The Self Organised Learning Environment (SOLE) School Support Pack.

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1. Introduction

This document is designed to support the implementation of Sugata Mitra's Self Organised Learning Environment (SOLE) into multiple school contexts. It contains 'whole school' related information for Head Teachers and senior staff in addition to teaching and learning support for teachers and support staff.

What is a SOLE?

In this document, 'Self Organised Learning Environment' refers to the adaptation of a school space to facilitate Enquiry Based Learning. A teacher encourages their class to work as a community to answer questions using computers with internet access. The class work around a guiding set of rules:

- Students need to form groups of about 4
- Children choose their own groups
- They can change groups at any time
- Children can look to see what other groups are doing and take that information back to their own group
- They should be ready to present their answers back to the class at the end of the session

Although Mitra's research contains designs for specially designed SOLEs, for most schools a SOLE will constitute a classroom, a set of laptops and a teacher willing to experiment with a different teaching style. As a result, this document focuses more on the mechanisms and strategies teachers can employ to successfully manage a SOLE than technical requirements.

This document is in an early stage of development and would benefit hugely from the experiences of staff undertaking this particular method of Enquiry Based Learning. Each section should be regarded as a starting point for your own practice. Our aim is to develop a document that makes it quicker and easier for schools to adopt the SOLE method of Enquiry Based Learning. This will be considerably more valid if it contains your opinions and experiences.

2. Whole School Issues

How Should a School go about setting up a SOLE?

This depends on the specific culture and structures that exist in your school. However, it is suggested that these criteria are essential to successful implementation:

- Supportive Senior Staff
- An environment in which staff feel able to make mistakes
- Staff who 'buy into the benefits'
- A communication system for staff to share ideas and experiences of working within a SOLE

Integration into Curriculum.

There are a range of levels at which a school could integrate this method into existing curriculum structures. It is advisable in the first instance to trial the method as part of a topic and then extend usage once a teacher is confident enough.

Some schools use the SOLE at the start of a topic as a way of generating interest and allowing students to find their own 'route in' to a subject.

Some schools use the SOLE more often, responding to either the student's preference for how they would like to learn or the teacher's perception of where an Enquiry is best placed within a topic. Successful implementation will likely differ from school to school but adhere to the above success criteria.

SOLEs can be used to allow students to learn about any subject. There are of course, time implications. It is likely that the teacher will at first envisage a small range of opportunities for what information/skills can be learnt using the method. As time goes on, and the teacher grows in confidence, more opportunities will present themselves.

For any significant change to occur, leadership must give active, sustained and informed support. Leadership cannot allow other priorities to compete.

Integrating SOLEs into the curriculum requires serious curriculum planning.

Key Stage Considerations

The SOLE method can be adapted to work with most Key Stages. Some aspects may have to be modified. For example, with younger students, the responsibility for behaviour management can be delegated to a 'police person' who tend to enjoy wearing a police helmet as part of their role. With older students, it might be necessary for this role to have a more professional title, such as 'student manager'. The principle of nominating a student to be responsible for student behaviour remains the same.

The age or maturity of a student may be a cause of concern when choosing which year group to work with. However, SOLEs allow students the opportunity to develop their social skills at a faster pace to a conventional classroom environment. This means that after an initial 'adjustment' period, even young children can function as a group.

Staffing

As a Headteacher of Senior Staff member, it is useful to consider the effects on teachers using the SOLE enquiry method for the first time.

It can be difficult to 'step back' from the conventional role of teacher and assume the role of a 'friendly mediator'. Teachers should, where possible and appropriate, act as partners, rather than mentors, exhibiting curiosity. It takes time and support to help the teacher gain confidence with the technique.

If the teacher's expectations of the outcomes are not met during early experiences it can be disheartening. It is likely that the class will also find it difficult to adjust to their own role changes, making it unlikely that a teacher trialling the method for the first time will experience 'instant success'.

Having said that, with the right direction and support from the teacher, the class will improve quickly. It is important to 'have faith' in the class and teacher that over a short period of time, they will adapt to working in a SOLE.

