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TEACHER GUIDE

WHAT IS ENGINEERING? GRADES K-2

COMMON MISCONCEPTIONS

Younger children are often unsure what engineering is. There are so many different types of engineers that it's challenging for young children to be aware of all the types. Some common types of engineers that young students can relate to might be aerospace engineers who work on designing airplanes or space craft, mechanical engineers who might work on cars, and biomedical engineers who work on medicines.

Another misconception involves the engineering design process. Failure is a big part of the engineering design process, so changing the mindset of students to a growth mindset is a great first step. It's very common for engineers to fail at a first attempt to solve a problem. Even failing at attempt number 3, 5, or 10 times is common. What students need to understand is that each time an engineer fails, it becomes an opportunity to improve.

ENGINEERING DESIGN PROCESS

There are many models of the Engineering Design Process. For young children, keeping it simple is important.

- Step 1:** Identify and define a problem.
- Step 2:** Plan and build a solution.
- Step 3:** Optimize the solution.

NOTE ABOUT STEM CHALLENGES

STEM challenges are popular in the schools these days. If you plan these challenges, it is important to make sure your challenges are geared to real life problems. Giving students relevant and realistic problems aligns with engineering in the real world. Constraints are also part of engineering. Whether it's time, materials, or cost, engineers need to be able to work within specific parameters.

TIPS FOR TEACHERS

There are some great picture books for young children that introduce engineering. One such book is *Rosie Revere, Engineer* by Andrea Beaty.