Prepare a portfolio, which illustrates a critical reflection of progress made on the planning and implementation of three pedagogical principles.

Student Name: Ellie McAdams
Student Number: 1902935
Pathway: Secondary PGCE
URL: https://uowtsd-my.sharepoint.com/:o:/g/personal/1902935_student_uwtsd_ac_uk/EoaCPe9CsktPmN5wSOuayTABRcv5NUIHNH_7CP1x1ncf2A?e=QexFEO

Good teaching and learning means employing assessment for learning principles.

Donaldson (2015) states that assessment for learning means giving feedback and using materials that fits the learner.
The following examples show how I have adapted my own teaching to fit this pedagogy.

True or False Plenary

Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Yr Athrofa
Institute of Education
Addysg i Gymru / Education for Wales

APLP PDPA

Lesson Plan Phase 1

Lesson Plan – Step 1 Cynllun Gwers – Cam 1

Student-teacher	Ellie McAdams	Class:	7D
AoLE or Subject	Biology	Date:	20.11.19
Lesson Focus:	Structure of a leaf		
Meaningful links to Curriculum	Photosynthesis		
Meaningful links to: Cross Curricular Responsibilities	Literacy: introducing new key terms such as palisade and stomata.		
Personal Targets (Linked to QTS and identifed in weekly review) Variation in voice and improve use of cold calling			

Mixed Ability Class. Around 25 pupils.

This was a new topic to the class. The class had prior knowledge of photosynthesis as a process. This lesson focused on how the leaf is structured to aid photosynthesis.

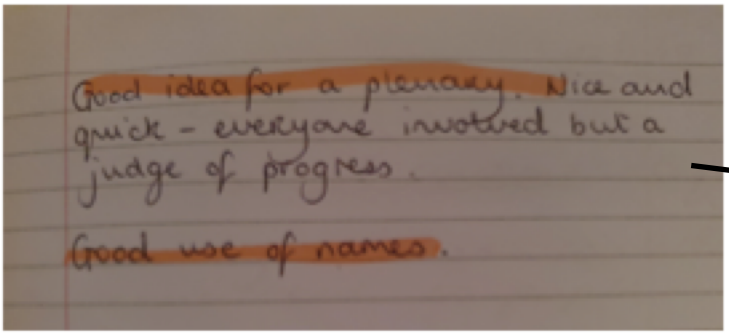
Learning Objectives (focus on Learning- use accessible vocabulary):
The pupils will learn to: Name and label each part of the leaf. Describe the function of various parts of the leaf.

Success Criteria (clearly linked to each Learning Objective and related to the process and/or product of learning)	Assessment of Pupils' Learning Evidence (What have the learners to say/write/do/produce – to demonstrate learning)
The students will be able to label a diagram of a cross section of a leaf. They will also understand how each part of the leaf functions by matching up function with the part of the leaf.	Group Discussion. Teacher Observation

As part of assessment of pupil's learning, I observed the responses of the pupils to the plenary to make a judgement of how much they understand the topic. This resource was informed by Rosenshine's principles of instruction.

Plenary	The students will be told true or false statements, such as "chlorophyll is coloured green" or "The stomta let oxygen move into the leaf" I will count down from three an the students will show thumbs up if they think the statement is true or thumbs down if they think it is false. The students will be asked to explain why certain statements are true/false and how they came to that conclusion.	The students will need to use their knowledge to decide if a statement is true or false.	

The idea for this was developed from discussion with colleagues and reading literature. I wanted a plenary that was quick, assessed the whole class but also identifies students who need more support with the topic. I also wanted to make the plenary link back to the learning objectives.
A common problem that was discussed with colleagues is when using something such as whiteboards, it is easy for students to copy or change their answers based on other students' answers. This led me to using the countdown before they showed their answers.
I also repeated the statement two or three times to allow plenty of thinking time and to make the statement clear. An improvement to this would maybe to have the statements on the board to avoid ambiguity. However, all the pupils seemed clear on this task.
Once the students showed their thumbs I would question them further on how they reached their conclusion to further assess understanding of individuals. This could be 'bounced' around the room if I wanted further clarification. I used verbal praise and would also confirm the answer as a form of verbal feedback.



The feedback for this plenary was very positive. It was a quick but effective way to assess progress of the class and also give them verbal feedback on their progress.

