What helps me learn language and mathematics? An analysis of a child's learning in mathematics and language with recommendations for ensuring progress.

Introduction

'Literacy and numeracy are universally acknowledged to be the essential foundations of education' (Welsh Government, 2015: p20)
Numeracy and Literacy within the primary school are very important for the future progression of children into adulthood, as the children need to learn the basics and apply them to everyday life in order to move their own learning forward. Teaching practitioners do however need to remember that children learn at different level and progress at different times, the new 'Successful Curriculum Framework' that is being introduced will help children learn at their own pace. The new framework has levels of progression so children work on a continuum learning rather than being graded and based on their age alone. This is seen to improve the child's learning as they are more focused as the learning it tailored to their specific ability. (Dunn, 2017) 'Children tend to behave better when they have something that they need to complete or solve' (Welsh Government, 2012: p4)
The main focus point for this assignment is to write an analysis of the chosen child's learning of mathematics and language and how they can progress their learning further. This will be done by gathering the child's work and critically analysing common misconceptions made. The writer will then discuss how the child can progress by writing down recommendations for the child. The chosen child is a boy who is a year four pupil, who is eight years old. The school setting is in South Wales and has average number of children within the school but the school has high poverty rate.

This particular child was in the red group which is a middle attainment ability for that class, he showed a love of mathematics and language as he stated in the fact file given to him. (See appendix 1) While on the placement the writer will observe the child, gather information regarding the child such as the child's work and carry out an interview with child to see what they say about mathematics and language. On analysis, the writer noticed the child stated that 'he only learns mathematics and language at his desk' but evidence showed (see appendix 2) that there were various different areas in the school and outside on the playground where the child can learn mathematics and language. The writer will also look in depth at the 'Mosaic Approach' to teaching as it is simply gathering various different parts of research such as observations and pictures to use to analysis the child's work and to help them progress further. 'The Mosaic approach enables young children to create a 'living picture' of their lives' (Clark and Moss, 2005: p13). The research is gathered my collecting a wide range resources to support what you want to say. Thinking of the various research gathered as one tile and then putting all those different pieces together to make one big picture that is basically a mosaic. The approach looks at the child's learning and how to progress their learning further, so therefore the child will look his learning and use methods to move his learning forward. It is very important when gathering personal data that the data remains anonymous at all times especially of that of children the teaching practitioner need to abide by the correct legislation and school policy with regards to gathering and sharing data. However, when gathering data permission off the person needs to be essential and cannot be gathered without consent. (Data Protection Act 2018)

Analysis of the child

Mathematics
Strand – Using measuring skills
Element – Length, weight/mass, capacity

Within in the year four area of learning the child need to be able to 'measure capacities to the nearest 50ml and 100ml and they needed to convert between both millilitres and litres' (Welsh Government, 2016: p6)

'Students in Wales were the lowest of the UK nations in science, reading and maths in the 2016 tests, scoring 478 in maths, 477 in reading, and 485 in science' (BBC News, 2017) This statistic is not good for maths in Wales, there has been a huge push for improvement on how teachers maths now especially with the new curriculum – 'Successful Futures' as Professor Graham Donaldson (2015: p17) suggest that 'Mathematics helps children and young people to make sense of the world around them and to manage their lives' he also discussed how pupils should learn mathematics for the use of everyday life and ensure the children see the importance of learning maths. Children that learn maths love to have focus point or catch point for them to understand why they are learning it. (Wightwick, 2019)

This particular child's learning showed a very good attempted of trying to achieve the outcome that was set. The child loves learning maths as he loves to solve problems and come to a conclusion. He stated 'that he only learned maths at this desk' so the writer aimed the lesson introduction to be practical. The reason for this is it thought by Sadler-Smith, (1996) 'Children are able to observe, learn and understand concepts in a far greater capacity, when they have been able to experience something for themselves'. However, Arends (2014: p13) would argue against Sadler-Smith as he suggested 'Sometimes it is not practical for students to learn every skill they need to know by actually performing them.' The child that was analysed showed a growth mind-set as he was to understand his own abilities and what helped him learn maths. He was set challenges (See Appendix 3) that were achievable for his level and had support from the class teachers when necessary. The challenges were set based on a chilli challenge green being the easiest and red being the most challenging for the child. The child made some mistakes which were common misconception made by any average

child, but he later learned from those to progress his learning. (Scottish Government, 2016) (See appendix 4)

The introduction of the lesson focused on the hand on approach to teaching, whereby the child had to go outside into the water try and measure out various different amount of water and had to see which jug would hold the most water and what as the jugs, maximum and minimum capacity it could hold. The child discussed that you could measure any liquid not just water. Observing the teacher showed the child two different size jugs. One was small but wide and the other was tall but narrow but they both had a maximun capacity of 1 litre. The child was asked which jug would hold the most amount of liquid? The child responded by saying the taller but narrower jug would hold more. This showed the misconception the child. Through the analysis of his work it easier to see where the misconception was for him while learning capacity. Teachers need to be aware of this as it is their responsibility to help support the child and plan future plans for him to be able to understand better and not have the misconception. (Kambouri-Danos, 2014) This teaching in this lesson is closely followed by that of the Connections Model created by Haylock and Cockburn in 1989. The model shows the purpose of learning mathematics effectively by making connections to mathematical ideas and formulas. Haylock and Cockburn (2003) suggest that when children do something for the first time there is sense in if we have done something previously we can link that experience to that to gain a better understanding and knowledge of that new concept.

The next lesson the child had to convert millilitres to litres and vice versa. The child's work showed a good understanding of converting millilitres to litres but struggled when converting litres back to millilitres as he got the numbers mixed up around the decimal point. (See appendix 3) As the child was in the middle attaining group for mathematics his work was changed to support his learning. The term is called 'scaffolding' based upon the theory from that of Jerome Bruner. Scaffolding is when the adult or teacher will provide resources or interact with the child with objective being to help the child achieve the lesson outcome. The term scaffolding although came from Bruner is very much the same as Vygotsky's 'zone of proximal development'.

