

## LANGUAGE AND MATHEMATICS IN SOME ABORIGINAL CLASSROOMS

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Classroom talk often consists of teachers' questions and commands and children's responses or answers. While this may not be the best approach to learning it is nevertheless very common. In this paper, some of the talk that occurred in some Aboriginal classrooms (Graham, 1987) has been examined to see just what children were saying (and therefore thinking) and if teacher talk was focusing on the things children need to know if they are to learn mathematics more effectively in school. To begin with let us look at what some children are saying and therefore meaning as they respond to teachers' questions.

### DO CHILDREN MEAN WHAT THEY SAY?

When teaching the number strand in mathematics, teachers assume that when they ask a question such as: *How many here?* that children will actually look at the materials in front of them and discover by looking or counting how many objects are present. That is, during classroom interactions teachers believe that children are attending to the information supplied and so are involved in learning whatever it is the teacher is presenting to them. However, sometimes children do not do this at all - they simply play a guessing game. For example:

- T. When I put them together  
Ch. Five? (i.e., Is it five?)  
T. How many have we got altogether?  
Ch. Six? (i.e., Is it six?)...Seven? (i.e., Is it seven?)...  
Six? (i.e., Is it six?)...Seven? (i.e., Is it seven?)  
T. No, don't guess.  
Ch. Eight? (i.e., Is it eight?)...Eight?...Nine?  
T. Wayne was right. It's nine.

The children here are not answering the teacher's questions. They are asking - Is it...? and so they are forcing the teacher to give them the answer.

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In this next example the children realise it is a mathematics lesson so they are offering their mathematical vocabulary as they guess:

T. How many will I have in this group?

Ch. Five?...Ten?...Nothing?

T. What are we doing?

Ch. Nine?...Plus? Plus?

T. What do we do?

Chn Equals? Equals?

Look at this other example of children playing this guessing game:

T. Watch! How many here?

Chn Six? Four? Four? Five?

T. Four, yes. Wayne said the right number.

T. And Denise, you tell me how many here?

D. Four.

T. How many altogether?

Chn Four? Five? Six? Five?

T. Close!

Chn Six? Five? Eight?

Unlike the teacher in the first example who told the children, not to guess, this teacher is playing the same game as the children. By saying 'close' she is letting the children think that guessing is a good strategy for solving mathematical propositions. The problem is that if teachers let children guess in the early years of learning mathematics they will often get the answer right which only means that they have managed to guess the right word. However, as children move further up the school it is not so easy to guess correctly. Children are then left without any effective strategies or ways to find answers to sums. They have not learned that answers are not found on the teacher's face or are any number that comes into their heads, but must be arrived at after thinking about the information that the teacher has supplied. Just as children cannot learn to play soccer if they use basketball rules, in the same way they cannot learn how to learn in school if they use the rules generally associated with guessing games like 'Yes, No, Black, White', or 'Hunt the Thimble'.

It seems that teachers are often quite happy to let children continue playing this guessing game because while the pattern of question and answer continues they feel that they are teaching the children. However, the question the teachers must ask is, "What are the children learning?" If children are not learning strategies that can help them find mathematical answers for themselves (e.g., seeing smaller groups within the set, or counting) they are not going to learn mathematics effectively in school.

Not all teachers, however, are talking to children about the things (strategies, skills and understandings) they need to know. In this next section we will look at some teacher talk from Aboriginal classrooms to help us see just what mathematical meanings teachers are sharing - or not sharing - with Aboriginal children.

### DO THE TEACHERS TELL CHILDREN WHAT THEY NEED TO KNOW?

Teachers who wish children to develop mathematical understandings also need to think about the way they talk and what they talk about when working with children. For example, children who are learning Western mathematics need to know that the last number they say when they are counting answers the question 'How many?' For example:

T. How many peanuts have I got?

Chn Ten? Five?

T. Let's count them.

T&Chn One, two, three, four, five, six, seven, eight, nine.

Chn Nine.

That is, the last number that was said, nine, is the answer to the question 'How many peanuts have I got?' However, sometimes, as in the following example, teachers forget this and they don't make sure that the children answer the question.

