Planning curriculum-embedded Project Based Learning with real world connections

Going places, meeting people, doing and making things

Newcastle University

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The PBL Goes to University team and authors of this guide are:

Professor David Leat, Professor of Curriculum Innovation

Ulrike Thomas, CfLaT Research Associate

Dr Alison Whelan, CfLaT Research Associate

Centre for Learning and Teaching (CfLaT), King George VI Building, Newcastle University.

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Newcastle University

CfLaT Centre for Learning and Teaching

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INTRODUCTION

This guide is the result of a two year project undertaken by a research team from the Centre for Learning and Teaching, Newcastle University and funded by the Edge Foundation. Our aim was to work with teachers interested in developing Project Based Learning (PBL) through providing them with brokerage, resources, professional development activity and perhaps most importantly encouragement. Throughout the two years we have been fortunate to work with many truly inspirational people both in schools and representing a range of organisations and businesses. Their commitment to PBL has been humbling.

We are conscious that there are already many excellent resources available to teachers interested in PBL and we will be making explicit links to these as appropriate. Our particular focus, however, has been on writing a guide that presents all that we have learnt about planning and executing PBL projects and which draws heavily on detailed case study examples all underpinned by relevant theory and research. Whilst we are cognisant of the fact that our project was based in the North East and our examples understandably draw on this context; we are very confident that similar opportunities are available nationally. So for example when we discuss visits to Newcastle University and the Great North Museum, or projects involving local employers like Rolls Royce, we know that FE colleges and universities close to your school will also offer outreach opportunities, that there will be museums near you and other local, relevant employers all equally keen to work with you.

Our guide is in two parts.

Part 1 focuses on the key principles and characteristics of Project Based Learning.

Part 2 focuses on the 'how to' aspect of planning, running and evaluating your project.

Case studies are used to exemplify ideas throughout this guide. Where a symbol appears a more detailed version exists on our project website, often with accompanying resources produced by the teachers and partners that we worked with.

= **https://research.ncl.ac.uk/pblgoestouniversity/**

We hope that this guide both provides inspiration but also useful resources to begin your own journey into the world of Project Based Learning.

Ulrike, Alison and David

PART 1


1646
Dear
I am writing to you
that
because he
parliamentarians.

SECTION 1

MAKING THE CASE FOR PROJECT BASED LEARNING (PBL)

It is fair to say that the main demand on schools is to hit exam targets and get good Ofsted ratings and one might therefore see Project Based Learning (PBL) as a distraction. So here are some reasons why you should NOT do PBL:

- **It will distract you from delivering a coherent curriculum as it does not fit with a normal timetable and staffing pattern;**
- **Exam results might suffer if subject content is not covered properly;**
- **Teachers will be out of their comfort zone and will struggle with a new pedagogy;**
- **If you give pupils more autonomy they will mess around;**
- **The EEF did a trial of PBL and the results were not good;**
- **Parents won't like it.**

Alternatively you could be on the side of history and be a part of educational change that can produce great outcomes, address social justice and widening participation issues, transform the lives of individual students, produce citizens to play their part in addressing the challenges of the C21st and position your school at the heart of the community by serving that community. BUT these noble outcomes are only possible if the PBL projects are high quality.

This guide is an important starting point in developing high quality projects – and it should be seen as a journey or trajectory marked by continuous improvement. There is no magic wand or silver bullet, it is hard work, but you can look forward to some of the following:

- **Students who ask if they can do more work or who pester teachers with challenging questions;**
- **Public facing events in which students' work is showcased and which amazes, captivates, benefits or challenges people in the local and wider community;**
- **Links with local businesses, charities, clubs, learned societies, universities, public bodies, religious groups and individuals, some of which become meaningful sustained partnerships;**
- **Students who come back to school from university or working lives to pay tribute to the experiences projects provided which opened their eyes to some intriguing aspect of life or study;**
- **Parents who report that their daughter or son has been talking about what they have done at school and nagging them to take them somewhere, watch something or change their behaviour.**

So it is a finely balanced decision – PBL or not PBL? You can make this decision as an individual teacher, a middle leader or senior leader and if the answer is PBL then two questions arise:

1. **What curriculum space can I use to experiment – maybe just 2 lessons with one class in Y5 or Y7?**

2. **Where can I get help? This guide is a good place to start AND will point you towards much more help, whatever your level of responsibility.**

Going a Bit Deeper

If you work in a school then it is difficult to imagine them differently, but they could be very different. It is through cultural and historical evolution that they have developed as they are. We all went to school and were educated there (and we have done OK?). School buildings, classes, classrooms, subjects, teachers, headteachers, timetables, exams etc. are all socio-cultural phenomena. This is not to suggest that they should abandoned - instead we should appreciate that these phenomena can be flexed and rethought. Currently they are anchored by the accountability regime and research shows that many school leaders are conflicted as they comply with statutory demands that they are not entirely in sympathy with. Accountability is for public good, but education is being held to ransom by an ideology that only uses a simple metric for accountability – exam results – and this is distorting education. It is important to note that there is a counter argument against change, that subject knowledge is 'powerful' knowledge, which represents the best that has been thought and said in long lasting communities of scholars, that we know as subject disciplines. If students, especially from disadvantaged homes are not given access to this 'cultural capital' then they are being excluded from important life chances.

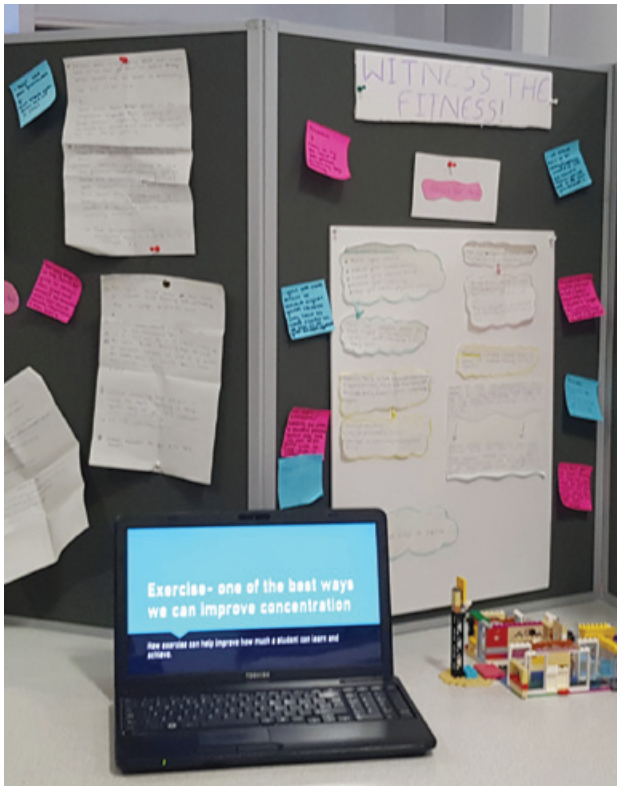
> I feel like this type of learning makes the information stay in your brain longer.
>
> **[Year 8 student]**

In some quarters PBL and powerful knowledge are presented as a binary choice, you must choose between them. This is a false binary. Anna Sfard's paper 'On the Two Metaphors of Learning and the Dangers of Choosing Only One ' (1998) is critical in this context. Sfard identifies the two metaphors as *Acquisition* and *Participation*. Acquisition refers to the processes that dominate the school system, mastering subject knowledge for examination purposes, while participation refers to learning from experience and application of knowledge, as represented in apprenticeship, outdoor education, performance art or indeed projects. The point of the paper is that there is greatest benefit in finding the marriage between the two. We would argue that subject knowledge becomes truly powerful when it explains the world and supports action in it, while at the same time raising the social and political consciousness of students (note that this does not mean any form of indoctrination).

PBL underpinned by powerful subject knowledge has many advantages for young people – motivation, collaboration, self-esteem, identity, self-regulation and agency (the ability to tackle the challenges in their lives). You will see evidence for this throughout this guide. The Ofsted inspection framework includes the following:

The school's curriculum is rooted in the solid consensus of the school's leaders about the knowledge and skills that pupils need in order to take advantage of opportunities, responsibilities and experiences of later life. In this way, it can powerfully address social disadvantage.

We will judge schools taking radically different approaches to the curriculum fairly. We recognise the importance of schools' autonomy to choose their own curriculum approaches. If leaders are able to show that they have thought carefully, that they have built a curriculum with appropriate coverage, content, structure and sequencing, and that it has been implemented effectively, then inspectors will assess a school's curriculum favourably.



It might appear risky to be taking the 'radically different approaches' BUT if you work in a strong network with good professional development the risk is greatly reduced. The EDGE foundation who have funded this report have national and international partnerships, which can access a plethora or outstanding resources and support. Local universities, not least Newcastle, provide a range of valuable support. The North East Local Enterprise Partnership are championing and supporting PBL, along with a host of employers and other organisations such as the Tyne and Wear Archives and Museums (TWAM). While schools operate in a competitive market for students there is great scope for collaboration which can turn the locality into Learning City (or Region). Many of you will be familiar with the African proverb that it takes a village to raise a child, capturing the sense that we have a collective responsibility for the education and care of the next generation. One can adapt this proverb for modern times and appreciate that it takes a community, a village, town or city to raise a child.

You can find scathing write-ups of PBL and they report a kind of truth – projects done without enough planning and professional support. Good projects change students' lives.

'GOING PLACES, MEETING PEOPLE, MAKING AND DOING THINGS'

At the heart of any enquiry/project based learning opportunity is the desire to create real-world projects that are underpinned by subject content/procedural knowledge, but which draw on the issues, expertise and resources in the local 'community' to give that knowledge a meaningful and therefore more engaging context. In addition, a project will encourage the development of social and cultural capital- providing students with the raw materials to construct more complex identities and inform their aspirations.

This may sound complicated, but it really doesn't need to be if you follow some key principles and build in the following when planning your project.

- **Student Agency**
- **The authenticity of the challenge/brief/question**
- **The authenticity of the outcome- a final product for a real audience**
- **The opportunity to go places (cultural capital)**
- **The opportunity to meet lots of different people (social capital)**

Student Agency

Fundamental to any project is that it draws on and develops your students' curiosity and creativity. This is achieved through the development of projects that will enthuse them but will also provide them with ownership over their learning. Lawson and Lawson (2013) refer to the concept of 'agentic engagement' (p.464) where students participate in learning opportunities that develop their engagement-related dispositions: cognition, emotion, behavior, and motivation' (p.462). To achieve this students need to develop the ability to direct their actions and learn to take responsibility for those actions. This will involve them making judgements and tricky decisions, operating in different contexts and, if necessary, not following the crowd.

Agency is not a fixed trait that people have. It is, to a large degree, developed if the environment allows it. We cannot expect young people to develop the agency that is needed to become a well-developed citizen, worker and family member, unless they have the opportunity to take the kind of responsibility made possible in projects. That will include opportunities to talk and discuss ideas, opportunities to take risks and make mistakes and explore why these occurred and importantly opportunities to work on things that matter to them.

Undertaking projects where students have greater ownership over their learning and decision-making and where teachers adopt a pedagogy that is markedly different from what is typically experienced in the classroom is an approach that students need to be prepared for.

Student Agency in practice: The Design Sprint

At the start of the project involving schools in the Northern Saints Catholic Schools Trust, three students were chosen by each school and asked to attend a meeting with teachers, external partners, and two external PBL facilitators, to discuss and decide on the themes of the project. The three students from each school then selected seven more students from their school, with no exclusion criteria – students could be from any Year (7-13) and of any ability and background. Interestingly several of the students chosen commented that they were surprised to be included as they had never been selected for this kind of extra-curricular activity before. The group of 30 students then worked in teams of mixed age and school. Speaking to students at the showcase event, one said that "working with different schools created a clean slate to work with new people and encouraged us all to take part", and it was clear that the groups had engaged with the process and enjoyed being able to direct their own learning and decide their own team name, project focus and content. One of the facilitators commented that "the lack of direct instruction allowed students to create their own processes and make sense of their own activities in ways that mattered to them."

In their evaluation of the DeLorean project, a Year 10 innovative pedagogical initiative that targeted the development of 21st Century learning skills, Grainger et al (2018) found that:

> ***"given the relative newness of this type of learning and possible lack of preparedness of students for its approach, some students expressed their frustrations. The freedom to choose their own project was particularly challenging for students. This is not an unexpected finding given that students generally have little say in the prescribed content of the school subjects they study. Students also found that their ability to work in groups and organise themselves was challenging." (p441)***

Just as you will need to build up your confidence and skills when developing PBL projects so too will your students. Further chapters in this guide will support your thinking and provide you with some practical ideas e.g. group work, peer assessment, keeping students on track, critique.

The authenticity of the project challenge and product

In order to develop agency it is important is to have a focus for the learning that is meaningful and relevant and which incorporates a *social-ecological conception of student engagement* (Lawson and Lawson, p.465). What this means is that when planning a project you should consider your students' interests, concerns, characteristics and their local community. So for example, projects could explore the science of climate change but in the context of local positive action **https://transitionnetwork.org/do-transition/transition-in-action/practical-projects/schools-in-transition/**, or they could involve a challenge being set by an external partner that is a real problem that needs addressing. For example Hexham Middle School worked with Northumbria Police Force Specialist Cyber Investigation Team to create a child-friendly version of the Computer Misuse Act 1990 that could be shared with other schools. This was a need that the Police had identified and an issue

"The work was interesting actually but it also mattered more as someone was going to see it, not just the teacher, and we didn't want to let each other down."

[Year 9 student]

that affects all people who use computers - young and old. The multi-media products that the students created in their computing lessons were to be judged by the Police Force with only the highest quality versions used by them in their wider work with schools.

This takes us neatly to the reason why it is important to create an authentic product that is showcased to an external audience. This needs to happen regardless of the scale or complexity of your project. Even if you are undertaking a relatively small-scale project, creating a product that your students know someone external to the class is going to see or experience will automatically put some pressure on thereby raising the quality of the work. If they are creating a presentation, an artifact, a design, computer programme etc. it could be showcased to the Leadership Team, parents and carers, or to other classes. You can even use protocols to ask the audience to provide feedback (see section 24).

Of course the moment community partners are involved this has the potential to raise the quality of the product even more, especially if there are organizational guidelines that have to be adhered to. For example at George Stephenson High School Year 7 students worked on a project with a focus on local history. They worked with the Great North Museum, which is located in Newcastle, to produce the content for an exhibition that would be on show to thousands of visitors. The students not only had to conduct the research, they also had to work to the museum's deadlines and take into consideration their guidelines with respect to fonts, text, accessibility etc. Only the highest quality panels would be allowed in the museum exhibition space.

The opportunity to 'go places and meet people' (the development of social and cultural capital)

STUDENT 2: it was nice to work with outside people instead of the same people all the time.

STUDENT 3: and get to meet new people.

STUDENT 2: you see other peoples' opinions and how they see things.

They had a great day and even if they don't like history, we hope it raised their aspirations. I mean, one of the girls on the day was obsessed with asking questions about living away from home and going out nightclubbing, but, you know, regardless, it was raising their awareness of another kind of life.

[Acting Head of History Ferryhill Business and Enterprise College]

Building opportunities into a project to go on visits and work with/meet people from different backgrounds has the potential to introduce students to new ideas, interesting places and an understanding of possible future study and employment pathways. As we mentioned in the introduction to this section these opportunities have the ability to provide students with the raw materials to construct more complex identities and inform their aspirations. The Ofsted Education Inspection Framework (2019) now acknowledges the importance of this when it states that inspectors will expect to see a broad, rich curriculum that equips pupils with 'the knowledge and cultural capital they need to succeed in life.' (p.43). Our recent experience demonstrates that inspectors are seeking evidence of this as the following email communication to us from a teacher who ran a project that involved visits to Newcastle university and work with an animator shows:

> We had Ofsted in last week. I was interviewed about Cultural Capital and enrichment. It was brilliant to be able to mention the projects we have done with [the university]….perfect for Cultural Capital!
>
> **[Head of Design and Technology]**

In the next sections within this guide we discuss all of these principles in detail and provide examples of them in action. Our planning materials will also support you to build them in whenever you design a curriculum project, at whatever scale and complexity.

▲ **Year 7 students go on a guided walk around Newcastle to learn more about the suffrage movement**

◀ **A parent comments on the work being undertaken by their child during the Cracking Cholera project**

CASE STUDY

A Tale of Two Sieges

PONTELAND HIGH SCHOOL

PBL Goes to University

National Curriculum subject content

Year 8 History: gain historical perspective by placing knowledge into different contexts; understand connections between local, regional and national history and between cultural, economic, military, political and social history.

Project summary

This project involved two schools, Ponteland High School and Newark Academy, who worked on a similar project plan but in their respective schools. Organised by the Special Collections Education Outreach team at Newcastle University, the Ponteland High School Year 8 students worked with Newark National Civil War Centre, Cap-a-Pie Theatre company, Time Bandits and Applied Comics Etc. The Ponteland students visited Newcastle University for a series of workshops and lectures on the Civil War, focusing on daily and military life, then spent a week off timetable incorporating their historical knowledge into the development of a play with Time Bandits and Cap-a-Pie Theatre Company based on the Siege of Newcastle. The students then travelled to Newark where they explored the National Civil War Centre and performed their play to their partner school.

Going places, meeting people, doing/making things

The project launch event involved a whole day visit to Newcastle University where the Ponteland students took part in a workshop on comics and historical illustrations, had a lecture from a history academic, and examined authentic artefacts in Special Collections and Archives. The Education Outreach team found that "touching artefacts brought history to life" for the students; the opportunity to work with creative practitioners and professionals was "a unique and enriching experience"; and "deeper learning occurred through a different style of 'fun' learning" (evidenced in videos produced during the process).

Embedding the key principles of PBL

1. *Student agency*: Students were given responsibility in selecting groups, developing the play and directing the content.
2. *Authenticity of challenge/brief/question:* This project was curriculum topic-based, but students were able to connect the Civil War to their own local area and current lifestyle. This increased the authenticity of the challenge and brief as they related the learnt knowledge to real life.
3. *Authenticity of outcome:* The plays produced were a combination of historical knowledge gathered in class and in visits to the museum and archives, and the students' perceptions of how the Civil War had impacted their current local area and modern life.
4. *Opportunity to go places (cultural capital):* Visiting Newcastle University provided a wealth of learning opportunities. Students had workshops and lectures with academics, visited the Special Collections archives within the university library, and were able to envisage what a student experience may be like on a city centre campus. The museum visit provided further cultural capital.
5. *Opportunity to meet different people (social capital):* Students met professionals from a variety of fields including academia, comic-writing, theatre and heritage.

Full case study is available at:
research.ncl.ac.uk/pblgoestouniversity/inspiringprojects/keystage3/ataleoftwosieges

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SECTION 3:

BROKERAGE: INSIDE AND OUTSIDE THE SCHOOL

If you are serious about doing PBL, then think seriously about brokerage.

If you are experimenting with or committing to PBL you are also committing to developing a more localised curriculum, rather than just following a national homogeneous curriculum. You are adapting your curriculum to the needs, opportunities and issues of the locality as well as global phenomena. To do that you need to *connect* to both the local and the global.

In business, a broker matches someone with a need or demand with an appropriate someone else who can meet that need or demand or vice-versa – with varying amounts of donkey work to make sure that the two parties are on the same wavelength. This brokerage role is essential in PBL bringing together the very different worlds of school and the world beyond the school gates. Brokerage addresses three important questions:

1. **What people, places and resources from outside the school will benefit the project?**
2. **What decisions need to be taken and action undertaken inside the school in order to make best use of those people, places and resources and give the project a reasonable chance of success?**
3. **Thinking longer term, can the project be sustained or developed in future years?**

However there are at least three issues to address:

1. **The sheer practical difficulty of finding the right person to access outside resources and communicating with them effectively;**
2. **Dealing with someone in a different organization, which has different purposes, language, structures, decision-making processes, rhythms, deadlines, timescales and resources;**
3. **Negotiating expectations and roles – who will do what, when and how?**

The other 'side' can seem like a different country. In one project, a community beekeeper volunteer reflected:

> ***Clearly I had a totally different one dimensional perspective on how school works and no-one with time or courage was willing to explain the system in school!***

But equally there are teachers who feel that they just don't know who is 'out there', who can help with their projects. Brokers are therefore critical in PBL as they play a vital role in surmounting these issues.

Four types of broker are evident:

1. **The internal school senior leader broker who gets the necessary support and decisions made in the senior leadership team;**
2. **The teacher or teacher assistant broker who does the practical work planning and organizing;**
3. **The external 'organisational' broker – such people occupy specialist roles in universities, large charities, government bodies and companies, and part of their work is specifically to work with schools;**
4. **The 'floating' broker – such people do not owe particular allegiance to any particular external organization and they have wide ranging networks that they draw upon.**

Much of the internal brokerage is fairly obvious and routine – based on the standard question stems of Who? What? Where? Why? When? How? Thus we get questions such as:

- **Who do we know that can talk about immunization in health care and disease prevention?**
- **What local businesses are involved in food production?**
- **Where can we put up an exhibition on tree planting?**
- **Why did they build the local Working Men's Club? Who did it and when was it built?**
- **How can we create a half day block for the students all to visit the supermarket supply hub?**

With these questions and many more, established school procedures will also come into play such as risk assessment, parental permission, cover etc. They all imply brokerage.

We are aware of a number of different models operating in schools deliberately using the rich resources of the community and locality. School XP in Doncaster has a dedicated role for finding contacts in the local area to support projects. In one primary, a grant was secured to employ a part-time community development officer to find and nurture both local business links and individual helpers for projects. In another primary a Higher Level Teaching Assistant had the job of connecting with or finding offers of help. In some secondaries it is left to individual teachers to do their own brokerage, which is a challenge on top of other duties.