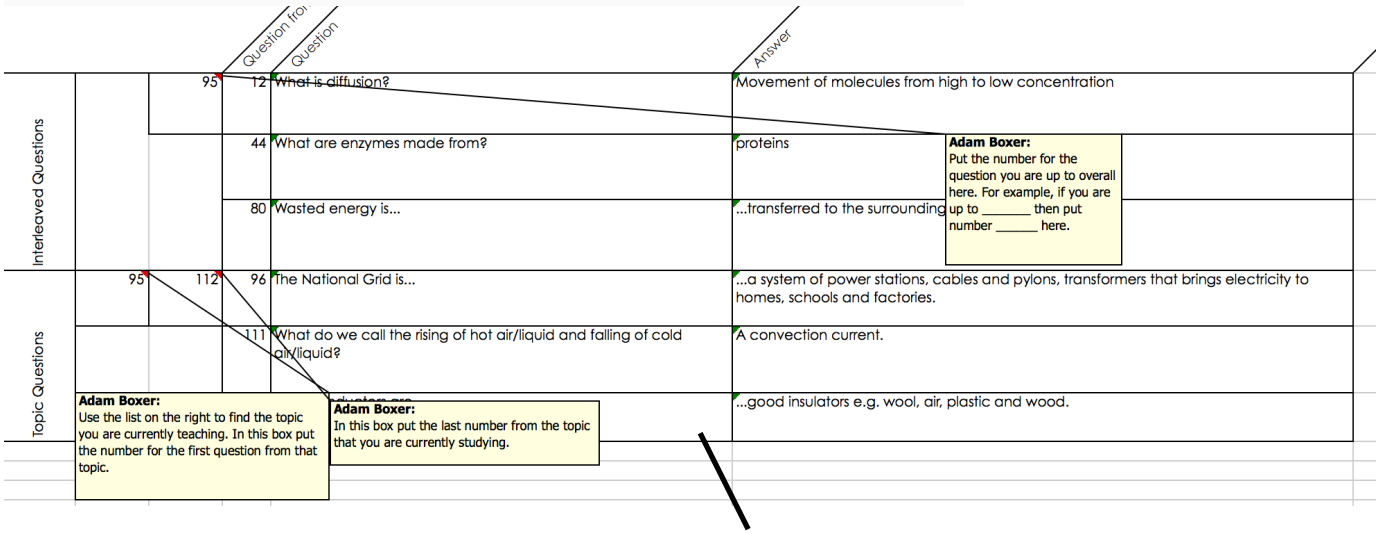
Retrieval Roulette

Retrieval Roulette is a resource created by the school for the science department. I use it in my Year 10 Applied Science class, as seen in the following lesson plan. Although it is a resource developed by the school it is something that I will continue to use in my teaching practice as it produces high quality answers and gets students into positive habits in preparation for exams.

Time	Activities/Methodology/Key Concepts (Teacher's Role – including key teaching points, differentiation strategies and key questions)	Pupil Tasks (Pupils' role –including differentiation, engagement in formative assessment and homework)	Resources (Including Health and Safety requirement)
Opening phase (with links to prior learning)	Retrieval roulette. The students will be shown six question based on past work for them to answer in the back of their books.	Use their own knowledge and the booklets to answer the questions on previous topics covered.	Retrieval Roulette
Teaching & Core Learning	The booklet will be read and highlighted and key points explained. One example will be gone through together on the board. And another example will be given for them to do in their books. An emphasis will be put on using the correct units. The students will be given past paper questions for them to complete. The answers will be gone through regularly.	The students will need to understand the key equations needed to calculate electrical cost. They will follow the example and complete a warm-up question. They will need to answer past paper questions	Booklet Past paper questions.
Plenary	How can we reduce the cost of our electrical bills?	The students will have a quick discussion on possible ways of reducing electrical bills.	

The class I use this resource in is a small, low-attainment, Applied Science class. This lesson was on calculating costs of electricity.

This resource is based on the concept of retrieval time in memory, which was discussed in an Inset day at the school.



This shows the initial set up of the resource. The spread-sheet contains questions for the whole course. I enter the numbers of the topics that I have covered and the topics that I am currently teaching. The first three questions can be from any of the previous lessons and the last three questions are on the current topic, so will be based on what has been covered in the last lessons.

1	What is diffusion?
2	What are enzymes made from?
3	Wasted energy is...
4	The National Grid is...
5	What do we call the rising of hot air/liquid and falling of cold air/liquid?
6	Poor conductors are...

This image shows what the resource looks like when it is used in lesson.

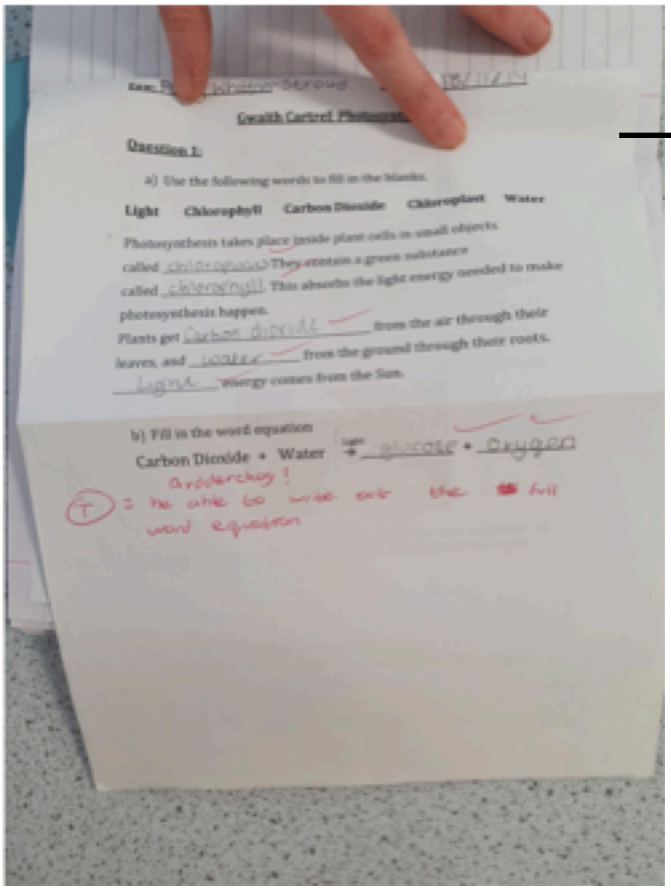
As previously mentioned, the idea of this resource is to improve retrieval time and long-term memory storage in students. It is especially beneficial for KS4 in preparation for exams. In lesson the students have time to answer the questions. The answers are then gone through and it is explained what examiners are expecting. It also highlights to the students and myself which topics might need revisiting. It also is the repetition that many students need to remember a the concepts. The school also use information booklets along side their workbooks, so activities like this make them mo

A question from last term.	A question from last month.
A question from last week.	A question from last lesson.

A drawback to this resource is that it can take along time to set up. The school has set up retrieval roulette for KS4 but not KS3. I see the concept as being equally beneficial for KS3 and have used a question grid with this set up in my year 9 class.
This allows me to give them verbal feedback on their answers and ways to improve.

