Overview

Thursday, November 14, 2019 9:51 AM

Student Name: Sean Discombe
Student Number: 1904958
Assignment Title: Collect, collate and critically reflect on examples of the implementation of three pedagogical principles in the first part of Professional Teaching Experience 1 (PTE1).
Pathway: Secondary PGCE – Geography

Link to OneNote: https://uowtsd-my.sharepoint.com/:o:/g/personal/1904958_student_uwtsd_ac_uk/Etw8Whh8PjxCt1eRlKRwaUYBr50dS0seCPq9UREX30C3Hg?e=fRhWrk

As part of Bridging 2, I was asked to develop an Action Plan in order to try and implement some of the pedalogical principles into my teaching practice in PTE1.

Action Plan (Sean...

Task	Actions	Timescale & Resources	Success Criteria	Monitoring & Evaluation
Good teaching and learning means employing assessment for learning principles.	Utilising whiteboards or other available classroom tools to get quick feedback from pupils about understanding. Use a range of questioning with an attempt to follow Bloom's taxonomy. Marking books using WWW and EBI. Use peer to peer marking ensuring students understanding of the concept of reflection.		The use of quick feedback mechanisms on understanding lesson content is reflected in the students written work in their notebooks. The building of structured oral answers can be seen through questioning to reflect knowledge and understanding in terms of both Describe and Explain. Students can reflect upon their own work and improve upon it by following EBI's. Students can also critically assess the work of their peers to improve that of their own.	Learning Journal. Weekly Reflection. Formal Lesson Observations.
Good teaching and learning regularly reinforces Cross-Curriculum Responsibilities, including literacy, numeracy and digital competence, and provides opportunities to practice them.	Incorporate starter literacy tasks relating to key geographical terminology and embed the use of graphs and statistical analysis in a topic area which is relatable and reinforces taught topic content.		Students are able to actively engage with both literacy and numeracy tasks based on transferable cross curricular knowledge already established from taught core subject content, and can relate the tasks to the geographic theme of the lesson.	Learning Journal. Weekly Reflection. Formal Lesson Observations.
Good teaching and learning means employing a blend of approaches including direct teaching.	Use of video with comprehension task associated with it to support chalk and talk.		Students are actively engaged in the video content through observation and note taking to be able to successfully complete the written comprehension task associated with the video afterwards.	Learning Journal. Weekly Reflection. Formal Lesson Observations.
Good teaching and learning means	Use group work which involves contrasting viewpoints on a sensitive issue. Students		Students are successfully able to argue and defend their points of view and to	Learning Journal. Weekly Reflection.

employing a blend of approaches including those that promote problem solving, creative and critical thinking.	argue a convincing case using subject knowledge effectively, e.g. in role or debate. This can be taken further in the form of role play, where members of the group assume different points of view based on their assigned role. They would have to research their role and argue/debate their case regardless of how they personally feel about the role.		individually ensure that their voice is heard. Students are also able to come to a collective understanding that some viewpoints are stronger or weaker than others based on the given case study.	Formal Lesson Observations.
Good teaching and learning sets tasks and select resources that build on previous knowledge and experience and engage interest.	Trial Spaced Learning APK's.		Students can remember and recall information from a previous lesson which can lead to increased complexity and specificity through structured questioning.	Learning Journal. Weekly Reflection. Formal Lesson Observations.
Good teaching and learning create authentic contexts for learning.	Place Wales and where they live at the centre of the lesson which additionally supports Curriculum Cymreig. An example of how to do this would be teaching 4 & 6 figure Grid References and getting pupils to identify key landmarks in Wales using OS Maps.		Students can demonstrate this by being able to locate places using 4 & 6 figure grid references and students demonstrate a sense of belonging, orientation, scale and maps skills.	Learning Journal. Weekly Reflection. Formal Lesson Observations.
Good teaching and learning ranges within and across Areas of Learning and Experience.	Look at the geography of a place and link it to how and why it has changed over time, as well as looking towards the future. An example of this which is relevant is Swansea. The geography of Swansea enabled the development of the copper works and the export of coal around the world to support the industrial revolution (Link to History). Since then Swansea has changed considerable both economically and culturally (Link to RE). In this 1 example		Students can demonstrate that they are knowledgeable about their culture, community, society and the world, now and in the past. Using this, students can engage with contemporary issues based upon their knowledge and values.	Learning Journal. Weekly Reflection. Formal Lesson Observations.

	multiple AoLE's are covered and interact with one another.			

Assessment for Learning Principles

Thursday, November 14, 2019 9:52 AM

7L Oracy Assessment

Lesson Plan

Sean Discombe...

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 5 GM Crops Oracy Assessment

Student-teacher	Sean Discombe (1904958)	Class:	7L
AoLE or Subject	***Geography***	Date:	5/12/19
Lesson Focus:	Genetically Modified Crops (GM): Lesson 5		
Meaningful links to Curriculum	This lesson is part of a unit looking at GM crops. The learners will take part in oral discussions on their respective tables where they: • Discuss the advantages and disadvantages of GM crops. • Discuss the current trend in GM crop producing countries. • Discuss the reasons of why we need GM crops in the world today. • Discuss the different viewpoints of people representing different organisations around the world, including religion. • Discuss their own views on GM crops given all of the information covered so far. **WM1**: Interpret and synthesis information to further inform understanding of the world. **WM3:** Develop an awareness of the interconnections between humans and their environment. **WM3&5:** Environmental challenges facing Humanity including climate change. **WM4:** Choices we all make, idividually and collecitvely, have major impacts. WM3 **H&W** Food production and sustainability. WM3 **S&T** Impact of scientific and technological development on the natural world. WM1 **M&N** Spotting trends and anomalies. **Ambitious, capable learners who >** *can communicate effectively in different forms and settings* **Ethical, informed citizens who >** *engage with contemporary issues based upon their knowledge and values.* **Ethical, informed citizens who >** *respect the needs and rights of others, as a member of a diverse society.*		
Meaningful links to: Cross Curricular Responsibilities	**Oracy > Developing information and ideas >** Speaking > *present topics and ideas clearly, using formal language and varying what they say and how they say it to interest listeners, e.g. expression, tone of voice, volume.* **Oracy > Presenting information and ideas >** Listening > *respond thoughtfully to others' ideas, asking pertinent questions*		

Brief description of lesson purpose

Planning is linked to the geography curriculum what matters statements

Planning is linked to geography cross-curriculum what matters statements

Planning is linked to Donaldson's four purposes

Planning is linked to the development of cross-curricular skills, particularly literacy, numeracy and ICT

	Oracy > Presenting information and ideas > Collaboration and discussion *> make a range of contributions to discussions, e.g. leading, encouraging and supporting others*

Personal Targets (Linked to QTS and identifed in weekly review)

My mentor and I have agreed that my main target for this week is to develop my ability to critically reflect on lessons and lesson planning. This means that I will take on board criticisms of my current teaching ability, and apply the necessary improvements in the coming lessons. The improvements I will try to enact upon in my next lesson are:

- Spelling – make sure I spell key words in the lesson correctly and continue to model good literacy behaviour.
- Improve incidental Welsh.
- Use a range of teaching techniques to exlore and explain lesson content in addition to chalk and talk, such as video, targeted worksheets, audio clips etc...
- Ensure enough time is left for a plenary to check understanding of lesson content.

I am also to maintain professional working relationships with leadership and fellow members of staff, learning to communicate more effectively.

Learning Objectives (focus on Learning- use accessible vocabulary):

The pupils will learn to:

1. Use key geographical reasons of why we possibly have GM crops in the world.
2. Use knowledge and understanding of the advantages and disadvantages of GM crops to support their own opinions.
3. Use religion to help form their own views.
4. Develop their own opinions and beliefs given the range of information they have been exposed to.
5. Clearly communicate their own opinions to other pupils using evidence to support their claims.
6. Listen and respect the views of others.

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)
1 Pupils will be able to recall and explain what GM crops are; why we need them and their advanatges and disadvantages in order to help formulate their own opinion on GM crops. 2 Pupils can use the opinions of others including religious scriptures to help formulate their opinions.	1. Answering open and closed questions on the success scriteria of an oracy task. 2. Participating in open class and group disucussions in which they formuate their own views on GM crops and clearly communicate these to each other and to the

3	Pupils can communicate using a range of language and key words to get their opinions across clearly to others, as well as listening and taking on board the opinions of others which may differ.	teacher. The students must use reasoning behind their choices.

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Time **1 hour**	**Activities/Methodology/Key Concepts** (Teacher's Role – including key teaching points, differentiation strategies and key questions) ***In school, you will have to include differentiation strategies, and be specific about the teaching strategies being used.***	**Pupil Tasks** (Pupils' role –including differentiation, engagement in formative assessment and homework) ***In school, you will have to include differentiation, and be specific about the learning and AfL strategies being used.***	**Resources** (Including Health and Safety requirement) ***Be specific about the resources you'll need and will be using.***
10 minutes **Opening phase**	Teacher is to outline the date and heading for the lesson. Teacher is to give the pupils the question which they must discuss. Teacher is to list the structure for a successful oracy task: • Purpose • Audience • Vocabulary • Success Criteria • Notes	Pupils are to write the heading and the date in their books, both underlined. Pupils are to write down the question in their books. Pupils are to record the structure of the oracy task in their own workbooks. Pupils are advised to record key words that they will use in their discussions in their Vocabulary. Pupils are encourages to make a few notes which they can refer to when having thier discussions.	GM Crops PowerPoint H&S: Ensure bags are away under tables, and computer cables are not likely to cause a trip hazzard.
40 minutes	Pupils are to discuss in pairs and on their tables about their own views on GM crops. Students are to take on board the range of information they have encountered in this topic so far to help them to do this. As well as giving their own opinions, they must also be able listen to the	Pupils are to disuss in pairs/tables about their opinions on GM crops. Pupils are to use some of the sentance starters and connectives listed on the debate sheets provided and to refer to any notes they make so that they are backing up	GM Crops PowerPoint Debate Statements H&S: Ensure bags are away under tables, and

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Main Phase	opinions of others, which may in turn sway their own opinion. The teacher will float around the classroom listening in to discussions on each table and to provide advice or guidance if necessary. The teacher will then initaiate some DIRT, where the pupils are required to reflect about what they have been learning and about the Oracy task they just completed, to decide WWW and EBI. A PowerPoint slide showing a range of WWW and EBI statements will be shown to help them engage with this task.	their opinions with sound reasoning and judgement. The pupils will be required to write a few sentances in their books describing WWW and EBI about the Oracy task that they completed during the lesson.	computer cables are not likely to cause a trip hazzard.

The assessment of learning will be conducted by the teacher by listening to the strength of debate going on in each table. I will be listening for the choice of words students will use to explain their own views on GM crops along with the factual evidence they select to support their views. Use of the debate statements as a lesson resource will enhance the discussion in each group, and students following this protocol will be able to actively listen and then engage with what is being said at the time.

Main Phase	opinions of others, which may in turn sway their own opinion. The teacher will float around the classroom listening in to discussions on each table and to provide advice or guidance if necessary. The teacher will then initaiate some DIRT, where the pupils are required to reflect about what they have been learning and about the Oracy task they just completed, to decide WWW and EBI. A PowerPoint slide showing a range of WWW and EBI statements will be shown to help them enagage with this task.	their opinions with sound reasoning and judgement. The pupils will be required to write a few sentances in their books describing WWW and EBI about the Oracy task that they completed during the lesson.	computer cables are not likely to cause a trip hazzard.
10 minutes **Plenary**	Pupils will be asked a range of questions to ensure their knowledge and understanding of topic content: • What are GM crops? • What is a social / economic / environmental advantage of GM crops? • What is a social / economic / environmental disadvantage of GM crops? • Remind the pupils about their leaflets for homework.	Pupils are to respond to a range of open and closed questions which consolidates their knowledge and undertsanding of tpoic content.	GM Crops PowerPoint

support their views. Use of the debate statements as a lesson resource will enhance the discussion in each group, and students following this protocol will be able to actively listen and then engage with what is being said at the time.

I have actively thought about a number of questions to ask the group in a plenary as another form of AfL.

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Lesson Resource

Debate statements

Statements to help with your discussion:

When you are listening to the other side:

I agree because…

I partly agree because… but these are the reasons why I disagree…

I see your point, but I think…

Yes, I understand, but my opinion is that…

That's all very interesting, but the problem is that…

I'm afraid I can't quite agree with your point because…

I/We can see what you're saying. Here's my reply…

I think I've got what you are saying, now let me respond to it…

I disagree because…

I can expand/elaborate on your reasoning because…

There are many examples of this such as…

For all of these reasons I must agree/disagree…

You make a strong argument and I want to agree/disagree…

Could you explain that further…

What you're saying contradicts with…

I developed this as a lesson resource to help keep the debates structured and flowing, and that use of this lesson resource would improve the performance of the students in this task.

When you need to say something now:

I'm sorry to interrupt, but you've misunderstood my/our point…

Sorry, I just have to disagree with your point…

Let me just respond to that, please…

Forgive me for interrupting, but I must respond to that…

If you don't mind, I'd like to take issue with what you just said…

When you give your rebuttal/response:

The first point I would like to raise is this…

Here's the main point I want to raise…

I'd like to deal with two points here. The first is…

Just to be clear, here is what I mean…

When you give concluding statements:

To recap, the main points are…

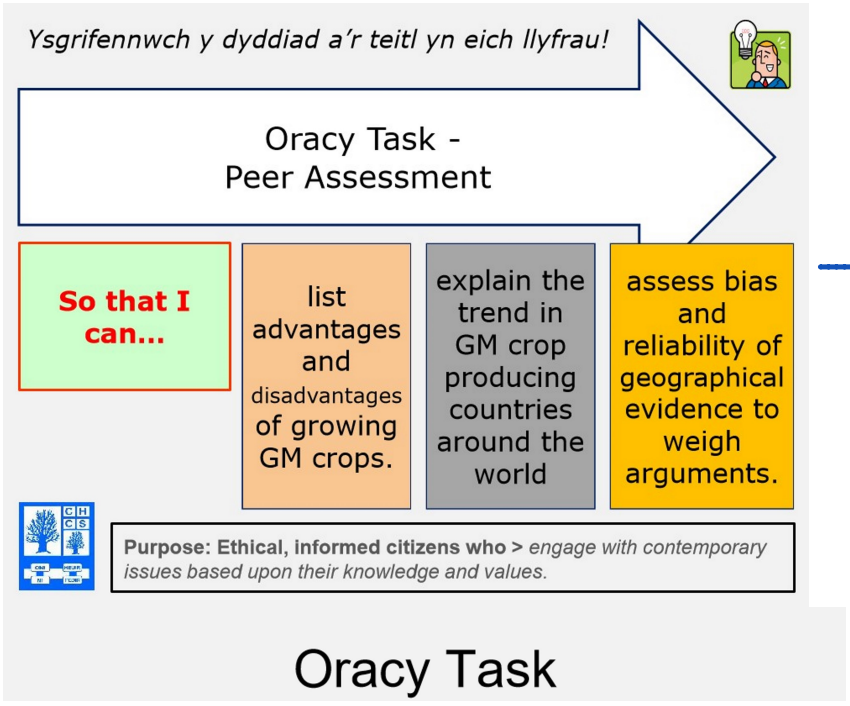
Let's sum up where I/we stand in this debate…

Let me summarise my/our position in this debate…

In summary, I/we want to point out that…

Lesson PowerPoint

Sean Discombe…



This slide is typical for every lesson and clearly outlines the focus question to be answered through the bronze, silver and gold learning goals that can be achieved by the learners. There is also a reference to Donaldson's four purposes.