Many readers will be familiar with the idea of **social capital.** This refers to the people you know, (family, friends and contacts) who you can call upon for information, help and support. Schools have social capital, usually through the contacts of individual staff. PBL implies that you go further, so that the school begins to identify its collective contacts, or social capital, and goes out to increase those contacts to underpin good projects. It should be mentioned too, that brokerage is not a one-way street, where you find people who can help you. The school and its students can do things for others, or respond to requests and thus take part in what is called **service learning,** whereby social action is undertaken for community benefit. (see sections 12, 13 and 20 for additional information)

At a larger scale brokerage can be seen as the connective tissue between organisations and individuals who promote and support learning. Although schools are often placed in competition with other neighbouring schools there are major advantages in strong networks between learning organisations (in which we would include museums, many charities, STEM and conservation organisations, arts and culture venues, local businesses and public services). Such networks make it easier for individuals to take up learning opportunities across their locality and move between them. This idea is evident to some degree in Bristol which is the UK's only **Learning City** (https://www.bristollearningcity.com/)

The current Ofsted School Inspection Framework offers the following grade descriptors for a **Good** judgement. Brokerage will bring you closer to achieving many of them.

- **The school provides a wide range of opportunities to nurture, develop and stretch pupils' talents and interests. Pupils appreciate these and make good use of them.**
- **The school promotes equality of opportunity and diversity effectively. As a result, pupils understand, appreciate and respect difference in the world and its people, including the things we share in common across cultural, religious, ethnic and socio-economic communities.**
- **Pupils engage with views, beliefs and opinions that are different from their own in considered ways. They show respect for the different protected characteristics as defined in law and no forms of discrimination are tolerated.**
- **The school provides pupils with meaningful opportunities to understand how to be responsible, respectful, active citizens who contribute positively to society. Pupils know how to discuss and debate issues and ideas in a considered way.**
- **Secondary schools prepare pupils for future success in education, employment or training. They use the Gatsby Benchmarks to develop and improve their careers provision and enable a range of education and training providers to speak to pupils in Years 8 to 13. All pupils receive unbiased information about potential next steps and high-quality careers guidance. The school provides good quality, meaningful opportunities for pupils to encounter the world of work.**

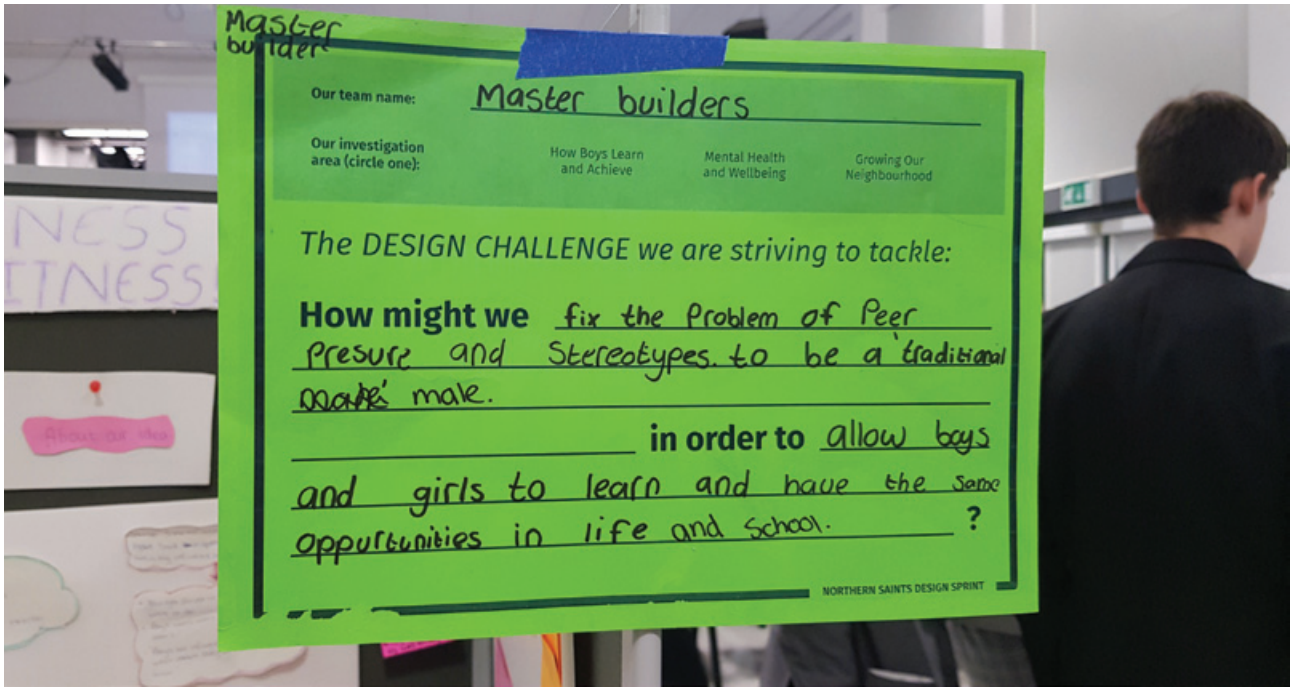
SECTION 4:

PLANNING WITH CONFIDENCE – MITIGATING RISK

Taking part in PBL, whether you have no experience or lots of experience, is inherently risky. When you are starting out and you are unfamiliar with the approach and corresponding pedagogy it can create mixed feelings of excitement and fear as you step into the unknown. But even as an experienced PBLer when you begin to give your students greater ownership of the project; when you work with external partners to plan; or hold an exhibition in a very public space, this creates risk and therefore maybe just a little bit of anxiety! Just read what this Head of Sixth Form said about creating a final product that would go on a public website.

Research has long shown that anxiety when taking risks with your teaching is normal. In her article about teacher perception of risk Le Fevre (2014) explains that it is related to the move away from 'ontological security' i.e. *the* ***departure from*** having a sense of ***continuity*** in relation to your self-identity and ***the constancy*** of your surrounding social and material environments (p.57).

> I think it was just wanting it to work, I didn't want to have these employers coming in and to have the involvement with the Northeast LEP and the promise of it, potentially, you know, the PowerPoints going on the website or whatever and to get to the end of it and feel like, oh god, the resources aren't good enough. And I think that's it. You know, that sounds critical or negative. And I don't mean it in that way. I think I just wanted. I wanted it to work out so well.
>
> **[Head of sixth form]**



So what is the answer? Things to think about and resources that can help you

Having that time to plan is essential

[Fitzalan High School teacher Curriculum for Wales blog post]

1. Make time for planning.

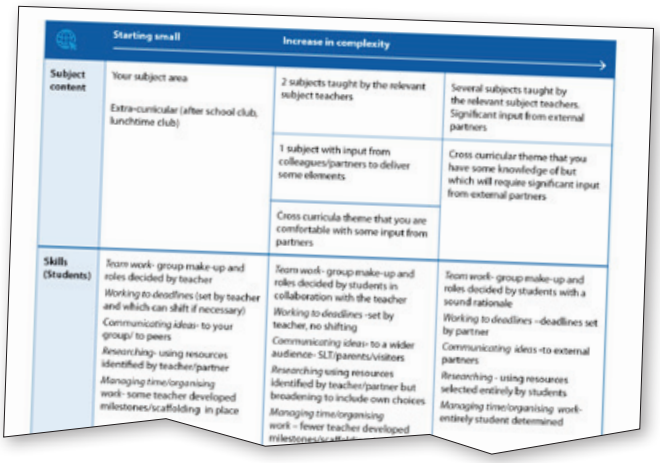
If there is one thing we have learnt working with teachers on PBL is that you need to make time for specific planning and that this needs to be started many months before you intend to actually run your project. This time is clearly linked to both the ultimate success of the project but crucially also to how confident and supported teachers feel as it progresses. In the most successful case study projects that we highlight, the teachers had developed detailed plans and timetables at the start (see Part 2 of this guide) but had made allowances for possible 'changes of course' and 'tweaking' (see section 23).

2. Plan projects at a manageable level that develop your PBL practice and that of your students, thereby building your confidence and theirs.

Even with the best will in the world, people can tend to adapt things to make them fit with something that feels more comfortable without really changing much about their practice."
[Humanities teacher]

It is important to plan a project that is manageable but also develops your PBL practice and that of your students. You want to take risks so that you don't just do what you always do, but not so many that you feel overwhelmed and out of control. As one teacher put it you shouldn't 'plan the risk away'
[Business Technology teacher]

In order to support you to do this we have produced a tool that is intended to help you think through building your skills in a systematic way (see page 20). We have broken down the principles and characteristics of PBL into levels of complexity that begin with the concept of a 'Starting Small' project and end with a 'really going for it' type of project. You can decide whether to develop projects that build systematically in complexity, or you can develop a project that has elements of all of the different levels. For example you may plan a project that is only in your subject area (less complex) but which is planned completely with external partners (very complex).



3. Discuss your project plan with others.

No matter what scale of project you undertake, it is always beneficial to discuss your planning with others. Articulating it not only helps you to think through the ideas and practicalities, it may also introduce you to different ideas and challenges that you hadn't thought of. If you plan a project with colleagues and external partners from the start this is likely to occur naturally. If you are planning largely on your own then we would recommend talking the plan over at the very least with some colleagues and if possible some students.

A protocol that is incredibly useful to support the discussions whatever scale of project, is called 'Project Tuning'. This was developed by High Tech High in the USA and is used by all of their staff. It is a process that we have used many times with teachers and its impact has been profound. It may seem time-consuming in the first instance but the rewards are worth it. Crucially the protocol provides a clear, time-bounded structure that keeps feedback concise and helpful. Because we consider the process so valuable we have include a more detailed discussion in Part 2, Section 19.

If you would like to hear some teachers talking about the benefits of planning together, we would recommend watching the video of the teachers at Fitzalan High School in Wales discussing how they worked together when developing cross-curricular approaches throughout the school.

Go to the 24th February 2020 Curriculum for Wales blog post: 'Trialling cross-curricular approaches'
https://curriculumforwales.gov.wales/page/2/

4. **Accept that both you and your students will feel anxious as you embark on this new way of working.**

Feeling anxious when you undertake a PBL project is understandable. You will be doing something new and using a pedagogic approach that means you won't have quite the same control over the learning in the classroom as you usually do. What is important to recognise though is that your students may well feel similar anxiety at this new way of working. In a fascinating piece of research conducted by Jean Ruddock back in the 1980's, she found that when students were faced with a new pedagogy that took them out of their comfort zones, this often led to tensions which made them yearn to 'reinstate the familiar, the comfortably predictable.' (1980 p.142). Crucially this led to some working 'against change' (p. 142) which in turn impacted on the success of the innovation. Ruddock proposed solutions to this that included:

- teachers providing concrete examples of the new way of teaching and learning so that the students would see the approach in action
- dialogue about managing it together.

Although you will not find an example of a project that exactly matches how you intend to work, there are plenty of videos available that will enable to you to talk through some of the principles and characteristics of PBL. The example below is provided by PBL Works and could provide a useful starting point.

The Water Quality Project
https://www.pblworks.org/video-water-quality-project

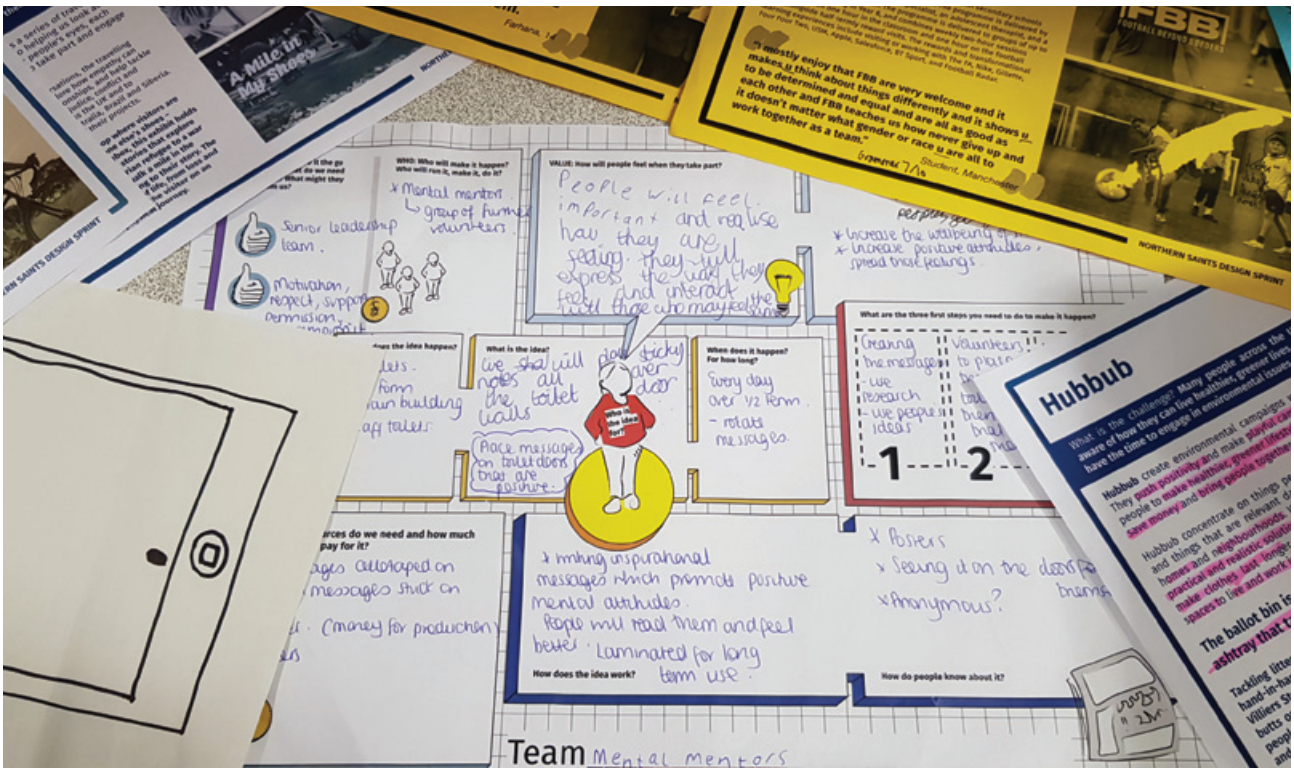
In terms of developing meaningful dialogue about PBL we are providing two frameworks that could help you to structure this.

Framework 1: Introducing innovative pedagogy to students

Content	Questions to structure the dialogue :
Rationale	*Why is the school/teacher introducing the pedagogy? What are the benefits for the students/teachers/ school?*
Process	*What are the skills, dispositions, rules we will need to know? What is expected of the student and teacher? – Is this different from what I have experienced at school to date?*
Tensions	*How will this new pedagogy make me feel? Are there aspects that may cause anxiety or stress–for example assessment, changing relationships, new classroom norms?*
Support	*What help can I expect? When and where can I ask questions/raise concerns (particularly if I feel anxious)?*

Framework 2: Characteristics of meaningful dialogue

Characteristics		Creating meaningful dialogue- example questions
Open/ respectful	The creation of a classroom community in which the opinions of all the participants- teachers and students- are openly discussed and where different perspectives are respected.	*What are your views about what we are doing?* *Why do you think this?* *Do others agree/disagree?* *How can we resolve any conflicting agendas?*
Continuous and reflective	The dialogue should involve continuous reflection on and reviewing of the pedagogy in action.	*What do you think of the teaching and learning experience so far?* *What is working well, not so well?* *How can we improve things?*
Proactive	The opinions of the students, as they take part in this open, dialogue must be engaged with and where possible acted upon.	*What were the opinions expressed by members of the class and how have these been addressed?* *If they haven't been, what are the reasons for this?*



Structuring the tasks you create and assigning roles to your students as they work in groups will also scaffold the PBL experience, thereby lowering its riskiness. As your skills and knowledge of PBL develop over time, this scaffolding can be reduced. Use the 'Building your confidence' tool at the end of this section, to help you consider the level of scaffolding you require.

5. Embrace 'going with the flow'.

One of the key things to do when planning your project is to accept that it may evolve in unexpected ways. As the PBL lead teacher at one school we worked with stated "*You need a plan with PBL but you have to be flexible with it. Be prepared to go off piste!*" There are a range of reasons why your project may change course. Some changes may purely impact on timings e.g. visitors unable to come in, events at school taking precedence; but some may occur because of the students' interests, the work with external partners etc. which results in more fundamental changes to the project content.

6. Think through some of the risks.

To a certain extent the very act of thinking through potential risks at the start means that you will be developing a mind-set that will enable you to be more flexible. Of course you can't predict everything but it should settle some of your apprehension. Ask yourself the questions 'What might happen?' and 'What will I do if it does?' Some of the things that cropped up with our project teachers were:

- In the **Amazing Careers project** , it was decided by the staff involved that the Year 12 students needed to trial the teaching resources they were producing with some Year 8 classes in order to ensure they would work. This resulted in additional time having to be added to the overall project.
- In the **Maths and Architecture project** , the task set by the architect required the teacher to teach her students specific aspects of the maths curriculum that were not usually taught at that point in the academic year. She only became aware of this once the students got going but she was able to adapt quickly to their needs.
- In the **Food and Nutrition project** , the students were offered the opportunity to have an extra session at the Ministry of Food, to cook for a guest visiting the Beacon of Light School. The teacher had not factored in this extra time but it was too good an opportunity to waste. The pandemic then closed the college, which meant that his planned showcase (cooking for the other students in the refectory) could not go ahead, so instead the students worked online remotely to create diet plans and recipe packs for the "clients" they had met earlier in the project.

PBL: Levels of Complexity

	Starting small	Increase in complexity →	
Subject content	Your subject area Extra-curricular (after school club, lunchtime club)	2 subjects taught by the relevant subject teachers	Several subjects taught by the relevant subject teachers Significant input from external partners
		1 subject with input from colleagues/partners to deliver some elements	Cross curricular theme that you have some knowledge of but which will require significant input from external partners
		Cross curricula theme that you are comfortable with some input from partners	
Skills (Students)	*Team work* – group make-up and roles decided by teacher *Working to deadlines* (set by teacher but can be shifted if necessary) *Communicating ideas* – to your group/ to peers *Researching* – using resources identified by teacher/partner *Managing time/organising work* – some teacher developed milestones/scaffolding in place	*Team work* – group make-up and roles decided by students in collaboration with the teacher *Working to deadlines* – set by teacher, no shifting *Communicating ideas* – to a wider audience – school leaders/parents/ visitors *Researching* – using resources identified by teacher/partner but broadening to include own choices *Managing time/organising work* – fewer teacher developed milestones/scaffolding in place	*Team work* – group make-up and roles decided by students with a sound rationale *Working to deadlines* – deadlines set by external partner *Communicating ideas* – to external partners *Researching* – using resources selected entirely by students *Managing time/organising work*- entirely student determined
Planning	Largely by yourself, but with input from some colleagues (e.g. via project tuning – see section 18)	With colleagues (different subjects/ year groups/schools) from the start, some input from external partners	With colleagues and external partners from the start
Student agency	Students able to follow own interests/ideas within parameters set by the teacher/partner e.g. teacher determines product, showcase and some content	Students able to follow own interests/ideas within scope of the project in terms of products/ showcase e.g. teacher determines product type and showcase but no input on content	Students determine entire project focus, product and showcase And/or Students determine entirely own response to a brief/challenge set by teacher or external partner
Product	Can be created in the lesson and does not require additional resources	• Requires additional resources • May be created in a different lesson in order to raise the quality e.g. A science project about climate change has a presentation as a final product. The research is done in the science lessons, a multimedia presentation is made in computing	• Requires financial resources • May be created in a different lesson in order to raise the quality e.g. art, D&T, music, computing • May be created in collaboration with the partner
Showcase	In school: for other classes, in assemblies	Local venue: library, community centre, local shops Wider school audience: leadership team, parents/carers	• Planned with the external partner • Public visible regional/national resource e.g. online, civic centre, museum, university, business

SECTION 5:

POWERFUL KNOWLEDGE AND PROJECT BASED LEARNING

Julie McGrane and Anne de A'Echevarria

You may not be old enough to remember *Jackie* magazine, but the questions were typically designed to elicit whether you were ready for love! The tongue in cheek questionnaire below invites you to question whether PBL is a 'bolt on' to your curriculum; something that enhances and enriches, or whether it is embedded; a pedagogical approach specifically designed to develop powerful knowledge.

In the current English educational context, standards, including 'knowing more, remembering more and being able to do more' are not only a key accountability measure; it is fair to say that without exam success pupils' choices about their next steps are limited. So regardless of our educational ethos, a school must deliver these outcomes. Is PBL in your setting, therefore, primarily an antidote to a knowledge-rich, standards based curriculum; a respite from relentless retrieval practice, or are these authentic learning experiences intended to help develop powerful knowledge and agency?

AN EXCITING PBL COMMUNITY LEARNING OPPORTUNITY PRESENTS ITSELF. DO YOU:

A. Say thanks, but no thanks, I've got too much on my plate already.

B. Invite the geography club to try this as a fun project to do at lunchtime.

C. Look at it and consider how it could help you deliver the content of your geography curriculum.

D. See opportunities for pupils to learn essential content and spot that it's a great chance to develop pupils understanding of geography's 'big ideas'.

YOU'VE BEEN TO A CPD SESSION TO LEARN MORE ABOUT PBL. THE APPROACH IS MORE COMPLEX THAN YOU FIRST THOUGHT. DO YOU:

A. Decide it's too complex: 'no one at school will want to help'.

B. Decide to read more then chat it through with your line manager.

C. Ask to feed back at the next curriculum team meeting and offer to pilot a project next term.

D. Before you're off the bus you've emailed the local Asylum Seeker charity and have meeting set up for next week.

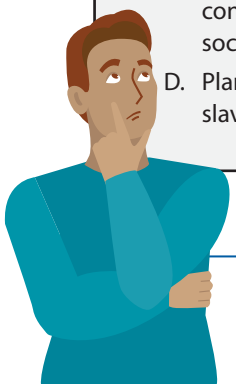
YOU'RE BORED OF TEACHING MIGRATION. WEST SIDE STORY'S 'AMERICA' HAS RUN ITS COURSE! DO YOU:

A. Get on twitter, there just isn't time to write a new unit of work yourself with everything that's going on.

B. Get pupils into groups and assign each one a different type of migration to study before presenting their findings to the rest of the class.

