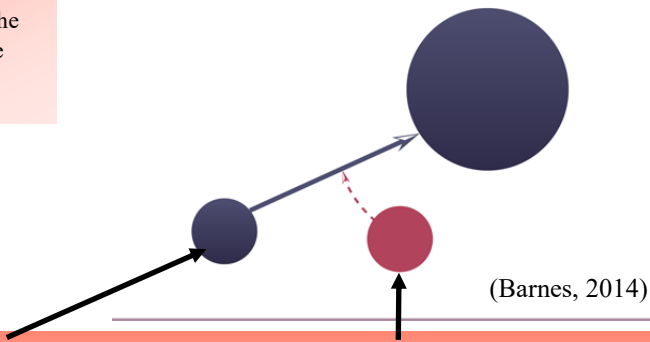


Exemplifying Barnes’ Cross-Curricular Models to embed Literacy, Numeracy and Digital Competence.

Hierarchical Approach to Cross-Curricular Learning

Barnes (2015a) suggests that the hierarchical model can be used to enhance learning in one subject by using skills from another discipline. A picture example of the hierarchical approach can be seen to the right.



D&T has been chosen as the main subject as it can be argued that many skills that are learned during these lessons require a foundation of skills in literacy, numeracy and digital competence.

The lessons below exemplify the hierarchical approach while also embedding the cross-curricular responsibilities suggested by Donaldson (2015) in the new curriculum.

In this example, Design and Technology will be the main subject. Literacy, numeracy and digital competency skills will be used as support to enhance the learning of D&T and will be the secondary skills during the use of this approach.

Lesson 1 – What are healthy ingredients?

Class will be placed in small groups and work using iPads to collect data about foods and their nutritional properties. Groups will create presentations on their devices and this work produced by the groups will be saved for use in the next lesson.

Lesson 2 – Recipe Writing

Pupils will make use of prior knowledge obtained during the previous lesson to create a recipe and write a method for a healthy cake. Literacy skills are used during this session as the class will be required to write for different audiences and purposes (recipe writing and instructional writing).

Lesson 3 – Creating a Healthy Cake

Pupils will use a recipe provided by the teacher to create a healthy cake. This lesson will be enhanced by their numeracy skills as children will be tasked with measuring different ingredients accurately. *(Higher ability differentiation – recipe provided by teacher will provide children with a further challenge of converting kg to g etc.)*

Curriculum Coverage

Design and Technology - apply current healthy eating messages and consider nutritional needs, develop a simple recipe for their products, classify food by commodity/group and understand the characteristics of a broad range of ingredients, including their nutritional properties (DCELLS, 2013).

Digital Competence Framework - save files to a specific location using an appropriate file name, find relevant information using different keywords and search techniques (Welsh Government, 2016b).

Literacy and Numeracy Framework - transfer mathematical skills to a variety of contexts and everyday situations and estimate and visualise size when measuring and use the correct units, adapt what they write to the purpose and reader (Welsh Government, 2013).

Other - use specific structures in writing (Welsh Government, 2016).

Benefits

- Can progress knowledge in one subject by also developing knowledge in other subjects. (Barnes, 2015a)
- “Effective and lasting learning” can take place if the link between the subjects used is genuine. (Barnes, 2015; Barnes, 2015a).
- ‘Weak’ subjects for the teacher can be taught through teaching alongside a stronger subject (Barnes, 2015). For example, Music can be taught within Geography lessons when learning about music from around the World.
- Can develop skills without children realising. During the author’s time on PTE, this model was used to overcome a child’s stigma towards numeracy.

Challenges

- New skills may not be learned in the subjects used to support learning. If literacy skills are used to support learning in other subjects but no new literacy skills are learned, the pupils will not progress (Barnes, 2015).
- Using this model, some subjects may always become secondary subjects as the teacher plays to their strengths. Therefore, the ‘secondary subjects’ may never be taught in a manner which will progress learners’ abilities.
- If there is not a genuine link between the subjects, effective learning may not take place (Barnes, 2015a).

