

The Oxford English Dictionary (2019) defines creativity as being the “power to create.” However, many children believe that creativity is the same as art (Elton-Chalcraft, 2015). This misconception leads many people to think they are not creative, even though “creativity means a person’s capacity to produce new or original ideas”(Vernon, 1989,p.94). Dacey and Lenon’s (1998) four attributes for a creative personality are: self-control, perseverance, determination and sustained hard work. These characteristics confirm that creativity is more than just an artistic ability and that creativity consists of components that all people possess. Additionally, enterprise learning is designed to “help young people be creative and innovative, to take risks and manage them, and do this with determination and drive”(DfE, 2010,p.12). Therefore, creativity is inextricably linked with enterprising skills and is becoming an increasingly vital modern skillset (Donaldson, 2015). It is beneficial for children to be provided with creative opportunities because they increase children’s self-esteem and overall attainment (NACCE, 1999). However, as the Government prioritise teaching time to improve literacy and numeracy, practitioners will have to ensure that creativity can be interwoven across the curriculum (Jeffrey and Woods, 2003; Grainger et al, 2004; DES, 2012). Consequently, there will be an analysis into my personal creativity and its position in education.

Creativity and enterprise skills are becoming increasingly prominent in Welsh education as students will be encouraged to be “enterprising, creative contributors”(Donaldson, 2015,p.31). The Welsh Assembly Government asserts that the Foundation Phase (FP) shows that creativity is not restricted to the Creative Arts and that “creative thinking is essential to other areas of everyday life”(DCELLS, 2008,p.5). Consequently, practitioners must recognise creativity as a key skill that must be fostered throughout the curriculum. However, schools are currently failing to provide opportunities for both students and teachers to be creative (Robinson, 2001; Sommer and Sommer, 2014). Sommer and Sommer (2014) conducted research which involved the same children completing the NASA creativity test across a ten year period to measure the proportion achieving the genius status. Initially, ninety-eight percent of aged three to five year olds achieved genius status. However, this percentage decreased to thirty-two five years later and only ten a further five years later. Thus, this signifies that schools are teaching children how not to be creative thinkers. This echoes an observation from Professional Teaching Experience (PTE), whereby teachers placed emphasis on literacy and numeracy rather than creative skills because the school was

evaluated on their pupils' literacy and numeracy tests. This highlights that teachers need to be supported in developing creative skills amongst curricular subjects.

To understand creativity in education it is vital to split creativity down into teaching creatively and teaching for creativity. Teaching creatively engages students in the learning, allowing them to participate in a journey of discovery (DfES, 2003). During PTE I taught creatively by dressing up as a character from our book which motivated the children in their learning (Appendix A). Whereas, teaching for creativity should develop children's creative thinking skills (Morris, 2006). Teaching for creativity involves designing pupil led activities which develop children's creativity (Horner and Ryf, 2007). During PTE, the children and I created a KWL grid for our topic which allowed their ideas to be valued and is a philosophy reinforced by the Children's Commissioner for Wales (2017) (Appendix B). To develop children's creativity skills, children need to be allowed to become more adventurous in their learning. However, Ferrari, Cachia and Punie (2009) state that teachers prefer to teach conforming children rather than risk takers. Nevertheless, it is paramount that teachers take on the responsibility of developing children's creativity because "65% of children [...] will ultimately work in jobs that don't exist today, putting creativity, initiative and adaptability at a premium"(WEF, 2016,p.4). These findings reinforce the necessity for creative skills to be taught in schools.

Currently in Wales, the QTS standards require trainees to establish a creative classroom, yet, there is no explicit requirement for teachers to be creative (DCELLS, 2009). However, because creativity is a paramount skill I will analyse and critique my personal creativity as a teacher using the Entrecomp Framework (EF) (2016). The EF (2016), designed by the European Commission, provides a rubric framework describing fifteen competences which could enhance creativity and enterprising skills in the classroom. Using the creativity competency, I would assess my current level of creativity as "Alone and as part of a team, I can develop ideas that create value for others"(JRC, 2016, p.24). My planning from PTE shows that I can work with additional adults to create ideas about the enhanced provision is was valuable for the children (Appendix C). I have also shown that I can deploy additional adults around the classroom to maximise the learning experience (Appendix D). Moreover, my lesson plan shows that I can develop my ideas into creative and exciting lessons

(Appendix E). This was emphasised on PTE by my mentor who stated “I liked the way you challenged the children to extend their ideas”(Shepherdson, 2018,p.1). My Assisted Reflective Conclusions (ARC) for this session highlights the positive impact that this had upon the students (Appendix F).Therefore, to develop my creativity further, I will “experiment with different techniques to generate alternative solutions to problems, using available resources in an effective way”(JRC, 2016, p.24). Although Welsh students need to learn to “think creatively to reframe and solve problems”(Donaldson, 2015,p.31), this aim is also applicable to my practice. I aim to achieve Donaldson’s (2015) aim by developing my ability to think divergently, which Kaufman and Sternberg (2010) describe is the fluency, originality and flexibility. Therefore, I will spend an increased amount of time planning my practice to ensure that fluency, originality and flexibility are evident. For example the potential locations and resources used (Appendix G).

Another competence from the EF (2016) is motivation and perseverance. Currently, “I can judge when it is not worth continuing with an idea” in the classroom (JRC, 2016, p.28). During PTE, I over-analysed and was critical in my ARC reflections (Appendix H). This condemning approach to my reflection was identified by my mentor who commented “You are overly reflective and identify your own weaknesses to continually try to improve” (Shepherdson, 2017,p.1). Therefore, to improve this competence I aim to “persevere in the face of adversities when trying to achieve my goals”(JRC, 2016, p.28). Firstly, I will ensure that my ARCs find successful aspects as well as areas for improvement because Cole (2007) and Scales (2012) place an emphasis on finding the positives in reflection which will support the children’s learning. Moreover, Pollard et al (2008) state that reflective teachers must ensure that both their practice and the children’s learning experience is improving. Also, I aim to achieve this competence by teaching more creatively, such as using the outdoor environment to improve pupil engagement. Evans (2017) asserts that Wales requires teachers who are actively aiming to improve their teaching by being creative and innovative and, so, I aim to “take measured risks”(Donaldson, 2015,p.31) in my teaching. However, the EF (2016) is limited because some of the competencies are tailored specifically to business entrepreneurship and, resultantly, have no relevance to the classroom. Additionally, although the framework does show the development stages for the competencies, there is no recognition in how to achieve the stages and the time period for the completion of the stages. Snow and Campbell (2017) state that designated time must be set aside in the classroom to

develop creativity. Yet, the EF (2016) does not explain the amount of time required to complete the stages or the expected age for each stage. This lack of information could be confusing for practitioners wishing to develop the framework in their schools.

Therefore, an example will be provided detailing how Seelig's (2018) 'Innovation Engine' can be utilised to teach creative Mathematics. The model depicts three inner values: attitude, imagination and knowledge. These are surrounded by three external factors: culture, habitat and resources (Appendix J). The first of Seelig's (2018) internal factors is attitude which is vital to developing children's creativity and, thus, teachers must not dismiss a child's creative idea because their attitude might become pessimistic towards creativity. Rominger et al (2018) suggest that students need to be placed into a state of relaxation in order for them to think divergently. Relaxation can be achieved by utilising Csikszentmihalyi's (1990) 'Theory of Flow' to set tasks containing a high skill and low challenge level. Moreover, Dweck (2008) and Ross (2008) comment that achievement is dependent upon effort and, thus, a willing attitude will encourage pupils to attempt creative tasks. Additionally, Grigg (2010) asserts that for Mathematics in particular students must be supported in feeling that they can succeed in the subject. Therefore, teachers could offer incentives to motivate children to be creative. Kohn (1999) asserts that children develop extrinsically first, through the offering of an incentive, before becoming intrinsically motivated. Consequently, to develop children's creativity, children need to be extrinsically motivated by offering incentives first. However, Glucksberg (1962) discovered that offering an incentive panicked the participants and increased the time it took to complete the task, thus, having a detrimental impact on children's creativity. Additionally, Kounios and Beeman (2015) comment that deadlines have a negative effect in developing creativity because pressure blocks the ability to overcome functional fixedness. However, as observed during PTE, schools are limited in the amount of time they can dedicate to creativity. Therefore, although children can be supported in having a confident attitude in their creativity, schools must ensure that time is made available to teach creativity across the curriculum.

