



Thornccliffe Association
Curriculum
Age 9 - 11



RoboThink is an international leader in STEM education, offering fun and engaging programs in **robotics, coding, and engineering** for children of all ages. Our hands-on curriculum is designed to spark curiosity, foster creativity, and build critical problem-solving skills.

Through guided activities, students learn to **design, build, and program robots** while developing teamwork, logical thinking, and confidence. Each session is structured to balance **learning and play**, ensuring that children not only gain valuable technical knowledge but also have fun throughout the process.

RoboThink programs are trusted by schools and learning centers worldwide and are carefully tailored to meet the needs of different age groups, ensuring that every student is challenged at the right level.

Our mission is simple: to inspire the next generation of **engineers, innovators, and problem solvers** through exciting, hands-on STEM experiences.



Program Description

Our **Engineer Cars STEM Program** puts students in the driver's seat of engineering discovery as they build and test different types of vehicles each week. Through hands-on projects, students explore how engines, wheels, gears, motors, and aerodynamics work together to power real vehicles.

This exciting program teaches students how mechanical systems create movement, how design affects speed and performance, and how engineers solve problems to build better machines. Guided lessons combine learning with creativity and play, building confidence while strengthening teamwork, critical thinking, and problem-solving.

Weekly Breakdown for Parents

Week 1 – The Piston

Students learn how pistons convert energy into motion to power engines. They build a working piston model and explore how fuel and air pressure create movement inside an engine.

Week 2 – Differential

Students explore how a differential helps wheels rotate at different speeds, especially while turning. They build a differential system model to understand stability, traction, and safe handling in vehicles.

Week 3 – Manual Transmission



Students build a model that simulates shifting gears to control speed and power. They learn how gear systems work, why different gears are needed, and how transmissions help engines run efficiently.

Week 4 – Pick-Up Truck

Students design and build a pickup truck model to apply their knowledge of power, torque, weight distribution, and suspension. They explore how trucks are engineered for hauling and durability.

Week 5 – IR Dragster

Students build a drag-racing vehicle and investigate acceleration, aerodynamics, and the science behind extreme straight-line speed. They experiment with design choices to maximize performance.

Week 6 – Build Your Own Race Car

Students use everything they've learned to design and build their own custom race car. They test and refine their models for speed and stability, then present their final designs to the group.

What Students Gain

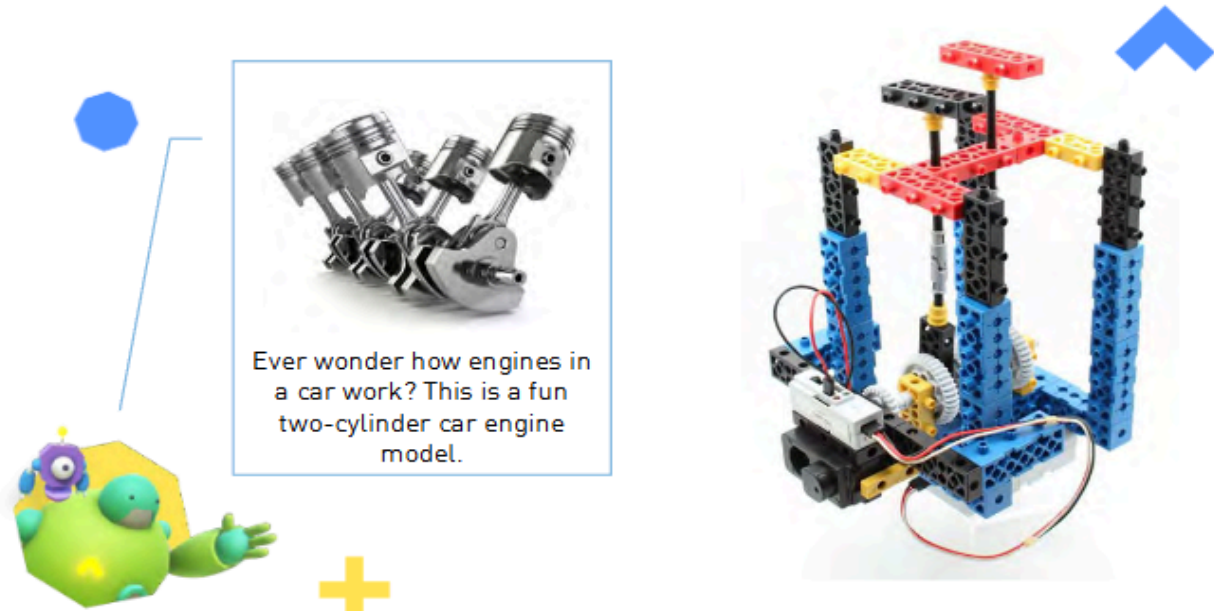
- Hands-on understanding of engines, gears, and automotive systems
- Mechanical engineering, design, and problem-solving skills
- Improved creativity, confidence, and teamwork abilities
- Real-world knowledge of how vehicles function and are engineered
- Pride in building and presenting their own working model

