



EDMONTON
Regional Learning
CONSORTIUM

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PROJECT-BASED LEARNING *Guide*

Introduction

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Students engaged in strongly crafted Project-Based Learning opportunities are better prepared to build knowledge and understand the world (Bereiter 2002). Project-Based Learning has the potential to transform learning environments, where the role of the teacher shifts from knowledge dispenser to that of a facilitator of learning. The teacher supports students in asking complex questions and then finding, choosing, understanding, synthesizing and communicating solutions to their questions. This kind of learning builds students' skills and competencies to experience success in an increasingly complex society.

Project-Based Learning is one way to achieve the goals of the Alberta Programs of Study and also aligns with the directions outlined in Alberta Education's Draft Teaching Quality Standard and the Ministerial Order on Student Learning.

This learning guide is designed for teachers, learning coaches and school leaders. It explains how to design and engage students in projects that begin with inquiry and end with a product, performance, or service that is shared with an authentic audience. This guide is intended to be used as a toolkit, rather than a step-by-step prescription.

“For students, the benefits of project-based learning include...growth in self-reliance, improved attitudes toward learning, opportunities to develop complex skills, such as critical thinking, problem-solving, collaborating, and communicating.”

- Intel® Teach Program

What is Project-Based Learning?



Project-Based Learning is a teaching method in which “students gain knowledge and skills by working for an extended period of time to investigate and respond to a complex question, problem or challenge that results in a product, publication, or presentation that is shared with a public audience” (Buck Institute for Education). Students are engaged in work that is substantial, shareable, and personally meaningful. Students often call Project-Based Learning, “hard work, but fun” because the effort and engagement produce results.

When engaged in project based learning, students work in teams to conduct research, and use multiple and varied resources. Teams produce multiple drafts of their work, engage in on-going self and group reflection, receive feedback from their classmates, teachers, and other stakeholders, and continually refine their work until it is ready for sharing with a public audience. Project-Based Learning can occur in any classroom and at any grade level. Projects can vary in length of time and complexity.

FEATURES IN THIS GUIDE



STOP AND REFLECT

- Pause to review
- Record ideas
- Examine subject



SUGGESTIONS AND TIPS

- Hints and tricks to planning
- Ideas to make projects easier

EXAMPLE

EXAMPLE PULL-OUT

- Ideas to get you on the right track

“The meaning of ‘knowing’ has shifted from being able to remember and repeat information to being able to find and use it.”

- (National Research Council, 2007)

Comparing Projects to Project-Based Learning

Project work has been around for a long time. Projects are often done at home and as a culmination to a unit of study. Individual students, or groups of students can complete the project quickly. In Project-Based Learning, the focus is more on the process of learning and learner-peer-content interaction than the end-product itself. The chart below shares some important differences between projects and Project-Based Learning.

Projects...	Project-Based Learning...
Are often completed alone	Is completed in teams
Utilize the teacher as knowledge dispenser	Utilizes the teacher as a guide
Are often completed by following the teacher's step-by-step directions	Requires students to make choices within pre-approved guidelines
Often have one "right" outcome	Results in unanticipated outcomes that are varied and often pleasantly surprising
Are often irrelevant to students' lives	Is connected to the real world; authentic
Solve fictional problems	Involves students in work that resembles the real world in which they solve real world problems
Are turned into the teacher for grading	Products, performances or services are presented to a public audience
Are based on Alberta's Programs of Study	Are based on Alberta's Programs of Study
Assessment occurs at the end	Assessment practices are an integral part of the project design. Students receive ongoing feedback related to established criteria and is based on learner outcomes

Photo courtesy of Grande Yellowhead Public School Division #77

Typical Project Based Learning Cycle:

The visual below shares key stages of a Project-Based Learning cycle. Because Project-Based Learning is more about the process of learning and learner-peer-content interaction, gathering evidence of learning and providing feedback to students is critically important throughout the entire cycle. Feedback must be based on established criteria, and aligned with Alberta's Programs of Study (see "Create your Project's Assessment Plan on page 15).