Homework Feedback

One of the most effective aspects of Assessment for Learning is providing feedback that is beneficial to learners for them to improve on. A key area in which I do this is homework.



This example is homework for my year 7 mixed-ability class. The homework was given at the end of the photosynthesis topic. As I see this class 1 a week the homework was collected, marked and handed back the next lesson.
Each homework has a comment in welsh and a target on how they can either improve the homework or next steps for learning. The students also could have specific comments for parts of the homework on how they could improve in that specific area. This could be from spelling to expanding on their answers.
In the example shown the student received full marks. The student received an A1 for excellent homework and verbal feedback. They also were given a target of learning and being able to write the full word equation. This is an example of next steps rather than improvement of their answers.
Targets for students who did not receive full marks ranged from revising chlorophyll and chloroplasts to being able to compare plant cells to animal cells. These give students specific points to work on and time is allocated to do this during lessons.

Good teaching and learning regularly reinforces Cross-Curriculum Responsibilities, including literacy, numeracy and digital competence, and provides opportunities to practice them.

The focus of cross-curricular responsibilities is the Literacy Numeracy Framework (LNF) and the Digital Competency Framework (DCF). These two frameworks are aiming to improve students' literacy, numerical and computational skills across every subject or Area of Learning Experience (Donaldson, 2015).

Online Research

Lesson Plan – Step 1 Cynllun Gwers – Cam 1

Student-teacher	Ellie McAdams	Class:	9YMD
AoLE or Subject	Chemistry	Date:	20.11.19
Lesson Focus:	Drinking Water		
Meaningful links to Curriculum			
Meaningful links to: Cross Curricular Responsibilities	**DCF:** planning, sourcing and searching		
Personal Targets (Linked to QTS and identifed in weekly review) Clear explanations and on-task behaviour managment,			

This class is a top set year 9 class of 38 pupils.

Learning Objectives (focus on Learning- use accessible vocabulary):
The pupils will learn to: Understand the need for a sustainable water supply. Explain how water is made safe to drink through sedimentation, filtration and chlorination.

This was a new topic. The students would have no prior knowledge of water supply

Success Criteria (clearly linked to each Learning Objective and related to the process and/or product of learning)	Assessment of Pupils' Learning Evidence (What have the learners to say/write/do/produce – to demonstrate learning)
Students will successfully research how water is treated to make it safe to drink and will be able to explain the three main steps and put them in order.	Discussion, teacher observation

Time	Activities/Methodology/Key Concepts (Teacher's Role – including key teaching points, differentiation strategies and key questions)	Pupil Tasks (Pupils' role –including differentiation, engagement in formative assessment and homework)	Resources (Including Health and Safety requirement)
Opening phase (with links to prior learning)	The students will be asked the question 'where does water come from?' They will then create a mind map using their own knowledge of where they get their water.	Create a mind map or bulletpoints of different water sources.	
Teaching & Core Learning	The students will be given tablets and asked to research how water is treated and made safe to drink. They will be given the titles of the three steps: sedimentation, filtration and chlorination. The students will then be asked to share their findings as a class discussion. Key points will be written on the board. The students will then complete a water treatment 'jigsaw' which produces a diagram of water purification including labels.	Research using the internet the water purification process. They will then share their findings with the class through discussion. The students will cut and stick a diagram of water treatment into their books. They will place the steps in order and label the diagram.	Tablets Water treatment jigsaw
Plenary	Words will be displayed on the board. The students will be told, this is the answer what is the question?	Students will write down possible questions for the answers on the board. Some of these will be shared with the class.	

The idea of the started was to get the students thinking about water treatment and also for me to assess their current level of knowledge on a new topic.

The main focus of this lesson was for the students to do their own research. This was focussing on the students digital competency skills. I gave them some guidance by putting key terms on the board. The discussion at the end of this task was to ensure that they had researched with enough detail, which many of them did.

Time	Activities/Methodology/Key Concepts (Teacher's Role – including key teaching points, differentiation strategies and key questions)	Pupil Tasks (Pupils' role –including differentiation, engagement in formative assessment and homework)	Resources (Including Health and Safety requirement)
Opening phase (with links to prior learning)	The students are asked if they were on a desert island how would they obtain water. In this situation, they would be given a knife two containers and some plastic sheeting.	The students needed to recognise that they can boil sea water and condense it to obtain fresh water.	

The next lesson with this class linked strongly with the previous. The focus of the lesson was distillation which is the treatment of seawater to be drinkable. The starter links again with DCF as it is problem solving. I always want my starters to get the students thinking for good engagement and focus in the lesson. The students needed to use their scientific knowledge as well as practical skills to problem solve and work out their own survival. I did this as a fun introduction to the lesson.

Combustion Practical

Lesson Plan – Step 1 Cynllun Gwers – Cam 1

Student-teacher	Ellie McAdams	Class:	Y8 MED
AoLE or Subject	Chemistry	Date:	19.11.19
Lesson Focus:	Testing Fuels (practical)		
Meaningful links to Curriculum	Combustion		
Meaningful links to: Cross Curricular Responsibilities	**Numeracy:** calculating temperature difference and difference in weights, reading thermometers **DCF:** working systematically and engaging in computational thinking.		
Personal Targets (Linked to QTS and identifed in weekly review) Clear explanations and on-task behaviour managment,			

This is a low-attainment year 8 class.

The theory behind combustion had already been covered with this class. This lesson is focusing on practical skills and revisiting the theory through a practical.

Learning Objectives (focus on Learning- use accessible vocabulary):
The pupils will learn to: Decribe how different different amounts of fuels are needed for a specific temperature change. Develop lab-based skills to follow a method and work safely.