Imagination, which is the second internal aspect of Seelig's (2018) model, is inextricably linked with mathematics and creativity. Claxton (2002) asserts that mathematics involves using your imagination to solve problems by creating solution. However, although children

will need to use their imagination in mathematics, it is vital that children are provided with real scenarios to place the mathematics into context (Pound and Lee, 2011; Donaldson, 2015). During PTE, the concept of halves was introduced practically, firstly by modelling what a half was and by then asking children to go and find halves in the classroom (Appendix K). This activity was conducted in small groups of three, in the hope that the children's ideas would enhance one another's learning. This session adhered to Donaldson's (2015) outlook on the curriculum, whereby children should "work collaboratively" (Donaldson, 2015, p.44). However, according to the Adobe (2012) study, 73% of UK participants would rather work in isolation than collaboratively when being creative. Therefore, in hindsight, potentially this task could have been more beneficial to the students if they had been asked to find the halves individually and, thus, develop their own imagination.

The final internal aspect within Seelig's (2018) model is knowledge. Both Devlin (2000) and Pound (2008) note that it is important that children have the mathematical knowledge to reframe problems. Additionally, Cohen and Levinthal (1990) argue that knowledge is required to develop creative solutions, suggesting that knowledge is imperative in the creative process. However, Stenmark (2000), Reiter-Palomon and Illies (2004) state that having more information stops people from thinking creatively. During PTE, Year One children were asked to create a large shape with ten lollipop sticks and were able to think creatively using techniques such as halving the sticks (Appendix L). However, Year Five children were challenged to create shapes with an area of 25cm^2 but were unable to think beyond regular polygons (Appendix M). Analysing the work produced by the two groups of children suggests that children do not need specific mathematical knowledge to be creative. This highlights that Seelig's (2018) model is limited in its effectiveness. Therefore, I propose that 'Time' should replace knowledge as the third internal aspect to creativity. Burton (2009), Henry (2013) and Wallas (2014) assert that in order to be creative people must have separation time from the activity to then revisit the scenario with advanced ideas. Sawyer (2012) believes that this incubation period is important when developing ideas because he himself has often developed a concept when he has not been intentionally thinking about any specific idea. Additionally, Dijksterhuis and Meurs (2006) discovered that the completion of a distraction task mid-way through a creativity activity led to an increase in the number of creative ideas produced. Consequently, this research indicates the importance of incubation time to develop

creativity in mathematics signalling that time should replace knowledge in Seelig's (2018) model.

Additionally, Seelig (2018) depicts three external elements which impact upon children's creativity. Firstly, resources are one aspect that can develop creativity in mathematics and these resources range from tangible to abstract. Physical resources are paramount in mathematics as they provide children with a concrete understanding of a concept (Morgan and Suter, 2014). During PTE, I expressed the difficulties that I faced when not using physical resources to aid Mathematical understanding (Appendix N). Additionally, the practitioner is vital in the development of creativity. Teachers need to be flexible in their teaching methods and adapt to changes that occur in the learning (Craft, Jeffrey and Leibling, 2001; Joubert, 2001; Desailly, 2012). Robinson (2001) asserts that many schools teach facts rather than skills which limit the children's depth of knowledge. Consequently, for creative learning to take place, learning should evolve from teacher-led 'pedagogical' learning to an andragogy approach. Knowles (2015) asserts that bidirectional learning is built upon a collaborative approach whereby teachers and students work in parallel. However, to develop creative learning the classroom could become a heutagogy learning space, whereby children become the drivers of their learning. During PTE, the children could choose the way they expressed their homework which mirrors the characteristics of heutagogy. The results were original to the children, highlighting the potential of this heutagogy approach.

Additionally, written resources, such as Assessment for Learning (AfL), is a crucial element in the classroom because students learning time can be increased if formative assessment is embedded across AoLEs (Wiliam, 2009). Both Black and Wiliam (1998) and Donaldson (2015) assert that formative assessment must be interwoven into all teaching. One effective AfL method is using show-me whiteboards (SMW), which is a WAG (2010) recommended strategy (Appendix O) and is a beneficial method because immediate feedback about areas of weakness is provided for the teacher (Blanchard, 2009). During PTE, I used the SMW to provide children with a reasoning task as children had to find as many mathematical ways of calculating forty-four, which allowed me to assess the number, variety and accuracy of their calculations (Appendix P). This method was effective because I was able to immediately provide the children with verbal feedback that was beneficial to their understanding.

However, when providing feedback schools must ensure that their comments are accessible to the children (Hattie, 2009) because otherwise the feedback is not beneficial to the children's development (Estyn, 2015a). Additionally, another method that can be utilised to assess children's creativity is the Torrance Test (Torrance, 1966) which, according to Davis (1997), is the most commonly used method of assessing creativity. Although labelled a 'test', Torrance (1966) wanted children to feel at ease during its completion. Hébert et al (2002) express that the Torrance test also provides an understanding of how best to develop creativity as a school. For example, if the children did not show fluency then this would be an aspect to develop as a whole school initiative. However, Baer (2011) argues that the tests cannot be labelled as a creativity test because they do not assess all eight elements of divergent thinking. Nonetheless, perhaps the Torrance Test could be used in schools to support the assessment of creativity. This is because teachers are restricted in their assessment of children's creativity to the level descriptors from the curriculum and, thus, it does not explicitly label the eight elements of divergent thinking and explain how to enhance these skills (Appendix Q). This lack of curriculum guidance reinforces the importance that resources, like the Torrance Test, have for developing creativity in mathematics.

The second external aspect of Seelig's (2018) model is habitat and Gandini, Edwards and Forman (1998) state that the environment is an advantageous factor for children's learning. The physical classroom environment has a direct impact on student achievement (Mortimore et al, 1988; Muijs and Reynolds, 1999; Wang, Haertel and Walberg, 1997). As observed during PTE, the majority of lessons are conducted in the classroom due to convenience. However, the classroom environment can be defined as being physical, social, atmospheric and embodying norms and values (Creemers and Rezigt, 1999). For Mathematics, outdoor learning is a powerful tool because it allows children to become practically involved in the concept (Skinner, 2005). Oppezzo and Schwartz (2014) argue that walking outside showcased the highest level of divergent thinking. Furthermore, Berman, Jonides and Kaplan (2008) compared walking in an urban landscape with a rural area and discovered that there was an increase in the performance of participants in the completion of a rural walk in comparison with the urban walk. Therefore, children should be taken on nature walks around the school to generate ideas rather than sitting in classrooms. Additionally, the habitat must offer children the chance to take risks and, thus, be encouraged to make mistakes (Lucas, 2011 and Chandler, 2015). Children must be taught to recognise that, at times, failure is

necessary in order to improve and become valued members of society (Taylor, 2013; McDonough, 2015; West-Knights, 2017). Therefore, the learning environment is vital in supporting both creative teaching and learning.

