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**“When we ask questions, sometimes there’s no answer”:**

**A study of year 3 and 4 children’s perceptions  
of curiosity in the classroom**

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### **Abstract**

*This study investigates pupil perspectives of epistemic curiosity and learning. Fostering curiosity is key to creating self-motivated students and is therefore an important subject for contemporary enquiry. A mixed methods case study approach is taken, using semi-structured interviews, drawings and observations to collect qualitative data, analysed using content analysis. This study finds that year 3 and 4 pupils perceive themselves to be more curious now than when they were younger, in contrast to findings of previous research, and suggests explanations for this disparity. The children in this study are more curious when material is pitched at an appropriate level, when learning outside the classroom or in an exploratory manner using real experiences and stimuli. This is congruent with previous research. Suggestions for classroom practitioners are offered along with questions for further enquiry.*

# **“When we ask questions, sometimes there’s no answer”: A study of year 3 and 4 children’s perceptions of curiosity in the classroom**

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## **Introduction**

The concept of curiosity has been chosen for this study as it can be argued that it is a central component to learning in a self-motivated manner. In examining pupil perspectives on curiosity, it is hoped that this project will enable teachers to understand what children think about this concept, and therefore to be able to plan learning experiences which fit with their expectations.

Engel (2015, p.16) describes curiosity as “an expression, in words or behaviours, of an urge to know more”. Litman (2005, p.793) describes it as “a desire to know, to see, or to experience that motivates exploratory behavior directed towards the acquisition of new information”. Thus, it is clear that a feeling of curiosity is likely to help children to acquire understanding about the world around them and to be self-motivated in their learning. As mentioned by Chak (2007), this concept has recently received little academic attention, but the potential benefits of fostering epistemic curiosity mean that it is worthy of consideration.

The aim of this study is to examine the perceptions of children about curiosity, specifically the sorts of experiences which help them to feel curious and ask questions. It is hoped that this will help educators to understand how to encourage children to have a desire to find things out, and thus lead to a more self-motivated class. After a consideration of the current literature, the following research questions were used as foci for the study:

RQ1: Do children perceive themselves to be more curious now or when they were younger?

RQ2: What types of activities do children perceive as encouraging them to feel curious?

RQ3: Where do children feel most curious?

## **Literature Review**

### **Epistemic Curiosity**

Curiosity is mentioned several times in the National Curriculum, in relation to varied curriculum areas. For example, it states that a high-quality mathematics education opens “a sense of enjoyment and curiosity about the subject” (Department for Education, 2013, p.99) and that reading opens a “treasure-house of wonder and joy for curious young minds” (Department for Education, 2013, p.14). Curiosity is also mentioned in the National Curriculum in relation to science, geography, history and Modern Foreign Languages. In terms of policy therefore, it is clear that instilling a sense of curiosity in our pupils is paramount. However, there is little detail about what this looks like in the classroom, how to create it, or indeed how to measure it. As mentioned by Dann (2013), the extent to which a child is curious is rarely included in assessments, however it is central to what teachers should be striving for in classrooms. Therefore, it is an important element for education researchers to consider.

Berlyne (1954, p.183) discusses ‘epistemic curiosity’, the type of curiosity which is related to knowledge and intellectual discovery, and he discusses the role of questions and conflict in this. Regarding the role of questions, he states these can be questions either posed by the individual themselves, or by others. He states that introspective and behavioural evidence suggests that when an acceptable answer has been found, curiosity is reduced, but that the higher the curiosity beforehand, the more reinforcement is necessary to reduce it. Berlyne (1954, p.189) also discusses the role of conflict in curiosity, stating that “patterns will be most curiosity-arousing at an intermediate stage of familiarity”. It is therefore worth considering whether different types of questions or levels of difficulty have an effect on how children perceive themselves to be curious in the classroom.

Berlyne’s (1954) theory on the level of conflict links to Day’s (1982, p.20) suggestion of the ‘Zone of Curiosity’, where on one side there is the ‘Zone of Relaxation’ and on the other is the ‘Zone of Anxiety’. Therefore, it is clear that the crucial part of both Berlyne and Day’s theories is that the level of curiosity is most effective if it is at a level which is congruent with current learning and already-accepted understandings. In brief, Berlyne and Day both suggest that the most successful

level of curiosity is one which encourages the child to find out more, but is not so much as to feel insurmountable.