Teachers are guided in their actions by their beliefs about learning. There may be need to be some unlearning to make SOLEs work well.

It can be useful for staff to partner with colleagues to share experiences and talk through some of the challenges of adapting to the SOLE enquiry method.

Discussing and even arguing about practice beliefs and outcomes is important. Such argument is best informed by evidence and feedback from the pupils.

What other whole school issues do you feel need discussing?

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3. Principles.

-Sometimes didactic lessons can impose defined boundaries on student progress. Within SOLEs student progress is not limited by teacher perceptions or expected curriculum levels.

-Students can be capable of learning and understanding more than the teacher and curriculum gives them credit for.

-Students can learn socially before internalizing their knowledge. This can help with memory recall and also development of social skills.

-Students actively construct their own understanding of new knowledge and concepts, which they do by relating it to what they already know. Sometimes existing, erroneous knowledge has to be challenged.

-Active construction of understanding requires thought and talk, especially explanatory talk.

-Learning to collaborate greatly improves explanatory talk.

-Choice greatly improves motivation.

-Children have a significant capacity to teach themselves and they can learn criticality surprisingly quickly.

-Learning is more than acquisition of specified curriculum knowledge, it is also about participation – being able to use learning tools.

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4. Benefits.

Please rate the importance of these suggested benefits by circling the numbers for each statement.

1=important; 2=fairly important; 3=not important; 4=don't know

There are also spaces in the table for you to contribute your own suggestions.

Teacher	Reduction in stress as 'teacher-student responsibility ratio' becomes more equal	1	2	3	4
	Students develop questioning skills	1	2	3	4
	Improved repertoire of strategies for common classroom problems	1	2	3	4
	Shared responsibility for class progress	1	2	3	4
	Greater interest in topics from students	1	2	3	4
	The sense of occasional teacher fallibility can improve relationships with class and provide a sense that the teacher is learning alongside the class.	1	2	3	4
		1	2	3	4
		1	2	3	4

		1	2	3	4
Student	Ownership over learning and direction of learning.	1	2	3	4
	Memory recall	1	2	3	4
	Greater opportunities for Intrapersonal and Interpersonal skill development	1	2	3	4
	Ability to work within preferred learning style	1	2	3	4
	Improved sense of trust with teacher	1	2	3	4
	Incorporation of external learning into classroom topics	1	2	3	4
		1	2	3	4
		1	2	3	4
		1	2	3	4
School	Students learn independent learning skills earlier in school life. Leads to stronger independent learning progression.	1	2	3	4
	Effect on student perception of ownership and connection to school.	1	2	3	4
	A climate of enquiry is established. The removal of teacher-imposed knowledge parameters leads to students with a larger desire for knowledge.	1	2	3	4
	Greater opportunities for interpersonal and intrapersonal learning to occur.	1	2	3	4
	School is offering personalised learning.	1	2	3	4
	Improved teacher – student relationships	1	2	3	4
		1	2	3	4
		1	2	3	4
		1	2	3	4

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5. Setting Up a SOLE

Although Sugata Mitra's SOLE designs involve the installation of custom furniture and technology, the same results are achievable in a normal classroom with a set of laptops or netbooks. The following information describes the minimal conditions necessary to make a SOLE followed by Mitra's 'advanced set up'.

Suggested Minimum Set Up	Please describe your set up:
Enough laptops for one per 4 students.	

Laptops with larger screens are preferable as they enable the group to get a better view of what is on screen.	
A blackboard, whiteboard or interactive whiteboard on which to write the Enquiry question.	
Paper and pens for the students to write notes.	
For younger students, a police helmet, sheriffs badge or similar symbol of authority for the student manager.	
A space for students to present back their findings at the end of the Enquiry.	

