AASL Standards-Based Learning

Project-Based Learning

for Elementary Grades

Maura Madigan

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AASL American Association of School Librarians
TRANSFORMING LEARNING

Maura Madigan is a school librarian in Fairfax County, Virginia, and the author of *Learning Centers for School Libraries* (ALA Editions, 2021), another AASL Standards-Based Learning series book. She's worked in education for more than twenty-five years in the United States, South Korea, Japan, and the United Arab Emirates.

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INTRODUCTION

Project-Based Learning for Elementary Grades was written for school librarians to use independently in the school library or collaboratively with classroom and other educators. If you're a classroom educator interested in facilitating these projects, I encourage you to talk to your school librarian about collaboration. School librarians have much to offer beyond resources and research skills lessons. Partnerships between a school librarian and classroom educator provide more enriching experiences for both the educators and learners.

HOW TO USE THIS BOOK

This book is divided into two parts. Part I provides background information about project-based learning (PBL) and tips to help your projects run smoothly. Part II includes fifteen versatile PBL projects that can be used with learners in grades K–6, as well as chapters on collaboration, virtual projects, and how to create your own projects.

It can be tempting to jump right in and flip to chapter 4, "PBL Projects," but resist that urge. Start by reading, or at least skimming, the chapters in part I even if you're a PBL expert. Chapter 1, "The Basics," defines PBL and discusses the benefits. This information might be helpful if you're trying to convince another educator to collaborate with you. Chapter 2, "Parts of a PBL Project," describes the essential parts of a PBL project, preparing you for what you'll find in each project. Chapter 3, "Logistics," lists things to consider before launching a project and provides helpful hints. You might want to revisit this section every once in a while.

The projects in chapter 4 are listed alphabetically. When deciding which project to use, you may want to look at table I.1, "PBL Projects and Standards," at the end of this introduction. This table lists all the projects, with their driving questions and pertinent AASL Standards and content-area standards.

Chapter 5, "Virtual Projects," provides tips on facilitating virtual and hybrid/concurrent projects. It also suggests ways to adapt in-person projects for use with virtual learning. If you'll be collaborating with another educator, chapter 6, "Collaborative Projects," will offer guidance. When you're ready to design some of your own

projects, chapter 7, "How to Create a PBL Project," gives you step-by-step directions and a PBL Project Planning Template (WS 7.1) to help.

AASL STANDARDS AND CONTENT-AREA STANDARDS

Specific Competencies from the *AASL Standards Framework for Learners* in AASL's *National School Library Standards for Learners, School Librarians, and School Libraries* (AASL 2018, 34–39) are listed with each project in chapter 4 and in table I.1, "PBL Projects and Standards," along with content-area standards. These Competencies are only suggestions. Feel free to focus on different AASL Standards and content-area standards or on more-specific state standards where those apply.

The Grow Domain of the *National School Library Standards* really comes into play with repeated practice and reflection, so try not to take the "one and done" approach. With each PBL project, learners gain more confidence and greater independence.

YOU'RE ON YOUR WAY

While you're here, take a look at the "PBL Projects and Standards" table and think about what project you'd like to start with. It's probably best to begin slowly, with just one project and grade level. Talk to your colleagues. Who might be interested in trying something new? Once you feel confident, branch out to form new collaborative relationships, perhaps facilitating a couple of projects during the same time frame. No matter where you begin, I hope that you enjoy these projects as much as your learners will.

REFERENCE

AASL American Association of School Librarians. 2018. *National School Library Standards for Learners, School Librarians, and School Libraries*. Chicago: ALA Editions.

TABLE I.1

PBL Projects and Standards

This table provides the driving question for each project and links applicable AASL Standards and content-area standards. This list is not meant to be exhaustive. Only the most pertinent standards appear.

