

basics & importance for children

STEM



What does STEM actually stand for?

Science

Technology

Engineering

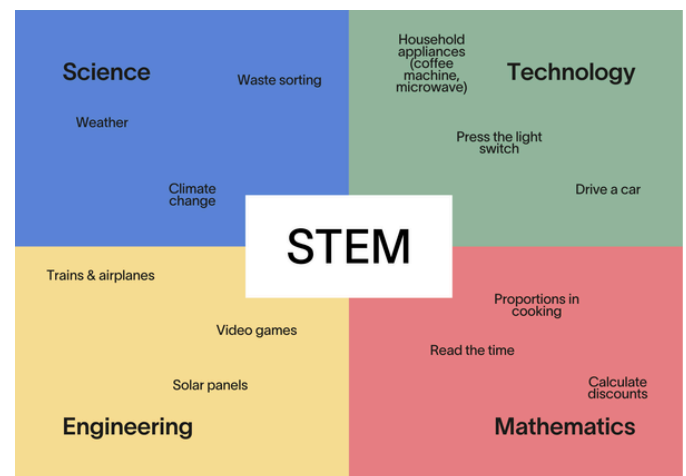
Mathematics

STEM stands for the subjects: Science, Technology, Engineering and Mathematics. In early childhood, this means...

- in science: getting to the bottom of things and understanding how the world works (observing plants and animals, experimenting, exploring the sky and the earth).
- in technology: wanting to understand how things work and why things happen – for example, when building and constructing, when trying out levers and wheels, or when discovering what happens at the push of a button.
- in engineering: sorting, recognising patterns, describing processes.
- in mathematics: realising how many things involve mathematics – whether calculating with numbers, comparing quantities, measuring and weighing, or recognising geometric shapes (circles, triangles, squares, etc.).

Where is STEM in everyday life?

We may not always notice it, but we come across STEM subjects all the time in our daily lives, quite naturally. Here are a few examples:



However, the STEM disciplines are often not clearly distinct from one another. Rather, science, technology, engineering and mathematics are intertwined.

This connection becomes clear when looking at the example of a fitness watch:

- Technology is required for the sensors (e.g. to measure the heart rate).
- Engineering is needed to process the collected data.
- The bodily functions being monitored fall within science (biology).

In summary:

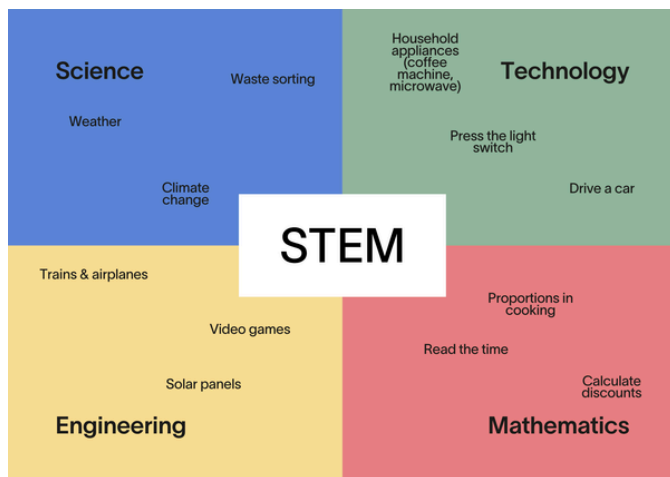
The individual STEM disciplines need each other to function!



Why is STEM important for children?

Today: Part of everyday life

The illustration shows that children are constantly exposed to STEM subjects. STEM is therefore part of children's everyday lives. This makes it all the more important for children to learn to understand this world – because only then can they grasp it and play an active part in it.



Tomorrow: Educational success

Early exposure to STEM subjects makes the subsequent educational journey easier. Children who count, build and experiment in a playful way are well-equipped to learn successfully at school.

The day after tomorrow: shaping the future

Many STEM subjects are important for the future. Tackling climate change, advancing digital media, and finding technical solutions to future challenges are significant tasks for the adults of tomorrow.



Findings from research

If children gain experience and knowledge in STEM at an early age, they will learn more about them later on.

If children develop an interest in STEM subjects at an early age, they are likely to continue exploring them as teenagers and adults.



In other words, if children are introduced to STEM subjects at an early age, they gain confidence in these areas.

Furthermore, learning tends to take place most effectively when children are interested in the subject. So if you spark children's interest, learning is much more likely to happen.



Summary

STEM affects us all. It is also worth introducing children to STEM at an early age. Picture books can be a great way to do this! If you would like to find out more about using picture books, please see the document below.

Reading



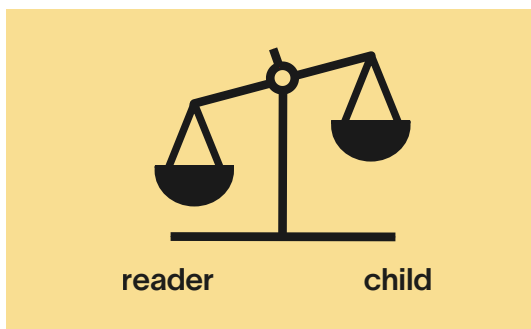
Picture books are important for children's early development. For children, the combination of pictures and words is particularly vivid, which is why books enable them to discover and learn about many new things – including STEM.