Success Criteria (clearly linked to each Learning Objective and related to the process and/or product of learning)	Assessment of Pupils' Learning Evidence (What have the learners to say/write/do/produce – to demonstrate learning)
Students will be able to intepret their results and reach a conclusion based on their own scientific knowledge. The students will complete the practical, following the method successfully and in a safe manner.	Discussion, teacher observation

Time	Activities/Methodology/Key Concepts (Teacher's Role – including key teaching points, differentiation strategies and key questions)	Pupil Tasks (Pupils' role –including differentiation, engagement in formative assessment and homework)	Resources (Including Health and Safety requirement)
Opening phase (with links to prior learning)	The students will be given a card sort activity of a method to a practical.	The students will need to put the cards in order to create a method for the practical.	Card Sort
Teaching & Core Learning	The students will be given a demonstration of how to complete the practical. A diagram will also be displayed on the board. The students will work in pairs and label themselves 1 and 2. Each student will be asked to gather different equipment. When all students are ready, they can light their fuel burners. Support will be given from teacher as needed. For the second fuel, the students can have more freedom to complete with less structured support, depending on behaviour. The students will have a table to fill out.	The students will need to test two fuels ability to heat a set volume of water. The students will compare the mass used-up by the two fuels for the water temperature to change by 40 degree celsius. The students will do this by burning fuel in a fuel burner. The students will need to write their results into a table. The students should complete this in a safe manner.	Practical equipment table
Plenary	The students will tidy up their equipment. They will then compare their results. The students will then be asked to write down three skills that they have used today.	The students will be able to give their results and compare them to other groups. The students will spot if any results do not fit a pattern. The students will identify the skills they have used in	Results from practical.

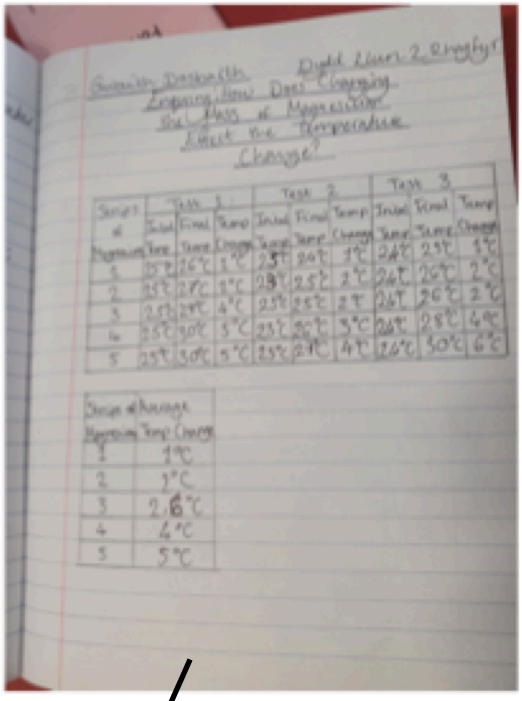
The starter of this lesson was focused on developing computational thinking as part of DCF. As this is a low-attainment cla I still wanted the task to be accessible for all and developing their own method would have take too long.. The card sort provides a good support and is a start in developing that skill. The aim for th future is for this class to develop computational thinking that they c write a method for a practical with decreasing amounts of support.

The practical part of this lesson developed the students' numeracy skills. They needed to calculate temperature change and mass changes and also calculate average These are common skills needed in science practical. For additional support the table for results was provided to give structure for the calculations.

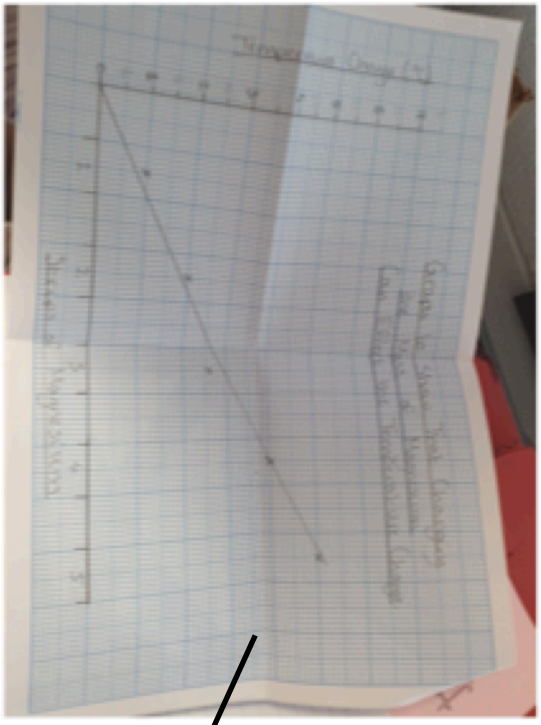
This lesson was with my high-attainment year 9 class. This was the 2nd lesson of a practical.

Time	Activities/Methodology/Key Concepts (Teacher's Role – including key teaching points, differentiation strategies and key questions)	Pupil Tasks (Pupils' role –including differentiation, engagement in formative assessment and homework)	Resources (Including Health and Safety requirement)
Opening phase (with links to prior learning)	The students will need to match up the variable with the definition. The students will be shown the equation for displacement. The method will be revisited as a reminder for the students.	The students will need to match up dependent, independent and control variable with their definitions.	
Teaching & Core Learning	The students will complete the experiment. Then the students will check their results for any anomalies and calculate the averages. The students will then graph those averages. And describe the relationship between the mass of magnesium and the heat given off.	The students will have to analyse their results for any anomalous results. They will then graph their results and comment on any patterns	

The students already had their results from the previous lesson. This was a numeracy based lesson.