The following content-area standards sets have been used:

Art: National Core Arts Standards[1]

English/Language Arts (ELA): NCTE/IRA Standards for the English Language Arts[2]

Mathematics: NCTM Principles and Standards for School Mathematics[3]

Music: 2014 Music Standards (PK–8 General Music)[4]

Physical Education: National Standards for K–12 Physical Education[5]

Science: Next Generation Science Standards (NGSS)[6]

Social Studies: C3 Framework for Social Studies Standards[7]

Technology: ISTE Standards for Students[8]

PBL Projects	AASL Standards Framework for Learners[9]	Content-Area Standards
Animal Habitats How can your team of exhibit designers create a model for a museum exhibit that features a habitat and a new animal adapted to life in that habitat? Page 23	**I.B.3. (Inquire/Create):** Learners engage with new knowledge by following a process that includes generating products that illustrate learning. **I.C.4. (Inquire/Share):** Learners adapt, communicate, and exchange learning products with others in a cycle that includes sharing products with an authentic audience. **III.D.1. (Collaborate/Grow):** Learners actively participate with others in learning situations by actively contributing to group discussions. **V.B.1. (Explore/Create):** Learners construct new knowledge by problem solving through cycles of design, implementation, and reflection.	**ELA:** 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. **Science:** Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) **Technology:** Innovative Designer 1.4.d. Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

(cont'd)

TABLE I.1

PBL Projects and Standards (cont'd)

PBL Projects	AASL Standards Framework for Learners[9]	Content-Area Standards
Energy Source How can you, as part of the Department of Energy Management, select and promote a type of energy for your community? Page 33	**I.B.1. (Inquire/Create):** Learners engage with new knowledge by following a process that includes using evidence to investigate questions. **I.C.4. (Inquire/Share):** Learners adapt, communicate, and exchange learning products with others in a cycle that includes sharing products with an authentic audience. **II.B. (Include/Create):** Learners adjust their awareness of the global learning community by: 1. Interacting with learners who reflect a range of perspectives. 2. Evaluating a variety of perspectives during learning activities. 3. Representing diverse perspectives during learning activities.	**ELA:** 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. 12. Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information). **Science:** Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4) Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem. (5-ESS3-1) **Technology:** Creative Communicator 1.6.a. Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication. Global Collaborator 1.7.d. Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.

PBL Projects	AASL Standards Framework for Learners[9]	Content-Area Standards
Gingerbread Man Escape Challenge How can you, as an engineer, design a way for the Gingerbread Man to safely get from one shelf to the next? Page 42	**II.C. (Include/Share):** Learners exhibit empathy with and tolerance for diverse ideas by: 1. Engaging in informed conversation and active debate. 2. Contributing to discussions in which multiple viewpoints on a topic are expressed. **V.B. (Explore/Create):** Learners construct new knowledge by: 1. Problem solving through cycles of design, implementation, and reflection. 2. Persisting through self-directed pursuits by tinkering and making.	**ELA:** 3. Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound-letter correspondence, sentence structure, context, graphics). **Mathematics:** Measurement: Apply appropriate techniques, tools, and formulas to determine measurements. Number and Operations: Compute fluently and make reasonable estimates. Problem Solving: Solve problems that arise in mathematics and in other contexts. **Science:** Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) Apply scientific ideas to solve design problems. (4-PS3-4)

(cont'd)

TABLE I.1

PBL Projects and Standards (cont'd)

PBL Projects	AASL Standards Framework for Learners[9]	Content-Area Standards
History Game How can you, as an educational game designer, create a new game to teach history or social studies? Page 49	**I.B.3. (Inquire/Create):** Learners engage with new knowledge by following a process that includes generating products that illustrate learning. **VI.C.2. (Engage/Share):** Learners responsibly, ethically, and legally share new information with a global community by disseminating new knowledge through means appropriate for the intended audience.	**ELA:** 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. 8. Students use a variety of technological and informational resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge. **Social Studies:** D2.His.10.K-2. Explain how historical sources can be used to study the past. (Additional state and C3 standards will apply depending on content.) **Technology:** Innovative Designer 1.4.d. Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems. Global Collaborator 1.7.c. Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
Just Read! How can you, as a literacy expert, encourage learners to read more and love reading? Page 59	**III.B.1. (Collaborate/Create):** Learners participate in personal, social, and intellectual networks by using a variety of communication tools and resources. **V.C.3. (Explore/Share):** Learners engage with the learning community by collaboratively identifying innovative solutions to a challenge or problem.	**ELA:** 5. Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes. 12. Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information). **Technology:** Global Collaborator 1.7.a. Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning. Global Collaborator 1.7.c. Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

