STRATEGIES USED AND CHALLENGES ENCOUNTERED IN SUPPORTING PUPILS WITH ENGLISH AS AN ADDITIONAL LANGUAGE, IN PRIMARY SCIENCE

Amanda Dowling

Principle Module submitted for BA (Hons) in Primary Education + QTS

University of Northampton
April 2016
Abstract

This research study aims to explore strategies that are used to support EAL (English as an additional language) pupils. It focuses specifically on strategies that primary schools in England use to support EAL pupils in science, and the challenges encountered by those schools. The study took place in a primary school in Buckinghamshire and a lower school in Bedfordshire. The large increase in the number of pupils who fall into the category of EAL continues to challenge policy makers and practitioners; this study looked at how the two schools meet the needs of this diverse group of children within a mainstream setting.

A variety of data was gathered for this study from interviews with the Science Coordinator and an EAL Leader from the two different schools, by observing science lessons, and by scrutinising the schools’ EAL policies. The data was analysed and triangulated, and conclusions were compared to the current literature review.

This study concludes that a range of strategies are required to successfully support EAL pupils in science, that there was considerable overlap in the strategies employed by the two schools, and that the strategies were successful. However, the two schools placed different emphasis on different strategies, with this being most evident in their procedures for allowing the use of first language in class.
## Contents

<table>
<thead>
<tr>
<th>Abstract</th>
<th>ii</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contents</td>
<td>1</td>
</tr>
<tr>
<td>List of Figures</td>
<td>4</td>
</tr>
<tr>
<td>Definitions</td>
<td>5</td>
</tr>
<tr>
<td>Abbreviations</td>
<td>6</td>
</tr>
</tbody>
</table>

### Chapter 1 – Introduction
1.1 Research focus 7
1.2 Background 7
1.3 Rationale for study 8

### Chapter 2 – Literature Review
2.1 Introduction 9
2.2 Language proficiency and academic achievement 9
2.3 What does good practice in EAL look like? 10
   2.3.1 Visual aids 11
   2.3.2 Collaborative talk and group work 11
   2.3.3 Vocabulary 12
   2.3.4 Modelling Vocabulary 13
   2.3.5 Hands on experience and practical work 13
   2.3.6 Teaching Assistants 14
   2.3.7 Using first languages in class 14
2.4 Challenges faced by teachers 15
2.5 Conclusion 16

### Chapter 3 – Methodology and Ethics
3.1 Introduction 17
3.2 Research approach: Case Study 17
3.3 Sampling 18
3.4 Data Collection 18
   3.4.1 Qualitative Interviews 18
   3.4.2 Qualitative Observations 19
3.4.3 Document Analysis 19
3.4.4 Triangulation 20

3.5 Validity and reliability 20

3.6 Ethics 21
3.6.1 Ethical Clearance 21
3.6.2 Voluntary Informed Consent 21
3.6.3 Right to Withdraw 22
3.6.4 Anonymity and Confidentiality 22

Chapter 4 – Results, Analysis and Discussion

4.1 Introduction 23
4.2 What strategies are used to support the science education of EAL pupils? 23
4.2.1 Visual aids 23
4.2.2 Collaborative talk and group work 24
4.2.3 Vocabulary 26
4.2.4 Modelling Vocabulary 26
4.2.5 Hands on experience and practical work 27
4.2.6 Teaching Assistants 28
4.2.7 Using first languages in class 29
4.3 What are the challenges encountered when providing for the needs of EAL pupils? 30
4.4 Summary 32

Chapter 5 – Conclusion

5.1 Introduction 33
5.2 What strategies are used to support the science education of EAL pupils? 33
5.3 What are the challenges encountered when providing for the needs of EAL pupils? 34
5.4 Reflection and Evaluation 34
5.5 Impact on professional development and teaching practice 35

Reference List 36
Appendices

Appendix 1  Dissertation Log  43
Appendix 2  Ethics Sheet  46
Appendix 3  Consent letter  47
Appendix 4  Coding System used for Question 1  49
Appendix 5a  Question 1 - Coded transcription of interview School A  50
Appendix 5b  Question 1 - Coded transcription of interview School B  52
Appendix 6a  Question 1 - Coded science lesson observation 1 School A  54
Appendix 6b  Question 1 - Coded science lesson observation 2 School A  57
Appendix 6c  Question 1 - Coded science lesson observation 1 School B  60
Appendix 6d  Question 1 - Coded science intervention lesson observation 2 School B  62
Appendix 7a  Question 1 - Coded EAL Policy School A  64
Appendix 7b  Question 1 - Coded EAL Policy School B  67
Appendix 8  Coding System used for Question 2  70
Appendix 9a  Question 2 - Coded transcription of interview School A  71
Appendix 9b  Question 2 - Coded transcription of interview School B  73
Appendix 10a Question 2 - Coded EAL Policy School A  75
Appendix 10b Question 2 - Coded EAL Policy School B  78
<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>The increase in the number of pupils whose first language is other than English, between 1997 and 2013</td>
<td>7</td>
</tr>
<tr>
<td>Figure 2</td>
<td>A chronological time scale showing the implementation of the methods discussed above.</td>
<td>20</td>
</tr>
</tbody>
</table>
Definitions

**English as an additional language (EAL)** is defined by Ofsted as ‘learners whose first language is not English. The learner may already be fluent in several other languages or dialects’ (Ofsted, 2014, p3).

**Bilingualism** is problematic to define as it has different meanings to different people; however, for the purpose of this study the term will be used to describe ‘a learner who uses two or more languages to communicate. There are various interpretations with regard to attitude, proficiency and use’ (Franson, 2009, p.2).

**Home language and first language** are used interchangeably to describe ‘the language used most frequently in the home’ (Franson, 2009, p.2).

**Intervention Group** is defined as withdrawal of EAL pupils from a mainstream class, focusing on pre-teaching of key language for a particular topic and supporting EAL learners with using a bilingual dictionary or translation (British Council, 2016b).

**Group Work** is defined as pupils working together in small groups to learn from each other and problem solve by sharing, discussing and developing ideas (Liversidge et.al., 2009, p.170).

**Practical Work** is defined, for the purpose of this study, as ‘any science teaching and learning activity in which the students, working individually or in small groups, observe and/or manipulate the objects or materials they are studying’ (Millar, 2010, p.109).

**Modelling Vocabulary** is defined, for the purpose of this study, as pupils using actions alongside words or phrases (Mistry and Sood, 2010, p.112) and/or the teacher using the desired vocabulary (Haslam et al., 2005, p.32).
Abbreviations

BICS  Basic Interpersonal Communicative Skills
CALP  Cognitive Academic Language Proficiency
CUP   Common underlying proficiency
EAL   English as an additional language
EMAG  Ethnic Minority Achievement Grant
SEN   Special education needs
TA    Teaching Assistant
Chapter 1 – Introduction

1.1 Research focus
This study aims to identify the strategies that are used in primary school science lessons in England to support pupils who have English as an additional language (EAL), with the intention of addressing the following questions:

- What strategies are used to support the science education of EAL pupils?

- What are the challenges encountered when providing for the needs of EAL pupils?

1.2 Background
Recent studies report that the number of primary school children with EAL in England has steadily risen from 9.6% in 2003 to 19% in 2014 (British Council, 2014; Hughes, 2008, p.210). This figure has increased by over 500,000 children in 16 years, as shown in figure 1.

![Figure 1 - The increase in the number of pupils whose first language is other than English, between 1997 and 2013 (Naldic, 2015a)](image-url)
EAL pupils are not a homogenous group and enter school from different backgrounds, with a variety of languages. Some children are bilingual whereas others have no knowledge of English. This huge spectrum offers a unique issue for schools, who must challenge pupils academically whilst ensuring that they do not set tasks and activities that frustrate or isolate pupils due to the language barrier (Ofsted, 2014, p3; Hughes, 2008, p.210).

As a science specialist and from school placement experience, I am aware of the difficulty that scientific vocabulary can cause to children especially EAL pupils. This challenges teachers who in line with the teaching standards aim to ‘promote good progress and outcomes, understanding the needs of all pupils including those with English as an additional language’ (DfE, 2011, p.11).

The Science Programme of Study emphasises the importance of spoken language stating:

‘The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions’ (DfE, 2013b, p4).

1.3 Rationale for Study

During the literature review it became evident that there was little science specific literature on the support of EAL pupils in the primary classroom. This knowledge gap in the literature informed the primary research questions and provides a clear rationale for this study. Furthermore, with the increasing number of EAL pupils in primary schools (section 1.2), it is vital that teachers are aware of and understand the strategies that can be employed to ensure effective teaching practice is implemented.
Chapter 2 – Literature Review

2.1 Introduction

Historically, it was claimed that EAL pupils fell within the lowest bands of educational achievement and were consequently overly represented in special needs provisions. This led to claims that EAL pupils need more support (Gillborn and Youdell, 2000, p.73; Savva, 1994, p39). More recent statistics have shown a narrowing in the attainment gap between EAL pupils and native English speakers (DfE, 2015, p.12). However, the DfE (2015, p.8) claimed the widest gap in attainment was between EAL pupils and all others in science, although the gap has narrowed over the last five years, suggesting more support is required in science for these pupils.

Science is a core subject within the primary national curriculum (DfE, 2013a), relying on listening, speaking, reading and writing to help develop scientific understanding. Inclusive science teaching offers pupils hands on experiences through group and collaborative work, facilitating conceptual understanding in sequential steps (Ross et al., 2015, p.216; Wellington and Ireson, 2012, p.198; Hoyle and Stone, 2000, p90). Teachers should plan science activities and learning that allow every child to participate through entry at different points dependant on English proficiency; allowing for language development at their own level (Lee and Luykx, 2010, p.183). This aim can be achieved by science leaders collaboratively planning with EAL support teachers and/or teaching assistants, with a focus on both language and subject content (Ofsted, 2014, p.4; Haslam et al., 2005, p.67).

2.2 Language proficiency and academic achievement

Jim Cummins proposed the ideas of basic interpersonal communication skills (BICS) and cognitive academic language proficiency (CALP) in connection to learning an additional language. Cummins’ research claimed that conversational aspects of language of a peer appropriate level (BICS) were achieved within 2 years of exposure to English, whereas for an EAL pupil to achieve academic language (CALPS) it takes between 5 and 7 years. This means that a child may be skilled in BICS at the age of nine but
not proficient in CALP until they are between twelve and fourteen (Cummins, 1980, cited in: Street, 2008, p.73).

Teachers must understand the difference between BICS and CALP otherwise, this can lead to EAL pupils being incorrectly identified as having special education needs (SEN). This understanding also enables planning to develop pupils’ CALP in all areas of the curriculum (Haslam et al., 2005, p.23; Cummins, 1980, cited in: Street, 2008, p.73). There is a danger that teachers may place unrealistic expectations upon EAL pupils who appear fluent in their conversation but whose language proficiency is far behind that required to support their academic progress. This is particularly relevant in science as the ability to use CALP is concerned less with non-verbal cues and more with abstract concepts. In order for children to reach their full academic potential they must first become skilled in CALP (Goepel et al., 2014, p93). It is therefore important that both BICS and CALP are considered during planning. This may be achieved by a proper structuring and sequencing of activities, by starting with those that require the use of conversation language skills (BICS) and progressing to activities that are more cognitively challenging to the EAL pupil, requiring the use of academic language (CALP) (Conteh, 2012, p.57). This will scaffold the learning of English for EAL pupils enabling them to be successful in science.