C. Assign your next curriculum meeting to work together on a PBL project which will teach the necessary content knowledge but will also help you implement two of your curriculum intentions: locally relevant and socially responsible.

D. Plan a meeting with the PHSE coordinator and history curriculum lead – you know that refugees and the slave trade is on their curriculum while you're doing migration.



HOW DID YOU SCORE? FIND OUT OVERLEAF...

MOSTLY As

Mission aborted! PBL is not for you – it's clearly a step too far.

MOSTLY Bs

One small step! You can see potential and it's sensible to take a cautious, considered approach. PBL can be a big commitment and so going in with your eyes wide open is a good idea.

MOSTLY Cs

You're fired up! You can see that PBL has the potential to help deliver the demands of the curriculum while giving pupils agency about issues and agendas that matter.

MOSTLY Ds

Blast off! You are thinking beyond the normal secondary school curriculum conventions. PBL is only just the beginning.

Having completed the questionnaire, none of you will, I suspect, be 'Mostly As' but there will be days, nevertheless, when you feel embarking on a project of this type is one step too far. Navigating the demands of teaching in the midst of a pandemic or at the peak of report writing season can compromise your capacity to take on anything new. Doing PBL well requires time to plan, implement and review so it's worth asking whether you have the capacity to give it your best shot rather than make a limited attempt which is unlikely to give a reliable account of impact. Others might be attracted to its potential to engage and enthuse pupils but because of real or perceived curriculum pressures, it remains a bolt on. To maximise the impact of PBL and secure a place for it within your subject or wider school curriculum it is worth considering how PBL can help pupils acquire, retain and apply subject knowledge and facilitate disciplinary thinking.

In this section we want you to think about:

- **What constitutes knowledge in your subject discipline and how can PBL help to develop it?**
- **Why and when might you need to teach knowledge during a project to ensure pupils can deploy it to deepen their understanding further?**

What is knowledge?

There has been a marked shift in education policy and practice in recent years towards the importance of subject knowledge and the delivery of a 'knowledge rich' curriculum. The development of generic skills and competences and the blurring of subject boundaries is now somewhat downplayed in favour of gaining essential knowledge through a curriculum framed by traditional subjects. This emphasis is echoed in the new Ofsted Framework which talks about rebalancing inspection to make sure that young people are being taught 'the best of what has been thought and said'.

? ***When designing a PBL project, ask yourself: What knowledge: substantive, procedural and powerful, do I want pupils to develop through this project?***

? ***What is your own conception of a 'knowledge rich' curriculum? What is this 'essential knowledge' as it relates to your subject area?***

Theorists such as Michael Young have been particularly influential in their insistence that schools should be 'bringing knowledge back in'. However, most of those who have called for the school curriculum to give young people access to rich knowledge or 'powerful knowledge' as it has also been termed, are not merely reprising old arguments about 'knowledge' vs. 'skills', or 'theory' vs. 'application'. In Young's so called, 'Future 3' curriculum, knowledge and skills are not opposed, but connected; integrated within systems of thought that are discipline based. The knowledge to be taught is not merely substantive (knowing what) but integrated with a subject's disciplinary or procedural knowledge (its 'know how').

Let's take the example of history. If students are to be given access to genuinely 'powerful knowledge' (see fig. 1 below) this must involve discovering the tools of a particular subject domain - the **concepts, skills and procedures** that will enable them to think historically and engage with, rather than merely consume, subject content. They will be introduced to **procedural concepts** such as change, causation, perspective, significance, evidence and interpretation which underpin the majority of historical questions. Exploring these concepts will challenge misconceptions and open doors into new ways of thinking about the subject. They will learn about the **process** of devising and investigating historical questions of their own, how to use evidence and reach conclusions. These are the conceptual tools needed for the study of the past as a discipline. They are 'powerful' in terms of what they enable students to understand and do:

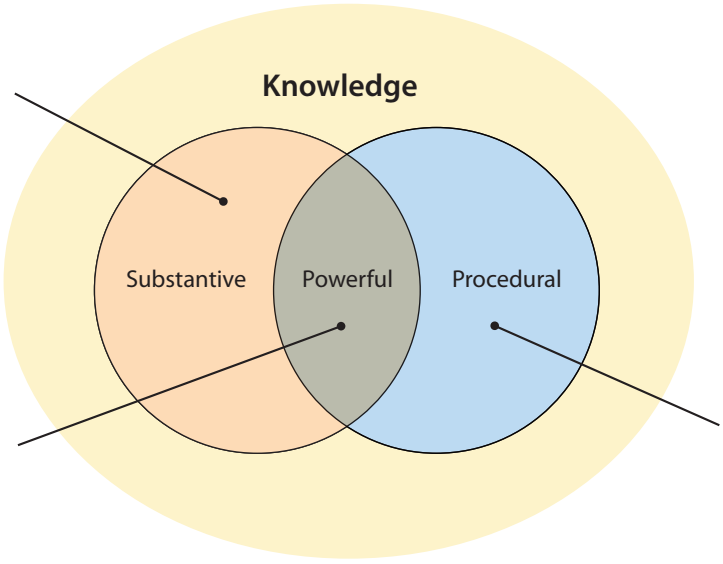
1. students gain **power over their own knowledge**: they develop understanding of i) how to acquire/make sense of/evaluate claims about knowledge; ii) how knowledge is developed and tested – *How do I know this? and how reliably do I know it?;* iii) the skills/ language of reasoning needed to generate and test their own arguments as well as those made by others.
2. Students develop the **capacity to participate**: they develop i) the conceptual tools, language, critical thinking skills they need to follow, participate in and influence debate; ii) the capacity to be critical of the opinions of the powerful, and to challenge the dominant sources of information in our society, to be independent thinkers.
3. Students develop **empathy for diverse peoples, cultures and world views** through the habit of attempting to see the past in its own terms and understand the perspectives of historical actors by thinking about the context in which they lived and the world-views that influenced them at the time.

What key procedural concepts underpin learning in your subject area?

As another example, let's now take Geography. While in History there is greater consensus about the procedural concepts which underpin historical enquiry there is no definitive list among the Geography community. There is, nevertheless, common ground: place, change, causality and interactions for example, underpin a Geographer's understanding of the world.

Substantive knowledge is the content teachers teach as established fact.

Specialised knowledge that gives students the ability to think about and do things that otherwise they couldn't – to engage in disciplinary thinking, discourse and practice.



..shapes the way in which the 'stuff' or 'substance' is understood, organised and debated, as well as the ways in which it is actually generated. Refers to the concepts and skills that capture what is at the heart of a given discipline.

Fig. 1 ***Powerful Knowledge*** *– a combination of the substantive and procedural*

Exploring these concepts helps Geographers better understand the physical world and human interaction with it and, understanding these interactions, better enables them to protect it, exploit it, manage it and marvel at it. This understanding emerges from study in the field and thus Geographers must be adept at the *procedure* of fieldwork and the skills required to conduct an investigation of this nature: cartographic, graphical, statistical and enquiry for instance. Knowledge becomes powerful as Geographers combine their substantive knowledge: the learned content, with the procedural: the big ideas, or concepts, that help them see patterns, trends and connections.

When they have both, this knowledge gives pupils:

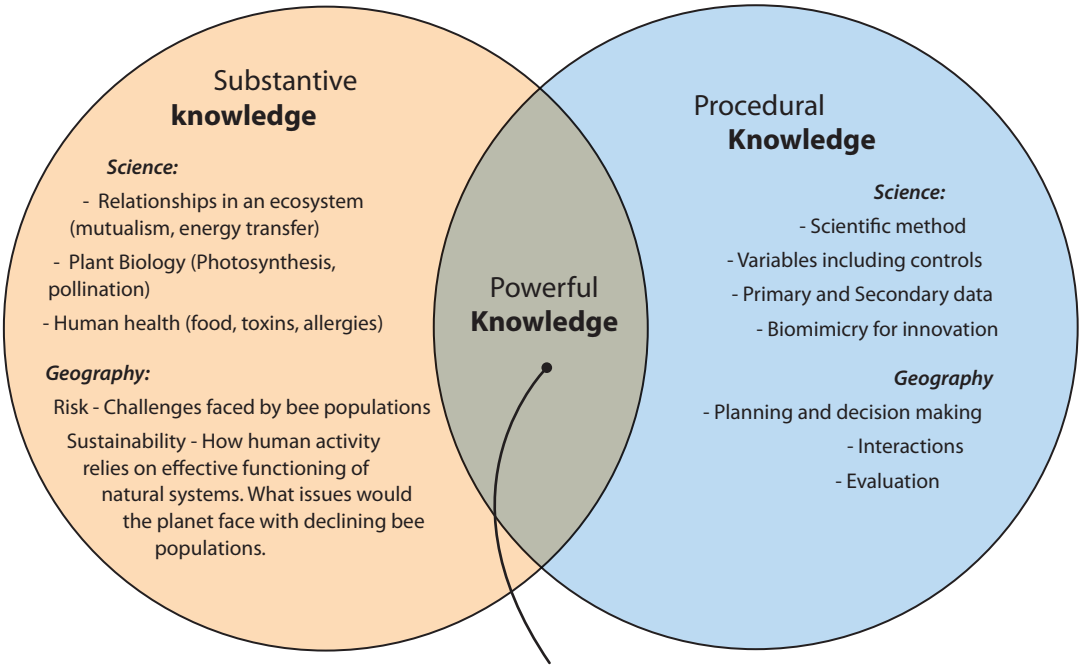
1. **power over their own knowledge**: they understand how to use the skills/language of fieldwork, enquiry, reasoning and problem solving to investigate geographical processes and issues, articulating persuasive explanations or solutions.
2. a strong sense of **citizenship:** committed to the duties, obligations, and functions that comes with being a good local and global citizen.
3. **agency** - a willingness and ability to take action to promote social justice, or environmental protection for example.

Integrating Powerful Knowledge within PBL – a case study

The Pele Trust is a MAT comprising one secondary school and five primary. A small-scale PBL pop-up project on Bees at Newcastle University aimed at disadvantaged Year 10 pupils in 2019 whetted teachers' appetite for PBL and was the first step towards developing a cross-curricular focus on bees that would bring together scientists, geographers and artists. After a pilot in 2019, coronavirus, surprisingly, accelerated engagement in stage 2 of the project: a transition project which saw Year 6 pupils across five feeder primary schools Zooming with beekeepers in Tuscany, Tresco, Cumbria, Northumberland and Newcastle to learn more about bees. Those pupils who moved on into Year 7 at the secondary school then continued to learn about bees in Geography, Art and Science. Dr Yates, biologist and head of key stage 3, made a short introductory video for Year 6 pupils to describe what they'd be learning about when they got there: (https://www.youtube.com/watch?v=LZuSw4fHlFQ).

Until now, this work has had a shared topic focus (bees) but has not adopted a multidisciplinary project approach. Now, however, teachers have recognised the potential of working on a shared project designed to help pupils develop both subject specific and inter-disciplinary knowledge by planting a meadow to create forage for pollinators on the new school site.
Given the current coronavirus restrictions teachers have chosen to work with an interested group of Year 8 pupils as a bolt on. This, we hope, will provide an opportunity for teachers to gain confidence in this pedagogical approach and see its potential for developing powerful, interdisciplinary knowledge (see Fig. 2 on the next page) on a larger scale, post pandemic. The project is likely to have three aims:

1. **Develop capacity for teachers to plan and lead a knowledge rich cross-curricular PBL project themselves.**
2. **Evaluate the impact of 'authentic work' on pupils ability to 'know more, do more and remember more' - promoting powerful knowledge.**
3. **Enable pupils to influence actions taken by policy makers and stakeholders.**



1) Power over their own knowledge: pupils learn how to work scientifically and use fieldwork techniques to make a case for planting a local meadow rather than generic commercial seed.

3) Agency – Environmental responsibility: influence planting scheme at new school site to ensure maximum ecological benefit.

Fig. 2 ***Developing powerful knowledge*** *through PBL at the secondary school*

To achieve the powerful knowledge shown in Fig. 2 the teachers in our case study example will need to draw on a range of pedagogical approaches in order to make knowledge available to pupils.

Fig. 3 below provides examples of the knowledge building strategies you might find useful when considering how best to engage pupils with substantive and procedural knowledge.

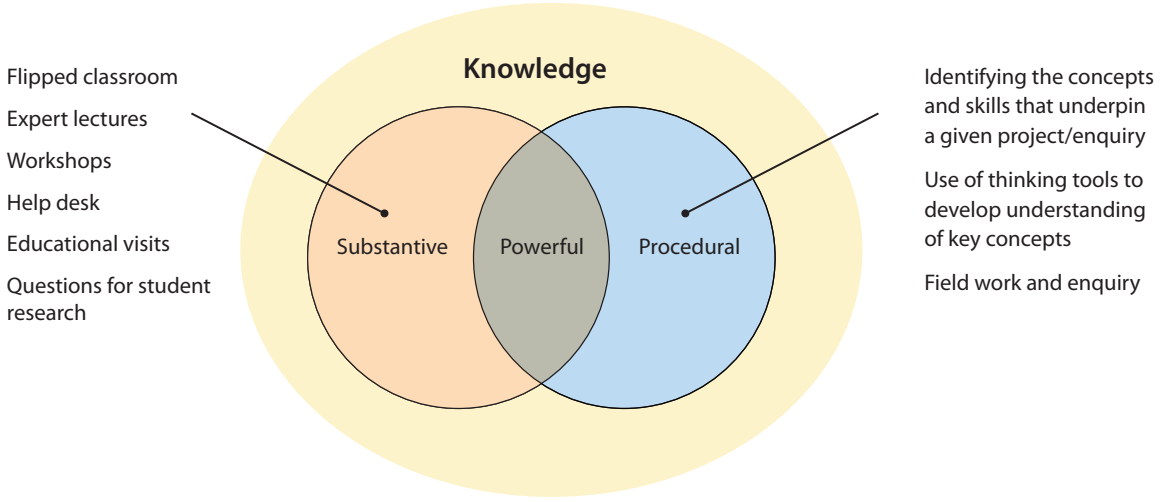


Fig. 3 ***Knowledge building strategies***

When might you need to teach knowledge during a project to ensure pupils can deploy it to deepen their understanding further?

While PBL is a pedagogy by which pupils can develop knowledge, not all knowledge needs to be discovered anew. To get depth and rigour from a PBL project it is likely that pupils need to be taught some substantive knowledge upon which they can build. They will also need support to develop procedural understanding and skills. Some pupils will be sufficiently skilled and inquisitive to seek this out for themselves sooner than others, but often teachers or partners will choose to impart their expert subject knowledge or expertise. Fig. 4 demonstrates this is action, drawing on examples from the Bee project..

Some decisions regarding when to use knowledge building strategies to inject some much needed information may be done at the project planning stage, based on previous experience. However, once a project is underway, decisions will also be based on an ongoing interplay between the teacher's professional judgement and the students' own assessment of their needs. An expert lecture, workshop or skills session, for example, can be injected on the initiative of any of the project stakeholders - teacher, students or community partners. It is likely that, as students become more familiar with the PBL approach, and more skilled in the disciplinary thinking and skills underpinning a given project, they will begin to take greater responsibility for the development of their own expertise. Across a given class, the questions asked and the paths they choose to take - when given the freedom to do so - are likely to become increasingly divergent. In this context, the teacher will be able to - indeed will need to - adopt the more facilitative role of a knowledge broker (fig. 4).

Emphasising and enabling students to develop both the substantive *and* the procedural knowledge underpinning a particular subject will build initiative and independence over time. It can be seen as a process of 'opening doors': giving young people knowledge that they can ultimately use to participate in society: to make decisions for themselves and their families; to engage in community action; to follow and to join political debate. Under this conception of knowledge, students are challenged to see knowledge not as something fixed and unchanging, but dynamic, socially constructed, provisional and open to question - their questions.

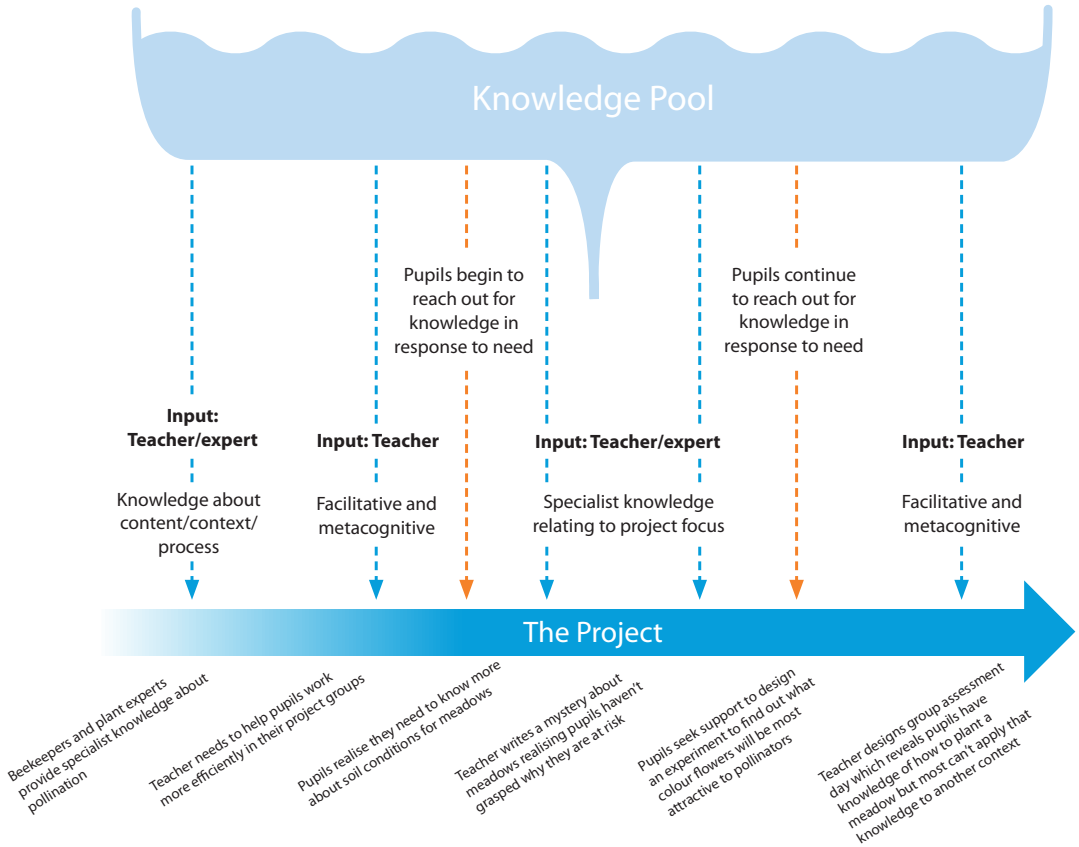


Fig. 4 ***Engaging with what is known***

SECTION 6:

DEVELOPING TRANSFERABLE SKILLS FOR FUTURE EDUCATION AND EMPLOYMENT

"Education is the kindling of a flame, not the filling of a vessel." – Socrates

Transferable or generic skills are useful across different subjects and employment contexts (Bridges, 1993) and include communication (written and verbal), interpersonal and problem-solving skills, learning how to learn, personal and professional development, amongst others (Washer, 2007) (Carvalho, 2016). PBL actively involves students in their own learning, and studies have shown that the enquiry process that they engage in is effective in promoting learning outcomes including deep thinking, the ability to apply knowledge, and reasoning skills compared to a traditional didactic approach (Chu, Tse & Chow, 2011).

These so-called "soft skills" such as problem-solving, self-directed learning and collaboration are in great demand from employers (Abraham & Karns, 2009; Rubin & Dierdorff, 2009). The Gatsby Good Career Guidance Benchmarks (2014) recommend that "Every pupil should have multiple opportunities to learn from employers about work, employment and *the skills that are valued in the workplace*". The changing nature of the workplace, due to globalisation, digitalisation and global crises such as the 2020 pandemic, has an impact on the skills required for the 21st century job market.

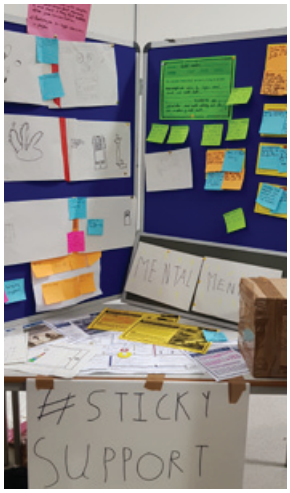
> ***"The acceleration of technological advancement has made digital literacies essential for people in this information age (Black, 2009). Globalization, too, has reshaped organizational and professional operations across the world, towards becoming more knowledge-based, geographically mobile, and collaborative in nature (Dunning, 2000). Meanwhile, machines have increasingly taken the place of the human workforce in tasks that involve routine cognitive and manual input. Consequently, the labor force is now hiring people for jobs that require more analytical thinking, digital skills and sophisticated communication skills (Levy & Murname, 2012)."*** (Chu et al, 2016)

> We're not used to working as a team - we weren't that good at it - but the lady said that team work was really important in her job so I'd like to do more. I think we need to just, like, talk to each other more, make more suggestions and divide up the work more
>
> **[Year 9 student]**

Carvalho (2016) notes that student satisfaction is increased as skills noticeably develop. Contact with real businesses and industries is vital in the PBL process, as students have the opportunity to see the inner workings of an organisation. They can envisage their furture working lives, and have a better grasp on the skills required to follow their chosen career path.

Many of the projects we have supported during the PBL Goes to University research have focussed on the development of transferable skills. The Northern Saints Design Sprint allowed pupils to choose their own group members; different year groups from three different schools were encouraged to collaborate, make their own decisions and choose roles without the direct intervention of a teacher or facilitator. The teachers worked alongside the groups in a more equal setting, and several pupils (not just the oldest) demonstrated strong leadership skills in directing their group members. Throughout the week, there was an emphasis on the development of problem-solving, reflection and creative collaboration. On the final day, group presentations to invited guests meant the pupils had to demonstrate listening, presenting and feedback skills.