Create a Classroom Culture of Inquiry and Collaboration

Engaging your students in Project-Based Learning may mean shifting your teaching style. If your most common method of instruction is one that centers around direct instruction, you may need to shift from a dispenser of knowledge and information to a facilitator who guides students to construct their own knowledge.



STOP AND REFLECT

To what degree do I...	Not Yet	Sometimes	Frequently
Model curiosity and “questioning” talk			
Value students’ curiosity and risk-taking			
Honour diversity of ideas, thoughts and actions			
Provide choice			
Foster opportunities for students to question and test ideas			
Help students learn from their failures			
Engage in ongoing discussions about classroom norms and ground rules			
Teach collaborative skills			
Nurture trust			



*“Tell me and I’ll forget.
Show me and
I may remember.
Involve me and
I’ll understand.”*

- Old Chinese Proverb

Create an Authentic Reason for Your Project

Begin planning your project by identifying an authentic and engaging reason for your project, based on the Programs of Study that you teach. The problem or challenge should be complex, and something students want to investigate and solve.



STOP AND REFLECT

What role will the students take: Historian? Researcher? Story teller? Other?
What is the authentic problem, challenge, or question the students will need to solve?
How will your project involve an authentic audience? Who will be interested or has expertise and can help support students in the inquiry they will be doing?
What community resources and experts could your teachers tap into, to make the project more authentic or real?
What special events occur in your community that could be inspirational for your project?
What will your students create: A Project? Performance? Community service? Combination of all three?

“Asking and answering questions are central to the learning process and to effective teaching and learning, yet studies show that teachers devote less than 4% of class time to asking or soliciting questions, and that the questions that are posed are rarely of the type that require students to think.”

- Davis, B.G.

“We learn more by looking for the answer to a question and not finding it than we do from learning the answer itself.”

- Lloyd Alexander

Craft the Project's Driving Question

The initial spark for your project comes from a passionate question it could be yours, a colleague's, or from a student's passion. A person's passion and excitement is infectious and provides a great start to your project.

The driving question sets the tone and purpose for the project. This question should be open-ended to allow students to develop multiple and diverse responses or products. The driving question should not have an "easy" answer, should stretch your students intellectually and ignite their passions and imagination. For your first project, you will most likely write the driving question. As your students become more competent in asking open-ended questions, include them in the creation of the driving question.



SUGGESTIONS AND TIPS

- If the problem or challenge can be answered asking Google, Cortana, or Siri, then it is not complex enough to drive a project.

EXAMPLE

EXAMPLES OF DRIVING QUESTIONS

Explore a philosophical question:

- When do we grow up?
- How can I be a responsible global citizen?

Examine a historical event, time period, or episodes in nature:

- Was the decision of the Canadian government to intern Ukrainians during WW I right or fair?
- Are we using our knowledge of the values and beliefs existing at the time to interpret the people, events and practices of the past?

Solve a challenging situation:

- What should we do about the mice in our school?
- How can we reduce the garbage in our landfill?

Look at a contentious issue:

- Should we raise taxes?
- Should the past Canadian government have been allowed to set up residential schools?
- Should pets be allowed to attend classes with students?

Create or design something to educate others:

- How can we create museum exhibits and plan an event that explains and celebrates the history of our community?

Adapted from the Buck Institute for Education

Encourage Students to Generate “Need to Know Questions”



A good driving question will lead students to ask more questions. After introducing your driving question, brainstorm with your students a list of “need to know questions”. “Need to know questions” get your students thinking about what they need to know to answer the driving question. “Need to know questions” are specific and can guide your students’ research.

EXAMPLE

Consider the driving question, “What should we do about the mice in our school?” Students might brainstorm the following “need to know questions”:

- What do mice eat?
- How often do they eat?
- Where do they hide or nest?
- How often do they reproduce?
- What is a safe way to get rid of them that is harmless to students and the environment?
- Who can help us learn more about getting rid of mice?
- Why do we need to get rid of the mice?

“Need to know questions” get students thinking about what they need to know to answer the driving question.



SUGGESTIONS AND TIPS

- Consider using a graphic organizer or an app like Popplet to help students capture their brainstormed “need to know questions”. This assists students in grouping their questions based on similarities, by the kinds of resources to access, or for the purpose of assigning need to know questions to different group members.