The final external aspect of Seelig's (2018) model is culture. For both Mathematics and creativity, modern society believes that you are born able to achieve in these areas. Cockcroft (1982) discovered that many adults lack the confidence to admit that they are numerate, and this fear mirrors the culture for creativity also. Robson (2015), Hindin and Mueller (2016) comment that parents have a deep-rooted angst of mathematics and, consequently, fear how best to support their children. Additionally, Meador (1992), Penaluna and Penaluna (2015) recognise that children grow out of being creative as they mature. Resultantly, schools must support children in their primary education to develop and foster their creativity skills. Estyn (2015b) recognises Ynystawe School as best practice for encouraging children's creative thinking by implementing the 'Leonardo effect'. In particular, one term involves the children developing their creativity in mixed year classes. However, to further enhance this practice, the school could allow FP children to mix with Key Stage Two (KS2) children in their topics because "younger children do not seem to suffer from functional fixedness" (German and Defeyter, 2000, p.710). The reason being is that as children become more knowledgeable, they struggle to 'think outside of the box' and devise a creative solution to a problem (Munoz-Rubke, et al 2018). By mixing FP and KS2 children, older children will feel supported and increased in their creative abilities through overcoming their functional fixedness. Resultantly, our society would evolve into a culture that accepts everyone's creativity and allows both children and adults to develop their creativity.

To conclude, there is a misconception that creativity is restricted to the expressive arts. However, as Kampylis and Berki (2014) comment, creativity is about developing questions, experimenting and evaluating ideas. Maslow and Webb (2013) recognise that schools must provide students with the opportunity to unleash their creativity because children's self-esteem, which is the penultimate stage of needs, can be satisfied by the opportunity to be creative. My personal analysis into my creativity highlights that my practice does have creative attributes but can also be improved upon. Additionally, Seelig's (2018) model shows how to implement creativity in Mathematics. This model is excellent because schools teach

Mathematics daily and, consequently, creativity skills could be developed and exercised daily. Donaldson's (2015) curriculum recognises that creativity skills are crucial in an evolving society and comments that students must be taught to use "technology creatively"(Donaldson, 2015,p.8). On the one hand, Chamorro-Premuzic (2015) notes that technology is discouraging children to be creative, for example through the use of predictive text whereby children are not having to think for themselves. However, alternatively, human attributes and technology should work in parallel to each other to further enhance productivity (NRC, 2003). Therefore, schools will need to find the balance between developing children's creativity in technology and also developing children's creativity by hand.

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Appendix A

Name of Trainee: <u>Megan Jones</u>		Session ref: _____		Date: <u>Thursday 25th January</u>		Class: <u>Reception and Year 1</u>		Cynllun Ffocws y Cyfnod Sylfaen 2d
Targed(au) Hyfforddi Personol		S3.1.4 plan for the deployment of additional adults support for learning		Number of learners: <u>26</u>		Age: <u>4 - 5 year olds</u>		
Learning objectives/intentions:	To predict what will happen in an experiment when materials change state.	Success Criteria	To understand what changing state is. To understand what happens to a material when heated, froze etc.		Meeting learners' needs:	Myles and Cain may require support to express their ideas.		
Introduction/plenary tasks		Main activities		Resources/ Key Vocabulary		Assessment for Learning (strategies and opportunities)		
Introduction Introduce the children to the term 'transformation' and discuss melting and freezing. Show the children the melting video. Reinforce hazards in muck, mess and mixtures.		Trainee focused task MJ to dress up as Granma from George's marvelous medicine. Read page from book about Granma eating insects to give her brain power. Children to help Granma find and eat her bugs. Children to search observe frozen bugs in tubs. Discuss what is ice. Use cold water, salt and bicarbonate soda to melt the ice, predicting which material children think will work fastest to free the bugs. Additional adult tasks CD Follow the recipe for making Mars bar crispy cakes, making prediction about which products will melt and how the ingredients will change when heated and cooled. Cool in fridge, cut into squares and have for the way home. TJ Follow a recipe to make some bird feeders (getting their hands mucky) ready for next week when the children will observe birds ready for the RSPB great bird watch.		Resources Melting and freezing video Ice tubs with insects inside Cold water Salt Bicarbonate soda Mars bars Heating reciprocal Lard Recipe for bird feeder Seeds Key Vocabulary Transformation Changing states Melting Freezing Boiling		What do the children already know about changing states? What will happen if? Are the children actively participating? (Observation sheets for trainee and additional staff to fill in to record the children's involvement Conclude each task with the children. What have we discovered as a group?		
Plenary To recap on what everyone has experienced today! What is melting? What is freezing?		Independent learning opportunities: CP (laid out by class teachers will be amser enfys.) Children will mainly be adult led this afternoon!						

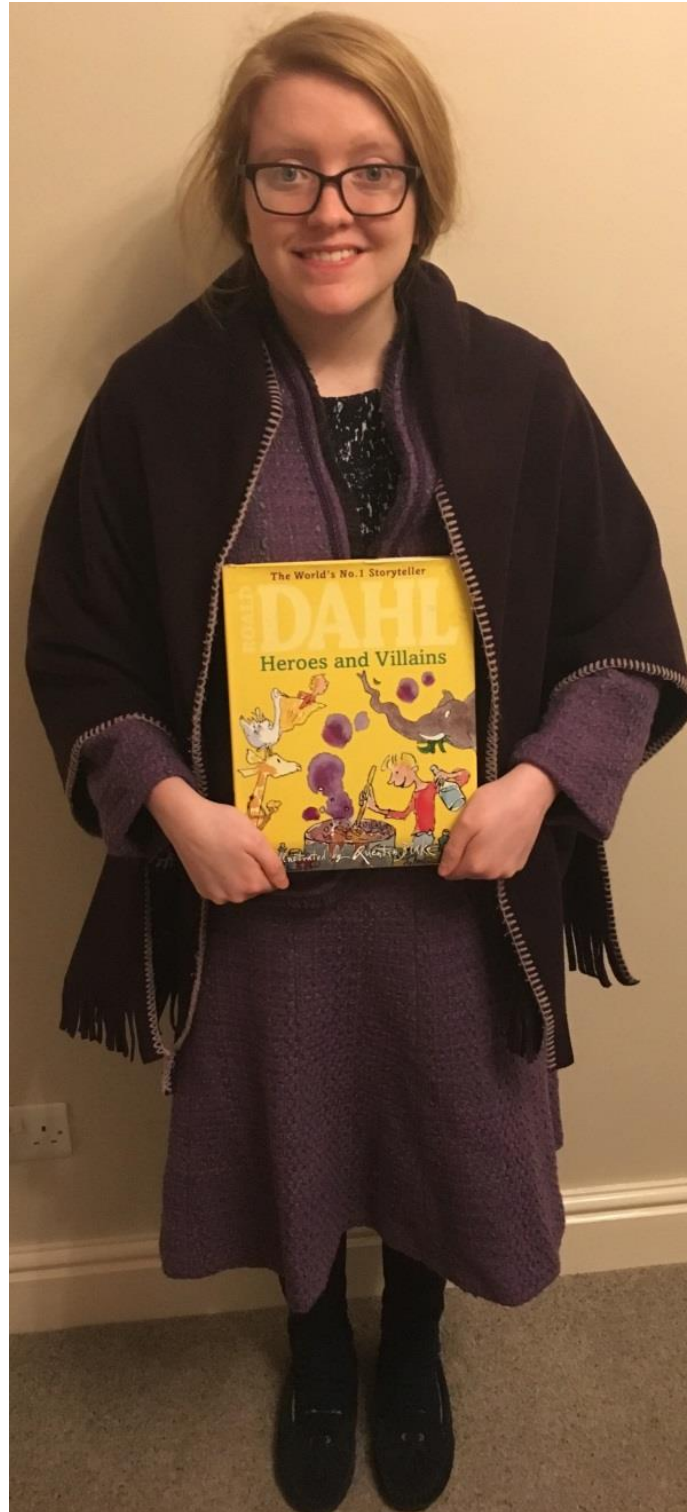
Curriculum coverage (range and skills) KNOWLEDGE AND UNDERSTANDING OF THE WORLD Understand how some everyday materials change in shape when stretched, squashed, bent and twisted, and when heated or cooled Exploring and experimenting Thinking about questions and then asking them and listening to the answers	
Literacy (LNF) Contribute to conversations and respond to others, taking turns when prompted Take part in activities with others and talk about what they are doing	Numeracy (LNF) Identify steps to complete the task or reach a solution
Thinking The children will have to think about why these materials are changing state. Prompt with questions 'what will happen if...?'	YCC Linguistic Incidental Welsh planning in folder

Megan demonstrated professional characteristics which motivated learners when she dressed up in class. By dressing up as a character from the book the children are studying, Megan inspired and motivated the learners in the focus task. The children were all very engaged and were able to meet the learning objective.