In the previous lesson the students' constructed their own results table, which is part of DCF.
In this lesson the students analysed their results for anomalous results and calculated averages.



The students also constructed their own graph, including axis, line of best fit and plotting results. As this was a top set class this was done with minimal guidance. However, this lesson provided a chance for them to practice this skill and also to deal with minor misconceptions. This data was further used in a future lesson to analyse their results.

Good teaching and learning sets tasks and selects resources that build on previous knowledge and experience and engage interest.

Donaldson (2015) in Successful futures explains that this pedagogy is based on building on previous knowledge and make subjects and lessons more interesting to individual children who have their own personalities and interests.

Absorbers Emitters

- **Comments and Evidence**
- **Targets for improvement and suggested ways forward**

Ellie is developing a sound understanding for teaching pedagogy and is on-track for this early stage of her teaching development. Ellie demonstrates a sound and developing knowledge and understanding of relevant pedagogies and disciplines within and across subject content. She plans appropriately for a range of learners at KS3 and KS4, though this is heavily supported at this early stage of teacher training. Ellie demonstrates a developing knowledge and understanding of the needs of all learners in planning, preparation and teaching. She can discuss the individual needs of leaners in terms of motivation, behaviour and academic attainment. Ellie demonstrates an understanding of the use of real life, authentic contexts for learning being provided as a natural part of the learning experience. She recently related a GCSE lesson on absorbers and emitters to some excellent real world examples. Ellie demonstrates a developing understanding of how learning develops, building on prior experience and learning. She can plan a succession of lessons, with support, that builds upon prior understanding.

This is part of the mid-placement review, which my mentor wrote. It comments that I take into account motivations of learners and give context to the lesson that they would relate to.

In the absorbers-emitters lesson mentioned, I was explaining how black matte materials are better absorbers and emitters than shiny silver materials. I knew that this class had shown interest in cars, so one of my explanations included how black cars can get really warm in the sun.
Another explanation included using tinfoil when cooking to reflect heat. Both of these contexts are things that the students have experienced in life and so these explanations will build on that knowledge as to why they occur. This is a good example of relating it to real-life knowledge as they are fairly universal experiences.

Lesson Plan – Step 1 Cynllun Gwers – Cam 1

Student-teacher	Ellie McAdams	Class:	10a Red
AoLE or Subject	Physics	Date:	20.11.19
Lesson Focus:	Convection and Radiation		
Meaningful links to Curriculum	Thermal Transfer		
Meaningful links to: Cross Curricular Responsibilities	**LNF:** Calculating temperature change and averages. Comparison of results.		
Personal Targets (Linked to QTS and identifed in weekly review) Clear explanations and on-task behaviour managment,			

This is the lesson plan for the lesson mentioned in the review.
I also made this lesson a practical lesson as the class finds practicals engaging and it is a good way of linking up the theory to what happens in practice.

Learning Objectives (focus on Learning- use accessible vocabulary):
The pupils will learn to: Investigate which materials are good/poor emitters/absorbers. Analyse data for repeatability and reproducibility.

Structure of a Leaf

Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Yr Athrofa
Institute of Education
Addysg i Gymru / Education for Wales

APLP PDPA

This lesson was the first example I gave for the Assessment for Learning pedagogy.

Lesson Plan Phase 1

Lesson Plan – Step 1 Cynllun Gwers – Cam 1

Student-teacher	Ellie McAdams	Class:	7D
AoLE or Subject	Biology	Date:	20.11.19
Lesson Focus:	Structure of a leaf		
Meaningful links to Curriculum	Photosynthesis		
Meaningful links to: Cross Curricular Responsibilities	Literacy: introducing new key terms such as palisade and stomata.		
Personal Targets (Linked to QTS and identifed in weekly review) Variation in voice and improve use of cold calling			

As previously mentioned this was a new topic. However, the students have previously completed lessons on photosynthesis and understand this topic very well. Photosynthesis links strongly with structure of the leaf.

Learning Objectives (focus on Learning- use accessible vocabulary):
The pupils will learn to: Name and label each part of the leaf. Describe the function of various parts of the leaf.

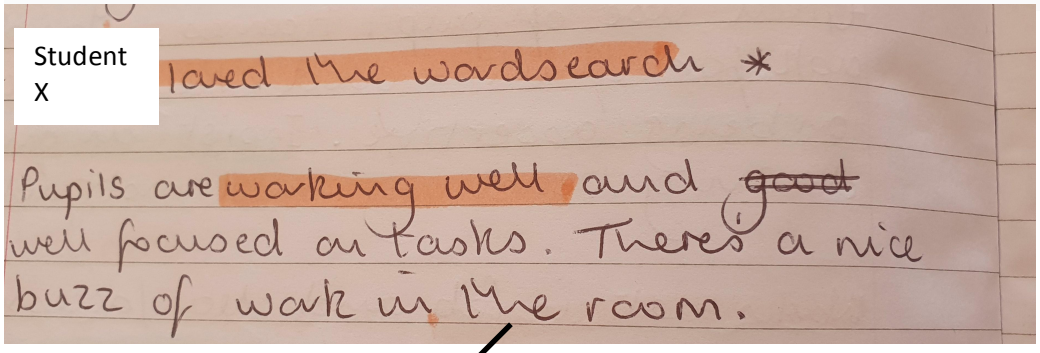
Success Criteria (clearly linked to each Learning Objective and related to the process and/or product of learning)	Assessment of Pupils' Learning Evidence (What have the learners to say/write/do/produce – to demonstrate learning)
The students will be able to label a diagram of a cross section of a leaf. They will also understand how each part of the leaf functions by matching up function with the part of the leaf.	Group Discussion. Teacher Observation