The feedback from the students at the end of the Design Sprint was overwhelmingly positive. In terms of the learning, they felt they learnt better, their problem solving skills were developed throughout and that these could be used in actual school scenarios. The alternative and challenging activities encouraged creativity. The students felt that it was easier to participate and enjoyed the responsibility to lead on the activities. The lack of direct instructions allowed the students to create their own processes and make sense of their own activities in ways that mattered to them. The relationships between the teachers and students during the week were altered as the teachers worked almost as peers alongside their students, with the usual boundaries blurred. Students felt they were treated like colleagues, not children, no matter what age they were, and considered the teachers to be adults rather than staff as there was mutual respect rather than authority.



Though the students felt the Design Sprint had benefitted them on personal levels, it is worth noting that this was a cross-curricular project which did not involve learning specific curriculum content. Feedback from the teachers was more mixed with most teachers involved stating they would have liked a more collaborative structure and co-construction between students and staff within the project. This chimes with Carvalho (2016) who found that active learning and self-directed approaches still require close instructor supervision and careful management if their potential is to be realised (Pepper, 2010; Vardi & Ciccarelli, 2008). As with all aspects of learning, skill development also needs to be scaffolded.

> "I've really enjoyed this week, I usually find it hard to make friends but we've really gelled as a group even though we're different ages"
>
> **(Year 7 student)**

CASE STUDY

Northern Saints Design Sprint

ST. WILFRED'S, ST. JOESPH'S AND ST. BEDE'S RC COLLEGES

PBL Goes to University

Project summary

The Design Sprint had two aims. Firstly, for students to design 9 projects that aim to tackle one of the three topics; How Boys Learn and Achieve, Mental Health and Wellbeing, and Growing our Neighbourhood. Secondly, to create a space for teachers and students to experience and reflect on the skills and capabilities required for Project Based Learning. Over the week, Northern Saints embarked on a process of Project Based Learning for Social Change. Over five days, mixed teams from across all three schools and across year groups collectively defined challenges, found opportunities for innovation, and came up with brand new solutions to these real world challenges. Each of the 5 days were broken up into the following five stages and introduced students to a new way of working; Collaborating, Ideating, Relaxing, Prototyping, and Mobilising.

Skill development

- Teamwork and leadership skills
- Listening and feedback skills
- Working independently and in a group
- Developing a collaborative idea and creating a final product (interactive presentation)
- Communicating ideas to an external audience and presenting a final project outline
- Developing confidence and respect for others

Cultural capital

Students worked on the development of communication skills and social skills by collaborating with students and teachers from different schools within the Trust and different age ranges. Students were able to engage in challenges that directly affected them and offered them the space to do something about it. The creative processes also allowed those who struggle with other elements of the school system to find their form of contribution; for example, using Lego to describe abstract thought and embracing the ethos of 'no right answer'. The blend of different age groups would equate to a multitude of interpretations of activities and conversations spanning wider fields.

Project activity and timescale

Initial Meeting	Design Sprint Day 1	Design Sprint Day 2	Design Sprint Day 3	Design Sprint Day 4	Design Sprint Day 5
Three chosen students, selected teachers and local employers attended an initial training meeting.	Collaborating: share thinking, ideas, and perspectives around social challenges.	Ideating: collectively develop ideas and widen imaginations about what's possible to explore their challenge.	Relaxing: let ideas 'percolate' and to create a reflective space for their learning to sink in.	Prototyping: test ideas in cheap ways in order to iteratively fail quick and learn fast from feedback and critical reflection.	Mobilising: articulate learning and investigations into an exhibition and presentation that aims to energise an audience.

"The lack of direct instruction allowed students to create their own processes and make sense of their own activities in ways that mattered to them."

(Facilitator)

Full case study is available at:

research.ncl.ac.uk/pblgoestouniversity/inspiringprojects/searchbytopic/cross-curricularprojects/northernsaintsdesignsprint/

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SECTION 7:

DEVELOPING YOUR HOOK QUESTION

Planning your questions: Encouraging the development of powerful knowledge

Australian Head Teachers Brett Millott and Paul Kenna (2017) have been using a form of PBL/Enquiry Based Learning called SOLES (Self Organised Learning Environments) as the basis for projects for many years. They have honed their approach to planning projects and this has become part of the induction process for new teachers coming to their schools. What they have been anxious to do is move teachers on from developing superficial or low-level project questions which result in 'finding simple facts'; rather they seek to develop the capacity of their teachers to ask higher order questions which demand greater cognitive effort on the part of their students. It is through doing this that students move from the accumulation of facts, to learning to apply them and form opinions about them, thus developing the powerful knowledge that we discussed in section 5.

The example below demonstrates the hierarchy of questions that Millott and Kenna have developed to support their teachers as they plan, and which we have applied to a potential project to help explain it.

Inquiry Stage or question	Examples	Comments
Hook Question	What does it take to run a half marathon?	The question to start thinking and initial discussion – two meanings of run!
Collective Knowledge Gathering Questions	How much training do you need to do (age?)? When do you need to start to train? Who can help you train? What do you need to plan & organize to put on a race?	Questions that can be investigated using archives, people and the internet. They will have mainly factual answers.
Forming an Opinion	Why do people 'run' half marathons (and more)?	A debating question – for which everyone can have a reasoned opinion.
Deeper Question	What good does running do? What is the downside or disadvantage to running?	A question that challenges – and can also draw in parents and wider community.
Applied/Problem Solving Question	Can we organise at least a simple race applying some of what we know?	The question that generates the product to the enquiry.

As your students become more experienced at undertaking PBL, they could be encouraged to think of their own questions using the hierarchy.

Useful resources for developing your hook question:

'Coming up with an Essential Question' (p38-39) in Work that matters: The teacher's guide to Project Based Learning
https://www.phf.org.uk/wp-content/uploads/2014/10/Teachers-Guide-to-Project-based-Learning.pdf

Go to the PBL Works website and register for free to look at their projects and the hook questions
https://my.pblworks.org/projects

SECTION 8:

LAUNCHING YOUR PROJECT

Launching a project can take a variety of forms and can range in complexity, but the fundamental point is that it is intended to act as an inspirational start that will spark your students' curiosity and desire to learn more. The launch has several purposes:

- **It sets the tone for the project**
- **It tries to engage all students**
- **It might introduce the driving question/ challenge**
- **It provides some initial context and subject content (students and teachers)**
- **It initiates the enquiry process and generates questions which can then be followed up with what PBL Works refer to as 'need to knows' i.e. what do we need to know in order to be able to answer our questions? How can we find out? Who can we ask?**

So what could you do to launch your project?

Just like your project can range in scale and complexity, so too can your launch event. You may not have the time to plan a big event with visits out or visitors in, but it is still possible to hook your students in with, for example, a film, a change in classroom layout, a relevant display etc. You want something that challenges the normal way of working, gets your students talking and thinking and engages them emotionally. The links at the end of this section provide lots of different examples of launch activities and events, but what we would like to do here is present some actual examples from our case study schools.

Set up your classroom:

The teacher in our Forensic Science case study (Durham Sixth Form College) launched her project by setting up a mock crime scene. The desks in her science lab were used as a different stations -fingerprinting, hair analysis and blood analysis. She also put a footprint on the windowsill and opened the window and closed the door to suggest that a fictional character had jumped out of a window to flee the scene. A blood splatter was splattered onto the window (vegan raspberry sauce!).

We can see here that the teacher wanted the students to walk into the classroom and immediately feel excited and eager to find out more. However, the classroom also contained the forensic clues i.e. the data that the students would need to conduct their research, as well as stations that would develop the skills required.

Continues overleaf...

In the example from the PBL Works video of Water Quality Project, the teacher puts up thought-provoking pictures and information around his classroom that relate to the subject content of the project. He doesn't actually introduce the question/challenge at this point, rather he wants to stimulate the students own questions and produce an emotional response. He does this through adopting the strategy referred to as 'I see, I think, I wonder'. To watch how he does this, go to: **https://www.pblworks.org/video-water-quality-project** (The Information about the launch is at 1.02 minutes.)

Start with a visit

To a university:

Interactive Archives (Corbridge Middle School)

The launch event involved the students visiting Newcastle University. They were introduced to the subject content knowledge underpinning the project through an visit to the University archives and a history lecture. They also went on a tour of, and met PhD students from, the School of Engineering thus developing their cultural capital.

To a local employer:

Maths in Architecture (Norham High School)

This project launched with a visit to an architect's office, where the students were able to meet the staff and work alongside them on their own tasks. This introduced them to a workplace environment but also highlighted the seriousness of the challenge. The students were treated like architects with appropriate terminology used throughout. A walk around the local area with a focus on looking at land use and gradients provided the mathematical context for the challenge (see the case study on page 34).

To a museum:

In the Tale of Two Sieges project students at Newark Academy visited the National Civil War Centre (a local museum) as part of their summer term work in Year 7. The whole year group was studying the Civil War in their history lessons. The PBL project then continued in the following Autumn Term when the students were in Year 8. See the case study on page 13 and/or watch the students talking about their project:

NATIONAL CIVIL WAR CENTRE
NEWARK MUSEUM

'A Tale of Two Sieges: A collaborative education outreach project' at:
https://www.ncl.ac.uk/library/in-the-community/education-outreach/projects/

Invite a visitor in (in person or virtually)

In an automotive project undertaken at Thornhill Academy, Sunderland the launch involved a presentation by the NE Local Enterprise Partnership and the school's Enterprise Advisor. They talked to the students about opportunities in the motor industry and introduced the project. Cooper BMW also brought an i8 for the students to look at. The aim of the launch was to create a wow factor and introduce the students to the focus and context of their project.

In the Cyber Security project (Hexham Middle School) a key component of the project was that it had an official start that would set the tone for the coming weeks. The whole year group attended an assembly where the challenge was set by Northumbria Police Force Specialist Cyber Investigation Team. The launch was publicised on social media and in the local paper thus raising the profile of the project within the school and community and raising the stakes for the students (see the case study on page 72).


News

Hexham pupils spread the word about cyber crime

To find out more about launch events, have a look at our case studies on the PBL goes to University website or these resources:

Starting With A Bang: PBL Entry Event
https://www.youtube.com watch?v=M6homrTDdWY

How to Get Projects Off to a Good Start By Suzie Boss (2011) Edutopia
https://www.edutopia.org/blog/summer-pd-starting-projects-suzie-boss

CASE STUDY

Maths in Architecture

NORHAM HIGH SCHOOL, NORTH TYNESIDE

PBL Goes to University

National Curriculum subject content

Year 9 Maths curriculum: Transformations, statistical diagrams and 3D shapes (see project plan and scheme of work).

Project summary

This exciting seven-week project was collaboratively planned and delivered by a maths teacher, an architect and a member of the NE Local Enterprise partnership. The aim was to introduce the students to a workplace setting where maths is used in a variety of ways and to connect their classroom learning to a real-world application. The project started with a visit to the architect's office where the students were presented with a project brief (Ouseburn Farm Goat House Challenge) and a series of tasks. All of these required to students to apply their mathematical knowledge (three dimensional shapes, statistical diagrams and transformations.) The students continued to work on their designs in their lessons supported by their class teacher, and by regular visits from the architect and two university maths undergraduate students. The project culminated in a presentation of the students work.

Cultural capital

The project launch event involved a whole day visit to the architect's office in the Ouseburn, Newcastle. Some of the students had visited the area before but visiting a working environment was quite new for them and gave them a taste of a real workplace and the different jobs which require a maths background.

Two undergraduate university students studying Maths and Statistics at Newcastle University joined the school students on the initial visit and then worked with them in a Maths lesson back in school. This introduced the school students to the potential of studying Maths at university.

Launch event/ Final product and showcase

The project launched with a visit to the architect's office, where the students were able to meet the staff and work alongside them on their own tasks. This introduced them to a workplace environment but also highlighted the seriousness of the challenge. The students were treated like architects with appropriate terminology was used throughout.

The aim of the project was to design a goat shed for a city farm based in the locality of the architect's office. The challenge had specific mathematical content, but also involved the creation of a 3D model and presentation. Criteria were set both for the design of the goat shed and for the detail expected in the presentation.

The showcase event involved lunch with the external partners followed by the students presenting their work. This bookended the experience for the students and gave an authenticity to their work which inspired them to produce a higher quality output to meet the criteria presented in the launch.

Full case study is available at:
research.ncl.ac.uk/pblgoestouniversity/inspiringprojects/keystage3/architectureandmaths

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SECTION 9:

PRODUCTS

Working towards the creation of a product is a fundamental part of a project. It gives the project direction and an end point. However, as with all aspects of your planning the product can range in complexity. It can be tangible (a presentation, a sculpture, a documentary), or intangible (a speech, a debate). It can be one that is easy to create in your lesson, or one that will require the support of colleagues or external partners. It can be a prescribed product or one that is left open for the students to determine i.e. where the students select what they consider to be an appropriate product to showcase their work.

As you start your planning here are some questions to ask yourself:

1. **How will the product map onto the curriculum/project requirements?**
2. **Am I going to prescribe the product or leave the decision-making to the students? (If the latter, how will I ensure that they have the confidence and skills to do this and that point 1. is achieved?)**
3. **Is it a product that can be produced effectively in my subject lesson or would it benefit from being produced in a different subject area or elsewhere in the community in order to ensure its authenticity and quality?**
4. **Is it a product that needs to be created by an individual student or a group?**
5. **Does the product require resources/funding to create it?**
6. **How is the product going to be assessed? How will it demonstrate the learning that has taken place?**

The importance of making the product public

Larmer et al (2015) identify three reasons for making student work public. First, like authenticity, a public product adds significantly to PBL's motivating power and encourages high quality work. Second, by creating a product, students make what they have learned 'visible' and thus, when shared publicly, discussible. Instead of only being a private exchange between an individual student and teacher, the social dimension of learning becomes more important. This has an impact on classroom and school culture, helping create a "learning community". Finally, making student work public is an effective way to communicate with parents, community members, and the wider world about what PBL is and what it does for students. When the public sees what high quality products students can create, they're often surprised, and eager to see more.

Products

There are lots of resources that you can draw on to think about potential products and you will of course have your own ideas that relate to your own subject area.

But just to start you off, here are some of the inspiring product ideas from our case study schools. You can find out more about them on our project website, PBL goes to University.

Comic, comic strip	Animation	Debate	3D mathematical model
Newspaper article	Film	Monologue/speech	2D/3D plans
Blog and tweets	Documentary	Law court defence/ prosecution case	Exhibition/display
Play script	Multi-media presentation	Panel discussion	Poster
Recipe/menu card	Marketing campaign		
Brochure			

Marketplace-style presentations

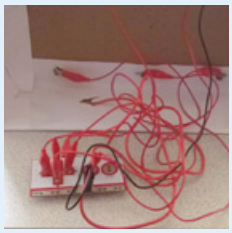
(Case study: Design Sprints – see page 29)

Documentary

(Case study: Documentary of the local area)

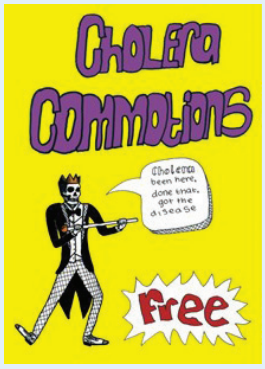
Interactive digital exhibits

(Case study: Interactive Archives)



A comic

(Case study: Cracking Cholera – see page 42)



Multimedia product

(Case study: Cybersecurity Project – see page 72)

A play

(Case study: A Tale of two Sieges – see page 13)

Ensuring the quality of the final product

The quality of the final product that you will accept depends to a certain extent on the audience and showcase and whether or not it will be used more widely by partners or the community. In the case study schools the quality of the product was ensured in a variety of ways. In some cases success criteria or content criteria were given to the students at the start. This was the case for example in the Suffragette project and the Cyber security project. In the former the final product was the creation of a stop-motion animation using puppets also made by the students. The animations were going to appear on a public website; the puppets were going on display in a local library. The students were provided with the following success criteria at the start of the project and told they needed to ensure they were all achieved before the animator would work with them.

- **Our stop-motion animation is factually correct.**
- **Our stop-motion animation makes use of information contained in the web links provided.**
- **Our stop-motion animation focuses on a person or event connected with the suffrage movement in the North East of England in the early 20th century.**
- **Our stop-motion animation is 2 minutes (or less) in length.**
- **Our stop-motion animation features puppets.**
- **Our stop-motion animation is of high enough quality to enable it to be made available on Newcastle University's website and to be put on public display in our local library.**

In the Cyber security project the teacher and external partners Northumbria Police and Northumberland County Council) identified success criteria that the students' products (a multimedia presentation) would be judged against by a panel at the end of the project. These focussed on both the information in the product and the quality of the digital output:

Computer Misuse Act 1990 Success Criteria (15 marks) **The focus is on the content of the product**
Relatability to younger audiences (5) How has the original CMA 1990 content been translated into language that can be understood by a younger audience?
Examples used (5) How did they think of these examples? - Progress notes to be saved so we can see how they came to deciding on the final examples
Teamwork (5) How the roles were used when creating the new content?

Digital Success Criteria (15 marks) **The focus is on the technology used**
Use of Adobe Spark (5) Type of template used? Why this template was chosen?
Preparation of product (5) Progress notes saved to highlight how they worked towards the final product
Teamwork (5) How the roles were used when using Adobe Spark?

Of course another important way to ensure the quality of the work is through feedback/critique from teachers, peers, audiences and external partners In Section 14 we discuss this in detail with further examples from our case study schools.

SECTION 10:

SHOWCASES

> The knife crime in particular -by the end of the project to stand up on the stage and in front of police officers and young offending officers and other school children and to rap their lyrics was massive. And one boy he forgot his words, he was so nervous. And then, and then to carry on was brilliant. And that wouldn't have happened if they didn't have a sense of pride about the work, they didn't feel proud of what they were doing.
>
> [PBL Lead teacher]

A real-world audience

Real-world work needs a real-world audience, and a showcase is a vital aspect of the PBL approach. Presenting their work gives students an authentic connection to the world beyond the classroom and can motivate them to produce something they want to show off. Newmann and Wehlage (1993, p. 10) cite "connectedness to the world beyond the classroom" as one of five standards of authentic instruction, defining this connectedness as a way for students to engage with real-world, public problems that require them to use personal experience in their problem-solving approach. PBL practitioner Cara Littlefield (in Leat, 2017) has found in her work over the years that:

> ***"Basing curriculum around real-world problems greatly increases student engagement and learning. It requires a higher level of responsibility and vocabulary and gives students a context for the work. It also increases student empathy, because they are forced to look at real-world problems through the eyes of the people dealing with them every day. This approach, however, does not necessarily require an authentic audience. If the same project has a direct connection and influence with real-world practitioners and/or the real-world people affected by the issue, student engagement increases even further."*** Chapter 8

The process of preparing for a showcase also encourages reflection on the learning which has taken place, including the content learning, skills learning, problem solving and collaboration that the students have engaged in. More importantly, a showcase is an opportunity for students to celebrate effort and success. Inviting external guests such as parents, employers, and collaborators allows the students to share their learning with a wider community audience, and asking professional invitees to judge a PBL product means that the students focus on creating something high-quality that fully meets the project brief. However, parents alone do not make up an authentic audience. Berger et al (2014), in their book which explores student-engaged assessment, describe a 'Hierarchy of Audience'. The more authentic the audience and public the work, the more students are motivated and engaged. This hierarchy increases in authenticity from presenting to a teacher to fulfil requirements; presenting to parents; presenting to a public audience beyond school; presenting to people capable of critiquing (such as local employers or relevant businesspeople); and finally being of service to the world.

Raising the quality of the work

If your students know from the start that their work is going to be showcased to, or even judged by, the public or external partners, this has the potential to raise the quality of the work. It puts your students under pressure to produce something worthwhile. In some cases where an external partner has set the challenge/brief it is even possible that only certain products that meet a particular standard will go forward to a showcase. Take for example the Cybercrime project that students at Hexham Middle School took part in. Here the groups' multimedia products were first judged internally by the school's computer ambassadors (peer assessment). The top product per class was entered into the final and was judged by the challenge setters- Northumbria Police and Northumberland County Council- using criteria that all of the students had been given at the start of the project. Only the winning group would have their product shared with other schools and receive a prize.

Although the above example is a more complex version of showcasing, you can raise the stakes at any type of event by asking for audience feedback. Providing clear criteria to comment on will result in feedback that can be reflected upon later by the students.

Making the most of opportunities

As we have outlined above showcasing to an external audience can take the form of having visitors in who would not normally come in to school to see the students' work. If you are working with an external partner it may be that they can help you to think about some different showcase opportunities. However, even if you are showcasing within the school it is possible to raise the stakes by inviting Senior Leaders, other teachers, admin staff, governors, students from other classes to see the work.

You could also start to consider ways of exhibiting work within your school's local community. Is there a library or some other community space that you could use? The added benefit of using local spaces to hold events or exhibitions is that the work has the potential to be seen by your students' friends and relatives- an opportunity that they may not get very often. When the Year 7 students at George Stephenson High School took part in a project about the Suffragettes during the centenary year of the Representation of the People Act 1918, their work (puppets, planning documents) was showcased in the local town library. The librarians used the opportunity to create a display that included relevant library books. This exhibition enabled the students to share their work with their families (see quote below).

> I went with my grandma cos I said there's a display and she said we need to go. It was good. They had all the books up cos it's a hundred years since.
>
> [Year 7 student]

SOME EXAMPLE SHOWCASES:

The projects detailed below represent showcases to a variety of audiences ranging from parents and partners to displaying work at local community events.

At South Eastern Regional College (SERC) in Northern Ireland, PBL has been embedded firmly into the curriculum, and showcasing work to a wider audience is key to the students' skill development and feelings of ownership.