Clearly, this links with Vygotsky's 'Zone of Proximal Development', as described by Vygotsky (1978, p.86) as "the level of potential development as determined through problem solving under adult supervision or in collaboration with more capable peers". The subtle difference here is that curiosity can be something which the child can work through independently, if given the right resources to find things out for themselves. In this study, we will see what the children's perceptions are of the role of adults or other children on their curiosity levels.

Engel (2015) agrees with the idea of the 'Zone of Curiosity', stating that even though we may be drawn to novelty, our appetite for it is balanced with our sense of fear of the unknown, and that "anxiety plays a subtle but powerful role in curiosity" (p.32). Engel (2015) cites several studies of children and rats to present her argument, and it is a strong case. In addition, Engel (2015) notes the importance of temperament, as curiosity is made up of both the ability to sense novelty but also the desire to explore, and this varies widely depending on the individual. Therefore, individual differences due to varying factors are likely to be apparent, and it will be important to bear that in mind during this current study.

### **Curiosity and Questions**

Chouinard (2007) undertook a study of children's questions which revealed that the questions asked followed the learning pattern that one would expect to see: they shifted from questions asking for facts to questions asking for explanatory information as the children got older (p.102). This is congruent with Bloom's Taxonomy and the development of cognitive challenge and thought processes (Pollard, 2014). Chouinard's (2007) study found that explanatory questioning spiked between the ages of 3 and 4, but also within a short-term investigation of a particular subject. In addition, Chouinard (2007) drew an important conclusion about the significance of using real objects and stimulus materials in order to stimulate curiosity and questioning in children. The study found that children who were shown drawings or replicas of animals asked fewer questions than the children who engaged with the real animal. To add to this, not only did the children shown drawings and replicas ask fewer questions, but there was also a reduction in the quality of the questions they asked, thus leading to the conclusion that replicas negatively affected the questions both quantitatively and qualitatively (p.104). Chouinard (2007, p.104) states "it is important to realize

that something is happening in the minds of children when they look at these different types of stimuli”. Engel’s (2015) observation of terrariums and aquariums in a classroom attracting steady enquiry also adds weight to this claim. Engel (2015, p.93) states that in most cases she observed where a physical object elicited attention, this “quickly turned into an enquiry of some more abstract aspect of the object”. This will be an important element to bear in mind during this study, as it will be interesting to see whether the children in question perceive their level of curiosity to be any different if they have experienced a real object or event rather than a replica or picture.

In Chouinard’s (2007) study, children between the ages of 14 months and 5 years asked an average of 107 questions per hour, the majority of which were questions seeking new information (p.22). It is important to note there were wide individual differences in the children who took part: Abe asked 69.6 questions per hour, compared to Adam who asked 198 per hour. Thus, we can see clear individual differences. Engel and Corona’s (2015) study showed that children who asked a lot of questions had mothers who also asked a lot of questions. They note their data cannot tell us in which direction the causal relationship exists, but that this does suggest family style has an influence on the level of question asking and curiosity, and the cycle of question-asking is self-perpetuating (Engel, 2015, p.61).

Therefore, there is evidence that children aged 5 years and under generally have high levels of curiosity. However, Engel (2015) found that once children entered formal education, the numbers of questions they asked diminished significantly, finding only 2.36 episodes of curiosity in a two-hour stretch in a kindergarten classroom, and only 0.48 in a fifth-grade classroom (p.88). Moreover, a study by Tizard and Hughes (2002) fitted pre-schoolers with audio recorders to find out how many questions they were asking. The pre-school children in this study asked an average of 26 questions to their mothers, compared to two per hour of their teachers (p.167). This adds weight to this argument as it again shows curiosity levels dropping when children start to attend school. It will be interesting to see what the children’s perceptions about this are during this study.

