Overview

Friday, 4 October 2019 14:00

Student name : Scott Clarke
Student number : 1904729

Assignment title : *A portfolio which illustrates a critical reflection of progress made on the planning and implementation of three pedagogical principles.*

Pathway : Secondary PGCE

Link to OneNote : https://onedrive.live.com/redir?resid=A1F55464FBA5FD6B%21390&authkey=%21AprETV3mtNZx-Mc&page=View&wd=target%28ECAD6008.one%7C94838dbd-7533-7644-ab2e-033efda86239%2FOverview%7C3034531a-fa7c-d942-b5b8-3c3a38ca5ad9%2F%29

Assessment for learning

Friday, 4 October 2019 14:01

1) Assessment for learning technique employed: Plickers
- Year 7 – whole class or global assessment
- Ages 12-13
- Mid-high-level questioning difficulty to test specific knowledge
- Plickers has the ability to track a specific number through various questionnaires and A name and class number are assigned to determine any weak areas for specific pupils in a class

Plenary	Plickers quiz: Ask the class probing questions to understand where (if any) mistakes were made and knowledge corrected	Use of QR codes to signal answer to multiple choice questions (A, B, C, or D) Verbal answers given to teacher questions	Plickers software, pre-set quiz, mobile phone, QR codes stuck onto card

Figure 1.1 relevant screen grab from the APLP lesson plan showing prior preparation to use of plickers in lesson

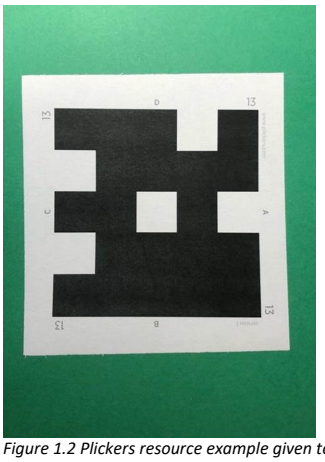


Figure 1.2 Plickers resource example given to pupil to interact with quiz

The first strategy was to use 'plickers', which I had previously observed a teacher using with her class. It uses the teachers' phone to capture the orientation of a QR code to answer a quiz questions shown on the white board (Jarrett, 2019). As seen in figure 1.2, this smart card would give an answer "D" when scanned with the teachers' phone. Figures 1.3a and 1.3b show the overall success in the class and the correct answer, followed by more in-depth analysis of each participant.

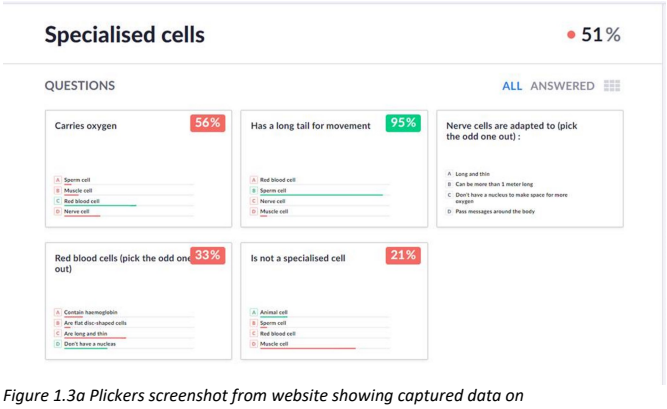


Figure 1.3a Plickers screenshot from website showing captured data on pupil performance

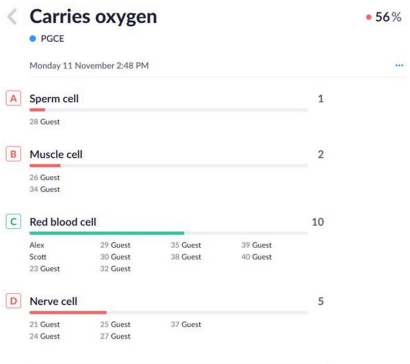


Figure 1.3b Plickers screenshot from website showing captured data on pupil performance

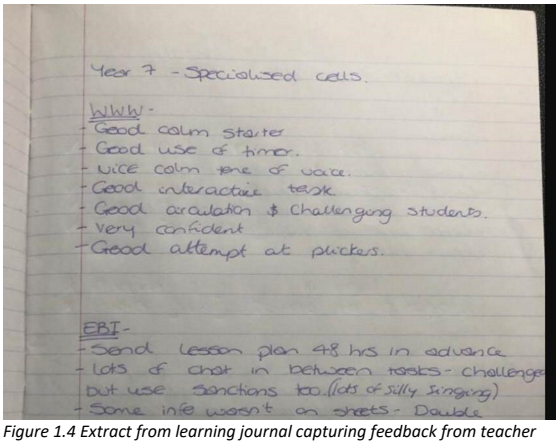


Figure 1.4 Extract from learning journal capturing feedback from teacher observing lesson

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)	3 tiered questions to be completed in silence: Name 3 specialised cells, give the location of these cells, and describe 1 function of the cells Probe for detailed understanding and correct issues around what cell has a long tail, what is the definition of a specialised cell, and any other questions that evolve	In silence, answer the questions on the board within their books Provide answers to the class Ask questions to develop understanding and close gaps in learning	Powerpoint, pupil exercise books

Figure 1.5 Lesson plan for starter task for cell model lesson based on plickers data from previous lesson

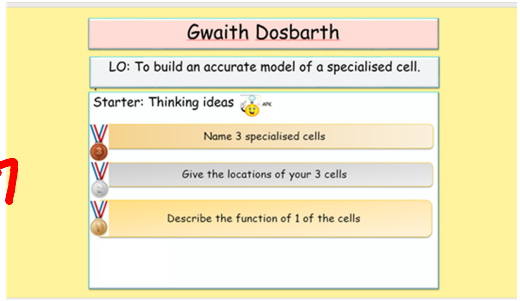


Figure 1.6 Starter task for cell model lesson based on plickers data from previous lesson

This was then used in my next lesson plan for making a model cell, as it was clear not everyone understood (Figure 1.5 and 1.6). This method of assessment only gave shallow understanding of the topic but from the whole class, whereas some pupils may have been able to give an in-depth description of a specialised cell (Mayes, 2002). I plan to continue using this method for assessing pupil knowledge on a regular basis however, additional strategies must be used to check for deeper learning and understanding.

2) Assessment for learning technique employed: Questioning

Year 8 – whole class or global assessment
Ages 13-14
Mid level questioning difficulty to test specific knowledge
Questions given orally due to the definitions being given at start of the lesson

Plenary	Set questions to pose and prepare multiple correct answers to appear after the room as run out of ideas	Answer set questions either orally posed or set on the board	PowerPoint and exercise books

Figure 2.1 relevant screen grab from the APLP lesson plan

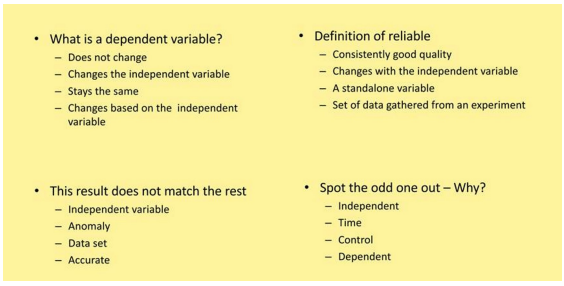




Figure 2.2 question bank used to pose questions and show correct answers

This led to me to developing a similar strategy centred around questioning, that allowed for global feedback as well as provide opportunities to check for deeper learning (Bartlett, 2017). Correct answers are indicated by hands up but not necessarily all hands up have a correct answer (Bartlett, 2015). On this occasion, I posed four questions to the class on the whiteboard one at a time. Each has a multitude of answers (see figure 2.2) and an opportunity to delve into further questions e.g. a question asked was what is a dependent variable?

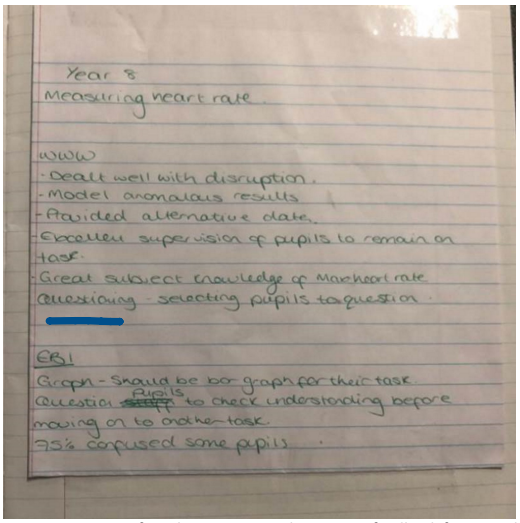


Figure 2.3 Extract from learning journal capturing feedback from teacher observing lesson

There are 4 possible definitions I was looking for, this was then followed up with additional questioning pertaining to the use of this specific variable, how is it measured, how would we show the data, what are the types of units etc. which were each asked to a different pupil around the room. This was time-consuming however, had engagement from the whole class and the use of naming pupils allowed for classroom management to be a non-issue as recorded in the teacher feedback (figure 2.3) (Renee, n.d). Future lesson planning will include this strategy of question and answer as it can show global understanding in the classroom however, there will be a planned 10 minutes to ensure as much discussion as possible around open-ended questions can be done.

