**Project-based Learning**

In project-based learning (PBL), academic knowledge and skills are taught to students in the context of carefully planned, interdisciplinary tasks that center around complex, real-world problems. Over the course of a project, students apply standards-based content knowledge across multiple disciplines and hone critical thinking, communication, and collaboration skills.

A well-designed project has several key design elements. First, projects should be designed around an essential question that provides an authentic learning experience for students. Where appropriate, students should be given choice in the project’s design, topic, or research approach. In most projects, there is a cycle of reflection, feedback, and revision that culminates in a publicly presented work product.¹

Throughout the project, teachers help students make decisions about the nature of the project, guide their learning and progress, and offer feedback to shape the final product.

PBL can be implemented in a variety of ways. Some projects span the course of a year, while others are modular. Content may be taught in traditional disciplines (math, ELA, etc.) or as interdisciplinary courses. While the model of implementation may vary, effectively facilitated project-based learning has common structures and resource implications to support a high-quality project design.

*Note: PBL is a major departure from traditional instructional approaches and requires strong foundational structures to be in place, particularly around school culture and teacher teaming practices. For this reason, schools in the beginning stages of reform or improvement may need to lay the groundwork for those structures before embarking on a PBL model.*

---

Rationale:

PBL has been well researched as an effective model for improving student learning. Students in well-designed project-based learning models demonstrate higher performance on assessments of college and career readiness, compared to students in traditional models. This is in part because students in PBL are given opportunities to apply reading, writing, and analytical skills across subjects to reinforce learning.

In addition, PBL connects students’ experiences in school directly to the real world, allowing them to explore potential careers, enabling them to confront issues and challenges relevant to their local communities, and empowering them as problem-solvers. When students find academic content relevant to their lives and communities, they are more likely to sustain interest and persist through learning challenges.

Finally, PBL helps students gain important 21st-century skills such as teamwork, collaboration, and critical thinking, which have become even more important with the adoption of college- and career-ready standards.

KEY COMPONENTS FOR SUCCESSFUL IMPLEMENTATION

Key components to support a project-based learning model include:

1. Curriculum and assessments that support teachers in designing rigorous interdisciplinary project units and allow them to assess students’ knowledge and skill development
2. Interdisciplinary teacher teaming to support high-quality project design and coordinate student learning and needs
3. Professional development and training to support teachers in implementing project-based learning
4. Flexible class structures that enable students to receive timely and appropriate supports for their projects
5. A collaborative school culture that fosters student agency and high expectations for learning
District-Level Enabling Conditions

Districts looking to support schools in creating teacher leadership roles can:

1. Develop curriculum and assessments that teach and assess both content knowledge and skills, and can be flexibly paced to incorporate project work throughout the curriculum.

2. Allow flexibility in schedules, staffing, and class size so that schools can structure classrooms to facilitate interdisciplinary project-based learning. This may include creating longer blocks of time, early release/late start options, assigning interdisciplinary co-teaching pairs, and/or staffing multiple teachers to large class sizes.

3. Eliminate seat time course requirements to support out-of-school learning and alternatively structured courses.

Clarity purpose:

Project-based learning should be structured to meet the unique context of your school. Use your student and teacher data to identify their most pressing needs, and determine how PBL will help meet these needs and increase student outcomes.

- *Based on your students’ and teachers’ most pressing needs, what must project-based learning accomplish in your building? How will it align with your school’s stated priorities or goals?*

- *Which groups of students (e.g. grade spans or subject areas) will first be targeted for project-based learning? Over what span of time will the entire school implement it?*

- *What are one or two high-level goals that you might use to measure success annually? For example, if PBL intends to increase student engagement, a school could consider attendance rates or student survey results. Schools could also use proficiency data to measure student learning as a result of PBL.*

2. For more information, refer to ERS’ Building Block Profile on Co-Teaching
MAKING IT WORK: RESOURCE IMPLICATIONS

Implementing a project-based learning (PBL) model will have implications for people, time, money, and other resources in your school. Specific decisions to make during the planning process with regard to these implications are noted below, organized by the building block components listed above.

