Ship Building at St Annes Primary School

5th June 2013

One class session before lunch

One class session after lunch

Each class session will be structured as follows:

1.	Introduction and demo of Liverpool Docks simulation so the children can see what we are aiming to do in the session.
2.	Ship building components slide show
3.	Exercise 1 - the naming of the parts: hull (draught, freeboard), keel, bow, stern, paddle wheels, sponson, wheel cover, funnel, superstructure, mast, rudder,
4.	Demo of Thing Builder software building a side paddle steamer. [Using positive and negative numbers to customise the model: sizing and locating].
5.	Children using the software to create the model in Exercise 1
6.	Play time
7.	Demo adding model to the Liverpool Docks scenario • as part of the scenario using narrative sentences to place the ship in a location and have it dock at a berth
8.	Demo adding model to the Liverpool Docks scenario • as a ship they can control manually using "throttle" and "rudder" controls. • develop the idea of a ship's **heading** with examples using a map of the Liverpool docks and the Mersey and Dee estuaries. The children can use the map to help understand which heading they should set in order to go where they want.
9.	If time permits: Bring a little bit of algebra to the scene. The paddle steamer can turn corners by travelling in an arc of a circle. For example a semi circle gets the ship going in the opposite direction to its original course. A key question is what is the radius of this arc - how tight a corner can a ship turn? The Builder software calculates the radius R when the rudder is hard over from the ship's length L and speed V like this: R = a*L + b*V + c*V*V (* means multiply)

	A particular ship has a certain length and the values of a, b and c can be customised as attributes of the model. The default is a = 0.33, b = 0.0 and c = 0.0. These default values mean that the radius of curvature is equal to 1/3 of the length of the ship no matter how fast the ship is going i.e. hand-brake turns ! Tell the children about the meaning of a turning circle and its radius and tell them that currently it is the same as 1/3 of the ship's length. We would then discuss how we might develop a formula that allows us to make R bigger or smaller than the radius and demonstrate its effect by changing the ship's 'a' value. Thus we have R = a * L We would then discuss how the ship's speed might affect R and develop the formula to R = a*L + B*V. The children would then try out the formula on their own ships by adjusting the 'a' and 'b; attributes.