Signed: CDanes

Position: Class Teacher

Date: 08.02.18

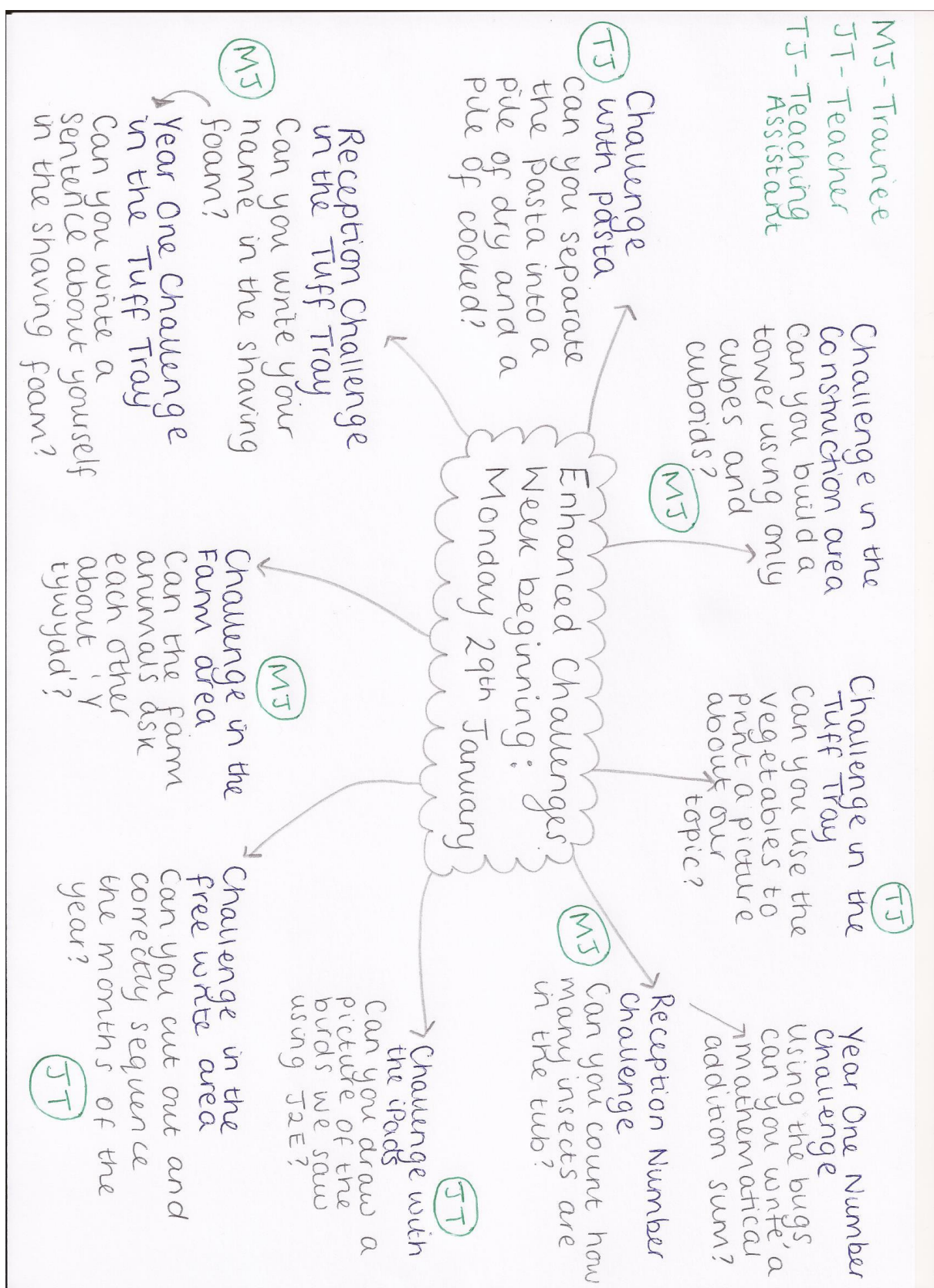


Dressing up as Grandma from George's Marvellous Medicine

Appendix B

Muck, Mess and Mixtures			
What I know		What I want to know	
K	W	L	
Mud is messy You can play in mess You mix when you are cooking Muck is found on a farm.	How is slime made? Do colours change if they are mixed? How do you make bread? Why is muck found on a farm?	Different colours can be mixed together to make different colours. Bread is made by mixing flour, yeast, milk and eggs. The yeast makes the bread rise. Animals live in the 'muck' otherwise known as the mud. Pigs, for example, like to roll around in the mud.	

Appendix C



Appendix D

Name of Trainee: <u>Megan Jones</u>	Session ref: _____	Date: <u>Tuesday 23rd January</u>	Class: <u>Reception and Year 1</u>	Cynllun Ffocws y Cyfnod Sylfaen 2d	
Targed(au) Hyfforddi Personal	<u>53.1 ability to plan for learning experiences both indoors and outdoors</u>	Number of learners: <u>26</u>	Age: <u>4 - 5 year olds</u>		
Learning objectives/intentions:	To create a messy piece of natural art based on an element of art. To use our senses to describe jelly in different states. To explore the properties of shaving foam.	Success Criteria	To understand that art can be made from natural materials. To understand that some materials can alter in state. To describe different materials.	Meeting learners' needs:	These sessions should be accessible to all. Some (LA Rec) may require help expressing their opinions about materials.

Introduction/plenary tasks	Main activities	Resources/ Key Vocabulary	Assessment for Learning (strategies and opportunities)
Introduction Remind the children about our topic. Explain to the children that today we will all be getting a bit messy and using our all of our senses. Play the children the senses video. Explain that at each focus task the adult will explain to you which senses you will be using! Reinforce the importance of not putting things in our mouths and importance of washing our hands!	<u>Trainee focused task</u> Plan A (If weather is dry). Take children outside to create a group piece of art that fills the tuff tray. Decide what element of arts they wish to focus on, e.g., colour, tone, pattern, texture etc. Children to go and find natural things, e.g. grass, mud, leaves etc). Once completed, ask the children to write down words that describes our sculptures and build up a mind map. (Scribe if require.) [Take photos on the iPad] Plan B (If weather is poor). Take children to the shelter area outside of class 2. Explain that because the weather is poor, you have had to gather the natural materials yourself (whereas you would have preferred the children to have collected them!). Explain that, as a group, we will make a piece of art that fills the tuff tray. Decide what element of arts they wish to focus on, e.g. colour, tone, pattern, texture etc. Once completed, ask the children to write down words that describes our sculptures and build up a mind map. (Scribe if require.) [Take photos on the iPad]. <u>Additional adult tasks</u> JT: Explore consistencies of jelly in cubed, liquid and set form. Mix different flavours and talk about the smells and tastes, expressing a preference. Provide an opportunity for children to respond to their experiences through mark making activities. Children to taste the jelly and also feel the texture. Scribe any words the children use to describe their senses. [Take photos] TJ: Explore the properties of shaving foam and gel. Encourage the children to make patterns in squirted foam, create foam from gel by rubbing and mixing it with water. Prompt children with 'what does it feel like, smell like, look like?' Add other materials for further interest such as glitter and sequins. [Take photos]	<u>Resources</u> Senses video Sugar paper Shaving gel Glitter Sequins Jelly [a few flavours] (including one set!) Large sheets of sugar paper <u>Key Vocabulary</u> Elements of art Senses Jelly Properties Flavours Creative	Which element of the art are we going to choose? What words can we think of to describe the piece of art? What can you smell? What does it feel like? Can you see a difference between...? What do the children think is going to happen to the shaving foam? Can the children express their opinions about the material Photo's on the iPads to be stuck into the children books as evidence.