Source: *Work That Matters*

Plan the Project's Launching Event



Projects begin with a launching event that will engage students' interest and initiate questioning.

A launching event:

- is short
- conveys a sense of urgency and importance; it is a call to action
- is based on the students' interests not the teacher's interests
- is often novel
- explains only the minimum information needed

EXAMPLE

The examples listed below may spark ideas for how you could launch your project:

- **Video** – YouTube, Ted Talks, Educational videos
- **Discussion or Debate** – excerpt from a novel; municipal, provincial or federal issues; at parent council
- **Guest Speaker** – sports player, businessman, curator, entertainer, broadcaster, editor or writer
- **Field Trip** – museums, businesses, parks, nature scapes
- **Piece of Correspondence** – historical correspondence, letter to the school, letter to the government

Decide on the Project's Final Outcome and Audience



The final outcome of a project might be a product, performance, or service, or a combination of any of these. In some classrooms, students are given choice in terms of the final outcome. When students know the outcome in the early stages of project work, they have a better sense of direction and focus for the project and demonstrate much more confidence in their work.

Presenting to an authentic audience significantly changes the nature of the students' work. When students know they will be sharing their work with family, friends or members of their Indigenous community their commitment is much greater and may help to strengthen the relationship between the school.

Capture your ideas on the template on page 22.



SUGGESTIONS AND TIPS

- Museums, galleries, parks, cafes, churches, community centres, friendship centre are excellent and authentic venues for sharing!
- Set the date for sharing the final product or performance early into the project work.
- If possible, find a venue outside of the school for sharing your final outcome.

Forming Project Teams

Creating a project team with the right mix of skills, attitudes and knowledge is vital to the success of your project. Team formation will depend on the level of expertise team members have, the scope of the project, and their experience in working collaboratively.



STOP AND REFLECT

Questions	Notes/Reflections
How many students will be on each team? The larger the team, the more complex the team dynamics.	
Will you give students the opportunity to select the group members they wish to work with? Consider some choice; the final decision on group formation is the teacher's.	
How will you help the members of your team support each other and build on individual strengths?	
To what degree will your teams need help in making decisions, assigning responsibility, norms for working together and dealing with conflict?	
How will you build in multiple opportunities for reflection such as team reflections and individual reflections?	
How will you monitor and assess each student's efforts to support their team?	
Does the work present a balanced, factual view or does it describe events in terms that state or imply the superiority of one group over another?	

Solicit Feedback From Colleagues



Talk to colleagues about your ideas; solicit their feedback several times before launching your project.



SUGGESTIONS AND TIPS

Sample questions include:

- Is the problem or challenge solvable and appropriate for the developmental level of the students?
- Is the breadth and scope of your project enough? Too much?
- Is the project engaging? Do you think your students will be thinking about getting back to school and working on the project?
- Who does the project satisfy? Great projects benefit the learner more than the teacher.
- Is the end product or outcome inspiring, motivating and relevant? Does it involve perspective making, reciprocal learning, and an authentic audience?
- Who (adults, community members, knowledge keepers, liaisons, elders) could we approach about getting involving in this project? What roles might they play?
- Do you have ideas for a venue outside of the school for the exhibition of the project?

Create Your Project's Assessment Plan

The outcomes you have identified from Alberta's Programs of Study form the basis for establishing criteria, or key learning goals for your project. "Criteria are statements, beginning with strong verbs, that identify the learning to be achieved, based on the Alberta Programs of Study." (Alberta Assessment Consortium). Criteria are the key learning goals that will be supported, through practice and feedback throughout the project (formative assessment) as well as at the end of the project (summative assessment).

Write the criteria for your project in clear and concise language so that your students clearly understand them.

Use the criteria to create a rubric for your project. A rubric consists of criteria for students' work along with descriptions of levels of performance quality of the criteria. You can create the rubric on your own, co-create the rubric with colleagues, or co- create the rubric with your students. Alternatively, you may have already developed some rubrics, so use them as a starting point.