PBL Projects	AASL Standards Framework for Learners[9]	Content-Area Standards
Make Some Music How can you, as a musical instrument builder, create an instrument from recycled materials? Page 66	**III.C.1. (Collaborate/Share):** Learners work productively with others to solve problems by soliciting and responding to feedback from others. **V.B. (Explore/Create):** Learners construct new knowledge by: 1. Problem solving through cycles of design, implementation, and reflection. 2. Persisting through self-directed pursuits by tinkering and making.	**Art:** Anchor Standard 1. Generate and conceptualize artistic ideas and work. Anchor Standard 3. Refine and complete artistic work. **ELA:** 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. **Music:** MU:Cr1.1.2a Improvise rhythmic and melodic patterns and musical ideas for a specific purpose.
Math Museum How can you, as a museum specialist, design an exhibit for the new Math Museum? Page 74	**I.A.2. (Inquire/Think):** Learners display curiosity and initiative by recalling prior and background knowledge as context for new meaning. **V.B. (Explore/Create):** Learners construct new knowledge by: 1. Problem solving through cycles of design, implementation, and reflection. 2. Persisting through self-directed pursuits by tinkering and making.	**Art:** Anchor Standard 1. Generate and conceptualize artistic ideas and work. Anchor Standard 3. Refine and complete artistic work. Anchor Standard 6. Convey meaning through the presentation of artistic work. **Mathematics:** Problem Solving: Build new mathematical knowledge through problem solving. Communication: Organize and consolidate their mathematical thinking through communication. Connections: Recognize and apply mathematics in contexts outside of mathematics. **Technology:** Innovative Designer 1.4.d. Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

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TABLE I.1

PBL Projects and Standards (cont'd)

PBL Projects	AASL Standards Framework for Learners[9]	Content-Area Standards
National Sport How can you, as part of the President's Council on Sports, Fitness, and Nutrition, create a new national sport that combines the features of other sports? Page 80	**I.A.2. (Inquire/Think):** Learners display curiosity and initiative by recalling prior and background knowledge as context for new meaning. **III.D.1. (Collaborate/Grow):** Learners actively participate with others in learning situations by actively contributing to group discussions. **V.B.1. (Explore/Create):** Learners construct new knowledge by problem solving through cycles of design, implementation, and reflection.	**ELA:** 8. Students use a variety of technological and informational resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge. 12. Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information). **Physical Education:** Standard 2. The physically literate individual applies knowledge of concepts, principles, strategies and tactics related to movement and performance. Standard 5. The physically literate individual recognizes the value of physical activity for health, enjoyment, challenge, self-expression and/or social interaction.
Natural Disaster Survival How can you, as part of the Federal Emergency Management Agency (FEMA), create a product or idea to protect people and property from natural disasters? Page 91	**I.C. (Inquire/Share):** Learners adapt, communicate, and exchange learning products with others in a cycle that includes: 2. Providing constructive feedback. 3. Acting on feedback to improve. 4. Sharing products with an authentic audience. **IV.A. (Curate/Think):** Learners act on an information need by: 2. Identifying possible sources of information. 3. Making critical choices about information sources to use. **V.B.1. (Explore/Create):** Learners construct new knowledge by problem solving through cycles of design, implementation, and reflection.	**ELA:** 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. **Science:** Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3) Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) **Technology:** Innovative Designer 1.4.d. Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

