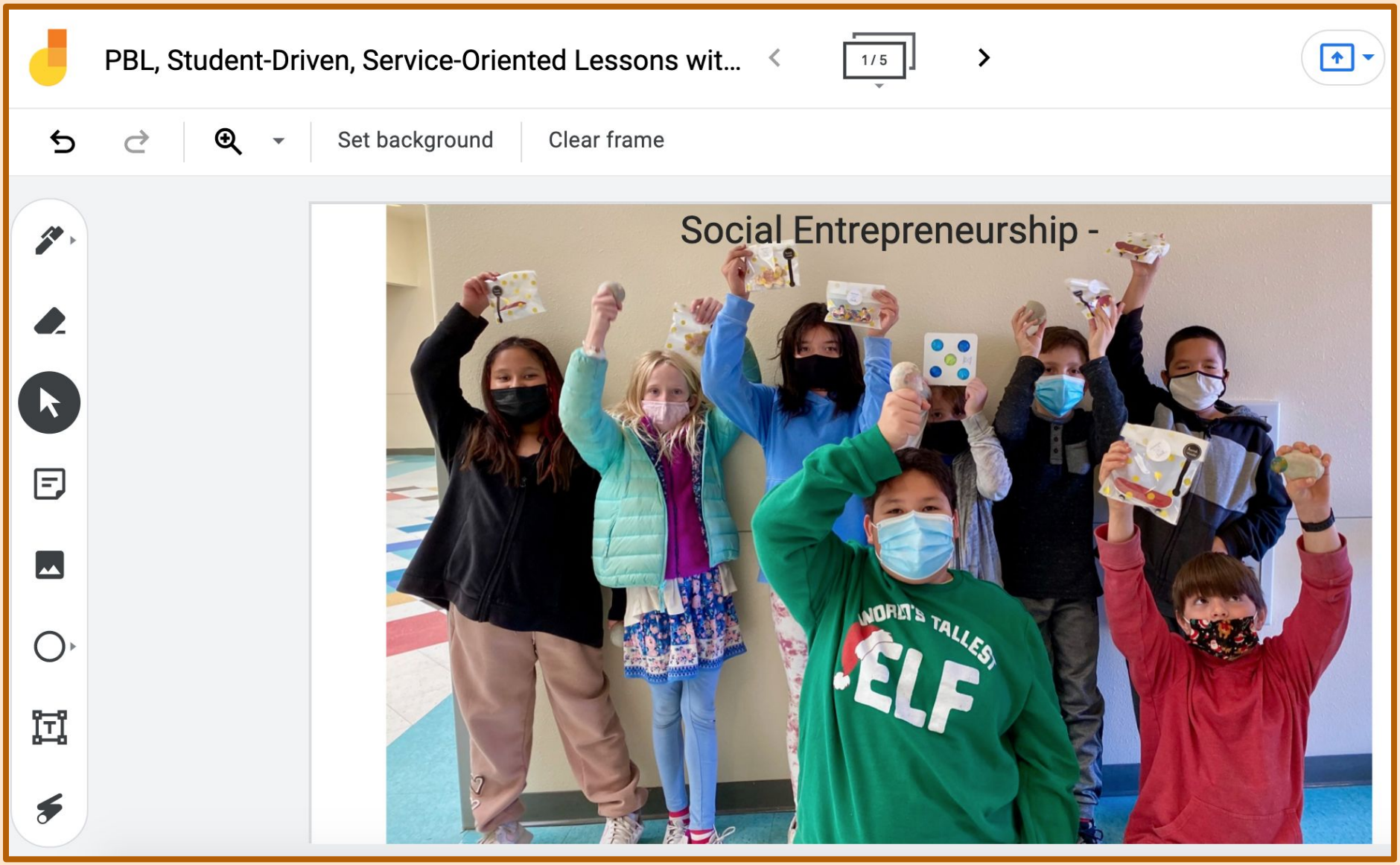

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Marble Runs

https://usergeneratededucation.wordpress.com/2022/04/09/a-stem-driven-marble-run-using-instructables-and-tinkercad/

Marble Runs

Standards Addressed

Next Generation Science Standards (Science and Engineering)

- Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved (https://www.nextgenscience.org/topic-arrangement/msengineering-design).

