Cross-Curricular Teaching in Year 3 (KS2)
Theme: The Human Body

Introduction

According to Barnes (2015) and Savage (2010) cross-curricular teaching and learning both motivates and engages pupils, simultaneously providing knowledge, skills and understanding from various subject areas. Essentially, the world beyond the classroom is cross-curricular (Barnes, 2015) therefore is necessary schools should teach in a cross-curricular manner for children to gain knowledge regarding the world which encompasses them, applying differing skills to various situations. Barnes (2015) has created a taxonomy in order to assist education professionals in performing cross-curricular education successfully, to use more than one subject to respond to a problem, theme or issue.

Things to consider in Wales…

The curriculum in Wales is currently evolving and there are matters teachers in Wales should consider and utilise before the 2022 curriculum is implemented.

- There are three cross-curricular responsibilities including literacy, numeracy and digital competence, which ought to be embedded within learning areas and experiences within the 2022 curriculum (WG, 2019a).
- The purposes of the curriculum in Wales should be that children and young people develop as:
- Ambitious, capable learners, ready to learn throughout their lives
- Enterprising, creative contributors, ready to play a full part in life and work
- Ethical, informed citizens of Wales and the world
- Healthy, confident individuals, ready to lead fulfilling lives as valued members of society.

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Each purpose is greater than a title; additionally, it is described in terms of key characteristics. In their entirety they should underpin all teaching and learning in Wales (Donaldson, 2015). Therefore, we should be teaching children the skills needed for later life, in order to successfully achieve the four purposes.

- Wales is aiming for a more holistic education (Newton, 2019) to create connections between subjects. Donaldson (2015) also proposes this is the way forward for Wales as children should be given opportunities to apply learning more holistically in real life situations.

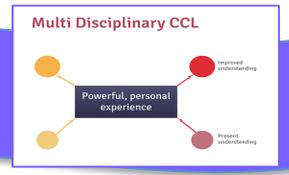
Effective? Cross-curricular approaches and models…

→Make **connections** between subjects as children can reconstruct problems into **meaningful** situations (Bleazby, 2015; Roy, 2016; Byrne, 2017). Rose (2009) elaborates implying cross-curricular teaching lessens the rigidness of specific subject boundaries simultaneously making **connections** in the brain aiding **memorable** learning (Cercone, 2006; Bromley, 2016).
→Promote thinking skills - Donaldson (2015) advocates there is a demand for children to improve their wider skillset, including critical-thinking. Charlton (2019) coincides stating the soft skill of critical-thinking helps employability standards, as critical thinking is needed for the **twenty-first century**. Barnes (2015) also advocates cross-curricular models and subjects correlate with one another therefore closely linked with engendering creative thinking implying, cross-curricular approaches can aid twenty-first century skills for both teachers and children.

Ineffective? Although, cross-curricular approaches and models can…

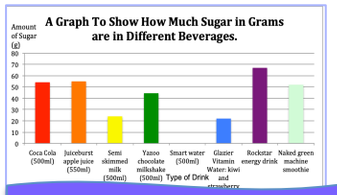
→Equally be ineffective by trivial and misleading teaching, which constructs new **misconceptions** as it fails to provide moral contexts for learning (Barnes, 2015). It is important to view education on a macro level focusing on the curriculum although cross-curricular teaching may have **micro implications** including pedagogy style classroom organisation and individual interactions (Barnes, 2011). Some teachers discussed the dangers of **artificial links** between subjects, believing their students are missing out in certain specific subject skills (Greenwood, 2013). Dunne and Peacock (2014) concur as occasionally connections are created between subjects for the sake of thematic learning. Some critics argue that attempting to force connections will make children more timid limiting their skillset (Holt, 1964).

The Multidisciplinary Model
Benefits, Limitations and Solutions



Barnes (2015) discusses the multidisciplinary approach, which essentially gives parity of importance to two subjects. Two subject disciplines are used to clarify a single experience, utilising a single stimulus for two individual intentions (Barnes, 2015) which is effective as people have tried making sense of our world by trying to organise knowledge into compartments, yet over time these compartments have changed and multiplied (TOU, 2019). Although, the subject disciplines do not always meet or affect the thinking process (Barnes, 2015) thus children understand what they are learning in each specific subject, yet still aligns learning through multiple disciplines to support teacher's creativity and enables children to use various skills in differing situations by constructing knowledge of one subject upon another (Smith, 2016).