Plenary Discuss what we have found out using our senses!	<u>Independent learning opportunities:</u> Playdough challenge: to make different potion bottles! Pasta challenge: children to sort the cooked from the dry pasta Building block challenge: children to build tower's with blocks only with even numbers Role play challenge: children to practice their Welsh in the role play area using the Fflic and tedi twt masks Free write challenge: Can you write a wish?		
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Curriculum coverage (range and skills) KNOWLEDGE AND UNDERSTANDING OF THE WORLD Thinking creatively and imaginatively Exploring and experimenting Making observations CREATIVE DEVELOPMENT Explore, investigate and use outdoor learning environments Explore and experiment with a variety of techniques and materials Make choices when choosing materials and resources Develop their understanding of planning, designing, modelling, modifying and reflecting Develop and use their understanding of colour, line, tone, texture, pattern, shape and form	
Literacy (LNF) Use capital letters and full stops with some degree of consistency Follow a form modelled by the teacher Take part in activities with others and talk about what they are doing Contribute to conversations and respond to others, taking turns when prompted	
ESD&C Natural Environment Learners should be given opportunities to develop a sense of awe and wonder at the beauty of landscapes, habitats and living things	YCC Linguistic Incidental Welsh planning attached.

	Session 1 9.50 - 10.15	Session 2 10.15 - 10.40	Session 3 11.00 - 11.30 (Tidy up during last 15 mins)
MJ Location: Outdoors/under shelter Task summary: Plan A (If weather is dry). Take children outside to create a group piece of art that fills the tuff troy. Decide what element of arts they wish to focus on, e.g. colour, tone, pattern, texture etc. Children to go and find natural things, e.g. grass, mud, leaves etc.) Once completed, ask the children to write down words that describes our sculptures and build up a mind map. (Scribe if require.) [Take photos on iPad] Plan B (If weather is poor). Take children to the shelter area outside of class 2. Explain that because the weather is poor, you have had to gather the natural materials yourself (whereas you would have preferred the children to have collected them). Explain that, as a group, we will make a piece of art that fills the tuff troy. Decide what element of arts they wish to focus on, e.g. colour, tone, pattern, texture etc. Once completed, ask the children to write down words that describes our sculptures and build up a mind map. (Scribe if require.) [Take photos on iPad]. L.O: To create a messy piece of natural art based on an element of art.	Morgan Carys Oscar Leo Cain Molly M Jessica Elsie F Henry	Zander Bronwen Owain Joe Roslin William Benjie Anyia	Jack Molly W Cian Oscar Elsie C Leo Cain Molly M James William Alexsander Myles Kate
JT Location: red and blue tables in classroom Task summary: Explore consistencies of jelly in cubed, liquid and set form. Mix different flavours and talk about the smells and tastes, expressing a preference. Provide an opportunity for children to respond to their experiences through mark making activities. Children to taste the jelly and also feel the texture. Scribe any words the children use to describe their senses. [Take photos on iPad] L.O: To use our senses to describe jelly in different states.	Jack Molly W Cian Oscar Elsie C Mille James Alexsander Myles Kate	Morgan Carys Oscar Leo Cain Molly M Jessica Elsie F Henry	Zander Bronwen Owain Joe Roslin William Benjie Anyia
TJ Location: Tuff troy in classroom Task summary: Explore the properties of shaving foam and gel. Encourage the children to make patterns in squirted foam, create foam from gel by rubbing and mixing it with water. Prompt children with 'what does it feel like, smell like, look like?' Add other materials for further interest such as glitter and sequins. [Take photos on iPad] L.O: To explore the properties of shaving foam.	Zander Bronwen Owain Joe Roslin William Benjie Anyia	Jack Molly W Cian Elsie C Mille James Alexsander Myles Kate	Morgan Carys Oscar Leo Cain Molly M Jessica Elsie F Henry

Appendix E

Name of Trainee: Megan Jones		Session ref: _____	Date: Monday 29 th January	Class: Reception and Year 1	Cynllun Ffocws y Cyfnod Sylfaen 2d
Targed(au) Hyfforddi Personol	S1.6 They recognise and understand the contribution provided by and needed from support staff		Number of learners: 26	Age: 4 - 5 year olds	
Learning objectives/intentions:	To take part in the Great Garden Bird Watch by counting the birds we can see, discussing which breed we saw most. To understand the importance of washing and to take part in washing up. To use Welsh artist Lizzie Spikes as inspiration to print leaves focusing on the element of colour.	Success Criteria	To understand why we feed the birds. To appreciate the importance of washing up. To understand the colour element of art.	Meeting learners' needs:	Year one's should be writing their own phrase to describe the washing. Reception may need some support in writing a word. LA Rec will need the adult to scribe.

Introduction/plenary tasks	Main activities	Resources/ Key Vocabulary	Assessment for Learning (strategies and opportunities)
Introduction Introduce the session to the children. Explain that there will be a variety of activities linking to our topic. Briefly explain what the children will be getting up to.	Trainee focused task Ensure that the bird feeders are hanging up outside. Plan A (If weather is dry). Take part in the Big Garden Bird Watch by going outside and counting the birds. Discuss the importance of counting the birds and why we made bird feeders last week. Discuss which bird we saw the most, didn't manage to see etc. Plan B (If weather is poor). Take part in the Big Garden Bird Watch by going to a window and counting the birds. Discuss the importance of counting the birds and why we made bird feeders last week. Discuss which bird we saw the most, didn't manage to see etc. Additional adult tasks JT: Wash clothes, fabric, or utensils in soapy water and help to clean up spaces after messy play. Children can wash the tuff tray with shaving foam in. Discuss the importance of washing up our belongings, importance of keeping clean. As a plenary, children to write a word to describe washing onto sugar paper (scribe if required). [Take photos] TJ: Introduce the children to Lizzie Spikes (Welsh artist from Aberystwyth). Show paintings. What do you notice (looking for she paints on natural materials with bright colours!). Explain to the children that they will be painting onto leaves but then printing onto paper. Children to paint a potion, focusing on colour. [Take photos]	Resources Bird counting sheets Washing up liquid Dirty pieces of cloth Leaves Paint Key Vocabulary Birds Counting Feeding Washing Soapy water Element of art Inspiration	Additional adults to complete observation of involvement form to track the learners throughout the focus task. Photo's on the iPads to be stuck into the children books as evidence.
Plenary Discuss what we have found out during each activity.	Independent learning opportunities: Pasta challenge: Can you separate the pasta into a pile of dry and a pile out cooked? Tuff tray challenge: Rec- Can you write your name in the shaving foam? Y1: Can you write a sentence about yourself? Free write: Can you colour in the month with your birthday and write the month underneath? Farm challenge: Can the farm animals ask each other about Y tywydd?		

