## PBL vs PBL

<table>
<thead>
<tr>
<th>Project Based Learning</th>
<th>Problem Based Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Often Multidisciplinary</td>
<td>Normally Single Subject</td>
</tr>
<tr>
<td>Often long projects (weeks or months)</td>
<td>Often short term projects</td>
</tr>
<tr>
<td>Includes the creation of product or performance</td>
<td>“Product” might only be a proposed solution, or presentation of findings.</td>
</tr>
<tr>
<td>Normally based on Real world Tasks and settings.</td>
<td>Often uses case studies, scenarios, and ill-structured, “messy” problems.</td>
</tr>
</tbody>
</table>

[@art_schultz](https://twitter.com/...)

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**Acara**

**Australian Curriculum, Assessment and Reporting Authority**
<table>
<thead>
<tr>
<th>Stage</th>
<th>Opportunities</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic</td>
<td>One or more learning areas</td>
<td>Dependent on time allowed</td>
</tr>
<tr>
<td>Idea</td>
<td>Driving, essential questions</td>
<td>Relevance to curriculum but also kids &amp; community</td>
</tr>
<tr>
<td>Links</td>
<td>Digital Technologies</td>
<td>Other Cross-curricular opportunities</td>
</tr>
<tr>
<td>“Hook” event</td>
<td>Exciting, open-ended, challenging, inspiring</td>
<td>Aimed at kid level, clear association to the driving question</td>
</tr>
<tr>
<td>Schedule</td>
<td>Visiting experts, Field visits, Drafts/milestones, formative assessments, review/reflections, plan B</td>
<td>Achievable, Measurable, Timely.</td>
</tr>
<tr>
<td>Exhibition</td>
<td>What, Where, Who, Why</td>
<td>Publicity, special invitations, Press, Target audience, Sustainability</td>
</tr>
</tbody>
</table>
Personal & Social Capability opportunities

- Project-based learning provides opportunities for:
  - Self-management
  - Self-awareness
  - Social management
  - Social awareness
Criteria for success

- authentic and meaningful
- maintain the integrity of subjects
- reflect the intentions of the Syllabus
- enhance transfer of skills and knowledge
- consistent with the NESA Outcomes
Criteria for success

• **authentic** and **meaningful**
• maintain the **integrity** of subjects
• reflect the **intentions** of the Curriculum
• **enhance transfer** of skills and knowledge
• **consistent** with AC Achievement Standards
Explicit teaching during projects

Project conception to realisation

The phases of explicit teaching include:

• planning
• setting the context
• modelled teaching
• guided learning
• working independently
• reflection.


Moving students from:

– Modelled to Guided to Independent
ALL REAL PROJECTS MUST INCLUDE:

- Essential question
- Significant content
- Multiple drafts and critique
- Student-created final product
- Public exhibition
- Authentic audience
Driving/Essential questions are...

- Questions that people ask in the ‘real world’
- Questions with no easy answer, which stretch students’ intellectual muscles
- Questions that ignite students’ imaginations
Authenticity

Community garden
Types of partnerships

The partnership continuum:

Levels of Engagement Activities:
- Awareness
  - Career Fairs
  - Site tours
  - Industry Ambassadors
- Involvement
  - Industry Affiliates or Advisors
  - Small Grants
  - Internships
  - Work Experience
- Support
  - Industry Mentors
  - Curriculum Development & support
  - Prof. Development Workshops
  - Student Sponsorships
  - Guest Speakers
- Sponsorship
  - Education Initiative Sponsorship
  - Large Grants
  - Outreach Programs
- Strategic Partner
  - Joint Partnership
  - Longer-term joint projects
  - Whole-school level involvement

* Adapted from University-Industry Demonstration Partnership
Where Do Projects Come From?

