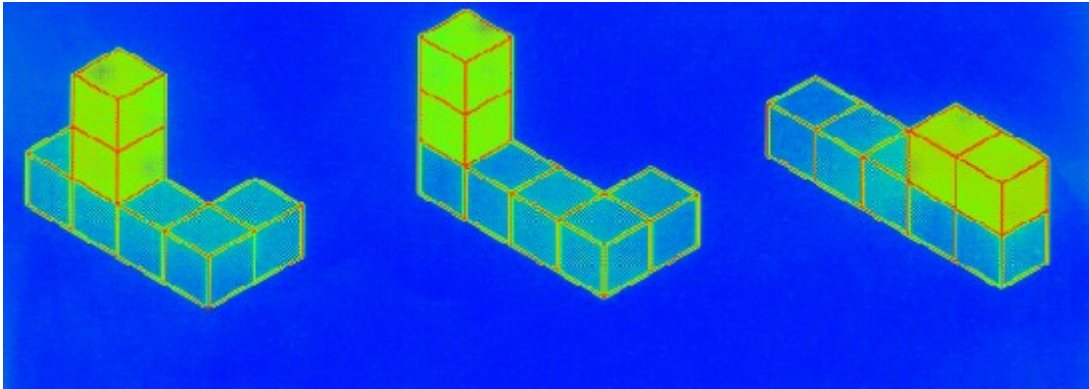




Let's get straight in and look at the different kinds of recordings that I've met in Primary schools when working with pupils in Mathematics lessons - particularly those lessons that have been focussed on concept development, problem solving and using and applying mathematics.

1. Pen and paper recording

Sometimes pupils record because there is not sufficient equipment for them to make new examples. So each time the example has to be broken up in order that a new one can be created, such as in the problem [Two on Five](#) , published in November 1997.



The recording I've witnessed in this activity has been very varied:

- The younger child has drawn - rather freely - around the base of the shape they have just made and their drawing doesn't look much like the shape. The purpose then might be just to help the pupil to check that they have not repeated any of their own ideas.
- At another stage the pupil draws around the shape rather more accurately and makes some extra mark to show the position of the cubes that are on top.
- Then we get to those who do not draw around the shape and simply look at the object they have made and transfer their idea onto paper - probably squared - using either a bird's eye view or a side view.
- Some pupils have invented ways of showing when the two upper cubes are actually placed on top of each other.
- There are those who make use of colours and show the ones on top by a new 'code'.
- Others like to use arrows accompanied by a few words to show more clearly where the cubes are placed.
- Some -usually older pupils- make use of symbols and have no drawing as such.

All the examples above have emerged when the teacher has added to the explanation of the challenge that the recording they do is purely for THEIR benefit, and does not necessarily have to make sense to an observing adult.



2 Photographic record

Sometimes it has been appropriate to take a digital photo of the accomplishment because the achievement has been to produce and not to just record. An example of such an activity might be to find out how many different shapes can be produced with 3 multilink cubes, then 4, 5 etc.

3 Practical making

Sometimes it is possible to make solutions to an investigation when there has been a lot of thought, trying alternatives and discussion going on. [Tea Cups](#) , published in December 1997, lends itself to this way of recording.

X	X	X	X
X	X	X	X
X	X	X	X
X	X	X	X



I have felt for a long time now that there are quite a few good reasons for pupils to record their work when involved in using and applying mathematics, and these are not just about satisfying adults that the work has been carried out!

- If pupils leave their work -to go to toilet, lunch, sharpen a pencil etc they'll know where they've got to on return.
- To be able to see if - when applicable - they're doing unnecessary repeats.
- To give them opportunities to see any patterns evolving.
- To get some extra idea of further work they could do - ones in a sequence that they have missed out - this might be applicable, for example, in [Red Express Train](#) (from March 1999) and [Tri.'s](#) (from March 1998).
- To help them get into a system for working further.
- To aid working with a friend and sharing aspects of the work and discussing the progress so far.
- To guide conversation and explanation with classroom adults.
- To lead to explaining to a group or the whole class what they have been doing.
- To lead much later on to being able to present some work to an adult, leave it with them and the adult fully understand what has been carried out - even in a test or examination!



One of the problems with viewing pupils' work in isolation is that assumptions can be made which either suggest that the pupil cannot do, or that the pupil can do a particular thing. The assumptions can be very far from what the pupil actually knows or does. I visited a school once as an advisory teacher and I was invited to spend some time with the class whilst their teacher carried out a Maths lesson. One boy had recorded many sums on his page that all seemed to have weird answers. As I came to him he had just recorded the following:-

$$\begin{array}{r} T \ U \\ 5 \ 8 \\ 4 \ 7 \\ \hline 1 \ 5 \\ \hline 1 \end{array}$$

I have shown many teachers this example and asked them what they would have done at this point and why. Most have said that the pupil obviously did not understand addition or did not understand place value. Some suggested that the pupil had no idea about adding up at all. Not understanding his thought processes I asked him what he did - just read his answer which follows and note that each sentence is true!!

"Well it's easy 7 add 8 is 15 -put down the 5 and carry 1. Add 4 and 5 and 1 [the little one that's beneath the line] and 5 [the one that is already in the units answer] makes 15."

Having heard that and thought about it I realised that there were a number of things to explore with this pupil. I pointed to the 58 and asked what it said. He said that it was a 5 and an 8. Thinking that here was an area needing exploration I wrote down 58 on a spare piece of paper and asked him what that said. He repeated that that was another 5 and 8. So I tried to think of another situation in which he may have come across 58.

I proceeded to ask: "What if a bus were to go by..."

He interrupted me saying, "It'd be a fifty eight."

"Yes," I said, amazed that he had anticipated my words. I then continued, "Could we pretend that this [pointing to the 58 in his recording] says fifty eight?"



Pupils' Recording or Pupils Recording

By Bernard Bagnall

He agreed and then said very quickly: "Fifty and forty makes ninety, seven and eight makes fifteen the answer's one hundred and five" -all said in less than five seconds. When teachers hear that they often feel ashamed because they had made assumptions that the boy was a failure and had no understanding of place value. Now they understood that he was very good, and quick, and he shows in this example that he can do mental arithmetic very well.

So like me, you might want to be wary about making assumptions from what we see recorded on pupils' pages. I recommend that we consider carefully the bullet points above and help the pupils to GRADUALLY develop recording that may communicate more and more as the child gets older. Let's see it as an aid to their understanding and consider what may be appropriate according to the challenge and the level of understanding and the learning style of the pupils.

This article also appears in Primary Mathematics, a journal published by [The Mathematical Association](#).