Oracy Task

- To what extent do you agree with the statement 'GM crops will benefit the world **socially**, **economically** and **environmentally** ?

This is a typical exam question a student is likely to receive in Geography, so emphasis on what are social, economic and environmental factors was talked through in an open class discussion so the students were clear on what their debates were to focus around.

Oracy Task

Purpose: To discuss/debate

Audience: Peers

Vocabulary: Yield, Productive, Bug Resistant, Genes, Scientists, Research etc…

Success Criteria: Gestures, tone of voice, projecting your voice, use of geographical terminology, responding to others, active listening, elaboration

It is important that both student and teacher are aware of the success criteria before commencing the task

WWW

- You used geographical terms correctly
- You elaborated my explanations
- You included a range of positive impacts
- You included a range of negative impacts
- You used connectives to link my sentences
- You used sophisticated connectives to add impacts
- You used sophisticated connectives to explain the impacts in more detail
- You used gestures
- You varied the tone of your voice
- You spoke clearly
- You ensured that your spoken language had a logical structure
- You ensured I answered the question fully

This task offered an opportunity for the students to practise peer assessment. Being as they are only in Year 7, and the fact it takes many years of practising these skills in order to perfect them, then suggestions on WWW and EBI have been given to the students in order to help them critically reflect on the task they just completed.

EBI

- You use more geographical terms correctly
- You elaborate my explanations
- You added a greater range of positive impacts
- You added a greater range of negative impacts
- You used connectives to link my sentences
- You revised and edited your word choice
- You used more sophisticated connectives to add impacts
- You used more sophisticated connectives to explain the impacts in more detail
- You used gestures
- You varied the tone of your voice
- You spoke clearly
- You ensured that your spoken language had a logical structure

Lesson Reflections:

- I had already attempted this very same lesson with 7W which didn't go as well. As a result I modified aspects of this lesson which made it a lot more successful.
- By looking at the assessment goals and success criteria, both the students and myself had a clear view of what was expected, and the ways in which they could improve.
- I successfully demonstrated ways in which the supporting lesson resources could be used to improve student performance in this assessment, and this was adopted by all groups involved.
- When reflecting upon their performance, the students were able to identify reasons of why their debates weren't as successful as other groups, which mainly focused around active listening and interruption. Students saw that these were skills which they had to work on in order to improve for next time.

9W Extended Written Task (EWT) Assessment

Lesson Plan

Sean Discombe...

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Lesson Plan Phase 1

Lesson 1 9W Rainforests

Student-teacher	Sean Discombe (1904958)	Class:	9W
AoLE or Subject	***Geography***	Date:	29/11/19
Lesson Focus:	Rainforests Lesson 1: EWT		
Meaningful links to Curriculum	This lesson is part of a unit looking at the rainforest ecosystem. The learners will complete a EWT (Extended Writing Task) where they will analyse 3 sustainable management strategies, looking at how effective they are or will prove to be by looking at the pro's and the con's of each one individually, and how this relates to the bigger environmental issues across the world. **WM1:** Apply understanding of concepts underpinning Humanities to local contexts. **WM1:** Apply understanding of concepts underpinning Humanities to national contexts. **WM1:** Apply understanding of concepts underpinning Humanities to global contexts. **WM2:** Construct their own informed perspectives. **WM2&5:** Differing interpretations of the key challenges and opportunties facing Humanity. **WM3:** Develop an awareness of the interconnections between humans and their environment. **WM3&5:** Environmental challenges facing Humanity including climate change. **WM4:** Choices we all make, idividually and collecitvely, have major impacts.		

Brief description of lesson purpose

Planning is linked to the geography curriculum what matters statements

	and their environment. **WM3&5:** Environmental challenges facing Humanity including climate change. **WM4:** Choices we all make, idividually and collecitvely, have major impacts. WM3 **H&W** The contribution of the natural world to our health and wellbing. WM3 **LLC** Cultural empathy and sensitivity **Ambitious, capable learners who >** *are building up a body of knowledge and have the skills to connect and apply that knowledge in different contexts.* **Ethical, informed citizens who >** *engage with contemporary issues based upon their knowledge and values.* **Ethical, informed citizens who >** *show their commitment to the sustainability of the planet and are ready to be citizens of Wales and the world.*
Meaningful links to:	**Oracy > Presenting information and ideas >** Listening > consider the relevance and significance of information and ideas presented to them.

Planning is linked to geography cross-curriculum what matters statements

Planning is linked to Donaldson's four purposes

1

Cross Curricular Responsibilities	**Reading > Responding to what has been read >** Comprehension > *compare and contrast themes and issues across a range of texts.* **Reading > Responding to what has been read >** Response and analysis > *understanding, e.g. of causes, consequences, patterns, using different sources.* **Writing > Organising ideas and information >** Meaning purposes readers *> use summary, discussion of issues, detailed explanations as appropriate to purpose.* **Writing > Organising ideas and information >** Structure and organisation *> select, interpret and evaluate ideas and information convincingly or objectively.* **Writing > Writing accurately >** Language *> use a wide range of technical terms, language and expression consistent with the subject content.* **Writing > Writing accurately >** Grammar, punctuation, spelling, hand writing *> produce fluent and legible handwriting.*

Planning is linked to the development of cross-curricular skills, particularly literacy, numeracy and ICT

Personal Targets (Linked to QTS and identifed in weekly review)

My mentor and I have agreed that my main target for this week is to develop my ability to critically reflect on lessons and lesson planning. This means that I will take on board criticisms of my current teaching ability, and apply the necessary improvements in the coming lessons. The improvements I will try to enact upon in my next lesson are:

- Spelling – make sure I spell key words in the lesson correctly.
- Improve incidental Welsh.
- Simplify explanations and ensure learners understand e.g. ask them to repeat the task / explanation in their own words.
- Set clear time limits for tasks so the learners know how long they have. Reminders would be helpful to ensure the lesson has pace and challenge.
- Ensure enough time is left for a plenary to check understanding of lesson content.

I am also to maintain professional working relationships with leadership and fellow members of staff, learning to communicate more effectively.

Learning Objectives (focus on Learning- use accessible vocabulary):
The pupils will learn to: 1. Create an informative piece of extended writing by analysing a number of different sustainable management strategies used in the Rainforest, and attempt to link these to wider national and global geographic issues.

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)
1. Students are to demonstrate they know the advatanges and disadvantages of sustainble	1. Students are to respond to a number of open and closed questions relating to the exam type question they are answering.

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management strategies used in the rainforest. 2. Students are to refer to timescale and state the effectiveness of the stategies analysed over time, which brings in other factors such as environmental benefit, economic costs and social costs.	2. The students will produce an extended piece of writing which will be marked by the teacher for WWW and EBI.

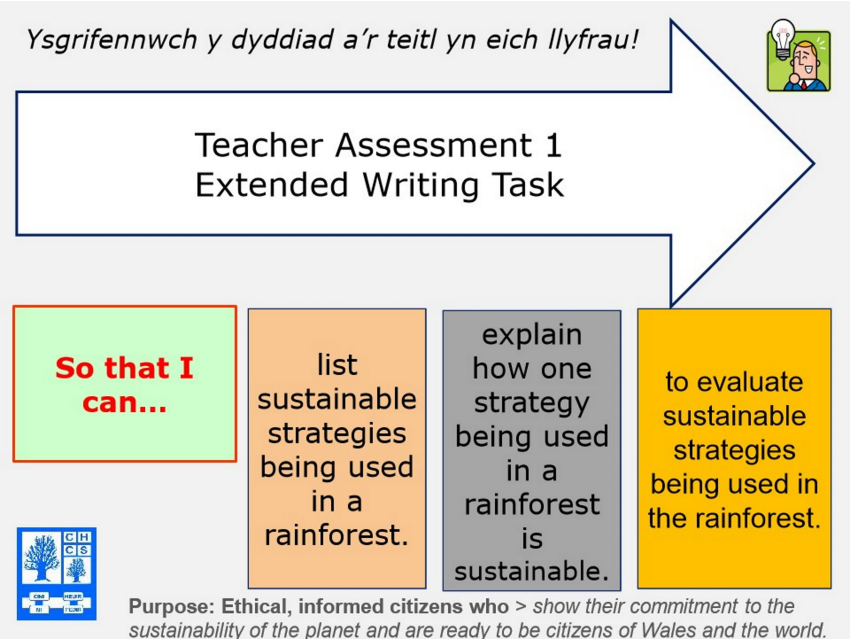
Time **1 hour**	**Activities/Methodology/Key Concepts** (Teacher's Role – including key teaching points, differentiation strategies and key questions) ***In school, you will have to include differentiation strategies, and be specific about the teaching strategies being used.***	**Pupil Tasks** (Pupils' role –including differentiation, engagement in formative assessment and homework) ***In school, you will have to include differentiation, and be specific about the learning and AfL strategies being used.***	**Resources** (Including Health and Safety requirement) ***Be specific about the resources you'll need and will be using.***
10 minutes **Opening phase**	APK: Teacher to ask pupils to conisder the work they've been doing on sustainable management strategies applied in the rainforest and to list some advantages and disadvantages of the strategies analysed. The teacher will also probe the students along Bloom's taxonomy to see if they can relate their answers to national and global issues besides local.	Pupils are to work in pairs for 2 mintues to discuss their work from the previous lesson. Pupils will then participate in an open class discussion/questioning covering the 6 sustainable management startegies used in the Rainforest.	Rainforest EWT PowerPoint H&S: Ensure bags are away under tables, and computer cables are not likely to cause a trip hazzard.
10 minutes **Main Body 45 Minutes total**	The teacher will outline the question for the EWT which the students have to write out in their books: • For one ecosystem that you have studied, evaluate the effectiveness of the sustainable strategies used. (8) The teacher will run through successful ways in which to answer this question and to get the most marks: • Notes (from Worksheet)	Students will write out the heading and the date in their books, followed by the question they are to answer.	Rainforest EWT PowerPoint H&S: Ensure bags are away under tables, and computer cables are not likely to cause a trip hazzard.

35 minutes	• Success Criteria (Adv/Disadv / SPAG / Elboration) • Sequence of Writing (3 paragraphs exploring 3 strategies used, with their respective Adv/Disadv and Elaboration) The teacher will then get the students to use the rest of their lesson to compose and write out their answers.	Students may want to spend a little bit of time planning the structure of their answer before they start writing. Students will be reminded that this is an indiviual assessed piece of work.	
5 minutes **Plenary**	Teacher is to run through a quick plenary to check for overall knowledge and understanding of pupils on the sustainable management strategies used in the rainforest.	Students are to repond to a range of closed questions to confirm that the subject content and message had been understood.	Rainforest EWT PowerPoint

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Lesson PowerPoint

Sean Discombe...



This slide is typical for every lesson and clearly outlines the focus question to be answered through the bronze, silver and gold learning goals that can be achieved by the learners. There is also a reference to Donaldson's four purposes.

Extended Writing Task

- For one ecosystem that you have studied, evaluate the effectiveness of the sustainable strategies used. [8]

This is a typical exam based question that students are likely to encounter in Geography and the marks on offer indicate the amount of content that is required.

Extended Writing Task (EWT) Writing Behaviours

Notes

- See Worksheet

This is an open book task, so students are actively encouraged to use notes they have made in previous lessons to help them answer the question above.

Success Criteria

- Range of strategies considered
- Elaborated points made
- Advantages and Disadvantages addressed
- Refer to long term and short term issues
- What are the Environmental / Economic / Social benefits / consequences / implications?
- Mention wider geographic impacts e.g. climate change, food production
- Include evaluative statements e.g. How effective is each strategy? Which strategy is most / least effective and why?

The success criteria is talked through by the teacher before the students start the task.

Sequence

- P1: One Strategy
- P2: Another Strategy
- P3: Another Strategy
- P4: Overall Evaluative Conclusion

Lesson Resource



Sean Discombe...

The 6 Sustainable Strategies Used

- Agro-forestry - growing trees and crops at the same time. This lets farmers take advantage of shelter from the canopy of trees. It prevents soil erosion, and the crops benefit from the nutrients from the dead organic matter.
- Selective logging - trees are only felled when they reach a particular height. This allows young trees a guaranteed life span the forest will regain full maturity after around 30 - 50 years.
- Education - ensuring those involved in exploitation and management of the forest understand the consequences behind their actions.
- Afforestation - the opposite of deforestation. If trees are cut down, they are replaced to maintain the canopy.
- Zoning - forest reserves - areas protected from exploitation.
- Monitoring - use of satellite technology and photography to check that any activities taking place are legal and follow guidelines for sustainability.

This slide was developed to help any students who had missed content from previous lessons in order to help them answer the question.

Lesson Reflections

Reflection for 9W on Friday 29/11/19 Period 3:

- I tried bouncing the answers off each other in the classroom when doing the APK. Again for those who couldn't offer any answer I should have circled their name and come back to them at another point during the lesson.
- The class were forthcoming with answers which made it easier to link in aspects as either environmental, economic or social, and then link these to the wider geographical issues.
- In future I will adapt the length of information required in the success criteria of an EWT according to the level of the class, so that they don't need to spend time writing out information they already know.
- I had my first real plenary where I was able to ask a number of questions to students around the classroom which underpinned the core lesson content.