This is what the child can do without help and that they can do with support from the adult and also their partner in school. (Chambers and Timlin, 2013) Through observations the child did ask their partner for help, as the children were sat by someone in the higher attaining group so they could help them but they did however have different work to avoid the answers just simply being copied. On the contrary to the positives of scaffolding there are some challenges of this teaching style as the teacher will need more training which can be very expensive for schools and it can also lead to the teacher having les control of their learning as the child needs to learn on a continuum which can be very time consuming. However, the new curriculum coming into schools does support scaffolding as the Donaldson 'Successful Futures' supports that of children learning on the continuum at their own pace, this is very child lead learning. Professor Donaldson (2015) recommends 'an end to the current system of key stages, so that there is a 'learning continuum' for pupils' Its suggests that it will have more high attainment levels as there will not be as much of a transition periods for children and their day to day life will flow better. (Lemke and Zhu, 2018)

Future Progression – Mathematics

The child is currently working on a National curriculum level of 3 which is about average from that year group. To get the child to be working at high level 3 and into level 4 the teacher need to support the child and push their learning forward effectively. There will be display areas with converting various different measurements and how to put the numbers into a decimal correctly in order to help the child with his further learning. The child needs to develop his multiplying and dividing skills further using number that will go into decimals. The child will notice certain patterns and be able to recognise the way the number will look. There would be resources available for the child to use such as movable numbers therefore child is able to move the number up or down depending when weather they multiplying or deciding. The child will notice that the decimal point never

moves it is just the numbers. The child can also use this resource inside or outside so if the learning is being down outdoors the child can still access the resource to help develop their learning. The child will also have access to the water tray in the classroom to practice the skills with a hand on approach to learning. (See appendix 5) The National Curriculum level 4 suggest that 'They use their understanding of place value to multiply and divide numbers by 10 and 100' (Welsh Government 2016)

Language

The Language section of the observation is sequence of lesson starting with finding words in dictionary and discussing how to use a dictionary. The objective for the child at the beginning was for them to 'gather ideas to plan writing' (Welsh Government, 2016)

Session 1 – The observed child noticed that all the words are in alphabetical order. (See appendix 6)

Session 2 – The next lesson was based on the previous to extend further knowledge it is when the observed child had to put words in alphabetical order. (See appendix 7) The work was tailored to the child's attainment level. As discussed previously the child was given scaffold work to help support his learning.

Session 3 – This session of this sequence of lesson is for the child to write down two or three adjectives on a grid this is to help the child with next phase of the lesson. In this lesson, the child is given the noun and they need to use the dictionary or thesaurus to help them find an adjective to go with the noun. (See appendix 8)

Session 4 – Is the past session coming together to help the child wiring the weekly write. The child has already gain the skill needed but has the access to use the past work completed to help support him. The lesson objective is taken from the Key Stage 2 Programme for English, 'use adjectival and adverbial phrases to add interest and precision' (Welsh Government, 2016) (See Appendix 9).

During the last session, the writer read the story Lucy goes to market…. To the child to show the child how their work should be written. It was discussed that the adjectives and nouns rhymed and they were in alphabetical order. The child used their previous knowledge and work to help them during the task and also had the support from their peer and teacher. The child was very good at Language and was a keen reader of books. During the start of the placement the teacher observed the child in his group being the most vocal and sharing their ideas during their guided reading lesson, throughout the placement the child became more and more confident with their reading and knowledge of advanced vocabulary. In addition, the child by the end of the placement had moved up to the higher attainment level with in the language groups. During the guided reading session and language lesson the child showed signs of curiosity to learning new words and using the vocabulary in daily life relating learning to real life. Donaldson (2015) supports learners working independently and relating learning to daily life situations. Furthermore, to Donaldson Kolb's theory of learning supports this through the experimental learning cycle. It is when children learn a concrete experience first. Secondly, they learn through observations and reflections, next the children learn through an abstract concept and finally they learn through an active experimentation. (Stice, 1987) In this case the child was observing the teacher first to have understanding what was expected from them.

Future Progress

The child is currently working on a National curriculum level of 3 which is about average from that year group. To get the child to be working at high level 3 and into level 4 the teacher need to support the child and push their learning of language forward effectively. There will be display areas with various nouns and adjectives to help the child have access to the learning in the future. The child will also have access to the library to the use the thesaurus to look up words they could use instead of using the same words over and over again. The child can improve the list vocabulary by doing this

and it will also teach him to improve his spelling. The child needs to develop his use of wider vocabulary. The child will see that there language is improving by the books they read and moving up groups. Most important is the verbal feedback given by the teacher. Supported by the assessment for learning strategy (AFL) is that of Black and William (1998) as they suggest 'Feedback to any pupil should be about the particular qualities of his or her work, with advice on what he or she can do to improve'. Although teacher need to avoid comparing pupils to each other as each child learns at a different pace. There would be resources for the observed child to access to support further learning. Resource available would a vocabulary poster on their desk, posters and child friendly books such as dictionaries and thesaurus. This child will use the various aids to improve and move their own learning forward. The child will become a more independent learner this way as they will not rely on the teacher to do the work for them. The child will have access to the outdoor area in the playground where they are playing and communication with the other children every day, thus improving their language skills without even knowing about it.

A child learns to communicate mainly by observing others and listening to others around them, the child will then copy what they hear. The observed the child showed a very good verbal background as he grew in confidence when communicating with others. He was observed at playtime playing a game with others and he was the more vocal one out the group and showed more of leadership role than that of the other children. It has been discussed by Girolametto, Weitzman and Greenberg (2006: p37) that 'Reading is a great activity to help improve your child's communication proficiency'. Reading is known to help develop children's language and helps to improve their range of vocabulary which will lead them to become better communicators. Children learn through play and talking to others interacting with peers and siblings. The observed child is known to have siblings to play and talk to which has helped him with self-esteem and confidence. Paiget (2013: p43) suggest that 'children learn through play'. His, theory is focused on the idea that the child's cognitive development helps improve the child's learning of language. The skills learnt by the

observed child made them feel more at ease in certain situation such when the child was asked to present work in front of the class he did not get nervous and read in a fluid style.
Normally a child with a high level of communication skills tends to find it easier to produce written work and verbal speaking. They tend to also perform better in exams or essay style writing. (Selvakumaran, 2019)

Conclusion

To conclude the observed child showed interest in learning mathematics and language he enjoyed and excelled in being challenged. He also tried his best with his work and worked well others in the class. To ensure the child progresses his learning he need to use the resources provided. He needs to remember that is he needs an answer to something to think himself first and then try looking for the answer independently, followed by asking his peer and finally checking with the teacher. The two learning areas discussed are the core subjects which the child should relate to daily task. The teachers, role is to facilitate the learning not give the child the answers. The child need the tools to help him become a more independent and capable learner.