2.3 What does good practice in EAL look like?

Vygotsky (1978, p.86) spoke of the zone of proximal development and suggested that children ‘learn interactively through problem solving under adult guidance or in collaboration with more capable peers’. This sociocultural theory is important to EAL learners in the classroom who through collaboration with adults and their peers are able to develop their language and academic skills (Conteh et al., 2008, p.225; Gibbons, 2002, p8).

Throughout the planning and teaching cycle, it is imperative that learning is not simplified for EAL pupils but correctly scaffolded, enabling EAL pupils to remain focused, motivated and to achieve in line with their peers whose first language is English. For this aim to be realised, teachers must have
high expectations and specific language objectives for all areas of the curriculum (British Council, 2016a; Gibbons, 1991, p.7).

2.3.1 Visual aids
Visual aids offer vital support for EAL pupils by acting as a universal language, thereby helping to develop language comprehension. They enable sense to be made of new information and language, and support learning and clarity of thinking by lessening the language demands but not the cognitive challenge of tasks. In order to minimise misunderstandings and misconceptions the visual cues need to be realistic (Gardner, 2006, pp.78-79).

Visual aids are also useful at a basic level to introduce new vocabulary highlighting their relevance to science, and they also enable pupils to access complex text and help EAL learners to grasp academic language, which can develop children’s understanding of scientific vocabulary further (British Council, 2016a; Hayes, 2012, p.107; Haslam et al., 2005, p.23).

2.3.2 Collaborative talk and group work
Vygotsky’s socio-cultural theory sees learning as taking place collaboratively between teachers and pupils through the construction of knowledge developed through discussion, whilst encouraging pupils to reason and develop higher order thinking skills (Vygotsky, 1978, p.86). Group work is particularly beneficial when EAL pupils are given a specific role within the group; this encourages participation and has a positive impact on the knowledge and understanding acquired whilst offering a less threatening environment (Conteh et al., 2006, p.43; Haslam, et al., 2005, p.79; Gibbons, 2002, p17). It has been suggested that pupils learn more quickly whilst interacting with their peers who speak English, because they are immersed in the English language (Ofsted, 2014, p.4).

Group work enables EAL children access to the curriculum whilst being introduced to specific vocabulary in a rich and meaningful context. In other words the language that they hear is used meaningfully for a purpose. This language is directed at them, which increases the knowledge input that the
learner receives and increases interaction of the pupil within a group. Therefore, output is increased due to the formulation and expansion of ideas (Conteh et al., 2008, p.228; Gibbons, 2002, p17). In order for the benefits to be maximised EAL pupils should not be grouped together, as a good role model for spoken English is required, and neither should they be placed in low ability groups (Haslam et al., 2005, p.32; Hall, 2001, p8). Collaborative talk and group work used in science lessons can facilitate the development of scientific vocabulary and scaffold learning, because pupils naturally progress from concrete to more abstract academic level of meaning in their use of language (Conteh et al., 2006, p.43).

2.3.3 Vocabulary
Science uses very specific vocabulary and terms. This can cause issues for children who have an understanding of a word, but find that the word has a different meaning when used in a scientific context. This use of homonyms is a particular problem for EAL pupils (Conteh, 2012, p.71; Hoyle and Stone, 2000, p91). The concept of ‘plants’, for example, may introduce the following homonyms: berry/bury, root/route and sow/sew (Luna et al., 2015, p.97). To help develop conceptual understanding newly learnt vocabulary needs to be embedded, through regular use (Westwood, 2013, p.44).

Learning for EAL pupils can be scaffolded by providing prepared pictures with words for different stages of an experiment for the pupils to sequence before the experiment is carried out and thereby encourage full pupil participation in the actual experiment (Wellington and Ireson, 2012, p.151; Haslam et al., 2005, p.29). However, Qualter (1996, p.106) argues that labelling pictures with English words does not enable children to develop higher-level understanding, as they only learn the vocabulary and not the meaning of the word. Therefore, additional support is required to ensure a proper understanding of the vocabulary surrounding the concept (Wellington and Ireson, 2012, p.202). Conteh (2012, p.71) claims that for EAL pupils to develop conceptual understanding, they need to make their own connections between word and meaning.
Teachers need to plan for new scientific language acquisition to ensure that EAL children are able to develop their vocabulary and science understanding at the same time (Buxton and Lee, 2014, p.209; Gibbons, 2002, p121). Support can be offered with bilingual dictionaries, words banks and vocabulary lists, and it has been found beneficial for EAL pupils to build keyword lists themselves (Haslam et al., 2005, p.41). However, Lemke (1990, p133) claims that the use of scientific language can lead to all pupils becoming disengaged. This may be particularly prevalent for EAL pupils, who may be struggling with understanding of vocabulary. The use of complicated scientific language can create a barrier between the language of experience and that of science. Lemke carried out research observing a sequence of science lessons; he found that pupils’ engagement in the lesson increased when the language was less scientific (Lemke, 1983 cited in Lemke 1990, p.134), suggesting more needs to be done to ensure children enjoy science and understand the concept, and do not view science merely as a challenge in understanding scientific vocabulary.

2.3.4 Modelling Vocabulary
The use of actions, alongside speech, encourages children to copy the actions (modelling), learn vocabulary and enables pupils to be active participants in their learning deepening their understanding (Mistry and Sood, 2010, p.112).

Teacher modelling the desired vocabulary allows EAL pupils’ to access the language needed to participate in-group discussions and to answer subject related question (Gibbons, 1991, p.21; Haslam et al., 2005, p.32).

2.3.5 Hands on experience and practical work
Hands on science allows EAL pupils to investigate and develop their understanding without strong English language proficiency, allowing children to practice the language of science whilst developing an understanding of the science ideas (Buxton and Lee, 2014, p209; Smyth and Smyth, 2012, p.119; McCallum and Miller, 2013, p.42; Sutherland, 2010, p.97). Savva (1994, p.39) speaks of a child who has no English but is able to participate in a science experiment for testing materials. She is able
to access the learning through hands on experience and observation and she synthesises and records in her home language. This allows for connections to be made across the two languages, supporting her English language acquisition, whilst providing clear meaning of the words. Furthermore, Haslam et al., (2005, p.29) claim that the use of first language for recording enables pupils to write in more depth and with greater freedom than using English.

Practical work in science allow for EAL pupils to work with their peers and build common experiences. This allows for students to learn from each other through observation and group discussion (Amaral et al., 2002, p.236).

### 2.3.6 Teaching Assistants

The use of bilingual teaching assistants is sometimes referred to as the ‘whispering radiator’ model. This model has the advantage of easing pressure on the teacher during the teaching input and reduces the stress on the EAL pupil. However, it can also mean that EAL pupils do not integrate fully into the class and become reliant on the support of a ‘translator’ (Haslam et al., 2005, p.67). Wardman (2012, p.661) argues that a bilingual teaching assistant can personalise learning for individual pupils whilst adding the appropriate level of challenge, which has a positive impact. If bilingual assistants are used in science lessons, they need to engage EAL pupils in the science lesson and not just translate (Qualter, 1996, p.105).

### 2.3.7 Using first languages in class

Ofsted (2009) report that ‘allowing EAL pupils to use their first language in the classroom did not hinder their progress’. Allowing children to use their home language in science can support conceptual development, whilst giving a better interpretation of the English associated with the concept (Gibbons, 1991, p61). A common misconception is that children will learn English quicker if they learn using English. Children that use both their home language and English acquire English language skills just as quickly as those who have been immersed into an environment where English is the only spoken tongue (Goepel et al, 2014, p.96).
The use of first language is a way of confirming language and meaning, to support learning (Hall, 2001, p.8). It can facilitate English acquisition as children that understand text in their own language, can then use this knowledge to recognize phrases and words in English (Haslam et al., 2005, p.26). Linguists believe that everyone has the ability to learn language 'and that the 'surface features’ of all languages derive from a common underlying proficiency (CUP). This means that the knowledge developed in the first language can easily be transferred to the second or third language' (British Council, 2016b). This supports the idea of the use of first language in the classroom.

2.4 Challenges faced by teachers

Offering an inclusive education for EAL pupils can challenge schools due to the monolingual nature of the national curriculum and assessment methods. Schools are limited in assessment and are often unable to take account of the learning journey of EAL pupils, who are assessed in the same way as native English speakers. Therefore, it is imperative to ensure that their science subject knowledge is assessed and not the pupils’ skill in English (Safford and Drury, 2012, p.73; Lee and Luykx, 2010, p181).

In order for EAL pupils to be successful in science, high levels of teacher scaffolding are required. This is time consuming and challenging for teachers who may have little experience of dealing with EAL pupils (McCallum and Miller, 2013, p.37). Conteh (2012, p.90) states that teachers must consider that just because an EAL pupil cannot carry out a task, it does not necessarily mean that they do not have the conceptual understanding. Evaluation of teaching methods is required to ensure that they aid and support specific EAL pupils (Mistry and Sood, 2012, p.284; Haslam et al., 2005, p.89). Therefore, during planning consideration must be given to the difficulties that are inherent in the unit of work whilst highlighting the opportunities to develop language skills.

Funding legislation changed in 2011, with the EMAG (Ethnic Minority Achievement Grant) being mainstreamed into general school funds, with no requirement for any money to be spent on supporting EAL pupils. From
April 2013, schools can apply to their Local Schools Forum for extra money to support EAL pupils. Most schools now have to rely on ‘pupil premium’ payments that are based on deprivation of individual children (Naldic, 2015b; Safford and Drury, 2012, p.79).

2.5 Conclusion
The review of the current literature identifies a gap in basic research into strategies for supporting EAL pupils in science. This lack of knowledge led to the following research questions being asked:

- What strategies are used to support the science education of EAL pupils?
- What are the challenges encountered when providing for the needs of EAL pupils?
Chapter 3 – Methodology and Ethics

3.1 Introduction
Methodology acts as a framework to facilitate the interpretation, comparison and discovery of new information by discussing appropriate methods (Creswell, 2014, p.3; O’Leary, 2004, p.85). The methods chosen for this study will be defined and justified. The differences between primary and secondary research and between quantitative and qualitative research will be delineated, and the positives and negatives for the methods employed will be discussed.

3.2 Research approach: Case Study
Primary research is new and original work that is gathered first hand by the researcher and secondary research is the gathering and synthesis of existing research. Primary research aims to fill gaps in the secondary research and therefore needs to ask specific questions (Costley et al., 2010, p.86).