Engel (2015) acknowledges that it is difficult to gain an accurate representation of exact levels of curiosity in children, as the data are descriptive, having to rely on observations as it is not possible to track thoughts in children’s heads. However, it is possible to measure the amount of curiosity expressed, by recording the number of questions asked and the amount of curiosity shown by children. It is important to note that both Chouinard’s (2007) study and Engel’s (2015) study were

conducted in the United States of America, so there may be cultural differences when thinking about how this relates to education in the United Kingdom, but it is a good indicator of children's behaviour in general.

### **Influences on Curiosity**

Engel (2015, p.92) also mentions what she terms 'curiosity in the margins', which is children expressing curiosity when left on their own or with their friends, about subjects peripheral to their studies. Engel (2015) links this to one of her previous studies where she found children were more likely to explore a curiosity box left in the classroom when with a group than on their own. This suggests the social constructivist theories of children making meaning with their peers through language plays an important part here, as the children are discussing and making meaning between themselves through collaboration and exploration. As mentioned by Henderson (1984), social influences play a large factor in the expression of curiosity. Henderson (1984) found that when an adult encouraged the child, they expressed more curiosity with the novel objects in the room, and this effect was strongest for those who had been initially the least exploratory (p.1245). Thus, it can be seen that curiosity is something which, in some children, requires fostering and encouraging, either by adults or by their peers, and that social interactions are important in this process.

It is also necessary to consider the idea of the power of interest. As mentioned earlier in this literature review, individual differences between children prevail in terms of curiosity levels. DeLoache, Simcock and Macari (2007, p.1583) explored children's 'extremely intense interests' in a study where they found children with particular interests asked "endless questions, indicating an active effort to learn more about the topic" and that as a result, the children "acquired substantial knowledge in their interest category". This study reported that nearly one third of children acquired an 'extremely intense interest' and they were relatively long-lasting, lasting between 6 and 36 months. As educators, the key point to consider from this is that it is important to find out what pupils are interested in and find a way of using this in lessons to capture curiosity.

This supports Engel's (2015) claim that as children get older, they tune in on finer details and that the more a child knows about an interesting subject, the more they are likely to want to know. As Engel (2015, p.112) states, "this loop connecting knowledge and curiosity is often what leads to expertise." As Gade (2011, p.10) states, one "cannot be aware of something about which we have no idea, so the desire to know has meaning only in relation to an awareness of an absence." This

would suggest that, contrary to Chouinard's (2007) findings, children should in theory become more curious as they start school and learn more about different subjects. It will be interesting to get the children's perspectives on this.

Engel (2015) offers some guidance on how to help foster curiosity in the classroom. She states that children need access to "books with good language and complex characters, fish tanks, terrariums, complex machines and gadgets, and conversations about the unseen and unseeable" (p.190). She suggests that teachers should try to plan activities which encourage children to consider their own questions and seek the answers, and that teachers should show curiosity themselves because children are influenced by the way adults behave. Hopkins and Craig (2015) undertook a wide study in Australia and proposed 'Theories of Action' which they claimed would help foster curious classrooms. They were: high expectations, enquiry focused teaching, consistency, harnessing pace, setting challenging learning tasks, using higher-order questioning, using feedback and data, Assessment for Learning, and using group work (p.5). It will be interesting to compare these strategies with those mentioned by the children in this study.

## **Methodology**

In order to gain an in-depth understanding of pupil perspectives on curiosity, I intended to mainly use a qualitative approach. After considering the research questions, it was clear that in-depth information would need to be gathered from the pupils. This approach allowed me to explore the pupils' opinions and thoughts, and then analyse them for further understanding.

To gain the depth of information necessary but also to have a variety of children participating, I decided to use a mixed methods approach. As part of this, I decided to select a small number of children and focus on the case study approach with them. As highlighted by Denscombe (2010, p.53), the aim of the case study approach is to "illuminate the general by looking at the particular." It also offers the researcher the opportunity to go into "sufficient detail to unravel the complexities of a given situation" (p.53). Seeing as the research questions around curiosity are complex, I decided this approach would be the best fit. To improve reliability of the findings, I decided to use a representative sample of children from the class in which I was working at the time.