PBL Projects	AASL Standards Framework for Learners[9]	Content-Area Standards
New Holiday How can you, as part of a presidential committee, create a new holiday? Page 99	**I.D.3. (Inquire/Grow):** Learners participate in an ongoing inquiry-based process by enacting new understanding through real-world connections. **II.A.3. (Include/Think):** Learners contribute a balanced perspective when participating in a learning community by describing their understanding of cultural relevancy and placement within the global learning community. **IV.B.1. (Curate/Create):** Learners gather information appropriate to the task by seeking a variety of sources.	**Art:** Anchor Standard 1. Generate and conceptualize artistic ideas and work. Anchor Standard 6. Convey meaning through the presentation of artistic work. **ELA:** 4. Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes. 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. **Social Studies:** D2.Civ.3.3-5. Examine the origins and purposes of rules, laws, and key U.S. constitutional provisions. D4.3.3-5. Present a summary of arguments and explanations to others outside the classroom using print and oral technologies (e.g., posters, essays, letters, debates, speeches, and reports) and digital technologies (e.g., Internet, social media, and digital documentary).
Playground Designer How can your team of landscape architects design a new playground that includes shapes and simple machines? Page 108	**III.B.2. (Collaborate/Create):** Learners participate in personal, social, and intellectual networks by establishing connections with other learners to build on their own prior knowledge and create new knowledge. **V.B. (Explore/Create):** Learners construct new knowledge by: 1. Problem solving through cycles of design, implementation, and reflection. 2. Persisting through self-directed pursuits by tinkering and making.	**Art:** Anchor Standard 1. Generate and conceptualize artistic ideas and work. **Mathematics:** Connections: Recognize and apply mathematics in contexts outside of mathematics. Geometry: Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships. **Science:** Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2)

(cont'd)

TABLE I.1

PBL Projects and Standards (cont'd)

PBL Projects	AASL Standards Framework for Learners[9]	Content-Area Standards
Please Vote How can you, as a historian, create a political campaign advertisement for a historical candidate? Page 118	**V.A. (Explore/Think):** Learners develop and satisfy personal curiosity by: 1. Reading widely and deeply in multiple formats and write and create for a variety of purposes. 2. Reflecting and questioning assumptions and possible misconceptions. 3. Engaging in inquiry-based processes for personal growth. **VI.B. (Engage/Create):** Learners use valid information and reasoned conclusions to make ethical decisions in the creation of knowledge by: 1. Ethically using and reproducing others' work. 2. Acknowledging authorship and demonstrating respect for the intellectual property of others.	**ELA:** 6. Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and nonprint texts. **Social Studies:** D2.His.3.3-5. Generate questions about individuals and groups who have shaped significant historical changes and continuities. D2.His.16.3-5. Use evidence to develop a claim about the past. D4.3.3-5. Present a summary of arguments and explanations to others outside the classroom using print and oral technologies (e.g., posters, essays, letters, debates, speeches, and reports) and digital technologies (e.g., Internet, social media, and digital documentary). **Technology:** Knowledge Constructor 1.3.a. Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits. Knowledge Constructor 1.3.c. Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

PBL Projects	AASL Standards Framework for Learners[9]	Content-Area Standards
Space House How can you, as an aerospace engineer, design a house or living community that can be launched into space for NASA? Page 125	**I.A. (Inquire/Think):** Learners display curiosity and initiative by: 1. Formulating questions about a personal interest or a curricular topic. 2. Recalling prior and background knowledge as context for new meaning. **V.B.1. (Explore/Create):** Learners construct new knowledge by problem solving through cycles of design, implementation, and reflection.	**ELA:** 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. **Science:** Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3) Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution. (4-PS4-3, 4-ESS3-2) **Technology:** Knowledge Constructor 1.3.d. Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions. Innovative Designer 1.4.b. Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

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TABLE I.1

PBL Projects and Standards (cont'd)