Robothink Schedule

Week	Activity
Week 1	The Piston
Week 2	Differential
Week 3	Manual Transmission
Week 4	Pick Up Truck
Week 5	I R Dragster
Week 6	Build Your Own Race Car

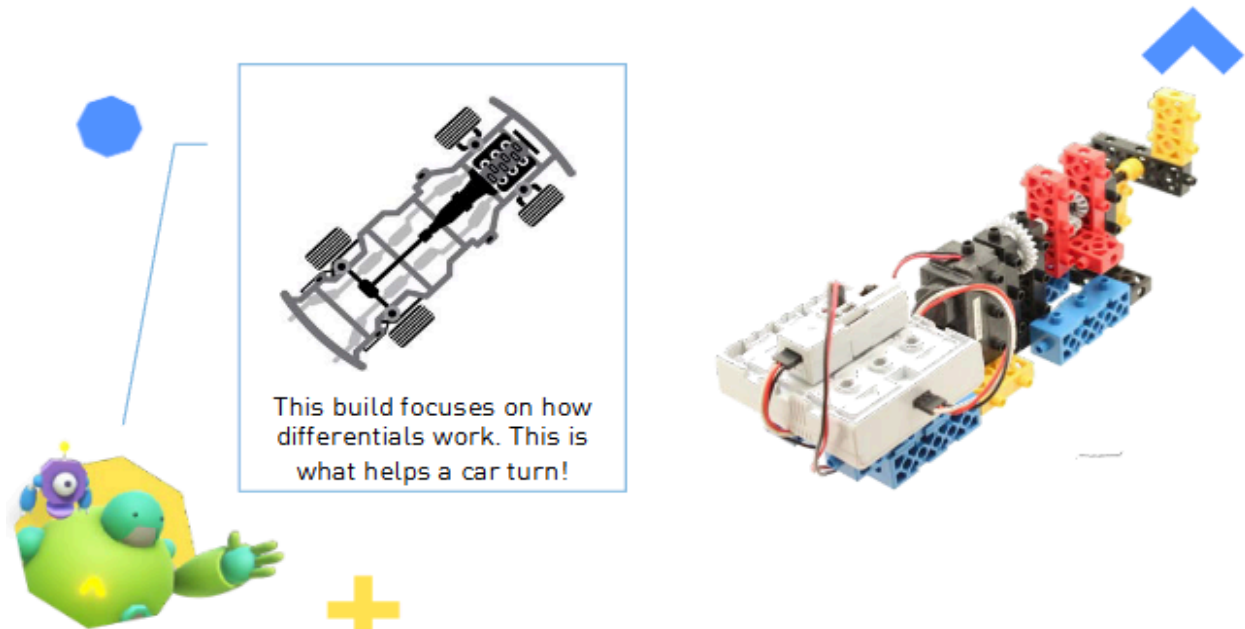
ENGINEER RACE CARS

LESSON 1: THE PISTON



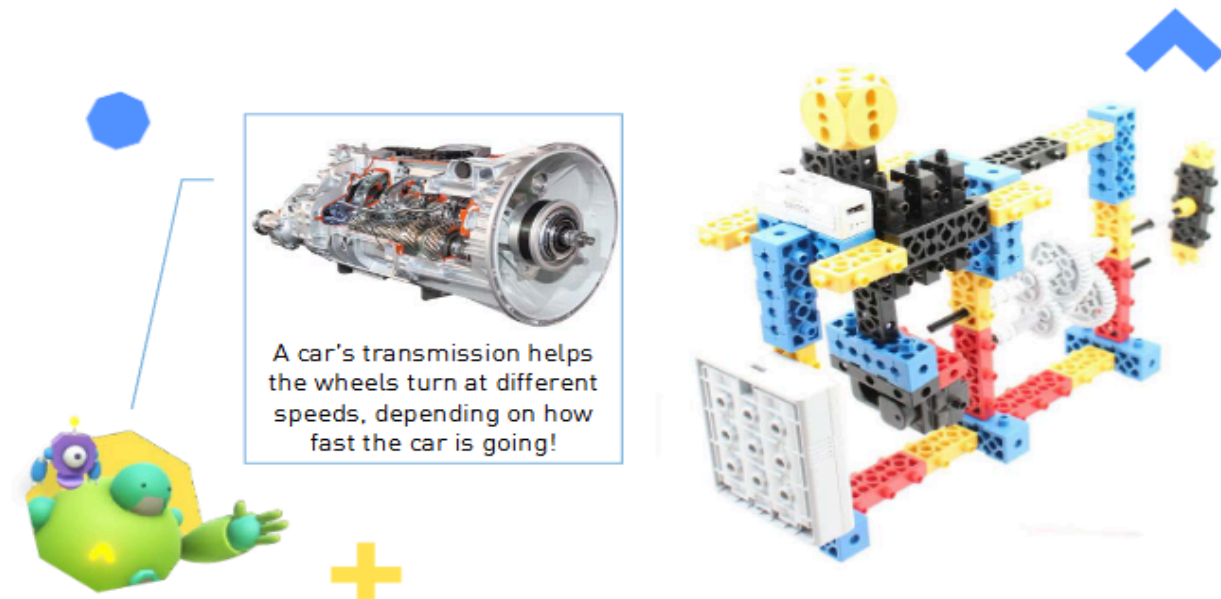