- ✓ Allows children to make clear connections within and across learning areas, achieving one of Donaldson's (2015) 12 pedagogical principles of making connections.
- ▪ Although, Donaldson (2015) published Successful Futures 4 years ago and there is still growing confusion regarding the aims of the new curriculum (James and Wightwick, 2017).
- ✧ Solution – it is necessary we utilise cross-curricular models like the multidisciplinary model to ensure connections are being made to enforce the cross-curricular responsibilities.
- ✓ Estyn (2017) recognises in Mynydd Cyffig Primary School the qualities of the multidisciplinary model declaring how stimulating and exciting it is for both pupils and teachers as it creates and increases children's confidence levels and a willingness to participate.
- ✓ The Open University (2019) list the benefits regarding the multidisciplinary model including an increase in motivation as students gain an authentic purpose for learning in real-world contexts, obtaining a breadth of knowledge as varied perspectives across differing subjects are explored and an increase in creativity as knowledge and application of various subjects leads to greater creativity.
- ▪ However, Barnes (2012) proposes subject progression is difficult to achieve with three or more subjects therefore can question how to incorporate the cross-curricular responsibilities and a specific subject through multidisciplinary learning as it may hinder children's progression, creating new misconceptions within teaching.
- ✧ Although a solution for this could be to not force subjects when using the multidisciplinary model as essentially, a forced education interferes with children's abilities to educate themselves (Gray, 2009) therefore, subjects should come natural to aspects of cross-curricular teaching (Barnes, 2015) therefore recommended for teachers not to force subjects into lessons for the sake of a thematic curriculum.



ACTIVITY 1 – OH MY ORGANS! SCIENCE, LITERACY, DCF, NUMERACY

Firstly, children will build upon their prior knowledge regarding body organs through discussion. Building upon prior knowledge helps children to feel good about what they already know before enhancing their skills further, helping to make connections throughout subjects simultaneously enhancing their vocabulary (Maguire, Frith and Morris, 1999; Meyer, 2004; Rillero and Padgett, 2012). In groups, the pupils will observe, describe, compare and record what real organs are to help them appreciate what they are on the inside discussing the texture, appearance, colour and smell in detail. This assists in creating memorable learning as when the brain explores physical materials it is actively involved (Jensen, 2004), also acknowledged by Estyn (2018a) in Ysgol Heulfan as activities that are hands on and utilise real experiences promotes good oracy skills. Essentially within multidisciplinary teaching, thinking should be generated by an engaging experience (Barnes, 2015) which touching and discussing real-life organs encourages. They will complete a sensory observation grid in order to write down their thoughts and discussions. This helps science and literacy to thrive as they are able to enhance communication skills using talk purposefully to complete a task, making connections between what they are learning and what they already know (DCELLS, 2016a) simultaneously enhancing writing skills as they are using specific vocabulary related to the subject (DCELLS, 2016a) and also achieving a scientific skill of making comparisons and identifying and describing trends of information regarding organs (DCELLS, 2008a). Although, for multidisciplinary learning to occur, each subject needs to have its own specific skills developed and needs to be clear for the pupils so they can understand what they are learning (Barnes, 2015). To solve this, each learning objective should be shared with the children using the LNF and Science skills discussed above for these two subjects to clarify a single experience regarding the human body (Barnes, 2015) maintaining successful multidisciplinary learning. Using digital skills can also enhance the literacy and science skills further. Children can use Virtual Reality headsets alongside Google expeditions to bring the organs to life within a virtual world, exploring inside them and searching for red and white blood cells which they cannot do physically in real-life. The virtual environment is as effective as real life for building upon learning (Jensen and Konradsen, 2018). This consists of developing the DCF as children are developing their strategies for finding information (WG, 2019b) rather than using search engines. This achieves one of Donaldson's (2015) twelve pedagogical principles as these activities create authentic contexts for children, enabling hands on real experiences learning about their own bodies.