Case studies illustrate ‘an individual unit’, for example ‘events, a community, group of people, periods, projects, policies, institutions or other systems’, by using at least one research method (Thomas, 2013, p.150). The findings aim to be generally relevant and may be the basis for further research, but one must be aware that case studies may be unique to a particular set of circumstances, and should not be used to generalise unless kept in context with the schools’ catchment area and ethnicity of pupils (Costley, 2010, p.90, Bell and Waters, 2014, p.12; Denscombe, 2010, p.61). When conducting primary research a target group needs to be identified. This group must be accessible to the researcher, must have the characteristics that the experimenter proposes to measure, and must allow the collection of reliable data. It is impractical to use the whole of the target population, so a sample of the group is required as representational of the whole group (Burns, 2000, p.83; Creswell, 2014, p.158).
3.3 Sampling
For the purpose of this study purposive sampling was used by selecting the schools based on particular characteristics. These schools were specifically chosen due to the high number of EAL pupils. The sampling method is biased and may not be representational of the wider population (Cohen et al., 2011, p.157). This case study was conducted in two large urban schools. School A is a large infant school in Bedfordshire, with most pupils speaking English as an additional language (Ofsted, 2015). School B is a larger than average primary school in Buckinghamshire, with a high proportion of pupils having EAL. Ofsted rated both schools as ‘good’.

3.4 Data Collection
There are two possible types of data collection: qualitative and quantitative. Qualitative research is used to explore a problem or issue by gathering the views of individuals in relation to a social or human problem whereas quantitative research is used for testing theories and hypotheses, and produces numerical data (Creswell, 2014, p.246).

In this study, qualitative data was collected through the observation of science lessons, by interviewing teachers, and by document analysis of the schools’ EAL policies. Such qualitative data will enable a deeper understanding of the perceptions of the respondents whilst gaining real data in a real setting (Creswell, 2007, p.41).

3.4.1 Qualitative Interviews
Interviews with two class teachers were chosen as a reliable method for collecting data; open ended questions would be asked, relating to the strategies and challenges that they encounter when supporting their EAL pupils. It was hoped that the use of open-ended questions would highlight any trends in opinion. This method would produce qualitative data by eliciting the perceptions and opinions of the respondents whilst gaining a deeper understanding of the issue. Interviews can be either structured or semi structured, but for the purpose of this study semi-structured interviews were chosen, consisting of prepared questions and unprepared follow-up questions. Both questions and answers were audio-recorded and
transcribed verbatim. However, there was scope for any identifiable gaps to be filled during the interview (Bell, 2005, p.16; Costley, 2010, p.93; Creswell, 2014, p.190).

### 3.4.2 Qualitative Observations

Observations allow the researcher to take field notes pertaining to behaviours and activities happening at a certain time and place, rather than what is reported to happen (Creswell, 2014, p.190; Bell, 2005, p.185; Costley *et al.*, 2010, p.95). Observations were planned to discover the strategies used in the classroom to support EAL pupils during science lessons; the aim was to identify any links or discrepancies between observed strategies, responses of the respondents and their EAL policies. This would provide first hand data to help answer the research questions.

Observations can be undertaken in three ways: structured, semi-structured and unstructured. Unstructured observations are normally employed when ‘the researcher has a clear idea of purpose but is not so clear on the detail’ (Bell and Waters, 2014, p.212). This format does not use predetermined categories or an observation schedule. The literature review had highlighted a variety of different strategies that could be used in the classroom but there was no guarantee that they would be observed, so an unstructured format was considered most appropriate and provided the freedom to record what was seen.

### 3.4.3 Document Analysis

Document analysis allows for a variety of documents to be analysed and used as primary data. This form of data is obtained from ‘pre-produced texts that have not been generated by the researcher’ (O’Leary, 2004, p.180). For this study the EAL policies of the two schools were investigated. This will be done using an ‘interview’ method, where it is assumed that the document is the respondent, where specific questions are asked by the researcher, and answers are obtained by the researcher highlighting relevant information (O’Leary, 2004, p.181).
3.4.4 Triangulation

Triangulation is used to reduce the risk of bias, examine the findings from different sources and build a comprehensible rationale. If different sources corroborate a theme or trait, especially if that theme or trait is qualitative in nature, we may speak of the data as being triangulated. This makes the data more robust, and can add to the validity of the study (Burns, 2000, p.419; Creswell, 2014, p.201; Denscombe, 2010, p.154). This study will triangulate primary observations in the classroom, interviews with teachers, analysis of school policy documents and secondary research from the literature review, with a view to obtaining a body of consistent and cross referenced data.

A schedule was drawn up for the implementation of the above methods and can be seen below in figure 2.

![Figure 2 - A chronological time scale showing the implementation of the methods discussed above.](image)

3.5 Validity and reliability

It is imperative for any study to consider the validity and reliability of all research used. Bell (2005, p.119) states that for a study to be considered reliable, comparable results would be produced if the study were repeated.
However, this is deemed to be impossible as the views and opinions gained are unique and unlikely to be exactly reproduced. This is the difficulty with qualitative data, but it can also be considered a strength (Cohen et al., 2011, p.167). However, the use of triangulation adds to the validity and reliability of the study, by looking at the research from different perspectives (Denscombe, 2010, p. 154; Cohen et al., 2011, p. 182).

The reliability of data collected from observations in this study must be considered, as children can change their behaviour when being observed. To ensure that children’s behaviour was as natural as possible a non-participant role was adopted with the researcher being placed in an inconspicuous position (Denscombe, 2010, p.204; Thomas, 2011, p.168; Creswell, 2014, p.190).

3.6 Ethics

Whilst carrying out any form of data collection the researcher must pay attention to ethical issues, to protect the researcher and the participants. The researcher must ensure that the participant’s human rights are protected including confidentiality, anonymity and integrity (Sargeant and Harcourt, 2012, p.83; Creswell, 2014, p.95). The researcher must also ensure that the study is designed so not to advantage or disadvantage one group of children over another (BERA, 2011, p.7). This study conforms to the British Education Research Association (BERA, 2011) and the University of Northampton (UoN, 2011) ethical guidelines.

3.6.1 Ethical Clearance

Ethical clearance is imperative to ensure the integrity of a research project. For this study, clearance was obtained from the University of Northampton (Appendix 2).

3.6.2 Voluntary Informed Consent

Consent must be obtained from the appropriate organisations and key personnel and parental consent may be required when conducting research with children (O’Leary, 2004, p.50; Sargeant and Harcourt, 2012, p.54; Greig et al., 2013, p.255; BERA, 2011, p.5). A letter was sent to head
teachers and key personnel, outlining the aim of the study; the methods to be used; the confidentiality and anonymity procedures that would be followed and explicitly pointing out the right to withdraw at any stage (BERA, 2011, p.6). Consent was gained from the head teachers and the key personnel involved in the study (Appendix 3). For this study parental consent was not deemed necessary, as no children were to be interviewed or spoken to. Therefore, the head teachers assumed responsibility for safeguarding the children, acting as gatekeepers (Greig et al., 2013, p.257; Sargeant and Harcourt, 2012, p.55).

3.6.3 Right to Withdraw

The right to withdraw at any stage was made clear to all participants in the letters of consent (Appendix 3).

3.6.4 Anonymity and Confidentiality

The identity of all participants was respected ensuring their right to anonymity in line with BERA (2011, p.7) and the UoN (2011) ethical guidelines. To protect the identity of the adults and children, an anonymous recording system was devised. Children are identified by a number, adults by their job title, and the schools are referred to as School A and School B. The observations and interview methods will be kept secure at all times, be recorded only in coded form for research purposes, and all confidential information pertaining to the participants will be destroyed at the finish of the project, in line with ethical guidelines (Creswell, 2014, p.101; Sharp, 2012, p.23).
Chapter 4 – Results, Analysis and Discussion

4.1 Introduction
This chapter will present, analyse and discuss the data obtained from the research methods presented in chapter 3, from the point of view of the two research questions formulated in Section 2.5. This coded data can be found in the appendices of this study.

4.2 What strategies are used to support the science education of EAL pupils?
The secondary research showed that good EAL practice relies on a range of strategies with tasks and activities scaffolded according to the individual’s language acquisition and academic ability (Gibbons, 1991, p.7; British Council, 2016). This was also evident in the primary research conducted here, which showed that both schools relied on a range of strategies for supporting their pupils. Therefore, it is clear that a range of strategies are needed to aid EAL pupil’s learning in science within different settings, as highlighted by the triangulation formed between the multiple methods utilised, validating the analysis drawn.

The specific data obtained will now be presented and analysed using the strategies discussed in the literature review (Chapter 2).

4.2.1 Visual aids
The literature review highlighted the importance of using visual aids in science lessons as a strategy for supporting EAL pupils in the development of language comprehension in a science context (Gardner, 2006, pp.78; Hayes, 2012, p.107; Haslam et al., 2005, p.23).

During the interviews the Science Coordinator in School A, explained that resources were labelled with English words to enable pupils to match the word with the resource and that key vocabulary cards with a visual image of the words were used when necessary. However, these were not seen in the two science lessons that were observed, which calls into question the
reliability of the comments made, and suggests this is perhaps not common practice.

The EAL Leader in School B stated that all teachers should be using visual aids when new scientific vocabulary is introduced and their policy also states that ‘real objects should be used to support understanding’. Visual aids were used in the year 2 science lesson on materials where the learning intention was to ‘discover what material made the best umbrella’. The teacher introduced the lesson by placing an umbrella over a teddy bear. This gave the children a realistic visual representation as recommended in the literature review (section 2.3.1). The use of the umbrella enabled pupils who recognised the visual object but not the word to match the two together, thus developing their vocabulary. This strategy had maximum benefit in developing pupil understanding. The analysis drawn in terms of School B may be considered more reliable because triangulation between the primary and secondary research methods gave consistent data.

4.2.2 Collaborative talk and group work
The literature review identified how group work and collaborative talk, with good role models of English, are particularly beneficial to EAL pupils giving them access to the science curriculum whilst learning specific vocabulary in context (Haslam, et al., 2005, p.79; Gibbons, 2002, p17; Conteh et al., 2006, p.43).

During the interview the Science Coordinator in School A, stated, ‘we use mixed ability groups and the EAL pupils are put in groups where the children with good vocabulary can support them’. This practice was observed in both of the science lessons. The lessons involved a considerable amount of talk and discussions all in English, which appeared to be on topic, and there was input from all children in the groups. This followed the procedure stated in the school’s EAL policy, thus forming triangulation between direct classroom observation and document analysis, which supports the idea that this is common practice in this school.
School B’s EAL policy specifies ‘support will be provided largely through co-operative teaching between class teachers and TAs, working with small groups which are not exclusively EAL children’. However, in the Year 2 science lesson, it was observed that three EAL pupils worked together with the support of the TA, and did not have the opportunity to interact with their non-EAL peers. The view of the experts (Haslam et al., 2005, p.32; Hall, 2001, p8) is to enable maximum benefit from group work EAL pupils should not be grouped together but be placed within groups with a good English speaker as role model (section 2.3.2). It was observed, however, that the TA acted as a good role model of English. It is concluded that a good role model of English is beneficial to EAL pupils, but need not necessarily come from within the peer group.