3) <u>Assessment for learning technique employed: Matching words & definitions</u>

Year 8 – specific testing with class then asked to agree or disagree
Ages 13-14
Mid level questioning difficulty to test specific knowledge
Definitions and key words presented on the white board with a line to be drawn by a chosen pupil between the 2 correct answers
The class then needed to agree or disagree
If it was wrong, the next pupil would come and make an attempt until whole class agreed that the slide was 100% correct

Plenary	Prepare 4 key words and 4 definitions for pupils to match using interactive white board	Chosen pupils to draw lines from key word to correct definition	Power point, interactive pen for white board

Figure 3.1 APLP lesson plan section on plenary

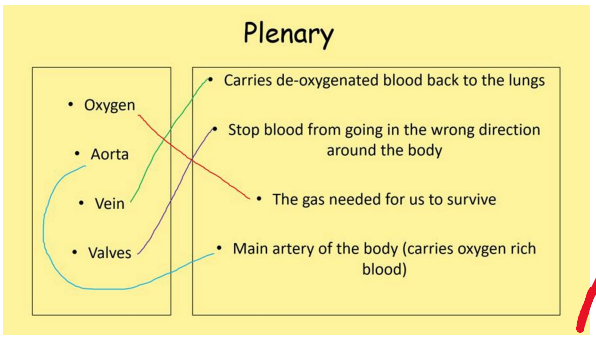


Figure 3.2 Pupils work after the whole class agreed between key words and definitions

The draw-back to the currently used types of AfL are there is no written work in the pupils' books. Although questioning get answers quick, and probing questions show a further understanding, there needs to be a change in plenary planning in terms of

and definitions

The draw-back to the currently used types of AfL are there is no written work in the pupils' books. Although questioning get answers quick, and probing questions show a further understanding, there needs to be a change in plenary planning in terms of perhaps using the example in figure 3.2, printing it off and distributing to the class. This was described as engaging and further questions can then be used secondary.

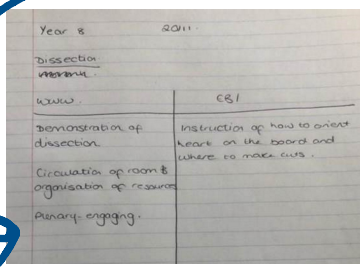


Figure 3.3 Extract from learning journal capturing feedback from teacher observing lesson

Cross-curricular responsibilities

Friday, 4 October 2019 14:03

4) Cross-curriculum responsibilities: Literacy
   Year 7 – comprehension task to search for answers within literature during a marketplace style activity
   4 common questions for each of the 6 cells proposed:
   What is special about the cell?
   What does it do?
   Where is it found?
   Describe something important

Opening phase (with links to prior learning)	3 tiered questions on the board related to the Lesson Objectives (LO) respectively in increasing difficulty: Name 2 types of cell, 3 PARTS of a cell, describe what 1 part of a cell does	In silence, answer the questions on the board within their books	Powerpoint, pupil exercise books
Teaching & Core Learning	Provide laminates around the classroom for pupils to investigate and find information Go over answers to ensure correct learning and assess investigation skills	Use resources to extract information to answer the comprehension questions on the hand-out Self-assess work to ensure correct answers	Laminates Hand-outs Powerpoint

Figure 4.1 extract from APLP lesson plan describing activities for start and main body of the lesson

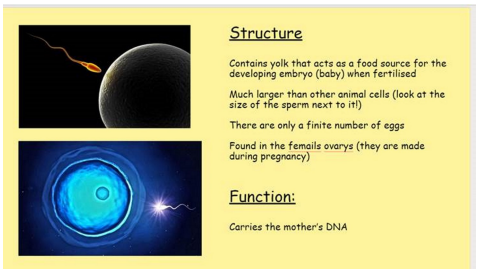


Figure 4.2a Example of information sheet (egg cell) that provided and laminated for use around the room (2 copies used)

A 'wall' of text may be off-putting or demoralizing to a low-skilled reader (Tomanggong, 2013). With this in mind, the information sheets prepared were as basic as necessary with bullet pointed sentences to ensure the information was as easily accessible as possible.

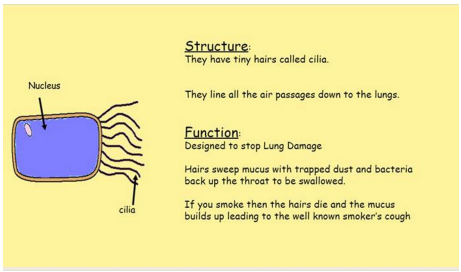


Figure 4.2b Example of information sheet (ciliate cell) that provided and laminated for use around the room (2 copies used)

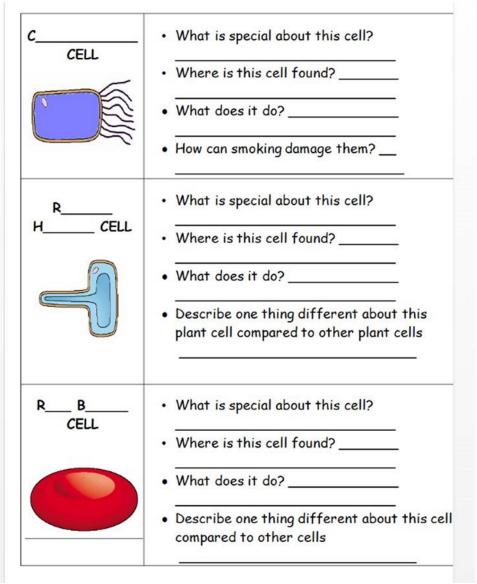
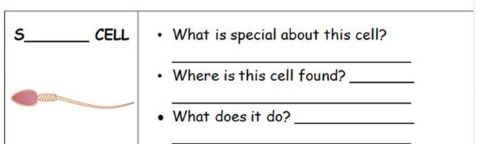


Figure 4.3a Investigation sheet pupils are to fill out (first page)

This leads onto the second pedagogical principle of cross-curriculum responsibilities. This is the opportunities generated to improve literacy, numeracy and digital competency. Within the first full lesson planned, a work sheet had been constructed with information sheets to fill in the gaps (see figure 4.2-4.3)

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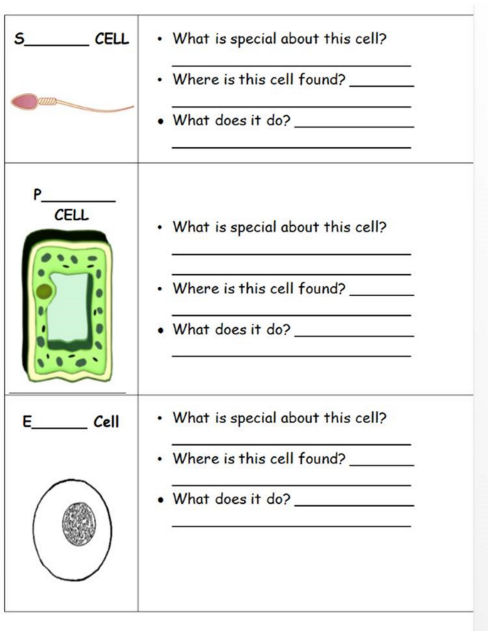
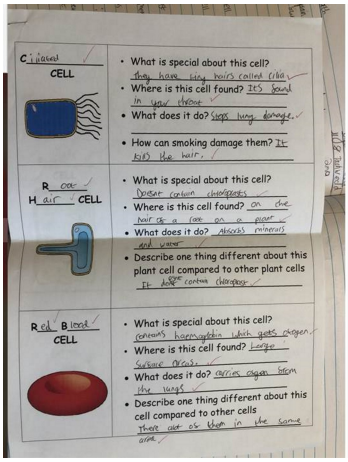


Figure 4.3b Investigation sheet pupils are to fill out (second page)



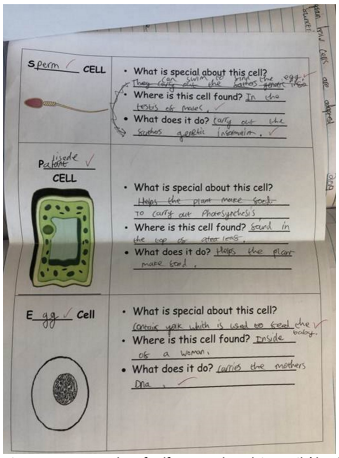
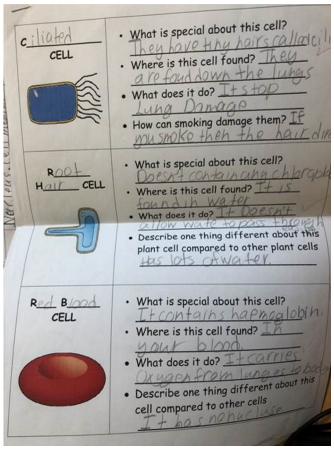


Figure 4.4.A Examples of self-assessed work in pupils' books



As seen in figures 4.3A to 4.3B, the pupils were able to complete the task in the 20 minutes provided and do so accurately. The purpose of this task is to improve reading skills as well as teach subject matter. This can only happen if the pupils are able to read in the first place