Time	Activities/Methodology/Key Concepts (Teacher's Role – including key teaching points, differentiation strategies and key questions)	Pupil Tasks (Pupils' role –including differentiation, engagement in formative assessment and homework)	Resources (Including Health and Safety requirement)
Opening phase (with links to prior learning)	The students will be given a wordsearch on key terms for photosynthesis.	Find the key terms for photosynthesis, including chlorophyll, glucose and carbon dioxide.	Word search
Teaching & Core Learning	The key pints of structure of a leaf will be discussed using diagram on the board. They will be given textbooks and worksheets. The first worksheet will ask them to label the different parts of the leaf. They will then be given a card sort task in which they will need to match the function up with the part of the leaf. As an extention another information sheet will be given including additional questions exploring more the function of stomata and palisade cells.	The students will need to read through the relevant pages and label their own picture of a leaf cross section. They will have to link up each part of the leaf with it's function.	Textbook Worksheets
Plenary	The students will be told true or false statements, such as "chlorophyll is coloured green" or "The stomta let oxygen move into the leaf" I will count down from three an the students will show thumbs up if they think the statement is true or thumbs down if they think it is false. The students will be asked to explain why certain statements are true/false and how they came to that conclusion.	The students will need to use their knowledge to decide if a statement is true or false.	

I have used word searches in both my mixed year 7 and my low attainment year 8 classes. I use this type of resource so students become more familiar with key terms and also as an engagement activity. It is easily accessible and also a fun activity so is ideal for a starter activity to settle students down. Also see comments from my mentor below.

During this explanation, I linked the structure of the leaf heavily with the process of photosynthesis. The structure of the leaf is adapted for the process of photosynthesis, such as short diffusion path for gas exchange. The students who finished the first task also got a extension sheet based on more specific parts of the leaf such a the stomata, which also goes into greater detail of their function during photosynthesis The aim of all this is to build on knowledge from previous lessons. I decided to link it in th way due to theory relating to constructivism and the link is important for the students to understand the whole process, rather than the topics being separate. It would not be beneficial for these students to just know the structure and no each part's function The students themselves may not b able to put the link together themselves so I used this link to scaffold their learning, as seen Vygotsky's zone of proximal development (Fournier and Riccio, 2013).

Student X



Student X's name has been removed for anonymity. This shows part of the feedback from the lesson on the structure of the leaf. Student X is a low-attainment student, with various additional learning needs (ALN) and tends to be very disruptive in lessons. Using a starter activity, whilst also having a positive relationship with student X, means that they were engaged from the start of the lesson and minimised disruption throughout the lesson. The resource was accessible and fun and this was one of the first lessons in which student X fully engaged in.

An issue I personally have with wordsearch's is that they are not the best educational tool. They get the students more familiar with the terms but its limited in how much theory they gain from completing this activity. However, I do see massive benefits in using these resources for many students including Student X as an engagement activity.

An improvement on this which I used in future lessons would be resources such as crosswords, which have the same element of fun, engagement and accessibility, but also has more educational impact. However, it is also important to use a variety of resources to maintain high engagement levels

Critical Reflection
Introduction

I will be presenting a portfolio of evidence that shows examples of my teaching methods that I used during my professional teaching experience. The assignment is based around Donaldson's 12 pedagogies (Donaldson, 2015), where I will be focusing on three: good teaching and learning means employing assessment for learning principles, good teaching and learning regularly reinforces Cross-Curriculum responsibilities including literacy, numeracy and digital competence and provide opportunities to practice them, and good teaching ad learning sets tasks and selects resources that build on previous knowledge and experience and engage interest. Each of these pedagogies will be discussed in terms of my practice where I will critically reflect on the effectiveness of these pedagogies in my practice. Reflective practice allows teachers to evaluate their teaching and set priorities for professional development (Kyriacou, 2014). The National Mission for Education in Wales mentions a self-improving system in which teachers are required to continually learn to ensure that each pupil leaves education having achieved their potential (Welsh Government, 2017). Therefore in this assignment, I will be reflecting to improve my practice with a focus on student learning.

My planning and implementation during my first professional teaching experience took place in an English-medium co-educational secondary school in South Wales. Following BERA ethical guidelines (2018) this school will be referred to as School X, to maintain anonymity. School X has 880 students, 15.9% of which receive free school meals (Welsh Government, 2018). Estyn (2018) states that 25.9% of the students at School X have additional learning needs (ALN).

Good teaching and learning means employing assessment for learning principles.

Assessment for learning (AFL) is emphasized by Donaldson (2015) in the new curriculum. AFL allows teachers to improve the effectiveness of learning, raises standards and nurture ambition.

Black *et al* (2005) states than any assessment where the priority is to promote students' learning is AFL. Both Black *et al* (2005) and Donaldson (2015) agree that the distinction between assessment for learning and assessment of learning is that AFL requires useful feedback that shows students steps to succeed in the future. Hattie and Yates (2014) add to this in asking what students understand by feedback and why it is important to them. They concluded that students want to improve in the future, so feedback should not be unnecessary critique, but a correction of mistakes and how they can improve.

The first example focuses on questioning. Questioning is a fundamental part of and AFL to assess progress and involve students in the lesson (Black *et* al, 2005, Kidd and Czerniarski, 2011, Glazzard, Denby andPrice, 2014). This was also emphasised at university and by my mentor. The activity starts with a closed-question. They can vary in difficulty but has a short response of thumbs up or down, which allowed me to assess whole-class understanding. I used this as a starting point for open-questioning to provide challenge. A resource which helped me develop this technique was 'Rosenshine's Principles in Action.' (Sherrington, 2019). This recommended asking a large number of questions, checking for student understanding, checking responses of all students and providing feedback. The thumb up or down tactic that I chose to use allows for me to give verbal feedback to the whole class, investigate how the child reached that conclusion, correct misconceptions.