Reflections for 9A Lesson 1 on Friday 29/11/19 Period 5:

- I did spend a little too long on the APK task with this class as they weren't as forthcoming with answers. Their previous lesson was a cover lesson as well which meant that some of them didn't have quite the level of information as other classes had leading into this lesson. Therefore, I spent more time looking at environmental, economic and social implications of sustainable strategies to make sure they understood what these were and what they meant, before trying to link them to wider geographic implications for the world.
- In future I would adjust the level of information in the success criteria that they need to write down, and target things that they might not remember to include in their answers.
- I targeted individuals who I thought might struggle with the EWT task and talked through their prospective answers with them before they put pen to paper.
- I didn't make enough time for a quick plenary at the end because I was too busy helping individuals around the classroom improve their answers and I didn't keep track of the time. This really needs to improve next week as plenary's are a vital component of AfL.

Year 7 Gentically Modified Crops Cartoon Strip

Lesson Plan

pdf

Sean Discombe...

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Lesson Plan Phase 1

Student-teacher	Sean Discombe (1904958)	Class:	7W
AoLE or Subject	***Geography (7W)***	Date:	05/11/19
Lesson Focus:	Genetically Modified Crops (GM): Step 1		
Meaningful links to Curriculum	This lesson is part of a unit of learning looking at GM. The learners will gain knowledge and understanding of how GM works at a very basic level. From this we will look at current trends in countries around the world using GM and then explore the possible reasons for the existence of GM in these countries. **WM1:** Interpret and synthesis information to further inform understanding of the world. **WM3:** Develop an awareness of the interconnections between humans and their environment. **WM3&5:** Environmental challenges facing Humanity including climate change. **WM4:** Choices we all make, idividually and collecitvely, have major impacts. WM3 **H&W** Food production and sustainability. WM3 **S&T** Impact of scientific and technological development on the natural world. WM1 **M&N** Spotting trends and anomalies. **Ambitious, capable learners who >** *are building up a body of knowledge and have the skills to connect and apply that knowledge in different contexts.* **Enterprising, creative contributors who >** *connect and apply their knowledge and skills to create ideas and products.* **Ethical, informed citizens who >** *engage with contemporary issues based upon their knowledge and values.*		
Meaningful links to: Cross Curricular Responsibilities	**Oracy > Presenting information and ideas >** Collaboration and discussion > *make a range of contributions to discussions, e.g. leading, encouraging and supporting others* **Reading > Locating, selecting and using information >** Reading strategies > *use their knowledge of word roots and families to make sense of words, sentences and whole texts.* **Writing > Organising ideas and information >** Structure and organisation > *select and organise ideas and information to give a clear*		

Brief description of lesson purpose

Planning is linked to the geography curriculum what matters statements

Planning is linked to geography cross-curriculum what matters statements, and this lesson very clearly links to aspects of the Science curriculum.

Planning is linked to Donaldson's four purposes

Planning is linked to the development of cross-curricular skills, particularly literacy, numeracy and ICT

	Reading > Locating, selecting and using information > Reading strategies > *use their knowledge of word roots and families to make sense of words, sentences and whole texts.* **Writing > Organising ideas and information >** Structure and organisation > *select and organise ideas and information to give a clear and full account* **Writing > Writing accurately >** Language > *use varied and appropriate vocabulary accurately, including subject-specific words and phrases.*

Planning is linked to the development of cross curricular skills, particularly literacy, numeracy and ICT

1

	Developing numerical reasoning > Represent and communicate > *interpret graphs that describe real-life situations, including those used in the media, recognising that some graphs may be misleading.* **Developing numerical reasoning >** Identify processes and connections > *estimate and visualise size when measuring and use the correct units.*

Personal Targets (Linked to QTS and identifed in weekly review)

In school, these targets will come from lesson evaluations, the Learning Journal and discussions in the weekly review.

My mentor and I have agreed that my main target for this week is to develop my knowledge and understanding of the planning process, with a particular focus on the link between learning objectives, success criteria and assessment. This is linked to Progression in Learning under the Pedagogy-Advancing QTS standard.

Learning Objectives (focus on Learning- use accessible vocabulary):

The pupils will learn to:

(Learning objectives must be specific about what children/pupils will learn, not what they will do)

1. Remember and understand the key components in how GM works.
2. Apply numerical reasoning and consequently list possible reasons for the existence of GM in the world today.

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)
Success criteria make it explicit what successful learning looks/sounds like. Be specific. 1. Pupils will be able to recall and explain the GM process as outlined during the session. 2. Pupils will be able to create a cartoon strip which brings together the key components of GM as demonstrated during the session. 3. Pupils will be able to identify current trends in major GM producing countries and go onto suggest possible reasons for the existence of GM in the world today.	***Assessment is how learning is evidenced/measured – how you and the children/pupils know the learning objectives have/haven't been met. Be specific.*** 1. Answering open and closed questions in verbal form to demonstrate knowledge and understanding of the key components in GM and why it exists in the world today. 2. Illustrative interpretation of the GM process (dual coding) alonside writen interpretations. 3. Plenary at the end of the lesson will examine their understanding of how GM works and the possible reasons for why GM exists.

2

Time 1 hour	Activities/Methodology/Key Concepts (Teacher's Role – including key teaching points, differentiation strategies and key questions) ***In school, you will have to include differentiation strategies, and be specific about the teaching strategies being used.***	Pupil Tasks (Pupils' role –including differentiation, engagement in formative assessment and homework) ***In school, you will have to include differentiation, and be specific about the learning and AfL strategies being used.***	Resources (Including Health and Safety requirement) ***Be specific about the resources you'll need and will be using.***
10 minutes **Opening phase** (with links to prior learning)	Teacher to outline this session's focus, and share the learning objectives with links to Donaldson's four purposes. The teacher is to explore with pupils what Genetic Modification could mean, with the aim of converting a 'CLUNK' into a 'CLICK'.	Pupils to listen to the teacher's introduction and interact in an open class activity to deduce the meaning of the words genetic and modification.	APLP Phase 1 GM PowerPoint H&S: Ensure bags are away under tables, and computer cables are not likely to cause a trip hazzard.
25 minutes **Teaching & Core Learning**	Teacher to adopt a direct teaching approach in order to guide pupils through the key components of the GM process. Teacher to ask key questions during this phase of the lesson to monitor and assess learning. Teacher to adopt a variety of questioning strategies (e.g. thinking time, cold calling, 'pose, pause, pounce, bounce'): ➢ What are the stages of GM? ➢ Why do these plants need to be grown in a controlled environment first?	Pupils to listen to the teacher's guidance and make notes to support their learning. Pupils to work individually to complete the GM cartoon template and use the example modelled by the teacher as a scaffold for their own work. Pupils to respond to key questions as groups or individuals. Pupils to respond to any feedback and targets given by the teacher.	APLP Phase 1 GM PowerPoint Example of a completed GM cartoon H&S: Ensure bags are away under tables, and computer cables are not likely to cause a trip hazzard.

3

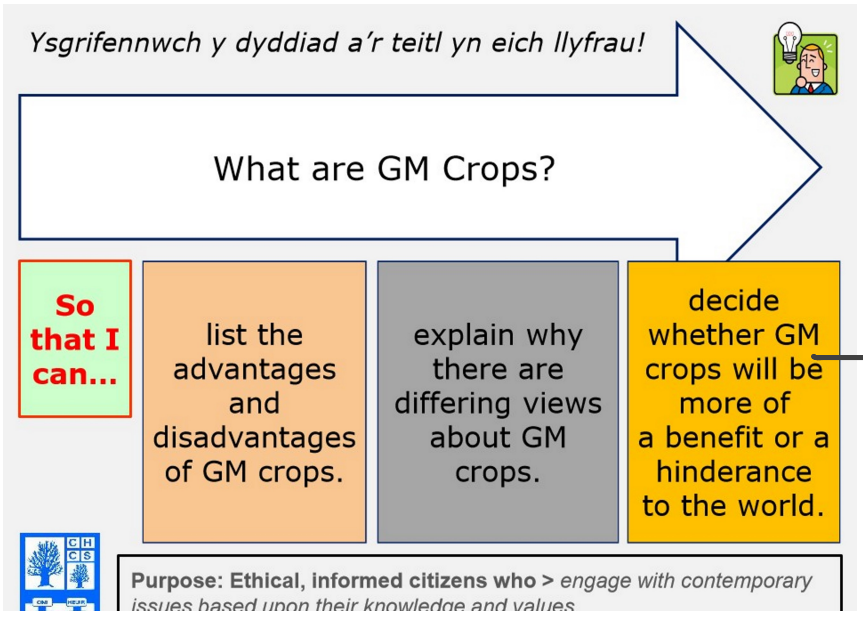
	➢ What do you think about governments having the over-archng decision on whether or not they should implement GM in their country? Teacher to provide feedback on responses to these questions, and to provide further information/guidance if necessary. Teacher to monitor the groups as they work on their GM cartoon, providing feedback and targets, identifying and responding to any misconceptions.	Pupils to ask further questions should they not understand what is required of them.	
15 minutes **Numeracy exercise**	Teacher to ask the the pupils to complete the numeracy exercise, allowing enough time for majority of pupils to complete. Teacher is to run though the answers with the pupils, addressing any potential wrong answers as to the reasons why. Room to include analysis of choice of graph to present the data.	Pupils to complete the numeracy task during designated time given.	H&S: Ensure bags are away under tables, and computer cables are not likely to cause a trip hazzard.
5 Minutes Discussion	Teacher to ask students to think about the possible reasons of why we have GM in the world today and to record the responses on a whiteboard.	Pupils are to record reasons for the existence of GM crops in relation to the trend identified from the numeracy exercise in their books.	
5 Minutes Plenary	Teacher is to quiz a range of students on how GM actually works (the process), what the trends are in major GM producing countries, and reasons for why we have GM in the world today.	Pupils are to respond verbally to the individual question asked of them which is a basic test of their recall and understanding of information presented in the lesson.	

This is AfL put in to action

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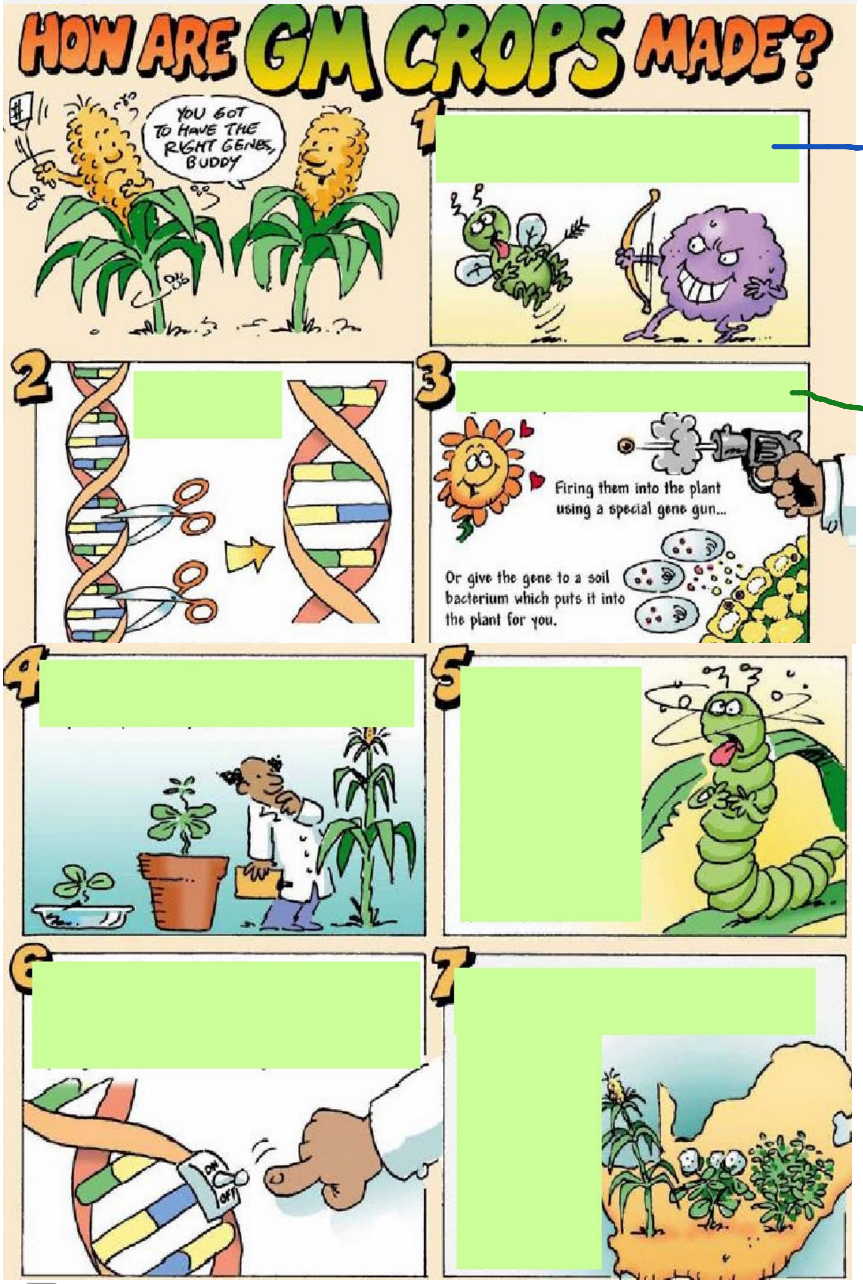
Lesson PowerPoint

Sean Discombe...



This slide is typical for every lesson and clearly outlines the focus question to be answered through the bronze, silver and gold learning goals that can be achieved by the learners. There is also a reference to Donaldson's four purposes.

Purpose: Ethical, informed citizens who > *engage with contemporary issues based upon their knowledge and values.*



As a teacher I talk through each stage or box by getting pupils to tell me what they see from the cartoon. The aim then is for the students to define each stage in their own words and to support this with a diagram of their own choice, all though many students will opt to copy the diagrams in this cartoon sequence.

This lesson offers clear cross-curricular support to Science.

Statements for Cartoon

Statements for Cartoon:

Identify organism with desired characteristics (e.g. bacteria that kills specific insects).

Plant cells that take up the new gene are grown into full size plants and are checked to make sure they develop normally and are safe.

Alternatively, a gene already in the plant can be switched off or modified to improve a specific characteristic, such as colour or size.

Transfer this gene into a plant that you want to protect by:
1) Firing them into the plant using a special gene gun.
2) Give the gene to a soil bacteria which puts it into the plant for you.

Remove the gene (length of DNA) that produces this.