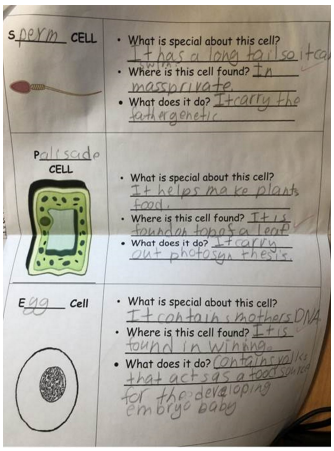
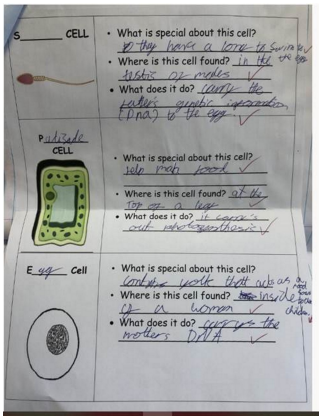


Figure 4.4.B Examples of self-assessed work in pupils' books



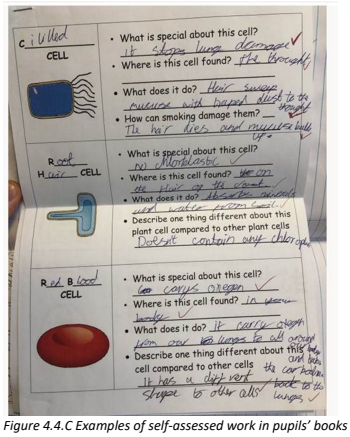
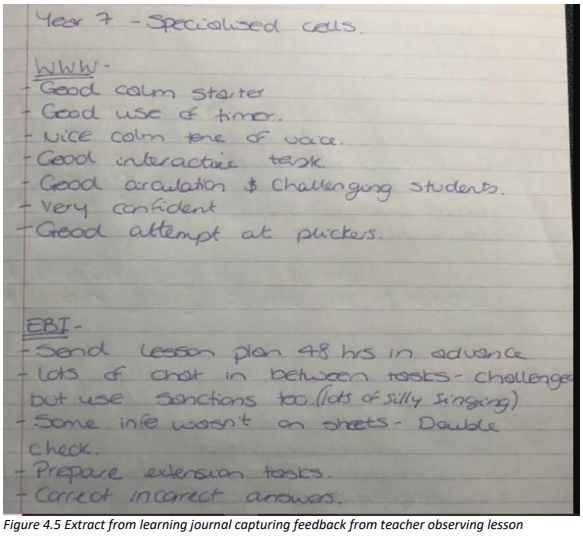


Figure 4.4.C Examples of self-assessed work in pupils' books

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Unfortunately, I underestimated the higher skilled readers in the class, leading to some misbehaviour. The next step is to ensure an extension task is prepared and readily at hand

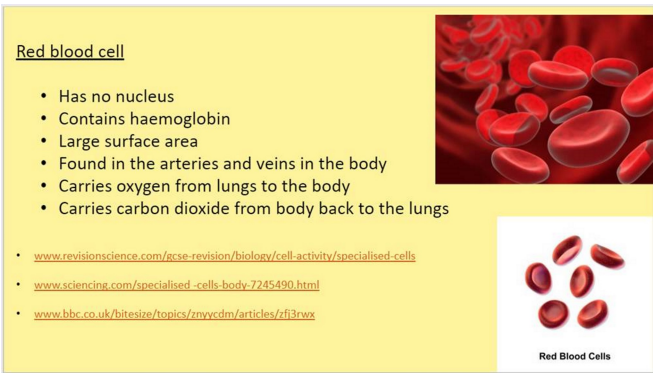
Figure 4.5 Extract from learning journal capturing feedback from teacher observing lesson

5) Cross-curriculum responsibilities: Literacy and digital competency

Year 7 investigation and finding information from reputable sources
Models of what adequate, good, and excellent look like

Teaching & Core Learning	Provide a tiered model for the pupils to see what bronze, silver and gold looks like Illustrate a good and bad source Show how to copy links into evidence sheet	Complete a fact sheet using the information found online – print off document and stick into books	Computer room

Figure 5.1 extract from APLP lesson plan describing activities for start and main body of the lesson

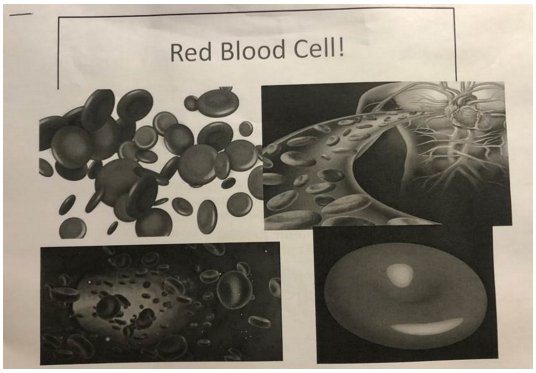


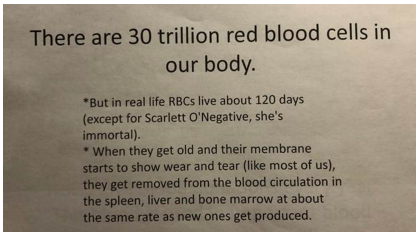
Model of good and excellent work

Figure 5.2a Example of a 'good' model showing at least 5 facts and 1 source



Figure 5.2b Example of a ''excellent' model showing at least 5 facts and 1 source



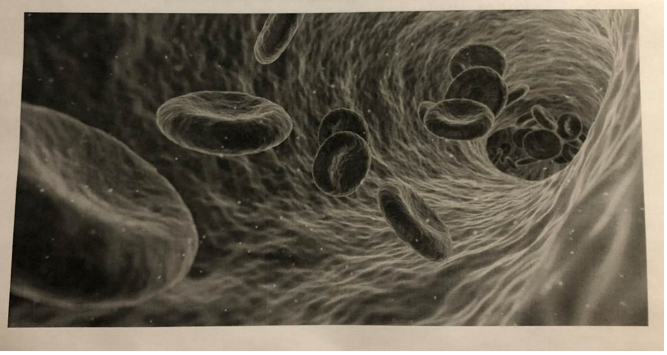


*Red blood cells develop in bone marrow and circulate in the body for around 120 days.

*White blood cells are an important part of the body's immune system. They defend against certain bacteria, viruses, cancer cells, infectious diseases and other unwanted materials.

*Platelets help blood clot in order to limit bleeding when your skin is cut. Blood clots can occasionally have negative effects, if they form in blood vessels going to the brain they can cause a stroke while clotting in a blood vessel going to the heart can lead to a heart attack.

*As well as delivering important substances to our cells, blood also helps take away unwanted waste products.



*Grouping human blood types can be a difficult process and there are currently around 30 recognized blood types (or blood groups).

*You might be familiar with the more simplified "ABO" system which categorizes blood types under O, A, B and AB. Do you know which blood type you are?

*Many generous humans around the world give blood donations every year. This blood is used in important blood transfusions or made into medication.

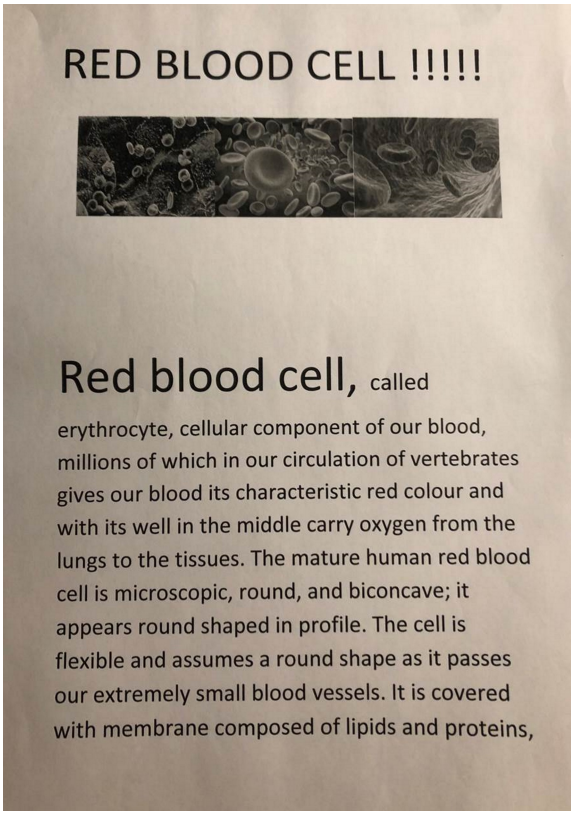
Red Blood Cell Facts.

*Diseases of the red blood cells include many types of anemia

*A condition in which your body can't produce enough normal red blood cells to carry sufficient oxygen throughout the body.

* People with anemia may have red blood cells that have an unusual shape or that look normal, larger than normal, or smaller than normal.

Figure 5.3a a collection of information put into a power point presentation by a pupil



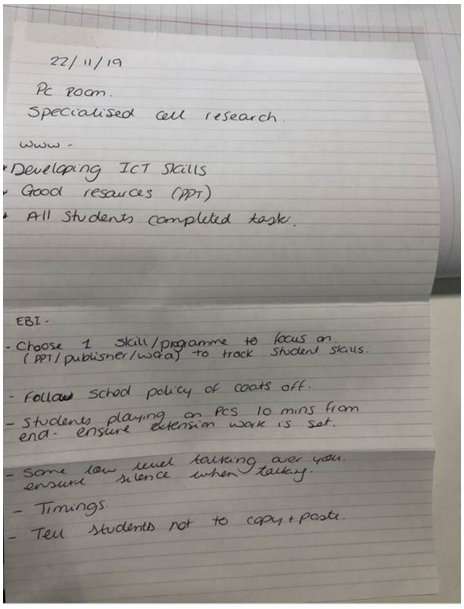
RED BLOOD CELL !!!!!