T. All right, how many altogether again Neil?

N. One, two, three, four, five, six, seven, eight, nine, ten.

T. Right, come on, your turn (to Glenda).

These children need to know that counting is the strategy that is used to find an answer but is not itself the answer.

In the next example the teacher has counted with the children but then has asked the 'How many' question again and so has helped children know what is required.

T. How many has he got altogether?

T&Chn One, two, three, four, five, six, seven, eight, nine, ten.

T. How many?

Chn Ten.

This is something that all teachers can do to help children acquire this important rule.

There are other things though that teachers forget to tell children. For example, if children don't know how many there are in a group, a teacher may suggest that they count. For example:

T. Let's count them, or, You count them up again.

In all the situations that were studied children started counting from one.

T. How many has he got altogether?

T&Chn One, two, three, four, five, six, seven, eight, nine, ten.

However, while counting is a good way to find the size of one large group of objects it is not what adults do when they want to find how many there are altogether in two groups. Adults in such situations usually count-on. For example, they look and see four in one group and so they say 'four' and count-on 'five, six, seven, eight, nine, ten.' In such situations teachers need to think more about what they do and what the children do to find answers and talk about these ways of doing and finding out (strategies) with the children.

This may be clearer if we consider 'looking' as a strategy for finding answers to mathematical situations. For example, in one lesson a teacher told children on 18 occasions to look and find the answer. She said things like:

T. Have another look...Have a look.

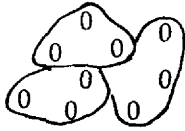
Now Aboriginal children learn a lot through looking and so it is a good strategy to use in school in the early years when children can look at small groups and see how many are there, for example:

0		0	0		0
0	0		0	0	
					0
					0

However, it is hard to look at a group like this and just see how many are there:

	0			
	0	0	0	
0		0	0	0
		0	0	

In these situations just telling children to look is not really helpful. They need to know that adults may count or look for small groups within large groups and add these together to find answers.



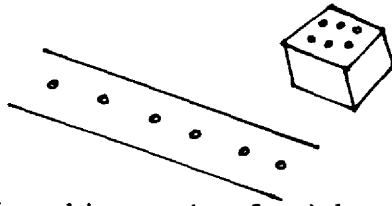
If teachers talk about what they see and encourage children to do the same when working with small numbers, children would find it much easier later on to cope with larger numbers that can only be managed if they are grouped or organised in some way.

There were many other mathematical ideas that were not talked about to children. For example, at times one teacher matched to see if two groups (some stick on dots and a pattern on a dice) were the same:

T. Is that enough?

Chn Yes.

T. Is that the same (matching strip of stick on dots to dice?)



However, the teacher did not talk about what she was doing (Let's match and find out.) and so did not focus children's attention on what was happening. Children who are to be mathematical people need to build mental pictures about what is going on as answers are found for mathematical situations. As it is a function or a role of language to help us build mental pictures, the failure of teachers to talk about what is happening means that the correct mental picture may not be being constructed. When these mental pictures are not built children do not have a plan in their head that helps them solve new mathematical problems that they need both in school and out. Hence, while the teacher matched to find out, children may not realise that that is something they can do too.

## TEACHING MATHEMATICS IS TALKING ABOUT MATHEMATICAL IDEAS

If the children in your class are to become mathematical people both you and the children need to talk about the mathematical ideas that they need to develop. Think about these questions. Do you know what you are saying to the children? Are you using

language to focus on the important mathematical ideas that you want children to learn? Do the children know what you are doing as you ask them questions and encourage them to talk, or are the children just playing a kind of guessing game that may mean that they will get the answer right but they will not learn how to find answers when guessing will no longer work.

If you really want to know what is happening in your classroom record a lesson on cassette then write down some of what has been said. Now listen to the cassette again and look at the language that you have used and the language of the children. Then think about what the children in your class are learning as they talk with you about mathematics. Are the children learning to be mathematical people and are they learning how to use language to learn in school. If these things are not happening what are *you* going to do about it?

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**Beth Graham, 1988**

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