GM organisms have to be approved by national government before they can be used.

This slide was developed to differentiate the learning goals and help those students in the lower sets who may struggle to define in their own words each stage of the creation of GM crops.

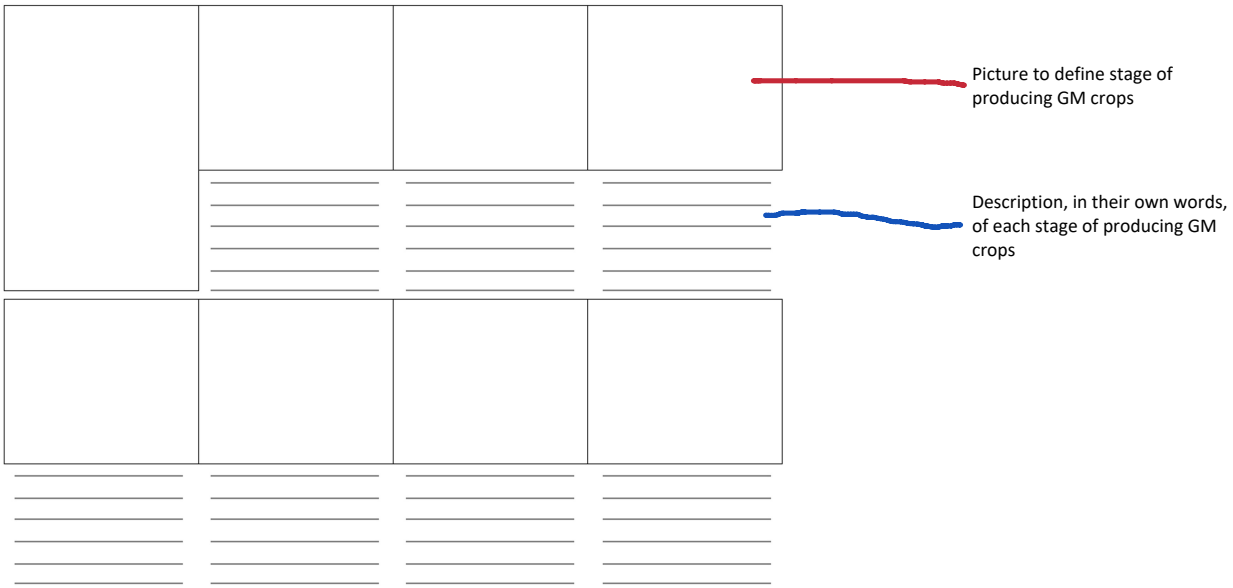
Remove the gene (length of DNA) that produces this.

GM organisms have to be approved by national government before they can be used.

Insects that attack/eat the plant die while other insects and animals are unharmed.

Lesson Resource

Lesson 5 - GM Crop...



Lesson Reflections

Reflections on teaching year 7 Geography on GM Crops:

- I thought I could get away with taking the register quickly and getting it out of the way, which meant that the pupils were sat there and had nothing to do which inevitably caused some disruption.
- I didn't start the lesson off with the theme – What are GM Crops? – with the title and the date in their books. Since the pupils had no idea about what we were studying in the lesson it made the exercise of creating a cartoon strip to show how genetically modified crops are created a lot more difficult.
- I struggled to convey the message of the first 3 boxes in the – What are GM crops? Cartoon. This maybe because I was using someone else's lesson slide and I didn't truly think about what I wanted the learners to understand from each box. I felt that the more I tried to break the message down into simpler formats that they could relate to e.g. Fortnite then the more they got confused or actually 'carried away' with Fortnite rather than concentrating on the GM task at hand. I also felt that I repeated myself too much too often – which may have sent mixed messages to the pupils.
- My lesson timings never really materialised and I constantly ran over the time limits I was setting in the lesson. This was because I was strict enough in setting the time limits and because I thought the pupils were struggling with the concept of what are GM crops and so needed more time to formulate their cartoon boxes.
- I struggled with the fact that there were some students who had completed their work really quickly and there was a massive difference to others who had barely started.
- I felt that the class became very 'needy' and were consistently coming out of their chairs to show me their work for validation, and at 1 point I remember turning around to find a cue of 3. I feel I need to set some classroom ground rules and stick to these to ensure that students remain seated and that I will get to them in good time, and that those who get out of their seat will mean that I delay the time in which I review their work.
- I got around to a few tables and could see that they were writing the right things in the boxes, but I often felt that some of them were just repeating exactly what I had said. I really wanted them to put it in their own words and to have a drawing to visualise their own text. I need to make sure that I write down the success criteria before they start the task so that they are sure of what I want them to produce.
- In a brief plenary which wasn't long enough at the end I got a mixed bag of responses which made me feel that there were the majority of students who got the lesson and understood and there were some that still appeared be a little confused.

This cartoon strip, alongside work to show the advantages and disadvantages of GM crops is used to eventually produce an informative leaflet. The production of this informative leaflet is supported by the following lesson PowerPoint slide:

Leaflet

- Text type = Leaflet
- Audience = Year 6 Pupils
- Purpose = To inform

- *present information and facts about a subject*
- *information divided into sections, all of which relate to the main idea of the leaflet*
- *straightforward, factual style*
- *layout - headlines, subheadings, pictures, graphics*

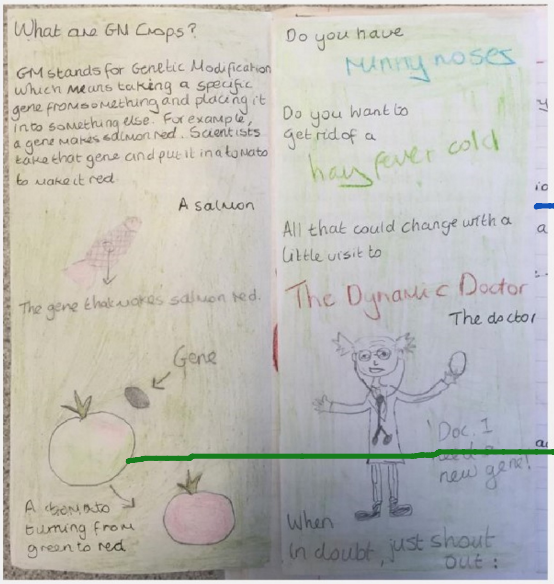
Students are made aware of the audience in which they have to adjust their language for and the purpose of their work, which will mean that the wording they use is factual. The success criteria for producing the best leaflet possible is also given before they start the task.

Using the success criteria in the slide above, students then produce an informative leaflet, like the one shown below. This presents an opportunity to develop ICT skills, where students are actively encouraged to use their ICT skills to reproduce their leaflet from paper into digital format as homework.

pdf

Sean Discombe...

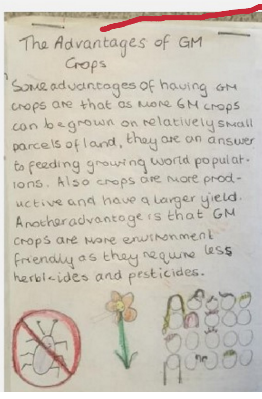


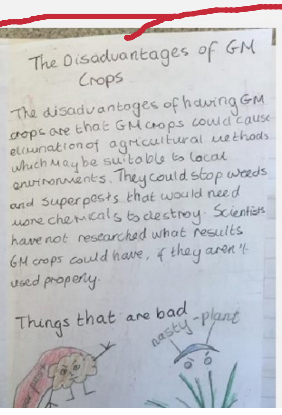


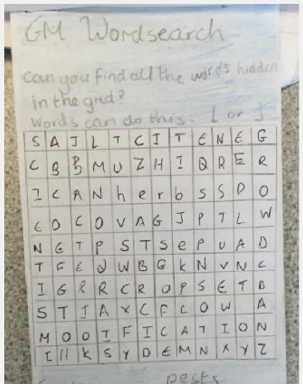
Students use all the work they have done leading up to this to produce a leaflet which will explain how GM crops are produce, and state the facts about the advantages and disadvantages to present a balanced argument and to make them ethically informed citizens.

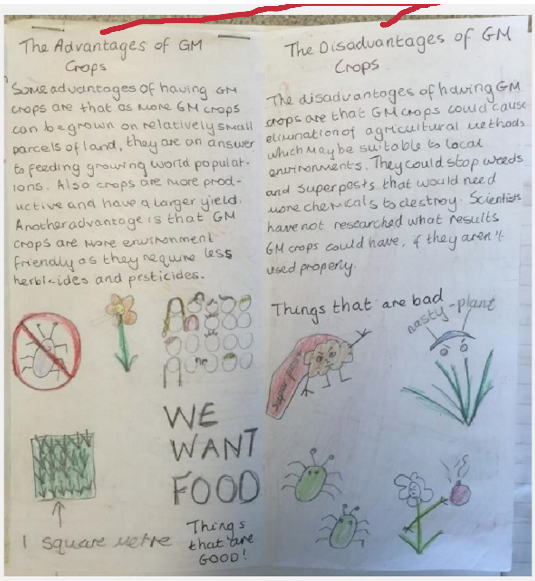
Use of pictures to support factual text

Use of headings to support the layout of their leaflet









The Advantages of GM Crops

Some advantages of having GM crops are that as more GM crops can be grown on relatively small parcels of land, they are an answer to feeding growing world populations. Also crops are more productive and have a larger yield. Another advantage is that GM crops are more environment friendly as they require less herbicides and pesticides.

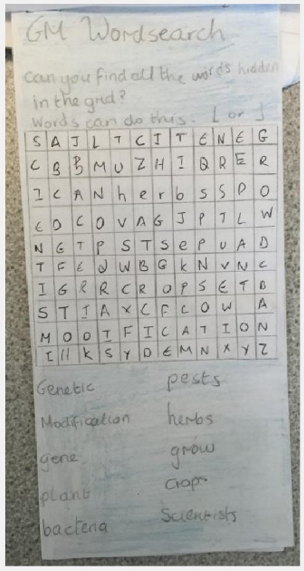
1 square metre

Things that are GOOD!

The Disadvantages of GM Crops

The disadvantages of having GM crops are that GM crops could cause elimination of agricultural methods which may be suitable to local environments. They could stop weeds and superpests that would need more chemicals to destroy. Scientists have not researched what results GM crops could have, if they aren't used properly.

Things that are bad



GM Wordsearch

Can you find all the words hidden in the grid?

Words can do this: ↓ or →

S	A	J	L	T	C	I	T	E	N	E	G
C	B	B	M	U	Z	H	I	B	R	E	R
I	C	A	N	h	e	r	b	s	S	P	O
E	D	C	O	V	A	G	J	P	T	L	W
N	G	T	P	S	T	S	e	P	U	A	D
T	F	E	Q	W	B	G	k	N	V	N	C
I	G	R	R	C	R	O	P	S	E	T	B
S	T	I	A	X	C	F	C	O	W		A
M	O	O	I	F	I	C	A	T	I	O	N
I	H	k	S	Y	D	E	M	N	X	Y	Z

Genetic
Modification
gene
plant
bacteria

pests
herbs
grow
crops
Scientists

Cross-Curriculum Responsibilities (Literacy, Numeracy & DCF)

Thursday, November 14, 2019 9:52 AM

Inclusion of Numeracy skills into a Year 7 Geography lesson on genetically modified crops

Lesson Plan

Sean Discombe...

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

Student-teacher	Sean Discombe (1904958)	Class:	7L
AoLE or Subject	***Geography (7L)***	Date:	05/11/19
Lesson Focus:	Genetically Modified Crops (GM): Step 1		
Meaningful links to Curriculum	This lesson is part of a unit of learning looking at GM. The learners will gain knowledge and understanding of how GM works at a very basic level. From this we will look at current trends in countries around the world using GM and then explore the possible reasons for the existence of GM in these countries. **WM1:** Interpret and synthesis information to further inform understanding of the world. **WM3:** Develop an awareness of the interconnections between humans and their environment. **WM3&5:** Environmental challenges facing Humanity including climate change. **WM4:** Choices we all make, idividually and collecitvely, have major impacts. WM3 **H&W** Food production and sustainability. WM3 **S&T** Impact of scientific and technological development on the natural world. WM1 **M&N** Spotting trends and anomalies. **Ambitious, capable learners who >** *are building up a body of knowledge and have the skills to connect and apply that knowledge in different contexts.* **Enterprising, creative contributors who >** *connect and apply their knowledge and skills to create ideas and products.* **Ethical, informed citizens who >** *engage with contemporary issues based upon their knowledge and values.*		
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Planning is linked to geography cross-curriculum what matters statements

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1

	Developing numerical reasoning > Represent and communicate > *interpret graphs that describe real-life situations, including those used in the media, recognising that some graphs may be misleading.* **Developing numerical reasoning >** Identify processes and connections > *estimate and visualise size when measuring and use the correct units.*
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The pupils will learn to: ***(Learning objectives must be specific about what children/pupils will learn, not what***

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	strategies (e.g. thinking time, cold calling, 'pose, pause, pounce, bounce'): ➢ What are the stages of GM? ➢ Why do these plants need to be grown in a controlled environment first? ➢ What do you think about governments having the over-archng decision on whether or not they should implement GM in their country? Teacher to provide feedback on responses to these questions, and to provide further information/guidance if necessary. Teacher to monitor the groups as they work on their GM cartoon, providing feedback and targets, identifying and responding to any misconceptions.	Pupils to ask further questions should they not understand what is required of them.	
10 minutes **Numeracy exercise**	Teacher to ask the the pupils to complete the numeracy exercise, allowing enough time for majority of pupils to complete. Teacher is to run though the answers with the pupils, addressing any potential wrong answers as to the reasons why. (i) Answer between 25-35,000,000Ha (ii) USA (iii) 3 marks on offer so success criteria includes:	Pupils to complete the numeracy task during designated time given accroding to the success criteria outlined by the teacher.	H&S: Ensure bags are away under tables, and computer cables are not likely to cause a trip hazzard.

Real time planning for completion of the numeracy task

	Description of trend (incresing / descreasing) Use of data from graph in appropriate units e.g. approx 45,000,000Ha (million) in 2000 Use of dates and figures from graph e.g. 2000 – 2015 increase from 45,000,000Ha to 175,000,000HA Room to include analysis of choice of graph to present the data.		