Curriculum coverage (range and skills) KNOWLEDGE AND UNDERSTANDING OF THE WORLD Thinking creatively and imaginatively Exploring and experimenting Making observations Identify the effects the different seasons have on some animals and plants CREATIVE DEVELOPMENT Explore, investigate and use outdoor learning environments Explore and experiment with a variety of techniques and materials Develop their understanding of planning, designing, modelling, modifying and reflecting Develop and use their understanding of colour PERSONAL AND SOCIAL DEVELOPMENT, WELL-BEING AND CULTURAL DIVERSITY Become independent in their personal hygiene needs and to be more aware of personal safety	
Literacy (LNF) Reception Take part in activities alongside others, with some interaction. Exchange ideas in one-to-one and small group discussions Copy and write words and phrases Year one Take part in activities with others and talk about what they are doing Contribute to conversations and respond to others, taking turns when prompted Write words and phrases	
ESD&C Natural Environment Learners should be given opportunities to develop a sense of awe and wonder at the beauty of landscapes, habitats and living things.	YCC Linguistic Incidental Welsh planning attached. Cultural To gain an understanding about Welsh artists

Appendix F

Assisted Reflective Conclusions (ARC) Model

Dyddiad/Date: Monday 29th January 2018

Digwyddiad critigol (Ffocws)/Critical incident (focus): Topic: range of activities.

Profiad/ Experience	
Feelings <i>"What are your feelings regarding the experience?"</i>	I'm feeling positive after today's session because the children all seemed to enjoy the session and the adults were very positive about the activities that the children completed.
Remember and Understand <i>"Can you list the aspects of the learning experience that went well?"</i> <i>"What were the elements of the learning experience that were disappointing?"</i>	I am so chuffed that all the children were able to have a go at all of the activities on offer today. I think that using the timetable to organise the children and staff worked really well and I will continue to do this in topic sessions. I think the children all gained good skills from this afternoon, particularly oracy. I don't think there are any disappointing aspects of this session.
Evaluate and analyse <i>"What will you keep the same to ensure effective teaching and learning in the future?"</i> <i>"What was the cause of the most important disappointing element?"</i>	I will continue to timetable the activities, labelling what children are in what group, at what time and what the activity is for the adult. I will do this in where appropriate in my planning. There were no disappointing elements to today's session.
Conclusions and actions <i>"What are your possible solutions to the disappointing issues identified?"</i> <i>"What will you do next?"</i>	I will continue to make timetables when using additional adults. This will have the task description, learning objective, layout of whole session, location and names of children. I will also ensure that all children are given the chance to be involved in all of the activities.
Y profiad newydd / Transformed experience	

Appendix G

Canolfan Addysg Athrawon De-Orllewin Cymru  The South West Wales Centre of Teacher Education		1B
Session Plan - Key Stage 2		
Name of trainee: Megan Jones		Session ref: Tuesday 14 th November 2017 Welsh Second Language Building sentences
Personal target(s) in relation to QTS: To increase my diversity of Assessment for Learning strategies used in the classroom		
Year group: 5 and 6	No. of learners: 36	ALN: Sarah will sit on the table with Cellan, Matilda, Olivia, Georgina and Sophia.
Additional Adults: Sarah [Class Teacher] Helen [Teaching Assistant]		
Learning objective(s): To write a variety of phrases and sentences accurately.		Success criteria: Year 5: Extend the sentence by including a connective or personal opinion or third person. Year 6: Extend the sentence by including a connective and a personal opinion and a third person.
Links to previous learning: The children have been looking at building sentences and have completed a lot of work onto the white boards. Now the children must get sentences written into their books.		
Curriculum coverage: WELSH SECOND LANGUAGE Skills: Write a variety of phrases and sentences accurately. Range: Write in a variety of forms. e.g posters. (This is what the children will be working towards).		
Literacy(LNF) Oracy Express issues and ideas clearly, using specialist vocabulary and examples Writing Use varied and appropriate vocabulary, including subject-specific words and phrases		
ESDGC Culture and Identity The children will use the Welsh language and feel excited to use it; feeling a sense of patriotism and identity.		YCC The linguistic element will be addressed as the children will be practicing using the language.
Key vocabulary(English/Welsh): Gwelais, Bwytais, Yfais, Prynais.		
Time	Session activities, organisation and management	Key questions & Assessment for Learning opportunities
	Introduction Children will play a game of snakes of ladder. Using the interactive dice, a number will be selected. Children will count with teacher on the board, and land on a square with a picture. The teacher will provide children with a sentence starter and the children will have to finish the sentence and tell me.	Where is this lesson taking place? Could it be taken outside? The children could play a large game of physical snakes and ladders rather than an interactive version.

To make this more engaging, could the children outside catch a ball when it is their turn to answer. The children will have to have an answer ready

This is not very engaging for the children. Could the sentences be attached to pieces of 'Duplo' and the children could physically build the sentences?	Main activities The teacher will go through the power point showing the children what makes the different levels of sentences. The children will then create their own sentences, the success criteria will be on the board for the children. Plenary Select a few children to read out some of their sentences. ↑ This is an opportunity to assess the children's creativity. How many sentences have they created? Are they original to the child? Are they imaginative etc?	The teacher will go will around and check how the children are getting on. ↑ Instead take a heurtagogy approach and step back. Tell the children they can display their work in their chosen way. Using traffic lights except, the children will put their books onto three different tables. Gwyrdd Melyn Coch The teacher will ensure that this information is put in their books.
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Appendix H

Model Casgliadau Adfyfyriol â Chymorth (ARC) (Model 'Myfyrio a Newid') *Assisted Reflective Conclusions (ARC)* *Model*

Dyddiad/Date: Tuesday 31st January 2017

Digwyddiad critigol (Ffocws)/Critical incident (focus): To lead a group Personal, Social Education session

Profiad/ Experience	
Teimladau/ <i>Feelings</i> "What are your feelings regarding the experience?"	This PSE lesson did not quite go to plan and left me feeling a little disheartened. However, after speaking to the teaching assistants and the class teacher, they have given me suggestions on how to improve in the future and encouraged me that what I did teach was good.
Cofio a Deall/ <i>Remember and Understand</i> "Can you list the aspects of the learning experience that went well?" "What were the elements of the learning experience that were disappointing?"	I managed to use the Dina puppet which gains the pupils attention remarkably. The questions that the children understood did allow scope for some discussion. I did feel quite nervous delivering this session because the questions that I had planned seemed to high-brow and the children didn't really understand. I therefore got through the lesson quicker than anticipated. It was also my first attempt at using a puppet, which I did think went okay. However, there is always room for improvement so I want to become more confident in using it.
Gwerthuso a dadansoddi/ <i>Evaluate and analyse</i> "What will you keep the same to ensure effective teaching and learning in the future?" "What was the cause of the most important disappointing element?"	I definitely want to use the Dina puppet again because it is such an effective resource tool. I will keep a solid topic as a theme the same, but it does need to be able to relate to children of this age. I need to re-think my questions and make them suited to a lower age. I also need to gain confidence in using a puppet.

Casgliadau a chmau gweithredu/ <i>Conclusions and actions</i> <i>"What are your possible solutions to the disappointing issues identified?"</i> <i>"What will you do next?"</i>	I want to attempt a PSE lesson again because I feel as though I learned a lot from today's session. I understand better now the levels of the children in the class and how I will have to include more prompters in my questions. The class teacher has lent me a puppet to practice the positioning and voice that I will put on when using it as a teaching resource. I hope this will increase my confidence of using a puppet in a lesson.
Y profiad newydd / <i>Transformed experience</i>	