Teaching using a cross-curricular approach is becoming an important aspect of the curriculum in Wales. Donaldson (2015) has proposed in the new curriculum that numeracy, literacy and digital competence should be cross-curricular responsibilities. Although almost a quarter of primary schools in Wales need to do more to embed these across the curriculum (Estyn, 2018, p29.), teaching these skills across the curriculum is an aim for Wales, as by 2021 the aim is to enable every pupil to have “relevant high-level digital, literacy and numeracy skills” (Welsh Government, 2017, p11.)

Barnes (2015) has stated that there are eight different cross-curricular approaches to learning which are used within the classroom. This poster will exemplify two of these cross-curricular models proposed by Barnes while embedding the cross-curricular responsibilities of numeracy, literacy and digital competence.

Each model will use a series of lessons to explain how the cross-curricular approach can be used. The lessons proposed within this poster are aimed at a mixed ability Year 4 class.

Thematic Approach to Cross-Curricular Learning

The thematic approach can be used to enhance cross-curricular learning. When used correctly, a thematic approach can motivate learners and unify learning (Barnes, 2015). The new curriculum in Wales will be more skills-based than knowledge-based and it is expected that more learning within the primary sector will take place through the use of themes and topics (Donaldson, 2015). The thematic approach refers to when a theme (friendship is used in the picture example to the right) to progress learning in numerous subjects. The following lessons will use the theme of ‘Food’ to enhance learning in Geography and Personal and Social Development while also embedding the cross-curricular responsibilities.

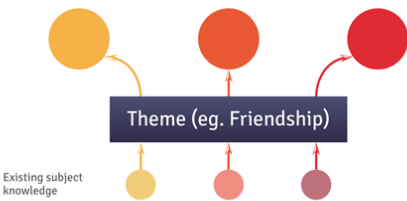
Lesson 1 – Research Different Foods

Children will use the first part of this lesson to use the internet to research a food from a different part of the world. Information found will be put into a presentation, with children citing where they got this information from. The second part of the lesson involves children presenting their findings to the class.

Lesson 2 – How Far Has My Food Travelled?

This lesson will involve children calculating how far each item of food from a lunchbox has travelled by using maps and their numeracy skills of measuring and addition.

Thematic CCL



(Barnes, 2014)

Lesson 3 – Create a healthy lunchbox

Children have a budget of £5 and will choose from a ‘menu’ of foods provided by the teacher to create a healthy lunchbox. The menu will provide children with pricing and nutritional information about each item. The target of the lesson is for children to choose healthy items while also learning about value for money.

Curriculum Coverage

Geography - use maps, imagery and ICT to find and present locational information, communicate findings in a variety of ways, e.g. using geographical terms, annotated photographs, maps, diagrams, or ICT (DCELLS, 2013a).

Personal and Social Development - the features and physical and emotional benefits of a healthy lifestyle, e.g. food, take increasing responsibility for keeping the mind and body safe and healthy (DCELLS, 2008).

Literacy and Numeracy Framework - explain information and ideas using supportive resources, e.g. on-screen and web-based materials, listen carefully to presentations and show understanding of main points, manage money, compare costs and determine what can be bought within a given budget, read and write numbers to 10 000, add and subtract 3-digit numbers using an appropriate mental or written method (Welsh Government, 2013).

Digital Competency Framework - cite all sources when researching and explain the importance of this, find relevant information using different keywords and search techniques (Welsh Government, 2016b).

Benefits

- Authentic themes can motivate learners when the theme is relevant to them (Barnes, 2015).
- use of a theme can provide learners with transferable knowledge which can be used in the real-world (Barnes, 2014).
- use of a theme can make learning interesting for learners (Kelly, 2013).

Challenges

- This approach requires very well-planned and thought-out lessons (Barnes, 2015).
- Choosing to teach a theme which is not interesting for learners can lead to learners losing motivation. The author has had experience of this on PTE, where the theme for topic lessons was ‘Shakespeare’ and lessons became very tedious.
- A theme can limit the amount of opportunistic learning that can take place, as lessons must comply with the theme.