



TECH MACHINES

Teacher Guide Introduction

Who is the material for?

The Tech Machines Teacher Guide is for preschool teachers. It is designed to help teachers develop children's early engineering skills, such as designing and building, investigating and solving problems, and exploring machines and their functions.

What is it for?

Designed for preschoolers, the construction theme enables children to explore engineering concepts in a familiar setting as they build vehicles, machines, construction equipment, and imaginative models.

The Tech Machines Teacher Guide provides fun and engaging exploration opportunities while promoting the development of children's science, technology, and math skills.

Using the Teacher Guide, preschool teachers can facilitate exciting lessons in which children will learn about machine parts like wheels, pulleys, and joints while exploring their functions. The specially designed screwdriver allows children to use tools in a fun and safe way. Most importantly, the lessons will enable them to become problem solvers, enhancing their creativity through construction and demonstration.





How are the learning objectives achieved?

Throughout the lessons, strategic questions will guide children through the process of applying engineering skills. Furthermore, the LEGO® DUPLO® building activities will reinforce creativity, inquiry, and exploration.

The Tech Machines set comes with a Getting Started card that includes five quick steps for introducing the set in your classroom. By following the steps, you will introduce the children to the unique elements of the set, such as the screwdrivers and interlocking bricks.

This Teacher Guide includes eight lessons. Refer to the table of contents for a brief description of lesson topics. Each lesson is labeled as *beginner*, *intermediate* or *advanced*, based on the skills and knowledge needed to complete the lesson. The lessons may be selected and adapted according to what is most relevant and appropriate for the children.

The activities and lessons contained in this Teacher Guide require the LEGO® Education Tech Machines set (45002)

Customizing to Your Class Needs

The Tech Machines lessons can be tailored to your needs and the needs of your class. One Tech Machines set can be used with up to four children at a time, working in pairs if the children are able. Children need a lot of practice before becoming proficient at building with a partner, and this is a good way to promote collaboration. Only the advanced activities explicitly ask the children to build with a partner. However, if the children are ready, you may incorporate partner building into all the activities.





Lesson Structure

Each lesson is structured according to a natural learning flow called the *LEGO® Education 4C approach*, which promotes successful learning experiences. The Connect, Construct, and Contemplate phases, which are the first three phases of each lesson, can be done in one session. The Continue phase is more challenging and can be completed in a later session.

Connect

During the Connect phase, discussions will spark children's curiosity and activate their existing knowledge while preparing them for a new learning experience.

Construct

In this phase, the children will participate in a hands-on building activity. As their hands create models of people, places, objects, and ideas, their minds will organize and store new information related to these structures.

Contemplate

During the Contemplate phase, children are given the opportunity to reflect on what they have done and to talk about and share insights they have gained during the Construct phase of the lesson.

Continue

New challenges in this phase build upon the concepts learned previously in the lesson, providing an opportunity for children to apply their newly-acquired knowledge during extension activities. Because the children may not be ready to complete the Continue phase until they have repeatedly practiced the skills learned earlier in the lesson, this phase can be done during a later session.





Did you notice?

The learning guidelines from the National Association for the Education of Young Children (NAEYC), Head Start, and the Next Generation Science Standards (NGSS) have been used to develop the Tech Machines lessons. This Teacher Guide focuses on the learning values for math, science, and engineering. Please refer to the learning grid for an overview of the learning values referenced throughout this Teacher Guide. The learning goals listed at the end of each lesson can be used to determine whether each child is developing the relevant skills. These bullet points target specific skills or pieces of information that are practiced or presented during each lesson.