The College wrote of their work:

"The students recently got the opportunity to display their projects at a Project Based Learning Showcase held at the colleges Bangor, Downpatrick, Lisburn and Newtowards campuses."

"All Full-Time students participate in Project Based Learning (PBL) activities at the college as it enables them to develop skills such as commercial acumen, communication, problem solving and teamwork and aims to inspire knowledge, raise aspirations, confidence and employability."

"The projects were very innovative and included ideas from mobile apps, to events planning. Staff and students who attended were very impressed with the standard of work the students had completed."

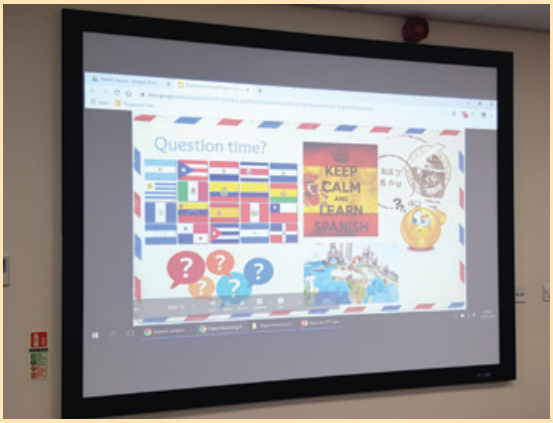
SERC Head of Enterprise and Entrepreneurship, Kieran McKenna said *"At SERC we are committed to providing every student with the opportunity to improve their employability skills. Giving our students the edge is a key priority as we seek to provide students with a range of opportunities to gain better skills and real-life experiences."*

(https://serc.ac.uk/event/serc-hosts-project-based-learning-showcase)

To see the students' 2019 showcase, go to:
https://www.youtube.com/watch?v=Q1EUQn-S6co

The Northern Saints consortium spent five days off timetable collaborating on a Design Sprint which culminated in a showcase held at St. Wilfrid's School in South Shields. Each Design Team built an exhibition showcasing their idea and also created a five minute presentation to mobilise the invited audience (made up of students, staff, leadership team, local community members and parents) about the social impact their idea would create.

From Cholera to Comic was a collaboration between Berwick Record Office, Berwick Museum, Berwick Academy and Newcastle University. Pupils created a comic book based on their research into local cholera outbreaks and their visits to the Special Collections archive at Newcastle University and a workshop in the Faculty of Medical Sciences. The pupils' work was showcased to a wider audience at two local community events in Berwick: a heritage open day and Berwick Literary festival.



Churchill Community College in Wallsend invited parents and partners from Newcastle University to their Digital Mentoring showcase, where Year 7 students presented their learning from five weeks of Spanish virtual mentoring. Not only did the guests enjoy listening to the presentations, they took an active role in the showcase, being invited to play bingo, participate in role-play scenarios and learn some Spanish language taught to them by the pupils themselves.

"..the exhibition is also something that's essential to PBL, to have that opportunity to present but also to share and preferably to share with people outside of the school. I always find that if you tell students that someone else is going to look at it from outside […] that there's a purpose other than the school, that students become much more invested in it."

[Head of Humanities]

CASE STUDY

Cracking Cholera

BERWICK ACADEMY

PBL Goes to University

National Curriculum subject content

Year 9 Cross curricular project incorporating: History (Health and the people), Science and Art.

Project summary

This project took place during the summer term over four days. The focus was on local history, specifically the Cholera outbreak of 1832 – an epidemic which affected the town in which the school is situated. The project had multiple aims:

- To develop the students' understanding of their local history and the link to their classroom studies (GSCE History: health and the people)
- To develop the students' skills as historians particularly AO3: analyse, evaluate and use sources (contemporary to the period) to make substantiated judgements, in the context of historical events studied
- To introduce the students to their local archives
- To develop the social and cultural capital of the students through visits and working with a range of experts
- To develop a range of transferable skills

The project included a visit to Newcastle University where the pupils were introduced to the special collection's archives more generally and then specifically to the resources related to cholera. They then took part in a science workshop in the Medical School looking at diseases and cures where they worked with a lecturer and PhD students.

Back in Berwick the students worked in the Record Office and Museum researching the local Cholera outbreaks. The pupils were introduced to the archives, visited local sites (streets, churchyard) affected by the outbreaks and heard about a volunteer's research on one of the victims. They then worked with a comics researcher/practitioner on the production of a comic which would introduce the subject to a teenage audience. The project also included a visit to a graphic designer/printer who talked about his job and demonstrated how he would be laying out and then printing the comic.

Final product and showcase

The students worked with the comic maker to produce a comic that would introduce the Cholera topic to a teenage audience. There was a very tight deadline to produce the content. The students worked in groups to produce a page each. They were told that the comic would be printed and given out in a range of settings (including their school) and at different events. Their work was also presented at a heritage open day and Berwick Literary festival and the students and their families were able to attend these.

Full case study is available at:
research.ncl.ac.uk/pblgoestouniversity/inspiringprojects/keystage3/fromcholeratocomic

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SECTION 11:

GOING PLACES: DEVELOPING CULTURAL CAPITAL

> And going off site with your group right at the beginning is a win-win. So we always have that in our planning document to go literally the second lesson.
>
> [PBL curriculum lead]

As we identified in in our section on the key principles of Project Based Learning, incorporating a visit should be planned in, if possible. At a basic level a visit will provide your students with rich and memorable experiences which will hopefully inspire the learning back at school as well as broaden horizons. It will develop their cultural capital. But a visit should not just be a nice add-on. There needs to be a sound rationale for any visit with the purposes clearly articulated. In our case study schools the following were identified:

- **It can provide a 'wow factor' launch to your project;**
- **It can provide some of the subject content knowledge that will be required to complete the project;**
- **It can provide the context for the project;**
- **It can provide an opportunity to put into practice the learning from the project.**

We appreciate that visits can be difficult to organise. They take time to arrange, they may cost money – which has implications for particular students*, they may require additional staffing and they make require the students to miss lessons other than the ones that you teach. Visits on this scale and complexity are important, but may be something that you only do once a year, and at times where there is less impact on other lessons and you have more time to make the arrangements.

? ***Can you find ways to reduce/eliminate costs? Universities and larger employers who do outreach often have travel bursaries that you can apply for? Can you use local transport?***

However do not underestimate the value in 'thinking local' and of creating smaller-scale visits. Not only are these easier, less time-consuming and cheaper to organise, they also encourage the students to see their locality through fresh eyes. Just read the quote from the student at Berwick Academy on page 44 to see what impact local visits can have.

Year 5 pupils visit the site of the former Swan Hunter shipyard, with former shipyard workers

To provide some insight into how to organise visits at different levels of complexity we are providing the following examples from our case study schools:

Berwick High School: local visit

Cracking Cholera project

The students explored the Cholera outbreak of 1832 as part of a history/science/art project. A series of local visits was arranged all within walking distance of the school.

The students went to the Record Office in the local library. They were introduced to the archive that contained information about the impact of the Cholera outbreak on local families (e.g. maps, census data).

Using the archival materials the students walked around the streets of Berwick and went to the local graveyard to contextualise the research they had undertaken in the Record Office.

Year 9 student:

I think it makes it more interesting, because when people say Cholera comes to Berwick and stuff like that you don't really think 'oh Spital or Tweedmouth', you think of the main, you know, where the town hall is. It was facts about the surrounding area and where I live and that makes it more interesting.

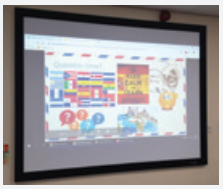
No cost

The historical subject knowledge was introduced that was needed to complete the project. Contact with the local Record Office archivist was required to set this up

Additional contextual information

Churchill Community College: university visit

Digital mentoring (Spanish)



The aim was to introduce the students to their Key Stage 3 Spanish curriculum using culture and authentic situations, people and places. The project was launched with a visit to Newcastle University where the students:

- took part in a Linguacuisine activity-cooking a Spanish recipe in the iLab digital kitchen,
- had a tour of Learning resource centre where they met their Language Ambassador (an undergraduate student studying Spanish and German at Newcastle University,
- had a Portuguese taster lesson.

Year 7 student:

"[I enjoyed] being able to go beyond the classroom and broaden my knowledge"

Wow factor launch

The school applied for the state school travel bursary offered by Newcastle University. This paid for the coach.

Spanish subject content knowledge. Activity provided by Newcastle University, no cost

Broadening horizons

Norham High School: employer visit

Maths and Architecture

The aim was to introduce the Year 9 students to a workplace setting where maths is used in a variety of ways and to connect their classroom learning to a real-world application. The project launch event involved a whole day visit to an architect's office in the nearby City. The students:

- were introduced to the staff and their roles and the software that they use to do their job. They were set the design challenge by the architect.
- toured the locality in order to understand the context of the challenge.
- worked on their own design project in the office spaces enabling them to experience a work environment.
- Supported by University undergraduate students from the School of Maths and Stats.

Year 9 student:

I learnt how maths is relevant outside of school.

Wow factor launch

Broadening horizons

Maths subject content knowledge was introduced

Local context gave meaning to the learning

The school mini bus was used to save on costs

Additional contextual information

When you are planning a visit as part of your project, think about the people and resources that you can draw upon to help you.

- **Are there local organisations or businesses that you could talk to in order to arrange a visit?**
- **Have you looked at your nearest university outreach webpages to see what kind of visits, workshops etc. it offers? Does it have a travel bursary that you can apply for?**
- **Do you have museums nearby that organise tours or workshops?**
- **Are there staff or parents/carers that have useful contacts?**
- **Does your school careers lead have contacts that you could speak to?**
- **Do any of the larger local employers allow visits and also contribute to the travel?**

SECTION 12:

MEETING PEOPLE "KNOW WHO AS WELL AS KNOW HOW" [LEMKE ET AL, 2015]

As we made clear in Section 2 of this guide, meeting people is a really important part of a project for your students. It has the potential to:

- develop their social capital and networks,
- develop their subject content knowledge and skills through meeting and working with experts,
- help them imagine possible futures through hearing about different careers and learning pathways (see section 13)
- learn about different people and their views
- provide role models for students.

If your project is quite complex and involves visits and working with external partners, it is very likely that your students will be meeting lots of different people. But even if you are planning a smaller-scale project, it is easy to build in opportunities for your students to meet people with relevant knowledge or skills. This could be in person or using virtual platforms.

The starting point should always be your local community but we mean this in the widest possible sense, because in the age of the internet it is possible to draw on contacts far and wide:

- your students' parents/carers/other relatives
- your colleagues, governors and their contacts
- local community groups, businesses, organisations
- societies, museums (local/national/international)
- local colleges
- universities (local/national/international).

"I enjoyed the Q&A with different employers, it helped with what we were designing for year 8 but it got me thinking about the sort of work opportunities there might be around here for me in the future - there were some options I'd never thought about before." **[Year 12 student]**

STUDENT 1: it was nice to work with outside people instead of the same people all the time.

STUDENT 2: and get to meet new people.

STUDENT 3: you see other peoples' opinions and how they see things.

The first questions you need to ask yourself when planning your project are 'how is the visitor going to strengthen the project and what level of involvement am I hoping for?'

- Are they going to launch the project to give it authenticity?
- Are they going to come in (or attend virtually) once and provide specific knowledge/skills at a key point in the project (see section 5)?
- Are they going to come in a few times and work alongside your students or provide virtual support?
- Are they going to provide a Q & A session?
- Are they going to judge something at the end of the project?

Year 5 pupils talk to former shipyard workers about their experiences.

To see the final product: 'Shipbuilding on the Tyne', go to; https://vimeo.com/392037829

Once you have made these decisions and decided who you would like to invite in, make sure you are very clear about what you are asking for and the level of commitment when you first get in touch. This will ensure that roles are understood. The following example is an email that was sent to potential employers to take part in a panel discussion about careers:

Reply | Forward | Delete

Subject: Amazing careers in the North East

In January 2020 Year 12 students at George Stephenson High School Killingworth are going to be starting an exciting project that explores the range of career opportunities that are available in the 4 key growth sectors identified in the North East Strategic Economic Plan:

- Digital
- Advanced Manufacturing
- Energy
- Health and Life Sciences

The students are going to be researching what these different careers are, what qualifications are required, apprenticeship opportunities and possible career pathways.

Armed with this research the students will then develop lesson plans and teaching materials for schools across the region that will introduce other students to this information.

As part of the research process we would like the students to meet some real employers representing the 4 sectors.

Agreeing to come and speak to the students will involve:

A 10 -15 minute presentation that includes the following:

1. An overview of your sector including any interesting facts e.g. any gender imbalance in the workforce which the sector would like to see addressed
2. A description of your specific organisation and the different jobs within it with examples of salaries and career development etc.
3. What qualifications are required e.g. BTEC, GSCE, A Level etc. and in which subjects
4. What the routes are into the career e.g. apprenticeship, college, university etc.
5. What the organisation looks for when interviewing prospective employees

We have two dates where we are looking for employers to speak to the students:

Tuesday 7th January 2020: 12.25 p.m. - 2p.m. [this is our preferred date]

Tuesday 14th January 2020:12.25 p.m. - 2p.m.

Additional information:

You may be asked to repeat the presentation a few times in order that we can create a carousel format with smaller groups of students. This will be confirmed as soon as possible.

You will be presenting in rooms that are technology enabled. Any specific requirements would need to be discussed with the school, but this can be arranged.

If you are able to help us with this please can you contact…..

A final point to mention is that whenever you involve visitors in your projects, to whatever degree, ask them not only to introduce themselves and their current role, job, expertise etc., but also to explain the journey they took to this point. What did they study? What jobs did they have? In the 21st century it is unlikely that your students will follow a linear study- 'career for life' pathway. Therefore the more they hear about other people's lives, the better their understanding of future possibilities, and the more they can imagine their futures.

CASE STUDY

Amazing Careers in the NE

GEORGE STEPHENSON HIGH SCHOOL

PBL Goes to University

National Curriculum subject content

Year 12 Careers Education.

Project summary

The aim of this project was to introduce the Year 12 students to a range of different career opportunities, but to do so in a way that would also develop skills useful in their futures. A brief was set by the North East Local Enterprise Partnership (NE LEP) who had recently produced a film and materials for school age students which focused on the key industry growth sectors in the NE. The sixth formers were asked to produce a lesson plan and activities/resources for Year 8 students that teachers would be able to use in careers lessons which would include reference to the LEP's materials. The final versions of the lesson plans and resources were to be judged by the LEP, with those of high enough quality published and put on the organisation's website for any teachers to download.

Over the project timeframe, visitors from the university and local businesses came in who provided content that the students could then build into their lesson plans. These visits took the form of a panel discussion and small group Q &A.

Ongoing feedback was provided informally by the sixth form staff and Head of Careers and then in formal group sessions.

Special capital

One of the early project sessions was led by an Education Officer from Newcastle University library who introduced the students to research skills (information literacy) and the resources available for sixth form students to help them with their A Level studies. Although this session took place at the school, it also runs in the university library.

This was followed by visits from representatives from a range of local businesses, including apprentices, who talked about their industries and the careers within them e.g. Rolls Royce, Sterling Pharmaceuticals, Home Group, Northumbria Police, and Northumberland County Council.

Entry event

The entry event took place just before Christmas with the actual project due to start after the holiday. This was to give the students time to do a pre-project task that would get them thinking.

This event took the form of an assembly led by a representative from the LEP, the Head of the Sixth form who was running the project, plus the Head of Careers. The LEP introduced the brief and set out success criteria. The head of the Sixth Form plus Head of Careers outlined the pre-project task.

Full case study is available at:
research.ncl.ac.uk/pblgoestouniversity/inspiringprojects/searchbytopic/careersandtransition/

Funded by EDGE FOUNDATION

Newcastle University

SECTION 13:

IMAGINED FUTURES: BUILDING IN LINKS TO FE COLLEGES, UNIVERSITIES AND EMPLOYERS

Back in 1999, Stephen Ball, Sheila Macrae and Meg Maguire conducted an important piece of research which involved tracking the post-16 experiences of a cohort of young people from a south- west London comprehensive school and two nearby Pupil Referral Units. When the young people were asked to imagine their futures and discuss what was required to achieve them, their responses fell into three broad categories. Firstly there were those whose `imagined futures' were 'relatively clear, relatively stable and relatively possible'. For a second group their `imagined future' was 'vague, relatively unstable and beset with uncertainties' and for a third group they had no `imagined future' that could provide a focus or locus for decision-making'. (Ball et al, 1999. p.210)

Arguably the situation has changed somewhat over the last 2 decades. The focus of subsequent governments on increasing access to university and the advent of statutory careers guidance (Gatsby Benchmarks) has raised awareness of opportunities amongst young people. However, there is still much more that could be done, particularly in the following key areas:

- Demonstrating to students the breadth of study and career opportunities that could be open to them, and
- Helping them understand what Ball et al (1999) refer to as the 'strategic link between now and then' (p.214) i.e. the pathways to achieve their imagined future.

The key to tackling both is to consciously think about possible study and career trajectories when planning your project and then making contact with the relevant organisations.

Making links with Universities and FE Colleges

If your project doesn't have a defined careers/ employment focus, a useful starting point will be to think of the subject content and how this could link to consideration of future study opportunities. Go to the websites of local or easy to reach FE college/universities and look at their outreach pages. There are a variety of ways to search on the college/university website:

> "..the project's made me think about engineering now - designing, and testing cars… designing the next Nissan GT-R!"
>
> **[Year 9 student]**

- You can look at the general outreach by searching 'information for schools and colleges.'
- You can type in a specific subject e.g. 'computing outreach'.
- Go to the webpages of the subject department and look for their outreach heading.

Most FE colleges and universities offer a mix of subject specific and more general activities – workshops, talks, visits, online videos or zoom opportunities. These can be on the college or university campus or in school. The subject specific outreach will include signposting to the wide range of courses available, the entry requirements and also the careers that graduates can expect to go into- in other words, they will be identifying the strategic links. They will also offer more general workshops, talks and tours that focus on the application process, student finance, student life etc. The outreach activity is very often led by recent graduates who are not only able to deliver the subject content but will also have recent experience of what it is like to be a student.

When you make contact with an outreach team make sure that you provide some specific details about your project and the links to the curriculum. Ask their advice about what they can offer and don't be afraid to request something bespoke.

Making links with employers

It may be that you are planning a project that you would like to be entirely linked to careers and employment – where the employer has planned it with you, has set a challenge or is assessing the outcome or it may be that you would like to include a visit out or visitor in that will provide some subject knowledge, skills, context or inspiration for your students. Use your own networks in school – colleagues (in particular the Careers Lead), but also parents/carers, grandparents. Send out a newsletter describing the project and asking if anyone works in a relevant sector that they would be prepared to talk about. Local businesses may be keen to establish links with your school. Larger organisations often have ambassadors and/or apprentices that will come into school, or they may provide opportunities to visit their sites. Collaborating on projects is an excellent way to raise the profile of both the school and business/organisation. At whatever stage you include an employer make sure that you ask them to describe the various careers available in the organisation and also the pathways to achieve them.

It is important to think carefully about why you are involving a university/FE college or employer and at what point in the project. If you haven't already read sections 11(visits) and 12 (meeting people) this is where we address these points. In section 20 we consider how to plan with external partners. In the meantime, the example below, taken from the 'Amazing careers' project on our website shows how both a university and employers were involved at key points in the timeline:

Aim: Challenge set by the Local Enterprise Partnership for the Year 12s to create lesson plans and resources that would introduce young people to the career opportunities in 4 growth sectors	
Week 1	**Education outreach officer from Newcastle University Library** goes in to school to talk to the Year 12 students about research/information literacy. This will help them to understand how to conduct the research and enable them to create their final product.
Week 2	Whole year group takes part in panel discussions **with local employers** representing 4 growth sectors e.g. social care, pharmaceutical, automotive etc. The employers provide the information about the sectors that can be included in the lesson plans/resources.
Week 4	**Individual employer and social care apprentice** go in to talk to the two groups focussing on health sector.
Week 5	**Individual employer and car manufacturer apprentice** go in to talk to two groups focussing on automotive sector.
Week 6	**Individual employer** goes in to talk to two groups focussing on digital sector.
Week 8	**Sample of employers** who participated in the project invited to judge the final products.

CASE STUDY

Digital Mentoring

CHURCHILL COMMUNITY COLLEGE, WALLSEND

PBL Goes to University

National Curriculum subject content

Year 7 Modern Foreign Languages (MFL) Spanish Curriculum: Developing linguistic competence, cultural appreciation and knowledge, and vocabulary.

Project summary

This exciting project was collaboratively planned and delivered by the Language Resource Centre (LRC) at Newcastle University and the North East Local Enterprise Partnership (NE LEP). The aim was to introduce Year 7 students to their Key Stage 3 Spanish curriculum using culture and authentic situations, people and places, and to broaden their knowledge of how languages are spoken in different countries, cultures and workplaces. The students took part in a series of virtual lessons via Skype with a student Language Ambassador on a variety of topics including typical food, cultural celebrations and music. The project culminated in a showcase from the partners and an interactive presentation of the students' work.

Cultural capital

The project launch event involved a morning visit to Newcastle University for the whole class. They took part in the Linguacuisine activity in the iLab digital kitchen and had a tour of the LRC and a taster lesson of Portuguese.

They also met Phil, their Language Ambassador, who is an undergraduate student studying Spanish and German at Newcastle University. During the project sessions, two further MFL undergraduates joined Phil to talk about their year abroad in Barcelona, Rio and Lisbon, and how they use languages in their studies and their work. This introduced the school students to the potential of studying MFL at university.

Gatsby Benchmarks

BM 4: Linking curriculum learning to careers

BM 5: Encounters with employers and employees

BM 6: Experience of workplaces

BM 7: Encounters with further and higher education

Links to external partners and HE

This project was collaboratively planned by the Head of MFL, the Industry Alignment Coordinator at the NE LEP, and the team at the Language Resource Centre (LRC). Initial planning meetings were held at the school, and frequent email contact was essential to ensure the smooth running of the project.

