

NUMBER WORK IN PRIMARY GRADES.

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The ideas on number work given in a recent REVIEW were very general. I shall now try to give more particular work.

Let us begin with grade one, and assume that the children are familiar with the numbers as far as 5. The next step is to teach combinations of these numbers, no result being greater than 5. Too much stress cannot be given to the teaching of combinations, and by that I do not mean to allow a pupil to count. He should have a picture of 4 as soon as he sees $1+3$; $2+2$; $0+4=4$; because he has been drilled on these. Tell him again and again that the only number in the world that he could put with 1 to get 4 is 3; also that if he was given a 3 the only number to put with 3 to give 4 is 1. He will be encouraged when he learns that he has only to learn $1+3=4$, $2+2=4$, $0+4=4$, and that he will then know the only numbers that will give 4 when added. Of course you will teach combinations to give 1, e. g. $0+1=1$; and 2, e. g. $1+1=2$, $0+=2$; these being the only numbers that will give 1 and 2. Also those to give 3.

Be sure to have the pupil master the combinations of 2 before proceeding to 3. It seems to me that the neglect of this principle is what leads to the trouble later on when the child is introduced to arithmetic. Let me say right here, *never, never*, allow a child to count, either marks or on his fingers, because when he is allowed to do this, number work to him is simply counting, and he will never make any progress in arithmetic until he is broken of that habit.

When you are teaching combinations concretely, lead the pupil to see that 2 boys and 3 boys are 5 boys, that is have them think 2 and 3 give 5 and not $1+1+1+1+1$ give 5. Also lead them to see that if $2+3=5$, so $3+2=5$, because the latter is just the former read backwards. I used to tell the children it was the same as though we said their names backward; they would still mean the same person.

When combinations of the numbers up to 5 are learned, teach 6 and on up to 10, but teach addition combinations first. The following are examples on combination work:

$$2+0=2; 1+1=2.$$

$$2+1=3; 1+2=3; 0+3=3; 3+0=3.$$

$$3+1=4; 1+3=4; 2+2=4; 0+4=4; 4+0=4.$$

$$4+1=5; 1+4=5; 2+3=5; 3+2=5;$$

$$5+0=0+5=5.$$

$$5+1=6; 1+5=6; 4+2=6; 2+4=6;$$

$$3+3=6; 0+6=6+0=6.$$

$$6+1=1+6=7; 5+2=2+5=7; 4+3=3+4=7; 7+0=7+0=7.$$

$$7+1=1+7=8; 6+2=2+6=8; 5+3=3+5=8; 4+4=8; 0+8=8+0=8.$$

$$8+1=1+8=9; 7+2=2+7=9; 6+3=3+6=9; 5+4=4+5=9; 0+9=9+0=9.$$

$$9+1=1+9=10; 8+2=2+8=10; 7+3=3+7=10; 6+4=4+6=10; 5+5=10; 0+10=10.$$

This table is built up by degrees. Put the first combination on the board and have the pupil finish the line.

A subtraction combination table is built up on the same idea. Subtraction is more easily taught through the addition idea.

e. g. $1-1=0$; $2-1=1$, because you must put 1 with 1 to get 2.

$$2-1=1; 2-2=0.$$

$$3-1=2; 3-2=1; 3-3=0.$$

$$4-1=3; 4-3=1; 4-2=2; 4-4=0.$$

$$5-1=4; 5-4=1; 5-3=2; 5-2=3;$$

$$5-5=0, \text{ etc.}$$

Also a multiplication combination table.

$$\text{e. g. } 0 \times 2 = 0.$$

$$1 \times 2 = 2; 2 \times 1 = 2.$$

$$2 \times 2 = 4.$$

$$3 \times 2 = 6; 2 \times 3 = 6.$$

$$4 \times 2 = 8; 2 \times 4 = 8.$$

$$5 \times 2 = 10; 2 \times 5 = 10.$$

In teaching a multiplication table it is as necessary to teach 0×2 as to teach $3 \times 2 = 6$, the cipher is met with in multiplication as often as any numeral. The only multiplication combinations taught in Grade 1:

$$0 \times 3 = 0.$$

$$1 \times 3 = 3; 3 \times 1 = 3.$$

$$2 \times 3 = 6; 3 \times 2 = 6.$$

$$3 \times 3 = 9.$$

$$\text{And } 0 \times 4 = 0.$$

$$1 \times 4 = 4; 4 \times 1 = 4.$$

$$2 \times 4 = 8; 4 \times 2 = 8.$$

In the same manner teach the division table. Try teaching it through the multiplication combination: e. g. There are 3 2's in 6 because it takes 2 3's to give 6.