Red blood cell, called erythrocyte, cellular component of our blood, millions of which in our circulation of vertebrates gives our blood its characteristic red colour and with its well in the middle carry oxygen from the lungs to the tissues. The mature human red blood cell is microscopic, round, and biconcave; it appears round shaped in profile. The cell is flexible and assumes a round shape as it passes our extremely small blood vessels. It is covered with membrane composed of lipids and proteins,

does not have a nucleus, and contains haemoglobin
https://www.britannica.com/science/red-blood-cell

Copy and pasted - needs strict guidance

Figure 5.3b a collection of information by a pupil put into a single info sheet



22/11/19
PC Room.
Specialised cell research.
www -
- Developing ICT skills
- Good resources (PPT)
- All students completed task.

EBI -
- Choose 1 skill/programme to focus on. (PPT/publisher/word) to track student skills.
- Follow school policy of coats off.
- Students playing on PCs 10 mins from end - ensure extension work is set.
- Some low level talking over you. ensure silence when talking.
- Timings
- Tell students not to copy + paste.

Figure 5.4 Extract from learning journal capturing feedback from teacher observing lesson

6) Cross-curriculum responsibilities: Literacy and numeracy
   Using previously gathered data to create a visual representation of that data accurately
   Modelled answer on the board
   Illustrated anomalous results
   Provided set of data so show what 'good' looks like

Teaching & Core Learning	Use of model data and model graph to show what 'good' looks like Written conclusion and sentence starters given to help structure conclusion writing	Using graph paper, plot a bar graph of the data collected from previous lessons to be able to then use this and write an appropriate conclusion	Powerpoint, data, graph paper

Figure 6.1 extract from APLP lesson plan describing activities for start and main body of the lesson

Those who had finished were able to move onto the conclusion where a paragraph describing the results linked both the literacy element and the numeracy as the writing is an account of the data (Mitchell, 2017).



Figure 6.2 Example of a 'good' graph with 2 data sets

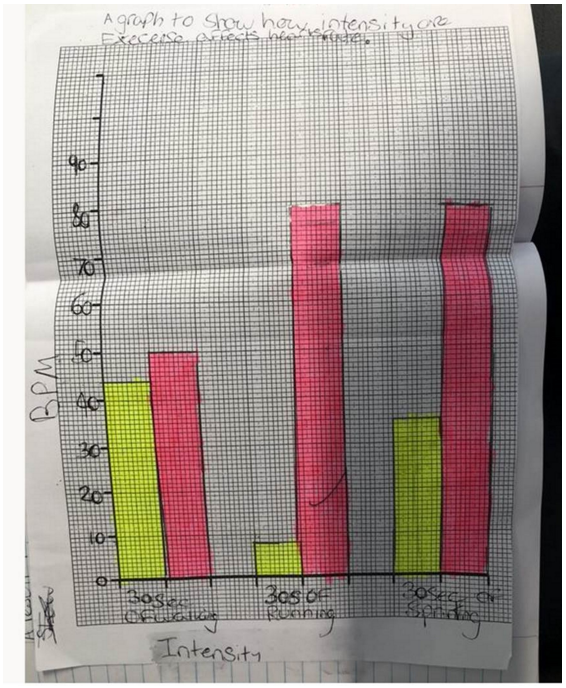
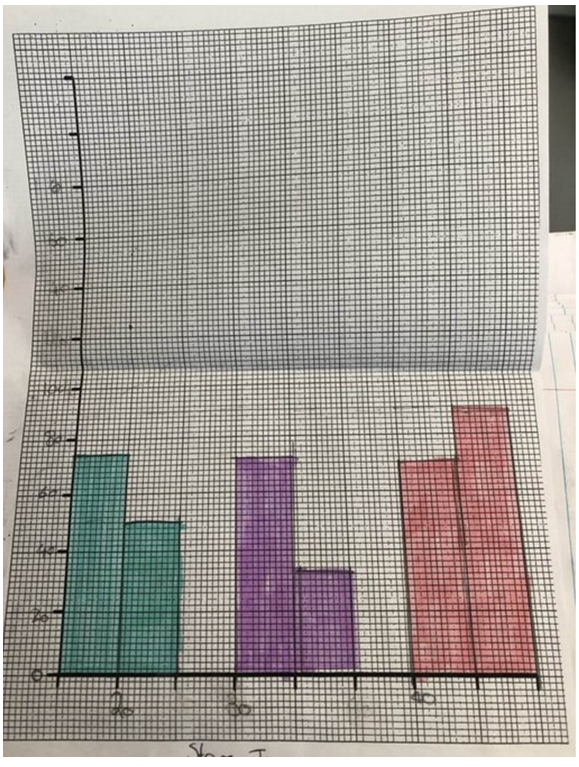


Figure 6.3a Example of pupils' graph skills based on their data



The data gathered from an experiment was to be drawn up into a graph. Graphs are commonly used in presentations in the real world to display data easily and show anomalies (Slutsky, 2014). This topic considers correct scale, labelling of axis and creating a suitable title. The work completed was to a high level, the students who were able to complete the work then gave aid to other pupils in showing what was needed, further improving communication and collaboration



Figure 6.3b Example of pupils' graph skills based on their data

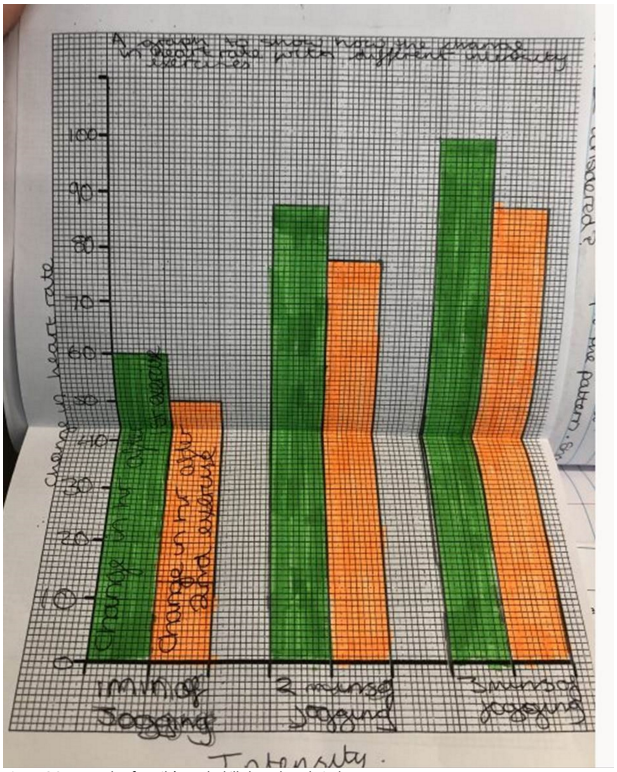


Figure 6.3c Example of pupils' graph skills based on their data

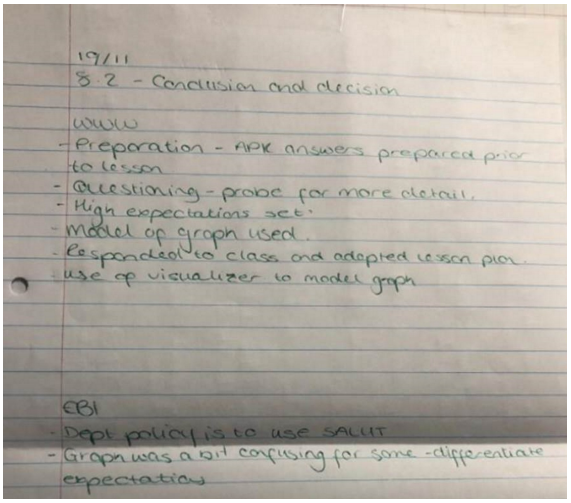


Figure 6.4 Extract from learning journal capturing feedback from teacher observing lesson

On the other hand, a lesson planned to analyse data and improve numeracy skills needed to be adapted due to the varied skill level within a class.

Create authentic contexts for learning

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7) Creating an authentic context for learning: Using Pokémon references

Year 7 – stem cells are something that can become any type of cell based on the input to that cell be it temperature, electrical signal, etc.
Eevee is a Pokémon that can evolve into many different evolutions with different inputs
Linking something small can have big impact
Pokémon is something pupils are interested in and can link to science on the same principles using words they actually understand

In terms of explaining specialised cells, a favourite analogy of mine is to use a Pokémon reference where 1 single Pokémon can become a multitude of options based on the input: this is a direct comparison to specialised cells. Pupils' in the classroom are very aware of Pokémon as it transcends generations having been on since the early 90's in popular UK culture (BBC news, 2016).