Please rate the attainability of the following 'advanced set up' suggestions based on the following scale:

1=Easily Attainable; 2=Attainable; 3=Difficult; 4=Impossible; 5=Don't know

Advanced Set Up	1	2	3	4	5
Identify a location in the school, typically a room that is highly visible to passing adults, for example, the Head of the school, the teachers, the parents coming to pick up children and other children.	1	2	3	4	5

Create glass walls for the room such that the entire area is visible. Put in bright CFL lighting and paint the walls in light, cheerful colours. The flooring should be easy to clean and dust free.	1	2	3	4	5
Design furniture that enables groups of 6-12 year old children (usually 4 to 6 in a group) to interact with a computer without over crowding.	1	2	3	4	5
About 6 items of furniture will enable a class of 24-30 children to use the facility.	1	2	3	4	5
Design the furniture such that there are no sharp edges anywhere. All furniture should be easy to clean and, preferably, washable.	1	2	3	4	5
Purchase desktop computers, one for each group of 4-6 children. The computers should have fast processors, a large (at least 19 inch) LCD monitor, speakers, wireless keyboards and wireless mouse. Fix the speakers securely.	1	2	3	4	5
Place the CPU of each computer in a safe place under the tables. The power switches of the computer and the connecting cables for power and monitor should not be accessible to the children. Place monitors on a stand such that they are raised, at least 12 inches over the surface of the table. This will ensure that the monitors are clearly visible from the outside when children are using them and are not blocked from view by their heads or bodies.	1	2	3	4	5
Place the CPU of each computer in a safe place under the tables. The power switches of the computer and the connecting cables for power and monitor should not be accessible to the children. Place monitors on a stand such that they are raised, at least 12 inches over the surface of the table. This will ensure that the monitors are clearly visible from the outside when children are using them and are not blocked from view by their heads or bodies.	1	2	3	4	5
Ensure that all the computers have broadband Internet access at speeds of 2MBps or more if possible. Do not use firewalls, unless unavoidable. Wireless broadband is recommended.	1	2	3	4	5
All electrical wiring and outlets should be concealed but easily accessible when required. It should not be necessary to crawl under tables to access connections.	1	2	3	4	5
Install any freeware, such as Open Office, for the children to work with. Software for painting, such as MS Paint or Adobe Photoshop or equivalent freeware is a must.	1	2	3	4	5

One of the computers in the SOLE should have a web camera and microphone installed. The camera should be permanently mounted such that it enables a full view of the SOLE. A camera with pan and tilt facilities and a built in microphone is recommended (for example, the Logitech Sphere camera). A person accessing the SOLE over, for example, Skype, should be able to see most of the children if they gather around the computer with the camera.	1	2	3	4	5
Install adequate and appropriate power conditioning and back up. An UPS is recommended in areas where electricity supply is not reliable. A generator, or solar panels and batteries should be used in areas that have no electricity.	1	2	3	4	5
Keep a small table and chair in the SOLE for an attendant.	1	2	3	4	5
Check to see that all monitors are clearly visible from outside the SOLE.	1	2	3	4	5
The SOLE would typically be set up by a vendor who would also provide a technical person for attending to any problems. This person should be capable of attending to electrical, electronic , software and connectivity problems.	1	2	3	4	5

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6. What Makes a Good Enquiry Question?

Large, open, difficult and interesting questions often make the best Enquiry questions. Questions that are unanswerable; such as 'Who made space?' are good to encourage students to offer theories instead of concrete answers. At the end of an enquiry session an answer such as "Well, no one really knows, but we think that it happened because of the Big Bang" may be arrived at. Questions that cannot be answered by 'yes' and 'no' and require developed answers, thought and discussion are preferable.

Enquiry questions should engage the class for around forty minutes of enquiry. It is important not to 'aim low' and ask questions with easy answers. "How many countries are there?" can be typed word for word into a search engine and answered almost immediately. Questions that encourage students to use Higher Order Thinking Skills tend to engage for longer and promote deeper conversations amongst groups and peers.

If you are asking an Enquiry questions around a topic already taught in class, it can be helpful to ask a question slightly removed from the specifics of previous class work. A question that refers to the 'big picture' can often yield more interesting results. For example, during a topic on Vikings, students at St. Aidan's Primary School were asked "What did the Vikings believe about God?" This was to open up investigation into an area that the teacher perceived the children had not learnt enough about.