The second observation, in School B, was a science intervention group with four Bengali speakers in Year 4; this was taught by a bilingual teacher and was aimed at targeting new vocabulary and misconceptions. During this session the pupils heard and used scientific vocabulary in a rich and meaningful science context. The literature showed that group work enables pupils to feel less threatened whilst encouraging confidence (Haslam, et al., 2005, p.79; Conteh et al, 2006, p.43). This was observed in the intervention group, where the pupils did not seem worried about making mistakes. The teacher stated, ‘the wires let electricity through them because they are a conductor. If there is plastic around the wire you won’t get electrocuted because…’ Child 2 replied without hesitation ‘It’s an unconductor’. The direct input of science-specific vocabulary and conceptual understanding enabled the boys to formulate and expand their ideas. This concurs with the literature (Gibbons, 2002, p17; Conteh, 2008, p.228). However, as this was an intervention group, these strategies may not be utilised in the mainstream classroom and thus the results are only indicative of intervention groups and this must be noted for the analysis to be drawn.

In agreement with Vygotsky’s (1978, p.86) socio-cultural theory, it was observed in both schools that EAL pupils were able to extend their knowledge and reasoning, and develop their higher order thinking skills,
through collaborative talk. This strongly recommends the use of such a strategy in primary school science lessons.

4.2.3 Vocabulary

School A and B emphasised the importance of key scientific vocabulary, discussing it almost immediately in interview. The Science Coordinator in School A, stated, ‘we introduce scientific vocabulary early and this is constantly reinforced’. The EAL Leader in School B said ‘we emphasise key vocabulary through planning and input’. In each of the four lessons observed, key vocabulary was written on the white board, with definitions given. The TA in School B worked with the EAL pupils to reinforce the meaning of the key vocabulary: for example, she encouraged the children to explain their understanding of the word ‘waterproof’ (Appendix 6c). Westwood (2013, p.44) states that for new vocabulary to be embedded, EAL pupils need to be given the opportunity to use it in context. This requirement was evident in all the observations, where children were expected to use the key vocabulary in discussions.

During the intervention group, the boys recorded ideas and vocabulary in their books for support in the class science lesson (Appendix 6d). This is found to be a beneficial method (Haslam, *et al.*, 2005, p.41), suggesting this is an effective strategy employed by the school.

The literature review highlighted the danger of EAL pupils becoming disengaged when the language becomes too scientific (Lemke, 1983 cited in Lemke 1990, p.134). It was observed that new key words were introduced during class, but the children were not inundated with difficult scientific vocabulary, and this enabled them to remain engaged in the learning.

4.2.4 Modelling Vocabulary

Modelling was observed in the intervention session in School B (Appendix 6d). The teacher modelled actions alongside the words ‘insulator’ and ‘conductor’ and the boys were encouraged to follow; the boys could use the words correctly with the actions, reinforcing the scientific vocabulary. Further on in the lesson, Child 3 answered ‘inconductors’ whilst he modelled
the learnt action for the word insulator, this enabled the teacher to see that the pupil had the correct understanding although the word used was not right.

The interview and lesson observations at School A demonstrated how modelling was effectively used within science lessons. The Science Coordinator stated that, ‘we spend a lot of time modelling working scientifically by asking questions’. This was evident in the second lesson that was observed, where the children including EAL pupils had questions that they had devised and were going to answer. The Science Coordinator modelled the required format for asking and answering the questions. The modelling enabled all children to be successful. The paradigm revealed by the literature review is that teacher modelling enables EAL pupils to participate in the discussions and answer questions appropriately (Gibbons, 1991, p.21; Haslam et al., 2005, p.32). There was thus triangulation between the literature review, direct observation and interview.

In School A’s science lesson on forces the teacher modelled ‘push’ and ‘pull’ whilst repeating the words and asked the children to copy. The children were successful in linking the right word with the correct movement, enabling them to make connections between the two. The literature suggests that this form of modelling enables pupils to be active participants in their learning and deepens understanding (Mistry and Sood, 2010, p.112), and triangulation between direct observation and the literature review suggest that School A are implementing effective practice to aid EAL pupils understanding in science.

4.2.5 Hands on experience and practical work

The Science Coordinator in School A stated, ‘we ensure that EAL pupils are provided with resources that give lots of practical hands on experience’. These resources and opportunities were identifiable in both lessons observed in School A, supporting the response given in interview. The first lesson was year 2, focusing on forces; the children were taken outside to experience push and pull forces using the playground apparatus and bicycles. The second lesson was also a year 2 class focusing on working
scientifically to answer their own questions. The pupils were observed freezing water and melting ice.

The EAL Leader in School B responded, ‘in science, we do try and give the children the opportunity to experience as much as possible through practical work.’ This was also evident in the science lesson with pupils investigating what material made the best umbrella. The children were given a variety of materials to experiment with, enabling them to feel, see and experience what materials were waterproof, suggesting that this is a beneficial strategy.

During these lessons EAL pupils were heard predicting and discussing their findings with their peers using scientific vocabulary in context; they drew on knowledge from their experiences.

Responses obtained in teacher interview were strongly corroborated by data gathered through direct observation of lessons, and completely agree with the literature position. This triangulation highlights how important hands on experiences are for EAL pupils to develop both vocabulary and conceptual understanding in science.

4.2.6 Teaching Assistants
The literature review highlighted the ‘whispering radiator’ model (Haslam et al., 2005, p.667), this model was observed in School B, with the teaching assistant working only with EAL pupils. Throughout the lesson she acted as scribe for the children and recapped what the teacher had explained. This appeared to linguistically support the children enabling them to focus on the science. However, it was observed that they were not given the freedom to make their own decisions regarding their experiment and the danger is that this will hold them back from becoming independent learners. In contrast to expert opinion, Wardman (2012, p.661) claims that the use of a bilingual teaching assistant can make learning more personalised for EAL pupils and enable appropriate challenges to be added, having a positive impact. This view was corroborated by classroom observation, where the TA was able to
question and challenge the children’s thinking commensurate with their academic ability and language skills. For example:

TA ‘Yes the plastic will make a good umbrella because …’
Child A ‘It’s waterproof’

This demonstrates how the TA was able to prompt Child A to think about why plastic was a good material for the umbrella.

As outlined, the literature has given two opposing arguments for the use of TAs supporting EAL children in science education, and the primary observations recorded here support the advantages of both but cannot make a decision whether the advantages outweigh the disadvantages. As discussed above, the presence of a TA challenged the pupils to consider more deeply the science and supported language development, but pupil independence was compromised and they were segregated from their non-EAL peers. More research is needed to resolve this issue, and to see if other strategies may be integrated with TA support to resolve the controversies surrounding the ‘whispering radiator’ model.

4.2.7 Using first languages in class
The views of School A and School B were very different when it came to the use of EAL pupils’ home language in school. School A’s Science Coordinator stated, ‘English is the language used in school and we only revert to children’s home language if they have very poor grasp of English.’ Whilst School B’s policy states that, ‘we recognise the importance of developing fluency in one’s first language’.

The EAL Leader in School B explained, 'for our new to English speakers, we also put some translations into the PowerPoint or the input resource we are using’. However, there was no evidence in either school of children’s first languages being used in class, even though this is a strategy recommended by expert opinion to support conceptual understanding in science (Gibbons, 1991, p.61; Hall, 2001, p.8; British Council, 2016).
Direct observation in the classroom backs up the claims made by the Science Coordinator in School A, but challenges the comments made by the EAL Leader in School B and their EAL policy. However, the observations were made only in two classes and may not be representative of the whole school, and no general conclusion may be drawn from the data collected here.

4.3 What are the challenges encountered when providing for the needs of EAL pupils?

The literature review highlighted that many teachers find assessment of EAL pupils a challenge, where methods of assessment often assess the English language proficiency of the EAL pupils rather than their scientific knowledge (Lee and Luykx, 2010, p181; Safford and Drury, 2012, p.73; McCallum and Miller, 2013, p.37). The respondents from both schools agreed with this data; the Science Coordinator in School A, stated that,

‘Children that are below the expected level in English can be well above in science. Science enables EAL pupils to be good at the subject without having to have a good understanding and use of English Language as they do not have to record anything at this age, only later on do they need to record. This can cause challenges when assessing EAL pupils in science and assessing their written work doesn’t give us a clear picture of their conceptual understanding so most science assessment is done through teacher observations’.

The EAL Leader in School B, concurred

‘For KS2 children, it is more evident in their writing. This is when it is most noticeable if they have the deeper understanding of the language that is required. But this is difficult if they have limited English and are not at the level of writing in science, it is then very much down to teacher observations and questioning’.

During the lesson observations in both schools it was evident that the teachers used constant questioning to ascertain EAL pupils’ understanding
of the science. They made allowances for the incorrect use of words or pronunciation as long as they could see that the understanding was correct.

Teacher  ‘If there is plastic around the wire you won’t get electrocuted because…’
Child 2  ‘It’s an unconductor’
Teacher  ‘Yes nearly right it is an Insul…’
Child 2  ‘Insulator’

This conversation from the intervention session (appendix 6d) shows how the pupil understood that the plastic around the wire stops you getting electrocuted because it is an insulator. Therefore, due to his limited English vocabulary a written assessment may not have demonstrated his understanding as clearly as conversation.

Both the respondents agreed that scientific vocabulary is a challenge and must to be considered within units of work. The Science Coordinator in School A said,

‘The main challenge is scientific vocabulary. Most of our EAL pupils have very little science specific language and there is very little scientific language used at home. Considering language that may cause problems and the ways in which new vocabulary can be introduced takes a lot of time. This is all added onto the time planning already takes’.

The EAL Leader in School B explained ‘planning for science lessons takes time with the scientific vocabulary and the impact this has on EAL pupils having to be considered, planned for and resourced’.

It is apparent that both schools find planning and resourcing for scientific vocabulary acquisition time consuming and a challenge, concurring with secondary evidence.

Neither school stated funding to be a challenge although, this was
highlighted in the literature review (Safford and Drury, 2012, p.79; British Council, 2016; Naldic, 2015b).

4.4 Summary
These results are representative of School A and B and the findings should not be generalised to other schools (Denscombe, 2010, p.61). Triangulation of the primary research data along with data obtained from the literature review has allowed firm conclusions to be drawn from a consistent corroborated set of observations (Denscombe, 2010, p.62).

It is evident that the general strategies recommended in the literature for supporting EAL pupils are transferable to the teaching of science.
Chapter 5 – Conclusion

5.1 Introduction
This chapter summarises the conclusions that may be drawn from triangulated primary and secondary data in the context of the research questions posed. Areas for future research are also identified. Reflection and evaluation of the methods used are discussed and the impact on personal teaching practice highlighted.

5.2 What strategies are used to support the science education of EAL pupils?
The triangulated data identified that a range of strategies are required to support EAL pupils. The strategies discussed within this study were observed in both schools, with the two schools placing dissimilar emphasises on different strategies.

The use of collaborative talk and group work was used in both schools. However, School A used mixed groupings as identified as an inclusive strategy by various scholars (Haslam, et al., 2005, p.79; Gibbons, 2002, p17; Conteh et al., 2006, p.43), whilst School B grouped EAL pupils together, using the TA as a role model for spoken English. This implies that whilst it is beneficial for EAL pupils to work in groups, the demographics of the group could be an area for further study. However, the ethical implications of this must be considered, as discussed in chapter 3, as providing control and comparison groups of children with different support may advantage or disadvantage one group over the other group, this could impact their science learning and therefore against ethical guidelines (BERA, 2011, p.7).