1. Start with an already successful project (‘Tribute Work’)
2. Start with your/your students passion
3. Start with the final product
4. Start with a driving/essential question
5. Start with the significant content you need to cover
Why does Australia have the highest extinction rate in the world?
Why are we following education systems that have failed?
What is the effect of urban sprawl?
Why does the common cold still exist?
Why are the world’s resources not distributed equitably?
How are cures made?
How do we know that we’re tasting the same taste?
What would the world look like if humans became extinct?
What do babies dream?
How can robots make our lives easier?
How do I know I know?
What will I be remembered for?
Why do people have allergies?
Why can’t children vote?
Why isn’t cow’s milk green?
How are accents born?
What is a laugh?
Problem-Based Learning: Six Steps to Design, Implement, and Assess
https://www.facultyfocus.com › Articles › Course Design
Nov 30, 2015 - By breaking down the PBL cycle into six steps, you can begin to design, implement, and assess PBL in your own courses. **Step One:** Identify Outcomes/Assessments. **Step Two:** Design the Scenario. **Step Three:** Introduce PBL. **Step Four:** Research. **Step Five:** Product Performance. **Step Six:** Assessment.

The Nine Steps of Project-Based Learning - ASCD
www.ascd.org/publications/books/.../The_Nine_Steps_of_Project-Based_Learning.asp...
If we examine project-based learning in the most general way, we can break it down into the following nine steps (of course, teacher-coaches should modify the ...}

How Does Project-Based Learning Work? I Edutopia
https://www.edutopia.org/project-based-learning-guide-implementation
Oct 19, 2007 - Here are steps for implementing PBL, which are detailed below: Start with the Essential Question. Design a Plan for the Project. Create a Schedule. Monitor the Students and the Progress of the Project. Assess the Outcome. Evaluate the Experience. Start with the Essential ... • Create a Schedule • Monitor the Students and ...

5 Steps for Sustaining PBL | Getting Smart
https://www.gettingsmart.com › Topics › Project-Based Learning
Aug 14, 2018 - By Jenny Pieratt - High Quality PBL is a journey, not a destination. This process can help continue on the trajectory of developing quality ...

The 5 Steps of Project-Based Learning - FreshGrade
https://www.freshgrade.com/blog/5-steps-of-project-based-learning/
Use Krajčík and Blumenfeld's five key steps to PBL as a helpful starting point to implement project-based learning in your classroom.

[PDF] Seven--steps of PBL
No. What to do? What to do in detail? Potential shortcomings. Clarification of terms and concepts. • ask for explanation of words or concepts that.
Refining your driving question

- Getting stuck with a ‘non-essential’ question limits the depth of learning

- It’s not just one question - sub-questions can steer your students to the content they need to cover

- Good driving questions can act as an engagement lever, and a call to action..

- .....so, it’s worth taking some time to get them right!
Paper Crane exercise
Aims:

• understand the nature of assessment in Project Based Learning

• begin planning for assessment within your learning area
How do I assess this?
Assessment framework

Assessment Checklist

- Student Reflection
- Student Involvement
- Student Voice
- Frequency
- Modality
- Purpose
- Alignment of Task
- Task Design
Assessment Framework

☑️ Clarity around What to Assess

What evidence of student learning do I need to collect to assess student achievement against the standards?

- TASK - Links to Content descriptors are clear
- TASK - Links to Achievement Standards are clear
- TASK - Learning Outcomes are clear
- PRIOR EXPERIENCES - Learning experiences have paved the way for students to understand and apply those outcomes
- TASK - allows students to demonstrate achievement of those
Assessment Framework

☐ Clarity around the Purpose (Why)

My assessment task will be placed

DIAGNOSTIC
☐ At the beginning of the learning journey

FORMATIVE
☐ At some point in the middle of the learning journey

SUMMATIVE
☐ At the end of the learning journey

My assessment task will be used as assessment

☐ OF learning (Summative / Diagnostic)
☐ FOR learning (Formative)
☐ AS learning (Formative)

My assessment task will help

☐ me better understand student understanding
☐ me and my students understand their progress
☐ students get feedback on their progress
☐ me in planning for next steps
☐ me evaluate student achievement
Assessment Framework