The pupils were selected on the basis of age and academic attainment. The class in which I was based was a mixed year 3 and 4 class, so 3 children were selected from both year 3 and year 4, to

give a total of 6 children. Within that, one child selected from each year group was generally a high attainer, one a middle attainer and one a lower attainer. This ensured the children represented a cross-section of the class population and improved the external validity of my findings. I considered carrying out a survey with the whole class and then selecting children based on the results of the survey, but decided that this method of selection would give a more impartial selection of the group as a whole.

I carefully considered how best to approach the concept of curiosity, and how to ensure the children's understanding of it. To engage the pupils and couch the concept in a familiar context, I intended to introduce the concept with a story including a character who showed traits of curiosity. I intended to read and discuss the story with the children, before exploring the concept with them. However, when I looked into children's stories with curious characters, it seemed that curiosity was generally being portrayed through children's literature in a negative light. For example, the stories of 'Curious George' by H. A. Ray were perfect examples of stories with a curious character, however it seems that the protagonist tends to get into trouble for investigating his curiosity. This was not the way I wanted to portray curiosity to the children as I felt it was important that it was presented in a positive manner. Therefore an alternative was found, whereby as part of a science lesson on space, I introduced the concept of curiosity with a book about the Mars Rover: 'Curiosity: The Story of a Mars Rover' by Markus Motum. This linked with the topic the children were learning about and gave them context with which to consider the concept. It was important to ensure the children knew that curiosity could be linked with any subject, not just space, so I ensured that this point was included in the discussion.

After introducing the concept of curiosity to the class, I decided to use semi-structured interviews with the 6 pupils chosen. Semi-structured interviews were chosen over structured or unstructured interviews to ensure some consistency and to ensure all points were covered, but also to allow for flexibility in the conversations. As noted by Thomas (2017, p.206), semi-structured interviews provide the "best of both worlds". I considered whether to interview children in small groups or individually and decided upon individual interviews to ensure each child had an equal opportunity to discuss their views. As noted by Thomas (2017, p.212), "people behave differently in groups". However, I was also interested to see how the children would respond in a group situation so after the individual interviews I brought them together for a short group discussion too.



As noted by Thomas (2017, p.202), it is important to put the interviewee at ease before the interview begins. The participants were already familiar with me but with this in mind, before beginning the interviews I ensured I established rapport with each participant to put them at ease and to ensure they were relaxed and therefore able to share their views accurately. I also ensured I posed open questions during the interviews, to encourage the children to share their thoughts and experiences openly and in detail. The interviews were audio recorded to ensure accuracy of reporting, but I ensured the participants were comfortable with this before commencing. As Wilson (2013, p.116) states, it is important to build trust and confidence, and I did this by ensuring the participants knew that their views were important.

Finally, I wanted to offer the participants the chance to portray their views in a visual way through drawing a picture of someone being curious. Clark and Moss's (2006) Mosaic Approach states the importance of listening being "a process which is not limited to the spoken word" (p.5) and offering alternative ways for children to communicate. Clark and Moss (2006, p.12) also state that observation is important as "listening also involves watching." Therefore, I decided to offer the children the chance to draw during the course of the interviews, and also to ensure that I made observations of the children in question. Not only would this ensure that the children were being listened to in a variety of different mediums, it also offers the opportunity to triangulate the findings to maximise accuracy and therefore increase the validity of this study.

## **Ethics**

This research was carried out in a school where a qualified teacher and headteacher acted as gatekeeper, whereby the research methods and intentions were discussed with and approved by such responsible persons. In addition, the guidelines on educational research ethics issued by the British Educational Research Association (BERA) were read and followed. As stated by BERA (2011, p.3), educational research is important as "the improved knowledge and understanding of all aspects of education is vital for our democracy and social well-being", however it is also vital to conduct such research with the highest regards for the ethical guidelines. As recommended by BERA's (2011) guidelines, this research has been carried out with an ethic of respect for "the person, knowledge, democratic values, the quality of educational research, academic freedom" (p.4).