Writing the rubric in student friendly language is critical to an effective assessment plan. Discuss the rubric with students at the beginning of the project and ensure that students are clear about what will be practiced throughout the project, and assessed at the end.

Create multiple opportunities for students to practice and receive feedback on their project work, as this will impact how students view their project, their learning, and themselves. It is especially effective when students are able to give feedback to each other, rather than just handing in drafts to a teacher. Peer feedback gives students the opportunity to learn in a structured and safe context. If students are not familiar with how to give feedback to each other, teachers will need to provide instruction and support with how to do this effectively. Feedback should be in relation to the criteria established, specific, and presented in a positive, respectful and supportive way.

EXAMPLE

Throughout the duration of the project, plan how you will gather evidence of learning for each criteria identified. Ongoing, multiple opportunities for receiving feedback related to the evidence gathered will assist students in reflecting and enhancing their understanding and/or skill development.

Sample methods for gathering evidence of learning could include:

- rough drafts
- journal or reflections
- concept maps or brainstorming plans
- entrance and exit slips
- practice presentations
- anecdotal notes and observations
- checklists
- observations
- thumbs up/thumbs down
- listening to conversations



SUGGESTIONS AND TIPS

- The Alberta Assessment Consortium is an excellent source of support and information on effective assessment practices.

Create Your Project's Assessment Plan

Continued

Below are some examples of approaches to assist students in giving feedback:

EXAMPLE

Dilemma Protocol:

- create groups of four to five students
- students share something they are struggling with on their product, share their draft or answer clarifying questions
- remaining students discuss possible solutions while the sharer remains silent (only taking notes)
- sharer then rejoins the group's conversation, restates helpful suggestions, and asks for clarification
- repeat all rounds until every student has had a chance to pose a dilemma and get feedback

Workshop-Style Critique:

- create groups of three with specific teacher-generated questions about the product or performance
- students take turns presenting their product to the two other students, and then discuss the questions as a way to improve product quality

Pair Critique:

- work in pairs
- using the rubric created for the project, pairs take turns giving each other feedback
- this protocol is best for final drafts of a product, performance or service

Adapted from Work That Matters

Teachers often mistakenly presume that a project's final product, performance or service is the only thing they should assess, which leads them to assume that they should be able to tell whether the students learned what they needed to by looking at the final outcome. In fact, assessing what students know should be ongoing throughout the project. The end product or performance is the motivation for learning the material, but it does not necessarily demonstrate that they learned it all.

The criteria used for formative assessment is the exact same criteria that should be used for final, or summative assessments. You may choose to give an exam that covers information or knowledge outcomes. Other summative assessments include: self- reflections, peer evaluations, or interviews.



Incorporate Voice and Choice

When students have some degree of voice and choice, their level of engagement and ownership of the project increases. Project design should indicate a clear direction but should offer many pathways to a solution. Decisions around student voice and choice are based on student ability and readiness. Choice can range from the need to know questions the students generate, to the tasks and roles they will take on as team members, to the product or performance they will create.



Try Out Your Project Before Launching With Your Students

You will have much more success with your project if you do it yourself first. There are several reasons for this:

- You will have a better sense of where your students may have difficulty and you can plan accordingly
- You will have a sense of how long it will take to complete the project
- You will have a model or exemplar of the project that you can show your students before they begin. It helps them to understand your expectations or how to meet the criteria for the project.

Looking at your model or exemplar together with your students helps them to understand what they are aiming for. It gives your students the opportunity to use the rubric created for the project and possibly evaluate your project.

Students will gain an understanding of what might be challenging, what might be easy, which aspects are most important, or least important and will create a shared understanding of what an acceptable product looks like.



SUGGESTIONS AND TIPS

- Be sure to archive your students' projects. The products that your students have produced for this year's project can be the models at the start of next year's project. Make sure you have digital photographs of all the products, including the drafts. Over time, you will build up a rich archive of excellence.

Source: Work That Matters

Make Contact with Experts Outside the School

Draw on the list of experts and organizations that you, with your colleagues have brainstormed, and make contact with them. Explain your project, and ask them to help you make the project more authentic by providing models, working with students (in school or on a field trip), or offering an exhibition venue. If you have an exemplar you can share with them, it will help them understand the outcome of the project.