"I have changed my ideas about how we view Spanish and the way the subject was taught" (Student)

"[I enjoyed] being able to go beyond the classroom and broaden my knowledge" (Student)

Full case study is available at:
research.ncl.ac.uk/pblgoestouniversity/inspiringprojects/keystage3/digitalmentoring

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SECTION 14:

FEEDBACK AND ASSESSMENT

This is the Achilles heel of PBL. Our current assessment system is geared towards attaching numbers to students, teachers and schools, all of which provide a metric through which to make education work as a market. In primary and secondary schools most teachers will rely on subject assessment frameworks as this is what they are held accountable for, not least in the current Ofsted framework. PBL provides the opportunity for students to develop on a very broad front, to learn about themselves and their capabilities as they go places, meet people and do/make things, and thus to develop positive and complex identities and aspirations. Such outcomes are not readily captured by any combination of numbers. One might argue that assessing PBL using current metrics has the potential to undermine its very essence, yet there is equally the danger that if it is not recognized then it is not valued by the student.

When adopting a PBL approach, it is imperative to align learning outcomes and teaching and learning activities to the required assessment tasks, in order to encourage deeper learning (Biggs, 2003). This means a more holistic and divergent approach is needed, involving significant peer and self-assessment, student and teacher reflection throughout the process, more flexible, student-led content as well as opportunities for more traditional summative assessment.

Torrance & Pryor, (1998) characterise divergent assessment in the following way:

- flexible planning or complex planning which incorporates alternatives;
- a focus on miscues—aspects of learners' work which yield insights into their current understanding—and on prompting metacognition;
- discussion prompting reflection on the task and its context with a view to constructing understanding of future situations in which new knowledge might be applied;
- formative assessment focused on a holistic view of criteria, the learners' understandings of them and how they fit into wider notions of knowledge and competence;
- involvement of the learners as initiators of assessments as well as recipients;
- conforming to a socio-cultural view of education with an acknowledgement of the importance of the context for the assessment;
- an intention to teach in the zone of proximal development;
- a view of assessment as a collaboration between and amongst teachers and students.

(adapted from Torrance & Pryor, 1998, p. 193)

Ongoing (formative) Feedback

The EEF's Education Toolkit states that feedback, if undertaken *effectively,* is able to impact positively on student learning. The point is made however that 'providing effective feedback is challenging' and needs to be done properly if it is not to have negative consequences. They identify that effective feedback tends to:

- be specific, accurate and clear (e.g. "It was good because you..." rather than just "correct");
- compare what a learner is doing right now with what they have done wrong before (e.g. "I can see you were focused on improving X as it is much better than last time's Y…");
- encourage and support further effort;
- be given sparingly so that it is meaningful;
- provide specific guidance on how to improve and not just tell students when they are wrong.

Or as Ron Berger has described it: ***Be Kind, Be Helpful, Be Specific***

Building in opportunities to provide feedback to students at key points in the project can serve a range of purposes. It can ensure that the subject content is being understood, it can ascertain if there are gaps or misunderstandings in knowledge or skills, it can ensure that the quality of the product is maintained and it can help to keep your students 'on track'. Feedback can be provided by the teacher, peers, the audience at a showcase or any of the external partners involved in the project.

Gallery Walks

A useful example of a way to obtain feedback from peers, an audience, external partners etc. is to set up what PBL Works term 'gallery walks'. Here the students display their work on a wall or exhibition board with no verbal explanation. The feedback is provided either on a blank sheet of paper sitting next to the students' work, or on post-it notes.

As the EEF and Ron Berger make clear, it is important that very specific feedback is given to a student if it is to inform changes and improvements. As teachers you will be aware of a range of strategies to do this and your school may also use particular approaches e.g. 'What works well. Even better if'. Make sure that whoever is asked to provide feedback is given a clear focus. Faye Jones, Head of Vocational Science at Durham Sixth Form Centre, has introduced 'thought partners' as a means for students to provide each other with feedback. In order to support the students to do this she creates protocols such as the one below. These are built on the philosophy of encouraging the students to provide kind, specific and helpful feedback and she has done this through providing example sentence structures:

EVIDENCE-BASED CLAIM CHARRETTE PROTOCOL		

PRESENTER	**Presentation**:
	• Presenter presents his or her claim and evidence to support the claim
	• Presenter explains why he or she chose this claim and the supporting evidence
	• Presenter asks a specific question to frame the feedback
	  • "What can I make better about..?"
	  • "How can I improve...?"
	Thought Partner listens.
		4 minutes

THOUGHT PARTNER	**Feedback:**
	• Partner gives suggestions providing helpful, specific, and kind feedback:
	  • **"I Like..."**: Audience shares what he or she likes about the claim and evidence
	  • **"I Wonder..."**: Audience shares concerns about the claim:
	  • too broad,
	  • already stated or obvious,
	  • does not state a position clearly or not at all, or
	  • is stated as an opinion but not as a basis for an argument (etc.)
	  • **"I Wonder..."**: Audience shares concerns about the evidence:
	  • is not concrete or explicit,
	  • does not support the claim,
	Presenter listens.
		4 minutes

PRESENTER & THOUGHT PARTNER	**Open Discussion:** Presenter and Thought Partner have a **dialogue** about the suggestions/ feedback. **Both Presenter and Thought Partner speaks.**	2 minutes
	TOTAL TIME	**10 minutes**

Building in opportunities for feedback should occur at the project planning stage. The timetable overleaf is from the Amazing Careers in the North East project. The ongoing feedback was given by the sixth form staff and the curriculum lead for Business and Enterprise.

The external partner that set the challenge, and the employers involved, were also timetabled to provide feedback to the students towards the end of the project, thus enabling them to make last-minute improvements.

Pre-project	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Launch event Pre-project task Split students into groups Research in Year 8 class	Give out project brief Introduction to library skills – how to research.	Panel discussions with employers and Sector leads from the LEP. Feedback from sixth form staff	Students make the lesson plans and resources Deadline 1: Lesson plan to be completed including an 'identify your needs' section Feedback from sixth form staff	Employer visit Students continue making the resources Feedback from sixth form staff	Employer visit Students to put together lesson resources Students present their lesson plans Head of Careers and he provided feedback	Employer visit Versions of resources ready for trialling	Trialling lesson with Year 8's Feedback given by the Year 8 teachers and students. Deadline 2: Final version of lesson plan completed All resources completed.	Presentation to panel and feedback Students to make revisions based on the feedback from the panel

End of project assessment: reflective and criteria-based

The end of project assessment approach that you adopt will depend, to a certain extent, on the aim of the project and where it sits within your curriculum planning. If the focus is not on embedding subject critical content that is going to be assessed as part of end of year or even statutory exams, then your focus will probably be on assessing and evidencing broader skill development. We have termed this ***reflection-based assessment***. If, however, your project is embedded in the curriculum with the intention of enabling your students to develop the key knowledge required to complete formal assessments, then you will need to ensure that these can be achieved, as well as the more holistic outcomes. We have termed this ***criteria- based assessment.***

In order to exemplify these starting points, we have asked three teachers to describe how they have addressed the assessment conundrum. We begin with two teachers who have been trialling reflection-based self-evaluation strategies and then follow this with a teacher who has being using PBL as an approach for her students to complete their BTEC Forensic Applied Science qualification.

Reflection-based assessment

Lynn Kerr is the Assistant Head Teacher at Valley Gardens Middle School in Whitley Bay. Here she describes their rationale behind introducing PBL and the assessment process they implemented in response to it:

Recording students' learning and identification of knowledge and skills that can be drawn on in later life.

PBL at Valley Gardens Middle School was designed and implemented in response to our pupils' views and our desire to widen the curriculum; to embrace a different way of learning outside of the 'normal' school experience and create a broader learning experience than that defined in the National Curriculum.

In PBL sessions, pupils benefit from having staff act as facilitators, with aspects of the project being delivered by the teacher, quickly developing into more autonomous group work where the taught element is taken, developed and extended by the pupils, mostly working as a team. Pupils love the opportunity to work independently; developing their projects within their groups, whilst utilising, and developing their skills. Each project has an outcome that is defined by the teacher; the route to this final outcome is defined in large by the pupils.

Each of our projects has a different outcome; written, spoken, filmed, performed, presented, displayed. In the first term of the first year it became apparent that the next steps in implementation had to be to consider how to showcase projects and also how to keep, reference and assess them.

The nature of PBL lends itself to skills development. We wanted to get pupils identifying and reflecting on skills they used, how they developed these and also be able to reference this as they moved through the School. We therefore identified a key skills bank for PBL (see page 59) and used this as a basis for the development of PBL, initially in our Covid Response PBL curriculum. Later, as we move back into longer PBL projects, we will use these specific skills set to develop and finetune our projects.

The next step was working on a way to get children to be self-reflective - a skill in itself which is often overlooked in adulthood. We wanted students to be able to specifically identify aspects of their work in PBL where they had developed or extended their skills set and be able to draw on the real-life examples from their projects, later in their school career – to write university or job applications for example.

The final issue was a physical one: how do we physically store the work produced? We wanted to show children the value in their work, but some pieces were physically large display pieces, some collaborative drama or performance pieces, some filmed documentaries.

In response to the above, we started to design a student self-reflection sheet (see below). The idea is that as the children go through school, the reflection can be less guided, with more free writing. In Year 5 the pupils will need a more structured proforma, perhaps identifying the specific skills used and signposting these in the sessions as they move through the year. The areas pupils will be directed towards are the basic activity (what they did), how they worked or achieved their product/outcome/skills they developed (younger children will have these specifically highlighted) and an evaluation of performance in that project (for younger students this would be a 'what I did well' and 'what I would do better section').

We undertook research on how work could be stored electronically and in a way which would allow us to build a portfolio of project work. Following discussion and meetings, we decided to trial Smartportfolio, part of the Realsmart suite which we subscribe to. Within it we have set up a PBL area which holds folders for each year group and within these are the three projects pupils will complete. Each project area is populated with a summary of that project, an area for the reflection work and an area to which the project can be uploaded, shown below. So far, because of the Covid pandemic, we have not been able to trial this, but we hope to be able to adapt our PBL practice in future and utilise this process.

The ability to progressively store, reflect and review their work will allow our students to have an increased understanding of how and when they learn. As we move forward, we are considering an evaluative session at the end of each academic year to explore pupils' personal learning, with consideration of skills development. This will give students the opportunity to reflect on what and how they learn in PBL. In this way, the appreciation of cognitive and metacognitive processes would be regularly reflected upon by children, at differing levels of sophistication, and used to inform and develop their personal learning, both in PBL and also as transferable skills in other subject areas.

Sunderland College have been introducing a PBL approach across a variety of their courses for several years. One recent project was with their Health and Social Care students, who were using persuasive techniques to encourage younger people to consider a career in the care industry. Incorporating visits from local care professionals, the project involved the students developing a social media campaign with an authentic audience in mind – young people like themselves. Nenagh Clark, Quality, Teaching, Learning & Assessment Manager, explains how a reflective portfolio system is being used to help students track their own progress, and how the Outcomes Star can help them to consider both the subject-specific skills and the transferable skills that they are developing through their involvement in the project.

STUDENT PROJECT TITLE:

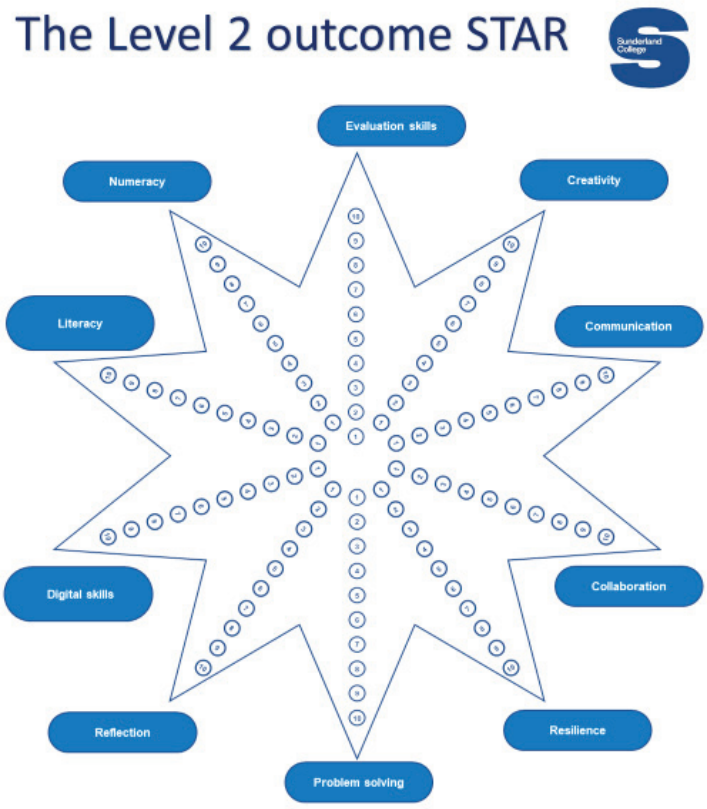
How can we support some of the of the recruitment challenges within the Health and Social Care sector?

Skill development:

- Skills: Communication / Oracy
- Resilience
- Numeracy and Literacy
- Collaboration
- Digital Skills
- Creativity
- Critical thinking/Problem Solving

Assessing these skills:

The development of these specific skills is tracked throughout the project using an outcome STAR*, observation, feedback and learner's reflection blogs. The students are introduced to the outcome STAR which has all of the above skills identified on each point. At key times in the project the students rank themselves out of 10 (using a different colour at each time point in order to capture progress). The students also use a reflective blog to record their PBL journey. Here, they are encouraged to reflect on the skills they are learning within the project through drawing on the observations, feedback and their own self-evaluation via the outcome STAR.



Stage	Date	Colour
Student self assessment		
Teacher feedback		
Meet & Exceed evaluation 1		
Meet & Exceed evaluation 2		

10 – Very Confident

5 – Slight Confidence

1 – Low Confidence

Awarding Body Assessment:

The students are also able to achieve the assessment criteria within the unit they are currently studying. The research and product they produce will allow them to achieve the assessment criteria set by the awarding body.

* https://www.outcomesstar.org.uk/

The outcomes star and reflection portfolios are two methods of documenting and tracking student progress throughout a project and beyond. In the case of Valley Gardens, students' progress and development are being tracked longitudinally throughout their school career. At Sunderland College, students are able to evaluate their own progress and keep a blog which they can they then use as a foundation when thinking of HE and career applications and interviews.

Criteria-based assessment

If PBL projects are to become embedded within the curriculum, and if you believe in the approach as a way to enable your students to pass their formal exams, then it is going to be critical for you to ensure that the specific learning takes place to enable your students to do this well. The experience of School XP in Doncaster (Ofsted outstanding 2017), https://xpschool.org/ who have designed their curriculum around projects that they call 'expeditions' has demonstrated that it is entirely possible to teach through project work and enable students to successfully achieve good grades in GSCEs. The way to approach this is to undertake 'backward planning' i.e. starting with the assessment criteria and then designing a project around these.

Faye Jones, Head of Vocational Science at Durham Sixth Form Centre, was conscious that her students had specific criteria which needed to be assessed in order to achieve their BTEC qualification in applied science Unit 2: Working in the Science Industry.

These criteria became the starting point for her project planning.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**	**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**
P1 outline procedures in the scientific workplace [IE1,2]	**M1** explain why procedures and practices are followed in the scientific workplace	**D1** analyse why laboratory procedures and practices must be clearly communicated
P2 identify how information is communicated in the scientific workplace [IE1,2]	**M2** explain how information is communicated in the scientific workplace	
P3 design a scientific laboratory, identifying its individual key features [CT1,3,4, EP3,4]	**M3** justify key features in the non-specialist and specialist laboratory	**D2** analyse why good laboratory design is important for efficiency, effectiveness and safety
P4 describe the procedure for storing scientific information in a laboratory information management system [RL4,5]	**M4** explain the processes involved in storing information in a scientific workplace	**D3** discuss the advantages gained by keeping data and records on a laboratory management information system
P5 demonstrate safe working practices in a scientific workplace. [TW1, SM2,3]	**M5** explain the need for current regulations and legislation in safe working practices.	**D4** evaluate the regulation of safe working practices in a scientific workplace.

Edexcel BTEC Level 3 Nationals specification in Applied Science – Issue 1 – January 2010 © Edexcel Limited 2009

Faye had already visited a Pharmaceutical Company (MSD Pharmaceuticals) as part of an 'externship' the aim of which was explore how she could build in real world links into her teaching. She used that experience, in particular visiting their Quality Control Lab, to design a project with the hook question: 'How can we, as scientists' improve global health?'

Project timetable:

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Guest speaker – Pharmaceutical professional Visitor to lead the discussion	Visit to Net Park	Design a Quality Control Lab	Research and use a LIMS system	Research how to put together an effective risk assessment for a laboratory	Simulated laboratory conditions to develop new drug	Student Portfolio and Group Presentation (Google Slide) Students will deliver their project to other classes, teachers and SLT

The students were asked to design a Quality Control Lab using information on MSD's website, information provided by staff from the company and Faye's own teacher input. The students then designed their lab using specialist software. Crucially undertaking this work informed their future planning - such as risk assessing processes/medicines. For example, the information they had obtained in order to design their lab enabled them to explore how a lab is important in the quality control process of raw products and the design/quality control of a medicine.

Faye is clear that the new project, with its link to a real industry, made the experience much more valuable and inspirational for the students. Had the Covid pandemic not occurred the students would have visited the company as part of the project, thereby increasing their understanding of the important aspects of a laboratory- this is certainly an aspiration for the future.

The Covid 19 pandemic and its impact on education has shone a spotlight on the inadequacy of our current assessment policies and practices.

The Edge Foundation are at the forefront of driving the debate into assessment and making it more relevant and beneficial for young people. They are working with a range of partners in order to achieve this. To find out more about assessment go to our 'Useful resources' section on page 87.

Project Based Learning Skills Bank

Skill	Explanation
Communication	This is written and spoken communication. It's about being clear and concise and focused on the task. As well as making your point, you need to listen to what others in your group say.
Teamwork	You need to show that you can work as part of a team, but also that you can delegate tasks and take the lead. You need to make sure everyone feels included and listened to, so that you can achieve the end goal.
Negotiation	Can you explain what it is you think you should be aiming at and what you would like to achieve in the end? Can you understand what others in the group are saying and work your way through to a compromise that everyone is happy with?
Problem solving	You need to show that you can take a practical and logical approach to solving problems and resolving issues that come up in your project.
Leadership	At times you might need to take a stronger role in your team and become a leader. Can you motivate your team and clearly set out what you need to do and how you are going to do it? Can you set a good example and work to deadlines?
Organisation	Can you show an ability to prioritise, work efficiently and productively and manage your time well? Can you encourage others in your group to do the same?
Perserverance or resilience	Project based learning can present many challenges. Show that you are the kind of person that can find a way through a problem and stick at it. Do you think of the final end result and carry on through the hard parts to achieve that?
Analytical skills	Can you look at a problem or task and understand what you need to do to achieve? Can you break the task down into smaller parts?
Enterprise	Can you suggest ways to improve the outcome and come up with new ideas?
Working under pressure	When the going gets tough and deadlines are looming, can you continue to get the project finished? Do you rise to the challenge, or drop out?
IT skills	Are you able to demonstrate your IT skills in the project? Think of examples where you have done this, either at school or at home when researching or working on the project. Actively search out opportunities to show these skills.

SECTION 15:

LEARNING SPACES

To contextualise the project learning the students visited the Law Courts. When they returned to the Sixth Form Centre they moved the furniture in the classroom to mimic the courtroom. I didn't prompt them to do so.

[Head of Department, Vocational Sciences]

If we accept the key principles of PBL as identified in this guide; then it is also important that we acknowledge that spaces are needed that will act as enablers and not constrainers of these principles. Research has demonstrated that if schools want to make any kind of change (in our case to pedagogy and curriculum), then 'the existing school space can either support or constrain the achievement of [that] desired change'. (Woolner et al., 2018: 236-7).

Spaces are required that will facilitate group work, independent learning, possibly making things, and conducting research. Spaces will be required where you can store work and then display work. You may like to have wall space where you can provide information or allow students to keep track of their progress and ideas. You may even like to recreate the type of environment that is the focus of your project e.g. a law court, an office, a laboratory.

Of course, some schools have been designed to facilitate PBL, with open spaces and flexible furniture, as in the example below. It may be that you have access to a space in your school that you can use in this way – for example a library/learning resource centre. However, most of you will be working in your own classroom and if this is the case then the best thing to do at the start of your project is to step back, have a good look at what you've got and then also start to think outside of the box (or at least your four walls!)

Rearranging the furniture?

At a most basic level rearranging the furniture to enable group work, to create opportunities for independent work or create a scenario like a law court, is probably the easiest option and is something that can be done on a temporary basis if necessary. In the examples below the teachers have organised their classrooms with seating options that can facilitate different ways of working, with or without a computer, in groups or alone.

You may be asking yourself though, why is this important? Well, research by Proshansky and Wolfe back in 1974 found that the *'physical and spatial aspects of a learning environment communicate a symbolic message of what one expects to happen in a particular place' (p.558-9).* This is true for both teachers and students. If you walk into a room with the tables in rows you will have certain expectations of what you will experience. To exemplify the impact that rearranging furniture can have, we turn to P.E and Sport teacher, Dan Gourley:

For the Performance Analysis unit on the BTEC Sport course, I wanted students to experience what it would be like being a member of staff at a Premier League football club. I set up the room in two ways, one as the staff section of a football stadium (in this case Selhurst Park) as there is VIP seating for analysis and coaching staff in all elite level grounds. The students had to wear their club ID badges to get into this section of the stadium. They watched the game 'live', completing differentiated tasks based on their role: Manager, Assistant Manager, Head Coach, Head of Performance Analysis etc. They then went to their meeting tables (simply pushed together tables so they can sit all around them) to prepare as a staff for their press conference with the 'media'. One team would be the backroom staff while the other team acted as reporters and journalists from different media outlets. I even

gave the students representing Spanish media outlets their Spanish equivalent name! Students then swapped over and changed roles. For this phase of the lesson I moved the tables and chairs so it resembled a press conference and put each team's advertising board up on the projector screen behind them.