ISTE Standards for Students (Technology Standards)

Innovative Designer Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:

- 1.4.a. know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- 1.4.b. select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
- 1.4.c. develop, test and refine prototypes as part of a cyclical design process.
- 1.4.d. exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems. (https://www.iste.org/standards/iste-standards-for-students)

Common Core Math Standards

- Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

https://usergeneratededucation.wordpress.com/2022/04/09/a-stem-driven-marble-run-using-instructables-and-tinkercad/

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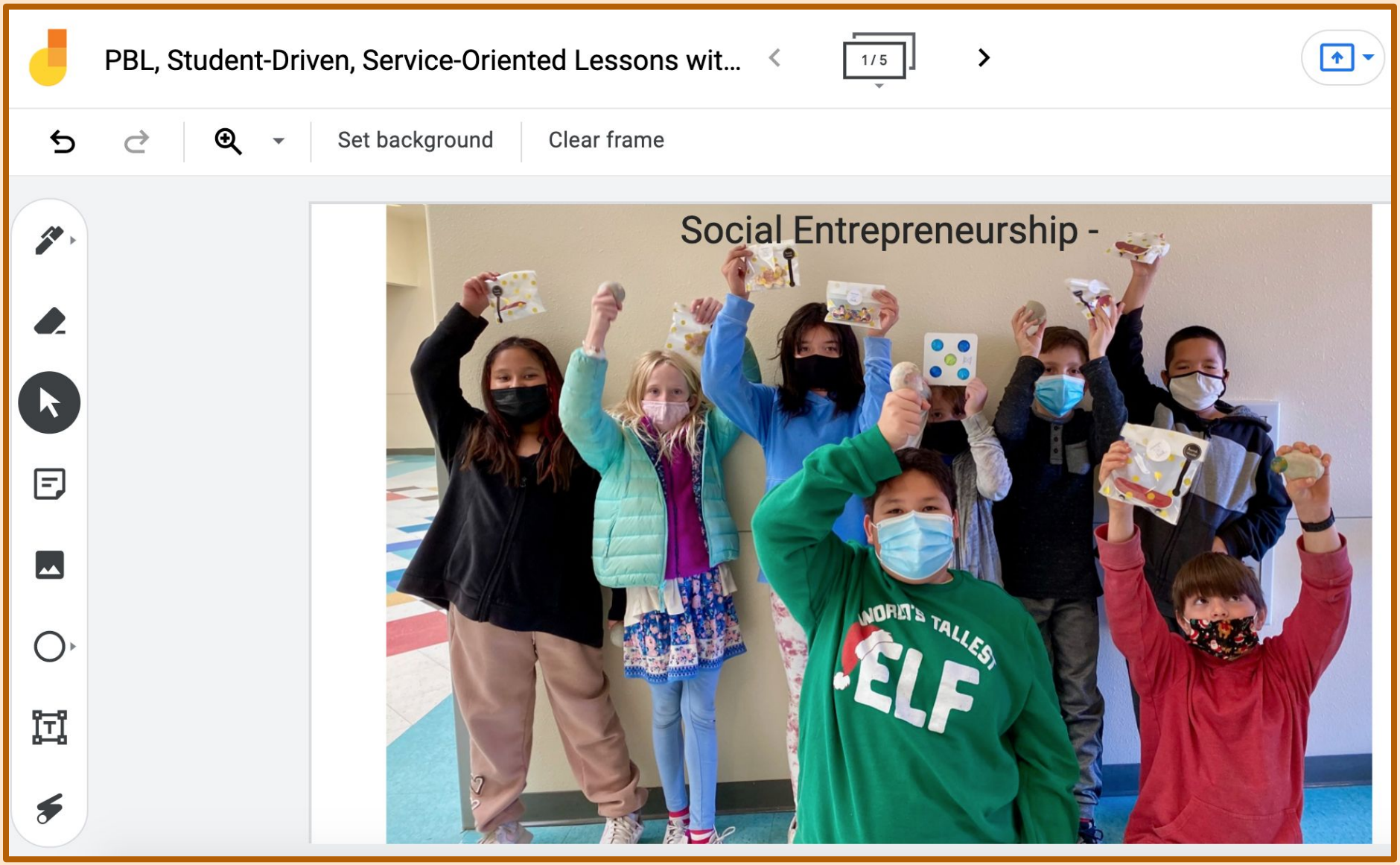