There was a divide in the two schools’ policies on the use of first language in class. School A took the view that English is the language used in school and home languages would only be used in cases where the pupil had a very poor grasp of English. Triangulation of all available data corroborated this position. School B claimed that the home language was an integral part of science education, but triangulation failed to corroborate this. To be
specific, no evidence for the use of any language other than English was observed in the classroom, although it must be conceded that the data obtained in this study may not be representative of all science lessons in the school. This strategy is recommended to support conceptual understanding in science (Gibbons, 1991, p.61; Hall, 2001, p.8; British Council, 2016) and is therefore a strategy that all schools could embed in their planning.

5.3 What are the challenges encountered when providing for the needs of EAL pupils?

Secondary data gleaned from the literature clearly show that many teachers find assessment a challenge when providing for EAL pupils (Lee and Luykx, 2010, p181; Safford and Drury, 2012, p.73; McCallum and Miller, 2013, p.37); although this was an issue both respondents placed more emphasis on the challenge of ‘scientific vocabulary’ and the time it took to plan for this. It was surprising that representatives from both schools spontaneously raised the issue of scientific vocabulary in interview, and it was clear that the issue is considered the single biggest challenge in teaching science to the EAL pupil. Although the understanding of scientific concepts is more important than a superficial knowledge of scientific language alone, the lack of adequate scientific vocabulary seems to be the single biggest barrier facing EAL pupils in achieving that understanding. This apparent paradox could be investigated in future studies.

Neither school raised the issue of funding EAL pupil learning, although this was highlighted as a major area of concern in the literature (Safford and Drury, 2012, p.79; British Council, 2016), suggesting that these two schools may have found ways to financially support the additional costs associated with supporting EAL pupils.

5.4 Reflection and evaluation

Reflection and evaluation of the methods employed enables a critical analysis of the strengths and weaknesses of a study. The use of semi-structured interviews (Bell, 2005, p.16; Costley, 2010, p.93; Creswell, 2014, p.190) enabled the perceptions and opinions of the respondents to be
gained, and gave the additional flexibility that any identifiable gaps could be filled in during the interviews. However, a focus group with a bigger sample size may have been more beneficial, and a wider response on the strategies schools use for supporting EAL pupils in science could have been obtained and triangulated.

The use of unstructured lesson observation protocol provided the freedom to accurately record and take cognizance of what was seen in each classroom without any pre-formed ideas or expectations. This was important, as the observations were often unique to a particular classroom setting.

5.5 Impact on professional development and teaching practice

This study has deepened and widened my knowledge of the strategies for supporting EAL pupils and the challenges that teachers meet, especially in relation to my specialised subject, science. With the increasing number of EAL pupils in mainstream primary schools this is an issue that will be encountered within my teaching career. The research highlighted the challenges EAL pupils face when posed with science specific vocabulary and how some English words have a different meaning when used in the context of science (Hoyle and Stone, 2000, p91; Conteh, 2012, p.71).

The experience gained in the course of this study will allow me to plan for the teaching of science to EAL pupils, and to devise a classroom strategy that allows all pupils, no matter what their proficiency in spoken English, to participate and enjoy science, to overcome the barrier of scientific language and jargon, and to gain a fundamental understanding of scientific concepts.
Reference list


II. Oxon: Routledge. pp. 204-222.


Appendix 2 – Ethics Sheet

School of Education

Name of Student: Amanda Dowling

Course and Module Code: ........................................

Proposed Research Area:

Strategies and challenges for supporting EAL pupils in primary science

The research involves field work [ ]

The research does not involve field work. [ ]

If the proposed research involves field work you must not collect data before you have ethical approval.

The ethics section of my research proposal has been approved by my dissertation supervisor. YES / NO

If ethical problems arise during the collection of data you must discuss this with your supervisor. In cases of uncertainty your supervisor may consult the Research Leader for advice.
Appendix 3 – Consent Letter

Amanda Dowling
(address removed)

28th October 2015

Dear [Name],

As per our telephone conversation, I write this letter to ask for your permission for the participation of some children in my research along with your EAL Leader or Science Coordinator, which is based on, ‘Strategies and challenges for supporting EAL pupils in primary science’.

I am currently in my third year at the University of Northampton studying Primary Education (QTS) and in the process of completing my dissertation, for which approval to begin has been granted. The research aims to address the following questions:

- What strategies are used to support the science education of EAL pupils?
- What are the challenges encountered when providing for the needs of EAL pupils?

If you agree, the children and their teacher will be observed during a science lesson. The aim is to observe the different strategies used and identify any challenges.

The research conforms to the British Education Research Association (2011) and the University of Northampton ethical guidelines. Any information you provide will remain entirely anonymous and confidential with all information being solely used for the purpose of this dissertation. On completion all information will be disregarded. As the Head teacher of the school, you have the right to withdraw the children or the school at any stage of the research. You may do this by contacting me on the details provided above.

If you have any questions about the research please do not hesitate to contact me. Furthermore, if you wish me to get the consent of the children’s guardian please select the option on the consent form below. If you wish to participate, please complete the consent form overleaf with the class teacher and return by the 20th November 2015 using the stamped addressed envelope provided.

Yours sincerely

Amanda Dowling
Part A – Head teacher

Name: 

School name: 

Address: Bala Way, Bletchley, Milton Keynes, Buckinghamshire MK2

Please delete as appropriate.

- I give my consent for the children and staff to take part in the above research
- To continue your research you need to gain the permission of each child’s guardian.

Signature: Date:

-----------------------------------------------------------------

Part B – Observation

Name: 

School name: 

Year group of class: 

I give my consent to be part of the above research and for my lesson to be observed.

Signature: Date:

-----------------------------------------------------------------

Part C – Interview

Name: 

Title: 

I give my consent to be interviewed as part of the above research.

Signature: Date:
Appendix 4 - Coding System for Question 1

Question 1 - What strategies are used to support the science education of EAL pupils?

Visual Aids
Collaborative talk and group work
Modelling
Vocabulary
Practical Work
Bilingual teaching assistants
Use of 1st language
Other  - Questioning
        - Interventions/pre-teaching session
        - Assessment
Appendix 5a

Coded Interview Transcription with the Science Coordinator School A.

What strategies are used to support the science education of EAL pupils?

1. **What strategies do you use to support EAL children specifically in Science?**

   We ensure that they have resources that give EAL children lots of practical hands on experiences, including clearly labelled resources. We help children develop their questioning skills through scaffolding their language. This is done through the use of question cards containing questioning words and phrases, question dice, and question quibble. From a very early age we encourage all children including those with EAL to ask their own questions. We introduce scientific vocabulary early and this is constantly reinforced. We give EAL pupils key vocabulary cards with a visual image of the word; these are relevant to the unit of science. We spend a lot of time modelling working specifically by asking questions.

   We also do most of our science in groups, these are mixed ability groups and the EAL pupils are put in groups where the children with good vocabulary can support them.

2. **Are there specific strategies for different groups of children?**

   In years 1 and 2 differentiated support is given where needed, in line with our EAL policy. This may be key vocabulary list, bilingual vocabulary lists, and support from teaching assistants. English is the language used in school and we only revert to children’s home language if they have very poor grasp of English.

3. **What challenges do you come across when planning and supporting EAL children?**

   The main challenge is scientific vocabulary. Most of our EAL pupils have very little science specific language and there is very little scientific language used at home. Considering language that may cause problems and the ways in which new vocabulary can be introduced takes a lot of time. This is all added onto the time planning already takes.

4. **When you are planning do you have to consider the language?**

   We consider the scientific language opportunities within each unit of work and this vocabulary is reinforced. Dependent on the individual’s ability in English depends on the strategies used, but this may include key vocabulary lists, bilingual picture cards, and group work with peers who act as good models in English.
5. **How do you assess the level of understanding in science of EAL pupils?**

Children that are below the expected level in English can be well above in science. Science enables EAL pupils to be good at the subject without having to have a good understanding and use of English Language as they do not have to record anything at this age, only later on do they need to record. This can cause challenges when assessing EAL pupils in science and assessing their written work doesn’t give us a clear picture of their conceptual understanding so most science assessment is done through teacher observations.

*In terms of summative assessment a banding system is being introduced. Picking up on vocabulary and talk during the teacher input and plenary. Looking at recorded work, self-assessment using the triangulation system is in place; the children understand how to use this.*

*As I said earlier we model working specifically by asking questions. This in turn enables the teacher to assess the child’s understanding by their question asking skills.*

6. **How are the resources funded?**

*The funding is allocated across the school and the SEN teacher looks specifically at EAL children and the resources and finances required.*

441 pupils on role
4 white British
6 Afro Caribbean
Rest of the children Bangladeshi or Pakistani heritage
Appendix 5b

Coded Interview Transcription with EAL Leader School B.

What strategies are used to support the science education of EAL pupils?

1. **What strategies do you use to support EAL children specifically in Science?**

The Wave 1 strategies we use are emphasising key vocabulary through the planning and input - sometimes having examples to support this, visual images at times to go with the vocabulary and hands-on experiences. The TAs will often be available to focus on these children - depending on ability.

For Wave 2 - the children will have a pre-teaching session with the EAL assistant, who will go through the language needed for the upcoming lesson, and go through and misconceptions from the previous one if needed. From this, the children should make a resource, either in their books or ipads that they can then take back into the classroom to support them.

For the children who are new to English, the EAL assistants and teachers prepare a booklet for them each week, which they can take home at the weekend. This allows them to work with their parents to gain a basic understanding in their own language, which they can then transfer in the pre-teaching.

2. **Do you use any different strategies specifically for science?**

In Science, we do try and give the children the opportunity to experience as much as possible through practical work, rather than just using images or discussing the vocabulary. Otherwise, it is difficult for the children to fully understand what is meant - e.g the feeling of materials, linked with the vocabulary, or experiencing ice melting.

3. **Are there specific strategies for different groups of children?**

As with other children, our EAL comprise of differing abilities. Therefore, the lower ability EAL children will have the same support as the LA children, as well as the EAL intervention. For the HA children, the ones who cope well with the general classroom teaching, the teacher may check on their understanding in the lesson, but they would not take part in the previously mentioned groups.

4. **What challenges do you come across when planning and supporting EAL children?**

Previously, the teachers have placed too much responsibility for these children on the EAL assistants, not always putting what is needed into the Wave 1 teaching. However, we have now moved away from this and the teachers should have key children in mind when planning to ensure they
can assess this. The EAL assistants do attend the planning meetings as well, so it gives discussion opportunities, this helps the teachers with planning but this can be difficult having teaching assistants out of class.

Planning for science lessons takes time with the scientific vocabulary and the impact this has on EAL pupils having to be considered, planned for and resourced. However it is necessary that this is done correctly in order to support the children.

5. When you are planning do you have to consider the language?

We put a key emphasis on the key language for all our children. For our new to English speakers, we also put some translations into the PowerPoint or the input resource we are using.