I didn't anticipate how much of an impact this would actually have on how students conducted themselves.

They discussed their game plan seriously in the meeting, came up with difficult questions as the reporters and asked those questions in a professional manner and when it came to them being in the spotlight for their press conference, I was amazed at how carefully they tried to navigate those challenging questions as they were aware they were representing the club. Their oracy skills improved straight away due to the scenario.

Other options

Dan makes it clear that the way the space was organised had a significant impact on the expectations of the students, and so on their engagement and actions, with this in turn impacting on their attainment. But what if you have limited options to create a learning environment in your own classroom that is more conducive to PBL? There is a further way you could address this, and that is by starting to think about how you might use other spaces in conjunction with your classroom. Is there a nearby classroom that is free at the same time? Is there useful corridor space? Can you book an IT

A school entrance is used to display project work

A school corridor with display boards and tables for group work

room? Is there a library? Is there a suitable outdoor space? Depending on the age of the students and the independence you want to develop, or on the availability of TA support, groups could be in two places at the same time, using the spaces for different purposes.

Of course, if you are working with other teachers from other subject areas on a more complex (see section 4) cross curricular project, then being able to draw on their spaces will already have created greater flexibility. A cross curricular project about climate change may involve science work in a lab, writing a blog in an English lesson, creating a multi-model presentation in an IT suite and designing an information poster in design/technology or art. Here the learning spaces with their subject specific equipment and resources will support learning and skill development and the creation of high quality final products.

Whatever your options, just starting to think about how you use your space is an important first step because it 'offers a usefully visible and tangible focus for reflection on existing practices'. (Woolner et al., 2018: 236-7).

Useful resources:

For tools to help you and your students think about your space, you could use the ones being developed through this European project:

Collaborative ReDesign with Schools (coReD)
https://www.ncl.ac.uk/cored/

SECTION 16:

AGENDAS: OFSTED AND STATUTORY CAREERS GUIDANCE

The intention of this guide has been to demonstrate the importance and merit of PBL in its own right. We hope we have established that it is possible to plan projects that cover subject content in a way that will enable your students to learn what is needed for their exams, but which will at the same time provide them with opportunities that will broaden their horizons and develop other important skills. However, there are also agendas that can be drawn on to make the case for PBL.

Ofsted

Ofsted has a renewed focus on curriculum with the 2019 Inspection Framework recognising that schools have the autonomy to '***choose their own curriculum approaches'***. The framework specifically outlines the need for schools to construct a curriculum that is '***coherently planned and sequenced towards cumulatively sufficient knowledge and skills for future learning and employment'*** and that 'teaching is designed to help learners to remember in the long term the content they have been taught and to ***integrate new knowledge into larger concepts'.*** As we outlined in section 5, PBL can be a powerful way to develop conceptual knowledge.

Perhaps even more pertinent to making the case for PBL is that Ofsted also highlight the need for school leaders to create a curriculum that:

- is 'ambitious and designed to give all learners, particularly the most disadvantaged and those with special educational needs and/or disabilities (SEND) or high needs, the knowledge and ***cultural capital*** they need to succeed in life;
- extends beyond the academic, technical or vocational. It provides for learners' ***broader development,*** enabling them to ***develop and discover their interests and talents***; supports learners to develop their character – including their ***resilience, confidence and independence.***

The quote we highlight on this page was from a Head of Department who had just experienced a 'deep dive' inspection where she was specifically asked how the department develops the students' cultural capital. She was able to draw on two recent curriculum projects that involved visits to the local university, work with external partners and showcases in the community.

> We had Ofsted in last week. I was interviewed about Cultural Capital and enrichment. It was brilliant to be able to mention the projects we have done with [the university]….perfect for Cultural Capital!
>
> **[Head of Design and Technology]**

Statutory Careers Guidance (Gatsby Benchmarks)

In 2018 the Department for Education updated its statutory careers guidance with a strategy that would ensure that 'young people in secondary school get a programme of advice and guidance that is stable, structured and delivered by individuals with the right skills and experience.' (P.5). The new strategy draws heavily on the Gatsby Good Career Guidance Benchmarks which provides a framework for high quality careers provision. Of the 8 benchmarks there are 4 that have a particular resonance with PBL:

BM 4 Linking curriculum learning to careers

BM 5: Encounters with employers and employees

BM 6: Experience of workplaces

BM 7: Encounters with further and higher education

In order to evidence how effectively PBL projects can address the Gatsby Benchmarks, all of the case studies we present in this guide and on our website identify the opportunities that were either explicitly addressed or were woven in as appropriate.

PART 2

Planning, running and evaluating your project

In this part of the guide you will find resources that will help you:

Plan your project

- A project planning map. This is the final version of the planning map that we have been using throughout our work with schools and partners. The aim of the map is to support you in thinking about the key principles of a project. In the example on page 65 in this guide we have linked back to the relevant sections in Part 1 that discuss each aspect in detail. Depending on the complexity and scale of your project not every box will need to be completed. (A blank version of this planning map can be downloaded from our project website.)
- A Project Tuning protocol. We detail how to use this protocol to plan/review your project with colleagues, students and/or external partners.
- A section about working with external partners with some case study examples.
- A section about managing group work.

Run your project

- A section about tweaking your project (reflection-in-action).
- A section about keeping your students on track.
- A section about maintaining authenticity and real-world links.

Evaluate your project

- A project evaluation checklist with questions to help you reflect on what went well and what could be improved next time.

SECTION 17:

PLANNING MAP AND TIMETABLE

[With links to relevant supporting sections in the guide]

Starting point A

[National Curriculum Subject content knowledge]

Starting point B

Big question/challenge/brief [teacher/partner/student led] [section 7]

Subject content knowledge
[section 5]

Procedural knowledge
[section 5]

Skills
[section 6]

Careers/employer links
[Section 13, 16, 20]

FE/HE links
[Section 13]

Possible activities
[section 5]

Going places: (Where and for what purpose?)
[section 11, 12]

Meeting people (Who and for what purpose?)
[section 12]

Launch
[section 8]

Product
[section 9]

Showcase
[section 10]

Student agency/ownership
[section 2]

Student groupings and roles?
[section 21]

I am planning this with…
[section 4, 20]

Feedback/Assessment opportunities
[Section 14]

Useful resources e.g . materials, links, funding streams

Risks and mitigation
[Section 4, 23]

Week by week outline of activities including deadlines, opportunities for feedback, visits

Project launch	Week 1	Week 2	Week 3	Week 4	Week 5	Showcase event

An example timetable: Amazing Careers project 

Pre-project	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Launch event Pre-project task Split students into groups Research in Year 8 class	Give out project brief Introduction to library skills – how to research	Panel discussions with employers and Sector leads from the LEP Feedback from sixth form staff	Students make the lesson plans and resources Deadline 1: Lesson plan to be completed including an 'identify your needs' section Feedback from sixth form staff	Employer visit Students continue making the resources Feedback from sixth form staff	Employer visit students to put together lesson resources Students present their lesson plans Head of Careers and he provided feedback	Employer visit versions of resources ready for trialling	Trialling lesson with Year 8's Feedback given by the Year 8 teachers and students Deadline 2: Final version of lesson plan completed All resources completed	Presentation to panel and feedback Students to make revisions based on the feedback from the panel

SECTION 18:

PROJECT TUNING

Planning and reviewing your project with colleagues, students and/or external partners

One of the most useful protocols that we have come across in our work to support teachers with their planning is called Project Tuning. We were introduced to the approach by a teacher visiting us from High Tech High in San Diego – a school that teaches its curriculum through PBL. We took part as external partners and 'tuned' a project being developed by a teacher in a local school. The approach made a big impact on us and all involved and we have used it on many occasions since. The key to its success is the structure (clear roles and types of questioning) and strict timings. Please don't be put off by the length (approx. 40 minutes). It has the potential to be the most useful 40 minutes you spend when planning as it will help you to hone your ideas, consider carefully the practicalities and perhaps most importantly benefit from the ideas of others.

What does it involve?

A project tuning takes the form of a meeting made up of 3 or more people. The size and make-up of the group may depend on the scale of your project and on when it takes place in your planning timeline e.g. right at the start when you just have initial ideas or later when the project is more fully thought-through. Ideally it will include staff from your subject and/or other subjects and possibly students and external partners.

All types of grouping work well. A homogenous group will understand the specific subject requirements and practicalities that a project needs to address; a heterogeneous group has the potential to bring ideas from other areas of the curriculum or real-world issues etc. and can help teachers think 'outside of the box'.

A project tuning needs a facilitator who times each section and who introduces the 'norms' (see below) as well as ensuring that they are adhered to.

The protocol (Using a timer that is visible to the participants encourages keeping to time.)

Norms

- Hard on the content, soft on the people
- Be kind, helpful and specific
- Share the air (step up, step back i.e. don't dominate the discussion)

Project Overview (3 mins)

The project presenter gives an overview of the project and shares their thinking about key issues. At the end the presenter poses a dilemma question to guide the rest of the discussion i.e. How do I make sure that this project engages the interest of all my students? How should I group my students?

The group participants are silent during this overview.

Clarifying Questions (5 mins)

Participants ask clarifying questions of the presenter. Clarifying questions require brief, factual answers. e.g. how many times a week will the students work on the project?

Probing Questions (5 mins)

Participants ask probing questions of the presenter. These help the presenter expand their thinking about their project. e.g. Why are you including a visit to the museum? How will it benefit the learning?

Discussion (15 mins)

During this discussion ***the project presenter moves a short distance away from the group, remains silent and takes notes.*** Participants direct their comments to each other and not the presenter

Participants discuss the project proposal. It is helpful to begin with positive feedback; for example, "What strikes me about this work is…..". The participants then undertake a more critical analysis of the work, using the dilemma question posed by the presenter to frame the discussion. For example "What is the presenter not considering?" or "I wonder what would happen if…?

Reflection (3 mins)

The project presenter returns to the group and has the opportunity to respond to the discussion. They may share what struck them and what next steps might be taken as a result of the ideas generated by the discussion.

The group participants are silent.

Debrief (5 mins)

The facilitator leads a conversation about the project tuning ***process*** and its effectiveness.

Closing the loop (3 mins)

Participants have the opportunity to highlight anything that they have taken from the discussion, for example: something they will use in their own practice, something they found interesting or thought-provoking.

(adapted from https://sites.google.com/a/hightechhigh.org/pbl-resources/project-tuning)

To watch a film of project tuning in action go to:

Project Tuning at High Tech Middle Chula Vista in Chula Vista:
https://www.youtube.com/watch?v=AC4hliY3ItI&t=141s

For HTH project development resources go to:
https://sites.google.com/a/hightechhigh.org/pbl-resources/project-tuning

SECTION 19:

PLANNING AND WORKING WITH EXTERNAL PARTNERS – WHY, HOW?

Teachers can ensure that they have the subject and content knowledge to facilitate their project effectively but working with external partners means that students get a broader range of experiences and can connect their learning to the real world.

In some cases, teachers may rely on a broker, such as university education outreach or a Local Enterprise Partnership advisor, to connect them with external partners. In others, they may use their own contacts through personal or professional networks. One BTEC teacher relied on her existing contacts at Teesside University to put her in touch with external speakers and workplaces for two different projects:

> ***"You really do need experts, if you can get them. And you know what, it wasn't that difficult to organize a guest speaker. Yes, it took a bit more effort but just look at what's on your doorstep. There's so much and you don't need to go miles and miles away. We've got loads in the North East, so just be a bit creative and form contacts."***

As teachers develop a network of contacts, they have a greater range of expertise to draw on when planning their projects:

> ***"So for me, the idea is that I build up a pool of contacts. And I say right well as we're doing it around this contact this person and they knew who we are. They weren't with us before and so on. So to get a database really yeah."***
> (Lead - BFC (Brighter Futures Curriculum)

External partners can also develop a teacher's subject knowledge, particularly if the project is cross-curricular or integrates real world concepts which are new to the teacher, topical or link to the wider picture. Teachers we worked with commented:

> ***"One of the key moments is definitely trying to get on the visit that links to [my project], if that's outside of my specialism too, then I need that sort of training."***
> (BTEC teacher)

> ***"I'm not used to planning with people from outside of school or outside of you know the partnership so it was great to get that bigger perspective of what's going on across Northumberland in terms of digital literacy with [our partner] and actually a real- life organisation like Northumbria Police and what they're looking at. It was nice to plan with other people and get their perspectives."***
> (Head of Science, Computing and Technology)

External partners bring so many benefits to a PBL project, from collaborative planning to providing a real-world perspective in the shape of visits and talks. There are mutual benefits for the external partners, and one teacher found that businesses were keen to work with her school:

> ***"[A] very important factor is to build a positive picture of our school because of the kind of students we have. Businesses, however, don't view it like that because it's a ticking the box for them to do some community work and so I usually say well we're going to have a newspaper article or on Twitter and we've got a blog, and I mention the website, I do bit of bartering like that as well. And they said, we'll come in once a week. If you want and come and see how the kids are doing and work with them or if they want to email us, however you want to do it. And they did, they came in every week for an hour."***

However, students can exhibit increased motivation and ambition in a project if they know that it will be publicly exhibited, showcased or critiqued, by family, peers or invited "industry experts". The project outcome becomes more than simply getting a good grade from their teacher. External partners invited as panellists or audience for a showcase give the students incentive to produce the best work possible, and again, increase the authenticity of the project.

Teachers commented that student engagement was increased through working with external partners, as seen in the examples below:

> ***"There are students passionate about tackling world issues, we need to take this interest seriously. We're connecting with somebody that we've met potentially at the launch event and then [the students] might ask me if they can reconnect with them or if I can reach out to the people again."***
> (Head of Humanities)
>
> ***"They really enjoyed the Rolls Royce [input]. I think that was another one where people were like, I never knew that Rolls Royce did that or you know, I would never have considered that. They were talking about how it was generally kind of a male oriented or lots of males in the office or whatever but one girl was really interested. She came away from it, it seemed like they might even talk more about the business or the finance kind of side of it. And again, that kind of opened up her eyes about different elements of sectors within sectors."***
> (Head of sixth form)

In order to help you think through the ways in which you could connect with external partners, as well as the purpose of your collaboration, we have created a series of questions for you to consider.
(See next page)

How to collaborate with external partners:

- As a teacher, who do you know? What links do you already have to businesses, industry partners, community groups, or specialists in your field?
- Who else can you ask? Parents may have skills or experience that fit your project plans. Colleagues will also have connections. Can you send out a newsletter to parents/carers or ask at a staff meeting?
- Access your local resources, such as university education outreach teams, Local Enterprise Partnerships, careers and skills providers, local councils, and arts, heritage and cultural providers.
- Think about what your external partners can bring to the project, in terms of their assets, compatibility, experience, and availability. Will you work with them in person or virtually? Is the partner willing to accept students to their workplace, or come into the classroom? Are they willing to plan collaboratively?
- What benefits will working with this partner bring to the students and their project? Will working with this partner inspire and motivate your students? Do they bring authenticity to your PBL project? Can they come in at different times throughout the project to keep the students on track? Are they open to communication from the students when they have questions and how could that work?
- If you are planning collaboratively with external partners, make sure you are clear about your roles and time commitments. What expertise are you all providing? Who is managing/organising what? Use the planning map and timetable (section 17) and work through it together. You may need several meetings to create a fully-formed project.
- Identify any adjustments that will need to be made to your project plan, particularly in terms of time, space and resources.
- Determine measures of success and what both students and partners can achieve through collaboration.
- Assess risks and consider other important factors such as costs to your institution or your students, travel requirements and possible impact on other courses or colleagues.
- Think about how the partners can be involved in the final outcomes of the project – the product and the showcase.
- Review and reflect – gather feedback from external partners and students in order to inform future iterations of the project. (See section 24)

CASE STUDY

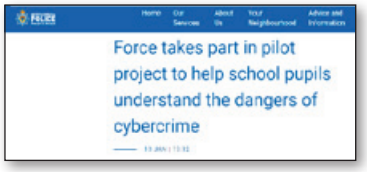
Cybersecurity Project

HEXHAM MIDDLE SCHOOL

PBL Goes to University

Project summary

The aim of this project was to create a meaningful context for the teaching of e-safety in the Computing Curriculum. The Year 8 students were set a challenge by the Northumbria Police Force Specialist Cyber Investigation Team to create a child-friendly version of the Computer Misuse Act 1990 that could be shared with other schools in the area and also be potentially shared with other schools across the country.



The project brief and success criteria/assessment as well as the overall timings, were developed collaboratively by the Head of Science and Computing, a Force Specialist Cyber Prevent Officer from Northumbria Police, the Digital Inclusion Project Co-ordinator from Northumberland County Council (NCC) and a researcher in Project Based Learning from Newcastle University.

Final product

The project challenge was set by Northumbria Police Force Specialist Cyber Investigation Team, and launched during an assembly. The students worked on their research and presentations during their computing lessons. Visits took place by all of the project development team throughout the seven week project to check up on the students' work and provide a sense of momentum. The final presentations were initially peer-assessed by the school digital leaders. Crucially the students were told that the winning team could have their child-friendly version of the Act shared with other schools in the area with the potential for it to also be shared with other schools across the country.

Planning with external partners

The planning process took several months and involved discussions at the university and at the school between the Head of Science and Computing, the Force Specialist Cyber Prevent Officer from Northumbria Police, the Digital Inclusion Project Co-ordinator from Northumberland County Council and the researcher from the university. This ensured that an interesting and authentic project developed using the ideas and knowledge all of the contributors, and the context of all stakeholders was understood. The Cyber Prevent Officer from Northumbria Police was able to draw on her knowledge of both the Act and her experience of working with school students in the region. The Digital Inclusion Project Co-ordinator from Northumberland County Council drew on his knowledge of developing projects that have digital products as their outputs.

"Well, I'm not used to planning with people from outside of school or outside of you know the partnership, so it was great to get that bigger perspective of what's going on across Northumberland in terms of digital literacy and actually a real- life organisation like Northumbria Police and what they're looking at."

(Head of Science and Computing)

Full case study is available at:

research.ncl.ac.uk/pblgoestouniversity/inspiringprojects/keystage3/cybercrime

Funded by EDGE FOUNDATION

Newcastle University

SECTION 20:

MANAGING GROUP WORK

"…it was nice to be able to see some of the students who you wouldn't expect take charge in the group work and hear the skills that they developed as a result […] they can develop things that actually, in their A-levels, they might not be doing, they might not be getting the skills."

[Head of Sixth Form]

Group work is an essential element in any PBL project but as the Education Endowment Foundation (EEF) highlight in their Teaching and Learning Toolkit, for it to be effective and successful, 'it is important to get the detail right'. Practitioners not only worry about the sheer practicalities, but perhaps more significantly that group work can be unproductive, that it is hard to control behaviour (Galton, 2007) and that it is difficult to cover the curriculum (Kutnick and Blatchford, 2014). Research has also shown that working well in a group does not necessarily come easily to many students.

What is key to overcoming all of these issues is a combination of planning and training (teachers and students alike) and an understanding that group work does not happen by itself just by sitting students together.

What do we mean by group work and is it worth the effort?

The EEF define group work (collaborative learning) in terms of students working together on separate tasks contributing to a common overall outcome, or working together on a shared task. Kutnick and Blatchford (2014) consider its defining characteristic to be that *the balance of ownership and control of the work shifts toward the pupils themselves (p.52)*. These definitions highlight the complexity of doing group work well and it is our aim throughout this section to provide information and resources to help you start to address this complexity. Yet before we do so, it is important to explain why it is worth the time and effort.

At a very basic level there is an intrinsic understanding that group work encourages working with others and this is an important and necessary skill in life and work. In terms of attainment the research shows that group work can have a moderate impact for a very low cost (EEF). If done properly it certainly does not lower attainment. These benefits are however also combined with equally significant gains in a variety of other areas. Trewel (2003 p. 59) identifies some of these as:

- Students experience different points of view and solutions to problems and these ***stimulate higher cognitive skills.***
- Small groups offer group members ***the opportunity to profit from the knowledge, skills and experiences that are available in the group as a whole***. What he terms 'resource-sharing'.
- Collaboration in small groups also means that students are given the opportunity to verbalize their thoughts. ***Offering and receiving explanations enhances the learning process***.
- Students in the 12 to 16 age group are strongly oriented towards their peer group and very interested in interaction with their fellow students. Group work can therefore impact on ***motivation*** and have positive effects.
- Varied assignments, which appeal to different levels of cognition and experiences, offer students the possibility of ***applying their strengths in the search for solutions***.

The case for group working appears to be worth the effort and in the context of PBL is really a must. To help guide you through some of the things you need to think about and do, what now follows are ideas and links to a range of resources introduced in the form of questions to ask yourself.

Things to think about to develop high quality group work

1. **What should group composition look like?**

So that was a concern was, some of the groups are going to be miles ahead if I let them be in their friendship groups. But then, was it going to be a case of where they're really strong students in the room, and they're just going to take over and just do all the work for their friends or for the other people in the group. (P.E and Sport teacher)

The comment from the teacher above demonstrates one of the key dilemmas facing teachers when they first consider group work. Do I determine the groups or let them work with their friends? And if I choose the groups, what do I base my decisions on? Ability? Diversity? Gender? Confidence? Interests? Behaviour? Kutnick and Blatchford (2014), after a three year project exploring group work, suggest that the obvious compromise is that young people should be consulted when their teachers make decisions about criteria to use when composing the groups. PBL Works in their protocol for creating project teams make the following very useful suggestions:

Form interest-based teams focused on the project content.