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Space Exploration, Sci-Fi Writing, Shadow Puppet Shows (2nd-3rd Graders)

https://usergeneratededucation.wordpress.com/2023/03/13/space-explorations-science-fiction-writing-shadow-puppet-shows-an-interdisciplinary-unit/

Space Exploration, Sci-Fi Writing, Shadow Puppet Shows (2nd-3rd Graders)

Standards Addressed

Next Generation Science Standards

- **ETS1.C:** Optimizing The Design Solution – Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.
- **ETS1.B:** Developing Possible Solutions

Science and Engineering Practices

- Asking questions and defining problems
- Developing and using models
- Constructing explanations and designing solutions
- Obtaining, evaluating, and communicating information

ELA Anchor Standards

1. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. (Writing Anchor 2)
2. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. (Writing Anchor 7)
3. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning...(Speaking/ Listening Anchor 4)
4. Make strategic use of visual displays to express information and enhance understanding of presentations. (Speaking/ listening Anchor 5)
5. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. (Reading Anchor 7) (source: https://www.artsintegration.net/shadow-puppets.html)

https://usergeneratededucation.wordpress.com/2023/03/13/space-explorations-science-fiction-writing-shadow-puppet-shows-an-interdisciplinary-unit/

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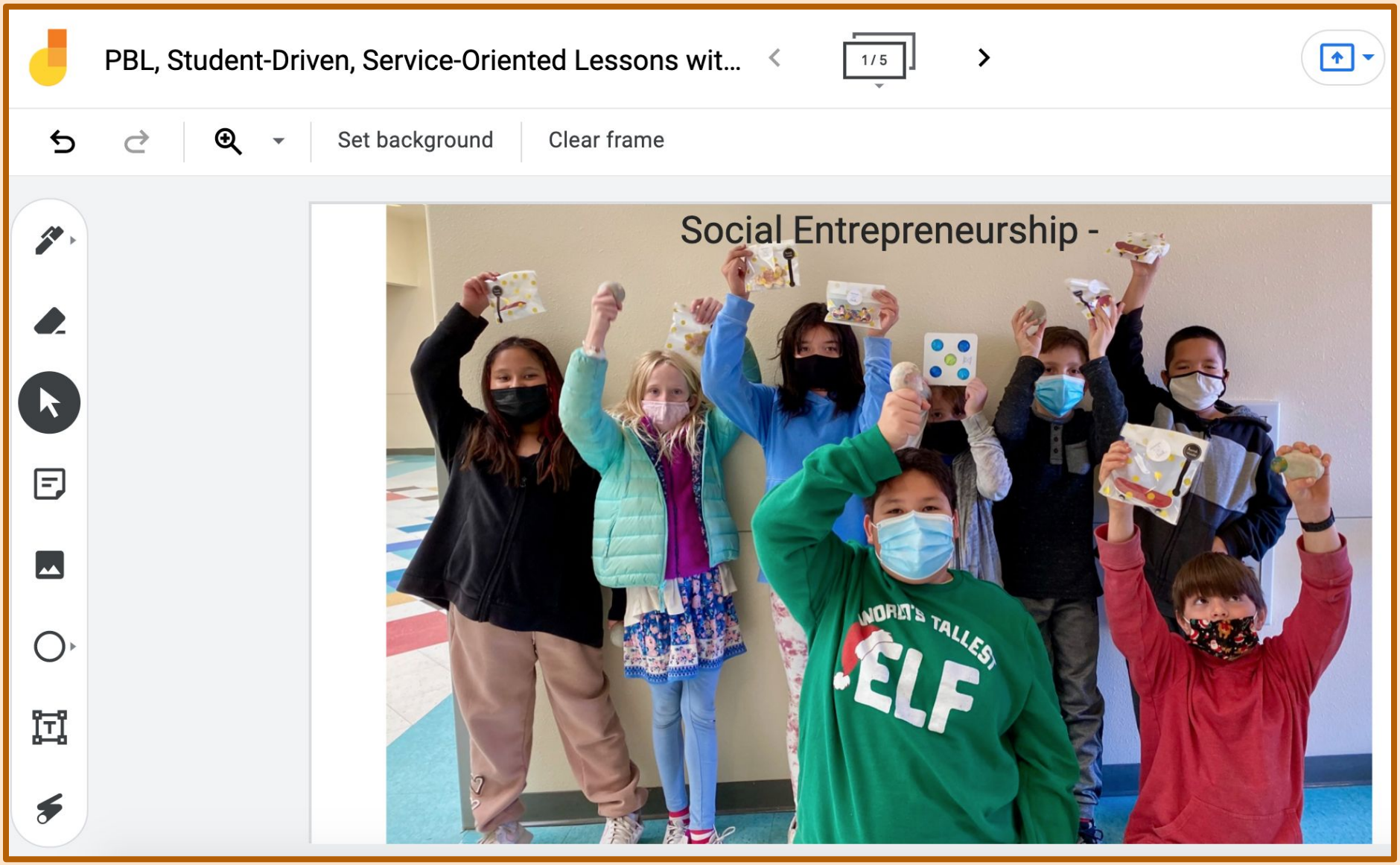

