



# The Value of Morphun

Teaching Science, Technology, Engineering and Mathematics



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# The Value of Teaching Children STEM



Countries across the world are increasingly recognising the role of **STEM** in economic growth, by providing a boost to manufacturing and innovation (OBHE, 2013).

Shanghai and Hong Kong SAR in China, Singapore, Taiwan, Korea, Finland and Switzerland all offer a great example of this in practice. These nations have the largest group of students at the top three proficiency levels in Mathematics; they are also exceptionally strong in research and development, are rapidly growing their scientific output, and have seen outstanding economic performance over the last two decades (Marginson, Tytler, Freeman, & Roberts, 2013).

For children to thrive in the modern world, both in the workplace and in a technologically advanced society, an understanding of **STEM** subjects is vital. The importance of learning through practical activities is recognised by those nations leading in **STEM** education:

**“...the most successful countries...are focused on making science and mathematics more engaging and practical, through problem-based and inquiry-based learning, and emphasises on creativity and critical thinking.”** (Marginson, Tytler, Freeman, & Roberts, 2013, p.15)

The skills developed through **STEM** subjects are highly transferable, making them useful not just for pursuing specialist careers in science, technology, engineering and mathematics, but in other sectors too.

## How Morphun Sets can Support STEM Education

The **STEM** movement encourages holistic learning, where the child is at the centre of the experience and learns the same material across different contexts (Sneideman, 2013). Making **STEM** interesting and engaging for children from a young age creates active learners who will approach learning enthusiastically, and increases the chance that they will go on to study related subjects in higher education.

**Colin Simonds** (Chief designer at Morphun) is passionate about holistic learning by doing, and tries to make **STEM** a key facet of most Morphun products. We are delighted to have this written independent confirmation from the team at Fundamentally Children, independent experts in learning through play, that we are going in the right direction. For more details see our website [www.morphun.com](http://www.morphun.com) or try our **FREE** game at the interactive site <https://morphun.education/>

The multi award winning Morphun Junior and Rainbow and our new Hi-Qube construction sets mean that even young children can experiment with 3-dimensional constructions, allowing them to explore the flexibility of form and movement from an early age. The wheels also mean that children can start to explore working mechanics and movement.

Understanding forces, and how mechanisms help us use smaller forces, are all a key part of **STEM**. The new Morphun Gears and Gears with Chains sets let children experiment with and investigate the effects of mechanisms through practical activities. The additional lesson plans provided support **STEM** knowledge, and the Gears also include activities for learning Mathematics.





Mathematics is important for **STEM** learning not only as a standalone subject, but also for science, technology and engineering.

**Multi-sensory experiences** are good for maximising learner participation and making learning richer and more varied (*QIA*). The blocks encourage a multi-sensory approach by giving children a practical activity, with objects they can move around while thinking about the problem.



**Addition and Multiplication Sets**

The sets also come with access to online games, which give children more **practice without needing input from a teacher**. The online games use the same blocks, so children can reflect on what they have learned in practical sessions. **Progress is recorded** so teachers can check how each child is doing, and children can also unlock achievements and high scores to encourage them to play.

It is useful for children to learn to solve problems using a **variety of techniques**; this means that they can use the method that suits them best, and also have a way to check their own working out. Using the Mathsphun blocks and the activities provided, children can try out different techniques, such as a number grid. The sets are also very **versatile**, so can be incorporated into the teacher's own lesson plans and teaching style.

**Using the Mathsphun sets, teachers can:**

- Ask children to use the number blocks and the grid included to calculate answers.
- Create problems for children to solve, by setting up sums with the number blocks, leaving spaces for children to add the correct block.
- Encourage children to use the blocks to find an answer, and then write the answer down.
- Use the single digits as hundreds, tens and units.



- E A R L Y Y E A R S M A T H S -



It's important to get children interested in **STEM** from an early age, and to teach them the fundamentals of mathematics before they advance to more complex problem solving. Playing is the best way for young children to learn, because it is both an engaging experience and a way for them to experiment with ideas.

When children first start learning the concepts underlying mathematics, they will **use physical objects to count, add and take away**. The Kindermaths set is designed for the early years (*ages 4-5*) and with the activities helps children progress from counting on their fingers, to counting blocks and dots, to recognising digits.

Using the blocks, children can learn how digits represent quantities. They can also **begin to work with numbers** by connecting blocks together - for example, understanding that connecting 1 block and 1 block makes 2 blocks.

**Using the Kindermaths set, teachers can:**

- Ask children to find certain numbers to encourage number recognition.
- Get children to match dots, numbers on their fingers, and stacks of blocks with a number.
- Have children use stacked blocks to work out simple sums.
- Ask children to put the number blocks in the right order.
- Build a number line and ask children to count forwards or backwards.



# WORDPHUN®

## My First 100 Words

This language learning set is designed to help children practice spelling 100 high frequency words, including vehicles, animals, colours and more.

Spelling using blocks helps children **think about how a word might be spelled** by moving the blocks around, and this means that teachers can watch a child's thought process without interfering. It's also easier for children to **recognise patterns in spelling**, by joining different letters onto the same graphemes. This can support them when learning similarly spelled words.

The set also comes with access to online games, which give children more **practice without needing input from a teacher**. The online games use the same blocks, so children can reflect on what they have learned in practical sessions. **Progress is recorded** so teachers can check how each child is doing, and children can also unlock achievements and high scores to encourage them to play.

100 high frequency words are included, but children can be encouraged to spell any words they are currently learning with the set. In this way the set can be used with other subjects, including **STEM**.



### Using the My First 100 Words set, teachers can:

- Ask children to spell the word of the object in the picture, using the activity sheets to support this.
- Play the word games included for fun learning sessions.
- Use the blocks to spell scientific terms to encourage **STEM** learning. These could also be used as labels (e.g. labelling parts of the body, or science equipment).



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Morphun Website [www.morphun.com](http://www.morphun.com)

Morphun interactive website with many free educational games and activities <https://morphun.education>



Wordphun, Mathsphun, Kindermaths, Junior Starter Rainbow, Junior, Gearphun sets and other Morphun educational products are from Thinkplay Ltd. London, England.



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Contact us at [www.morphun.com/contact.php](http://www.morphun.com/contact.php) or visit [www.morphun.com](http://www.morphun.com)

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LT316 V2 02/18