5 Minutes Discussion	Teacher to ask students to think about the possible reasons of why we have GM in the world today and to record the responses on a whiteboard.	Pupils are to record reasons for the existence of GM crops in relation to the trend identified from the numeracy exercise in their books.	
5 Minutes Plenary	Teacher is to quiz a range of students on how GM actually works (the process), what the trends are in major GM producing countries, and reasons for why we have GM in the world today.	Pupils are to respond verbally to the individual question asked of them which is a basic test of their recall and understanding of information presented in the lesson.	

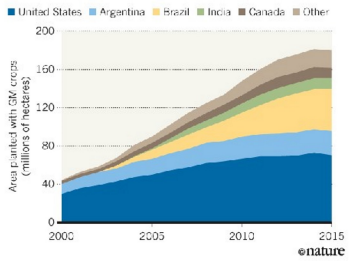
5

Lesson Resource

5. New Higher Exa…

Geographical Skills

Land area used for genetically modified crops by country (2000 – 2015), in millions of hectares.



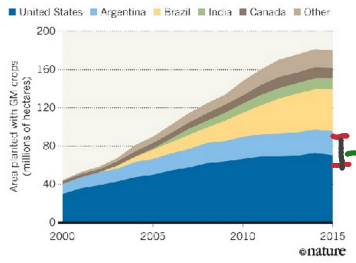
(i) How many hectares of GM crops did Argentina produce in 2015? (1)

(ii) Which country has had the most land area used for GM crops since 2000? (1)

(iii) Using the graph, describe the changes in land area used for genetically modified crops since 2000. (3)

Geographical Skills

Land area used for genetically modified crops by country (2000 – 2015), in millions of hectares.



(i) How many hectares of GM crops did Argentina produce in 2015? (1)

(ii) Which country has had the most land area used for GM crops since 2000? (1)

(iii) Using the graph, describe the changes in land area used for genetically modified crops since 2000. (3)

This is an example of a typical Geography exam based question where the choice of graph is used to challenge students. Students need to be aware that to answer the first question they need to measure the 'chunk' or proportion of the graph that represents Argentina, which I have indicated here.

Students then need to use their estimation numeracy skills to estimate how many Ha this proportion represents.

In Year 7 we need to outline the success criteria to the students so that it then becomes engrained into their practises so that they are able to answer similar questions autonomously in the future. The success criteria is:

- State the generalised **trend** of the graph
- Use **figures** and **dates** from the graph to support the trend you have identified
- Correct use of units e.g. Ha

Lesson Reflection

- I asked the students to do the numeracy activity to start, which a lot of them appeared to struggle with. What I should have done is talked though the graph to the whole class at the beginning, so they all knew where they were and how to do it, and perhaps even talking through the 1st answer. I should have expressed that the answers required units of measurement, which most were leaving out of their answers. Finally, I should have written the success criteria for the last answer on the board which was worth 3 marks. Most pupils were able to describe that the graph trend had increased, but very few people used dates or figures from the graph to support this – and this is a very important skill to get them used to doing.

Inclusion of Numeracy skills into a Year 9 Geography lesson on crime

Lesson Plan

Sean Discombe…

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 1 9W Crime

Student-teacher	Sean Discombe (1904958)	Class:	9W
AoLE or Subject	***Geography***	Date:	3/12/19
Lesson Focus:	Where do crimes occur in Swansea? Lesson 1		
Meaningful links to Curriculum	This lesson is part of a unit looking at crime. This lesson will look to analyse the national trend in crime, but then focus in on a local level to really explore and describe the geographic nature of crime across Swansea. From here students will be able to determine whether or not there is a link between geography and crime by looking at real life data, and then go on to suggest possible explanations/reasons why these links exist. **WM1:** Think critically and to reflect upon evidence. **WM1:** Apply understanding of concepts underpinning Humanities to local contexts. **WM2:** Construct their own informed perspectives **WM2&5**: An individuals viewpoint of their own role and responsibility as a citizen **WM3:** Identify what makes a place distinct **WM4:** Awareness of how they, as individuals, can shape the communities in which they live **WM4:** Societies are dynamic, both driving and reacting to changes on a local, national and global scale. **WM4&5:** Justice and fairness in societies **WM5:** Encourages learners to be active, informed, and responsible citizens, who are able to identify with and contribute to their local, national and global communities, now and in their future lives. WM1 **M&N** Interpreting a range of graphs. WM1 **M&N** Sorting and classifying. WM1 **M&N** Spotting trends and anomalies. WM4 **H&W** Social influences on individuals. **Ambitious, capable learners who >** *understand how to interpret data and apply mathematical concepts.* **Ethical, informed citizens who >** *find, evaluate and use evidence in forming views.* **Ethical, informed citizens who >** *engage with contemporary issues based upon their knowledge and values.*		
Meaningful links to: Cross Curricular Responsibilities	**Oracy > Presenting information and ideas >** Listening > consider the relevance and significance of information and ideas presented to them.		

Brief description of lesson purpose

Planning is linked to the geography curriculum what matters statements

Planning is linked to geography cross-curriculum what matters statements

Planning is linked to Donaldson's four purposes

	Reading > Locating, selecting and using information > Reading strategies > *use a range of strategies, e.g. speed reading, close reading, annotation, prediction, to skim texts for gist, key ideas and themes, and scan for detailed information.* **Reading > Responding to what has been read >** Response and analysis > *synthesise and analyse information to gain in-depth.* **Writing > Organising ideas and information >** Structure and organisation > *select and organise ideas and information to give a clear and full account.* **Writing > Writing accurately >** Language > *use a wide range of technical terms, language and expression consistent with the subject content.* **Developing numerical reasoning >** Identify processes and connections > *prioritise and organise the relevant steps needed to complete the task or reach a solution.* **Developing numerical reasoning >** Represent and communicate > *select and construct appropriate charts, diagrams and graphs with suitable scales.* **Using data skills >** Present and analyse data > *construct and interpret graphs and diagrams (including pie charts) to represent discrete or continuous data, with the learner choosing an appropriate scale.*

Planning is linked to the development of cross-curricular skills, particularly literacy, numeracy and ICT

Personal Targets (Linked to QTS and identifed in weekly review)

My mentor and I have agreed that my main target for this week is to develop my ability to critically reflect on lessons and lesson planning. This means that I will take on board criticisms of my current teaching ability, and apply the necessary improvements in the coming lessons. The improvements I will try to enact upon in my next lesson are:

- Spelling – make sure I spell key words in the lesson correctly and continue to model good literacy behaviour.
- Improve incidental Welsh.
- Use a range of teaching techniques to exlore and explain lesson content in addition to chalk and talk, such as video, targeted worksheets, audio clips etc...
- Ensure enough time is left for a plenary to check understanding of lesson content.

I am also to maintain professional working relationships with leadership and fellow members of staff, learning to communicate more effectively.

Learning Objectives (focus on Learning- use accessible vocabulary):
The pupils will learn to: 1. Analyse the national and local trend of crime and explore possible reasons why such a trend exists. 2. Interpret data to show a choropleth map of the distribution of crime on a local scale. 3. Use key geographic language to describe the distribution of crime on a local scale. 4. Suggest possible causes and explanations for the distribution of crime identified.

2

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)
1. Be able to identify the current trend in crime on a national and local level. 2. Be able to interpret real life data to construct an appropriate scale which clearly shows the distribution of crime across Swansea. 3. Use the map and scale created to describe the pattern of crime across Swansea. 4. Suggest possible explanations for pattern of crime across different wards in Swansea using local knowledge.	1. Students are to analyse and interpret the graph showing the trend in crime across England and Wales over the last decade. 2. Students are to construct a chloropleth map of Swansea, with an appropriate scale which can show the distribution of crime across different wards. 3. Students are to use their maps and the data to find the wards with the highest and lowest levels of crime, and then to suggest possible reasons why using local knowledge.

3

Time 1 hour	Activities/Methodology/Key Concepts (Teacher's Role – including key teaching points, differentiation strategies and key questions) ***In school, you will have to include differentiation strategies, and be specific about the teaching strategies being used.***	Pupil Tasks (Pupils' role –including differentiation, engagement in formative assessment and homework) ***In school, you will have to include differentiation, and be specific about the learning and AfL strategies being used.***	Resources (Including Health and Safety requirement) ***Be specific about the resources you'll need and will be using.***
10 minutes **Opening phase**	Teacher is to ask pupils to work in pairs to discuss the success criteria for the crime graph shown. Success Criteria for 3 marks: • Trend (Inrease / Decrease) • Figures • Dates Teacher is then to record the success criteria on the board that the students respond with. After writing out the lesson heading and date, the teacher is to get the students to answer the question in their books using the success criteria identified.	Pupils are to work in pairs for 2 mintues to discuss the possible success criteria for question given by the teacher. Pupils are then questioned about their discussions, and answers for success criteria are recorded on the board.	Location of Crime PowerPoint H&S: Ensure bags are away under tables, and computer cables are not likely to cause a trip hazzard.

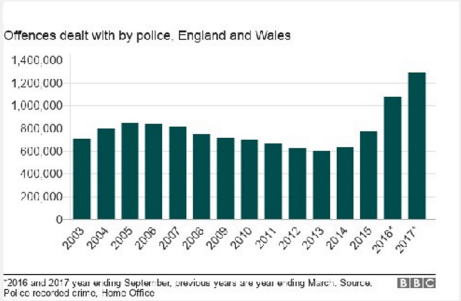
Real time planning for the practise of numeracy skills by the interpretation of graphs and extrapolation of data.

4

Lesson Resource

Sean Discombe…

GCSE Skills and Application



Describe the trend of violent crimes in England and Wales between the years 2003-2017 (3).

The success criteria for completing a question like this was posed to the students during an open class discussion before they started the task. The success criteria was then recorded on the whiteboard for all students to read and use. The success criteria recoded should emulate the same criteria the students have been taught since Year 7 when answering questions of a similar nature.

Inclusion of Literacy skills into a Year 7 Geography lesson on genetically modified crops

Lesson Plan

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 2 GM Crops

Student-teacher	Sean Discombe (1904958)	Class:	7W
AoLE or Subject	***Geography***	Date:	20/11/19
Lesson Focus:	Genetically Modified Crops (GM): Step 2		
Meaningful links to Curriculum	This lesson is part of a unit looking at GM. The learners will explore possible reasons for the existence of GM in the world today, relating to deeper geographic contexts such as population increase, western diet and climate change. The learner can analyse the land use of Wales used for agriculture and possibly GM crops. The learners will learn about the advantages and disadvantages associated with growing GM crops. The learners will learn about the viewpoints from different people representing different organisations, and understand how and why their opinions may differ. The learners will consider quotations from a variety of religious texts and interpret whether or not they are for or against GM crops. **WM1:** Interpret and synthesis information to further inform understanding of the world. **WM3:** Develop an awareness of the interconnections between humans and their environment. **WM3&5:** Environmental challenges facing Humanity including climate change. **WM4:** Choices we all make, idividually and collecitvely, have major impacts. WM3 **H&W** Food production and sustainability. WM3 **S&T** Impact of scientific and technological development on the natural world. WM1 **M&N** Spotting trends and anomalies. **Ambitious, capable learners who >** *are building up a body of knowledge and have the skills to connect and apply that knowledge in different contexts.* **Ethical, informed citizens who >** *find, evaluate and use evidence in forming views.* **Ethical, informed citizens who >** *respect the needs and rights of others, as a member of a diverse society.*		
Meaningful links to: Cross Curricular Responsibilities	**Oracy > Developing information and ideas >** Speaking > *respond to listeners' questions and comments constructively and in detail.* **Oracy > Presenting information and ideas >** Collaboration and discussion > *make a range of contributions to discussions, e.g. leading, encouraging and supporting others* **Reading > Locating, selecting and using information >** Reading strategies > *use their knowledge of grammar, sentence and whole-text structure to make sense of words, sentences and whole texts.*		

Brief description of lesson purpose

Planning is linked to the geography curriculum what matters statements

Planning is linked to geography cross-curriculum what matters statements

Planning is linked to Donaldson's four purposes

Planning is linked to the development of cross-curricular skills, particularly literacy, numeracy and ICT

	Developing numerical reasoning > Identify processes and connections *> choose an appropriate mental or written strategy and know when it is appropriate to use a calculator.* **Developing numerical reasoning >** Identify processes and connections *> estimate and visualise size when measuring and use the correct units.*
Personal Targets (Linked to QTS and identifed in weekly review) My mentor and I have agreed that my main target for this week is to develop my ability to critically reflect on lessons and lesson planning. This means that I will take on board criticisms of my current teaching ability, and apply the necessary improvements in the coming lessons. I am also to maintain professional working relationships with leadership and fellow members of staff, learning to communicate more effectively.	

Learning Objectives (focus on Learning- use accessible vocabulary):
The pupils will learn to: 1. Understand key geographical reasons of why we possibly have GM crops in the world. 2. Gain knowledge and understanding of the advantages and disadvantages of GM crops. 3. Gain awareness of the opinions and viewpoints on GM crops from different people representing different organisations around the world. 4. Interpret religious texts to further understand reasons for and against GM crops.

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)
1. Pupils will be able to recall and explain what GM crops are. 2. Pupils will be able to complete the worksheet, colour coding comments as advantages or disadvantages of GM crops. 3. Pupils will colour code the differnt viewpoints on GM by different people. 4. Pupils will colour code and interpret the different religius quotations as for or against GM crops.	1. Answering open and closed questions in verbal form to demonstrate knowledge and understanding of what are GM crops and possible reasons for why they exist in the world today. 2. A written worksheet where there is a numeracy exercise; a link to epic cymru; a list of advatanges and disadvanates of GM crops that need colour coding; a list of different viewpoints from different people representing different organisations which need colour coding; a box to enable to pupils to infer from the religious quotations whether or not they are for or against GM crops in their own words and to also colour code.