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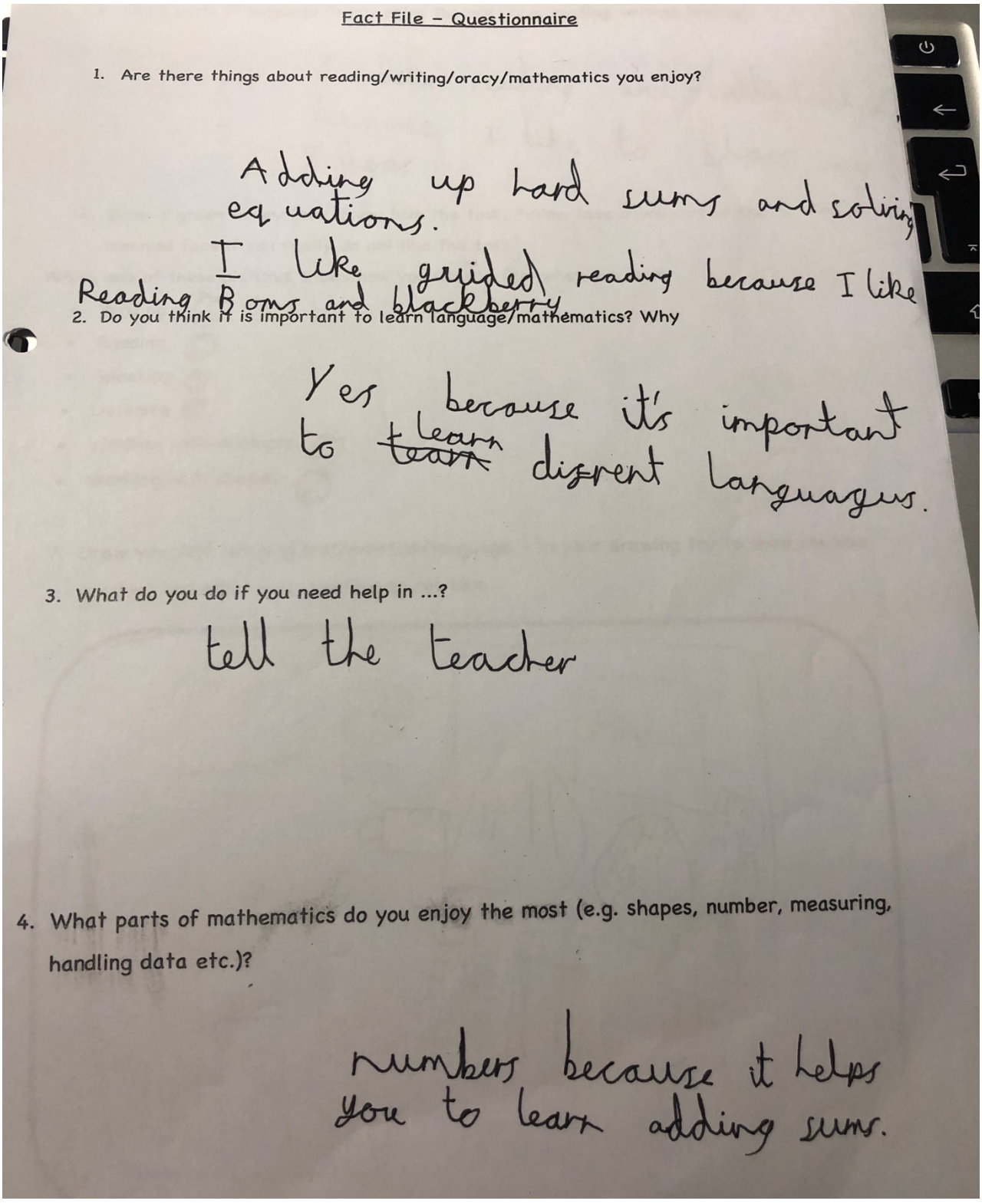
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Appendix 1 – Fact File



Fact File – Questionnaire

1. Are there things about reading/writing/oracy/mathematics you enjoy?

Adding up hard sums and solving equations.

I like guided reading because I like Reading Rooms and blackberry

2. Do you think it is important to learn language/mathematics? Why

Yes because it's important to ~~learn~~ learn disrent languages.

3. What do you do if you need help in ...?

tell the teacher

4. What parts of mathematics do you enjoy the most (e.g. shapes, number, measuring, handling data etc.)?

numbers because it helps you to learn adding sums.

5. What parts of language do you enjoy the most (e.g. reading, writing, talking)?

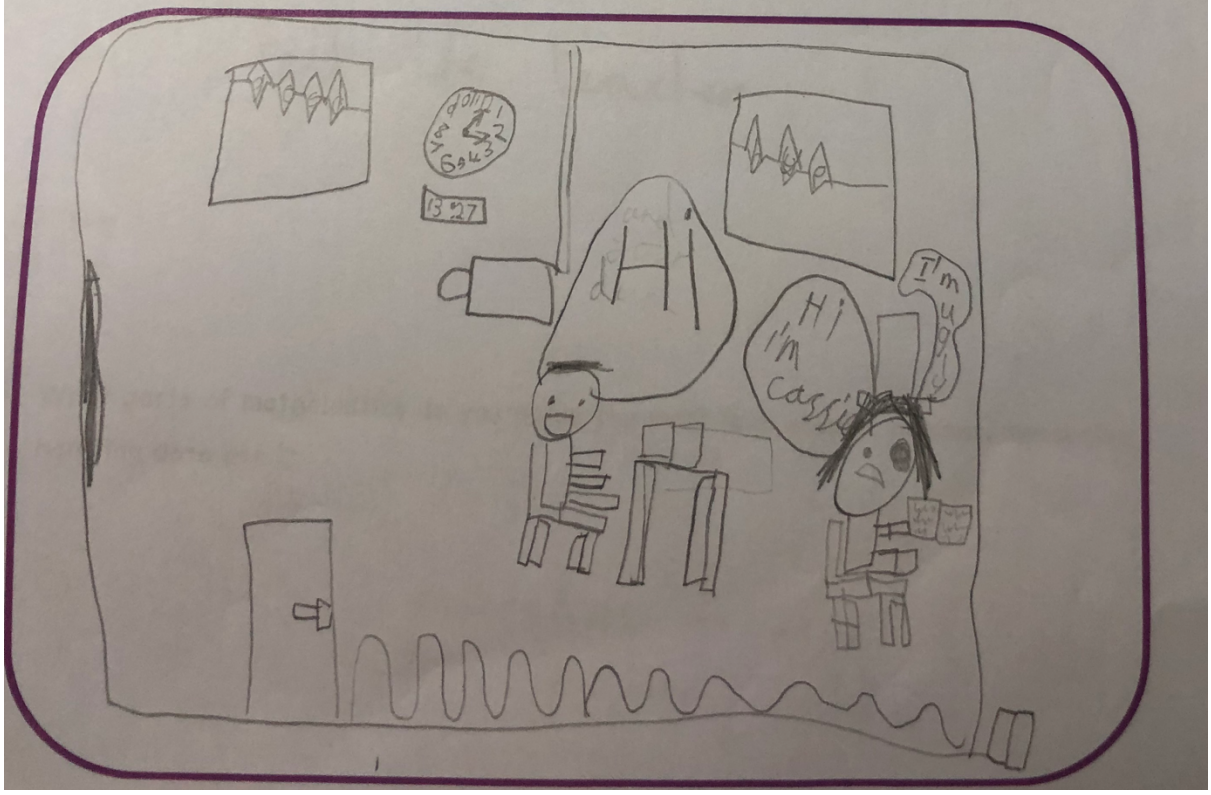
I like reading and ~~talke~~ talking because I like to share my Ideas

6. Draw a green smiley face if you love the task. Yellow face if you sort of like it. Red annoyed face if you really do not like the task.

Which one of these pictures shows how you usually feel when you are?

- Writing
- Reading
- Speaking
- Listening
- Working with numbers
- Working with shapes

7. Draw yourself learning mathematics/language – in your drawing try to show me how you feel and what you may like or not like.