☐ Clarity around How to assess
  I have chosen the appropriate way to assess students

☐ Assessment aligns to relevant achievement standard – key active verb: ________________
☐ Assessment aligns to what is taught
☐ Assessment provides opportunities to demonstrate the extent of student
  ☐ Knowledge
  ☐ Understanding
  ☐ Skills
Assessment Framework

☑️ Student Reflection

☐ Students get **feedback** on learning
☐ Students **reflect** on learning
  ☐ What have I learned?
  ☐ How do I know I have learned it?
  ☐ What could I have done differently?
  ☐ What can I do next?

☑️ Student Involvement

☐ Students have a chance to negotiate the assessment task *eg*, through the use of rubrics
☐ Students get a choice of **format**?
## Assessment Framework

### ✔ Multiple Pieces of Evidence

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Checkmark] I have provided <strong>one time / two or three / multiple</strong> opportunities for students to demonstrate success</td>
<td>![Checkmark] I have provided <strong>one / two / multiple different modes</strong> of assessment for this standard</td>
</tr>
</tbody>
</table>
What does it look like in your school?

Assessment Checklist

STUDENT REFLECTION

STUDENT INVOLVEMENT

STUDENT VOICE

WHY

HOW

WHAT

PURPOSE

ALIGNMENT OF TASK

TASK DESIGN

FREQUENCY

MODALITY
Different forms of evaluations

- Teacher evaluations
- External evaluations
- Peer evaluations
- Self evaluations
Assessing Student Participation

• Working in groups. Students increase capacity and learning through shared cognition (Resnik, 1991)
• Students have choice and voice
• Projects are presented publicly to an audience which the problem and solution impacts.

Bethany A. Clark
University of Nebraska
Sharing and feedback

THE LADDER OF FEEDBACK

SUGGEST
Make suggestions for improvements.
“Maybe you could...”
“What if...”

STATE CONCERNS
Kindly express your concerns.
“I wonder if...”
“It seems to me...”

VALUE
Express what you like giving detailed examples.
“I really like... because...”

CLARIFY
Ask questions to help you understand fully.
Rubrics

- play an important part in the grading of artifacts.
- need to be detailed enough that students understand what is desired of them once they achieve a specific problem solution.
- shared prior to beginning an artifact
Dog Story

the dog walked to the tree.

the dog jumped.

the dog wags, then goes back.
Planning teaching and learning

What do we want our students to learn?

How does the school situation affect planning?

What is our agreed purpose and approach for teaching and assessing the curriculum in our school?

How do we develop a scope and sequence that addresses all curriculum requirements?

How do we develop effective units of work?

What evidence of student learning do we need to collect?

How do we teach to achieve improved outcomes for students?

How will we know if we are being effective in teaching this curriculum?
# Project management

- Explicit teaching of this skill

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Create and organise ideas and information systems independently and with others, and <strong>share</strong> these with known people in safe online environments</th>
</tr>
</thead>
<tbody>
<tr>
<td>F - 2</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Plan, create and <strong>communicate</strong> ideas and information independently and with others applying agreed ethical and social protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - 4</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Plan, create and <strong>communicate</strong> ideas and information, including collaboratively online, applying agreed ethical, social and technical protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - 6</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Plan and <strong>manage</strong> projects that create and communicate ideas and information collaboratively online, taking safety and social contexts into account</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 - 8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Plan and <strong>manage</strong> projects using an iterative and collaborative approach, identifying risks and considering safety and sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 - 10</td>
<td></td>
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</table>
Wrap-up
### Australian Curriculum: Digital Technologies

#### Years 3 and 4 band description

Learning in Digital Technologies focuses on further developing understanding and skills in computational thinking, such as categorising and outlining procedures, and developing an increasing awareness of how digital systems are used and could be used at home, in school and the local community.