6. How do you assess the level of understanding in science of EAL pupils?

This depends of the age of the children involved. In KS1 it tends to be through the engagement in conversations and how they are able to express themselves and explain their ideas. For KS2 children, it is more evident in their writing. This is when it is most noticeable if they have the deeper understanding of the language that is required. But this is difficult if they have limited English and are not at the level of writing in science, it is then very much down to teacher observations and questioning. We complete NALDIC assessments each term, with the EAL assistants and the teachers working together.

7. How are the resources funded?

The majority of resources come out of the budget that we have designated for EAL children. We have recently done some further work with the EMA Network, which has provided some additional funding for resources.
**Appendix 6a**

Coded lesson observation 1 in School A  
Science – Year 2 Lesson on Forces

What strategies are used to support the science education of EAL pupils?

<table>
<thead>
<tr>
<th>C1</th>
<th>Are we doing scientist...science</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>Yes we are. Who can remember what were we doing last week in science?</td>
</tr>
<tr>
<td>C2</td>
<td>Answering questions</td>
</tr>
<tr>
<td>T</td>
<td>Yes, we were and today we are going to be learning about forces.</td>
</tr>
<tr>
<td>TA</td>
<td>Action: writes the word ‘Forces’ on the board</td>
</tr>
<tr>
<td>T</td>
<td>Does anyone know what forces are?</td>
</tr>
<tr>
<td>C3</td>
<td>When you move something</td>
</tr>
<tr>
<td>T</td>
<td>Yes when you move something you give it a force</td>
</tr>
<tr>
<td>C1</td>
<td>Putting your hand up</td>
</tr>
<tr>
<td>C4</td>
<td>Lifting</td>
</tr>
<tr>
<td>C5</td>
<td>Stretching</td>
</tr>
<tr>
<td>T</td>
<td>There are 2 forces one is push (Action: pushes hand up) and pull (Action: pulls arm down).</td>
</tr>
<tr>
<td></td>
<td>Can you all push your arms up (Children follow action)</td>
</tr>
<tr>
<td></td>
<td>Can you all pull your arms down (Children follow action)</td>
</tr>
<tr>
<td></td>
<td>Lets do it again this time saying the words push and pull for each force</td>
</tr>
<tr>
<td></td>
<td>What force am I using to write (Action: Using the visualizer T writes)</td>
</tr>
<tr>
<td>C6</td>
<td>Push</td>
</tr>
<tr>
<td>C7</td>
<td>No pull</td>
</tr>
<tr>
<td>C1</td>
<td>Push</td>
</tr>
<tr>
<td>T</td>
<td>I am using both push and pull watch (Action: demonstrate writing on the visualizer) Look I am using push now I am using pull. So I am using both push and pull to write</td>
</tr>
<tr>
<td></td>
<td>Lets know watch this video (Espresso – Discovery Push and Pull)</td>
</tr>
<tr>
<td>T</td>
<td>We are now going outside to use the apparatus and bikes to look at forces but first lets look at our Learning objective (Reads out and children join in) We are learning what forces are and when we use them. Our steps to success are What forces do you use to stop, go faster and change direction? All forces are pushes or pulls. Sort the movements in school deciding on push, pull or both.</td>
</tr>
<tr>
<td></td>
<td>Even when we stop a force is being used. (Action: pushes hand out) look I am using a pulling force to stop.</td>
</tr>
<tr>
<td>T</td>
<td>You are going to work in your normal table groups.</td>
</tr>
</tbody>
</table>

**OUTSIDE** Teacher with group 1
<table>
<thead>
<tr>
<th>T</th>
<th>What force are you using when you are running? Have a go and see?</th>
</tr>
</thead>
<tbody>
<tr>
<td>C8</td>
<td>Pull</td>
</tr>
<tr>
<td>C9</td>
<td>Push</td>
</tr>
<tr>
<td>T</td>
<td>Have another go and see what force you think you are using?</td>
</tr>
<tr>
<td>C9</td>
<td>Push</td>
</tr>
<tr>
<td>C8</td>
<td>Yes push</td>
</tr>
</tbody>
</table>

There were many different answers to what force they thought they were using.

| C10       | Smiled when he said push or pull giving an indication as to how confident in his answer he was |

**OUTSIDE Teaching Assistant with group 2**

<table>
<thead>
<tr>
<th>TA</th>
<th>What force are you using when you jump down from the bar?</th>
</tr>
</thead>
<tbody>
<tr>
<td>C11</td>
<td>Push</td>
</tr>
<tr>
<td>C12</td>
<td>Push</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TA</th>
<th>What about on the balance balls?</th>
</tr>
</thead>
<tbody>
<tr>
<td>C13</td>
<td>balancing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TA</th>
<th>Yes you are balancing but what force are you using? Push or Pull?</th>
</tr>
</thead>
<tbody>
<tr>
<td>C13</td>
<td>Push no pull no push</td>
</tr>
</tbody>
</table>

**TA** Talk to each other what force do you think C13 is using?

| C14       | maybe both                                                     |

**Back in the classroom**

<table>
<thead>
<tr>
<th>T</th>
<th>Everyone is going to sort activities out by what force is used. You can discuss them with your work partners. Green and blue group this is your worksheet (Action: shows the worksheet on the visualizer) You need to decide what force is being used push, pull or both and circle your answer like this (Gives a demonstration) to open the door I am using pull. Yellow and Orange group this is your worksheet (Action: show the worksheet on the visualizer) You need to decide what force is being used push, pull or both and then write your answer like this (Gives a demonstration) to open the door I am using pull. You can all go to your tables now apart from red group stay here..What is this? (Shows a Venn diagram on the visualizer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C11</td>
<td>Venn</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>T</th>
<th>Yes it is a Venn Diagram. You are going to use this to sort the activities that are on the sheet like this. I am labelling one circle push, the other pull and the overlapping part both. (Action: demonstrates on the visualizer) You then need to decide what force is being used for the activity and write it in the correct circle. Ok off you go. All children are engaged in the activity and they are all discussing it on their tables, some children just speak with their work partner while others talk in larger groups but all children are talking to complete the activity. All of the talk is in English.</th>
</tr>
</thead>
</table>

<p>| T         | Look at me everyone when we were outside and you were changing direction what force were you using? |</p>
<table>
<thead>
<tr>
<th>C7</th>
<th>Push and pull</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>Well done – push and pull together make a turn – which is a force. Who has heard of twist? (12 children raise their hands). A twist requires a push and pull force look at me twisting this paper (Action: demonstrates push and pull on a piece of paper to twist it.) Now what happens when I open my hand (Action: opens hand paper falls to the floor). What happened?</td>
</tr>
<tr>
<td>C12</td>
<td>You pushed</td>
</tr>
<tr>
<td>T</td>
<td>No I didn’t I only opened my hand</td>
</tr>
<tr>
<td>C13</td>
<td>You dropped it</td>
</tr>
<tr>
<td>T</td>
<td>Yes it did fall to the floor but I didn’t push or pull it I only opened my hand. Why do you think this happened? (No answers) Over 400 years ago there was a famous scientist called Isaac Newton, he sat under a tree and an apple fell on his head and he wondered why. This was because of a force. Does anyone know which one? (No answers) It begins with G.</td>
</tr>
<tr>
<td>C1</td>
<td>Gr gr gra don’t know (he has an attempt but gives up)</td>
</tr>
<tr>
<td>T</td>
<td>It is gravity have any of you heard of gravity (Action: 16 children raise their hands). Gravity is what helps us all stand up and not float away and next week we will be looking at gravity.</td>
</tr>
</tbody>
</table>
Appendix 6b

Coded lesson observation 2 in School A
Year 2 science lesson working scientifically to answer questions

What strategies are used to support the science education of EAL pupils?

<table>
<thead>
<tr>
<th>T</th>
<th>The following is displayed in the white board:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>How can you find the answer to your scientific questions</td>
</tr>
<tr>
<td>T</td>
<td>1. Do you have experience from investigations or work you have done?</td>
</tr>
<tr>
<td></td>
<td>2. You can observe closely over time</td>
</tr>
<tr>
<td>T</td>
<td>3. Do research using books, internet, other children or adults</td>
</tr>
<tr>
<td>T</td>
<td>4. You could so an investigation or fair test</td>
</tr>
<tr>
<td>T</td>
<td>5. Can you collect and use data</td>
</tr>
</tbody>
</table>

| T | What did we do last science lesson? |
| C1 | Ask questions |
| T | What were we asking questions about? |
| C2 | About materials |
| T | Yes you used **questioning dice** to ask questions and you came up with some very good scientific questions. **You are going to work in your normal groups and I am going to give you all your questions back, you need to as a team choose 2 questions that you want to answer.** We are finding out different ways to answer our question. What are we doing today? |
| All | Finding ways to answer our questions. |
| T | Lets all read the whiteboard steps, first lets put on our white coats because we are going to be scientists today. Scientists often work in laboratories asking questions and finding ways to answer them. |
| T | Do you have any experience maybe from something you have done at home or school? |
| T | Can you observe closely over time? |
| T | Do you know what observe means? |
| No children answer |
| T | **Observe means to look closely.** Can you remember what happened when we put gingerbread in water? |
| C2 | It went soggy |
| T | Yep what else? |
| C3 | The fox ate it |
| T | No that was the story not our science. It dissolved didn’t it? |
| T | **We could do research using books, internet, other children or adults but only use the laptops if you cant find the information in books.** |
You could investigate but you probably won’t need to collect and use data.

Shows the following question on the board and reads out ‘Why are biscuits hard but soft in water?’

What could I do to answer this? Do we have experience of this?

C  No
T  You may have experience of this from home if your parents put biscuits in their tea but not at school. Could I observe over time to answer my question?
C4 No because erm...
T  C2 what do you think? Could I observe yes I could. I don’t need to research because I need to see so I might do a test. I would choose to observe. I have C2’s question – writes on the board “What happens when you put sugar in hot water?” How can C2 answer this?
C5  It might be soggy
T  OK how can he answer it? Let’s look at the different ways. Has he got any experience of this?
C2  No
T  Could you observe?
C2  Yes
T  Does he need to look in books?
All  No
T  You could do a test. You must choose 2 good scientific questions as a team.

**Children are at their tables**
CA, CB and CC choose the following questions: “What happens when water is put in the freezer?” “Why are bricks used for building?”

CA  We could read a book
CC  No we could use the laptop
CA  We can’t use the laptop we have to use books first
T  Do you have any experience from home or school?
CB  Yes ice lollies
T  What do you know about ice lollies?
CA  They freeze
T  Why do they freeze
CC  Cause they’re cold
T  How do they freeze
CC  Freezer
T  So how could you answer your question
CC  Put some water in the freezer
T  What will happen to the water when it is in the freezer?
CA  Freeze
T  What do we call frozen water?
<table>
<thead>
<tr>
<th>CB</th>
<th>Ice</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>And what do you think will happen to the ice when we take it and leave it out of the freezer?</td>
</tr>
<tr>
<td>CC</td>
<td>It will melt to water</td>
</tr>
<tr>
<td>T</td>
<td>Have a go then put some water in a container and take it to the freezer and see what is in the freezer and what happens when you take it out.</td>
</tr>
<tr>
<td></td>
<td>Children fill cups with water and place them in the freezer. They also take out a tray of ice cubes, they take these out of the tray and handle them.</td>
</tr>
<tr>
<td>CC</td>
<td>Look, look they are melted</td>
</tr>
<tr>
<td>CA</td>
<td>Mine is making water</td>
</tr>
<tr>
<td>T</td>
<td>Yes it is melting</td>
</tr>
</tbody>
</table>

C2 – white British
Appendix 6c

Coded lesson observation 1 in School B
Year 2 Science Lesson – Materials

What strategies are used to support the science education of EAL pupils?