Appendix 2 – Photos of where the child could learn Maths and English



Chalk Board – In the playground, where the children have access to this resource during outdoor maths lesson and at break and lunch times.

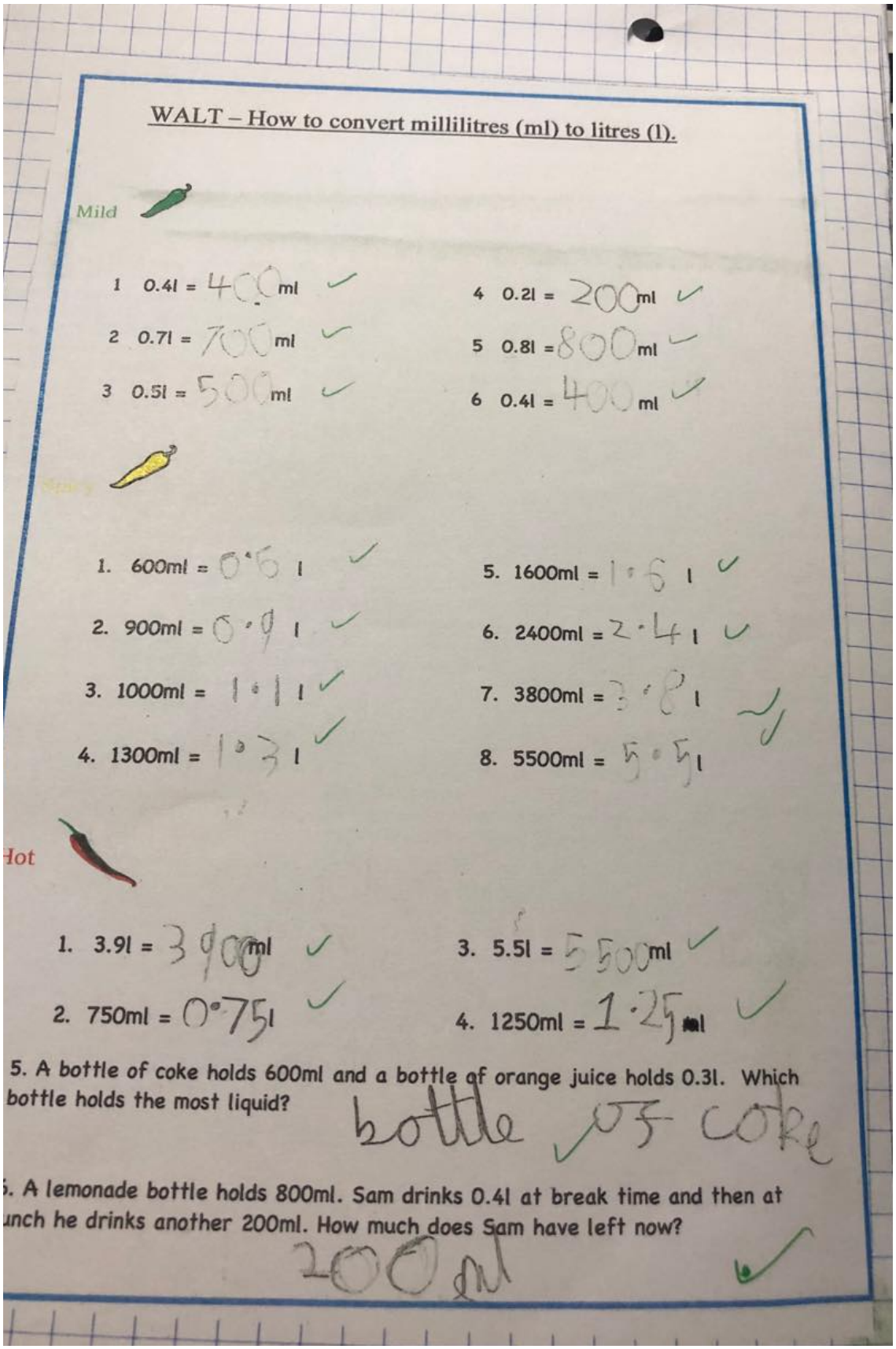


Placed on the junior yard.



Number line game on the playground wall and floor.

Appendix 3 – Evidence of the Maths work set at according ability level.



WALT – How to convert millilitres (ml) to litres (l).

Mild

1 0.4l = 400ml ✓
2 0.7l = 700ml ✓
3 0.5l = 500ml ✓
4 0.2l = 200ml ✓
5 0.8l = 800ml ✓
6 0.4l = 400ml ✓

1. 600ml = 0·6 l ✓
2. 900ml = 0·9 l ✓
3. 1000ml = 1·0 l ✓
4. 1300ml = 1·3 l ✓
5. 1600ml = 1·6 l ✓
6. 2400ml = 2·4 l ✓
7. 3800ml = 3·8 l ✓
8. 5500ml = 5·5 l

