

Target	How I have achieved this
Further strengthen your critical writing by making references to literature throughout your writing.	Refer (more than previously) to relevant literature throughout my writing to enhance my points

Demonstrate how cross-curricular teaching and learning can influence in-depth skills and understanding. Underpin this with reference to relevant research, a detailed lesson plan and an enhanced provision material.

Introduction:

In the modern educational climate there is a growing recognition of the interconnected nature between subjects, which can be exploited in developing children's skills and understanding. The Curriculum for Wales (CFW) is designed in a manner to provide pupils with a diverse and balanced education, allowing schools to curate their own curriculum tailored to the needs of their pupils, as long as it is in accordance with the national curriculum guidance and the four purposes (Welsh Government, 2022). Pedagogy is central to the CFW and closely linked to the four purposes, so in order to realise them schools and teachers need to have a comprehensive approach to learning, focusing on the reasoning behind it and the role of the learning environment (WG, 2023). The curriculum outlines literacy, numeracy and digital competence as mandatory cross-curricular skills, highlighting them as crucial transferable skills in fully exploring the curriculum and preparing pupils for success in the modern world (WG, 2022). The literacy, numeracy and digital competence frameworks by Welsh Government strongly convey the role of all practitioners across all areas in integrating these cross-curricular skills across the curriculum, and provide support in promoting frequent authentic learning opportunities to do so (WG, 2019).

Fostering teaching approaches that recognise the relationship between subjects, as opposed to employing narrow focuses that lack meaningful outcomes, can encourage deeper thinking and problem solving skills (Rowley & Cooper, 2009). Through creating diverse connections in subject knowledge, pupils' understanding can be elevated by introducing alternative ways of thinking, potentially altering the scaffold of their thought process (Kerry, 2015). It can be argued that cross-curricular teaching and learning supports the application of this by promoting simultaneous engagement with multiple disciplines. Cross-curricular learning recognises how children's minds operate, seeking to make sense of the world unrestricted from the viewpoints of one specific subject, and encourages the combination of knowledge which is used in real life problem solving (Barnes, 2015). Integrating cross-curricular teaching into practice could possibly increase the quality of pupil education, encouraging a holistic approach that more accurately reflects the world, creating opportunities for deeper understanding and the application of knowledge (Cotic et al., 2021). This idea of having a holistic approach to education is supported by educationalist John Dewey, emphasising the requirement for an education that reflects the way complex ways we seek to understand, creating meaningful and rich learning environments that are reflective of pupils' needs (Dewey, 1938).

However, while cross-curricular learning may be beneficial for pupils, some schools may face challenges in its implementation, such as deprivation. In 2014, a report on 'Deprivation in Education' by the National Foundation for Educational Research found that there is a multifaceted relationship between deprivation and learning outcomes in Wales, driven by factors including a lack of opportunities and resources. Therefore, schools in areas of poverty may be faced with limited resources and equipment, including technology, which may limit their ability to engage fully with cross-curricular learning (Child Poverty Action Group, 2023). A petition by Chairs of School Governor Associations throughout Wales in 2023 states that significant number of schools in Wales are struggling to meet learning requirements, due to funding that poorly reflects the current economic climate, meaning fewer support staff and more under-resourced classrooms.

Main Body:

The lesson plan outlined in appendix 1 encompassess the cross-curricular framework, with meaningful links across the curriculum, including the Literacy and Numeracy Framework and the Digital Competancy Framework. The lesson plan has the most explicit links to the science and technology AOLE, as the overall lesson objective is to have an understanding of the properties of different materials and if they float or sink. Linking to the fourth statement of what matters within the science and technology AOLE, "Matter and the way it behaves defines our universe and shapes our lives", and the second progression step where pupils are able to investigate the properties of materials and give reasoning for their uses (WG, 2022). The enquiry based nature of science as a subject makes it an optimal opportunity to develop skills on a cross-curricular level because of the types on conversation it can generate within the classroom, including prediction, describing, catagorising and evaluation (Kelly & Stead, 2012). These discussions could encourage pupils to make connections between their prior knowledge and experience to new topics, fostering deeper understandings and development of skills. While also supporting pupil development in one of the four purposes, encouraging "enterprising and creative contributors, ready to play a full part in life and work", through applying and connecting knowledge to formulate ideas (WG, 2022). As stated in appendix 1, the teacher will encourage discussion within the classroom by asking pupils to describe the characteristics of objects through questions like "what is it?" and "what is it made of?", to encourage the pupils to share their observations and provide reasoning for their predictions. The use of progressive questioning here will help students to actively engage with the lesson in the form of problem-solving, creating opportunities to build confidence in using new vocabulary, approaches to problems and solutions they have not encountered previously (Solomon, 1994). It could be argued that this approach of capitalising on the role of group settings to deepen individual understanding aligns with the constructivist ideologies of learning (Matthews, 1998). Vygotsky's work supports the idea that learning is a social process, in the sense that influence of others on learning is not explicitly from interaction with them but from developing understanding through listening to others' thoughts and ideas (Smidt, 2009).