Time **1 hour**	**Activities/Methodology/Key Concepts** (Teacher's Role – including key teaching points, differentiation strategies and key questions) ***In school, you will have to include differentiation strategies, and be specific about the teaching strategies being used.***	**Pupil Tasks** (Pupils' role –including differentiation, engagement in formative assessment and homework) ***In school, you will have to include differentiation, and be specific about the learning and AfL strategies being used.***	**Resources** (Including Health and Safety requirement) ***Be specific about the resources you'll need and will be using.***
7 minutes **Opening phase** (with links to prior learning)	APK: Teacher to ask pupils to conisder the work they've been doing on GM crops. Teacher is to use a literacy exercise to test for spelling. The students are also to gain the message behind the textabout what GM crops are and an example of GM crops.	Pupils are to write their name and their class number on a scrap of paper and to find any of the 5 spelling corrections in the text on GM crops. Pupils are also to read the text and gain an understanding of what it is telling them. Pupils are also to finish sticking in their work from the last lesson that we ran out of time for.	GM Crops PowerPoint H&S: Ensure bags are away under tables, and computer cables are not likely to cause a trip hazzard.
2 minutes for pupils discussion **10 mins for overall class discussion**	Pupils are to discuss in pairs and on their tables about the possible reasons for the existance of GM crops in the world today. The teacher will float around the tables and listen to disussions, prompting tables to looking at the geographic reasons if nescessary: • Population Rise • Western Diet • Climate Change Introduce worksheet. First activity is the numeracy excersise where I want them to show	Pupils are to work as a group to discuss the reasons for WHY we possibly need GM crops in the world today. These reasons are voiced by the different tables in an open class disucssion. Pupils to listen to the teacher's guidance and to complete the worksheet in its required stages listed oppoisite. The first acitivity is to correctly calculate the % yield increase used for growing crops, which leads into the advantages and disadvantages associated with growing GM crops, which the pupils will colour code.	GM Crops PowerPoint GM Crops Worksheet H&S: Ensure bags are away under tables, and computer cables are not likely to cause a trip hazzard.

Shows real time planning for completion of the literacy skills exercise.

Lesson Resource

Sean Discombe...

5 Spelling Mistakes in the text:

Genetically Modified (GM) crops are those that scientsts have enginered to have certain traits, e.g. pesticide resistence, or to grow in certain ways that may be impossible naturally. Sometimes these genes are taken from other plants; other times they are from complately different organisms, such as bacteria. An example of GM crops is Golden Rice, which has been modified by scientists to be more productave and to contain Vitamin A. This means it can help prevent blindness and starvation in kids in south-east Asia.

This worked really well as a starter activity where the students had to proof read a paragraph of writing that I composed with deliberate spelling mistakes. The words that I focussed on were:

- Scientists
- Engineered
- Resistance
- Completely
- Productive

This is because the students would commonly use these words throughout this topic, so by introducing them at the start of the topic would mean that students would correctly use them for the exercises that follow.

Teaching and Learning ranges within and across AOLE's

Thursday, November 14, 2019 9:52 AM

Inclusion of Curriculum Cymreig (Epic Cymru) and RE into a Year 7 lesson on genetically modified crops in Geography

Lesson Plan

Sean Discombe...

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 2 GM Crops

Student-teacher	Sean Discombe (1904958)	Class:	7W
AoLE or Subject	***Geography***	Date:	20/11/19
Lesson Focus:	Genetically Modified Crops (GM): Step 2		
Meaningful links to Curriculum	This lesson is part of a unit looking at GM. The learners will explore possible reasons for the existence of GM in the world today, relating to deeper geographic contexts such as population increase, western diet and climate change. The learner can analyse the land use of Wales used for agriculture and possibly GM crops. The learners will learn about the advantages and disadvantages associated with growing GM crops. The learners will learn about the viewpoints from different people representing different organisations, and understand how and why their opinions may differ. The learners will consider quotations from a variety of religious texts and interpret whether or not they are for or against GM crops. **WM1:** Interpret and synthesis information to further inform understanding of the world. **WM3:** Develop an awareness of the interconnections between humans and their environment. **WM3&5:** Environmental challenges facing Humanity including climate change. **WM4:** Choices we all make, idividually and collecitvely, have major impacts. WM3 **H&W** Food production and sustainability. WM3 **S&T** Impact of scientific and technological development on the natural world. WM1 **M&N** Spotting trends and anomalies. **Ambitious, capable learners who >** *are building up a body of knowledge and have the skills to connect and apply that knowledge in different contexts.* **Ethical, informed citizens who >** *find, evaluate and use evidence in forming views.* **Ethical, informed citizens who >** *respect the needs and rights of others, as a member of a diverse society.*		
Meaningful links to: Cross Curricular Responsibilities	**Oracy > Developing information and ideas >** Speaking > *respond to listeners' questions and comments constructively and in detail.* **Oracy > Presenting information and ideas >** Collaboration and discussion > *make a range of contributions to discussions, e.g. leading, encouraging and supporting others* **Reading > Locating, selecting and using information >** Reading strategies > *use their knowledge of grammar, sentence and whole-text structure to make sense of words, sentences and whole texts.*		

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Planning is linked to geography cross-curriculum what matters statements

Planning is linked to Donaldson's four purposes

Planning is linked to the development of cross-curricular skills, particularly literacy, numeracy and ICT

1

	Developing numerical reasoning > Identify processes and connections *> choose an appropriate mental or written strategy and know when it is appropriate to use a calculator.* **Developing numerical reasoning >** Identify processes and connections *> estimate and visualise size when measuring and use the correct units.*
Personal Targets (Linked to QTS and identifed in weekly review) My mentor and I have agreed that my main target for this week is to develop my ability to critically reflect on lessons and lesson planning. This means that I will take on board criticisms of my current teaching ability, and apply the necessary improvements in the coming lessons. I am also to maintain professional working relationships with leadership and fellow members of staff, learning to communicate more effectively.	

Learning Objectives (focus on Learning- use accessible vocabulary):
The pupils will learn to: 1. Understand key geographical reasons of why we possibly have GM crops in the world. 2. Gain knowledge and understanding of the advantages and disadvantages of GM crops. 3. Gain awareness of the opinions and viewpoints on GM crops from different people representing different organisations around the world. 4. Interpret religious texts to further understand reasons for and against GM crops.

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)
1. Pupils will be able to recall and explain what GM crops are. 2. Pupils will be able to complete the worksheet, colour coding comments as advantages or disadvantages of GM crops. 3. Pupils will colour code the differnt viewpoints on GM by different people. 4. Pupils will colour code and interpret the different religius quotations as for or against GM crops.	1. Answering open and closed questions in verbal form to demonstrate knowledge and understanding of what are GM crops and possible reasons for why they exist in the world today. 2. A written worksheet where there is a numeracy exercise; a link to epic cymru; a list of advatanges and disadvanates of GM crops that need colour coding; a list of different viewpoints from different people representing different organisations which need colour coding; a box to enable to pupils to infer from the religious quotations whether or not they are for or against GM crops in their own words and to also colour code.

Time **1 hour**	**Activities/Methodology/Key Concepts** (Teacher's Role – including key teaching points, differentiation strategies and key questions) ***In school, you will have to include differentiation strategies, and be specific about the teaching strategies being used.***	**Pupil Tasks** (Pupils' role –including differentiation, engagement in formative assessment and homework) ***In school, you will have to include differentiation, and be specific about the learning and AfL strategies being used.***	**Resources** (Including Health and Safety requirement) ***Be specific about the resources you'll need and will be using.***
7 minutes **Opening phase** (with links to prior learning)	APK: Teacher to ask pupils to conisder the work they've been doing on GM crops. Teacher is to use a literacy exercise to test for spelling. The students are also to gain the message behind the textabout what GM crops are and an example of GM crops.	Pupils are to write their name and their class number on a scrap of paper and to find any of the 5 spelling corrections in the text on GM crops. Pupils are also to read the text and gain an understanding of what it is telling them. Pupils are also to finish sticking in their work from the last lesson that we ran out of time for.	GM Crops PowerPoint H&S: Ensure bags are away under tables, and computer cables are not likely to cause a trip hazzard.
2 minutes for pupils discussion **10 mins for overall class discussion**	Pupils are to discuss in pairs and on their tables about the possible reasons for the existance of GM crops in the world today. The teacher will float around the tables and listen to disussions, prompting tables to looking at the geographic reasons if nescessary: • Population Rise • Western Diet • Climate Change Introduce worksheet. First activity is the numeracy excersise where I want them to show	Pupils are to work as a group to discuss the reasons for WHY we possibly need GM crops in the world today. These reasons are voiced by the different tables in an open class disucssion. Pupils to listen to the teacher's guidance and to complete the worksheet in its required stages listed oppoisite. The first acitivity is to correctly calculate the % yield increase used for growing crops, which leads into the advantages and disadvantages associated with growing GM crops, which the pupils will colour code.	GM Crops PowerPoint GM Crops Worksheet H&S: Ensure bags are away under tables, and computer cables are not likely to cause a trip hazzard.

33 minutes total **1st Acivity 3 mins** **2nd Activity 7 mins** **3rd Activity 8 mins** **4th Activity 5 mins**	working out as well as their answers and they can use calculators. This activity further enhances their awareness of countries that grow GM crops and their current rate of increased land use to do so. 2 Ways to calculate: • 25/100 x 4000 = 1000 • 1000 + 4000 = 5000 OR • 1.25 x 4000 = 5000 Second activity is to read the statements on the worksheet and decide if they are advatanges or disadvantages of growing GM crops, using a colour coding system to represent this. Third activity if to read the different viewpoints/opinions from different people representing different organsiations around the world and decide whether or not their view is for or against GM crops, again using the same colour coding system to represent this. The fourth activity is to look at Wales as a country given that 80% of our land area is used for agriculture, and Wales could be the next big GM producer. This is linked to the epic cymru task on their worksheet.	The pupils are to read through the viewpoints and colour code them appropriately as either for or against GM crops. The pupils are to consider whether or not Wales could be a potential 'GM Crop powerhouse' given that 80% of our land area is used for agriculture. The pupils will talk on their tables for 2 mintues before giving their viewpoints in an open class discussion. The pupils are to read the quotations from a range of religious texts and try and infer in their own words whether or not the scriptures present a view for or against GM crops.	

Cross-curricular planning link to Curriculum Cymreig (Epic Cymru)

4

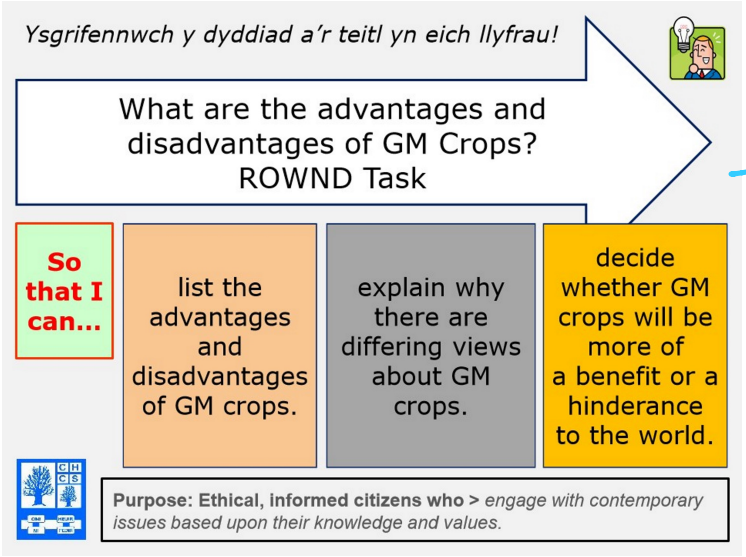
5th Activity 10 mins	The fifth and final task is to read and attempt to infer from the religious texts whether or not they provide additional views in favour or against GM crops.		
10 minutes **Plenary**	Teacher to ask the following questions so a summary of learning is provided by pupils: • What are GM crops? • What is the current trend of growing GM crops in countries around the world? • What is an advantage of GM crops? • What is a disadvantage of GM crops? • Why would someone from Oxfam be against GM crops? • Why would someone from the UK Government be for GM crops?	Think, pair, share: Pupils to respond to the teacher's questions as groups or individuals. Using the seating format for the lesson, a range of pupils will be selcted to provide answers on the lesson content.	

Cross-curricular planning link to RE

5

Lesson PowerPoint

Sean Discombe...



This slide is typical for every lesson and clearly outlines the focus question to be answered through the bronze, silver and gold learning goals that can be achieved by the learners. There is also a reference to Donaldson's four purposes.

Religious Interpretations	
'God calls mankind, beginning with Adam and Eve, to exercise dominion over the earth, subdue it, and develop its latent potential'. Genesis 1: 26-28	
'God said, "Let the land produce vegetation: seed-bearing plants and trees on the land that bear fruit with seed in it, according to their various kinds." And it was so. The land produced vegetation: plants bearing seed according to their kinds and trees bearing fruit with seed in it according to their kinds. And God saw that it was good." Genesis 1:11-12	
'[Adhere to] the fitrah (nature) of Allah upon which He has created [all] people. No change should there be in the creation of Allah.' Surah 30:30	
'And the righteous among you are those who offer food to the needy, the orphan and the captive.' Quran 76: 8-9	

- 80% of the land is dedicated to agriculture, ranging from crops to livestock.



Lesson Resource

5. Complete Worksheet

GM Crops

Epic Cymru Link:

Numeracy Challenge:

The use of GM crops is said to increase yield by roughly 25% in the Philippines. If 4 mt (4000kg) of non genetically modified corn per hectare was produced, how much would be produced for a crop which was genetically modified?

Advantages and disadvantages of importing food:

	- more food can be grown on smaller amounts of land
	- genes do not work in isolation so changing a few could have unpredictable results
	- there has not been enough research into the potential risks
	- they are more capable of thriving in extreme climates and poor soil
	- they are more resistant to pests, weeds and diseases
	- GM crops tend to be stronger so threaten food diversity
	- GM crops could lead to stronger weeds and pests so strong chemicals would be needed to destroy them
	- food stays riper for longer so they can be sent for longer distances and kept on shop shelves for longer
	- they could get rid of allergy causing properties in some food
	- they require less pesticides so can be classed as more environmentally friendly
	- new technology interferes with traditional methods which might be more suitable to local environments

"We should all have a right to enough food and water but I struggle to provide enough food for my family. GM crops should help us have more food."
Oumar *Dembélé*, Mali citizen

"GM crops are good for the environment because they don't need as many pesticides to grow. China uses half the amount of pesticides since growing GM crops.
Professor Guy Poppy,

For
Against

"We need GM crops because of the growing populations."
UK government spokesperson

"MNCs promise that GMOs will feed the world, but since they began to be marketed two decades ago, the number of starving people in the world has only grown, just like the profits of the companies that produce the seeds."
Spokesperson for Oxfam

"I think GM crops should be allowed as they earn farmers more money. It is estimated that farmers earnt $44.1 billion more between 1996 and 2007 when they grew and sold genetically modified corn."
Spokesperson for Dupont, MNC

"GM crops cover large areas of land which means less space for other plants. This means that there is less variety of plants so GM crops should not be used"
Spokesperson for Greenpeace

"I think that GM crops should be allowed because we have spent a lot of money to research and create the technology."
Tracey Fuller, Scientist

"I don't like the idea of GM crops because there hasn't been enough research into them. We don't know what the side effects might be in the future."
Darren Williams, UK citizen

Religious Interpretations		
'God calls mankind, beginning with Adam and Eve, to exercise dominion over the earth, subdue it, and develop its latent potential'. Genesis 1: 26-28		
'God said, "Let the land produce vegetation: seed-bearing plants and trees on the land that bear fruit with seed in it, according to their various kinds." And it was so. The land produced vegetation: plants bearing seed according to their kinds and trees bearing fruit with seed in it according to their kinds. And God saw that it was good." Genesis 1:11-12		
'[Adhere to] the fitrah (nature) of Allah upon which He has created [all] people. No change should there be in the creation of Allah.' Surah 30:30		
'And the righteous among you are those who offer food to the needy, the orphan and the captive.' Quran 76: 8-9		

In the box titled Epic Cymru link, the students make note of the fact that 80% of the land in Wales is dedicated to agriculture and that this underpins a large part of the economy in Wales. Students are then asked to provide an opinion of whether or not they would be happy for Wales to be involved in producing GM crops.