Teaching & Core Learning	Direct teaching of topics Key terms given, misconceptions corrected, and definitions given to copy into books Use real world context to simply and aid in retention of information – useful topic eevee from pokemon	Copy down definitions Worksheet completed and stuck into books	Powerpoint, exercise books, worksheet

Figure 7.1 extract from APLP lesson plan describing activities for start and main body of the lesson

Fact :
- a thing that is known to be or proved to be true
- Information that can be used as evidence

Opinion :
- A view or judgement about something
- Doesn't have to be based on fact
- Personal view

Stem cell :
- An *UNDIFFERENTIATED* cell
- It is a cell that can become a specialised cell when told what to do

Figure 7.2 examples of using simple scientific definitions – this was the basis of creating a real world context based on the relationships built with pupils and conversation during the class

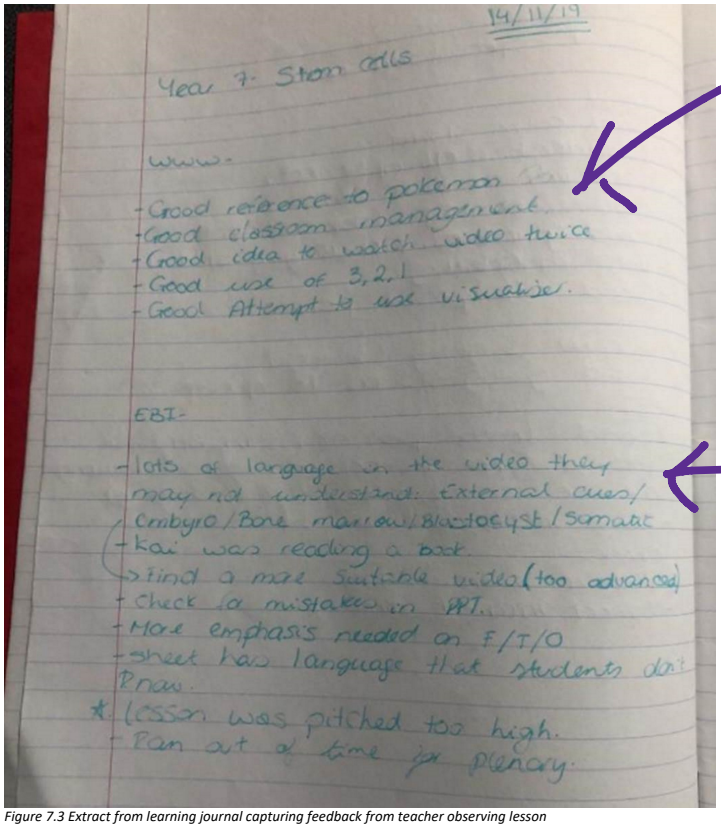


Figure 7.3 Extract from learning journal capturing feedback from teacher observing lesson

This opened a wide discussion in the classroom linking the complexities of biology to something relevant and current the pupils had a deep understanding of. This did not work for every pupil in the class. Linking the learning to an understandable context comes majorly from positive student-teacher relationships and understanding the learner.

The greater the student-teacher relationship the easier it is to set the scene for how a concept can be understood easily by the class, or if needs be, by an individual learner (Gonzalez, 2016).

8) Creating an authentic context for learning: Healthy lifestyle and personal relevance

Year 8 – healthy lifestyle is for everyone, it is important to know how it happens and links to plaque building up, but could happen to someone in the classroom due to things like lack of exercise, poor diet, smoking etc.

Teaching & Core Learning	Showing 4 images describe how each point negatively impacts someone's life and could lead to CVD Ensure the message contains age and gender may have less impact than pupils think Use stories from class to show real world impace Diet, smoking, exercise, and emotion control (anger)	Engage in discussion on proposed caused to CVD Proffer information about personal stories on each topic Create a leaflet using the info sheets	Powerpoint, info handouts

Figure 8.1 extract from APLP lesson plan describing activities for start and main body of the lesson

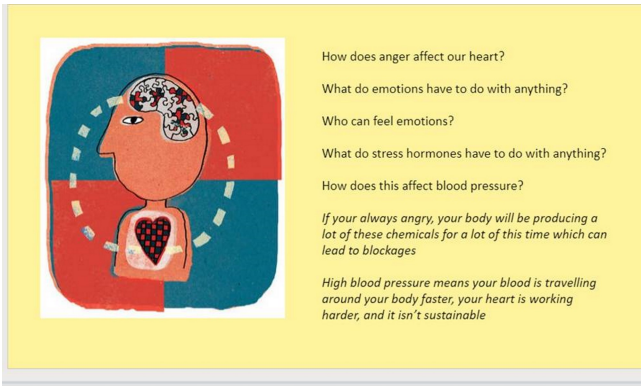


Figure 8.2 a slide from the presentation given to class – key question is around how emotions affect health and linked to who can feel emotions (i.e. pupils in the classroom)

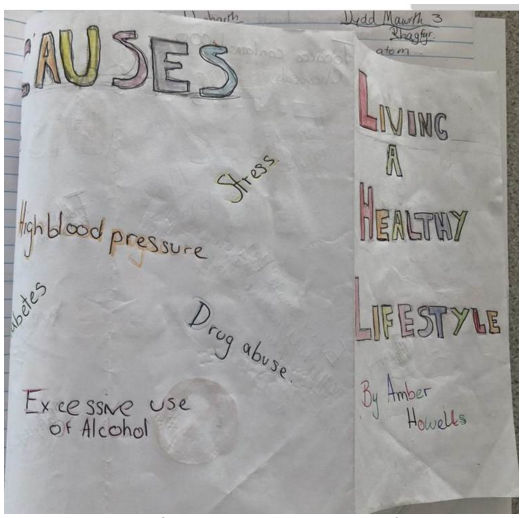


Figure 8.3a illustrated leaflet created by pupil during lesson and finished as homework

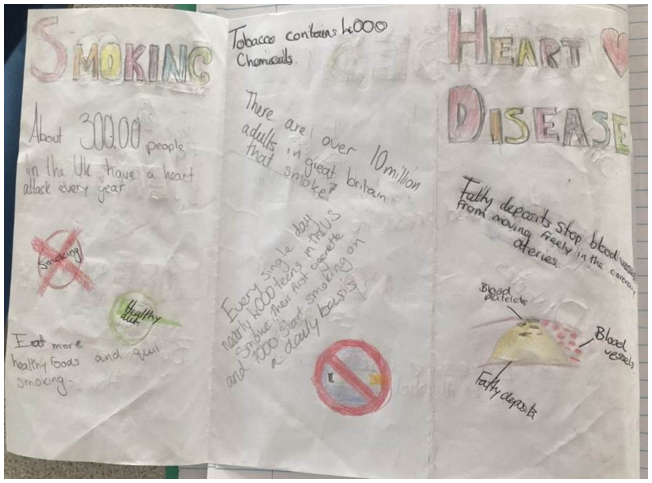
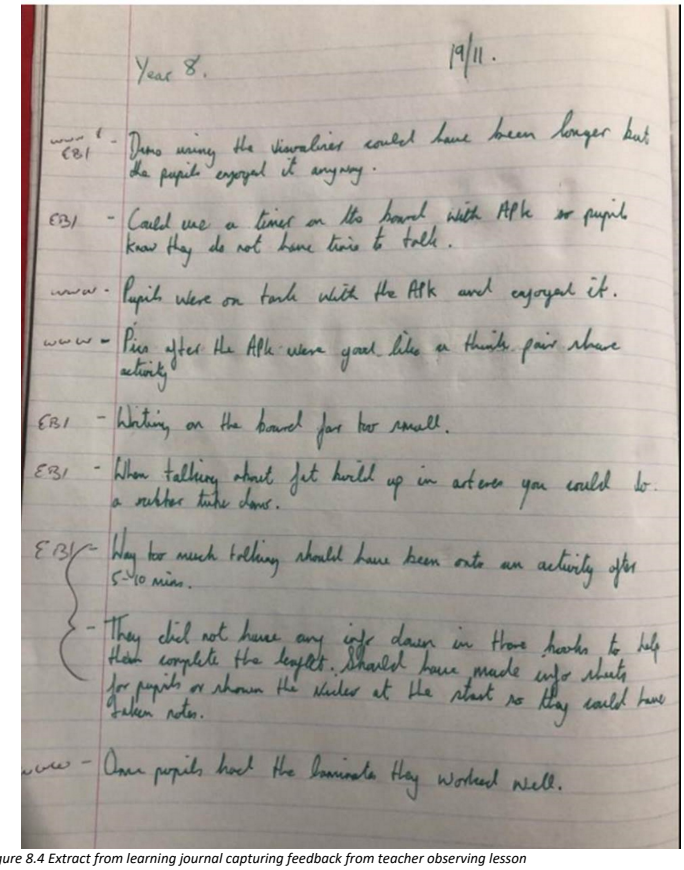


Figure 8.3b illustrated leaflet created by pupil during lesson and finished as homework



Year 8. 19/11.

WWW/EBI - Demo using the Bivalirus could have been longer but the pupils enjoyed it anyway.

EBI - Could use a timer on the board with AfL so pupils know they do not have time to talk.

WWW - Pupils were on task with the AfL and enjoyed it.

WWW - Pics after the AfL were good like a think pair share activity

EBI - Writing on the board far too small.

EBI - When talking about fat build up in arteries you could do a rubber tube demo.

EBI - Way too much talking should have been onto an activity after 5-10 mins.

- They did not have any info down in their books to help them complete the leaflet. Should have made info sheets for pupils or shown the video at the start so they could have taken notes.