ACTIVITY 2 – HOW MUCH SUGAR?! SCIENCE, LITERACY, DCF, NUMERACY

The second activity aims to enhance science and numeracy skills becoming the two main subjects clarifying a single experience, which is important for multidisciplinary teaching to occur yet there is still an inclusion of literacy and digital competence. The pupils will build on their prior knowledge of what makes a healthy body coinciding with Donaldson's (2015) four purposes: making healthy confident individuals. To enhance this, children will identify a variety of beverages and discover how much sugar is in each drink, promoting independent learning as Piaget (1964) believes children learn best when enduring independent tasks without too much teacher interaction. Communication skills can become strengthened, as children will be able to declare which drink they think has the most sugar and discuss why they think this is thus "talking purposefully in order to complete a task" (DCELLS, 2016a). They can collect this data and transfer it into a table listing the name of the drink and how much sugar in grams it contains, allowing numerical skills to be achieved including representing data using a table and drawing conclusions from it (DCELLS, 2016b). Harrison (2002) advocates children's skills in creating and using graphs are particularly poor, therefore for children to advance in this and develop DCF skills, children can create a bar chart using Microsoft Excel therefore achieving the digital competence skill of collecting and entering data to analyse the given format (WG, 2019b) simultaneously developing numeracy as children can extract and interpret information from the bar chart (DCELLS, 2016b). Assessment for learning (AFL) can be utilised throughout multidisciplinary teaching as the teacher should plan for progression within the subjects most relevant to the experience (Barnes, 2015), for example in this case science and numeracy therefore the teacher can identify clear links between progression within specific subjects, as they provide a different skillset yet both enhance knowledge regarding the human body.

Top Tips for Teachers & Conclusion

- ✧ Consider the 2022 curriculum to gain a deep understanding of the four purposes and pedagogical principles, as Donaldson (2015) proposes when teachers plan the learning, they need to ensure activities relate directly to the curriculum purposes.
- ✧ Good cross-curricular teaching needs to be relevant, authentic and meaningful with no tenuous subject links (Barnes, 2015) in order to assist in children's progression.
- ✧ Consider Assessment for Learning – Barnes (2015) advocates that planning, progression and assessment are essential to ensure challenge and progress, as cross-curricular learning is more successful when assessment is given attention for the purpose of improved learning.
- ✧ Consider the progression steps and what matters statements from the 2022 draft curriculum and identify what learners 'can' do. For example, identifying the skills from activity one and two learners "can can convey information and share ideas and feelings about familiar topics" (WG, 2019c:p.48).
- ✧ Literacy, numeracy and digital competency are the foundations for success and are skills necessary for the twenty-first century (Donaldson, 2015) allowing collaboration, problem-solving and critical-thinking skills to flourish giving children an array of opportunities to use in and outside of the classroom.

Barnes' taxonomy (2015) can assist teachers in achieving successful cross-curricular activities using a range of models. Perhaps teachers could begin with the multidisciplinary model as this incorporates fewer subjects and enhances separate subject specific skills. Confidence is key when teaching in a cross-curricular manner (Barnes, 2015) therefore when confident, teachers could try the theme-based approach using more than two or three subjects to give children a variety of opportunities to develop their literacy, numeracy and DCF skills. Additionally, perhaps teachers could view the opportunistic model using the suggested reading, as this is mostly child-led thus can aid children's independent skills as Donaldson (2015) suggests independence should be fostered throughout the teaching and learning process. Therefore teachers could incorporate aspects from different models including the multidisciplinary model as this makes the subject specific skills learnt explicit to the children, aspects from the theme-based model utilising more than two or three subjects to incorporate the cross-curricular responsibilities to clarify a certain theme and also aspects from the opportunistic model to create child-led experiences. Although, teachers need to fathom what works better for them, developing their own taxonomies within the classroom.

Suggested reading:

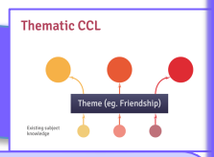
1. Barnes, J. (2015). *Cross-Curricular Learning 3-14*. 3rd Ed. London: Sage.
2. Donaldson, G. (2015). *Successful Futures: Independent Review of Curriculum and Assessment Arrangements in Wales*. Cardiff: Crown.
3. Hayes, D. (2010). The seductive charms of a cross-curricular approach. *Education 3–13*, *38*(4), pp.381-387.