Example Questions asked to a Year 4 class:

- What was ancient Egypt really like?
- What kinds of animal are endangered and why?
- What is the function of the human skeleton?
- How does a solid turn to a liquid then a gas?
- Why do people slip on wet surfaces?
- Did dinosaurs really exist?
- What is the Greenhouse Effect?

Questions you have asked your class	**Student Response to Question**

7. The Role of the Teacher in a SOLE.

This is a loose model for how teachers can manage a SOLE. The timings are a starting point

A Kindle version of Sugata Mitra's "Beyond the Hole in the Wall: Discover the Power of Self-Organized Learning" is available at http://goo.gl/iaL4B.

and may need adjusting. Most commonly, the time allocated for the Enquiry can be reduced whilst students are familiarising themselves with how to work in a SOLE. Depending on the complexity of the question posed and answers collected, the Review will regularly require different amounts of time.

Phase	Time	Activity
Question	Approx 5 mins	•Pose an enquiry question (see 'What Makes a Good Enquiry Question?'), perhaps generating interest by showing visual/audio stimulus and having a brief discussion around the question. •Explain the 'rules' (printable list in Appendix 2) •Nominate a student to take responsibility for behaviour management. Discuss briefly what this role may involve.
Enquiry	Approx 40 mins	•Let the students work in groups for around 40 minutes to find answers to the questions on laptops. •Intervene minimally, with urgent issues delegated to the student manager to take responsibility for. •Avoid direct interventions and instructions that undermine the authority of the student manager. •Try not to give students answers for the sake of 'speeding things along'. Instigate 'kind and purposeful learning interventions' in the form of useful and open questions. •Record the situation – take notes – direct quotations, photographs, audio recordings and present it back to the class without judgement. Ask questions about what they think. Inevitably they will present a comparable judgement to your own. This can be an excellent opportunity to reflect on behaviour and group dynamics during the review.
Review	Approx 10-20 mins	•Organise students in a space where they can feed back their answers/information. •Facilitate a discussion in which students are able to give opinions on the question itself and then *how* they went about answering it. For instance, they class may have generated excellent information, but behaved inappropriately whilst doing so. •Not make judgement calls on the class, but ask questions that allow them to assess themselves.

Working in a SOLE enquiry based learning situation for the first time will likely the teacher to experience role conflict. The structures and systems that teachers use to maintain order and

balance in their classrooms all of a sudden become ‘judgement calls’ and ‘direct interventions’.

The short term effect on the teacher can be disorientating. Instead of observing, reflecting, and instigating ‘kind and purposeful teacher interventions’, there is a natural desire to fix problems for students. Short term fixes, however, will not lead to the long term benefits possible by use of the SOLEs.

It is important that the teacher allows students to make mistakes. These mistakes, once discussed with the class later on, presented without judgement, can lead to the class taking increased responsibility for their actions.

The problem with being a good ‘teacher’ in a SOLE is that teachers must seek to reduce ‘visible’ teaching mechanics, thereby appearing to do less of things that a ‘good teacher’ is expected to do.

It is common for the teacher to ‘worry that when other teacher’s come in they think that I’m not doing anything.’

The teacher must be prepared to reflect back student questions in such a way as to instigate new learning opportunities for students. It can be difficult to be efficient in identifying and acting upon these moments initially, but perseverance can lead to inspired student led solutions for ‘nagging’ and consistent problems, such as arguing over who gets to use the laptops first.

To students, and teachers who are not familiar with acting as ‘Mediators’, it can seem as though the teacher is not actively managing the class. Indeed, it can sometimes feel like this for the teacher themselves. Ultimately, the reduction of teacher’s ‘whole class’ talk time and instruction giving is a powerful strategy in maintaining the shift of learner responsibility to the students.

It may be helpful to compare the role of a teacher in a SOLE with that of a conventional

classroom environment. Please edit this table and contribute with your own suggestions.