SUGGESTIONS AND TIPS

- **Coach students in advance:** Before inviting experts into the classroom, coach your students. Make sure they understand that the experts are very busy and have generously given their time and expertise to assist with your project. Explore ways students can share or express their appreciation to the time the expert.
- **Prepare the expert in advance:** Let the expert know important details about the project, including the driving question. Provide some specific examples of how the expert can assist the students or ask for specific information that you would like the expert to share with the students. Invite the expert to bring in artifacts, if appropriate.
- **Timing/age appropriate presentations:** Experts are typically specialists in their field, not necessarily experts in teaching. Try to get a sense of their confidence level if working with children and respectfully suggest strategies they can use to engage the students. Whole group presentations may not be as effective as working with small teams.
- **Keep records:** Keep track of which students or teams that have had the opportunity to work with the expert and what they have worked on.
- **Safety considerations:** Many school districts require visitors to complete a background check form. Follow all required procedures when inviting visitors into your classroom.



Create a Project Calendar and Timeline

Creating a project calendar and timeline is one of the most important structures in project work because it makes a potentially daunting project feel manageable to students, and helps you make sure that they will have time to accomplish everything that you expect from them.

When they present their work to a wide audience, they become confident and articulate advocates. If possible, post your timeline online so that students, parents, and other members of staff can check it whenever they need to.

Create a template, such as the one below, to structure your project calendar or timeline. Considering all aspects of this template in advance of launching your project will support a successful project outcome.



SUGGESTIONS AND TIPS

- Set interim deadlines for drafts, and final deadlines for specific components of a product.
- Hold regular check-ins. Set tasks for completion by the next check-in, and make sure you both have a copy of the tasks you've agreed on. Make adjustments to your plans if needed.
- Schedule peer feedback sessions. Peer feedback sessions will tend to follow draft deadlines (since students will be critiquing each other's drafts).

Project Calendar/Timeline

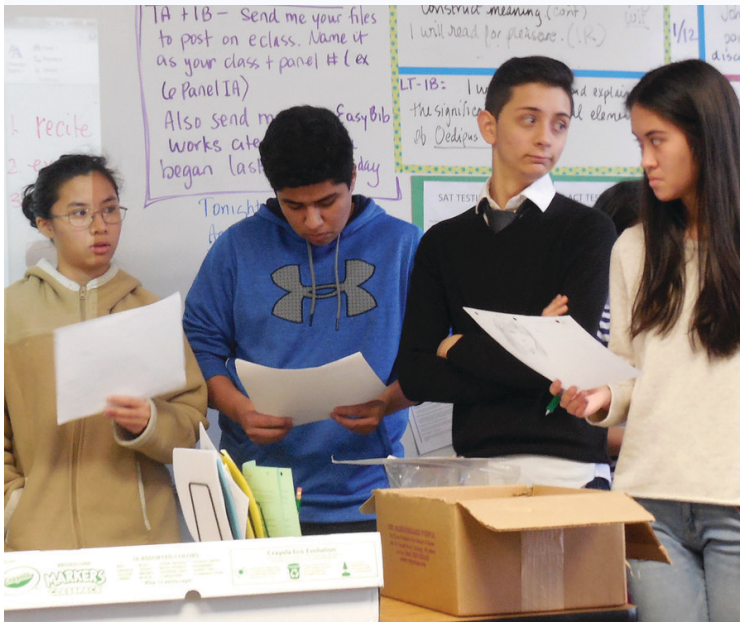
Date/Lesson	What teacher does	What students do	Assessment	Resources

Plan the Sharing Day

From a student's perspective, this is the most important day of the project. It is important that the students take ownership of the sharing event; it is all about their work, and they should be in charge of it. Think about the roles everyone will play on this day.

EXAMPLE

- **Audio Visual team:** students make sure AV equipment is working, make sure event runs to time, go-to people for last-minute crises
- **Greeters:** students greet the audience and manage the crowd. They tell the audience explicitly what their role is. People often feel uncertain about what is expected of them at exhibitions, and will appreciate being given a clear brief
- **Student presenters:** stand by their work in order to explain it and answer questions



Conclusion

Most likely, your first project will not go as well as you hoped. Your driving question may not have been broad or complex enough, some of your students may have found it challenging to work in teams, or you may have discovered that your students need more guidance in how to give each other effective feedback. Even if the project did not go exactly as planned, don't be discouraged.