The students are asked to infer meaning from the passages in various religious scriptures. They are then required to write down in their own words what each passage is telling them in terms of supporting or rejecting the idea of genetically modified crops in the world today.

The students have to decide if each fact about GM crops is an advantage or a disadvantage, and combines cross-curricular knowledge of Geography, Science and History. The students use these facts when creating their informative leaflets.

Critical Reflection

Thursday, November 14, 2019 9:52 AM

Each learning theory has a view of what learning is and how it takes place, but none claim to have a view about the implications for the construction of learning environments, for teaching, or for assessment (James, 2006). James (2006) goes on to state that "*This has sometimes created problems for learning theorists, because practitioners and policy makers usually expect them to have a view on these matters, and if they haven't then there are others who try to fill the gap*". That is why Assessment for Learning (AfL) is not underpinned by one specific learning theory, and so represents the 'gap' that has been filled by combining features which have been cherry picked across a number of learning theories that include cognitive, constructivist, and socio-cultural.

The best definition of AfL was developed by the Assessment Reform Group (ARG) in the UK in 2002, where "*Assessment for learning is any assessment for which the first priority in its design and practice is to serve the purpose of promoting pupils' learning"*. It is seen that any activity which involves assessment can help learning so long as it provides information to be used as feedback by teachers, and by their pupils in assessing themselves and each other, in order to modify the teaching and learning activities in which they are engaged.

AfL strategies are directly linked to improvements in student performance and a lot of research in the literature shows that these strategies particularly help low-achieving students to enhance their learning. Black and William (2006) argue that if teachers use formative assessments as part of their teaching, students can learn at approximately double the rate, and this is supported by the work of Bloom *et al* (2008) which suggest that assessment for learning has the power to substantially improve educational outcomes for all learners. Research on AfL has concluded that it is effectively put into practice through the delivery of four key strategies: Questioning; Feedback; Peer and Self-Assessment; The Formative use of Summative Assessment.

Researchers noticed problems in the way teachers were developing and applying questions, and found that not only were the questions insufficiently challenging in many instances, but that the wait time given for a student to think and elaborate on an answer was too short (Ko *et al*, 2013 and Black & William, 2010). This often results in only a select number of pupils in the class answering the teacher's questions as the rest of the class feel they cannot respond as quickly (Discombe, 2019). A better practice in questioning was essential for putting the principles of AfL into practice. The specific adjustments were related to an increase in the wait time and an improvement in the selection and quality of questions employed by teachers, meaning that there is greater use of open rather than closed questions in character, which encourages students to develop and use higher-order thinking skills along Bloom's taxonomy to answer questions. Research by Gipps *et al* (2005) found that such practice requires the generation of a non-threatening climate of dialogue, where students feel free to share their ideas and expose their misconceptions without fear of giving an incorrect answer. The idea is that student learning is enhanced by opportunities for discussion of misconceptions and clarification of these in the classroom (Torrance and Pryor, 2001). On the very notion of probability, it is very likely that similar misconceptions or mistakes are made by a number of students, implying that all students can learn from one another's mistakes or misconceptions when addressed through this approach. Work by Black and William (2010) referred to several successful ways that encourage students to feel comfortable enough to share their very own ideas on taught subject content in a public manner:

1. *“Ask pupils to discuss their thinking in pairs or in small groups so that a respondent is speaking on behalf of others”*
2. *“Giving pupils a choice between different possible answers and asking them to vote on the options”*
3. *“Asking all of them to write down an answer and then reading out a selected few”*

Good quality feedback is viewed as a crucial aspect in the use of AfL, and Hattie and Timperley (2007) declared that feedback “*is one of the most powerful influences on learning and achievement*”. Research by Butler (1987) has shown that informative and descriptive feedback is judged to be more appropriate for a learning-centered perspective than the exclusive practice of marking work as right or wrong and giving just an overall mark. The latter promotes competition and comparison between students, which was evidenced in the work by Elliot and Dweck (1988) to prove a hinderance and may in consequence damage the self-esteem of students if they get low scores compared with other students in their class. They argue that motivation is a lot higher if students focus effort only on their own work by using feedback to review their own progress and learning process (Discombe, 2019). This has been shown to focus students’ attention on factors that are controllable, and so they learn to attribute success and failures based on these factors. Being in control in this way has shown to boost a learner’s confidence and achievement.

The feedback needs to be closely linked with the use of shared learning goals or success criteria because it is argued that students can only understand the feedback they receive from either teachers or peers when they are clear about the purpose of what they are learning and what they are expected to produce (Black and William, 2010). Research by Nicol & Macfarlane (2006) further illustrate this point by concluding that feedback will only connect when both the students and the teacher share the same ideas and conceptions of assessment goals (Discombe, 2019). Feedback comments should make explicit reference back to the success criteria so that students understand the progress that they have made towards achieving them, and to identify strategies that may help them ‘close’ the learning gap between what they have achieved and their desired learning goals (Black and William, 2010). The feedback should address what has been done both correctly and incorrectly, but most importantly it should provide explicit guidance on what the students can do to improve their work, and how to keep on progressing towards their learning goal expectations (Hattie and Timperley, 2007). Nicol & Milligan (2006) have noted that the use of ‘exemplars’ of performance are highly effective in clarifying goals and assessment requirements as it provides students with a tangible grasp of what the work looks like in relation to set goals (Discombe, 2019). This feedback practice which focuses on improving students work is seen as fundamental to improving their motivation and commitment to enhancing their own learning and autonomy in their learning process.

The exercise of providing written feedback on a student’s work has been shown to have a major benefit for enhancing the professional learning and development of teachers as they evaluate the quality of the learning tasks for which they have designed. This in turn provides understanding about which learning activities or tasks are better able to scaffold the learning process in a student and prove to be “*good instruments for obtaining appropriate evidence of student learning in relation to some specific learning goals or criteria*” (https://www.educationdevelopmenttrust.com/EducationDevelopmentTrust/files/5a/5a6d6203-ec49-4d33-9c5d-42c188184807.pdf, 26/1/20). Yorke (2003, p.482) notes, “*The act of assessing has an effect on the assessor as well as the student. Assessors learn about the extent to which they (students) have developed expertise and can tailor their teaching accordingly*” (Discombe, 2019). The most effective teachers choose how much or how little to integrate AfL into their lessons as a natural part of what they do, meaning that AfL can be modified and adapted to suit the age and ability of the learners involved. In AfL, it is the purpose of assessment,

rather than the nature of it that is important (https://cambridge-community.org.uk/professional-development/gswafl/index.html, 26/1/20).

Peer and self-assessment are regarded by authors such as Brookheart (2001) and Gibbs (1999) as good strategies for students to develop greater autonomy in relation to their own learning in addition to promoting their metacognition and collaborative learning skills (https://www.educationdevelopmenttrust.com/EducationDevelopmentTrust/files/5a/5a6d6203-ec49-4d33-9c5d-42c188184807.pdf, 26/1/20). Students who do this successfully adjust their self-regulatory approach during subsequent learning activities. Therefore, "*self-regulation is considered a cyclical process that works as a feedback loop; information from previous self-reflection phases is used to adjust current efforts*" (https://core.ac.uk/download/pdf/55539065.pdf, 26/1/20). Research by Kostons, Van Gog, and Paas (2012) showed that enhancing students' self-assessment skills increased their understanding of the next step in their learning by improving their ability to employ metacognitive strategies. It takes time to develop the required level of awareness so that students are able to understand their own learning process and act upon it, however, Discombe (2019) noted that some students may not have the mental cognition or experience required to identify the strengths and weaknesses of their own or peers' work (Li & Gao, 2016). Wherever metacognitive skills are taught in lessons, there appears to be improvements in pupil outcomes, irrespective of which subjects are being taught. Research by Hattie (2016) indicates that metacognitive strategies have an effect size of 0.53. Hattie (2013) suggests that pupils are very clear about their own academic performance when taught appropriate skills of metacognition. Baas *et al* (2015) found that the effective use of metacognitive strategies both supported and developed the effectiveness of AfL strategies, thus accelerating learning in a virtuous spiral (https://core.ac.uk/download/pdf/55539065.pdf, 26/1/20). It would appear that when pupils are taught how to learn, through metacognition, in conjunction with accurate formative assessment, through AfL, the potential for academic success is high (https://core.ac.uk/download/pdf/55539065.pdf, 26/1/20).

Discombe (2019) found that peer assessment helps develop the skills needed to make objective judgements against success criteria standards, and that these are skills which are often transferred when students turn to regulate their own work (Gibbs, 1999). Topping (1998, quoted in Li and Gao, 2016, p.269) concluded that peer assessment can "*yield significant gains in the cognitive, social, affective, transferable skill, and systemic domains that are at least as good as those from staff assessment*." (Discombe, 2019). When their work assessment comes from a peer, it has been evidenced by some researcher's that student's demonstrate a greater acceptance of the observations made because their peers use a similar language, thus making feedback more accessible and understandable (https://www.educationdevelopmenttrust.com/EducationDevelopmentTrust/files/5a/5a6d6203-ec49-4d33-9c5d-42c188184807.pdf, 26/1/20). Li and Gao (2016) highlight the drawbacks of peer assessment in the form of peer pressure, and the fact that students may not be able to follow or apply the marking criteria appropriately (Discombe, 2019).

Summative assessments are also used formatively to help students improve. A good example of using a summative assessment strategy in an AfL context is where a test or exam is used to identify a lack of understanding and subsequent targets and teaching material are developed to address the shortcomings (https://cambridge-community.org.uk/professional-development/gswafl/index.html, 26/1/20)

Research from Boud (2000, p.151) maintains that "*the development of lifelong learning skills requires that assessment must move from the exclusive domain of the assessors into the hands of the learners*", where students are not overly dependent on teacher assessment, and can create a learning environment where they develop

their ability to self-assess and self-correct, thereby taking responsibility for their own learning (Discombe, 2019). This involves the teacher handing over an element of control to the students, and they can be seen to be facilitating the learning which is directed by the students. This is seen to create learners that are confident, responsible, reflective, innovative and engaged, thus helping students to become enthusiastic life-long learners. We have clearly evidenced that assessment can be a powerful tool to enhance students' use of metacognitive strategies. However, scholars in the field of AfL emphasise that its potential relies heavily on teachers' professional competence in assessment (Smith, 2011). This process of AfL requires teachers to learn how to work from this perspective and to develop the necessary skills for doing so. Work by the ARG recognised the need for good quality professional development programmes as a fundamental requirement for the successful implementation of AfL in classroom practice.

Developing literacy, numeracy and ICT skills not only supports learning but also enhances understanding within the curriculum area and is a key way of raising standards and outcomes in all subjects (https://www.unrwa.org/sites/default/files/teachers_role_in_promoting_literacy_and_numeracy.pdf, 26/1/20). One of the aims of teaching these skills across the curriculum is to broaden and enhance children's command of these skills by providing them with a range of different contexts in which to use and practice them. Pupils need planned opportunities to practice by selecting from and experimenting with the skills they have learnt elsewhere in the curriculum, and applying them with an increasing degree of independence to new and varied contexts (https://dera.ioe.ac.uk/2231/1/sec_func_skill_ge_0007210.pdf, 26/1/20). These planned opportunities should have both relevance to the learner and a real purpose in relation to the subject, because making the information relative increases engagement (https://dera.ioe.ac.uk/2231/1/sec_func_skill_ge_0007210.pdf, 26/1/20). Pupils need to reflect on the progress they are making through peer and self-assessment in order to identify particular aspects of their skills development that need further attention and work (https://dera.ioe.ac.uk/2231/1/sec_func_skill_ge_0007210.pdf, 26/1/20).

Teachers need to identify the skills that are central to their taught subject to support children's learning. In Geography, students develop literacy capability as they learn how to build geographical knowledge and understanding and how to explore, discuss, analyse and communicate geographical information, concepts and ideas (https://www.australiancurriculum.edu.au/media/3654/literacy-geography.pdf, 3/1/20). These elements are essential for students to develop discipline-specific knowledge, understanding and skills, and to demonstrate their learning in Geography. It is argued that improving literacy enhances the learning of a subject itself and improves the attitudes of children towards that learning

(https://www.australiancurriculum.edu.au/media/3654/literacy-geography.pdf, 3/1/20).

In Geography, students develop numeracy capability as they investigate concepts fundamental to geography, for example, the effects of location and distance, spatial distributions and the organisation and management of space within places (https://australiancurriculum.edu.au/media/3671/numeracy-geography.pdf, 3/1/20). They apply numeracy skills in geographical analysis by counting and measuring, constructing and interpreting tables and graphs, calculating and interpreting statistics and using statistical analysis to test relationships between variables (https://australiancurriculum.edu.au/media/3671/numeracy-geography.pdf, 3/1/20). In constructing and interpreting maps, students work with numerical

concepts of grids, scale, distance, area and projections. Numeracy skills are also used when evaluating natural events or phenomena, such as the percentage of rainfall or the wind speeds of a cyclone

(https://australiancurriculum.edu.au/media/3671/numeracy-geography.pdf, 3/1/20).

Providing stimulating and engaging opportunities for children to become totally at ease with the main mathematical functions is crucial. Children will be better able to describe, explain and justify their thinking as well as being more confident in using and handling numbers in a range of contexts (https://www.unrwa.org/sites/default/files/teachers_role_in_promoting_literacy_and_numeracy.pdf, 26/1/20). How well pupils can select and apply the appropriate mathematical skills across the curriculum will indicate to a teacher the areas for development and the areas where children are competent and comfortable.