Conventional Classroom	SOLE
Teacher predominantly tells students answers	Students find out answers themselves
Teacher constantly manages student behaviour	Teacher delegates behaviour management to 'student manager'
Teacher organises group structures	Teacher perceives student mistakes as learning opportunities
Possibility for social and peer learning is limited and/or structured by teacher	Students free to organise their own groups
Students perceive teacher controls the direction of lessons	Frequent opportunities for social and peer learning
Students perceive teacher as 'beholder of all knowledge' and infallible.	Students perceive greater control over the direction of learning in lessons
Students feel learning is 'owned' by the teacher	Students perceive teacher as equally fallible and equally interested in the answer to purposeful questions.

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8. The Role of the Student Manager in a SOLE.

If direct teacher intervention is to be kept to a minimum, what strategies can be employed to maintain a purposeful learning environment?

It is a natural requirement for there to be an authoritative figure in the room. It can be useful to visibly pass this on to a student or group of students in order to solidify in their mind that a shift in responsibility has occurred.

A single student can be put in control of managing behaviour in the class. Depending on the class itself, the student can either sit out from the enquiry task and fully focus their efforts on classroom management or work within a team, occasionally roaming and responding to problems as they occur. A new manager can be selected for each lesson. Any interventions the teacher wishes to put in place must be coordinated through the student 'manager'.

The thoughts and opinions of the student manager on the behaviour of the class is generally very interesting and helpful to debrief and reflect on at the end of the lesson. Often, it is the first time that the student has been placed in a position where they feel such responsibility for the collective performance of the class. A camera can be given to the police person to take photographs of good and bad examples of team work in the class. This can form part of the review at the end of the session.

Some students are naturally more accustomed to imposing 'law and order' in a classroom situation. It can be helpful to encourage student managers to share best practice during reviews, and open up discussions about how to deal with difficult behaviour.

At the end of the SOLE session, the removal of the police helmet or end of the student manager's 'shift' signifies the passing of responsibility back to the teacher.

Please use this space to contribute your own observations of student manager good practice:

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9. Common Situations.

Problem	Possible Solution	Outcome	Your solution	Outcome
Child approaches teacher with a behaviour problem. 'Miss, Lucy isn't doing any work'	Teacher diverts responsibility back to student manager. 'That sounds like something the student manager should know about. Have you told them?'	Students realise that the 'easy option' of having the teacher 'fix' a problem is not viable. This forces the students to compromise, communicate and experience difficult group situations.		
One child in a larger group is off task	A simple solution may be to remind the students of the rules. They can change groups if they choose to. It may be necessary for the teacher to speak to the student manager, asking them questions about why the child might be off task. Perhaps the other members of the group are not listening to their ideas. 'Is there anything you could do to help them get back on task?	Students understand that they can change the situation by moving groups. Students become experienced at positive behaviour reinforcement strategies.		
A group are off task	Again, remind the group as a whole of the rules may prompt them to change groups and resume working. Teacher speaks with student manager to find a solution. It could be the group need to split up and join other groups. The student manager should make these decisions.	Students understand that they can change the situation by moving groups. Students recognise the importance of choosing a team that can work together.		

A student or group present back a factually inaccurate / irrelevant answer.	The teacher deconstructs the answer, asks about which sources the group used. A conversation about how to find a reliable source of information on the internet happens. Perhaps the students start to keep bookmarks of 'trusted sources'.	Students begin to interrogate internet sources more thoroughly.		
A student has difficulty reading the information collected from the internet	There are often discrepancies between the student's reading level and the complexity of the written language found online. Sometimes it easier to ask the student to not read from the paper. The understanding may be there but their reading ability may not. Asking a student to explain in their own words can avoid this problem.	Students do not perceive reading ability as a 'barrier'. Reduces student anxiety about presenting back information.		
The student manager is misbehaving.	Depending on the situation, it could be that the student manager is unaware of how to manage the class, and will need plenty of helpful suggestions and advice from the teacher. Try to avoid challenging the student manager in front of other students. Praising good examples of student manager behaviour at the end of the enquiry can help other students become aware of what the expected standard is.	Student manager develops social skills and confidence. Class behaviour improves. Less likely for teacher behaviour management interventions.		

