



Thornccliffe Association
Curriculum
Age 12 - 14



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 **Mars Expedition STEM Program** takes students on an exciting journey across space as they explore robotics, engineering, and planetary science through hands-on building projects. Each week, students learn about real NASA missions and Mars exploration technology while designing and constructing mechanical models that simulate spacecraft, rovers, and planetary systems.

Through creative engineering challenges, students develop problem-solving skills, teamwork, and confidence while discovering how scientists and engineers explore outer space. The program balances learning and fun, making complex space concepts engaging and easy to understand.

Weekly Breakdown for Parents

Week 1 – Orrery

Students build a working model of the solar system to understand planetary orbits, rotation, gravity, and why exploring Mars is so important.

Week 2 – CraterCrawler

Students construct a rover designed to travel over rough terrain like the rocky surface of Mars. They learn about wheels, traction, balance, and how real rovers navigate obstacles using sensors and data.

Week 3 – ECK Wings

Students create a spacecraft model focused on wing structure and aerodynamics. They explore how spacecraft enter and travel through different atmospheres and what makes flight on Mars different than on Earth.



Week 4 – Perseverance

Students build a model based on NASA's **Perseverance Rover**, learning about scientific instruments used to search for signs of ancient life and collect samples from the Martian surface.

Week 5 – Curiosity

Students explore engineering principles used in NASA's **Curiosity Rover**, including suspension systems, mobility, and technology used for remote scientific experiments.

Week 6 – Build Your Own Spaceship

Students apply everything they've learned to design and build an original spacecraft or rover capable of exploring Mars. They test, evaluate, and present their creations to the group.

What Students Gain

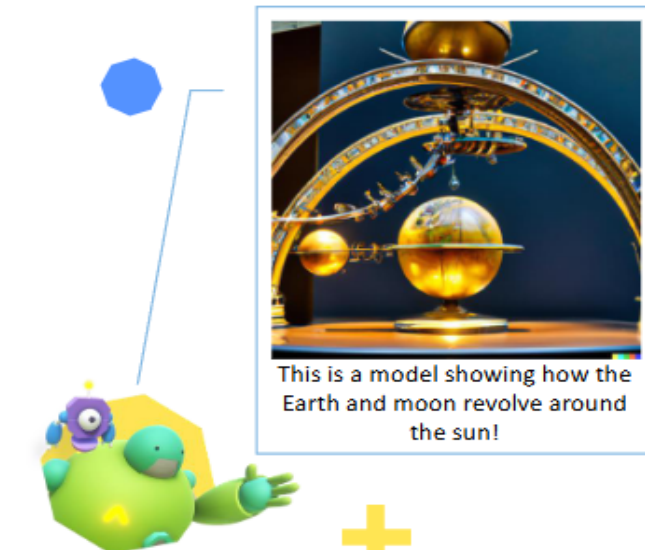
- A foundation in robotics, engineering, space science, and mechanical systems
- Critical thinking, creativity, and design problem-solving
- Understanding of real NASA missions and the challenges of space exploration
- Improved teamwork, communication, and presentation skills
- Hands-on experience building working mechanical models

Robothink Schedule

Week	Activity
Week 1	Orrery
Week 2	CraterCrawler
Week 3	Eck Wings
Week 4	Preserverance
Week 5	Curiosity
Week 6	Build your own Spaceship

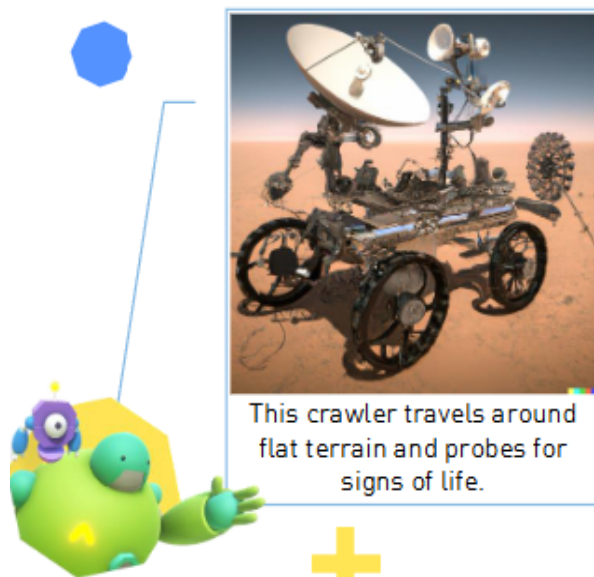
EXPEDITION: MARS

LESSON 1: ORRERY



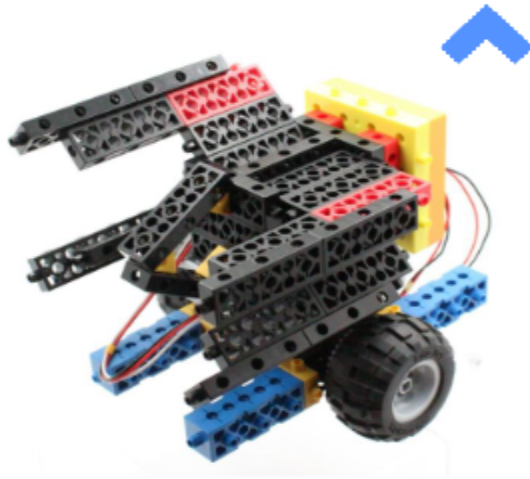
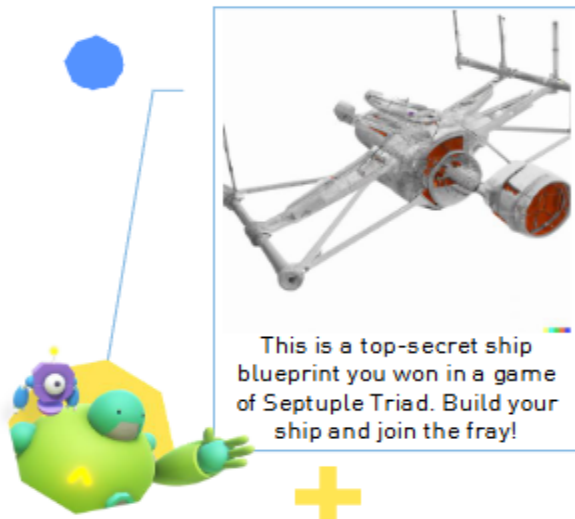
EXPEDITION: MARS

LESSON 2: CRATER CRAWLER



EXPEDITION: MARS

LESSON 3: ECK'S WING



EXPEDITION: MARS

LESSON 4: PERSEVERANCE



EXPEDITION: MARS

LESSON 5: CURIOSITY



EXPEDITION: MARS

LESSON 6: BUILD YOUR OWN SPACESHIP