The role of ICT in schools is increasingly being viewed as connected to the development of both teaching and learning. "*ICT is a means of accessing, storing, sharing, processing, editing, selecting, presenting and communicating information through a variety of media"* (Cohen *et al*, 2010), and involves finding, sharing and restructuring information in its diverse forms (Cohen *et al*, 2010). Work by Cohen *et al* (2010) evidences several advantages of ICT, literacy and numeracy which include: raising student achievement in all subjects for all students; promoting higher order thinking in order to evaluate knowledge and promoting learning for capability and problem-solving. Pupils who can apply these functional skills effectively will make better progress as they will understand the purpose of the English, Mathematics and ICT skills they are transferring and securing, and will take greater responsibility for furthering their own progress (https://dera.ioe.ac.uk/2231/1/sec_func_skill_ge_0007210.pdf, 26/1/20). Students will not only engage in the content of what is being taught but will become more actively involved in the learning process (https://dera.ioe.ac.uk/2231/1/sec_func_skill_ge_0007210.pdf, 26/1/20). Effective teaching will enhance the development of these skills, and Cohen *et al* (2010) evidences that the inclusion of ICT, literacy and numeracy skills into everyday classroom practices will foster collaborative learning and raise students' motivation and engagement significantly.

The term cross-curricular learning is used to "*describe the application of skills, knowledge and attitudes of different disciplines to a single experience, theme or idea (Barnes, 2007); it also incorporates the interdisciplinary dimension of linking subjects to develop conceptual insight into particular phenomena."* This notion that knowledge is interrelated was first presented by Dewey (1938) and supported by Carr (2007), whereby integration promotes understanding through making connections between central concepts in meaningful learning experiences. From this the learner is able to develop this notion of higher order cognitive thinking, such as problem solving and reasoning (Barnes, 2011). Learners apply knowledge and skills learnt in one subject to another but will also synthesise information and ideas from a range of sources. It is often seen that learning to make links is one of the attributes of a good learner (Claxton, 2002). Moving away from merely memorising facts, cross curricular learning encourages students to make their own connections and draw their own conclusions based on the material.

Both Alexander and Rose (http://www.educationengland.org.uk/documents/pdfs/2009-IRPC-final-report.pdf, 26/1/20) recommended that schools should decide '*when learning is best served by teaching subject content discretely and systematically'*, but give '*children ample opportunities to use and apply their developing subject knowledge, skills and understanding in cross-curricular studies*'. The decision about what aspects of the

geography curriculum is best taught discretely, and what can be linked effectively to other subjects should be made at the long-term planning stage, where serious consideration should be applied on how to make these links meaningful and seamless (Savage, 2011).

Barnes (2015) describes different styles for delivering cross-curricular work, which include **Tokenistic, Hierarchical** and **Thematic**. He notes that the Hierarchical style, which involves achieving progress in one subject by teaching aspects of another, is seen as the most common and most popular method of integrating a curriculum across areas of learning and experience. CUREE (2009) found that effective cross-curricular approaches were context based or connected the school-based curriculum where young people's experiences varied more widely. Barnes (2011) and Savage (2011) have noted that it should not be assumed that skills and knowledge learned in one context will be automatically transferred and applied to a different context, so in order to be effective the links between subjects need to be made explicit.

A lot of emphasis is placed on a teacher's subject and pedagogic knowledge in order to combine areas of learning and experience to actively draw out the common body of knowledge, as well as the skills and understanding in order to identify the ways in which they might provide opportunity for application, development and reinforcement in learning. The teacher must also ensure they are being "*sensitive to the culture or values of a subject as well as the concepts, knowledge and skills inherent in that subject*" (Savage, 2011).

The real skill comes in making learning relative and authentic to the real world of pupils, by developing learning experiences to reinforce this. If a subject does not fit logically into the theme or topic the skills and concepts of that subject may not be adequately addressed (Jarvis, 2009; Muijs and Reynolds, 2011), thus compromising learning in the subject. When planning teachers need to ensure there is an appropriate balance between subjects and that the planned teaching and learning is not superficial. It has been evidenced by Ofsted (2008) and Jarvis (2009) that a successful way of informing planning has been to use the National Curriculum programmes of study. Research by Laurie (2011) has found that it may be appropriate to have a lead subject to drive a particular study for some topics. In any case, Barnes (2015) recommends that limiting the number of subjects which contribute to cross-curricular learning to three or four will ensure that subjects are not compromised in an effort to fit them all in. Jarvis (2009) has noted that learning may be driven in one particular direction based on the enthusiasm of pupils for one particular subject. In fact a lot of the recent literature on cross-curricular work has shown that it improves motivation and engagement, and this could be purely down to the breadth of study or the fact that it allow for more independent, learner-led exploration of the topic (Muijs and Reynolds, 2011). Research by Rennie *et al* (2011) found that "*when children worked on a cross-curricular project, the motivation for learning was mastering a task or solving a problem rather than gaining a good grade in a test or exam*".

Research by Ofsted (2008) has shown that when pupils are given a role in planning cross-curricular work they had the sense of individual discovery which increased engagement. An advantage of a child-led approach is that activities or topics can be changed or adapted in response to the interests of the children or to current events (Barnes, 2015). In order to adapt this and for it to work, teachers first need the freedom and confidence to be flexible in their approach to planning. So that planning doesn't become too onerous, it is recommended that changes should not be too frequent, and that if planning is done in a rush and last minute, the links made between subjects could become superficial (Barnes, 2015).

The application and delivery of cross-curricular teaching can present significant challenges to experiences as well as novice teachers (Jarvis, 2009). There is an automatic assumption that teachers can make connections across areas

of learning and experience, and research by Venville *et al* (2002) found that despite the enthusiasm, teachers were unable to articulate clear goals for their actions. These goals are seen to be influenced by several factors which include curriculum requirements and guidance, the school context, personal motivations and epistemological commitments (Chan and Elliott, 2004). Another challenge relates to time, which needs to be allocated in three different aspects of cross-curricular work. The first consideration is that planning takes longer, especially when the topic is new, because the resources are not established within the school. The second consideration focuses on managing the timetable flexibly to enable children to become engaged, and hopefully engrossed, in the topic. There may be a need for intense focus on one aspect at one point on the topic. The third consideration is to allow time for an evaluation of the topic from both the children's perspective and the teacher's perspective. Another aspect of time was reported by Ofsted (2008) and Jarvis (2009) where the successful development of cross-curricular work should be embedded in teacher training programmes and carefully designed professional development for teachers. This is because many teachers have received little or no training in designing the curriculum for their schools as their emphasis has been on discrete subject teaching and reliance on detailed schemes of work.

Taking the positives and the negatives into consideration, an Ofsted (2002) survey of schools which had adopted a cross curricular approach to the curriculum found significant benefits for children's personal and social development, where "*schools awarded a high grade for curriculum balance and breadth score better results than those who offer a curriculum which is narrow and restricted. This trend persists across all schools analysed, regardless of their context*." The characteristics of successful schools were when pupils learnt from a broad and challenging curriculum and where the curriculum should involve first-hand experience and be taught in ways which make sense for pupils (Ofsted, 2008). They also found that achievement in a range of subjects across the curriculum has a positive effect on pupil's attainment in the core subjects (Ofsted, 2008).

References

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Barnes, J. 2007. *Cross-curricular learning 3–14*, 1st Edition. London: Sage.

Barnes, J. 2011. *Cross-curricular learning 3–14*, 2nd Edition. London: Sage.

Barnes, J. 2015. *Cross-curricular learning 3–14*, 3rd Edition. London: Sage.

Black, P. & William, D. (2006) *Developing a theory of formative assessment*, in: J. Gardner (Ed.) Assessment and learning (London, Sage).

Black, P. and William, D. (2010), *Inside the Black Box: Raising Standards Through Classroom Assessment*, Vol. 92, Issue 1, p.81-90, 10p, 1 Colour Photograph, 1 Black and White Photograph.

Bloom, Howard & Hill, Carolyn & Black, Alison & Lipsey, Mark. (2008). *Performance Trajectories and Performance Gaps as Achievement Effect-Size Benchmarks for Educational Interventions*. Journal of Research on Educational Effectiveness. 1. 289-328.

Boud, D. (2000) *Sustainable assessment: rethinking assessment for the learning society,* Studies in Continuing Education, 22 (2): p.15-67.

Brookhart, S.M. (2001) *'Successful students' formative and summative uses of assessment information'*. Assessment in education, 8(2), 153-169.

Butler, R. (1987) *'Task-involving and ego-involving properties of evaluation: effects of different feedback conditions on motivational perceptions, interest, and performance'*. Journal of educational psychology, 79(4), 474-482.

Carr, D. (2007). *Towards an educationally meaningful curriculum: Epistemic holism and knowledge integration revisited*. British Journal of Educational Studies, 55(1),

3-20.

Centre for the Use of Research & Evidence in Education [CUREE]. (2009). *Findings from the CUREE learner survey 2009*.

Chan, K.W., & Elliott, R.G. (2004) *Relational analysis of personal epistemology and conceptions about teaching and learning.* Teaching and Teacher Education, 20, 817–831.

Claxton, G. L. (2002) *Building learning power: helping young people become better learners* (Bristol, TLO).

Cohen, L., Manion L., Morrison K., Wyse D. (2010) *A Guide to Teaching Practice*. Revised 5th Edition by Routledge.

DfES (2007) *Assessment for learning: 8 schools project report*. London: DfES Publications.

Discombe, S. (2019) *A critical evaluation and the identification of next teaching and learning steps focusing on a case study of an individual learner or a group of learners, based on an observed critical incident.* ECAD 6007: The Learner: who am I teaching? University of Wales, Trinity Saint David. Unpublished assignment.

Elliot, E. and Dweck, C. (1988), *Goals: An approach to motivation and achievement, Journal of Personality and Social Psychology*, 72, p.5-12.

Gibbs, G. (1999), Using assessment strategically to change the way students learn. In Assessment matters in higher education: choosing and using diverse approaches, Edited by: Brown, S. and Glasner, A. Buckingham: Open University Press.

Gipps, C., McCallum, B., Hargreaves, E., Pickering, A. (2005) *'From TA to Assessment for Learning: the impact of assessment policy on teachers' assessment*

practice'. Paper presented at the British Educational Research Association Annual Conference, University of Glamorgan, 14−17 Sept 2005.

Hattie, J. and Timperley, H. (2007), *The power of feedback*, Review of Educational Research,77(1), p.81-112.

Hattie, J. (2009) *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement.* Routledge: London

Hattie, J. (2013). *Calibration and confidence: Where to next?* Learning and Instruction, 24, 62–66.

James, Mary. (2006). *Assessment, Teaching and Theories of Learning*. 10.13140/2.1.5090.8960.

Jarvis, T. (2009). *Promoting creative science cross-curricular work through an in-service programme*. School Science Review, 90, 39–46.

Ko, J. & Sammons, P. with Bakkum, L. (2013) *Effective teaching: a review of research and evidence*. Reading: CfBT Education Trust.

Kostons, D., van Gog, T., and Paas, F. (2012). *Training self-assessment and task-selection skills: A cognitive approach to improving self-regulated learning*, Learning and Instruction, *22,* 121–132.

Laurie, J. 2011. "Curriculum Planning and Preparation for Cross-Curricular Teaching." In *Cross-curricular Teaching in the Primary School: Planning and Teaching Imaginative Lessons,* edited by T. Kerry, 125–141. London: Routledge.

Li, L. and Gao, F. (2016), *The effect of peer assessment on project performance of students at different learning levels*, Assessment & Evaluation in Higher Education; Sep2016, Vol. 41 Issue 6, p.885-900, 16p.

Muijs, D and Reynolds, D. (2011) *Effective Teaching: Evidence and Practice.* London: Sage.

Nicol, D. Macfarlane-Dick, D. (2006), *Formative Assessment and self-regulated learning: a model and seven principles of good feedback practice*, Studies in Higher Education, Vol. 31, Issue 2, p.199-218.

Nicol, D. Milligan, C. (2006), *Rethinking technology-supported assessment in terms of the seven principles of good feedback practice*, in Bryan, C and Clegg, K (eds) Innovative Assessment in Higher Education, p.64-77, London: Routledge.

Ofsted (2008) *Curriculum Innovation in Schools.* London: Ofsted. Available at http://www.ofsted.gov.uk/resources/curriculum-innovation-schools, 26/1/20).

Rennie, L.J., Venville, G. and Wallace, J. (2011) *Learning science in an integrated classroom: finding balance through theoretical triangulation.* Journal of Curriculum Studies, 43(2): 139-62.

Savage, J. (2012–14) *Cross-Curricular Teaching and Learning in the Secondary School*, series (The Arts, English, Foreign Languages, Humanities, Computing and Mathematics). London: Routledge.

Smith, K. (2011). *Professional development of teachers - A prerequisite for AfL to be successfully implemented in the classroom*. Studies in Educational Evaluation,37,55–61.

Torrance, H. and Pryor, J. (2001) *'Developing formative assessment in the classroom: using action research to explore and modify theory'*. *British educational research journal*, 27(5), 615-631.

Yorke, M. (2003), Formative assessment in higher education: moves towards theory and the enhancement of pedagogic practice. Higher Education, 45(4): p.477-501.

Venville, G.J., Wallace, J., Rennie, L.J., and Malone, J.A. (2002) Curriculum integration: eroding the high ground of science as a subject. Studies in Science

Education, 37(1): 43-83.

https://www.australiancurriculum.edu.au/media/3654/literacy-geography.pdf, 26/1/20.

https://australiancurriculum.edu.au/media/3671/numeracy-geography.pdf, 26/1/20.

https://cambridge-community.org.uk/professional-development/gswafl/index.html, 26/1/20.

https://core.ac.uk/download/pdf/55539065.pdf, 26/1/20.

https://dera.ioe.ac.uk/2231/1/sec_func_skill_ge_0007210.pdf, 26/1/20.

http://www.educationengland.org.uk/documents/pdfs/2009-IRPC-final-report.pdf, 26/1/20

https://www.educationdevelopmenttrust.com/EducationDevelopmentTrust/files/5a/5a6d6203-ec49-4d33-9c5d-42c188184807.pdf, 26/1/20.

https://www.unrwa.org/sites/default/files/teachers_role_in_promoting_literacy_and_numeracy.pdf, 26/1/20