By the end of Year 4, students will have had opportunities to create a range of digital solutions, such as interactive adventures that involve user choice, modelling simplified real world systems and simple guessing games.

In Year 3 and 4, students explore digital systems in terms of their components, and peripheral devices such as digital microscopes, cameras and interactive whiteboards. They collect, manipulate and interpret data, developing an understanding of the characteristics of data and their representation.

Using the concept of abstraction, students define simple problems using techniques such as summarising facts to deduce conclusions. They record simple solutions to problems through text and diagrams and develop their designing skills from initially following prepared algorithms to describing their own that support branching (choice of options) and user input. Their solutions are implemented using appropriate software including visual programming languages that use graphical elements rather than text instructions. They explain, in general terms, how their solutions meet specific needs and consider how society may use digital systems to meet needs in environmentally sustainable ways.

With teacher guidance, students identify and list the major steps needed to complete a task or project. When sharing ideas and communicating in online environments they develop an understanding of why it is important to consider the feelings of their audiences and apply safe practices and social protocols agreed by the class that demonstrate respectful behaviour.

#### Years 3 and 4 achievement standard

By the end of Year 4, students describe how a range of digital systems (hardware and software) and their peripheral devices can be used for different purposes. They explain how the same data sets can be represented in different ways.

Students define simple problems, design and implement digital solutions using algorithms that involve decision-making and user input. They explain how the solutions meet their purposes. They collect and manipulate different data when creating information and digital solutions. They safely use and manage information systems for identified needs using agreed protocols and describe how information systems are used.

<table>
<thead>
<tr>
<th>Digital Technologies knowledge and understanding</th>
<th>Digital Technologies processes and production skills</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Digital systems</strong> Identify and explore a range of digital systems with peripheral devices for different purposes, and transmit different types of data (ACTDIK007)</td>
<td><strong>Collecting, managing and analysing data</strong> Collect, access and present different types of data using simple software to create information and solve problems (ACTDIP009)</td>
</tr>
<tr>
<td><strong>Representing data</strong> Recognise different types of data and explore how the same data can be represented in different ways (ACTDIK008)</td>
<td><strong>Creating designed solutions by:</strong> Define simple problems, and describe and follow a sequence of steps and decisions (algorithms) needed to solve them (ACTDIP010)</td>
</tr>
<tr>
<td></td>
<td><strong>Producing and implementing</strong> Implement simple digital solutions as visual programs with algorithms involving branching (decisions) and user input (ACTDIP011)</td>
</tr>
<tr>
<td></td>
<td><strong>Evaluating</strong> Explain how student solutions and existing information systems meet common personal, school or community needs (ACTDIP012)</td>
</tr>
<tr>
<td></td>
<td><strong>Collaborating and managing</strong> Plan, create and communicate ideas and information independently and with others, applying agreed ethical and social protocols (ACTDIP013)</td>
</tr>
</tbody>
</table>
The purpose of this task is to link a task with content descriptors and achievement standard.

<table>
<thead>
<tr>
<th>F-2</th>
<th>3-4</th>
<th>5-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper coding</td>
<td>Jam Sandwich Algorithm</td>
<td>Micro:bit Step-o-meter</td>
</tr>
<tr>
<td></td>
<td>Human Crane</td>
<td></td>
</tr>
</tbody>
</table>
Tips

• Describe scope of tasks *in Technologies*

• Link to
  – Knowledge and understanding
  – Process and production skills

• Describe student achievement with respect to standard

• Outline areas for growth linked to progress through the standard
In Technology over the last semester some of the things our class learnt about was how and when to use different computer programs, SEESAW, Coding, Makers Empire and the moving object project in which students had to research, plan and design an object that can move without human interaction.