As per the University of Cambridge ethics checklist and as discussed with my Personal Tutor, this research has been carried out in a considered manner, with the participants' interests put first. To the best of my belief there is no reason to think it may have caused any detriment to any participant. When gathering data, I made it a positive experience for those concerned by making sure they knew I was interested in their thoughts and beliefs, and giving them an opportunity to talk and discuss their learning and experiences. I checked the children were happy before starting the interview, made sure they knew it was not a test, and ensured they knew they could stop the interview at any time if they did not wish to continue. All participants talked at length and with ease about their thoughts and experiences.

Before carrying out interviews, letters were sent home to check parental permission. The Headteacher of the school advised that giving parents information about the project and asking for permission on an opt-out basis was appropriate for this study, so that is the format the letter followed. All participants are anonymised at all times during this report and alternative names are used throughout (Henry, Isobel, Joseph, Neil, Tony, Zara). It is worth noting that Zara used a name in her drawing (see Appendix 1), but this is a name she chose for the character in the picture and not one of the participants' names. Recordings made of the interviews, drawings made, and observations taken will be destroyed once the project is complete.

## **Presentation and Discussion of Data**

To present the findings of this study, the data will be presented in accordance with the three research questions outlined in the introduction. The responses have been presented in themes to signify the main categories mentioned, and selected quotations will be used to illustrate the children's thoughts.

### **Do children perceive themselves to be more curious now or when they were younger?**

To answer this question, the children were asked whether they thought themselves to be curious, followed by a discussion of why. Later they were asked if they thought they were more curious now or when they were younger, and whether they think asking or answering questions is more important. The tables below show their responses, including the number and percentage of pupils who gave each response.

<i>Would you describe yourself as curious?</i>		
<b>Response</b>	<b>Quantity</b>	<b>Percentage</b>
Yes	3	50%
No	1	16.6%
Not sure	2	33.3%

**Table 1: Responses to “Would you describe yourself as curious?”**

<i>More curious when younger or now?</i>		
<b>Response</b>	<b>Quantity</b>	<b>Percentage</b>
Younger	1	16.6%
Now	4	66.6%
Not sure	1	16.6%

**Table 2: Responses to “Are you more curious now or when you were younger?”**

<i>Asking or answering questions?</i>		
<b>Response</b>	<b>Quantity</b>	<b>Percentage</b>
Asking	3	50%
Answering	0	0%
Both	3	50%

**Table 3: Responses to “Is it better to ask or answer questions?”**

As can be seen from Tables 1-3 above, half the children considered themselves to be generally curious, and the majority thought themselves more curious now. This goes against the literature’s findings that children generally display fewer signs of curiosity and ask fewer questions when they start school. As discussed in the literature review, several studies have found episodes of curiosity dropping when children start school. However, the children in this study did not perceive this. As stated by Zara, “I’m learning more things and when I learn more I have more questions about why and what.” I observed them asking a high level of varied questions during my time in school, which would support the children’s evidence. There could be several reasons for this. As mentioned above, it is difficult for researchers to gauge accurate levels of curiosity through observations alone,

and it may be that getting the perceptions of children themselves is a more accurate method. Alternatively, it is worth bearing in mind that the class in question were generally highly motivated by topics being studied. They were studying space and local history at the time, both being topics which had captured the children's imaginations and which they told me they were particularly curious about. It may be that if this study had been undertaken at a time when they were studying topics which interested them less, the findings could have varied. However, this research can only take into account the findings at a specific moment in time.

Tony was unsure about his level of curiosity, and stated, "it needs to be not too hard, not too easy." This corroborates with the theories of Berlyne (1954) and Day (1982) whereby it has been suggested that curiosity acts on a level just outside of the child's current understanding, in the "intermediate stage of familiarity" (Berlyne, 1984, p.189), or the 'Zone of Curiosity' as related to Vygotsky's 'Zone of Proximal Development'. Joseph's statement of "I have the same amount of questions but they're about different things" and Isobel's comment of "I like learning new stuff more than old stuff" also support this. In addition, Joseph said "I don't have any questions about metal because I've already learnt it. I'm interested in things I don't know about yet." This further supports that the pupil perception of curiosity is congruent with the literature's findings, as it shows Joseph's 'Zone of Curiosity' moving as he learns more.