1. Curriculum and assessments that support teachers in designing rigorous interdisciplinary projects and allow them to assess students’ knowledge and skill development

In a traditional curriculum, units are designed to teach new concepts and assess mastery through various sequenced activities that often culminate in a project or unit exam. By contrast, in a project-based learning curriculum, the project is introduced at the beginning of a unit, and sets the context for the learning to follow. Content is taught in a variety of modes—traditional lectures, homework, and activities—but also in labs, while conducting research or simulations, or in other activities that teach content specific to the project’s tasks.³

For this reason, PBL curriculum must be designed to support learning standards and project-specific content, and must be aligned across content areas to ensure that content is taught in the right sequence for the project.

This alignment starts with identifying the project’s essential question. Good project questions offer students an opportunity to apply content knowledge to real-world challenges and practice critical 21st-century skills. For example, 11th graders at one PBL high school used DNA barcoding to develop forensic techniques to protect African wildlife.⁴ At another school, ninth graders conducted research and interviewed local community members to define courage and how it benefits humanity. In both project examples, students needed specific content across multiple disciplines to complete the project, and in a sequence that allowed them to progress through project tasks.

Once curriculum is aligned, schools must determine what assessments will best measure student success. In PBL, assessments serve two primary purposes. First, they provide valuable information to students to guide them through their project. Secondly, they inform teachers how to refine the project and target individual and whole-class supports. Assessments may include traditional, content-based assessments; performance-based tasks (such as labs or modeling exercises); and rubrics that assess project outcomes and skill development.

⁴ Example from Edutopia, found here: http://www.edutopia.org/project-based-learning-student-motivation
⁵ Example from Teach21, found here: http://wveis.k12.wv.us/teach21/public/project/Guide.cfm?upid=3298&tsele1=1&tsele2=109
There are several resources available for project-based learning curriculum and assessments; several are open source, but others may require purchasing materials and/or professional learning to support their use. If schools choose to develop projects, curriculum, and assessments internally, this work is typically done in the spring or summer preceding implementation, and may require providing stipends to teachers given the time commitment.

Key Questions:

- Will curriculum and/or assessments be developed in-house or purchased from a quality provider, and if so, at what cost?
- If they are to be developed in-house, who will be responsible for doing this work (including developing project essential questions, modifying existing scope and sequences to align with project units, and developing assessments that measure student learning and skill acquisition)?
- When will those people meet to complete this work (before/after school, over the summer, during collaborative planning time (CPT) and/or faculty meetings during the planning year, etc.)?
- Will you need to provide stipends to staff for completing this work? If so, how many teachers will be compensated and at what stipend amount?
- When will the new curriculum and assessments be rolled out to all staff?

2. Interdisciplinary teacher teaming to support high quality project design and coordinate student supports

In most PBL schools, interdisciplinary teams are responsible for designing projects and aligning them to the curriculum and assessments that provide support. This work, as referenced above, requires a large investment of time prior to the implementation of PBL.

Throughout the year, interdisciplinary teams continue to adjust curriculum based on project progress. They also analyze student work; discuss who will provide feedback, and in what ways, on different aspects of the project; and determine how to address student learning needs.

PBL also has implications for how teachers are assigned to roles within teams. Some schools may decide to maintain traditional teacher assignments (math, science, social studies, etc.) while others may choose to create interdisciplinary roles (a STEM/humanities teacher, etc.) that enable more integrated coursework and collaboration, such as co-teaching. Teacher assignment affects what teams need to meet, the content they need to meet about, and when and how often each team meets.

