

Low-Cost Experiments in STEM Education



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Building Stem Connections

Play well, Inquire well

Building bricks are often used to model ideas, like the atomic theory. There is also huge potential to exploit their adaptability in carrying out experiments, and graphing data in the STEM area.

Students tend to be more comfortable expressing ideas using physical models. This allows for common misconceptions to be identified and teased out at a very early stage in the learning process. The therapeutic element of manipulating building bricks cannot be underestimated. Students with additional educational needs show greater levels of motivation.



Light ... **Model**
Expressing ideas, misconceptions

A LEGO model on a blue baseplate illustrating light refraction and reflection. A vertical red brick acts as a boundary. To the left of the boundary is a green area labeled 'Air' and to the right is a blue area labeled 'Water'. A yellow brick is placed on the green surface, and a white brick is placed on the blue surface. A white arrow points from the yellow brick to the white brick, labeled 'Reflection'. A white arrow points from the white brick back to the yellow brick, labeled 'Refraction'.

Equilibrium... **Experiment**
Variety of variables

A LEGO model on a blue baseplate illustrating equilibrium. A yellow brick is placed on a blue brick, which is placed on a red brick. The entire structure is balanced on a green baseplate. The word 'Equilibrium' is written in white cursive at the bottom.

Patterns... **Represent**
Choice of 2D, 3D representation

A LEGO model on a blue baseplate illustrating patterns. A yellow brick is placed on a blue brick, which is placed on a red brick. The entire structure is balanced on a green baseplate. The word 'Patterns' is written in white cursive on the left side.

Graphing experimental or other data often represents the least stimulating part of the investigation process for students in the STEM subjects. Even with the aid of the technology, there can be a challenge to draw a conclusion or find patterns. Building bricks allow for a more personal, relevant method of presenting results. Modelling chemical reactions adds greatly to the understanding of chemical equations.

Conclusion: Using physical models gives greater opportunities for inquiry in topics not ideally suited to conventional experiments. The chance to return to a box of building bricks, abandoned years earlier, can be nostalgic and bring a playful, creative feeling sometimes absent in STEM classrooms.