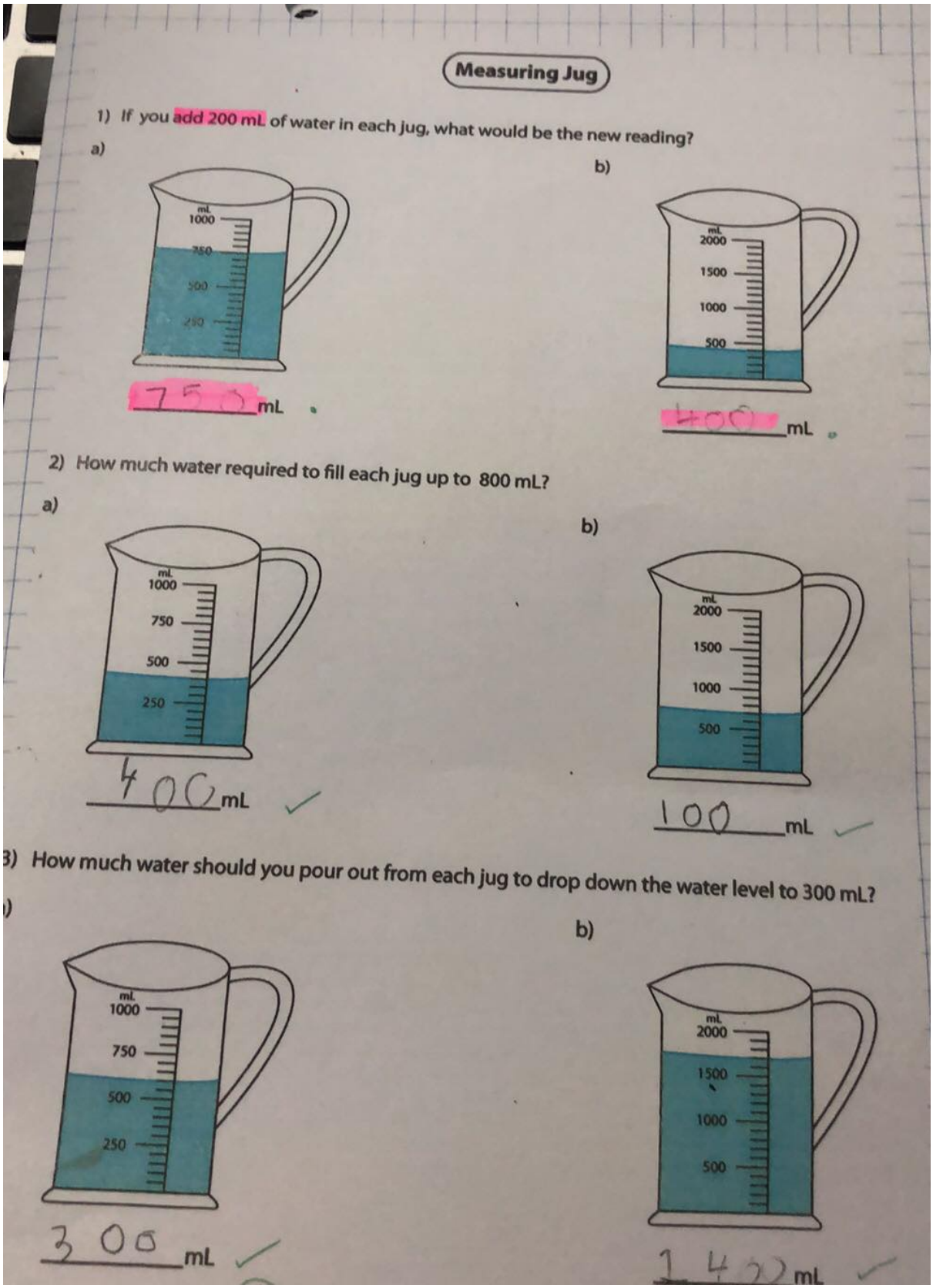
Hot

1. 3.9l = 3900ml ✓
2. 750ml = 0·75l ✓
3. 5.5l = 5500ml ✓
4. 1250ml = 1·25ml ✓

5. A bottle of coke holds 600ml and a bottle of orange juice holds 0.3l. Which bottle holds the most liquid? bottle of coke ✓

6. A lemonade bottle holds 800ml. Sam drinks 0.4l at break time and then at lunch he drinks another 200ml. How much does Sam have left now? 200ml ✓

Appendix 4 – The common misconception.



Measuring Jug

1) If you add 200 mL of water in each jug, what would be the new reading?

a)

750 mL

b)

400 mL

2) How much water required to fill each jug up to 800 mL?

a)

400 mL ✓

b)

100 mL ✓

3) How much water should you pour out from each jug to drop down the water level to 300 mL?

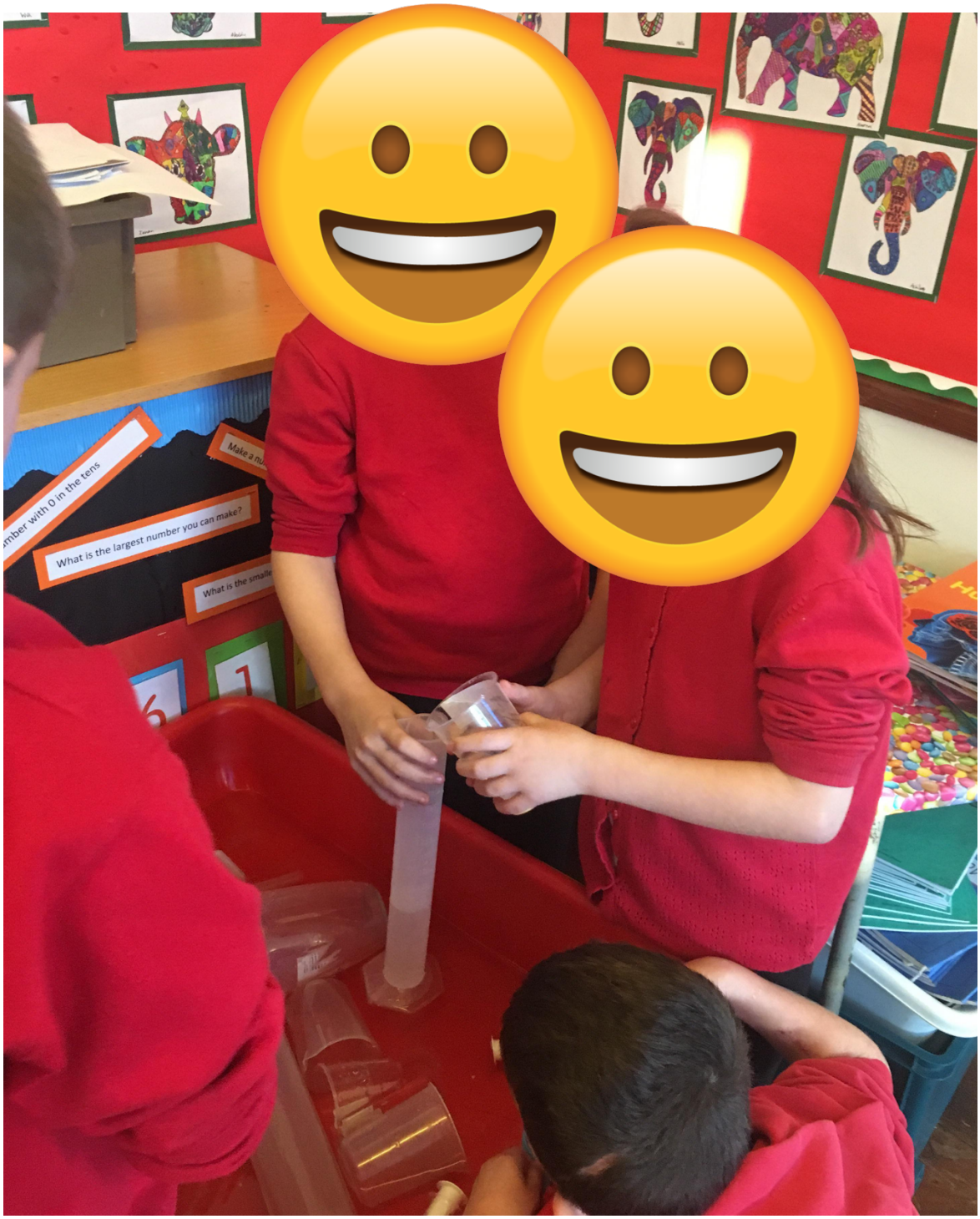
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300 mL ✓