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Beartown Play (6th graders)

https://usergeneratededucation.wordpress.com/2023/05/22/the-beartown-play-a-play-written-enhanced-and-performed-by-6th-graders/

Beartown Play (6th graders)

Standards Addressed

Common Core State Standards – ELA

- Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.
  - Engage and orient the reader by establishing a context and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically.
  - Use narrative techniques, such as dialogue, pacing, and description, to develop experiences, events, and/or characters.

ISTE Standards for Students

- Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.
- Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals

NAGC Standards

- Students with gifts and talents demonstrate their potential or level of achievement in their domain(s) of talent and/or areas of interest.
- Students with gifts and talents demonstrate growth in personal competence and dispositions for exceptional academic and creative productivity. These include self-awareness, self-advocacy, self-efficacy, confidence, motivation, resilience, independence, curiosity, and risk taking.
- Students with gifts and talents develop competence in interpersonal and technical communication skills. They demonstrate advanced oral and written skills and creative expression. They display fluency with technologies that support effective communication and are competent consumers of media and technology.

https://usergeneratededucation.wordpress.com/2023/05/22/the-beartown-play-a-play-written-enhanced-and-performed-by-6th-graders/

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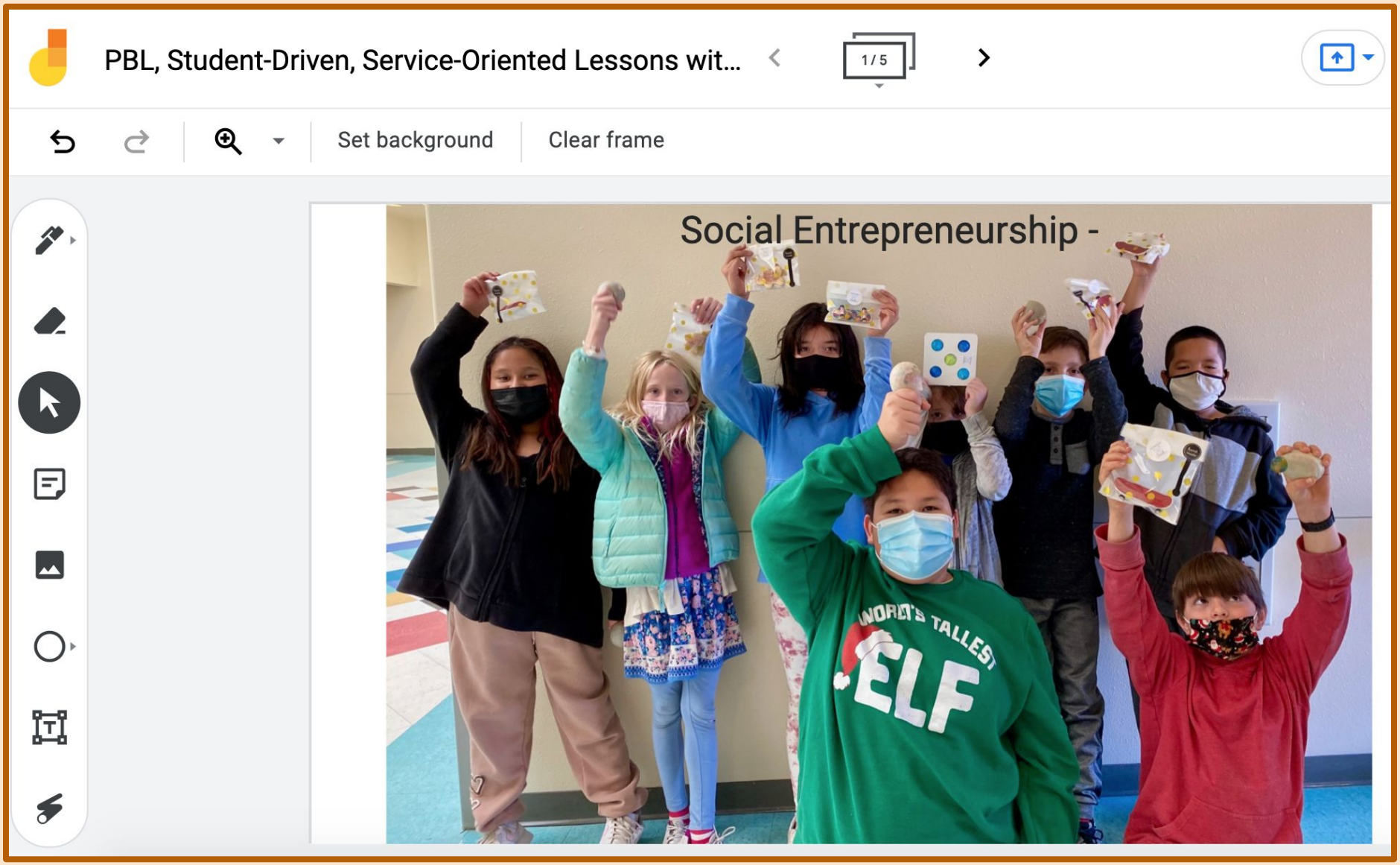

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Gardening

https://usergeneratededucation.wordpress.com/2023/03/05/gardening-program-with-sage-elementary-students/

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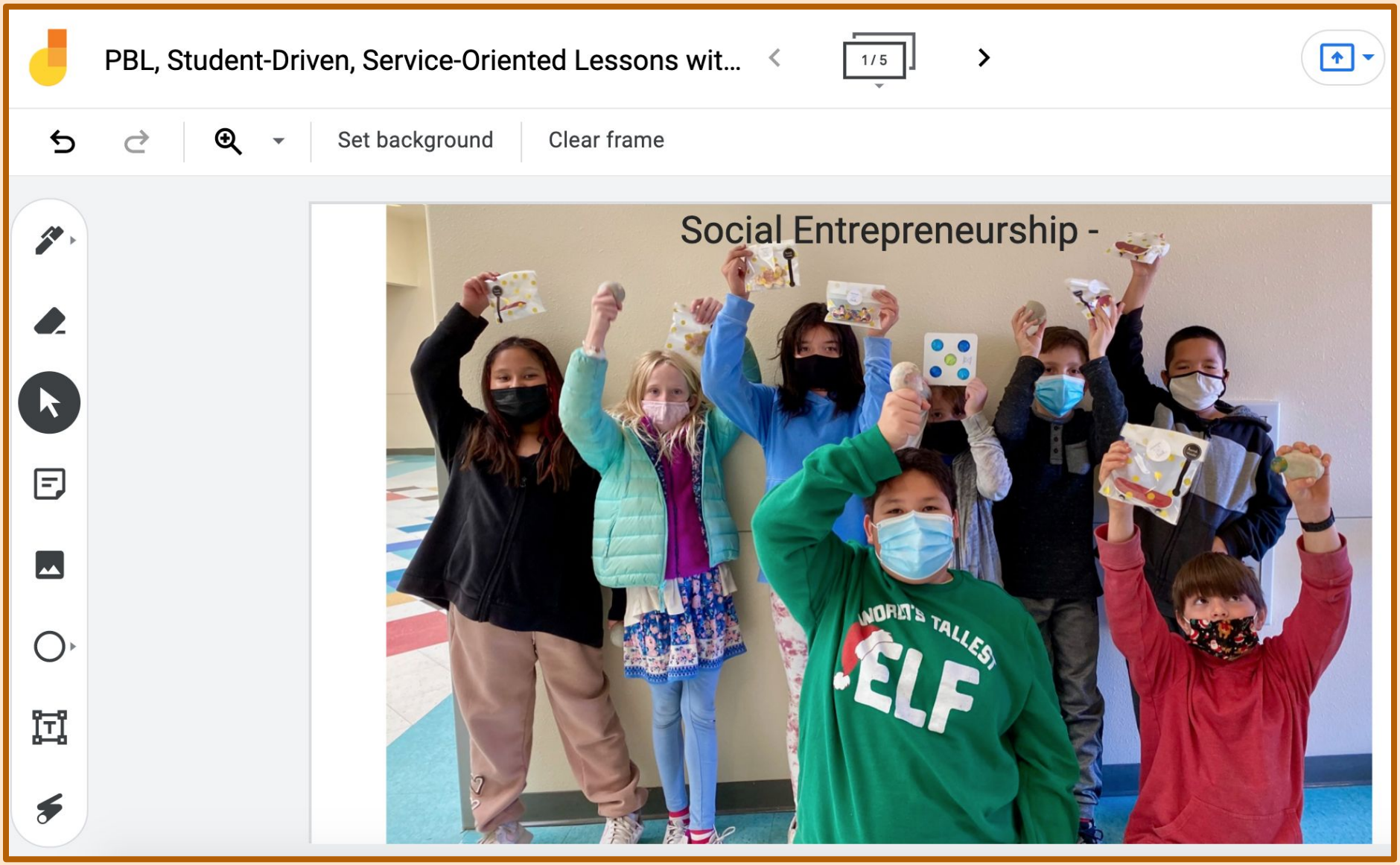