Appendix 2 is a learning resource to be used within the floating and skinking activity referenced in appendix 1. The resource is a table that gives pupils a space to record their predictions, with images of the objects they will need to assess before making their decision. One way the resource is cross-curricular is because of its links to the use of literacy skills, encouraging pupils to use potentially unfamiliar vocabulary, such as prediction or the types

of materials the objects are made of, and as mentioned previously pupils will need to give reasoning behind their choices which may further develop communication skills. Additionally, the resource has further cross-curricular links in relation to numeracy. As pupils will be required to organise the objects based on their predicted outcome, and comparatively analyse their predictions in relation to the actual result of if the object floats or sinks. This explicitly links to the Literacy and Numeracy Framework, through the process of collecting and sorting information and classifying objects (WG, 2022). Also, the action of collecting, entering and analysing data aligns closely with the "Data and Information Literacy" skills within the Digital Competence Framework. While pupils may be entering data into the table by hand, the process of data organisation and analysis arguably still correspond with digital competency skills (WG, 2022).

Utilising everyday objects, such as the ones outlined in appendix 2, can have great educational potential in cross-curricular approaches to teaching and learning, as they can be utilised to expand pupils' skill and understanding in different contexts. An example of this includes visual literacy, which is a crucial skill in today's media-rich climate, as methods of consuming information, entertainment and communication become increasingly visual (Grigg & Lewis, 2018). For example, the recent global debates surrounding the technological advances in artificial intelligence (AI) and the concerns surrounding the use of AI-generated images (Hsu & Myers, 2023). This advocates how our ability to visually assess content accurately is essential. The development of visual literacy as a skill is an evident focus within appendix 1 and encouraged further in appendix 2, where pupils will need to make assessments and observations of the objects to curate a prediction of whether they believe it will float or sink.

By questioning pupils on new content, educators can encourage them to create meaningful connections between their existing knowledge and new topics or ideas (Pressely et al, 1992). This fosters the nature of cross-curricular learning skills, encouraging pupils to transfer their previous ideas and skills to another area of learning in order to understand it, further supporting pupils in being enterprising and creative contributors. The relevance and benefits of encouraging the use of prior knowledge learning is recognised in appendix 2 where the objects chosen for the floating and sinking activity would be familiar to pupils. While how these objects interact with water may be unfamiliar to some pupils, using their existing knowledge of the objects and how they are used, informed predictions can be made of whether they will float or sink, potentially making the learning experience more meaningful and effective. Although, vast disparities in pupil understanding of key vocabulary or topics, highlighted in appendix 1, could be a challenge in delivering cross-curricular teaching and learning. Particularly in Placement School A as its catchment area is recognised for its socio-economic deprivation. Therefore, it should not be assumed that all pupils have identical prior experiences or knowledge, and in recognition of differentiated approaches to teaching and learning should be applied (Tomlinson, 2014). By having this awareness and incorporating differentiation in approaches, the educator is expressing their understanding and the importance of the pedagogical principles. The twelve pedagogical principles reinforce the importance of learner-centered pedagogy in foundation learning, to support the progression of all pupils (WG, 2023). Bloom agrees that evaluations should be an ongoing process within the learning environment as teaching and learning is occurring, in order to make sure that the approaches used are having the most beneficial impact on pupil understanding and skill development (Bloom, 1969). The lesson plan in appendix 1