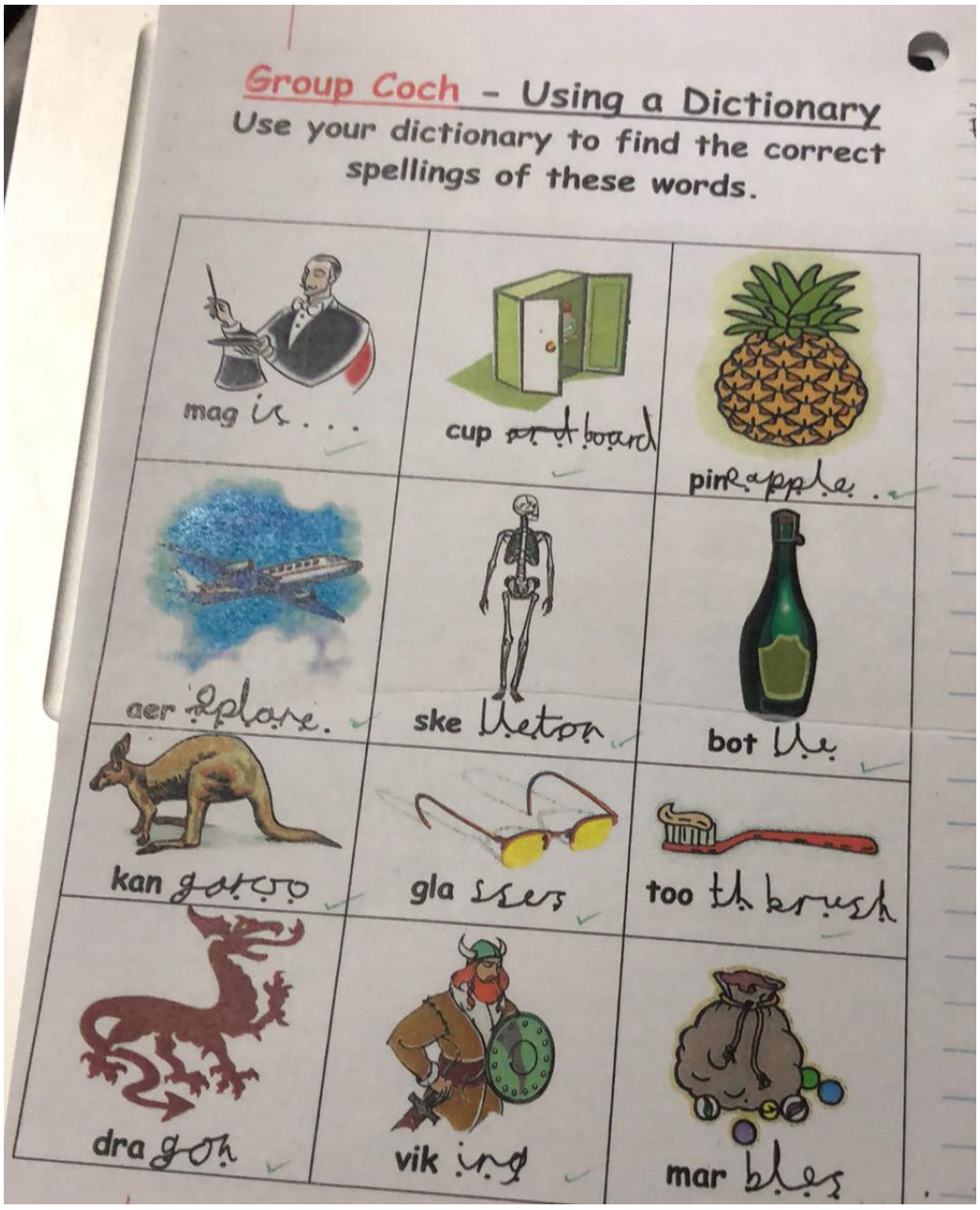
b)

1400 mL ✓

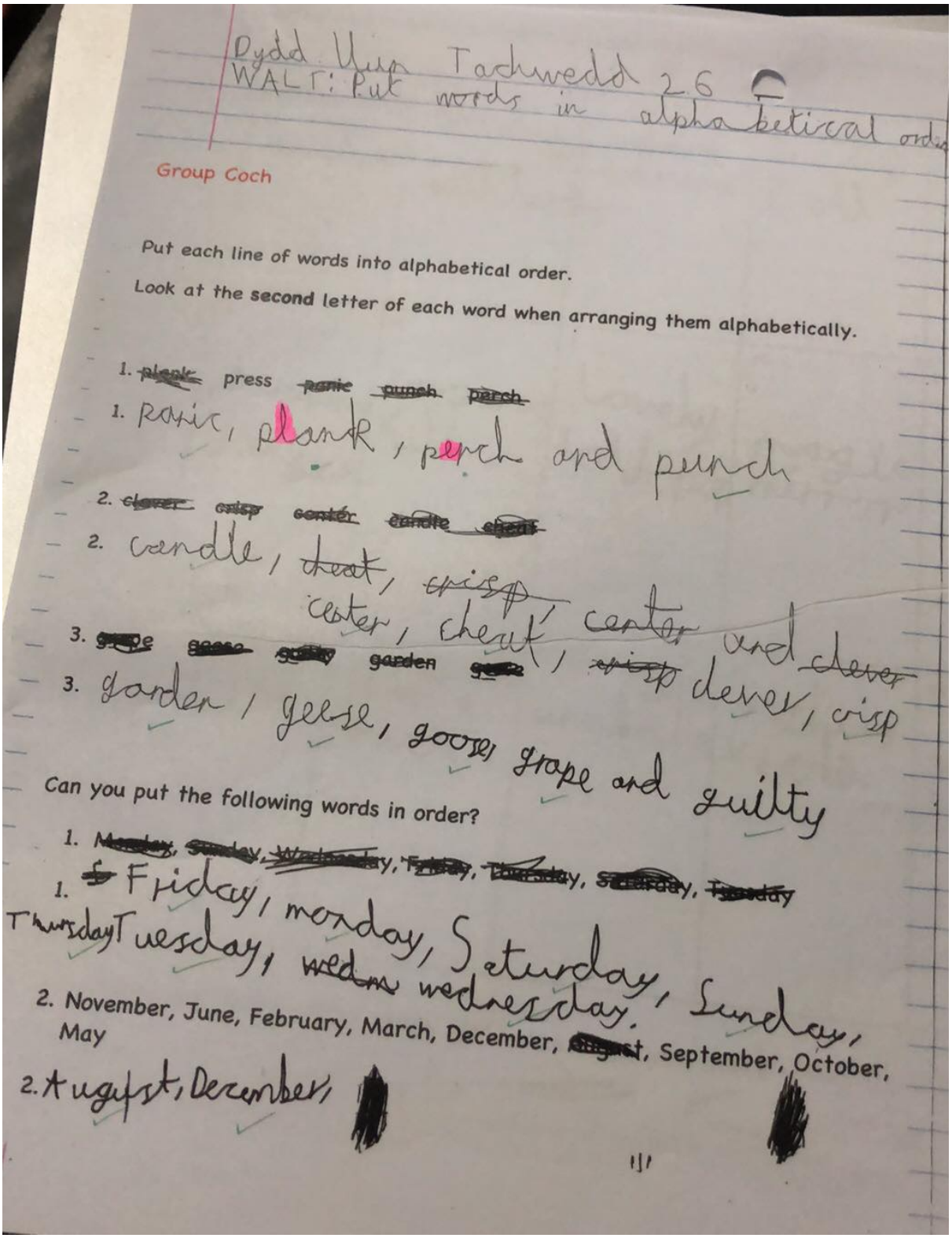
Appendix 5 – Practical hand on experiences.