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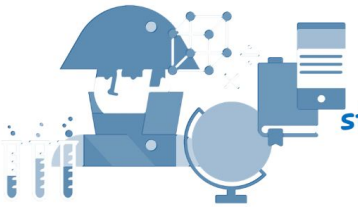
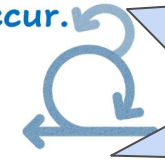


Interdisciplinary standards and skills are addressed.

Community of learners share ideas, ask for help, brainstorm.

Troubleshooting and iteration often occur.



In your classroom?

A state of flow emerges.

Authentic Learning

Learning is minds-on, hands-on activities.

Learners do not ask, "Why do I need to know this?"

Projects are long term not finished in one class period.

learning activities are open-ended. Learners put their "selves" into their projects.

The focus is on learners learning rather then teachers teaching.

Authentic Learning Experiences https://usergeneratededucation.wordpress.com/2019/01/20/authentic-learning-experiences/

Focus is on Process Rather Than Product

Open Ended Tasks Presented

Engagement of Mind, Body, and Heart Occurs

In your classroom?

Learner-Initiated, Directed, and Determined

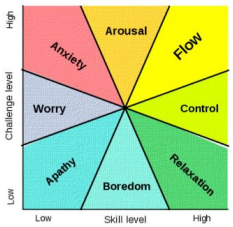
Characteristics of Experiential Minds-On/Hands-On Activities

