

The British Steel Challenge at Studfall Junior School

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A model harbour

■ Planning the unit of work

A unit of work, focusing entirely on the Challenge itself was planned for years 5 and 6. Science and geography were central to the project but it was also a prime opportunity for the children to become involved in design and technology activities.

■ Cross-curricular activities

During the early weeks of the project the children constructed circuits and practised using switches, so that they would be able to motorise boats and make working lighthouses. They investigated hull shapes to find out which moves most easily through the water. Children completed an application form to become a crew member and worked in groups to brainstorm a list of necessary provisions for the journey. They also enjoyed a visit from David Wallbank, a crew member of the Pride of Teesside.

■ Design and technology activities

■ 1. Building a harbour

The obvious design activity was to make model yachts. But to encourage children to think about creating an environment, we extended our idea to designing and making a class harbour. This might include boats, buildings, a lighthouse and any other harbour furniture that the children could identify, through looking at photographs taken

especially for us by one member of staff. The photograph here shows the harbour made by one of the classes. Each child designed and made a building from card, thinking particularly about function and position. The lighthouse was kept running by a transformer to save on batteries. In this case the water in the harbour was very shallow, so the children used lengths of 1 cm² timber sawn into small pieces and glued together to make their yachts. Some children were keen to use Lego Technic as an alternative.

■ 2. Making boats

■ Designing

Our harbour was built around a child's plastic sandpit. The children were given a chance to examine a range of materials including plastic containers of all shapes and sizes, paper, card, polystyrene and wood. They were asked to design a boat which they would be able to make with the tools available to them in school. The challenge was that the finished yacht should float from one side of our harbour to the other when given a push, without sinking, toppling over, or absorbing water. The children then set to work, planning their model on paper, drawing and listing the materials and tools to be used. This included making a note of the way in which they intended to join any of the materials.



Date: 7th Sept → 22nd Oct.

Class 7

Topic: The British Steel Challenge Year: 5

	1 7 th -11 th Sept	2 14 th -18 th Sept	3 21 st -25 th Sept	4 28 th -29 th Oct	5 5 th -9 th Oct	6 12 th -16 th Oct	7 19 th -22 nd Oct
W.E.R.:							
Main focus:	Plans and Preparations (Which preparations need to be made).	Preparations to be made).	off they go! (The harbour/race)	Sink or Swim? (Floating v Sinking)		Finding the way. (Magnets / Compasses)	
ENGLISH	SEL - Brainstorming ↓ W - a list of provisions application form for membership	W - flow diagram to show order of preparations	Ready - stories from around the world. collecting W - creative-poems about the sea for sailors	Probability → (Using language of probability - what are chances of boats reaching destination)	Using PIP or logo to explore angles Drawing v measuring angles. Points of the compass.		Thank Q letters to Trevor.
MATHS	Volume - counting cubes - how much space for each sailor? Co-ordinates Plotting points in 1 st quad - identifying locations on route)	→ Reflective symbology					
SCIENCE	Which hull shape moves most easily through the water? (investigable) Constructing simple circuits (battery/bulb)	Continue construction of circuits (motors/buzzers)	Finding a way to propel boat.	Testing materials for ability to float. Making a "float" sink and a "sinker" float.			
D.T.	T-shirt design to identify crew members.	Constructing harbour scene with lighthouse →					
Art	Collage of sailing boats →	→ making a boat which will float and move		Reflecting pictures →			
I.T.	Map of Britain - Southampton		Weather v winds				
GEOGRAPHY	The Globe - World Map plotting route					Compass points Why do they sail on this route?	
R.E (Living together)	Me / My Family	Me / My School	Me / My community	Being a member of a team		Being a member of the "family of man" →	
P.E	Using space → practise getting / using diff levels out app	Useball skills throwing diff patterns / accuracy	Sequences using walls, pathways, movement - shape.	Flight → jumping / landing in space	jumping for height	jumping for dist	jumping feet to hands.

■ Making

Most of the children selected different kinds of plastic container for the hull, and used paper or wooden sticks for the mast. Sails were made out of paper or fabric, ranging from the fairly flimsy to the quite stiff. The children pierced holes, cut shapes, used glue, sellotape, staples, each child busy trying to produce their solution to the challenge. Some children tried to create wooden hulls from pieces of wood. They had a sophisticated model in mind and worked very hard to try and overcome the limitations imposed by the basic tools. They were disappointed when they discovered that they had set themselves an impossible task, but by the time they came to this conclusion, they had realised that choice of materials has to be influenced by the tools available. Safety was an important issue, so we had one table set aside for the use of tools and the glue gun. Valuable learning took place as the children found out that hot glue will melt some types of plastic.

■ Testing

We watched as each individual boat was placed in the harbour and given a push. As the testing progressed it became evident that many of the boats were top heavy and tended to dive into the water. Some leaked and very few managed to travel the metre across the harbour. We talked about the problems and the children realised that, in fact, most of the boats were not boat-shaped. They had not altered the original shape of their container.

■ Evaluating

The children were then asked to evaluate their work. We talked about the original plans the children had made for their boats and noticed that the final model did not relate very closely to them. We discussed the importance of thorough planning and how much time and thought at this stage can affect the outcome. We then tried to identify all the factors that had presented problems; the shape, size, weight and balance, tools and materials. The children decided to have another go and this time most of them chose to use polystyrene.

■ The second attempt

Valuable learning had taken place through the first attempt and the children were now equipped to construct a more effective model. Through looking at pictures in books some children came to realise that a keel was important and wanted to add one of these to their own models. The children drew their hull shape to size on a flat piece of polystyrene and either made an attempt to cut it with scissors, or were closely supervised in using a Stanley knife. Everyone was pleased with the result of their work and most of the boats floated from one side of the harbour to the other. We then went on to motorise some of the boats, using a simple motor and a propeller, attached to the hull. The children had great fun learning how to do this, and really enjoyed playing with the finished models.

Children playing with their games



■ 3. Other activities

The children also had opportunities to design and make a game which related to the race. Most children made a board game in which the course of the game represented the journey around the world. Dice were hand made from cardboard, as were cut out figures, chance cards and obstacles attached to the board game. The challenge was then further extended to include collaborative writing of rules and the designing and making of a box to package the game and make it attractive for others to play. This activity involved a great deal of co-operation and evaluation in the sharing of each other's games. Some of the children decided to make card games such as 'snap' or 'pairs', or games along the lines of 'build a beetle'. Once the results had been shared with the rest of the school, younger children, not directly involved in the project, were keen to play with the games.

One class set to the task of designing and making lighthouses in groups. Again, this involved examining different materials, and deciding on an appropriate shape for the lighthouse. Problems to be solved included working out how to wire up the bulb from within the lighthouse, how to make sure that the light could be seen, and how to make the light flash (although we did have flashing bulbs to hand if necessary!). Another teacher asked the children to design posters for the galley area where most of the sailors would spend their resting time, reminding inexperienced sailors of safety aspects on board.

With sponsorship from British Steel themselves, we have been lucky enough to subscribe to Campus 2000, the educational communications system that is being used by the schools involved in the Challenge project. We have been able to receive up to the minute information about the race and are still trying, though with difficulty, to contact schools in Hobart and Cape Town through the electronic mail system.

This unit of work proved to be very popular with both children and adults. The feedback from parents showed that the children had been enthusiastic, some of them checking Ceefax daily for race positions. Many of the activities were practical, providing the opportunity for real learning to take place. We are still monitoring the progress of the race and look forward to the safe return of the sailors at the end of May.

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