ENGINEER RACE CARS

LESSON 2: DIFFERENTIAL



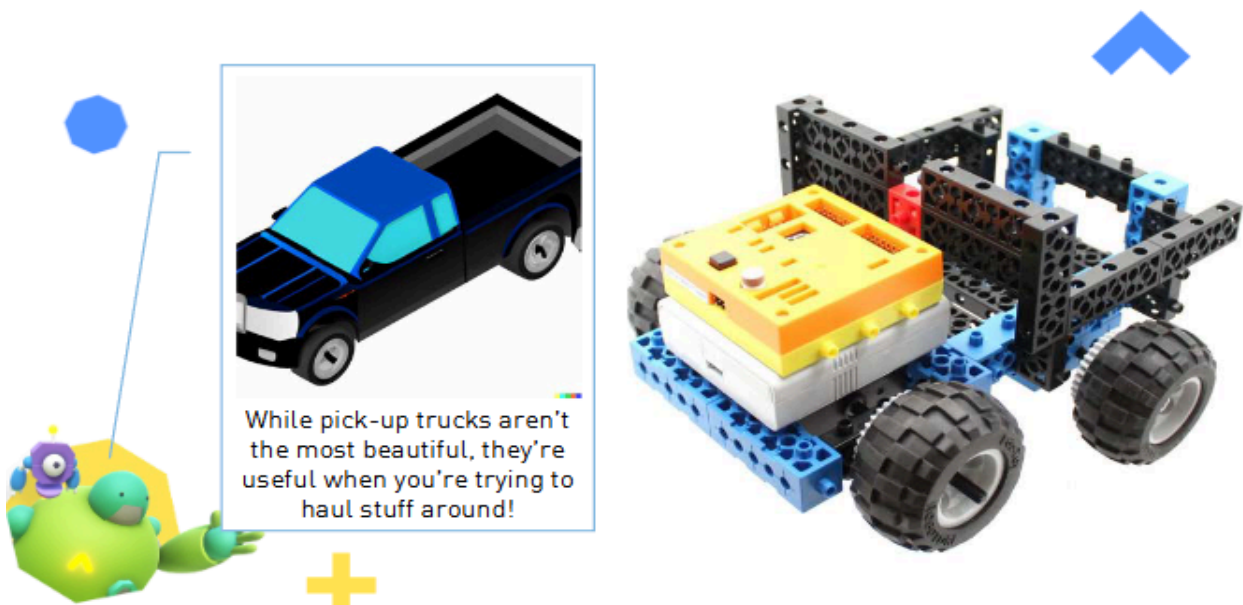
ENGINEER RACE CARS

LESSON 3: TRANSMISSION



ENGINEER RACE CARS

LESSON 4: PICK UP TRUCK



ENGINEER RACE CARS

LESSON 5: IR DRAGSTER



ENGINEER RACE CARS

LESSON 6: BUILD YOUR OWN RACE CAR