Tim demonstrates a great interest in Technology. He is able to successfully write detailed algorithms creating a sequence of steps to complete different tasks. Tim quickly gains proficiency in using technology and is capable of using a range of online tools, such as blogs and videos, to create and share information. He was engaged in learning how to use SEESAW and has used this to share his work in various ways, such as video, audio and pictures. He is able to confidently communicate design ideas using sketches and models. When designing his car Tim displayed his designs neatly, labelling sizes and materials within his design. Tim understands how electricity can create movement, sound and light in products and uses this within his own designs. He can describe the properties of material based on its strength, flexibility and appearance and used this knowledge to select the appropriate materials to create his own designs. Tim is confident using technology and can use the internet to research information for his assignments.
Dean uses technology for a variety of purposes with confidence and enthusiasm. He happily takes photos and videos with the iPads and is learning how to edit photos. Dean is improving his touch-typing skills through a program called TypingClub.com. It is not easy keeping his fingertips where they are meant to be, but he is being persistent. Practise and more practise makes us better.

Dean showed good participation in our discussions where he learnt that many familiar products come from a variety of environments and that before they reach us they go through a sequence of technological and design processes. He also learnt that this production process could be severely affected by weather. Keep up the good work Dean.
Can my students read?

Hemingway App makes your writing bold and clear.

The app highlights lengthy, complex sentences and common errors; if you see a yellow sentence, shorten or split it. If you see a red highlight, your sentence is so dense and complicated that your readers will get lost trying to follow its meandering, splitting logic — try editing this sentence to remove the red.

You can utilize a shorter word in place of a purple one. Mouse over them for hints.

Adverbs and weakening phrases are helpfully shown in blue. Get rid of them and pick words with force, perhaps.

Phrases in green have been marked to show passive voice.

You can format your text with the toolbar.

Paste in something you're working on and edit away. Or, click the Write button and compose something new.
Can my students read?

Tests Document Readability

Readability Calculator

This free online software tool calculates readability: Coleman Liau index, Flesch Kincaid Grade Level, ARI (Automated Reader Index), used here is the indication of number of years of education that a person needs to be able to understand the text easily after training.

This tool is made primarily for English texts but might work also for some other languages. In general, these tests penalize long sentences. Your writing will score better when you: use simpler diction, write short sentences. It also displays complicated sentences (with many words and syllables) with suggestions for what you might do to improve them.

Basic text statistics are also displayed, including number of characters, words, sentences, and average number of characters per sentence.

Enter text (copy and paste is fine) here:  

https://www.online-utility.org/english/readability_test_and_improve.jsp
Ways of thinking

Design thinking

- Empathize: Learn about the audience.
- Define: Sharpen key questions.
- Ideate: Brainstorm and create solutions.
- Prototype: Build representations of one or more ideas.
- Test: Test ideas and gain user feedback.
Processes and Production Skills

- **Empathize**
- **Define**
- **Ideate**
- **Prototype**
- **Test**

**Steps:**
- Investigating and defining
- Generating and designing
- Producing and implementing
- Evaluating
Design thinking activities

Band F-2
Explore and state the purpose of different illustrations.
*Link: Author Study Yr1 T1: Mem Fox.*

Band 3-4
Ask: What’s an effective way of getting facts across to an audience? Determine with guidance, processes and elements to use when designing an infographic poster.
*Link: Earth & Space Yr3 T2: Earth’s Rotation*

Band 5-6
Brainstorm: What is essential energy? Negotiate criteria to and explore alternatives.
*Link: Physical Sciences Yr6 T2: Energy*
Design thinking activities

Band F-2
Compare and contrast features of illustrations and express likes and dislikes in relation to the design idea. Design new ideas to incorporate the feedback.
*Link: Author Study Yr1 T1: Mem Fox.*

Band 5-6
Develop a plan for a game based on teaching the concepts linked to essential energy. Consider components needed for the game and visual aesthetics (in addition to the computational thinking aspects)
*Link: Physical Sciences Yr6 T2: Energy*
Activity 1.2
Design thinking activities

Empathize
Define
Ideate
Prototype
Test

Investigating and defining
Generating and designing
Producing and implementing
Evaluating