

Maths Materials

Does the use of concrete material help children learn mathematics?



There are two interesting elements to this finding. The first is that results do not come overnight. Improvement in achievement came with *long term use*. The second finding was that materials on their own do not teach but rather it is the 'knowledgeable' teacher who makes use of materials that produces better results.

versions have been produced. You can try them at www.matti.usu.edu or <http://illuminations.nctm.org/imath/index.html>

No matter how good these might appear I still believe children need to experience the 'real thing'.

The short answer is a qualified YES, but like everything it depends on how they are used. In themselves mathematics manipulative materials do not teach, but in concert with good teaching they make a great deal of difference.

There have been many comprehensive reviews of the research on the use of concrete manipulatives. All have concluded that student achievement is increased as a result of being exposed to materials.

Dorward (2002) cites a study by Sowell who, after analysing sixty studies between 1954 and 1984 found:

Results showed that mathematics achievement is increased through the long-term use of concrete instructional materials and that students' attitudes toward mathematics are improved when they have instruction with concrete materials provided by teachers knowledgeable about their use (Sowell, 1989, p. 498)

If maths materials are so good, why aren't they used in middle and upper primary classes?



To suggest that manipulative materials are not used in middle and upper primary classrooms is probably too harsh, but certainly research indicates a marked decline in their use from Year four onward. There are several reasons why this may be the case. Storage and management issues and the thinking that materials are 'babyish' are commonly stated. Clearly older students can and do benefit from using materials.

Virtual manipulatives

To overcome some of the issues associated with the use of manipulative materials, software and web based

Basic list of manipulatives

Abacus (three prong)

Attribute Blocks

Balance

The Brick

Counters

Cubes –centicube, multilink,

Dominoes

Unifix, 2 cm wooden ...

Coloured Rods (Cuisenaire)

Dice

Geoboards

Geoshapes/Polydron

Multibase Arithmetic Blocks (MAB)

Pattern Blocks

Playing Cards

Scales

BOLD = Class materials

References

- Dorward, J. (2002). Intuition and research: Are they compatible? *Teaching Children Mathematics*. Feb, 329-332.
- Sowell, E. J. (1989). Effects of manipulative materials in mathematics instruction. *Journal of Research in Mathematics Education*, 20, 498—505.