Projects get better with practice and reflection. Talk to your students and your colleagues about what went well, what didn't go so well, and what you might want to try in the future.

Hopefully this guide has inspired you to use a project-based learning approach. When students are engaged in projects, they surprise themselves, their parents, and their teachers with what they are capable of.



SUGGESTIONS AND TIPS

- When you engage your students in a similar project in future years, your reflections will assist in designing an even better learning experience
- Complete a self reflection using the template on page 23.

References and Resources

Websites:

Project-Based Learning: An Overview

<https://www.edutopia.org/project-based-learning-overview-video>

Project Management Webinar

http://www.bie.org/object/webinars_archived/managing_projects

Articles:

6 Strategies for Differentiated Instruction in Project-Based Learning

https://www.edutopia.org/blog/differentiated-instruction-strategies-pbl-andrew-miller?utm_source=twitter&utm_medium=socialflow

PBL Elementary Teachers Offer Field-Tested Advice | Edutopia

<https://www.edutopia.org/blog/pbl-elementary-teachers-offer-advice-andrew-miller>

My PBL Failure: 4 Tips for Planning Successful PBL

<https://www.edutopia.org/blog/pbl-failure-planning-successful-pbl-katie-spear>

Learning by Doing: A Teacher Transitions Into PBL

<https://www.edutopia.org/blog/learning-by-doing-teacher-transitions-pbl-shawn-canney>

Partnership Strategies for Real-World Projects

https://www.edutopia.org/blog/partnership-strategies-real-world-projects-suzie-boss?utm_source=dlvr.it&utm_medium=twitter

Feeling the Power of Oral Communication

https://www.edutopia.org/blog/feeling-power-or-oral-communication-gai-jones?utm_source=twitter&utm_medium=socialflow

Twenty Tips for Managing Project-Based Learning

<https://www.edutopia.org/blog/20-tips-pbl-project-based-learning-educators-andrew-miller>

Resources:

Focus on Inquiry. A Teacher's Guide to Implementing Inquiry-based Learning

<https://open.alberta.ca/dataset/032c67af-325c-4039-a0f3-100f44306910/resource/b7585634-fabe-4488-a836-af22f1cbab2a/download/29065832004focusoninquiry.pdf>

Project Planning Template

Grade Level

Teacher

Approx Duration of Project

Name of Project:	
Project Idea <ul style="list-style-type: none">• Student roles• Description of the real world, authentic problem or challenge	
Driving Question <ul style="list-style-type: none">• Engaging, written in student language, grade level appropriate and guides the learning	
Launching Event <ul style="list-style-type: none">• Key event or activity to launch the project which engages and motivates the students	
Culminating Task <ul style="list-style-type: none">• Product, performance or service that demonstrates student understanding of the solution to the driving question	
Presentation Audience (Parents, Community Members, etc.)	
Venue and Date of Final Presentation	
Program of Studies Learner Outcomes <ul style="list-style-type: none">• Identify learner skills, attributes, and Indigenous perspectives that will be targeted during the project	
Success Criteria <ul style="list-style-type: none">• Based on learner outcomes and help students understand what success looks like and sounds like	
Rubric	
Formative Assessments <ul style="list-style-type: none">• Aligned to the criteria established and should provide feedback to the learner and direct instructional planning for the teacher	
Summative Assessment <ul style="list-style-type: none">• Aligned to the criteria established	
Resources Needed <ul style="list-style-type: none">• On-site, equipment, materials, online supports, community resources, etc	

End of Project Reflection

Point of Reflection:	Notes
What was the success of the overall project?	
How well did the driving question and lessons work?	
To what degree was the project teacher-led vs. opportunities provided for student inquiry and initiative?	
Did the assessment tools, criteria and feedback provide a broad range of evidence of, and support for student growth and learning of outcomes?	
Any modifications for next time?	