6. For more information, refer to ERS’ Building Block Profile on Co-Teaching
For example, interdisciplinary co-teaching teams need time together to co-plan lessons and look at student work, while teachers with traditional teacher assignments will need time both with interdisciplinary teams to co-plan integrated projects, and with their shared content teams\(^7\) to do collaborative lesson planning. Finally, how teacher roles and teams are structured affects expert support and professional learning opportunities that teachers may need to help them in their new roles.

**Key Questions:**

- **What is the work that teaching teams will be expected to do throughout the year (e.g., designing projects, developing curriculum and assessments, modifying existing materials, providing feedback to students on projects, etc.)?**
- **What types of teams will you need to create (interdisciplinary, shared content,\(^8\) or both) to do this work, and when will they meet throughout the year?**
- **Will teachers be assigned into interdisciplinary roles (such as STEM/humanities teachers) or maintain traditional single-discipline roles?**
- **Who will provide expert support and facilitation for teaching team meetings?**
- **If current internal expert support for teams is insufficient, will you hire expert support roles?**
- **At any point, will outside partners be leveraged for expert support, and at what cost?**

### 3. Professional development and training to support teachers in implementing project-based learning

PBL requires extensive training and planning for successful implementation. For teaching teams that have never done PBL, this includes training on quality project development, student facilitation techniques, effective interdisciplinary teaming practices, and classroom management support.

Schools should assess teacher need and capacity before implementation and determine who might be able to lead this work and who might need extra support and in what areas. Schools should also identify where external supports may be needed. Since this training typically happens over the course of the spring and summer preceding implementation, schools may need to set aside stipends for teachers and leaders of this work and/or time in the professional development calendar for the beginning of the year.

Teachers will also need support during the year as they implement PBL. In addition to expert-supported team meetings and curriculum/assessment modifications as described above, this includes ongoing professional learning, coaching, and regular feedback. If professional learning

---

\(^7\) For more information, refer to ERS’s Building Block Profile on Shared Content Teams.

\(^8\) For more information, refer to ERS’ Building Block Profile on Shared Content Teams.
needs are particularly high, schools may need to find additional time in the schedule, or pay teachers to come in before or after school. Finally, schools must determine their internal capacity to support teachers throughout the year, and if it is insufficient, they may need to hire additional coaches or seek outside professional development.

Key Questions:

• Based on teacher needs and capacity, and any new roles being developed, what types of professional learning opportunities do teachers need up front to support implementation?

• When will up-front professional learning take place (before/after school, over the summer, etc.)?

• Who will support or lead up-front professional learning?

• In addition to time during expert-supported team meetings, how much time will you devote to professional learning for project-based learning throughout the year?

• How will schedules need to change to support professional learning for PBL (including more time in the schedule, early release/late start schedules for long professional learning blocks, time during PD days, etc.)?

• Who will provide ongoing expert support for teachers? Are these people currently on your staff?

• If not, will you create new positions or repurpose existing positions (e.g., instructional coach role)?

• At any point, will outside professional development be leveraged, and at what cost?

4. Instructional needs will change during the course of a project unit, requiring flexibility in spaces used, the time allocated, and teachers available for classes.

For spaces, students may need access to large rooms for collaboration, computer labs for research, small rooms for teacher conferencing, or off-campus space for research.

Regarding time, students need time for direct instruction from their teachers, independent work, and group work, depending on the stage of the project. Some schools choose to organize long blocks of time to facilitate projects, including double-blocking or double periods in the regular schedule, rotating day or week schedules with additional time on certain days for projects, early-release and late-start options for students to work before or after school, or intercessions, where regular course schedules are paused for a week or more to provide condensed time for project work. Projects may also require additional, out-of-school learning experiences, including field trips, interviews with industry experts, or field-based research.
Finally, classes must be flexible to provide students the supports they need from different teachers, and in different group sizes as the project progresses. For example, students may need more help from a science teacher during the research phase of their project, but more time with their ELA teacher when writing the research report. Writing coaching may require small group sizes, while independent work can be done in very large groups. This type of flexibility can be enabled with a rotating or alternating schedule that includes different types of classes on different days or weeks (e.g., research classes in a technology lab, large group lectures, teacher conferencing schedules, etc.).