Appendix 6 – Finding words in the dictionary.



Appendix 7 – Putting words into alphabetical order.



Dydd Iau Tachwedd 26
WALT: Put words in alphabetical ord

Group Coch

Put each line of words into alphabetical order.

Look at the second letter of each word when arranging them alphabetically.

1. ~~plank~~ press ~~panic~~ ~~punch~~ ~~perch~~

1. Panic, plank, perch and punch

2. ~~clever~~ ~~crisp~~ ~~center~~ ~~candle~~ ~~cheat~~

2. candle, ~~cheat~~, ~~crisp~~, center, cheat, center and ~~clever~~ clever, crisp

3. ~~grape~~ ~~geese~~ ~~guilty~~ garden ~~geese~~

3. garden, geese, goose, grape and guilty

Can you put the following words in order?

1. ~~Monday, Sunday, Wednesday, Friday, Thursday, Saturday, Tuesday~~

1. Friday, monday, Saturday, Sunday, Thursday Tuesday, ~~wednesday~~ wednesday.

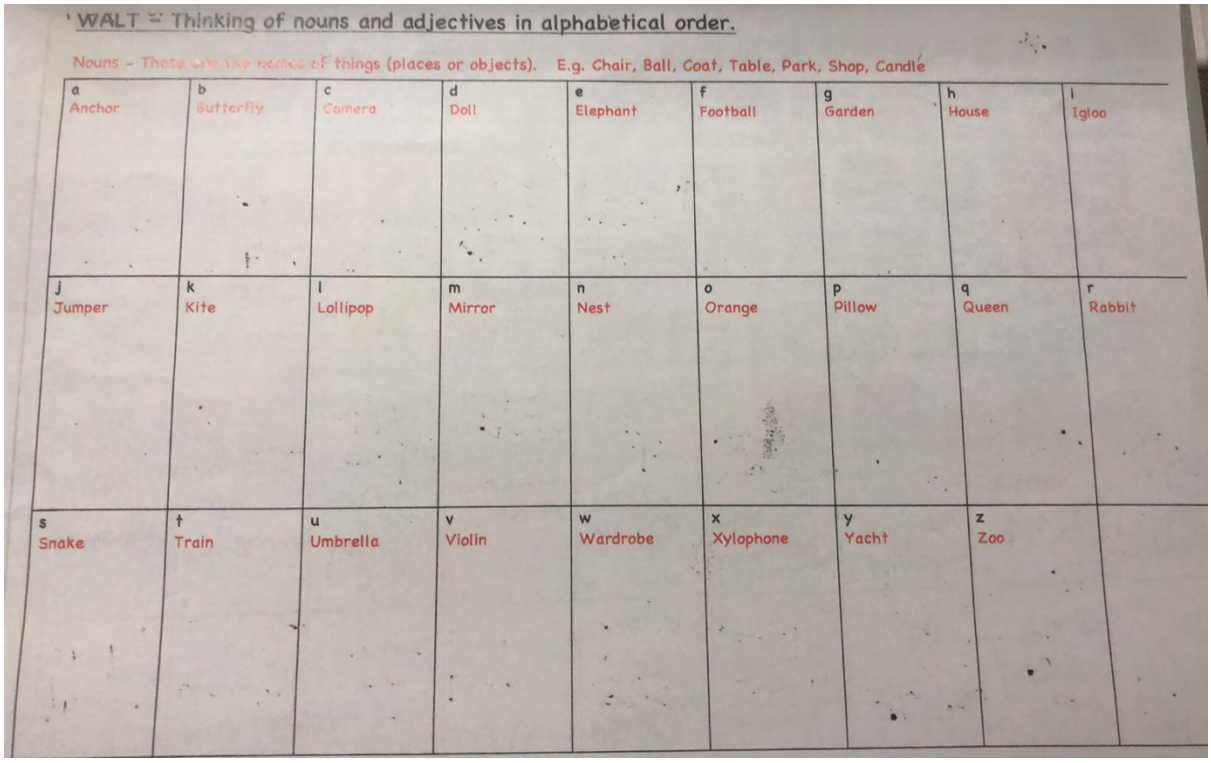
2. November, June, February, March, December, ~~August~~, September, October, May

2. August, December,

111

Appendix 8 – Noun and adjective grid.

The Nouns given in red.

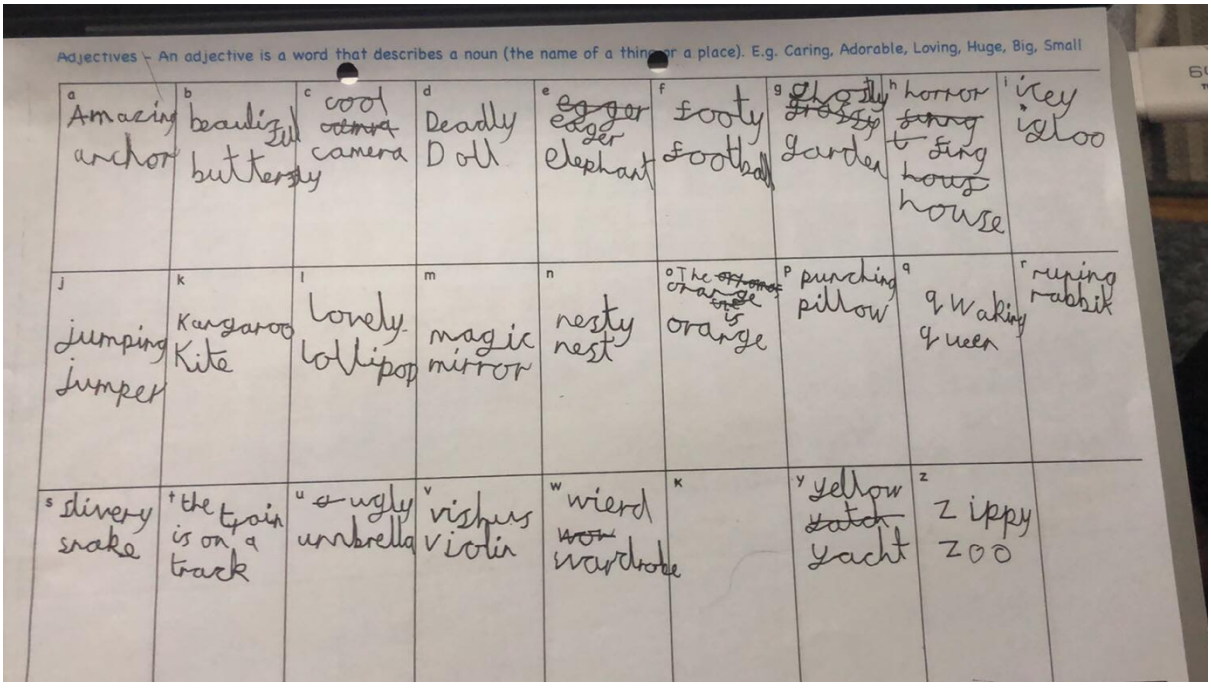


WALT = Thinking of nouns and adjectives in alphabetical order.