Additionally, all participants thought being curious and asking questions was important for their learning, having a good understanding of how asking questions and being curious helps them learn more. The school was undertaking a meta-cognition programme with the children, so it could be argued that one benefit of this programme was that the children had a good level of meta-cognition, and therefore helped them realise that curiosity and asking questions was positive for their learning. It is outside the remit of this study to consider whether a group who were not undertaking the meta-cognition programme would have a similar response, but this could be interesting for further research. In particular, Zara's comments of "when we ask questions, sometimes there's no answer" and Tony's response to that of "that's better than having an answer" shows that these children are comfortable with the unknown, the pursuit of new knowledge, and have a growth mindset.

### **What types of activities do children perceive as encouraging them to feel curious?**

To analyse the findings of this study in relation to specific activities, answers given have been grouped by themes. This has been done using the approach of content analysis, as a way of

quantifying themes mentioned. During my discussions with the participants, I noted the subjects and the learning activities they mentioned rather than providing them with a list of options, in order to minimise any bias and therefore increase the validity of the findings. The number of children who mention each has been noted, to see which were mentioned by the majority. However, as one drawback of content analysis is that it can dislocate meaning from context (Denscombe, 2010, p.283), I have been careful to preserve context. Table 4 shows curriculum subjects mentioned, and Table 5 shows specific learning activities discussed.

<i>Subjects</i>	
<b>Subject Mentioned</b>	<b>Quantity</b>
Science	5
History	3
Art	2
English	2
Geography	2
Mathematics	2
Nature	1
Languages	1
Building	1

**Table 4: Subjects mentioned during discussion of "Which subjects make you feel most curious?"**

<i>Activities</i>	
<b>Activity Mentioned</b>	<b>Quantity</b>
Experiments	4
Roman soldier visit	3
Class walk around village	3
Drawing	2
Research carousel	1
Reading	1

**Table 5: Activities mentioned during discussion of "What kind of lessons make you feel curious?"**

As can be seen from Tables 4 and 5 above, science and history were the top subjects mentioned regarding feeling curious. This may be linked to the specific activities they discussed as the top activities (experiments, Roman soldier visit and class walk around village) as these had been the teaching activities in those subjects. That leads one to wonder whether it is possible to increase curiosity in other subjects by adopting those teaching methods in a wider range of curriculum areas. On the other hand, it may be a sign that the children have a particular interest in those subjects. As mentioned in the literature review, DeLoache et al. (2007) explored children's 'extremely intense interests.' Therefore, this would be worth further investigation, using a targeted intervention and tracking the results to see any effect.

The specific school activities mentioned by the children in this study align with those mentioned in the literature as curiosity-inciting teaching strategies. As mentioned by Chouinard (2007), research has found the use of real objects and stimulus materials plays a significant role in the development of curiosity, and the participants of this study agreed with this. The experiments engaged them in the learning task, something which I also observed, and the children enjoyed discovering things for themselves. During my observation, I noted that one class member said, "I feel like a real scientist!" It made the learning real as there was a purpose to it, and as stated by Neil, "we were solving a real crime!" This is linked to the visit to the village and the Roman soldier visit, as again, those activities provide a purpose for learning and make it real. As Zara stated, "it helped me imagine it and made it real" and as Joseph stated, "you can think back and see them here." My observational evidence can also add that during the trip the children asked a large number of questions about a variety of subjects. Therefore, this research backs up the literature.

It is interesting to see research carousels and reading being mentioned. Joseph stated, "when you read, you find more information and that makes me even more interested." This links with Engel's (2015) suggestion that teachers should encourage children to construct and research their own questions, as well as Hopkins and Craig's (2015) mention of enquiry-focused teaching. The children in this study found these independent research strategies useful. The mention of drawing by two children in this study is also noteworthy. The literature analysed for this study did not include any specific mention of the link between drawing and curiosity, so this could be worthy of future research. It would be interesting to see whether drawing and other creative activities could affect children's curiosity levels.

It is also worth noting the mention of learning languages by one pupil in this study. Even though it was only mentioned by one pupil, two others mentioned travelling to other countries and geography, which could link together. This leads me to consider whether more explicit links could be made between these subjects, to help harness curiosity around other cultures and languages. This may be worthy of future study.