- Ask each student to complete an index card that lists the names of up to four students with whom they can be productive, and one person with whom they cannot be productive (this could be a best friend, a student with whom they have a personal conflict, etc.).
- Identify the characteristics that you want balanced across each team (e.g. big picture thinkers and detail-oriented thinkers, introverts and extroverts).
- As you plan projects across a school year, ensure that you vary teams so that students have an opportunity to work with different team members over the course of the year.

2. **What size should the group be?**

The general consensus is that 4/5 students is the optimal size for group work. This is large enough to allow for diversity of opinion and a range of problem-solving suggestions, but small enough to ensure that each student will have a meaningful role. The evidence would suggest that it can be beneficial to build up to working to this size, starting with paired work. To maintain social relations and particularly support students who prefer to work alone it can also be worth creating tasks that involve opportunities for the students to undertake individual or paired work with the results of this being fed back to the wider group and the final product.

3. **Do the students need training to work effectively in a group?**

We can't take it for granted that [the students] just know how to plan or evaluate, know how to make suggestions, or how to.....or just believe it's their job to make suggestions." (Business Technology teacher)

If you want your students to work effectively in groups without continual teacher input then they are going to need to understand what this involves. Of course you may not have the time to build in this training within your actual project so it is worth considering whether you could undertake some activities focusing solely on this before your project starts or making it part of tutor time/PSHCE. Kutnick and Blatchford (p.59) outline the following skills that students need to be introduced to in order for them to become 'metacognitively wise' and to ensure that you create a classroom climate for successful group working:

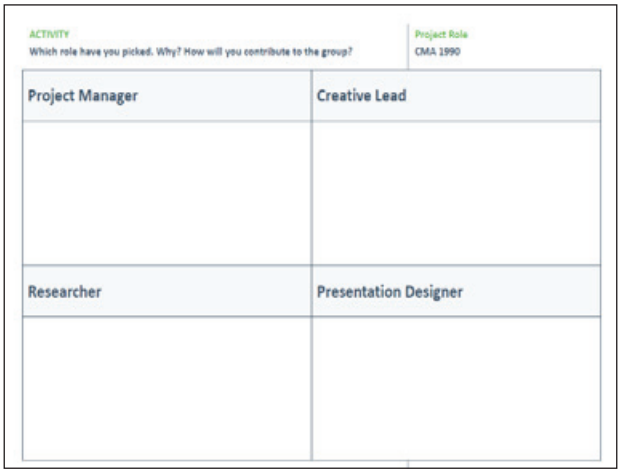
- Effective communication: listening, explaining and sharing ideas,
- Trust and respect,
- The ability to plan and organize their group work so they work more autonomously from the teacher and engage actively in learning,
- The ability to make considered group decisions; reach a compromise and avoid petty disputes.

In the research project that Kutnick, Blatchford and colleagues undertook they found that one of the most successful ways to support students to work effectively in groups was to make the time to brief and debrief the whole class at the start and end of a lesson.

The briefing involves discussing the skills that the group will need to draw on to complete the task; the debriefing explores what worked well and not so well and what needs to change or stay the same in future.

4. Planning group work into the project challenge (tasks/activities)

When you are planning your project in terms of the subject content, visits, products, showcase etc. it is important to consider how the group work will facilitate this and also how you will encourage the group to work together. Creating group roles with specific tasks is one way of scaffolding the work. In the example below the teacher and external partner created and explained the roles that would be required to complete the project challenge. In this case the students picked their own groups and own roles but were asked to explain how they would be contributing to the group as a whole.



ACTIVITY Which role have you picked. Why? How will you contribute to the group?	Project Role CMA 1990
Project Manager	Creative Lead
Researcher	Presentation Designer

Breaking down a project brief/challenge into manageable, possibly differentiated, tasks is a way to create less risk for the students allowing them to develop their group work. In some instances pre project tasks that focus on the group work element and/or subject content might ensure that the students are ready to begin.

Adding deadlines for 'deliverables' (e.g. research, sketches, storyboards etc.) before being allowed to move on to the next task is an effective way of keeping the group and project on track. The PBL works 'Project Team Work Plan' is a useful document to provide students with. This could be linked to a larger planning wall in the classroom, where each group visually records where they are in the process.
https://my.pblworks.org/resource/pbl_project_wall

The EEF found that 'competition between groups can be used to support pupils in working together more effectively'. However, they also stress that overemphasis on this can cause learners to focus on winning rather than succeeding in their learning. Linking competition to the quality of the product and the audience/showcase is one way to manage this.

SECTION 21:

TWEAKING (reflection-in-action)

Reflective practice is 'learning through and from experience towards gaining new insights of self and practice'

[Finlay, 2008]

A key aspect of engaging in PBL that emerged from our case studies was the need for teacher to 'tweak' their project as they progressed. Though many of the teachers we interviewed and worked with did not explicitly follow a reflection cycle, such as Kolb's Learning Cycle (1984) or Gibb's reflective cycle (1988), their comments suggested that they were both reflecting-in-action and reflecting-on-action (Schön, 1984) as their projects progressed.

Kolb's learning cycle: developed by educational researcher David Kolb in 1984. This cycle uses reflective practice as a tool to gain conclusions and ideas from an experience, with the aim to take the learning into new experiences, completing the cycle. The four-stage cycle aims to draw on the importance of using both our own everyday experiences and educational research to help us improve. It is not simply enough to reflect: the reflection must drive a change which is rooted in educational research.

Gibb's Reflective Cycle: developed by Graham Gibbs in 1988 to help structure learning from experiences. As a framework for examining experiences, it incorporates six stages, including description, feelings, evaluation, analysis, conclusion and an action plan for the future.

Reflection-in-action / Reflection-on-action: developed by Donald Schön in 1984, this suggests there are two types of reflection, one which takes place while the experience is occurring and tends to be immediate and spontaneous, and one which takes place after the event, which can be more time-consuming and involve evaluation and review for future experiences.

Both experienced teachers and those who were new to the PBL approach found that they "tweaked" their projects at different stages as a result of pupil feedback, colleague feedback, new developments (such as unexpected visitors or changes to the planned sequence of lessons) or personal reflection on the project's successes and requirements.

Tweaking can take place once a project has been completed, in the form of reviewing success and planning for the next cycle:

> ***"We later reflected, after we had run the project for a few years. We thought, how can we improve this project… And over the years, we did more, we adapted it and we did improve the overall project."*** (Head of Humanities)

Tweaking can also be done in the form of "mini-plenaries", evaluating progress at key points in the process and reassessing the delivery, as one teacher explained:

> ***"As we've gone*** **through we've had sessions, review sessions where we've had time to talk to each other and do a tweak after the first, after the first term because each project runs for a term, we had a review session, we did some tweaking what worked, what didn't work.** ***So we did a bit of work around there and tweaking it and then went back to, to the project. And then we ran it and then did a review. Just looking at that, reviewing it, seeing how they fit in with the original and some I'm going to have to pull back a little bit."***

Tweaks to the PBL process do not mean a lack of structure, but rather that the structure is flexible and allows for movement, alterations and immediate action:

> *"There was a structure to it……..***having that structure, which was like a framework, but not so rigid that it didn't not allow for any flexibility** *and yeah it was just advice from you and your previous projects that you've run and then just* **how we could tweak that to work for us."** (Head of Careers)

> *"I guess the key moment is you* **know when stuff isn't going right just tweak the project… I've learned to just amend as you go along. It's not concrete… And if it doesn't work, that's fine."** (Head of Vocational Science)

> *"There were a couple of moments where I thought oo my word,* **I'm going to do this immediately and put a change in place."** (Acting Head of History)

Some teachers acknowledged that the reflection from all those involved was key to the PBL approach, and that both teachers and students were on the learning journey together:

> *"***I'd tweak loads of things for next year, I would change loads of things…** *Once it gets up [and running], I know you can tweak it and change it as it goes and take their advice and I basically said to them in that initial lesson where so I gave them the overview after that launch event, look, this might change. It's a new thing. Like, I've had the training on it. There's only 30 people in the country or so doing it.* **So I don't know how it's gonna work. You guys can evolve that, I can evolve it and everyone just went yeah, no worries."**
> (BTEC Sport and Nutrition leader)

> *"***The kids are obviously going to be learning and completing these projects and the staff have also have that that learning journey** *of you know, in terms of how best to deliver it, how did the kids receive that, how could you make that better, why would you want to tweak that, do we want to change the outcome. And so those key moments really have been happening all the way through."* (Assistant Head, Middle School)

Ultimately, tweaking is not necessarily about fixing a problem, but striving for improvement:

> ***"And as you go through, it's that being able to recognise that you're going to have to adapt as you go through and adapting doesn't mean that something's failed. It means that you're looking for a better way for it to work."***
> (Assistant Head, Middle School).

The PBL process is fluid and malleable, but time and space for planning and reflection are vital. The approach can be a learning curve for everyone involved but effective collaboration means practitioners are able "embrace the failures as well as the successes".

> ***"It's worked really well and it's not perfect. There are still things we need to look at, still things we need to kind of tighten up on. But because we kind of planned the space for it to happen first in terms of the timetable and then we launched into the planning. It's meant all of this year has been a learning curve, but because people have been up for it, it's worked, you know you've got to embrace the failures as well as the successes and I think that's what we've done as we've gone through."***
> (Assistant Head, Middle School)

CASE STUDY

Ministry of Food

DURHAM SIXTH FORM CENTRE

PBL Goes to University

National Curriculum subject content

BTEC First Extended Certificate in Sport: learners have opportunities to develop personal, learning and thinking skills (PLTS); develop functional skills.

Project summary

This project is structured around the criteria of the BTEC First Extended Certificate in Sport. The students all already play or are involved in sport and fitness at a high level and are planning careers in sport and fitness. The aim is to develop their knowledge of nutrition by examining different diets: vegetarian, vegan, paleolithic, Mediterranean and pescatarian. The entry event involved a series of four cookery sessions at the Jamie Oliver Ministry of Food at the Beacon of Light in Sunderland, where they made increasingly more complex recipes and learnt a variety of cooking skills. They demonstrated their cooking skills in the Ministry of Food to invited guests. They then met with five people following the five diets, and after a "client consultation" devised meal plans and recipe cards for them. As a final showcase, the plan was that the students would cook a meal in the college refectory, and the winners of a public vote would have their meal included on the menu in the refectory for a day. This was "tweaked" as a result of pupil feedback and teacher reflection throughout the process, and the college being unexpectedly closed due to Covid-19, meaning that the final lessons were transferred online.

Project activity and timescale

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Students visit Jamie's Ministry of Food at the Beacon of Light to take part in four cooking sessions: soup and bread; pancakes and eggs; sizzling beef stir fry; pizza. They learn about nutrition, hygiene and cookery skills. Winning pair each week are awarded a Jamie Oliver cookery book each.				Students demonstrate their cookery skills making chicken tikka masala to invited investors and guests at the Beacon of Light.	Students hold client consultations with five people following the selected diets.	Students develop meal plans and recipes based on their client consultation.	Showcase: Students cook a recipe in the refectory and guests/other students vote for their favourite.

Reflection from the teacher focused on the importance of "tweaking" and adapting the project:

"And the kids were just really buying into it and once it gets up, I know you can tweak it and change it as it goes and take their advice and I basically said to them in that initial lesson where so I gave them the overview after that launch event, look, this might change. It's a new thing. Like, I've had the training on it. There's only 30 people in the country or so doing it. So I don't know how it's gonna work. You guys can evolve that, I can evolve it and everyone just went yeah, no worries."

Full case study is available at:

research.ncl.ac.uk/pblgoestouniversity/inspiringprojects/searchbytopic/healthandfitness/ministryoffood/

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SECTION 22:

KEEPING YOUR STUDENTS ON TRACK

In section 2 we outlined that student agency is one of the key principles of PBL. This refers not only to determining aspects of the content, type of product etc. but also that they manage their time and workload. Of course the more experienced a student is at PBL and perhaps the older they are, the more able they will be to self-regulate in this way.

It may be that you think that students should learn these skills through experience- where the learning comes from potentially not completing the work or a product to a high quality or even at all. In such a scenario, when the showcase occurs, this becomes evident and the student learns for next time. This is certainly one way to approach this and it may be appropriate at certain times.

However, the fact is there are a range of strategies that can be introduced to enable students to work more effectively and which they will be able to draw on in later projects and later life in both work and/or further education. In this section we outline the ways that the teachers and partners we worked with ensured that the students 'kept on track'.

1. **Providing the students with the project success/assessment criteria**

In the majority of the projects the students were provided with the success or assessment criteria at the start to make certain that they had a good understanding of what was required. In section 9 we outlined how in The Suffragettes project and the Cybersecurity Project these were used to ensure the quality of the final product.

2. **Deadlines**

Deadlines were provided to the students at the start and were often linked to the success criteria. These were not just final deadlines but deadlines throughout.

3. **Project walls**

PBL Works encourage the use of project walls where the tasks are outlined in columns and the students

place their names on post it notes in the section they are working on. This could be a group of names or individual names. As a task is completed the post it notes are moved, thus creating a very visual way of recording the progress that is being made. These could be linked to deadlines if necessary.
https://my.pblworks.org/resource/pbl_project_wall

4. **Visits from and/or communication with the external partner**

In some of the projects that were planned in collaboration with partners, regular visits were built in where the partners would look at the students' work and talk to them about it. This demonstrated the importance of the project and meant the students felt pressure to work hard.

The architect involved in the Maths and Architecture project identified 4 key points where he felt the partner should be involved:

- To set the project off
- To accelerate the project – deal with issues and create a sense of urgency regarding the deadline.
- To Introduce a scenario to move the project forward (see point 6 bellow)
- To attend the final showcase event.

The potential of establishing regular communication between the students and the external partners/ experts was also raised. For example could they get in touch when they had questions? This is something that would need to be considered and agreed with the partner at the project planning stage as well as how this might be done e.g. through the teacher as gatekeeper? Via a class zoom session or a visit etc.?

5. Subject content input

An expert lecture, workshop or skills session introduced at points throughout the project can help to keep motivation and interest high. As we make clear in Section 5 (Powerful Knowledge and PBL), these can be initiated by the teacher, students or external partners.

6. Throwing in a curve ball

An interesting idea proposed by the Architect involved in the Maths and Architecture project was to introduce some new information/ a scenario half way through the project that ensures that the project moves forward. For him, this was very much like real life where a client would suddenly announce changes to their requirements – we want a goat shed that fits 25 goats, not 22 as we originally requested.

7. Reflection on the process

Finally it is important to ask your students at the end of the project to reflect on how well they have worked, individually and as a group, and how they could improve next time. See the end of Section 14 for a self-reflection sheet designed by the Deputy Head Teacher at Valley Garden's Middle School.

SECTION 23:

MAINTAINING AUTHENTICITY AND REAL-WORLD LINKS

Authenticity is key to the PBL approach. John Larmer, Editor in Chief of PBL Works states that *"PBL means students are doing work that is real to them - it is authentic to their lives - or the work has a direct impact on or use in the real world."* (2012).This emphasis on authenticity must run through the whole project, from the planning to the final product and showcase.

PBL projects can be *not authentic, somewhat authentic* or *fully authentic*. In those projects which are *somewhat authentic*, students are doing work that simulates what happens in the world outside of school. In a project that is somewhat authentic, students play a role such as scientist, engineer, or website designer, in a scenario that reflects what might actually occur in the real world, or create products that will not be actually used by people but are viable products which could theoretically be used.

Fully authentic PBL means students are doing work that is real to them and is authentic to their lives, or the work has a direct impact on or use in the real world. This could be school, their local community, or a workplace. As one BTEC Science teacher said, *"[PBL] shows the real-world link doesn't it, that authenticity that you wouldn't get if you were just in the classroom, just in the lab."*

Larmer, Mergendoller and Boss (2015) described authenticity in four ways:

1. It meets a **real need** in the world beyond the classroom or the products students create are used by real people.
2. It focuses on a problem or an issue or topic that is **relevant to students' lives**—the more directly, the better—or on a problem or issue that is actually being faced by adults in the world students will soon enter.
3. It sets up a scenario or simulation that is **realistic**, even if it is fictitious.
4. It involves **tools, tasks, standards, or processes used by adults** in real settings and by professionals in the workplace.

Effective PBL projects therefore have an authentic context and involve real-world tasks and tools, thus speaking to the students' personal interests and real lives, as shown in the PBLWorks Project Design Rubric below:

	Lacks Features of Effective PBL The project has one or more of the following problems in each area:	*Needs Further Development* The project includes some features of effective PBL but has some weaknesses:	*Includes Features of Effective PBL* The project has the following strengths:
Authenticity	• The project resembles traditional "schoolwork;" it lacks a real-world context, tasks and tools, does not make a real impact on the world or speak to students' personal interests.	• The project has some authentic features, but they may be limited or feel contrived.	• The project has an authentic context, involves real-world tasks, tools, and quality standards, makes an impact on the world, and/or speaks to students' personal concerns, interests, or identities.

https://my.pblworks.org/resource/document/project_design_rubric

Stockwell (2015) identified three different aspects to authenticity in PBL: authentic **task**, authentic **output** and authentic **audience**.

Authentic task projects are linked to the real world that students either already experience or will experience in later life. In one project, the PBL team used pupil voice to establish the authentic scenarios pupils wanted to work on, and "they came up with things, you know, how to open a bank account, how to get a mortgage, how all of that works… And so we used some of that feedback as well to incorporate into the projects and really it was looking at a different way of learning and inquiry based learning where the children are the ones who take the lead, and staff became more facilitators".

Authentic output projects require students to produce something which can be used in the real world. Several of our projects had authentic outputs, from creating meal plans and recipes which could be used by authentic "clients" and served in the college refectory as part of the menu, to a child-friendly version of the computer misuse act which could be used by Northumbria Police in their work with children and young people. One PBL teacher explained that creating an authentic output "makes it real for [the students], it's not just a piece of creative writing they are completing for homework or a worksheet".

An **authentic audience** could be as diverse as Northumbria Police, real clients with specific dietary needs, a community in need of a Christmas market to reduce isolation, or a group of younger students within a school. Designing a project with a real-life audience in mind helps the students to connect with the local community and understand both their role in the wider world, and the role of those they come into contact with. It increases the buy-in and the attention that students give to the project, as they see it as more meaningful and more valuable than work directed solely at their teacher.

However, Barab and Duffy (2000) suggest that PBL illustrates the richness of real life, as authenticity can neither be pre-planned, nor pre-authenticated by teachers. "Rather in true constructivist fashion, the students must find their own authentic learning answers, in other words there should be many variations of right answer… The authentic task must be of value to students personally and of value to a real community of practice." (Roach, Tilley and Mitchell, 2018).

SECTION 24:

EVALUATION

End of project checklist

When you have finished your project, sit down with your project planning map in front of you jot down bullet point comments about the following in order to inform your next project. These should focus on what went well and therefore what you would do the same, as well as what you would change.

The hook question:
The subject content:
The launch event:
The product:
The exhibition:
The assessment:
The groupings (if applicable):
Student agency:
Visits (if applicable):
The involvement of external partners (if applicable):
The timing of the project – was it long enough, was it at the right time of year?:

Continues overleaf

Did you have to tweak it – if yes how and why?:

How did the students respond to the project?

- From your perspective?
- What did they think? (See the end of this section)

How effective was the partnership working?

- From your perspective?
- What did they think? Ask them for feedback. (See the end of this section)

Anything else you want to note for next time e.g. useful resources, links, contacts etc.?

Obtaining student feedback

At the end of the project, a feedback session with your students can provide insight into what they enjoyed, and what they would change, which can inform the next iteration of your project. Make sure that you say you want honest feedback and link back to Ron Berger's statement 'Be Kind, Be Helpful, Be Specific' (see section 14). This feedback could take the form of a whole class discussion, paired/group feedback using post it notes next to statements such as those below, or a short survey. The following are some example questions:

- **What did you enjoy most about the project and why?**
- **What did you enjoy least about the project and why?**
- **Did you always understand what you had to do?**
- **What could have improved this project and why?/ If there is one thing that should change next time the school runs this project what should that be and why?**
- **What did you not have the opportunity to do that you would have liked to have done?**
- **How effectively did you work in your group?**
- **How happy were you with the quality of your final product? What could have made it better?**
- **Did you think the visit / having visitors in/working with [name of partner] was an important part of the project?**

Obtaining external partner feedback

If you have worked with an external partner to plan and/or deliver your project, obtaining their feedback at the end of the project is crucial. This could take the form of a face to face meeting where you go through the checklist above or an email where you ask what worked well and what (if anything) needs be changed next time. This could include asking for comments on processes and communication as well as content.

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Useful resources: general

The Edge Foundation: https://www.edge.co.uk/. For specific resources including the Project Based Learning (PBL) Toolkit go to: https://www.edge.co.uk/edge-future-learning/our-offer/our-resources

High Tech High: https://sites.google.com/a/hightechhigh.org/pbl-resources/home

PBL Works https://www.pblworks.org/

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School XP: https://xptrust.org/
Watch the video 'How to XP' at: https://www.youtube.com/watch?v=-t9EaMRncdg&t=497s

School 21: https://www.school21.org.uk/

UK Ashoka Changemaker Schools: https://www.ashoka.org/en-gb

Work That Matters: The Teachers' Guide to Project Based Learning
https://www.innovationunit.org/publications/work-that-matters-the-teachers-guide-to-project-based-learning/

Useful resources: assessment

Professor Bill Lucas: Learning from assessment practices across the world:
https://www.edge.co.uk/sites/default/files/documents/bill_lucas_assessment_across_the_world_for_ra_edge_session.pdf

You can find out more about Bill Lucas's work at: https://www.winchester.ac.uk/research/enhancing-wellbeing-nurturing-the-individual/centre-for-real-world-learning/

The International Baccalaureate: https://www.ibo.org/

The Royal Society 'Parents' views on broadening school education' (Thornton, A et al, 2019)
https://royalsociety.org/-/media/policy/Publications/2019/broad-and-balanced-research.pdf

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