WWW - Once pupils had the laminate they worked well.

Figure 8.4 Extract from learning journal capturing feedback from teacher observing lesson

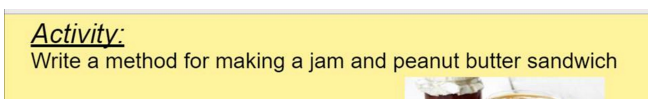
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9) Creating an authentic context for learning: Method writing

Starting off having year 8 to create a method in writing a jam sandwich to illustrate that there is more detail required to create something useful
Most had details omitted
Demonstration using pupils work clearly showed how a method should be written

Teaching & Core Learning	Instruct pupils to write a method for making a jam sandwich Use pupils' examples to create a sandwich (this will fail as not enough detail) Write model answer while pupil makes a sandwich correctly	Write a method for making a jam sandwich Attempt and correctly find their pulse Write a method for the following practical to come - stealing the style of the jam sandwich	PowerPoint, exercise books, worksheet

Figure 9.1 extract from APLP lesson plan describing activities for start and main body of the lesson



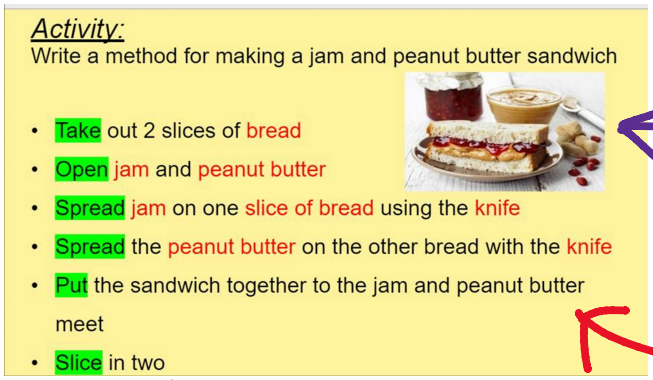


Figure 9.2a model method for making a peanut butter and jam sandwich with equipment and verbs highlighted

Another way to bring the outside into the classroom is to use everyday tasks. Having the pupils create a method for making a jam and peanut butter sandwich, I was able to determine how well the class could write in general and understand scientific processes. Using a sample of methods, I tried to create a sandwich at the front of the class (figure 9.3)

A set method was then written on the board and copied down into the pupils books (figure 9.2): they were then able to compare what went well and what could be better without dismissing the task as unrelatable (Goss and Sonnemann, 2017).

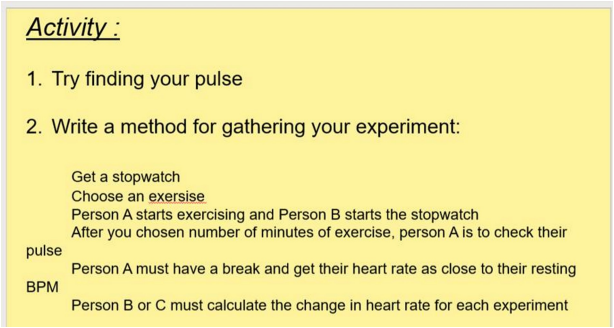


Figure 9.2b model method created for the experiment about to be carried out – created by the class

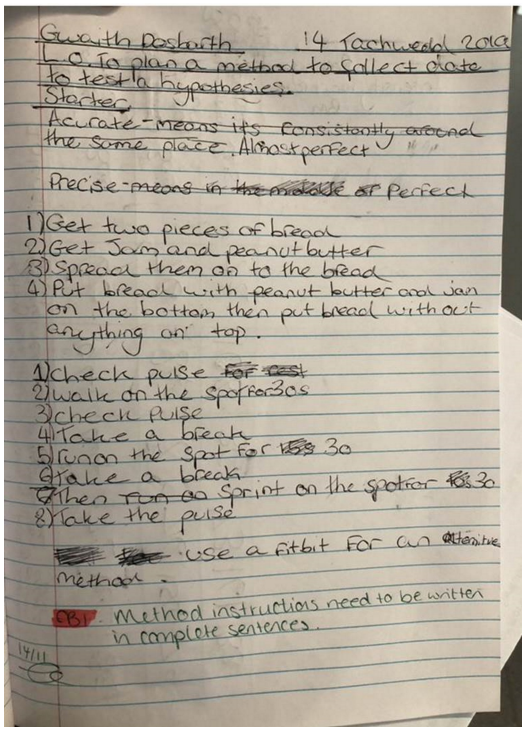
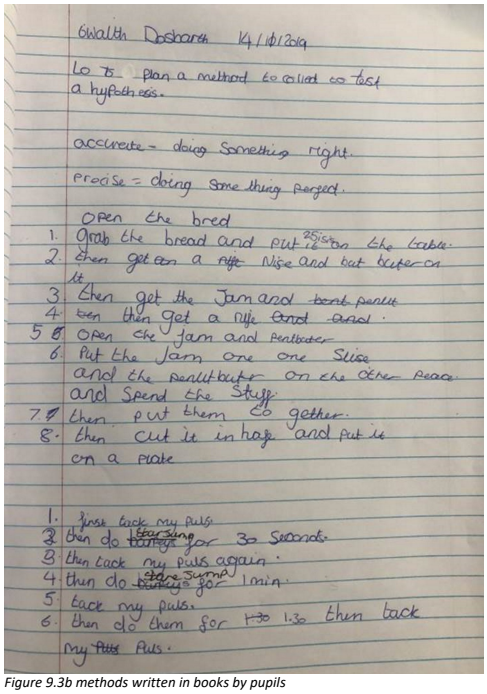


Figure 9.3a methods written in books by pupils



6Walth Dosbarth 14/10/2019

Lo To plan a method to collect data to test a hypothesis.

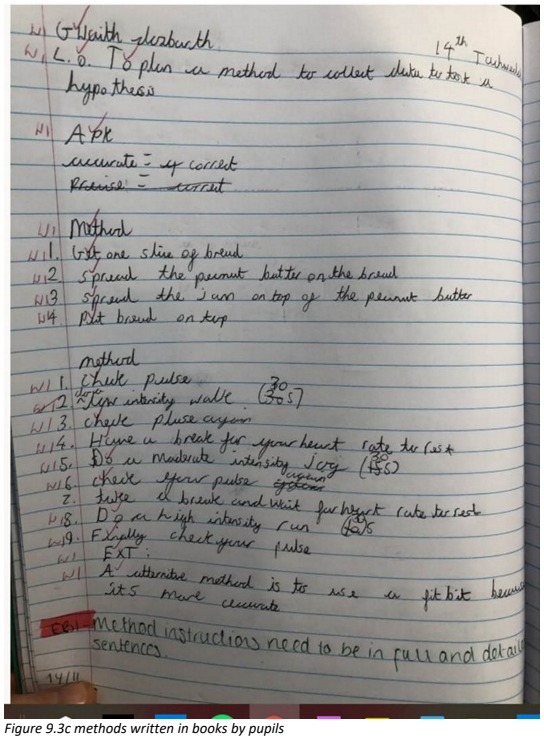
accurate - doing something right.

Precise = doing something perfect.

Open the bread
1. Grab the bread and put it on the table.
2. Then get a knife Nise and put butter on it.
3. Then get the Jam and ~~bank~~ peanut
4. ~~ten~~ then get a knife ~~bread~~ and.
5 6 Open the jam and peanutbutter
6. Put the Jam one one Slice and the Peanutbutter on the other Peace and Spread the Stuff.
7 8 Then put them to gether.
8. Then cut it in half and put it on a Plate

1. Finse tack my Pulse
2. then do ~~star~~ ~~jumps~~ for 30 seconds.
3. then tack my Pulse again.
4. then do ~~star~~ ~~jumps~~ for 1 min.
5. tack my pulse.
6. then do them for 1 to 1.30 then tack my ~~Pulse~~ Pulse.

Figure 9.3b methods written in books by pupils



6Walth Dosbarth 14th October

L.O. To plan a method to collect data to test a hypothesis

AFL

accurate = if correct

~~Precise = correct~~

Method

1. Get one slice of bread
2. Spread the peanut butter on the bread
3. Spread the jam on top of the peanut butter
4. Put bread on top

method

1. check pulse
2. 30 [30 S] Have intensity walk
3. check pluse again
4. Have a break for your heart rate to rest
5. Do a Moderate intensity Jog (45S)
6. check after pulse again
7. take a break and wait for heart rate to rest
8. Do a high intensity run (45S)
9. Finally check your pulse

EXT:

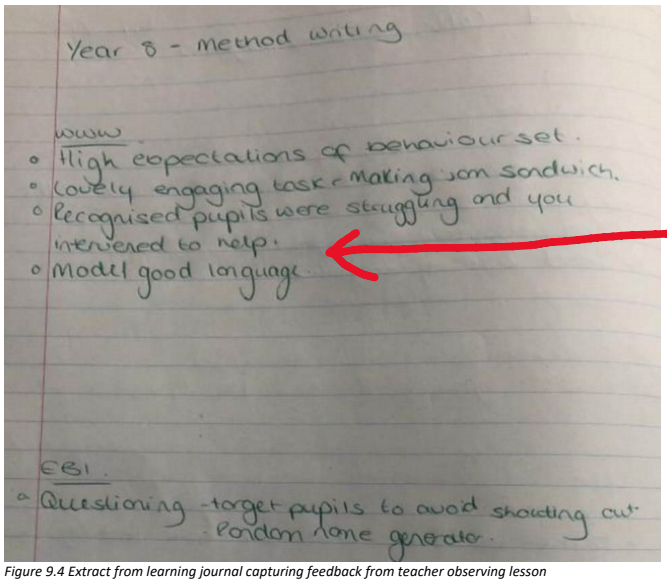
A alternative method is to use a fit bit because it's more accurate

Method instructions need to be in full and detailed sentences.