### Where do children feel most curious?

As in the above section, these responses have been analysed using content analysis to quantify the responses given. Table 6 below shows the themed responses and the number of participants mentioning each.

<i>Locations</i>	
<b>Response</b>	<b>Quantity</b>
School trips / museums	3
On holiday	3
At school	2
At home	2
Outside	2
Friend's house	1
Sports club	1

**Table 6: Locations mentioned during discussion of "Where do you feel most curious?"**

This section backs up the previous question in that school trips / museums and holidays were the most commonly mentioned places. Henry's comment of "when someone tells me something I want to see it myself" sums up the feeling about this. This adds weight to the argument that allowing children to see and experience things themselves is key in inciting curiosity. It is worth noting Joseph's strong opinion about climbing trees making him feel curious. He stated, "I'm curious when I climb trees". When asked if he could draw someone being curious, he drew a selection of leaves, backing up his verbal evidence. Being outside may be linked to experiencing new things and exploring learning, and therefore may add further evidence to the above.

In addition, there is evidence here that being around other people helps pupils' curiosity levels. Zara specifically mentions being around her friend who is older than her, stating "I'm curious when she tells me all this stuff because she knows more." Zara also stated, "When one person feels curious and asks questions, then another person will too." This backs up the literature that curiosity has been found to be stronger amongst children who are interacting with others, aligning with the social-constructivist view of learning. Looking at the drawings (see Appendix 1), one pupil drew a group of three people, however the other children drew one person on their own, which would suggest that some children perceive themselves as more curious when amongst others while some feel curious on their own. In terms of my observations, it seemed that children had more questions when working together. This may be worthy of further study, as here most of the visual evidence does not agree with the verbal and observational. Having said that, it may also be that the children did not have enough time for the drawing task and therefore the validity of the pictures as evidence may be reduced.

Additionally, it is worth considering this research question in collaboration with question one. The literature showed children's curiosity levels dropping when starting school, and although the children in this study did not agree with that, they were mostly in agreement that they felt more curious when they were out of school. The majority of the research in the literature review was carried out on children's curiosity levels in classrooms and then taken to mean that the children of that age were or were not curious. However, these studies may not have taken into account the context of where the children were. Perhaps it is not that children's curiosity levels reduce as they get older, but that classrooms were failing to incite their curiosity. If they had carried out the studies on the same children but in different locations and contexts, perhaps different results would have been found, as this study has found that children of school age do feel curious, but that they mainly feel curious outside school or when being engaged with immersive educational experiences. This would be worthy of further research.

## **Reflection on Research Methodology**

Firstly, it is important to note this research has been carried out on a small scale, with six children from one class, from one school. Even though careful consideration was taken to choose a representative selection of pupils, there will be differences in other classes and in different areas of the UK. No pupils with diagnosed Special Educational Needs, with English as an Additional



Language, or from a different socio-economic background were included. Therefore, in order for this research to become reliably generalisable, it would be necessary to repeat it on a larger scale with a larger cross section of the population. As stated by Denscombe (2010, p.62), the main disadvantage of the case study approach is the credibility of generalisations made. However, this research has been holistic by talking in depth with the children and using a mixed methods approach, followed by triangulation of the data, so findings are reliable for the sample group and give rise to credible further questions.

Whilst undertaking the research, it was found that individual interviews were the most fruitful. This may be because children felt at ease and able to discuss thoughts without interruption from others. When the short group interview was undertaken, many children tried to talk over each-other, despite some 'ground rules for talk' having been discussed. It was found that some children dominated the discussion while others tended not to talk unless asked. Therefore, for further research the recommendation would be to concentrate on individual interviews. In terms of the 'visual listening' approach (Clark & Moss, 2006) general observations were useful, but to maximise credibility, more structured observations would be better. Additionally, there is a question over the reliability of the children's drawings as evidence. Some children did not wish to draw, with Henry and Neil not drawing anything, and others seemed to draw something very quickly without considering it much. This leads me to question the reliability of these, although they have been interesting to consider from a different angle.

