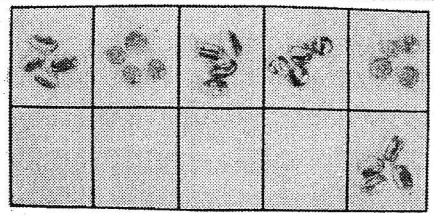
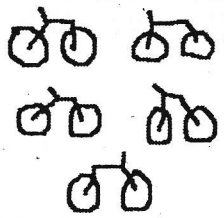
Models of Multiplication

From Additive Reasoning to Multiplicative Reasoning

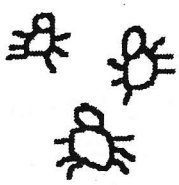
Additive



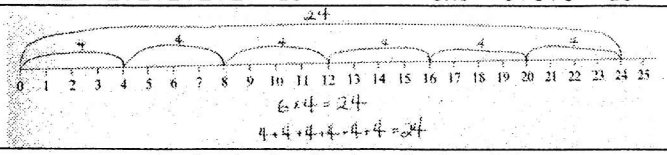
4+4+4+4+4+4 = 6x4 = 24



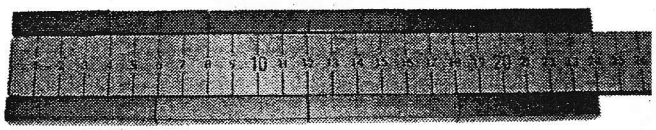
5x2 = 2+2+2+2+2 = 10



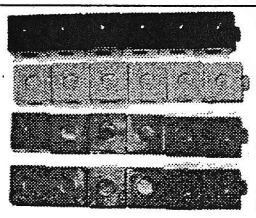
3x6 = 6+6+6 = 18



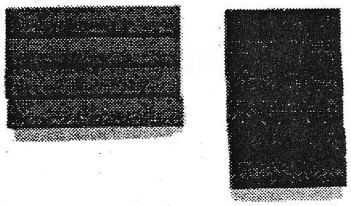
4+4+4+4+4+4 = 6x4 = 24



6+6+6+6 = 4x6 = 24

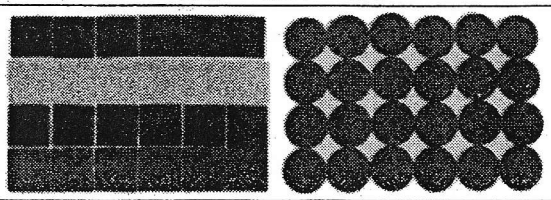


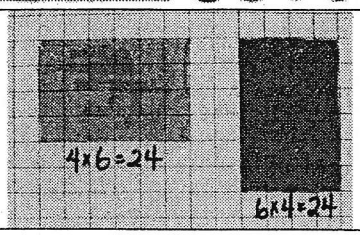
6+6+6+6 = 4x6 = 24



4x6 = 6x4 = 24

Multiplicative





Counting Strategies

Children's initial strategies for investigating multiplication problems often rely on counting by ones, or the skip counting of groups.

Addition Strategies

By exploring problem contexts, students will soon realize that counting strategies are inefficient. Repeated addition is a more efficient strategy. Students familiar with part-whole relationships and number combinations, may begin to use more sophisticated reasoning, like the doubling strategy.

Unitizing

As children begin to think multiplicatively, they begin to unitize the groups of objects. That is, they see the <u>whole</u> as a number of groups of a number of objects.

Arrays

Arrays are an important model to help students develop multiplicative reasoning. An array can represent the relationships in multiplication and division and their connections to repeated addition and subtraction.

Sources: Young Mathematicians at Work: Constructing Multiplication and Division, Fosnot (2001)
A Guide to Effective Instruction in Mathematics: Number Sense and Numeration, Ministry of Education (2004)
www.eworkshop.on.ca - Ministry of Education, Ontario