The next example is of a resource called recall roulette, which was first highlighted to me during an inset day. To understand why I find this resource so effective, it is important to understand how memory works.
Recall specifically refers to transferring information from long-term memory to working memory. To improve recall, visiting the topic often, for a short period of time, is more beneficial than revisiting once for a long time period. For topics to be remembered they must be constantly rehearsed, which makes it easier to recall (Hattie and Yates, 2014).
This resource has developed my own teaching practice as it has increased my knowledge of the course as a whole. It has also given me chance to give constructive feedback, track progress and develop my questioning technique. Similarly to the thumbs up technique, it is a good starting point to delve further into student understanding.
A drawback to this in my practice is that it is a school-specific resource that I may not have access to in the future. I will have to develop either my own software, or another method that achieves a similar result. An example of how I could do this is shown in my evidence in the form of a question grid, which would be less in depth, but achieve a similar result. This concept is one that I wish to continually use and adapt for my teaching as it has a massively positive impact on learning.
The last example I gave is the feedback for homework. As assessment should be formative and serve a purpose and highlighting future progression steps, I gave this topic as a formative end of topic assessment.
I ticked correct answers and crossed incorrect answers. Some of these marks will have an additional comment on how to improve or some positive feedback. I also included a specific target for each student. During the lesson, after I returned the homework, I gave the class time to read their targets and also act upon them.
I think this is an effective way to give feedback as it is individualised to each student and also gives the students the chance to reflect and work on the target set. As the homework was differentiated, it allowed for targets to be even more specific and individualised, and also make it accessible and engaging to all.
Overall I have used a variety of resources for AFL. A target of mine was to improve questioning strategy which I have continuously worked on and also use specific feedback in lessons and formative assessments. The AFL techniques I have used engaged learners and helped them improve their own work. They have clear progression steps and targets to improve.
To further develop AFL in my lessons, I could plan my questions. Some questions I ask can be vague or I do not take the opportunity to develop students' answers further. Another area I struggled in was to provide specific targets for students who performed excellently. I did not want to give a general "well done" comment, as I do not see this as helpful for their future progression. I could have given an extra task for them to do during the time in the lesson, as this would be more challenging.

Good teaching and learning regularly reinforces Cross-Curriculum Responsibilities, including literacy, numeracy and digital competence, and provides opportunities to practice them.

Donaldson (2015) says that the aim of embedding the literacy and numeracy framework (LNF) and Digital Competence Framework (DCF) is so that there is a focus on across subjects, which should raise the standards of these skills. This emphasis was brought forward by the

Minister of education and Skills in Wales who also stated that these are essential for students to achieve later in life (Welsh Government, 2013,2019).

In my practice I have made an effort to implement these frameworks into my lessons, but also making effort to ensure they are not shoehorned in. The first example I use of this is using tablets to research in my year 9 class in teaching a new subject. The part of the DCF this links to is the sourcing and searching strand (Welsh Government, 2019).

I gave the students some guidance by writing key terms and questions on the board, including an extension question. I felt that this technique provided some support for the students whilst allowing them to be independent in their learning. I noticed during the discussion at the end of the task that some of the responses were not as in-depth as I expected from this class. This highlights that the students still need to develop research skills and also an improvement I need to make in my practice. I should have checked in with the whole class more regularly to assess level of detail and give further guidance instead of just at the start of the task.

I also mentioned the starter for the next lesson in which the starter linked strongly with the problem solving aspect of the DCF (Welsh Government, 2019). The students had to use their scientific knowledge and problem-solve to source drinkable water. This activity was engaging and promoted discussion between students. It also was a good introduction to link their previous knowledge to the topic being taught. I felt that I implemented this aspect of DCF better than the research task as it produced high quality answers and I became more involved in discussion with the pupils. This shorter task was also easier for me to check in on student progress.

The next example I used was in my l year 8 class. This was a practical lesson using elements of both LNF and DCF. The starter was linked to the computational thinking strand in creating a flowchart-like method (Welsh Government, 2019). Computational thinking is applying techniques from computing to understand and reason processes (Connell *et al*, 2015). Using a card sort provided support for the class in developing this skill. However, it would be more beneficial for this class to spend more time on this type of activity so that they can produce their own method without the support. This would be the next progression step of this class, starting with a more simple method.

The main task in the class was the practical activity. Aspects of the practical links LNF in terms of measuring skills and number skills (Welsh Government, 2013). This activity was supported by results tables, which help in the calculation, whilst it still is a challenge for the students, many who attend mathematics support sessions.

What I find with this class is keeping them engaged with longer activities. One way I could possibly do this is breaking down the lesson into short tasks. This is something I need to try in future lessons to see how it impacts the behaviour in this class.

The last example is a displacement enquiry with my Year 9 Class. In this lesson, students produced graphs. Within science education, students struggle with graphing, as graphing has mostly been taught in mathematics without some features seen in science, such as units and non-linear functions (Lai *et al*, 2016). This is a skill across many subjects and is essential in being scientifically literate (Glazer, 2011), and also for employment in the modern digital age (Murray, 2003). We have integrated mathematics into the science as a practice, we need to incorporate it more effectively within our curriculum and science classrooms (Clary and Wandersee, 2014).

As this class is high attaining who have had experience in this skill, this lesson had minimal guidance from me except highlighting discussion points. A key part of the LNF is to allow for students not just to learn the skill once, but also practising these skills. The students presented results and also were able to draw conclusions and interpret their results, which is part of the numeracy framework (Welsh Government, 2013).