Productive Struggles and Persistence

Learning Comes from Natural Consequences, Mistakes and Successes

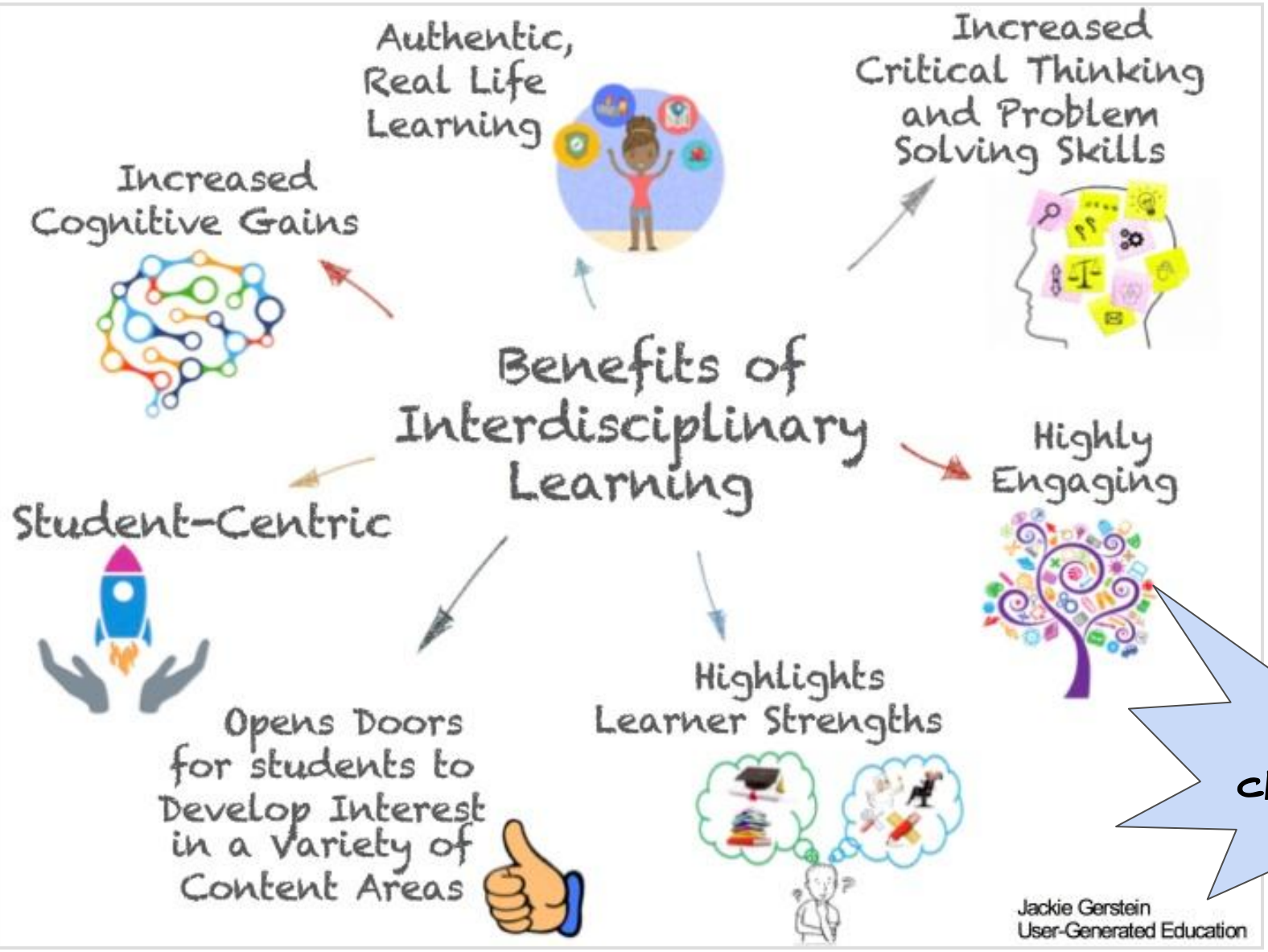
Increased Creativity and Innovation

State of Flow Results



Jackie Gerstein – User Generated Education

Increasing Engagement, Creativity, and Innovation with Minds-On/Hands-On Activities https://usergeneratededucation.wordpress.com/2021/02/09/increasing-engagement-creativity-and-innovation-with-minds-on-hands-on-activities/