TOPIC AFTERNOONS – TUDOR MEDICINE
HISTORY, D&T, LITERACY, NUMERACY, DCF

For theme-based learning to occur, more than three subjects must be developed from a single theme, therefore numeracy, literacy, digital competency, history and design and technology will be developed with children learning about the theme of Tudor medicine.

Previously, children will have learnt about the quirky eccentric ways the Tudors tried to cure illnesses, including the Black Plague. Within upcoming various topic afternoons, children will play the role of an Apothecary attempting to cure the Black Plague using seven items to create their medicine. Hyson (2008) advocates children's interest in learning, motivation and persistence is enhanced when children are given a role to play, therefore are more likely to enjoy learning and develop skills within literacy, numeracy and digital competency. This helps to develop a historical skill of understanding the daily life of the Tudors (DCELLS, 2008b) understanding what they had to endure when they fell ill. Firstly, children will write a set of instructions of how to create their own Tudor Medicine, using and developing imperative verbs within instruction writing enhancing the literacy written skill of "presenting processes in a clear sequence" and "using connectives for causation and consequence" (DCELLS, 2016a). Most pupils agree that writing is an essential skill to succeed in life (DFE, 2012) therefore developing this through role-play will stimulate motivation and creativity. Next, the children will create their medicines developing their design and technology skills as they will choose appropriate materials, tools and utensils (DCELLS, 2008c) simultaneously enhancing numerical skills as they will select and use suitable instruments of measurement (DCELLS, 2016b) when creating their medicine. Estyn (2018b) advocates pupils can develop a strong understanding of measuring when teachers utilise thematic education, suggesting an enjoyment towards numeracy as hidden mathematics creates a positive outlook towards the subject (Abramovich and Brouwer, 2006). To develop children's digital competency skills, children can create and edit a video (WG, 2019b) using the app FlipGrid revealing how their Tudor medicine is created, enhancing their learning of how to put text and images onto video and how to upload it online. Additionally, this enhances oracy skills as children will "emphasise key points, sequencing an explanation" (DCELLS, 2016a). Reissman (2017) believes that rather than banning YouTube, teachers should find smart ways to use it. Therefore utilising YouTube and FlipGrid can be an effective means to show different subjects and issues realistically (Alismail and McGuire, 2015). This correlates with creating enterprising, creative contributors ready to play a full part in life and work (Donaldson, 2015) as they are learning skills that will aid them within the future.

The Theme-Based Model
Benefits, Limitations and Solutions



Theme-based approaches are the most common in schools, as it causes exploration through different subjects (Barnes, 2015). More than two or three subjects are recommended when utilising this model, however the subjects should not be forced as some links between subjects are unnatural (Hayes, 2010). Estyn (2016) agree with using theme-based learning within primary schools as Ty'n y Wern Primary School has introduced interesting cross-curricular themes which give pupils a variety of opportunities to develop their literacy, numeracy and ICT skills. Literacy, numeracy and digital competence should be the responsibility of all teachers to develop throughout subjects (Donaldson, 2015) therefore, utilising the theme-based model allows this to occur.

- ✓ When this model is in the hands of confident knowledgeable teachers, it works well to develop motivation in children (Barnes, 2015).
- ▪ Although, Ofsted (2009) proposes some teachers' subject knowledge is inadequate, therefore the theme-based model may be confusing for these teachers as there is a mixture of subjects.
- ✧ Solution- Perhaps these teachers can begin with multidisciplinary teaching as each subject is separate, and there are less subjects to teach at one time therefore can develop towards the theme-based model.
- ✓ The theme-based model creates authentic learning (Barnes, 2015) achieving one of Donaldson's (2015) 12 pedagogical principles of creating authentic learning environments.
- ▪ However, this teaching model must be well-planned (Barnes, 2015) which can become time consuming and it is already established that teachers need more time to complete everything else that occurs within education (Steele, 2019).
- ✧ Nevertheless, this model allows for more than three subjects to be taught during a unit of work (Barnes, 2015) allowing teachers to combine an array of different skills together for children to achieve, therefore could be deemed as time saving, which allegedly enables children to progress quicker, understanding how to use an array of skills in various subjects and situations (Johnston, 2012).