A student complains there is ‘nothing to do’ as someone else is using the laptop.	Perhaps the teacher asks the students how they feel about sharing laptops during the review, and brings about solutions from students on sharing.	Students develop their own solutions and retain ownership over their self management systems.		

Please contribute problems you have encountered whilst in a SOLE.

Problem	Your solution	Outcome

Appendix 1

Self Organised Learning Environments

The Hole in the Wall (referred to as HiW in the rest of this article) experiments were first implemented in 1999, when a computer with an internet connection was embedded into a wall, for children to discover and use unsupervised. The wall adjoined a slum; and only a month later, it was evident that the children had taught themselves to use the computer and also picked up some skills in English and Mathematics. This kind of design was then set up in more remote areas across India with almost identical results. These were computers embedded in walls or kiosks in easily accessible and highly visible public spaces, facilitating peer interaction, discovery and learning in groups of children.

We concluded that groups of children from disadvantaged and remote settings can learn to use computers and access internet resources, on their own, if given appropriate free, public and unsupervised access.

These earliest experiences also showed that children could develop some skills in English and Mathematics. What came through unequivocally in this and further work on self organising systems in education was that groups of children irrespective of who or what they are, or what language they speak in; given free and public access to the internet can:

1. Become computer literate on their own, that is, they can learn to use computers and the Internet for most of the tasks done by lay users.
2. Teach themselves enough English to use email, chat and search engines.
3. Learn to search the Internet for answers to questions in a few months time.
4. Improve their English pronunciation on their own.
5. Improve their mathematics and science scores in school.
6. Answer examination questions several years ahead of time.
7. Change their social interaction skills and value systems.
8. Form independent opinions and detect indoctrination.

We then went on to show that the quality of traditional schooling reduces with a clear decline in performance, running concurrent with the geographical remoteness of schools from the urban centre of New Delhi. A similar decline is also visible in the UK as one goes to more economically disadvantaged areas. The reasons for this have been attributed to the lack of and unwillingness

of teachers to work in these areas.

Finally, we found that the presence of a ‘friendly, but not knowledgeable mediator’ can enable children to reach similar levels of learning as in formal advantaged schools with trained teachers. We went on to set up a ‘cloud’ of ‘eMediators’, mostly retired school teachers with broadband access from their homes. Schools can access this ‘cloud’ over Skype and children can interact with the mediators over free video conferencing.