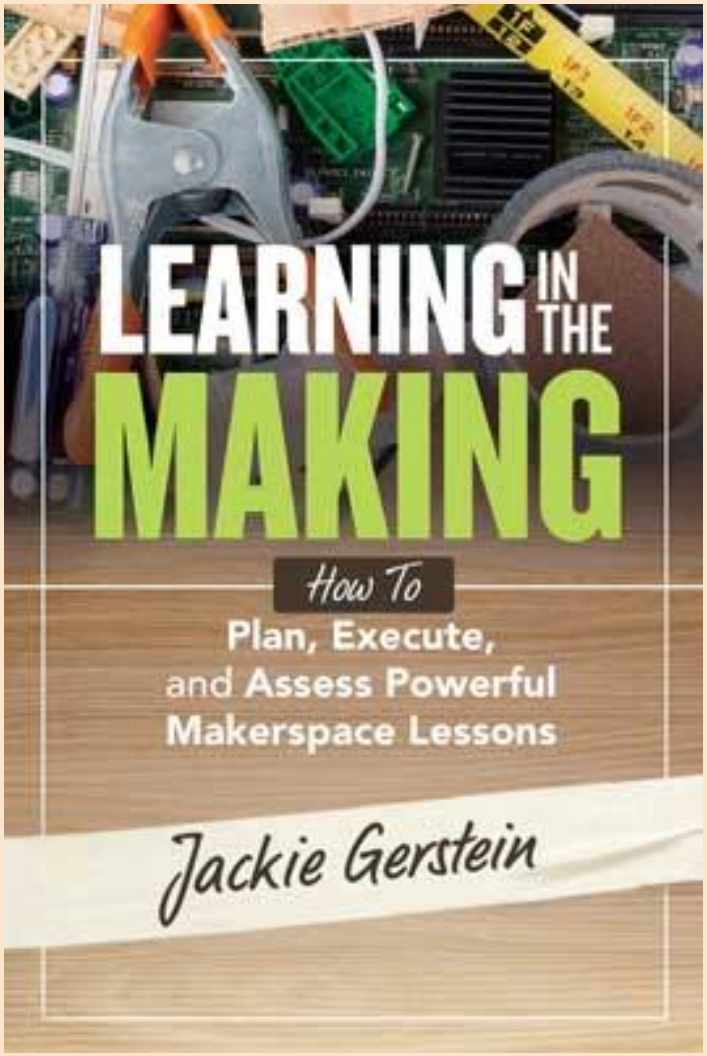


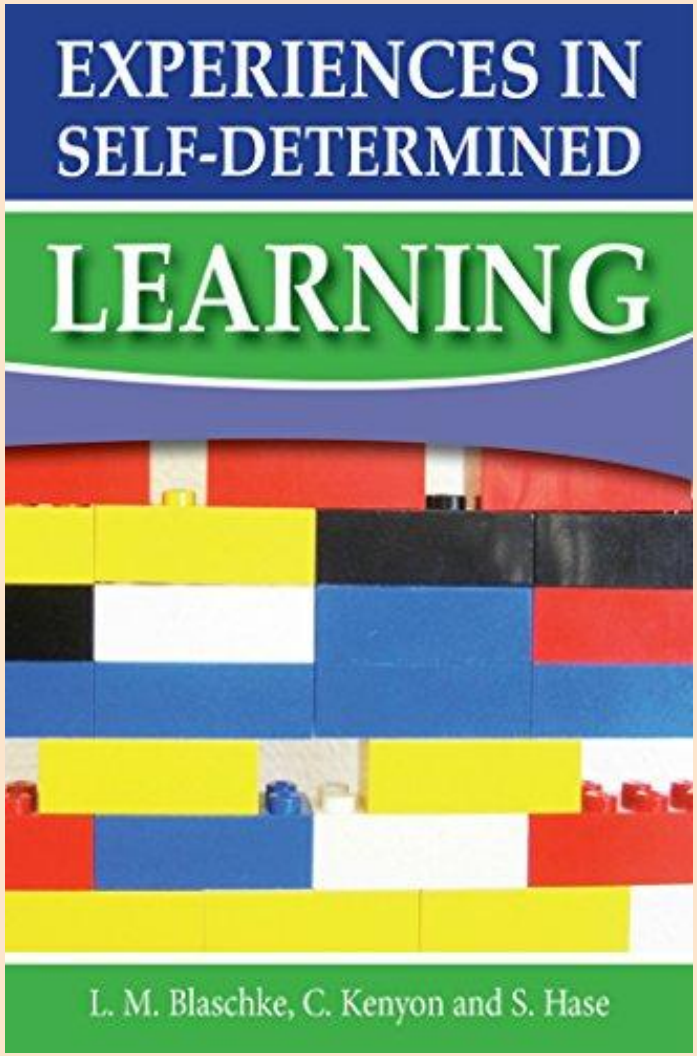
In your classroom?

All Lessons Should Be Interdisciplinary
https://usergeneratededucation.wordpress.com/2019/01/13/all-lessons-should-be-interdisciplinary

One Action Step?

Dr. Jackie Gerstein





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