3 x EAL pupils – 2 Bengali and 1 Polish

<table>
<thead>
<tr>
<th><strong>Children are sat in their places on the carpet.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td><strong>TA</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td><strong>C1</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td><strong>C1</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td><strong>C2</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td><strong>C3</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td><strong>C4</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td><strong>C3</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td><strong>Children return to their table groups</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td><strong>All</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td><strong>C4</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td><strong>T</strong></td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>----</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>EAL1</td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>EAL1</td>
</tr>
<tr>
<td>EAL2</td>
</tr>
<tr>
<td>EAL</td>
</tr>
<tr>
<td>T to TA</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>EAL1</td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>EAL2</td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>EAL3</td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>ALL</td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>EAL1</td>
</tr>
<tr>
<td>EAL2</td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>EAL3</td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>EAL1 &amp; 2</td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>EAL1</td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>All</td>
</tr>
<tr>
<td>TA</td>
</tr>
<tr>
<td>EAL1</td>
</tr>
</tbody>
</table>
Appendix 6d

Coded lesson observation 2 in School B
Science Intervention Group Year 4 - 4 boys Bengali speakers

What strategies are used to support the science education of EAL pupils?

<table>
<thead>
<tr>
<th>This <strong>intervention group</strong> follows a previous lesson.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C1</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C1</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C1</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C3</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C2</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C2</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>All</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C4</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C2</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C4</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>All</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C1</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C3</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>All</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C3</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>C2</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C2</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C2</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>C2</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C3</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C1</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C4</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C1</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C1</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>C1</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>All</td>
</tr>
<tr>
<td>T</td>
</tr>
<tr>
<td>All</td>
</tr>
</tbody>
</table>
Appendix 7a

Coded EAL Policy of School A

What strategies are used to support the science education of EAL pupils?

**English as an Additional Language Policy**

**Introduction**

The term EAL (English as an Additional Language) is used to refer to pupils whose main language at home is other than English.

EAL pupils, from complete beginners to those with considerable fluency, will have varying degrees of difficulty in accessing the full curriculum and in achieving their full potential. Research has shown that those new to English will acquire conversational fluency in two years, but will need a minimum of five years to achieve competence in academic English. Such pupils will need language support if they are to reach their full potential. The provision of this support fulfils the requirements of the Race Relations Act of 1976 which seeks to promote Equality of Opportunity and to eliminate discrimination in the provision of education.

This policy sets out the School’s aims, objectives and strategies with regard to the needs and skills of EAL pupils.

**Aims**

- To welcome and value the cultural, linguistic and educational experiences that pupils with EAL bring to the School.
- To implement School-wide strategies to ensure that EAL pupils are supported in accessing the curriculum.
- To help EAL pupils to become confident and to acquire the English language skills they need to be able to fulfil their academic potential.

**Objectives**

- To be able to assess the skills and needs of pupils with EAL and to provide for their needs.
- To equip teachers and teaching support staff with the knowledge, skills and resources to be able to support and monitor pupils with EAL.
• To monitor pupils’ progress systematically and use the data to inform classroom management, curriculum planning and the setting of targets.

• To maintain pupils’ self-esteem and confidence by acknowledging and giving status to their skills in their own languages.

Strategies

There will be a positive and effective language ethos:

• There will be an understanding that a limited knowledge of English does not reflect a lack of ability or a lack of literacy in a pupil's mother tongue. Appreciating and acknowledging a pupil's ability in her/his own culture is crucial for her/his self-esteem.

• The language development of all students is the responsibility of all teachers and teaching support staff.

• There will be liaison between mainstream and support departments to discuss language development within the structure of the lesson.

• Diversity will be valued and classrooms will be socially and intellectually inclusive.

• Teachers will be knowledgeable about pupils’ abilities and needs in English and other subjects and use this knowledge to inform their curriculum planning, classroom teaching and pupil grouping.

• Support will be provided in various forms, including induction classes for complete beginners in English; the provision of in-class support and work in small groups where appropriate.

Teaching and Learning

In order to ensure that we meet the needs of EAL students, staff will:

• assess the pupil’s fluency level as soon as possible

• show differentiated work for EAL pupils
• employ a range of strategies within each lesson to reinforce understanding and meaning so as to develop language in context

• have high expectations, expect pupils to participate in all classroom activities/tasks

• monitor progress carefully and ensure that EAL pupils are set appropriate and challenging tasks, including the setting of appropriate extended tasks

• recognise that EAL pupils need more time to process answers and to complete extended work

• give newly arrived pupils time to absorb English bearing in mind that there is a “silent period” when those new to the language understand more English than they use

  • group pupils so that EAL pupils hear good models of English

  • use collaborative learning techniques

Spoken and written communication between the students and teaching and non teaching staff, and between the School and parents and the local community, will be positive and appropriate.
Appendix 7b

Coded EAL Policy of School B

Question 1 - What strategies are used to support the science education of EAL pupils?

Policy for pupils with
English as an Additional Language
February 2015

Many of the pupils attending school at School B have English as an Additional Language (EAL) and a range of ethnic backgrounds are represented. It is our intention that these differences should be celebrated and any resultant needs addressed. The Governors have appointed an EAL Leader to oversee the provision we offer. We recognise the importance of developing fluency in one’s first language and how this forms a firm basis for the development of any further languages. To this end parents will always be encouraged to support and develop fluency in the first language. The School is committed to maintaining the bilingualism of pupils wherever it can.

AIMS:

• To welcome and value the cultural, linguistic and educational experiences which pupils with EAL bring to the School.

• To implement school-wide strategies to ensure that EAL pupils are supported in accessing the curriculum so that they will not fail to reach their full potential due to English not being their first language.

• To support EAL pupils in becoming confident and fluent in English in order to be able to fulfil their academic potential.

• To monitor pupils’ progress systematically and use the data in decisions about classroom management, curriculum planning and provision.

• To maintain pupils’ self-esteem and confidence by acknowledging, celebrating and giving status to their skills in their own languages.

Practice

Pupils learning English as an additional language are entitled to the full National Curriculum. English is best learnt through the curriculum and pupils with EAL should be encouraged to play a full part in class activities from the start. All teachers are responsible for planning strategies to support the language development of pupils with EAL and their access of the curriculum.

It will be important when pupils join the school in classes other than Year R, that they are given time to settle in, particularly if these pupils have recently arrived in the country.
On the basis of information gathered, pupils will be grouped and supported appropriately. Grouping will be organised to provide opportunities for interaction with good language models. In the first instance, children will be supported in basic conversational English as required. Thereafter, second level acquisition skills will be supported to enable understanding of, and access to, the curriculum in its entirety.

Support will be provided largely through co-operative teaching between class teachers and Teaching Assistants (TAs), working with small groups which are not exclusively EAL children. This allows children to continue interaction with all peers, developing language both formally and informally, receiving support specific to their individual needs either within, or outside of, the normal classroom situation and when appropriate.

Written work will be preceded by modelling, shared work, scaffolding and oral and mental rehearsal. Visual aids will be used to support the learning of pupils in the early stages of acquiring English. The allocation of resources to support the teaching of EAL will be provided through the EAL budget.

The EAL Leader will consult with class teachers to identify needs and share in the planning process for class, group and/or individual programmes of study as appropriate.

Gathering Information
The EAL Leader will be responsible for maintaining a register of pupils who have English as an Additional Language and the various ethnic groups represented among the pupils.

Strategies for staff working with pupils who have English as an additional language:

School/class ethos
• Recognise the child’s mother tongue; boost the child’s self-esteem.
• Remember, he/she has the potential to become a bilingual adult
• Identify the pupil’s strengths
• Acknowledge the time it takes to become fluent in an additional language, with a good command of the range of language needed for academic success

Teaching and Learning
• Observe the pupil’s competence in English in relation to the NC standards and expectations as soon as possible.
• Show differentiated work for EAL pupils in planning.
• Have high expectations; expect pupils to contribute and give you more than one-word answers.
• Monitor progress carefully and ensure that EAL pupils are set appropriate and challenging learning objectives.
• Recognise that some EAL pupils may need more time to process
answers.

• Give newly arrived young children time to absorb English (there is a recognised ‘silent period’ when children understand more English than they use – this is acknowledged and work is done to ensure that self-confidence is maintained and developed so that children move on to the next stage of language acquisition as quickly as possible.
  • Teachers to use visual aids and real objects as far as possible to support understanding.
  • Ensure that EAL pupils hear good models of English.
  • Use collaborative learning techniques.

Parents

As a school we want to develop strong partnerships with our parents. We encourage parents to work with their children and use their mother tongue to explore concepts. To ensure that they can access information regarding their children, we can provide translations and interpreters where necessary. We also provide or sign post parents to English as a Second Other Language classes (ESOL). We want families to feel confident about approaching the school so, where possible, parents are supported in making links with other parents who speak the same language so that they can gain support from each other and not feel isolated.

This policy will be reviewed in June 2017 by the EAL Leader.
Appendix 8 - Coding System for Question 2

Question 2: What are the challenges encountered when providing for the needs of EAL pupils?

- **Funding**
- **Assessment**
- **Planning**
- **Resources**
- **Time**
- **Lack of experience**
- **Other**
  - TA’s out of class
  - Too much responsibility on TA’s
Appendix 9a

Coded Interview Transcription with the Science Coordinator of School A.

What are the challenges encountered when providing for the needs of EAL pupils?

1. What strategies do you use to support EAL children specifically in Science?

We ensure that they have resources that give EAL children lots of practical hands on experiences including clearly labelled resources. We help children develop their questioning skills through scaffolding their language. This is done through the use of question cards containing questioning words and phrases, question dice and question quibble. From a very early age we encourage all children including those with EAL to ask their own questions. We introduce scientific vocabulary early and this is constantly reinforced. We give EAL pupils key vocabulary cards with a visual image of the word; these are relevant to the unit of science. We spend a lot of time modelling working specifically by asking questions.

We also do most of our science in groups, these are mixed ability groups and the EAL pupils are put in groups where the children with good vocabulary can support them.

2. Are there specific strategies for different groups of children?

In years 1 and 2 differentiated support is given where needed, in line with our EAL policy. This may be key vocabulary list, bilingual vocabulary lists, and support from teaching assistants. English is the language used in school and we only revert to children’s home language if they have very poor grasp of English.

3. What challenges do you come across when planning and supporting EAL children?

The main challenge is scientific vocabulary. Most of our EAL pupils have very little science specific language and there is very little scientific language used at home. Considering language that may cause problems and the ways in which new vocabulary can be introduced takes a lot of time. This is all added onto the time planning already takes.