14/11

Figure 9.3c methods written in books by pupils

Pupils were then able to compare what went well and what could be better without dismissing the task as unrelatable (Goss and Sonnemann, 2017).



Year 8 - Method writing

WWW
- High expectations of behaviour set.
- Lovely engaging task - making jam sandwich.
- Recognised pupils were struggling and you intervened to help.
- Model good language.

EBI
- Questioning - target pupils to avoid shouting out. Random name generator.

Figure 9.4 Extract from learning journal capturing feedback from teacher observing lesson

This was a particular difficulty for those with English as an additional language (EAL), as there was no scaffolding or key words to be used. Oral communication was strong within the class however, the written skills weren't as strong independently (Cameron and Besser, 2004).>

Critical reflection

Friday, 4 October 2019 14:03

In (Rosenshine, 2012) and (Lennon, 2016), it is suggested that "the best teachers are those who love their subject and have excellent subject knowledge". This is emphasised by the Universities and Colleges Admissions Service (UCAS) stating a degree must be obtained in order to qualify as a primary or secondary teacher in the U.K (UCAS, 2019). However, John Hattie explains that this is only one point of two-hundred and fifty-two influences on students' achievement, with classroom management being three times as effective to a pupils' learning (Hattie, 2012). Subject knowledge and the entirety of influences from Hattie are two extremes of how to measure the effectiveness of a teacher, a students' learning, and the curriculum.

In 2014, Professor Donaldson was approached to review and update the curriculum in Wales (Donaldson, 2015) with part of this report introducing "12 key pedagogical principles". Pedagogy is the umbrella term for "interactions between teachers, students, and the learning environment and the learning tasks" (Learning Portal, 2019). These proposed 12 key principles have been identified through research and discussion with, but not limited to, headteachers, teachers, children and young people (Donaldson 2015).

3 of these 12 principles will be discussed with how they create an effective learning environment, and how they have been introduced into my teaching practice. These 3 principles are:

- 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 provides opportunities to practise them, and finally;
- Good teaching and learning create an authentic context for learning (Donaldson, 2015).

Assessment in education has several functions as it can foster learning and directly improve teaching by providing feedback on who is learning and at what pace, but also what mediums are having the greatest impact on learning in the classroom (Mayes, 2002). There are two types of assessment for learning and these are called formative and summative assessment (NFER, 2019).

Summative assessment usually takes place under 'test' conditions where pupils are aware that they are being examined formally and the results will determine the grade or level they obtain at GCSE, A-level, and so on (Cohen, 2012). Test conditions are defined as providing the pupils with the same test, at the same time, for the whole of the academic year. The same verbal and written instructions are provided, as well as equal spacing between pupils, all prompts are removed from sight, complete silence and any breaking of these rules results in immediate disqualification (Sumner, 1991). Formative assessments occur frequently and within the environment where the learning had originally taken place, as opposed to using an examination hall. Formative assessment is much more informal (Mayes, 2002). Formative assessment is described in (Dean, 1996) as 'frequent checking of student work in progress', responding to live questions in the moment and helping students think through problems.

Some positives to summative and formative assessment are they help to identify pupils who need more help and who needs further challenging. They both provide feedback to a pupil on individual performance and may motivate certain pupils if they can see positive and gradual progress over time (Dean, 1996). This is not an exhaustive list. On the other hand, it is also said that there are negatives to any kind of assessment (Mayes, 2002). Purposeful assessment may reduce a students' motivation where they see the exercise as another opportunity to highlight failings. Alternatively, it may produce teachers teaching to the test to ensure the whole class pass the assessments and improve their own reputation (Voza, 2019). An exam under test conditions may not be the best way to evaluate a student due to individuals having different needs and skill sets (Nixon, 2019)

As stated, both types of assessment have their advantages and disadvantages, therefore, both are used to ensure that every opportunity is given to pupils to succeed. The formative assessment is a brief check in that can be done globally or individually, it can look at shallow learning or at deeper cognitive development (Jones, 2005), but most importantly feeds information into the teachers lesson planning (Dean, 1996) so that it may ensure, where possible, that the gaps in pupils learning are closed along the way (Cambridge Community, 2019) and not at the end of an academic year where the summative assessment is due to take place, so that it has the greatest impact.

The second pedagogical principle of interest is the cross-curriculum responsibilities. This describes literacy, numeracy, and digital competency skills within the new curriculum for wales. Literacy and numeracy frameworks have been introduced in Wales back in 2012 (Donaldson and Lewis, 2015). This pedagogy is being introduced as it is suggested that in the 21st century a learner must be equipped with these three skills 'to be able to participate successfully and confidently in the modern world' (Welsh Government, 2019).

Within the current literacy and numeracy framework, catch-up strategies are used to provide help for pupils with low attainment: Low attainment is where a pupil's ability or skill is below the age expectation in a specific part of the curriculum (DfE, 2018). Low attainment is identified using question level analysis (QLA) programmes to be able to illuminate specific areas where support is needed. The results can be used to tailor pupil learning and provide additional support where needed. The results may also be used to apply for additional funding for year 7 pupils to pay for the extra support needed such; as small-group tuition or funding a summer school programme (Gov.uk, 2014).

The next step is to include digital competency into this framework (Donaldson, 2015). Digital competency concentrates on improving digital skills not just limited to information and communication technology or I.C.T (Welsh government, (2018). A key difference between DCF and the LNF is that skills will be tracked against progression steps as opposed to year groups vs. chronological age (Thinkuknow.co.uk, n.d.).

In order to provide structured support, the DCF is split into 4 main topics of:

- Digital citizenship;
- Interacting and collaborating;
- Producing;
- Data and computational thinking (Welsh government, 2017).

Within each topic are up to 4 different elements all accompanied by a statement describing the skill and the expectations of what should have been learned at any given stage (Welsh government, 2018). Under the digital citizenship element there are 4 skills: one of these is online behaviour and cyberbullying, covering such topics as health and wellbeing and online safety (Thinkuknow.co.uk, n.d.).

There is now a QLA-type assessment for the DCF available through hwb such that, pupils can now be benchmarked as to current ability and then taught the skills that are shown to be weak or missing: It is still evolving alongside assessment trackers to determine the best ways to identify and teach the DCF skill set (Welsh Government, (2017).

Finally, the third pedagogical principle to be discussed is the creation of authentic context for leaning. This is linking theory to practice and bringing the outside world into the classroom, giving the learning purpose and visible links to application (Donaldson, 2015). It is said that deeper knowledge from higher order thinking and deeper retention of information, alongside improved classroom engagement, comes from a learning environment where a multi-sensory approach is used to create a meaningful link between the topic at hand and the learner (Innis, 2016). This has been said to encourage further reading and learning as well as improved learner resilience and self-drive (Revington, n.d). Furthermore, the four most common themes to create authentic learning are:

- An activity that involves real-world problems;
- Use of open-ended inquiry and thinking skills;
- Students engage in debates and using multiple perspectives;
- Using project work to create something to presented or built (Rule, 2006).

The 4 points could be captured in a single local project within the community of the local school such as a water sampling project. It would involve the real-world problem of pollution, using investigation skills to determine sources of pollution, use of group work and creation of a presentation to inform class of findings. This is where, as (Rosenshine, 2012) suggest, the best teachers are those with a deep subject knowledge who already know how the subject matter is used in the real world and can then adapt the materials for the classroom with ease.

Nevertheless, a teacher without the same dense subject knowledge may be of greater effect in the classroom as they are able to model the learning behaviours, generating engagement with the students and the subject matter (ACEL, 2016). Other limitations or barriers to creating these authentic contexts of learning are:

- Rigid curriculum and content standards;
- Embedded educator practices and habits;
- Testing and results, and even;
- Policymakers (Perkins, 2019).

Although the curriculum is changing, it is difficult to modify the current state of affairs due to having such a compressed volume of information that needs to be delivered through the academic year, especially when it is believed that covering content is the best way to deliver the higher scores on tests, which are a part of the reflection on how well a teacher is performing (TalentLMS, 2018). There is also the issue with getting practitioners to 'learn a new way of working' and can be disengaged from the start however, these barriers can be overcome (Perkins, 2019). Use of structured timed to complete tasks as well as creating a 'safe' space for learners to voice concerns and issues either privately or in a group (TalentLMS, 2018).

This final point is further evidence to incorporate as much of the new curriculum for Wales into our teacher training and lesson planning as early as possible so that the next generation of teachers are familiar with the expectations and tools needed to deliver before the curriculum becomes live in 2022.

Within my own work, I have had to adapt my planning to understand how the pedagogies fit into the classroom environment based on what strategies worked well, what wasn't as effective, and the reasons behind this. 'TES teach', formerly known as 'Blendspace', is a resource bank for teachers and students to aid creation of lessons and provide inspiration and new ideas to be introduced into the classroom (Tes, 2019) and is one of the main sources used for introducing the 12 pedagogies into my classrooms.