How do I read?

Generally speaking, a distinction is made between traditional reading and interactive reading. The main difference between the two forms lies in the division of roles: in traditional reading, the person reading does most of the talking, as they are the one reading the text aloud. In interactive reading, the child plays a more active role and speaks a lot.

Traditional reading

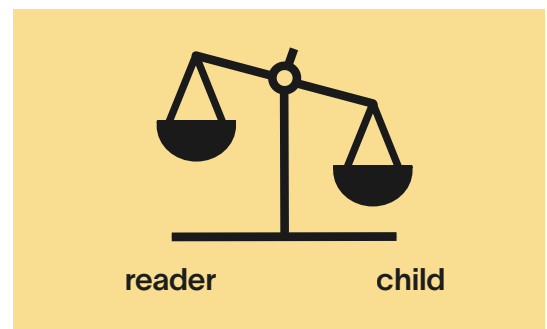
- The person reading does most of the talking. The child is passive and says very little.
- The focus is on bonding and the relationship between reader and child, as well as on relaxation and becoming immersed in the story.
- This allows the child to begin to familiarise themselves with written language.



Interactive Reading



- The person reading speaks very little. The child is active and talks a lot.
- Involving the book encourages dialogue and plenty of interaction.
- The child can compare the events in the book with their own experiences whilst talking to the person reading.



Important!

Both approaches are suitable for different situations. If you are reading aloud to help a child fall asleep, the aim is for the child to relax, so traditional reading is best. If you want to engage the child in conversation, interactive reading is more suitable.

Reading



Excursion: Open Questions

- To encourage children to speak, open questions are particularly well suited to interactive reading.
- Open questions cannot be answered with 'yes' or 'no'.
- During interactive reading, the content or illustrations in the book can be used to ask the child an open question.
- The questions can relate to the child's experiences and everyday life.

Example:

If the book is currently discussing the weather, the reader can ask the child what the weather was like today. To follow on from the child's answer, you can then discuss with the child what clothes are needed for that weather (e.g. wellies, a rain jacket and rain trousers if it's raining).

Exercise: Do I read aloud traditionally oder interactively?

traditional	interactive
The readers do most of the talking.	The child does most of the talking.
The child mainly listens.	The readers ask open questions about the book.
It's more likely that no conversation will take place.	A conversation is taking place.
The child can relax.	Readers engage with the child.
The child can get into the story.	Dialogue about the child's experiences.

Where do you
stand?

Attention!

Very often, you don't read in either the traditional or interactive style, but use both depending on the situation.

That's why, as a reader, you may find yourself on both sides of the table.

STEMthinking

at home



Our aim: to get children excited about STEM – science, technology, engineering and mathematics. STEM books spark their curiosity.

If this works, children will soon start asking STEM questions of their own accord. Such questions are valuable – they show that a child is engaging with the subject. Our 'STEMthinking' approach shows you how to respond.

STEMthinking: Being told is boring. Searching is exciting.

Take questions seriously:

If your child asks a STEM-related question in everyday life, take the time to respond. It doesn't matter whether you know the answer or not. It's important to take your child's questions and ideas seriously.

Thinking together rather than explaining:

If you talk to the child seriously about the issue, they will realise: there's room here for my questions. These questions are therefore an invitation to think things through together out loud. Ask open questions such as:

Do you have
an idea?

What do you
mean?

How can we find
out?



This helps your child to think for themselves and feel confident enough to express their own ideas.

More than knowledge:

It may seem as though this prevents the child from arriving at the correct answer. However, STEMthinking helps to develop important skills along the way: creativity, problem-solving and critical thinking. And because your child talks a lot during the process, their language skills are also enhanced. That is why it is more important to let the child think for themselves than to simply give them the correct answer straight away.

Joint research

During a discussion about a STEM topic, you can also refer to the internet or picture books on the subject. You can then discuss the answers to the STEM question provided there with your child.



Get involved in STEM!

You can also take the first step yourself: show your child STEM in everyday life (see the overview at the start). Your question will then serve as a starting point for STEM thinking and, at the same time, spark a new interest.

Checklist



Reading STEM picture books aloud to your child in a conversational style is beneficial: it helps them become familiar with the topics and develop an interest in them.

If you'd like to try interactive reading, you can use our checklist to guide you through the process. You don't necessarily have to follow every point: simply use the tips that work best for you when doing interactive reading!

	Set aside some time. So that you can have a quiet chat with your child.
	Borrow a STEM picture book from the kindergarten. Or simply use one you have at home.
	Let your child choose the book. They're more likely to talk about things that interest them.
	Find a quiet place. Read aloud undisturbed and strike up a conversation.
	Let your child turn the pages. That way, they can set their own pace.
	Ask questions that link the book to everyday life. This makes the content more accessible.
	Let the child finish speaking. That will give you time to think of a good follow-up question.
	Build on what the child has said. That is the only way to establish a genuine dialogue.

**If you are still
unsure...**



Start by practising with a book you're already familiar with.
⇒ You know the content. That makes it easier to ask questions.

New book? Have a quick look at it beforehand and think of a few questions.
⇒ But you don't have to do that. You can just go with the flow.

Don't let tricky STEM questions throw you off balance.
⇒ You don't have to know everything! Why not look for the answer together – on the internet, through discussion, or by applying STEMthinking?