Key Questions:

- Will your school’s class structures require changes to facilities or technology (including changes to classroom size, creation of small-group space, installation of computer labs, or modular furniture)?
- How much time will students need to work on projects, and how will that time be organized?
- How will student schedules need to change to allow for long blocks of time or out-of-school learning for project work (including block scheduling, early release/late start, or intercessions)?
- What types of out-of-school learning will students have access to (including internships, field research, dual enrollment opportunities, or external advisors)?
- How will you organize teacher schedules to provide students the right supports from different types of teachers (through conferencing structures, office hours, or rotating schedules)?

5. A collaborative school culture

PBL is a student-centered instructional model, whereby students take on a high level of autonomy and responsibility for their own learning. On any typical day, students may be working collaboratively in teams, doing independent research in the back of a classroom, getting individual help from a teacher or advisor, or interning off-campus in support of a project.

To support this kind of working environment, schools should develop a set of values and norms that are shared by students and teachers and set mutually agreed-upon expectations for student learning. These can include expectations for working with peers, teachers, and outside partners; the respectful use of space and facilities; and clear processes and consequences when students violate established norms.

For more information on creating a culture of high expectations and student agency, and for guiding questions for implementation, see ERS’ Building Block Profile on Student Agency and a Culture of High Expectations.

For more information, refer to ERS’ Building Block Profile on Student Agency and a Culture of High Expectations.
Questions to guide planning for Student Agency/Culture of High Expectations can be found in the Building Block Profile.

**NEEDS ASSESSMENT**

- Based on your students’ and teachers’ most pressing needs, what must project-based learning accomplish in your building? How will it align with your school’s stated priorities or goals?
- Which groups of students (e.g. grade spans or subject areas) will first be targeted for project-based learning? Over what span of time will the entire school implement it?

**STRATEGY DEVELOPMENT**

- How will PBL support your school’s vision for the ideal student learning experience?
- Will curriculum and/or assessments be developed in-house or purchased from a quality provider, and if so, at what cost?
- If they are to be developed in-house, who will be responsible for doing this work (including developing project essential questions, modifying existing scope and sequences to align with project units, and developing assessments that measure student learning and skill acquisition)?
- When will those people meet to complete this work (before/after school, over the summer, during CPT and/or faculty meetings during the planning year, etc.)?
- What is the work that teaching teams will be expected to do throughout the year (e.g., designing projects, developing curriculum and assessments, modifying existing materials, providing feedback to students on projects, etc.)?

**MASTER SCHEDULE**

- What types of teams will you need to create (interdisciplinary, shared content, or both) to do this work, and when will they meet throughout the year?
- How will schedules need to change to support professional learning for PBL (including more time in the schedule, early release/late start schedules for long professional learning blocks, time during professional development days, etc.)?

---

10. For more information, refer to ERS’ Building Block Profile on Shared Content Teams.
• How much time will students need to work on projects, and how will that time be organized?

• How will student schedules need to change to allow for long blocks of time or out-of-school learning for project work (including block scheduling, early release/late start, or intercessions)?

• What types of out-of-school learning will students have access to (including internships, field research, dual enrollment opportunities, or external advisors)?

• How will you organize teacher schedules to provide students the right supports from different types of teachers (through conferencing structures, office hours, or rotating schedules)?

JOB AND TEACHER ASSIGNMENT

• Will teachers be assigned into interdisciplinary roles (such as STEM/humanities teachers) or maintain traditional single-discipline roles?

BUDGET AND STAFFING

• Will you need to provide stipends to staff for completing this work?

• At any point, will outside professional development be leveraged, and at what cost?

• Will your school’s class structures require changes to facilities or technology (including changes to classroom size, creation of small-group space, installation of computer labs, or modular furniture)?