Nouns - These are the names of things (places or objects). E.g. Chair, Ball, Coat, Table, Park, Shop, Candle

a Anchor	b Butterfly	c Camera	d Doll	e Elephant	f Football	g Garden	h House	i Igloo
j Jumper	k Kite	l Lollipop	m Mirror	n Nest	o Orange	p Pillow	q Queen	r Rabbit
s Snake	t Train	u Umbrella	v Violin	w Wardrobe	x Xylophone	y Yacht	z Zoo	

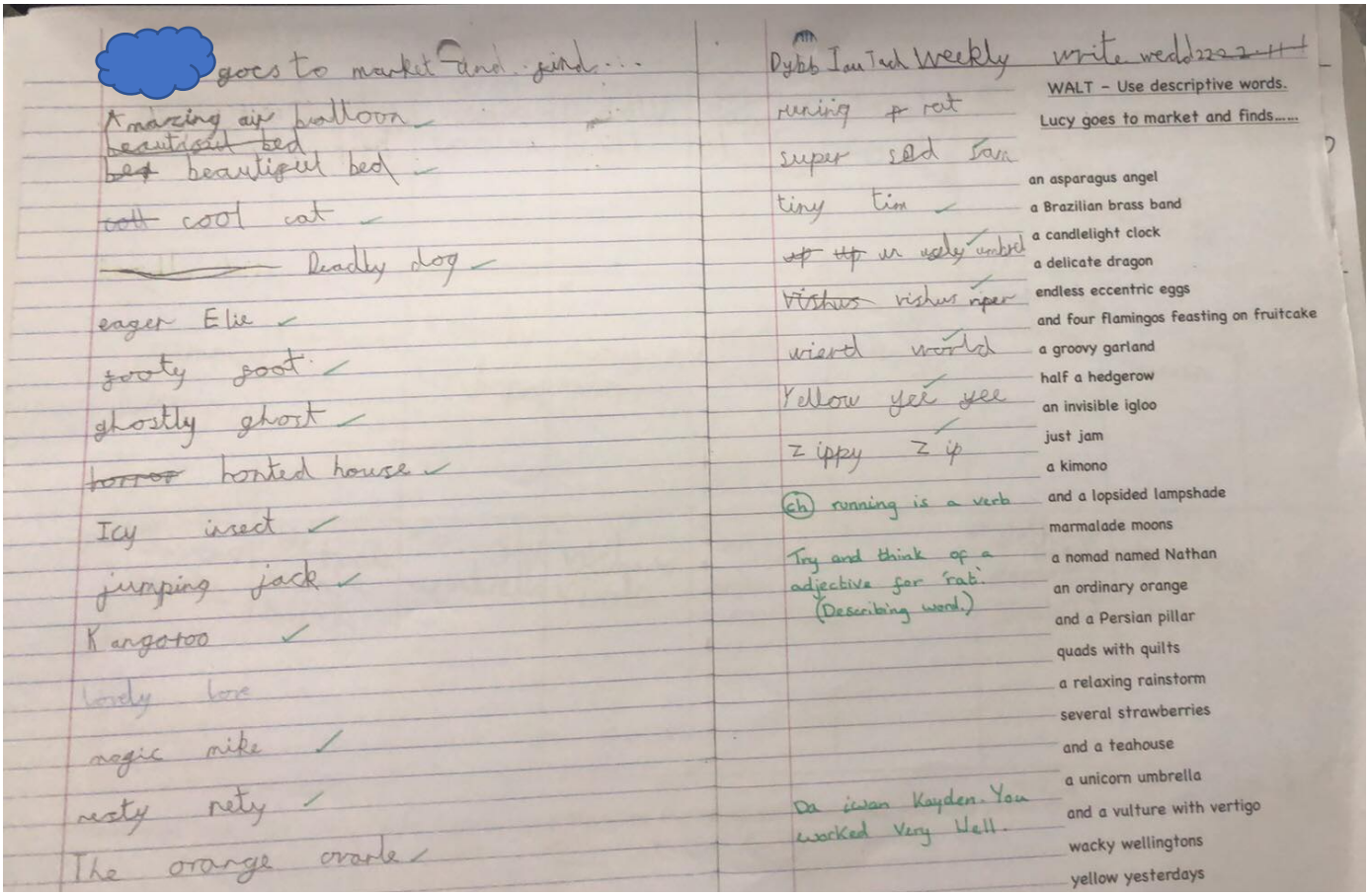
Adjectives the child using the dictionary and thesaurus given to support learning



Adjectives - An adjective is a word that describes a noun (the name of a thing or a place). E.g. Caring, Adorable, Loving, Huge, Big, Small

a Amazing anchor	b beautiful butterfly	c cool camera	d Deadly Doll	e ~~Eager~~ elephant	f footy football	g ~~Ghostly~~ Garden	h horror ~~thing~~ king house	i icey igloo
j jumping jumper	k Kangaroo Kite	l Lovely lollipop	m magic mirror	n nesty nest	o ~~The orange is~~ orange	p punching pillow	q ~~Waking~~ Queen	r ruping rabbit
s slivery snake	t the train is on a track	u ~~a~~ ugly umbrella	v vishus violin	w wierd ~~wardrobe~~ wardrobe	x	y yellow ~~yatch~~ yacht	z zippy zoo	

Appendix 9 – The final session. Writing their own story.



goes to market and finds...

A mazing air balloon
~~beautiful bed~~
~~bed~~ beautiful bed
~~cat~~ cool cat
~~———~~ Deadly dog
eager Elie
~~sooty~~ soot
ghostly ghost
~~horror~~ hosted house
Icy insect
jumping jack
Kangaroo
lovely love
magic mike
nasty nety
The orange oracle

Dybb Im Tech Weekly write wed 22-2-17

running ~~r~~ rat
super ~~sad~~ sam
tiny tim
~~up~~ ~~up~~ ur ~~ugly~~ umbrel
~~Virtues~~ virtues ~~viper~~
wierd ~~world~~
Yellow ~~yee~~ yee
zippy zip

(ch) running is a verb

Try and think of a adjective for rat. (Describing word.)

Da iwan Kayden. You worked very Well.

WALT – Use descriptive words.

Lucy goes to market and finds.....

an asparagus angel
a Brazilian brass band
a candlelight clock
a delicate dragon
endless eccentric eggs
and four flamingos feasting on fruitcake
a groovy garland
half a hedgerow
an invisible igloo
just jam
a kimono
and a lopsided lampshade
marmalade moons
a nomad named Nathan
an ordinary orange
and a Persian pillar
quads with quilts
a relaxing rainstorm
several strawberries
and a teahouse
a unicorn umbrella
and a vulture with vertigo
wacky wellingtons
yellow yesterdays