In terms of bias, it is important to note all research is subject to bias. As stated by Denscombe (2010, p.298), objectivity denotes research which is "impartial and neutral in terms of the researcher's influence on its outcome". In this study, I made significant attempts to minimise bias by making sure children knew the interviews were confidential and that I was talking to them as someone who was interested in their views more widely. As a trainee teacher who had been teaching the class, it is possible that their responses could have been influenced by this, and this needs to be considered. To further reduce bias, it may be useful for future studies to be carried out by an independent researcher who did not have any relationship with the children in question. Having said that, it did sometimes help to have an already-established rapport as they opened up easily and shared their views, which they may not have done so easily with someone they had never met.

## **Implications of the Research**

In terms of professional development, this research has provided information which could help shape a trainee teacher's future practice. It was found that the children in the study feel more curious now than when they were younger, as they know more now and that helps them ask more questions. This is contrary to previous research that children's curiosity levels decrease once they start school. This could be explained by the topics and learning experiences happening in the class. The implication of this in the classroom is that teachers need to consider activities to pique children's interests and to encourage them to want to find out more. It was also found that the children felt learning needed to be pitched at a careful level to maximise their curiosity, tying in with Vygotsky's 'Zone of Proximal Development'.

This research found that children strongly perceived certain types of learning experiences as having a positive effect on their curiosity levels, namely experiments, outside visitors and school trips. This ties in with previous research which found that using real objects and artefacts helps make learning real for children. The implications of this for my future practice is that I will endeavour to engage children's curiosity by using experiments, real artefacts, and experiences in my teaching, to pique children's curiosity and encourage them to find out more through child-led research. Most children also found they felt more curious when they were outside the classroom. The implication of this for my future practice is that I will incorporate learning in alternative settings where possible, and to consider how to bring those experiences inside the classroom too.

In terms of wider implications of this research, as mentioned above, it would need to be repeated on a wider scale to produce credible generalisations. However, as it has been completed in a robust and considered manner, the further questions arising from this study would be worthy of future research. Creating curiosity in the classroom is a key element to creating life-long learners, and recent research into this concept is minimal. Therefore, this subject is a key one for educators and researchers to consider going forwards. Additionally, getting the pupil perceptions on this question has been illuminating and shows how important it is to listen to children.

To conclude, I plan to use these findings to help create a climate of curiosity in my future classroom. This will be achieved by taking the recommendations of this research and fostering an experience-based learning environment with child-led research opportunities. This will help me to

create curious and engaged learners with intrinsic motivation to ask questions and open their minds to new possibilities and learning.

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## Appendix 1

### Drawings



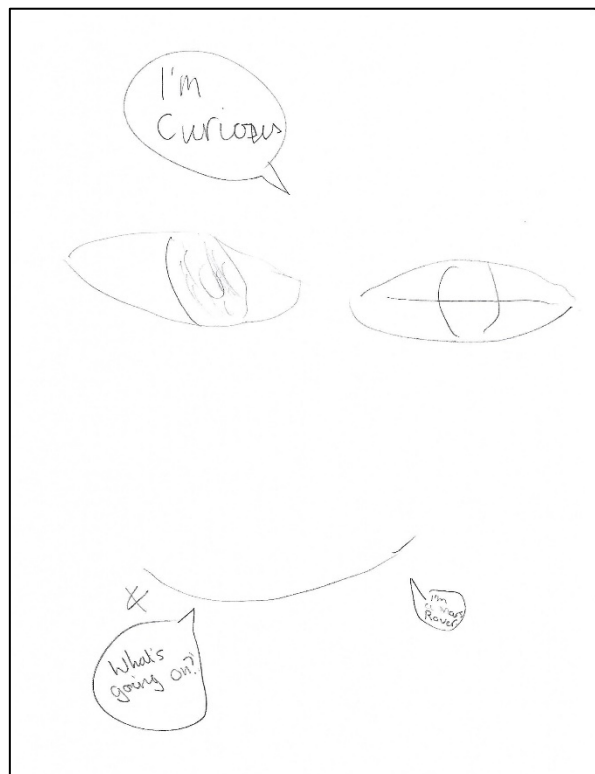
Joseph's drawing – different types of leaves



Zara's drawing – several people



**Isobel's drawing – one person**



**Tony's drawing – one person**