• At any point, will outside partners be leveraged for expert support, and at what cost?

ANNUAL PROFESSIONAL LEARNING PLAN

• When will the new curriculum and assessments be rolled out to all staff?

• Based on teacher needs and capacity, and any new roles being developed, what types of professional learning opportunities do teachers need up front to support implementation?

• When will up-front professional learning take place (before/after school, over the summer, etc.)?

• Who will support or lead up-front professional learning?

• In addition to time during expert-supported team meetings, how much time will you devote to professional learning for project-based learning throughout the year?
STRATEGY IMPLEMENTATION AND MONITORING

• What are one or two high-level goals that you might use to measure success annually? For example, if PBL intends to increase student engagement, a school could consider attendance rates or student survey results. Schools could also use proficiency data to measure student learning as a result of PBL.

Note that implementing PBL represents a complex initiative, and this Building Block Profile has focused on the questions that have the most direct resource implications- not necessarily all possible questions or challenges that a school may need to consider in its planning for PBL. Please refer to the Additional Resources section below for more detailed information.

<table>
<thead>
<tr>
<th>POTENTIAL CHALLENGES</th>
<th>POTENTIAL SOLUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students struggle with group-work dynamics, including division of labor and conflict resolution.</td>
<td>Strong school values and routines should help guide all work that takes place in classrooms, and give students and teachers tools to use to solve problems quickly. Teachers may also need to take an active role in facilitating groups that require more support. In order to do so, teachers may need training themselves or access to other resources to support group work, particularly to evaluate individual contribution.</td>
</tr>
<tr>
<td>Schools may struggle to assess proficiency and award credit for out-of-school learning, while maintaining rigorous standards.</td>
<td>Rubrics aligned to the skills that students are expected to master over the course of the project can help make determining proficiency easier and more standardized. Trainings with partners who will be participating in out-of-school learning also help to standardized proficiency assessments. In some cases, schools may decide to assign a teacher to oversee the particular partnership and guide the grading process for partners.</td>
</tr>
</tbody>
</table>

Design Interactions

Strategic school designs have many interconnected components. Well-designed project-based learning should be integrated with the following domains:

• Expert-led Collaboration and Professional Learning
• Personalized Time and Attention
• Responsive Learning Community
Research


**Additional Resources**

Several organizations, including the Buck Institute for Education and Edutopia, publish resources for implementation and evaluation of project-based learning. There are also several school networks, such as New Tech Networks, Big Picture Schools, and Building21, that specialize in project-based learning and provide resources, example projects, and implementation guides for schools looking to implement PBL.

Several of those resources can be found below:

- [http://bie.org/blog/gold_standard_pbl_essential_project_design_elements](http://bie.org/blog/gold_standard_pbl_essential_project_design_elements)
- [http://www.edutopia.org/project-based-learning-guide](http://www.edutopia.org/project-based-learning-guide)
- [http://newtechnetwork.org/resources/](http://newtechnetwork.org/resources/)

Schools wanting to learn more about how to create schedules that enable project-based learning can refer to ERS’s scheduling module in the *School Designer* curriculum.
Advisory Through “Crew” Structure at The Springfield Renaissance School
SPRINGFIELD, MA

“Being together for so long, the people really get to know each other and everyone kind of has each other’s backs.”
—Sasha, a student at Springfield Renaissance

Context: Renaissance is a small, lottery school within Springfield Public Schools that serves children in grades 6–12 in Springfield, Massachusetts, where 78 percent of the school-age children live in poverty. Springfield Renaissance is part of a larger school network called EL Education (formerly Expeditionary Learning). Through EL, Springfield Renaissance focuses on rigor and high expectations, character education, service, leadership, and college preparation.

Purpose: Advisement in “crew,” the name for the student advisory structure of EL schools, is one of the key structural supports Springfield Renaissance adopted to achieve a rich and meaningful academic experience for every student and to meet its ambitious goal of 100 percent college acceptance rate.