Appendix J

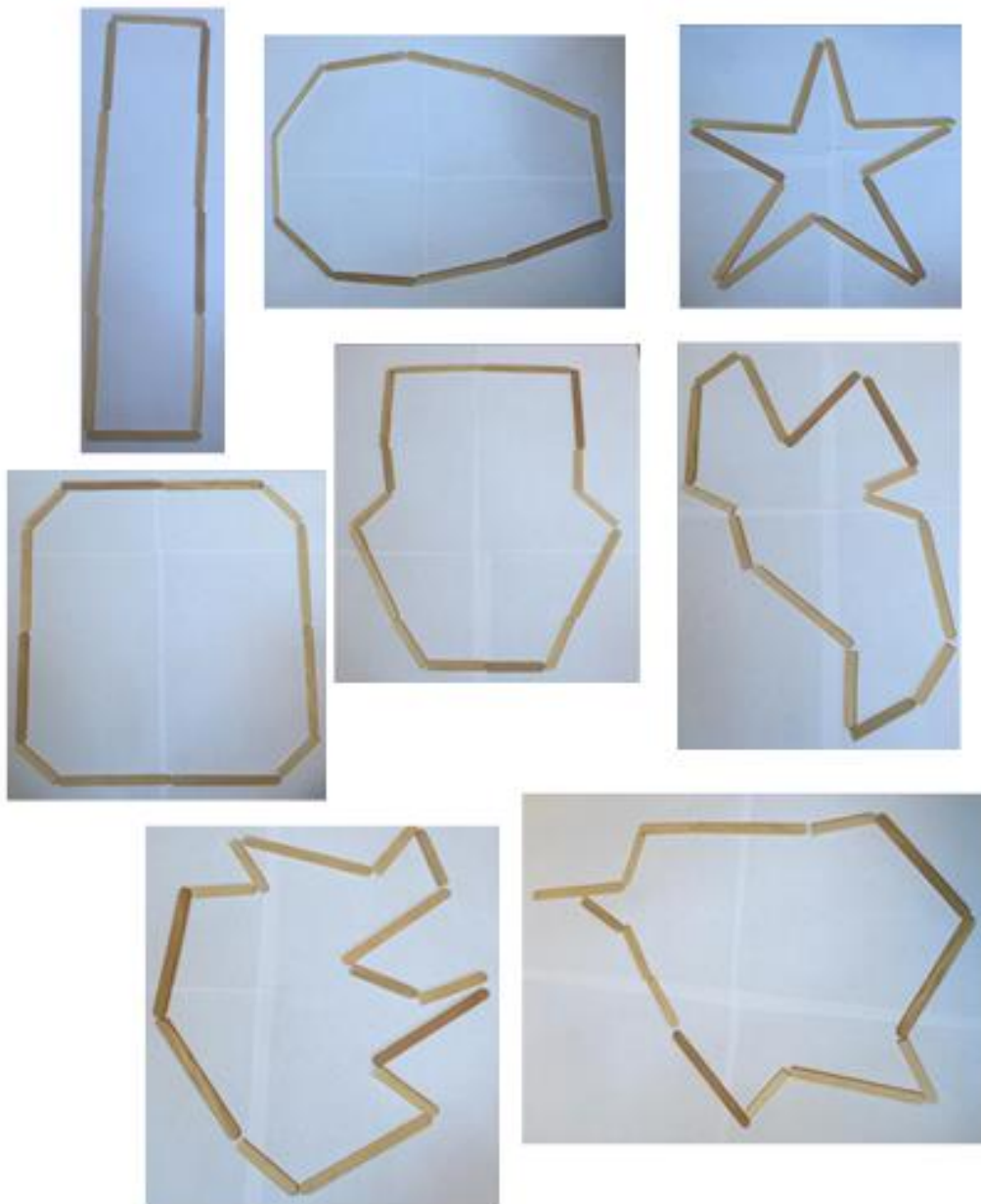


(Seelig, 2018)

Appendix K

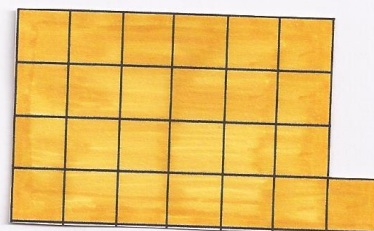
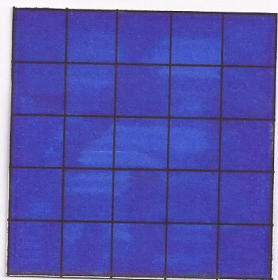
Introduction/plenary tasks	Main activities	Resources/ Key Vocabulary	Assessment for Learning (strategies and opportunities)
Introduction Straight away split up the two year groups. JT to take Yr1 into the kiva whilst MJ teaches reception with TJ to support. MJ Intro Whole reception group on carpet. Trainee to use the 100 square on the wall and count up to 50. Look out for children who don't say 'teen'. Children to wave their hands at 10, 20, 30, 40 and 50. Whisper voice from 30-40. Deep voice 40-50. JT Intro Whole Year One group. Break playdough into two pieces, one bigger than other. Discuss if this is in half. Present some string, banana, paper shops and challenge children where they would cut to make a half.	Trainee focused task (Rec) MA: To work with both Y1 groups. UA: Sitting on yellow table. Children to have one large bus laminated sheet. Children to work as a group to complete the question cards. Children to physically put the people onto the bus. (Do first one together). Extension: draw and write about another bus journey writing how many are on the bus at the end? LA: Children to get into groups of three and find items around the classroom. The children to mark on the object where the half would be, for example half of a chair. Prompt the children to realise that if they pick up two of something, for example two pieces of Lego, then splitting it in half would mean one piece each. Additional adults task (Yr1) TJ to work with LA Reception. Show the children a washing line with numbers 1-10. Say we will complete this activity in silence. I will point to a number and I want you to hold up that many fingers. Discuss the different ways of showing that number (scribe sum on whiteboard, e.g. 3+4). Work through numbers randomly (trying to encourage children to become quicker). Using the Numicon, you point at a number and children need to find either that number or two pieces which will total your number. JT to work with UA Reception. Show the children a washing line with number 1-20. Say we will complete this activity in silence. I will point to a number and I want you to hold up that many fingers. Discuss the different ways of showing that number (scribe sum on whiteboard, e.g. 3+4). Ask children how can they show me 12 (take answers toes, partners etc). Then ask children to show you 13 (look out for children who instantly know that is 1 more). Work through 14, 16, (discuss 10 + ?). Finish with showing 20.	Resources 3 x iPads Numicon Banana String Paper shops Numbers 1-20 Numbers 1-10 Laminated bus and people Challenge cards Sweets with labels Plastic money Playdough Key Vocabulary Teen numbers Thirteen Thirty Half Halves Equal	All adults to take photos as evidence for the children's books. L.O is typed and ready to be stuck into the children's books Reception Watch out for children who: are not secure counting beyond 10 and muddle 11 and 12 as these are not 'teen' numbers UA Rec: Outcomes Children can: match numbers 1-20 to the appropriate number of objects (fingers). recognise that teen numbers are 10 and some more LA Rec: Outcomes Children can: Match numbers 1-10 to the appropriate number of objects (fingers). Year One Outcomes Children can: Understand that halves need to be equal Work through some practical problems based on halves

Appendix L

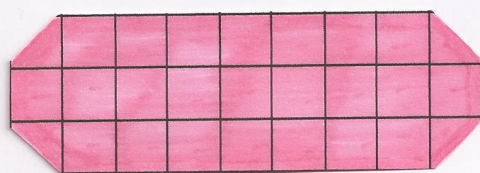
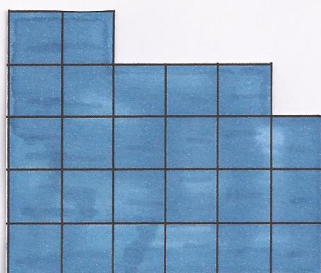
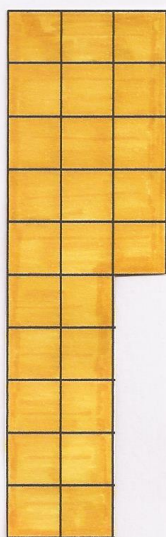
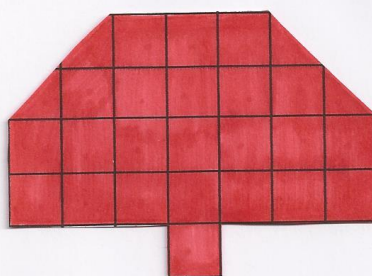
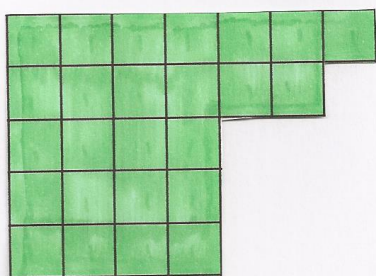


Appendix M

Shapes that the children created...