recognises this, whereby the concept of floating and sinking will be introduced to the pupils by the teacher reading the book "Sunk!" by Rob Biddulph. By asking pupils the specified key questions before and during reading the book, the educator can integrate the use of new vocabulary and introduce ideas to pupils. In doing so the educator can formatively assess the level of pupils existing knowledge, and tailor their approaches to better support pupils and address any misconceptions (William, 2018). Using a book in this context could be extremely beneficial for pupils, as it will provide them all with an basis of knowledge in the topic which the teacher will be aware of and able to build on appropriately. This approach has been observed previously in School A, where the teacher used a book to introduce the importance of the pupils looking after their mental health. This was beneficial as the questions being asked of pupils inspired great discussions, and at the end of it all pupils were aware of how they can look after their mental well-being and who to approach if they are struggling.

Conclusion:

To conclude, the use of cross-curricular teaching and learning approaches can significantly influence deeper skill and understanding among pupils, particularly through encouraging active engagement and exploration (Barnes, 2015). The Curriculum for Wales acts as a framework for schools and practitioners in their approaches to cross-curricular learning, by allowing creative liberty, in correspondence with national guidance, in creating personalised curriculums that reflect their needs and contexts (WG, 2022). Within the curriculum literacy, numeracy and digital competence are defined as essential cross-curricular skills, which has the benefit of preparing pupils with the relevant skills for future learning and employment (WG, 2022). These skills can include effective communication, problem-solving and visual literacy. Therefore, I will strive to incorporate these in my future teaching approaches. The literacy and numeracy framework and digital competence framework urge practitioners to integrate these skills across all subject areas, and the guidance documents available are definitely going to help in my application of this in my future practice (WG, 2019). I will further support pupil progression by building my teaching around the twelve pedagogical principles, which promote active learning and inclusivity in education (WG, 2023). To do this, in correspondence with the professional standards for teaching and learning, I will utilise differentiation in my teaching approaches. Effectively achieving this could include getting to know each pupil in my class personally, and then altering my types of instruction to meet their needs. For example, some may benefit from visual aids while others may benefit from direct instruction, allowing each pupil to learn as quickly and deeply as possible and come away with the relevant skills to continue their learning journey (Tomlinson, 2014). An additional element I will implement across my practise is reflective teaching, to avoid stagnation in my approaches. In entering this profession I recognise the importance of being a lifelong student of teaching, meaning I know that continuous evaluations of my attitudes and practise will be crucial in ensuring both personal and pupil progression (Shandomo, 2010). Particularly throughout my upcoming placement, I will be extremely reflective in my practise, to secure the foundations for my own growth and development over the course of becoming qualified. For example, if a lesson did not go the way I expected I would explore how and why, and how I can learn from the experience.

Millie Brace
Student Number: 2304293

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Millie Brace
Student Number: 2304293

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Millie Brace

Student Number: 2304293

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Millie Brace

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Appendix 1 - Lesson plan

 			
Student-teacher:	for Education Millie Brace	Class / Group:	Year 2
AoLE or Subject:	Science and Technology Topic: Floating & Sinking	Date (please note that this may be a continuous session):	15.04.24
Meaningful links to Curriculum (What Matters Statements, Descriptions of learning, 'previous' curriculum...)	SOWM 4 Matter and the way it behaves defines our universe and shapes our lives. PS2 : I can explore and describe the properties of materials and justify their uses.		
Meaningful links across the curriculum Links to other AoLEs or the Cross-curricular skills frameworks	LLC – WM3 Expressing ourselves through languages is key to communication. LNF – Literacy: Listening :I can listen to others and understand that they may have a different perspective to my own (PS2). LNF- Numeracy: Collecting data: I can collect information by voting or sorting (PS2) LNF- Numeracy: Representing data: I can present work orally, pictorially and in written form, and use a variety of ways to represent collected data (PS1). DCF-Data and Information Literacy: I can collect, enter, organise and analyse data into different groups or formats, e.g., tables, charts, databases and spreadsheets (PS2)		
Personal Targets (targets and consequent impact on learning - refer to any targets that have been identified in learning journal or weekly reflection meeting and describe the desired impact on learning). N/A			
Learning Intention <i>'This should focus on the pupils' learning during the lesson, rather than what they will be doing, and should be short, achievable and measurable.'</i> (Crichton, H., and Mcdaid, A. 2016 p. 196)			
Identify uses of some common materials Have an understanding of the properties of different materials and how they interact with water			
Success Criteria <i>What the pupils need to demonstrate to successfully meet the Learning Intention.</i>			
Recognise the appropriate materials to build a mini boat			
Planning for misconceptions: <i>Use this section to anticipate pupil errors and misunderstandings and your planned responses to them.</i>			
Thinking materials float/sink based on appearance - encourage students to explore and test materials to develop understanding of different weights, textures			