Based on my resources, the pupils' workbooks, and education literature, I can track and determine how well the pedagogies have been employed within my first half of my professional teaching experience or 'PTE 1'. Taking each of the three discussed pedagogies in turn, I shall reflect and analyse my effectiveness at incorporating them into my lessons. Reflective practice is 'learning through and from experience, working towards gaining new insights of self and practice' (Finlay, 2008).

Assessment for learning has been introduced into every lesson plan by way of formative assessment in a "plenary". This is between five and ten minutes of the end of every lesson, to track pupils understanding and retention of the lesson, by means of BINGO, a quiz, or other technique. It has been introduced school-wide within my placement school due to the ability it shows in student progression. It can be used to show 'outstanding' teaching during an observation (Bradley, 2017). I then adapt my future lessons to cover any misunderstandings which come forth that I cannot resolve in the short time before the lesson is over.

The first strategy was to use simple questioning to check the recall and understanding of the pupils (Williams, 2016). The software 'plickers', which I had previously observed a teacher using, had been employed to do this. It uses the teachers' phone to capture the orientation of a QR code to answer a quiz questions shown on the white board (Jarrett, 2019). As seen in figure 1.2, this smart card would give an answer "D" when scanned with the teachers' phone. Figures 1.3a and 1.3b show the overall success in the class and the correct answer, followed by more in-depth analysis of each participant. This was then used in my next lesson plan for making a model cell, as it was clear not everyone understood (Figure 1.5 and 1.6).

This method of assessment only gave shallow understanding of the topic but from the whole class, whereas some pupils may have been able to give an in-depth description of a specialised cell (Mayes, 2002). I plan to continue using this method for assessing pupil knowledge on a regular basis however, additional strategies must be used to check for deeper learning and understanding.

This led to me to developing a similar strategy centred around questioning, that allowed for global feedback as well as provide opportunities to check for deeper learning (Bartlett, 2017). Correct answers are indicated by hands up but not necessarily all hands up have a correct answer (Bartlett, 2015). On this occasion, I posed four questions to the class on the whiteboard one at a time. Each has a multitude of answers (see figure 2.2) and an opportunity to delve into further questions e.g. a question asked was 'what is a dependent variable?' There are 4 possible definitions I was looking for, this was then followed up with additional questioning pertaining to the use of this specific variable: how is it measured?, how would we show the data?, what are the types of units?, etc. which were each asked to a different pupil around the room.

This is time-consuming, however, had engagement from the whole class and the use of naming pupils allowed for classroom management to be a non-issue as recorded in the teacher feedback (figure 2.3) (Renee, n.d). Future lesson planning will include this strategy of question and answer as it can show global understanding in the classroom however, there will be a planned 10 minutes minimum and up to 15 minutes (Williams, 2016) to ensure as much discussion as possible around open-ended questions can be done.

This leads onto the second pedagogical principle of cross-curriculum responsibilities. These are the opportunities generated to improve literacy, numeracy and digital competency. Within the first full lesson planned, a comprehension task had been prepared consisting of a work sheet provided with information sheets to fill in the gaps (see figure 4.2-4.3). The plan is for the pupils to undertake their own learning, move around the classroom with the blank handout and return with the information on each of the six specialised cells. This allows for independent learning or collaboration to determine the answers after reading about the topic (TES, n.d.).

As seen in figures 4.3A to 4.3B, the pupils were able to complete the task in the 20 minutes provided and do so accurately. The purpose of this task is to improve reading skills as well as teach subject matter. This can only happen if the pupils are able to read: A 'wall' of text may be off-putting or demoralizing to a low-skilled reader (Tomanggong, 2013). The information sheets prepared were as basic as necessary with bullet pointed sentences to ensure the information was as easily accessible as possible.

Unfortunately, I underestimated the higher skilled readers in the class, leading to some misbehaviour. The next step is to ensure an extension task is prepared and readily at hand. This was the same situation with the same class during their next lesson in a computer lab and is a personal target moving forward (figure 4.5).

On the other hand, a lesson planned to analyse data and improve numeracy skills needed to be adapted due to the varied skill level within a class. The data gathered from an experiment was to be drawn up into a graph. Graphs are commonly used in presentations in the real world to display data easily and show anomalies (Slutsky, 2014). This topic considers correct scale, labelling of axis and creating a suitable title. The work completed was to a high level (figure 6), the students who were able to complete the work then gave aid to other pupils in showing what was needed, further improving communication and collaboration. Those who had finished were able to move onto the conclusion where a paragraph describing the results linked both the literacy element and the numeracy, as the writing is an account of the data (Mitchell, 2017).

Lastly, the third pedagogical principle of creating an authentic context for learning is the, personally, more meaningful one to choose. Teaching pupils' subject knowledge and skills has no merit if they don't see the reason for it. Linking theory to practice and bringing in the outside world into the classroom, shows how and where the skills that are being learned are applied to an array of careers (Donaldson, 2015). Moreover, it also allows access to the curriculum where concepts or language is specific and complicated (Kober, 2015).

In terms of explaining specialised cells, a favourite analogy of mine is to use a Pokémon reference where 1 single Pokémon can become a multitude of options based on the input: this is a direct comparison to specialised cells. Pupils' in the classroom are very aware of Pokémon as it transcends generations having been on since the early 90's in popular UK culture (BBC news, 2016). This opened a wide discussion in the classroom linking the complexities of biology to something relevant and current the pupils had a deep understanding of. This did not work for every pupil in the class. Linking the learning to an understandable context comes majorly from positive student-teacher relationships and understanding the learner. The greater the student-teacher relationship the easier it is to set the scene for how a concept can be understood easily by the class, or if needs be, by an individual learner (Gonzalez, 2016).

Another way to bring the outside into the classroom is to use everyday tasks. Having the pupils create a method for making a jam and peanut butter sandwich, I was able to determine how well the class could write in general and understand scientific processes. Using a sample of methods, I tried to create a sandwich at the front of the class (figure 9.3). It soon became apparent why details are so important and how language affects communication of thoughts and opinions in the real world. After this, having a pupil make a sandwich at the front of the class based on their peers' instructions created something edible. A set method was then written on the board and copied down into the pupils' books (figure 9.2): learners were then able to compare what went well and what could be better without dismissing the task as unrelatable (Goss and Sonnemann, 2017).

This was particularly difficulty for those with English as an additional language (EAL), as there was no scaffolding or key words to be used. Oral communication was strong within the class however, the written skills weren't as strong independently (Cameron and Besser, 2004).

In order to continually improve in my career there are several targets I must now work towards. To being, further development needs to be done on questioning in plenaries to include work that is captured within the pupils' exercise books. TES offers a wide range of options that engage pupils such as exit tickets: Having the pupils write down something they've learned and having it marked by the teacher before they leave (Hartwell, n.d.). As a general target, I must also plan to have extension tasks available for the class due to the frequent completion of set work by several students. This has invariably led to misbehaviour and a missed opportunity for further learning (British council, n.d.) In order to ensure I can continually introduce

authentic contexts for learning, student-teacher relationships need to become the bedrock of my teaching profession as well as ensuring the correct scaffolding is provided for all students abilities when completing written tasks.

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Appendix

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Task	Actions	Timescale	Success criteria/Outcomes	Monitoring & Evaluation
Good teaching for learning means employing assessment for learning principles.	Use of plickers Think, Pair, Share Research tasks	4 – 8 weeks	Questions asked from class to broaden and deepen understanding Homework tasks showing evidence of class covered knowledge and additional reading	Learning Journal Weekly reflection Lesson observations
Good teaching and learning regularly reinforced Cross-Curriculum Responsibilities, including literacy, numeracy, and digital competence, and provides opportunities to practice them.	Use of graphs and comprehension tasks	2 weeks	SALT method being followed, and each child being able to draw accurate graphs from data sets and texts provided	Learning Journal Weekly reflection Lesson observations
Good teaching and learning creates authentic contexts for learning.	Videos Guest speakers	10 weeks	Having conversations and visual prompts to show practical employment of skills and topics learned. Class work displayed on walls	Learning Journal Weekly reflection Lesson observations
Good teaching and learning means employing a blend of approaches including direct teaching	Use of visualisers to model answers WGLL (What Good Looks Like)	4 weeks	Marking books and identifying 100% accurate methods displayed. Check correct skills learned even if answers may be wrong	Learning Journal Weekly reflection Lesson observations
Good teaching and learning means employing a blend of approaches including those that promote problem solving, creative and critical thinking.	Group tasks Mind maps	8 weeks	Detailed and accurate work based on topic showing advanced knowledge based on lesson. Evidence of additional reading and research	Learning Journal Weekly reflection Lesson observations
Good teaching and learning sets tasks and selects resources that build on previous knowledge and experience and engage interest	APK's	1 week	Use of APK set to tier levels, differentiating ability to reach whole class At least 1 'question' or 'activity' attempted and understood, checking within first 10 mins of lesson and then closing gaps	Learning Journal Weekly reflection Lesson observations
Good teaching and learning ranges within and across Areas of Learning and Experience (AoLE)	Set tasks	6 – 8 weeks	Each lesson incorporates a literacy and numeracy component due to the nature of the work taught in science. Evidence captured in students books	Learning Journal Weekly reflection Lesson observations