Shapes that I was aiming for the children to make...



Appendix N

Assisted Reflective Conclusions (ARC) Model

Dyddiad/Date: Monday 13th November 2017

Digwyddiad critigol (Ffocws)/Critical incident (focus): Mathematics - Volume

Profiad/ Experience	
<i>Feelings</i> "What are your feelings regarding the experience?"	Overall, I am happy with today's Math's session. It didn't quite go to plan with my timings but I think the changes that I made were to benefit to the majority of learners. For those who still seem unsure (from marking their books), I will ensure that I cater for their needs by using a physical object to explain the concept of volume. For example filling up a plastic box with water and explaining that the area inside the box (that the water is taking up) is the volume.
<i>Remember and Understand</i> "Can you list the aspects of the learning experience that went well?" "What were the elements of the learning experience that were disappointing?"	The introduction went well and all the children got involved by using the assessment for learning strategy 'show-me whiteboards'. There were high levels of participation from all children of all abilities which was very pleasing to see. Also, after marking the children's books, the majority seem to have understood the concept of volume. I'm pleased with the fact that the children have remembered to include the units of cm^3, and m^3 because I really did push for this aspect today in their work. The disappointing element of the learning experience today is that I felt it was necessary for the introduction to be extended because after a practice question on the show-me whiteboards, it became clear that many of the children didn't understand the concept of volume. I therefore had to explain the equation further and simpler for the children to understand (edits which can be seen on my lesson plan).
<i>Evaluate and analyse</i> "What will you keep the same to ensure effective teaching"	I think that a ten minute warmup introduction is of benefit to the children as it is engaging, gets them thinking about mathematics from the previous week and gives them confidence. The children enjoy using the 'show-me whiteboard's' as they can actively take part in the lesson. Our classroom set of rules for using the show-me whiteboards has also proved successful as the children were not revealing their answers to me until I asked for them. I will continue to use quick, interactive introductions. It was difficult to explain the concept to the children, especially for the Year 5s where volume was only just being introduced to them. (Many of the Year 6's had been introduced to volume the year before).

<i>and learning in the future?"</i> <i>"What was the cause of the most important disappointing element?"</i>	Therefore, I need to work on my own personal subject knowledge whereby I have strategies that can help me teach concepts, like volume, in an alternative way if children don't understand at first. For instance, in a more concrete way so the children can physically see what volume is.
<i>Conclusions and actions</i> <i>"What are your possible solutions to the disappointing issues identified?"</i> <i>"What will you do next?"</i>	The problem identified is my lack of pedagogical knowledge for teaching Mathematics. Therefore, I will have to ensure that when teaching a concept, we are building on volume in tomorrow's session, that I've thought of an alternative way to teach it to children if they don't understand it at first. For volume, I am going to ensure that I have a physical object that will help the children understand what volume actually is. I think from here, understanding what they need to multiply together will become easier.
<i>Y profiad newydd / Transformed experience</i>	

Appendix O

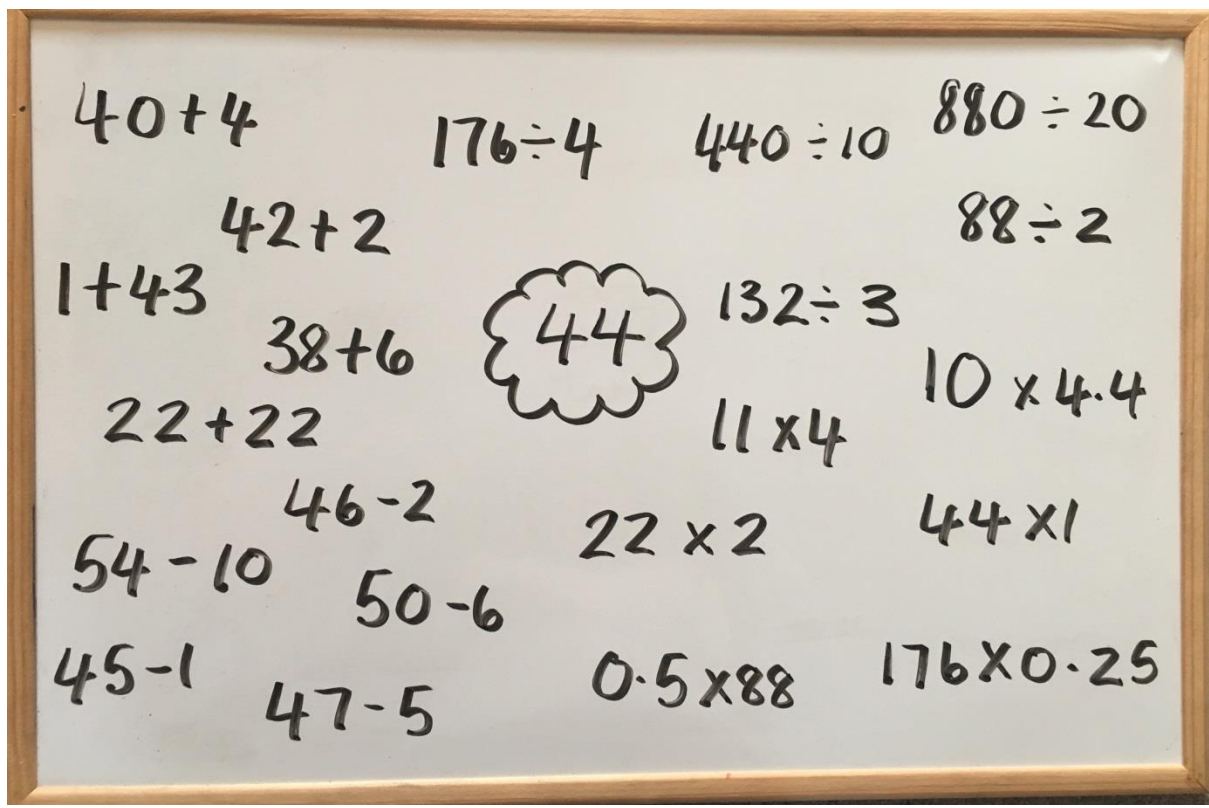
38. Mini-whiteboards

Potential for: Formative feedback

What is it? The use of mini write on/ wipe off whiteboards – either as individuals or as groups so that learners can display their answers; allows all learners to make a contribution. The teacher can select a few to read aloud, or quickly identify a wrong answer which it would be useful to explore.

Some teachers use laminated A4 card, perhaps with red one side and green the other side. If learners are confident of their answer, they write on the green side; if they are in some doubt, they write on the red side. This lowers any stress they feel about getting the answer wrong. *Tentative talk* is often necessary when learners are feeling their way into a new understanding, and this is a good way to encourage learners to explore their tentative ideas.

(DCELLS, 2010, p.63)

Appendix P

Appendix Q

The level descriptor does not mention

seven of the eight elements of

divergent thinking:

- complexity
- curiosity
- flexibility
- fluency
- Risk-taking
- elaboration
- originality

Level 5

Pupils make comparisons between the methods and techniques used in their own work and that of others, communicating their ideas and feelings imaginatively and clearly indicating an understanding of the methods and purposes used by others from various cultures. They make drawings and use other methods selectively to explore, interpret and record their ideas and feelings from observation, experience and imagination. They organise their work by collecting and using reference materials to develop an idea or theme. They experiment practically and imaginatively with a variety of methods, materials, tools and techniques, applying a broad knowledge of visual, tactile and sensory qualities. They review and modify their work to fulfil their intentions.

One element of divergent thinking

Therefore, are schools actually assessing children's creativity?