SEQUENCE OF TEACHING & LEARNING (Add or remove rows below as appropriate)				
Timing: Break down timings into groups if appropriate, ensure pupils are 'doing' quickly and that transitions are taken into account	Role of the teacher & support staff: e.g., key questions, retrieval of prior learning, modelling and explanations, checking understanding, planned use of additional adults. Choice of pedagogical model or of the 12 pedagogical principles	Pupils' learning and activities: What will the pupils be learning to do and what activities / resources will facilitate this? Please refer to Foundation Learning planning document for details of continuous provision.	Inclusive Strategies (including differentiation): Reasons for and details of scaffolding. Types of representation in tasks.	Check what pupils know, understand, and can do: Key questions, types of retrieval practices, self and peer assessment opportunities, purposeful AfL strategies, live marking opportunities, planned feedback.
20 mins	Introduce the concept of floating and sinking by reading "Sunk!" By Rob Biddulph Asking key questions: - what do we think the book might be about? - What do we already know about sinking? - How could we improve their boat? (Size, materials, shape etc) - Why did their boat sink? Introduce key vocabulary: Float, sink, weight, absorbent, buoyancy,	Resource = "Sunk!" By Rob Biddulph Encourage whole class discussions when answering the key questions throughout the book.	Visual aids - Use visual prompts from the book during the questioning phase to support students' comprehension and engagement. Differentiation - visual representations alongside questioning supports different learning styles, e.g visual learners, to help pupils understand and process information.	Key questions: - What do we think the book might be about? - What do we already know about sinking? - How could we improve their boat? (Size, materials, shape etc) - Why did their boat sink?

 Prifysgol Cymru Y Drindod Dewi Sant University of Wales Trinity Saint David	 Yr Athrofa Centre for Education Addysg i Gymru Education for Wales		 APLP PDPA Partnership Ddwy Phroffesiynol Yr Athrofa Yr Athrofa Professional Learning Partnership Partnership Ddwy Phroffesiynol Yr Athrofa Partnership Ddwy Phroffesiynol Yr Athrofa	
30 - 45 mins	Conducting the “experiment” Review their knowledge of materials and their properties using common objects / materials they are familiar with. Put the objects into a container of water so that pupils can see whether their predictions were correct or incorrect. Explain to the impact of weight, shape, and density on whether objects float or sink - the scientific principles involved in the activity. Key questions: - What do you know about the objects? - What shape is it? - What are they made of? - Can you predict if they will float or sink? - Did you expect that result? - Why do you think that happened? Key vocabulary: predict, observation	Allow time to consider the questions Recording predictions in the previously created table Record the actual results of whether the objects float or sink, and compare this to their predictions. As the questioning progresses, the complexity of the questions increases gradually. This allows students to build upon their existing understanding and engage with the material at a level that is appropriate for their individual abilities. Students who grasp the basic concepts quickly can be challenged with more advanced questions, while those who need additional support can work through the simpler questions first before moving on to more complex ones.	Progressive questioning - Questions gradually becoming more difficult, building pupil understanding as the questioning progresses. Differentiation - Progressive questions allows all students to participate regardless of their prior knowledge or ability level. The educator can also assess any misconceptions in learning or difficulty in understanding, and target questions appropriately.	AFL - Formative assessment, providing ongoing feedback and adjusting instruction based on student responses during the progressive questioning

Appendix 2:

*LET'S DIVE INTO...*

SUNK!



Can you be a Creative
Enterprising Connor?

**Record your prediction:
Will the objects float or sink?**

OBJECT	PREDICTION	RESULT
		
		
		
		
		
		