Although this skill is not new to this class, it is an opportunity to practice that skill which I then hope to develop in future lessons with more complicated graphs and analysis. That been said, an improvement I could have made is for the students to have done a more in-depth analysis. I focused a lot on discussing anomalies, but I could have also had them discuss improvements that could be made to the method, and explanation of the results using their scientific knowledge and to discuss more in-depth the relationships and patterns. I think the graphing was as in-depth as possible for this practical, but I hope to improve my teaching of analysis skills in the future. I can do this by breaking down the steps and making clearer my expectations.
Overall, I have implemented the LNF and DCF fairly well across my lessons. The methods I have chose have had a high impact on the students' skill development and have made an effort to integrate these frameworks seamlessly into my lesson.
I do, however, have some key development points for my future in teaching. This includes assessing progress more regularly in the class, ensuring the tasks are engaging for my low-attaining class and ensuring it is challenging enough for my high-attaining class.

Good teaching and learning sets tasks and selects resources that build on previous knowledge and experience and engage interest.

Donaldson (2015) recommended this pedagogy for the future curriculum to emphasise progression for the students. These progression steps are guidelines for teachers to select resources that build on previous knowledge and also take into account students' interest and experiences.
The first example in this pedagogy is a lesson with my Year 10 Applied class. My mentor mentioned in my mid-placement review that in this lesson I gave some "excellent real-world examples." In this lesson I made an effort to link an abstract science concept that is difficult to visualise to things that they might have noticed during their everyday life, such as cars and cooking. Although this is not previous knowledge in the curriculum it is an experience that the students will have which will help them understand the topic. One of my strength is clear explanation of theory and so I delivered this part of the lesson well and promoted good discussion with the students.
Another way in which I made the theory more understandable by having them complete a practical so they can see the theory actually happening. This class is also highly motivated during practical work and like to understand how things work so this was an ideal method in teaching. In literature there is strong evidence that students prefer practical work to direct teaching and that it is one of the appeals of studying science (Abrahams, 2009). This and that it is important for any students who wish to have a future in science and in building science skills in general is why I want to incorporate more practical work into my lessons. However, I need to work on my explanations of practical and time management to make learning more efficient during practical work.
Another example of my selection of resources is in my Year 7 class. As this is my only mixed class it is the one that I do the most differentiation in, including homework.
It is mentioned throughout this assignment that I have attempted to scaffold or support students. This is from Vygotsky's Zone of Proximal Development (ZPD), which explains that children learn socially and needs scaffolding from an adult or more knowledgeable other. This helps them access topics that they may not necessarily be able to access on their own and also provide challenge (Ludlow and Gutierrez, 2014, Pritchard, 2005). This is a theory in

constructivism in which the basic principal is to build knowledge on top of previous knowledge (Pritchard and Woollard, 2010). I try to use this theory across my lessons by providing support especially in the resources I use.
The lesson I used as an example was the structure of a leaf lesson, which is a new topic. However, it has strong links with the previous topic of photosynthesis. Therefore in my teaching and resources I linked up the old and new topic to develop a deeper understanding and build on prior knowledge. I did this by direct teaching. I then allowed the students to use an textbook as a source of information to complete a worksheet. This worksheet was highly focused on the parts of the leaf's function within photosynthesis and accessible to the whole class. The students who finished quickly were given another information sheet and questions that goes further into the theory for extra challenge.
I think this method and the way I used it was effective in supporting learning in the classroom as all students were challenged and engaged. However, I do think working from textbooks and worksheets if done all the time will get dull and may not engage the class in the future.
One resource I did use in this lesson that was incredibly engaging was the word search, especially for the low-attaining pupils. The level of enthusiasm at the start of the lesson was very high and when I ended this part of the lesson I was met with some disappointment as all students wanted to finish the task. This led me to conclude that my starters for lessons should have an element of fun to develop an interest in the lesson early on.

Conclusion

The nature of teaching as a career means that I can always improve. I will be continually learning and developing. At this early stage of my career a clear effort has been made to teach in line with Donaldson's Pedagogies and develop a good teaching practice.
In AFL I have improved my questioning of the class. I have gave valuable feedback in a variety of different ways and have used different techniques to assess learner progress.
With regard to Cross-Curricular responsibilities, my subject has many areas where LNF and DCF can be incorporated. I implement it particularly well during practical lessons.
In terms of the resources I choose I would argue that this is one of my strengths. I make an effort to build a good relationship with all my students and design resources, which are accessible and engaging. I relate my teaching to experience and prior knowledge with clear explanations and my classroom tends to have a good learning environment.
Overall, my practice has been informed by literature, personal experience and collaboration with others. I have a strong focus on teaching with the learners being the priority. I make an effort to make my lessons varied and engaging and take time to reflect after each lesson. However, clear improvements can be made. My weakest area would be cross-curricular. I need to become more knowledgeable with the frameworks so I can more effectively incorporate them into my lessons. My lessons mostly have some aspect implemented, but I need to make this more of a focus and clarify this for both my students and myself.
In AFL, although I have made progress in developing my questioning this is still a focus for me. A common theme across all the pedagogies is that also need to check in on my classes' progress more regularly. One option I have looked into using in the future is pit stop plenaries during my lesson and not just at the end. This would easily allow me to assess progress whilst also giving me time to correct misconceptions early in the learning.
Regarding resources I use, I need to maintain variety. Although I have found effective techniques to build on previous knowledge and maintain engagement, any activity when done enough will become boring. To prevent this occurring I will keep up to date with literature, continue to seek support from more experienced teachers and try out a variety of resources and teaching methods.

In conclusion, I have learned a lot during my first teaching experience. I have showed examples of how I have implemented three of Donaldson's pedagogies and have reflected on how effective they have been in my lessons. I have identified key areas of improvement and made suggestions on how I can improve my future practice.

[Word Count: 3234]

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