4. When you are planning do you have to consider the language?

We consider the scientific language opportunities within each unit of work and this vocabulary is reinforced. Dependent on the individual’s ability in English depends on the strategies used, but this may include key vocabulary lists, bilingual picture cards, and group work with peers who act as good models in English. We show the language and resources within our planning and it often takes along time.
5. **How do you assess the level of understanding in science of EAL pupils?**

Children that are below the expected level in English can be well above in science. Science enables EAL pupils to be good at the subject without having to have a good understanding and use of English Language as they do not have to record anything at this age, only later on do they need to record. *This can cause challenges when assessing EAL pupils in science and assessing their written work doesn’t give us a clear picture of their conceptual understanding so most science assessment is done through teacher observations.*

_In terms of summative assessment a banding system is being introduced. Picking up on vocabulary and talk during the teacher input and plenary. Looking at recorded work, self-assessment using the triangulation system is in place; the children understand how to use this._

_As I said earlier we model working specifically by asking questions. This in turn enables the teacher to assess the child’s understanding by their question asking skills._

6. **How are the resources funded?**

_Funding is allocated across the school and the SEN teacher looks specifically at EAL children and the resources and finances required._

441 – 4 white British
6 Afro Caribbean
Bangladeshi heritage
Pakistani heritage
Appendix 9b

Coded Interview transcription with the EAL Leader of School B.

What are the challenges encountered when providing for the needs of EAL pupils?

1. **What strategies do you use to support EAL children specifically in Science?**

   The Wave 1 strategies we use are emphasising key vocabulary through the planning and input - sometimes having examples to support this, visual images at times to go with the vocabulary and hands on experiences. The TAs will often be available to focus on these children - depending on ability.

   For Wave 2 - the children will have a pre-teaching session with the EAL assistant, who will go through the language needed for the upcoming lesson, and go through and misconceptions from the previous one if needed. From this, the children should make a resource, either in their books or ipads that they can then take back into the classroom to support them.

   For the children who are new to English, the EAL assistants and teachers prepare a booklet for them each week, which they can take home at the weekend. This allows them to work with their parents to gain a basic understanding in their own language, which they can then transfer in the pre-teaching.

2. **Do you use any different strategies specifically for science?**

   In Science, we do try and give the children the opportunity to experience as much as possible through practical work, rather than just using images or discussing the vocabulary. Otherwise, it is difficult for the children to fully understand what is meant - e.g the feeling of materials, linked with the vocabulary, or experiencing ice melting.

3. **Are there specific strategies for different groups of children?**

   As with other children, our EAL comprise of differing abilities. Therefore, the lower ability EAL children will have the same support as the LA children, as well as the EAL intervention. For the HA children, the ones who cope well with the general classroom teaching, the teacher may check on their understanding in the lesson, but they would not take part in the previously mentioned groups.

4. **What challenges do you come across when planning and supporting EAL children?**

   Previously, the teachers have placed too much responsibility for these children on the EAL assistants, not always putting what is needed into the
Wave 1 teaching. However, we have now moved away from this and the teachers should have key children in mind when planning to ensure they can assess this. The EAL assistants do attend the planning meetings as well, so it gives discussion opportunities, this helps the teachers with planning but this can be difficult having teaching assistants out of class.

Planning for science lessons takes time with the scientific vocabulary and the impact this has on EAL pupils having to be considered, planned for and resourced. However it is necessary that this is done correctly in order to support the children.

5. When you are planning do you have to consider the language?

We put a key emphasis on the key language for all our children. For our new to English speakers, we also put some translations into the PowerPoint or the input resource we are using.

6. How do you assess the level of understanding in science of EAL pupils?

This depends of the age of the children involved. In KS1 it tends to be through the engagement in conversations and how they are able to express themselves and explain their ideas. For KS2 children, it is more evident in their writing. This is when it is most noticeable if they have the deeper understanding of the language that is required. But this is difficult if they have limited English and are not at the level of writing in science, it is then very much down to teacher observations and questioning. We complete NALDIC assessments each term, with the EAL assistants and the teachers working together.

7. How are the resources funded?

The majority of resources come out of the budget that we have designated for EAL children. We have recently done some further work with the EMA Network, which has provided some additional funding for resources.
Appendix 10a

Coded EAL Policy of School A

What are the challenges encountered when providing for the needs of EAL pupils?

**English as an Additional Language Policy**

**Introduction**

The term EAL (English as an Additional Language) is used to refer to pupils whose main language at home is other than English.

EAL pupils, from complete beginners to those with considerable fluency, will have varying degrees of difficulty in accessing the full curriculum and in achieving their full potential. Research has shown that those new to English will acquire conversational fluency in two years, but will need a minimum of five years to achieve competence in academic English. Such pupils will need language support if they are to reach their full potential. The provision of this support fulfils the requirements of the Race Relations Act of 1976 which seeks to promote Equality of Opportunity and to eliminate discrimination in the provision of education.

This policy sets out the School’s aims, objectives and strategies with regard to the needs and skills of EAL pupils.

**Aims**

- To welcome and value the cultural, linguistic and educational experiences that pupils with EAL bring to the School.

- To implement School-wide strategies to ensure that EAL pupils are supported in accessing the curriculum.

- To help EAL pupils to become confident and to acquire the English language skills they need to be able to fulfil their academic potential.

**Objectives**

- To be able to assess the skills and needs of pupils with EAL and to provide for their needs.

- To equip teachers and teaching support staff with the knowledge, skills
and resources to be able to support and monitor pupils with EAL.

- To monitor pupils' progress systematically and use the data to inform classroom management, curriculum planning and the setting of targets.
- To maintain pupils' self-esteem and confidence by acknowledging and giving status to their skills in their own languages.

**Strategies**

There will be a positive and effective language ethos:

- There will be an understanding that a limited knowledge of English does not reflect a lack of ability or a lack of literacy in a pupil's mother tongue. Appreciating and acknowledging a pupil's ability in her/his own culture is crucial for her/his self-esteem.

- The language development of all students is the responsibility of all teachers and teaching support staff.

- There will be liaison between mainstream and support departments to discuss language development within the structure of the lesson.

- Diversity will be valued and classrooms will be socially and intellectually inclusive.

- Teachers will be knowledgeable about pupils' abilities and needs in English and other subjects and use this knowledge to inform their curriculum planning, classroom teaching and pupil grouping.

- Support will be provided in various forms, including induction classes for complete beginners in English; the provision of in-class support and work in small groups where appropriate.

**Teaching and Learning**

In order to ensure that we meet the needs of EAL students, staff will:

- assess the pupil's fluency level as soon as possible
- show differentiated work for EAL pupils
• employ a range of strategies within each lesson to reinforce understanding and meaning so as to develop language in context

• have high expectations, expect pupils to participate in all classroom activities/tasks

• monitor progress carefully and ensure that EAL pupils are set appropriate and challenging tasks, including the setting of appropriate extended tasks

• recognise that EAL pupils need more time to process answers and to complete extended work

• give newly arrived pupils time to absorb English bearing in mind that there is a “silent period” when those new to the language understand more English than they use

• group pupils so that EAL pupils hear good models of English

• use collaborative learning techniques

Spoken and written communication between the students and teaching and non teaching staff, and between the School and parents and the local community, will be positive and appropriate.
Appendix 10b

Coded EAL Policy of School B

Question 2: What are the challenges encountered when providing for the needs of EAL pupils?

Policy for pupils with English as an Additional Language
February 2015

Many of the pupils attending school have English as an Additional Language (EAL) and a range of ethnic backgrounds are represented. It is our intention that these differences should be celebrated and any resultant needs addressed. The Governors have appointed an EAL Leader to oversee the provision we offer. We recognise the importance of developing fluency in one’s first language and how this forms a firm basis for the development of any further languages. To this end parents will always be encouraged to support and develop fluency in the first language. The School is committed to maintaining the bilingualism of pupils wherever it can.

AIMS:
• To welcome and value the cultural, linguistic and educational experiences which pupils with EAL bring to the School.

• To implement school-wide strategies to ensure that EAL pupils are supported in accessing the curriculum so that they will not fail to reach their full potential due to English not being their first language.

• To support EAL pupils in becoming confident and fluent in English in order to be able to fulfil their academic potential.

• To monitor pupils’ progress systematically and use the data in decisions about classroom management, curriculum planning and provision.

• To maintain pupils’ self-esteem and confidence by acknowledging, celebrating and giving status to their skills in their own languages.

Practice
Pupils learning English as an additional language are entitled to the full National Curriculum. English is best learnt through the curriculum and pupils with EAL should be encouraged to play a full part in class activities from the start. All teachers are responsible for planning strategies to support the language development of pupils with EAL and their access of the curriculum.

It will be important when pupils join the school in classes other than Year R, that they are given time to settle in, particularly if these pupils have recently arrived in the country.
On the basis of information gathered, pupils will be grouped and supported appropriately. Grouping will be organised to provide opportunities for interaction with good language models. In the first instance, children will be supported in basic conversational English as required. Thereafter, second level acquisition skills will be supported to enable understanding of, and access to, the curriculum in its entirety.

Support will be provided largely through co-operative teaching between class teachers and Teaching Assistants (TAs), working with small groups which are not exclusively EAL children. This allows children to continue interaction with all peers, developing language both formally and informally, receiving support specific to their individual needs either within, or outside of, the normal classroom situation and when appropriate.

Written work will be preceded by modelling, shared work, scaffolding and oral and mental rehearsal. Visual aids will be used to support the learning of pupils in the early stages of acquiring English. The allocation of resources to support the teaching of EAL will be provided through the EAL budget.

The EAL Leader will consult with class teachers to identify needs and share in the planning process for class, group and/or individual programmes of study as appropriate.

Gathering Information
The EAL Leader will be responsible for maintaining a register of pupils who have English as an Additional Language and the various ethnic groups represented among the pupils.

Strategies for staff working with pupils who have English as an additional language:

School/class ethos
- Recognise the child’s mother tongue; boost the child’s self-esteem.
- Remember, he/she has the potential to become a bilingual adult
- Identify the pupil’s strengths
- Acknowledge the time it takes to become fluent in an additional language, with a good command of the range of language needed for academic success

Teaching and Learning
- Observe the pupil’s competence in English in relation to the NC standards and expectations as soon as possible.
- Show differentiated work for EAL pupils in planning.
- Have high expectations; expect pupils to contribute and give you more than one-word answers.
- Monitor progress carefully and ensure that EAL pupils are set appropriate and challenging learning objectives.
- Recognise that some EAL pupils may need more time to process
• Give newly arrived young children time to absorb English (there is a recognised ‘silent period’ when children understand more English than they use – this is acknowledged and work is done to ensure that self-confidence is maintained and developed so that children move on to the next stage of language acquisition as quickly as possible.
• Teachers to use visual aids and real objects as far as possible to support understanding.
• Ensure that EAL pupils hear good models of English
• Use collaborative learning techniques

Parents
As a school we want to develop strong partnerships with our parents. We encourage parents to work with their children and use their mother tongue to explore concepts. To ensure that they can access information regarding their children, we can provide translations and interpreters where necessary. We also provide or sign post parents to English as a Second Other Language classes (ESOL). We want families to feel confident about approaching the school so, where possible, parents are supported in making links with other parents who speak the same language so that they can gain support from each other and not feel isolated.

This policy will be reviewed in June 2017 by the EAL Leader.