MAKING IT WORK: RESOURCE IMPLICATIONS

Focusing resources deliberately around crew had resource implications for people, time, money, and other resources at The Springfield Renaissance School. These implications are noted below, organized by building block components.

1. Deliberate student and teacher assignment to advisory group, aligned to the program’s purpose(s) and ideally in ratios of 16:1 or less

- At Renaissance, all students are assigned to a grade-level crew. At the high school level, the crew classes have 16 students, in contrast to a typical ELA class of 25–30 students.
- When assigning 9th graders to crew, the guidance counselor collaborates with the students’ 8th grade teachers to ensure that the composition of students in the crew is diverse and balanced in terms of need and makeup.

• Teacher assignment largely depends on what experience balance is needed; however, Renaissance aims to have 12th grade advisors become 9th grade crew teachers the following year so they can stay with the same group of students for four years. In addition, although what content the teacher teaches is not taken into consideration during assignment of teachers to crew, Renaissance has found that it is helpful to have one person on a grade-level crew team who teaches the same grade level for communication purposes.

2. **A high-quality curriculum** to ensure advisory time is used well

• Crew is a credit-bearing class and its curriculum combines social-emotional development with academic goal setting. Most of the curriculum for crew was developed in-house with support from EL Education.

• Given that the model of crew at Renaissance comes from EL Education, the school has created a position for an EL Education lead teacher, whose primary responsibility is to maintain the crew curriculum.

3. **Dedicated time for advisory groups to meet**, matched to the curriculum and approach

• At Renaissance, crew meets daily during the first period for 30 minutes.

4. **Start-up professional learning opportunities** that prepare advisors to facilitate advisory effectively

• Teachers receive paid professional development over the summer and as part of their collaborative planning time throughout the year. New teachers get professional development specifically about crew before school starts.

5. **Clearly defined outcome measures and collaborative time** for advisors to track and monitor student progress, problem-solve, and review future advisory sessions

• Renaissance has adopted a crew teacher requirements checklist. The purpose of the checklist is for teachers to use as a reminder of important crew consistencies. Additionally, it is used by administrators and others to track and share feedback with crew teachers during a team-building meeting that takes place once a week. The checklist for effective crew implementation was developed in-house with support from EL Education.

• In SY 2015-16, crew teachers at Renaissance met in a cohort once a month for an hour. This meeting served as more planning time with some professional development embedded in it. Teachers spent the first half hour on academic intervention, math, homework, and conferencing.
LEARNING FROM IMPLEMENTATION

Crew at Renaissance has evolved since it launched in 2005 as Renaissance found it important to:

1. Give teachers the flexibility on lesson plans as long as they are aligned to the social and emotional learning objectives
2. Continue evolving the program’s content, accountability structure, and PD time based on feedback from students, teachers, and parents; and
3. Find space in unit plans for crew so that teachers can be reactive to social and world events that may affect students emotionally. In the event of a broad-scale news story or event at Renaissance, the crew structure allows a group of teachers to create a lesson plan and send it out to teachers to help students regain their emotional balance. Without this structure, crew conversations felt devoid of a connection to the outside world.

RESULTS

• 100% of students from classes of 2010, 2011, 2012, 2013, 2014, and 2015 applied and gained admission to a college or university
• An average of $2 to $3 million in grants and scholarships were awarded to each of the schools’ graduating classes

ARTIFACTS

The Springfield Renaissance School’s website: http://www.springfieldrennessanceschool.com/
The school website provides a multitude of information, including the student and family handbook, bell schedule, calendar, and details about the seven character traits at Renaissance.

WKCD focuses on providing compelling examples of what young people can accomplish when given the opportunities and supports they need and what they can contribute when their voices and ideas are taken seriously.

Teachers at Renaissance use the checklist as a reminder of important crew consistencies. It is also used by administrators and others to track and share feedback with crew teachers during a team-building meeting that takes place once a week.