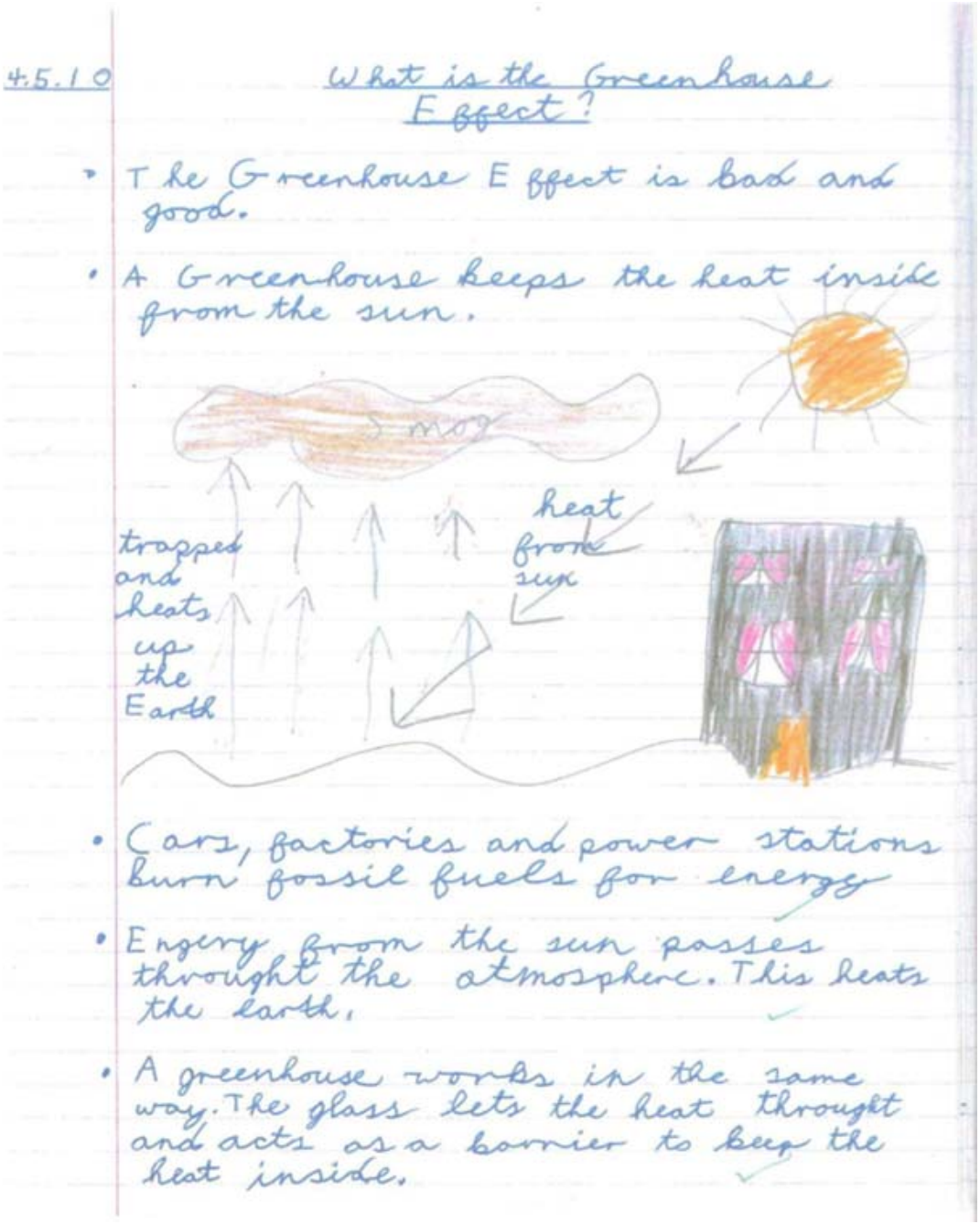
Interestingly, in the hands of good teachers, these methods can be powerful motivators for children, resulting in better performance. What started out as a solution for remote areas turned out to have universal applicability.

Both HiW and the work done later are based on the concept of ‘Minimally Invasive Education’ (MIE), a pedagogic method that motivates groups of children to learn in an environment with little or no intervention from teachers or other adults and formed the basis of the design of the ‘HiW’ computers.

Appendix 2

Samples of Student Work –Mixed ability Year 4 class

Please contribute work from your class.



6.10

India

What can we find out?

- India is in South Asia
- The capital of India is Dehli
- India is the 7th largest country in the world.
- The National animal is a tiger.
- Greet by bowing head and saying namaste.
- India is 13 times bigger than U.K..
- Women wear sari - word from sanskrit means 'cloth'.
- Hinduism is the main religion.
- India has 14 cities.
- Maried women have a red spot on their forehead.
- Hindus dont eat meat.
- It is very hot in India
- Bollywood in India is like Hollywood where films are made.
- People eat spicy food in India
- India was the first place to grow cotton
- Men wear dhoti aroand their legs.

Tuesday 2nd March 2010

Internet Research

Why do we slip on wet surfaces?

- Friction occurs when two surfaces meet.
- There isn't as much friction on wet sufaces.
- Less friction means less friction.
- Rough surfaces creat more friction so things don't slip as easily.
- We slip because there isn't enough friction between the surfaces of your shoe and the ground.
- Friction is a force.
- Friction creates heat.
- When there is a lot of friction created it slows things down.
- Force is measured in Newtons (N)

* Marley, you are an excellent scientific researcher! (2LP)

You worked well in your chosen group to answer the question.