PBL Projects	AASL Standards Framework for Learners[9]	Content-Area Standards
Upcycled Fashions How can you, as a fashion designer, help the environment by using discarded or recycled materials in your designs? Page 132	**I.C. (Inquire/Share):** Learners adapt, communicate, and exchange learning products with others in a cycle that includes: 2. Providing constructive feedback. 3. Acting on feedback to improve. 4. Sharing products with an authentic audience. **V.B. (Explore/Create):** Learners construct new knowledge by: 1. Problem solving through cycles of design, implementation, and reflection. 2. Persisting through self-directed pursuits by tinkering and making. **VI.A. (Engage/Think):** Learners follow ethical and legal guidelines for gathering and using information by: 1. Responsibly applying information, technology, and media to learning. 2. Understanding the ethical use of information, technology, and media.	**Art:** Anchor Standard 1. Generate and conceptualize artistic ideas and work. Anchor Standard 3. Refine and complete artistic work. Anchor Standard 6. Convey meaning through the presentation of artistic work. **ELA:** 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. **Science:** Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem. (5-ESS3-1; see also 3-ESS2-2, 4-ESS3-1)

PBL Projects	AASL Standards Framework for Learners[9]	Content-Area Standards
Water Bottle Innovation How can you, as an industrial designer, create a new product or innovate an existing one from plastic water bottles? Page 138	**I.A.1. (Inquire/Think):** Learners display curiosity and initiative by formulating questions about a personal interest or a curricular topic. **V.B. (Explore/Create):** Learners construct new knowledge by: 1. Problem solving through cycles of design, implementation, and reflection. 2 Persisting through self-directed pursuits by tinkering and making. **V.D. (Explore/Grow):** Learners develop through experience and reflection by: 1. Iteratively responding to challenges. 2. Recognizing capabilities and skills that can be developed, improved, and expanded. 3. Open-mindedly accepting feedback for positive and constructive growth.	**ELA:** 7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience. **Science:** Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) **Technology:** Innovative Designer 1.4.c. Students develop, test and refine prototypes as part of a cyclical design process. Innovative Designer 1.4.d. Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems. Global Collaborator 1.7.d. Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.

NOTES

1. NCCAS National Coalition for Core Arts Standards. *National Core Arts Standards: A Conceptual Framework for Arts Learning*. www.nationalartsstandards.org/sites/default/files/NCCAS%20%20Conceptual%20Framework_0.pdf.
2. NCTE/IRA National Council of Teachers of English and the International Reading Association. 1996. *Standards for the English Language Arts*. https://cdn.ncte.org/nctefiles/resources/books/sample/standardsdoc.pdf.
3. NCTM National Council of Teachers of Mathematics. 2000. *Principles and Standards for School Mathematics*. Reston, VA: NCTM. www.nctm.org/standards.
4. NAfME National Association for Music Education. 2014. *2014 Music Standards (PK–8 General Music)*. Reston, VA: NAfME. https://nafme.org/my-classroom/standards/core-music-standards/.
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6. National Research Council. 2013. *Next Generation Science Standards: For States, By States*. Washington, DC: National Academies Press. www.nextgenscience.org.
7. NCSS National Council for the Social Studies. n.d. *College, Career, and Civic Life (C3) Framework for Social Studies State Standards: Guidance for Enhancing the Rigor of K–12 Civics, Economics, Geography, and History*. www.socialstudies.org/sites/default/files/2017/Jun/c3-framework-for-social-studies-rev0617.pdf.
8. ISTE International Society for Technology in Education. 2016. *ISTE Standards: Students*. www.iste.org/standards/iste-standards-for-students.
9. AASL American Association of School Librarians. 2018. *AASL Standards Framework for Learners*. Chicago: ALA Editions. https://standards.aasl.org/wp-content/uploads/2017/11/AASL-Standards-Framework-for-Learners-pamphlet.pdf.

Part I

CHAPTER 1

PBL Basics

"Education is not the filling of a bucket, but the lighting of a fire." These words are spoken at graduations and conferences, printed on posters and coffee mugs, all meant to inspire. Yeats is often credited with this poetic quote, but his authorship is difficult to prove (Strong 2013). It doesn't really matter. The meaning clearly resonates with many. Learning isn't a passive act that is finished when one's brain is full of facts. Instead, education is the spark or catalyst for further learning and action. Facts may be forgotten, but skills can be mastered for life. Project-based learning (PBL) lights the fire.

WHAT IS PBL?

PBL is a type of experiential learning in which learners take an active role in their education. They learn by doing. Projects start with a question or real-world problem to guide research and exploration. Learners usually work in small groups to find solutions, create products, and present their projects to an audience. The emphasis is on the process rather than the product, with students learning as much from their mistakes as their successes.

The essential parts of PBL projects—entry event, driving question, learner choice, inquiry, product creation, feedback and revision, authentic audience, presentation, and reflection—are discussed in greater detail in chapter 2. PBL projects offer numerous benefits as listed in the following subsection.

Benefits

This type of hands-on learning offers natural differentiation and caters to multiple learning styles. Project-based learning:

- Empowers learners
- Builds resiliency
- Fosters independence
- Engages learners
- Targets multiple standards
- Introduces different career options
- Builds creative and critical thinking and collaboration skills

Problem-based learning, also called PBL, is a subset of project-based learning. The main difference is that problem-based learning projects usually end with the solution. This book focuses on project-based learning projects, which tend to be longer, with groups going on to create and present their products.

WHY DOES PBL BELONG IN THE SCHOOL LIBRARY?

PBL projects are an engaging and efficient way to focus on the *AASL Standards Framework for Learners* in the *National School Library Standards*. Most projects could address all six Shared Foundations. Because it's difficult to target all the AASL Standards at once, only a few suggested standards are listed with each project.

PBL doesn't just target learner standards. It also appears in the Curate Shared Foundation of the *AASL Standards Framework for School Libraries*: "The school library provides problem-based learning experiences and environments by: (1) using resources and technology to foster inquiry and scaffold mastery of skills necessary for learning to progress" and (3) "focusing on the effective use of a wide range of resources to foster information skills appropriate to content areas" (AASL 2018, School Library IV.A.1., IV.A.3.). By offering PBL projects, you'll be meeting learner, school librarian, and school library standards.

PBL, school libraries, and inquiry go hand in hand in hand. Inquiry and research skills could arguably be the essence of school library instruction. Learners need to master certain skills for academic and future success.

So research is important, but it's not the only reason you should consider PBL. Just as school librarians play many roles, school libraries serve multiple purposes. They're often called the heart of the school, a place where everyone belongs. For many learners, the school library is a safe haven where they can explore without fear of failure. PBL challenges learners in new ways, so a positive environment is important.

Access—to learners and resources—is also important. Elementary school librarians on fixed schedules see learners regularly for lessons. They're able to facilitate PBL for all learners, ensuring equitable access to these valuable learning experiences. School librarians with flexible schedules can collaborate with classroom educators (read more on this in chapter 6, "Collaborative Projects"). Resources, such as books and possibly makerspace materials and tools, make the school library an ideal location for PBL.

The interdisciplinary nature of PBL projects also makes them well suited to school library instruction, which isn't subject-specific. School librarians teach skills, not content, which provides enormous freedom. They have the flexibility to collaborate with any educator, on any subject, at any time, or they can choose to facilitate PBL projects on their own. School librarians don't often have the same constraints as classroom educators, such as grading and following a pacing guide.

This freedom can be shared with learners who can explore new ideas and work at their own pace. Classroom educators often have to stop a lesson or project prematurely because they need to move on to the next unit. Most school librarians don't have to adhere to these guidelines. Projects can be expanded and extended to include teachable moments. They can embrace the organic nature of inquiry, which doesn't always fit neatly into a time line.

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