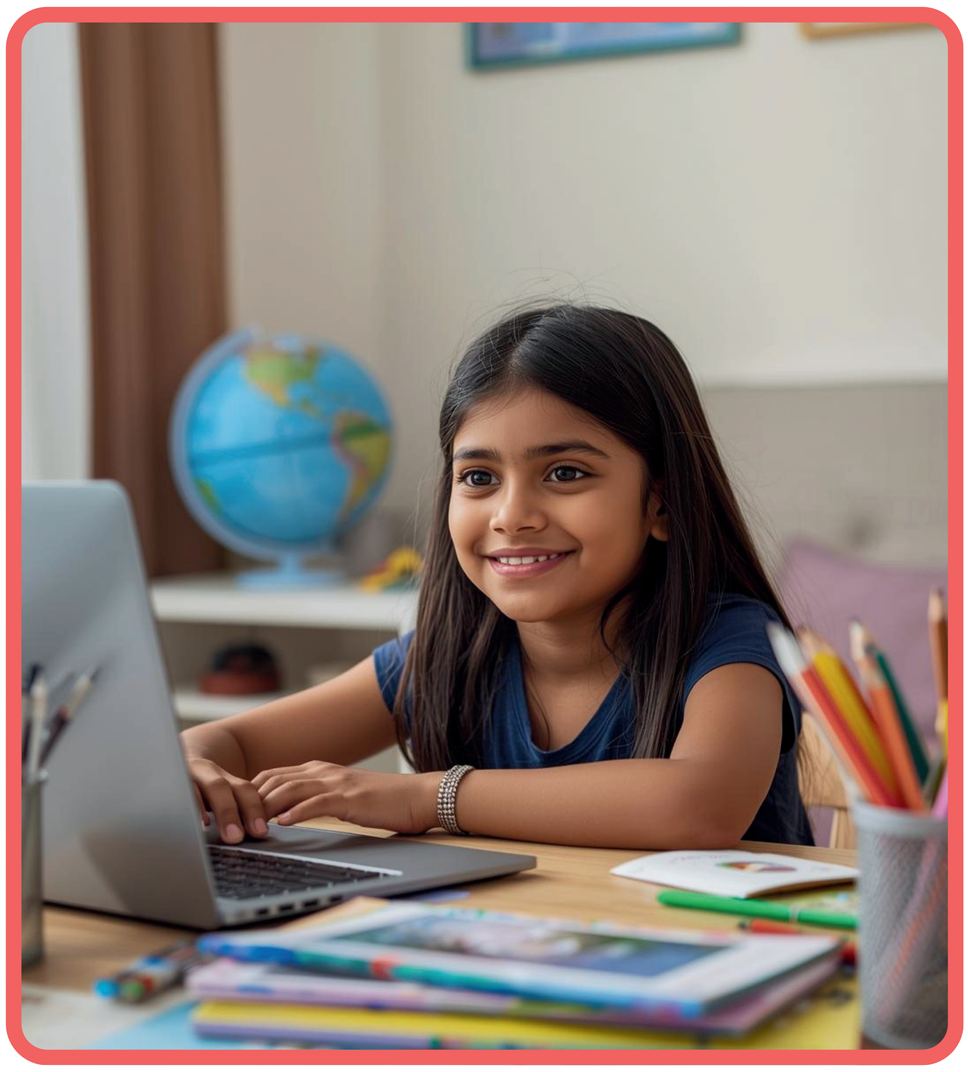
21K School
Where Every Learner Finds Their Path

STEM LEARNING: AGE 5–8

(EARLY LEARNERS' CREATIVITY PROGRAM)



OVERVIEW

At the Early Learning Center (ELC), children aged 5–8 explore the world of STEM through play, building, and storytelling. They use interactive kits that make Science, Technology, Engineering, Art, and Math fun and tangible. The focus is on curiosity, imagination, teamwork, and understanding simple real-world systems.

LEGO STEAM PARK

WHAT STUDENTS DO

Students use the LEGO STEAM Park kit to build creative amusement park models, learn how things move, and explore cause and effect through storytelling and play.

WHY WE USE IT

This kit encourages open-ended exploration and introduces the basics of engineering and physical science in a playful way.

HOW IT RELATES TO STEM

- **Science :** Motion, gravity, and balance
- **Technology :** Understanding functional mechanisms
- **Engineering :** Building stable, moving structures
- **Math :** Measuring, counting, comparing sizes

IMPACT ON CHILDREN

Develops early problem-solving, fine motor skills, spatial reasoning, and curiosity to understand how things work.

LEARNING OUTCOMES

- Identify and describe how motion and balance affect structures.
- Construct models that move or perform simple functions.
- Collaborate with peers to plan and build creative amusement park designs.
- Explain what makes their builds move using simple science words.

NOVEMBER PROJECTS

- Functional Elements (Nov 2) : Build park rides that move and spin using gears and wheels.
- Welcome to STEAMPARK (Nov 6) : Create a story-based park with characters and attractions.
- Ramps (Nov 12) : Experiment with slopes to learn about speed and motion.
- Moving on Water (Nov 18) : Build a floating model that shows buoyancy.
- Probability (Nov 21) : Create fairground games to explore chance and outcomes.
- Performing Arts (Nov 26) : Design a mini stage setup and explore storytelling through builds.

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LEGO CODING EXPRESS

WHAT STUDENTS DO

Children learn basic coding and sequencing by using colored action bricks to control a train's movement and sounds.

WHY WE USE IT

This set introduces coding logic without screens, helping young learners visualize cause and effect.

HOW IT RELATES TO STEM

- **Science :** Motion and direction
- **Technology :** Coding logic and commands
- **Engineering :** Track design and flow
- **Math :** Patterns, sequencing, counting

IMPACT ON CHILDREN

Encourages structured thinking, logic development, and early problem-solving through fun, story-based play.

LEARNING OUTCOMES

- Demonstrate understanding of sequencing and cause-effect relationships.
- Design train routes using color-coded logic bricks.
- Collaborate with peers to test and refine train movement programs.
- Recognize how coding can control physical systems.

NOVEMBER PROJECTS

- First Trip (Nov 4) : Learn how colored bricks trigger train actions.
- Train Sound (Nov 7) : Program sounds and stops along a train route.
- O-Shaped Track (Nov 13) : Build loops and observe repetitive sequences.
- Y-Shaped Track (Nov 16) : Introduce branching paths and decisions.
- Caterpillar (Nov 22) : Practice sequencing and pattern logic.
- Music Concert (Nov 27) : Program sound patterns for the train's journey.

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LEGO BRICQ ESSENTIAL

WHAT STUDENTS DO

Students build models that show forces, balance, and motion—learning science concepts through active building.

WHY WE USE IT

BricQ teaches STEM through movement and experimentation, helping children understand how things move and react.

HOW IT RELATES TO STEM

- **Science :** Force, push, pull, balance
- **Technology :** Understanding physical mechanisms
- **Engineering :** Experimenting with structure stability
- **Math :** Measuring distance, speed, and results

IMPACT ON CHILDREN

Improves observation, patience, and early scientific inquiry through playful engineering challenges.

LEARNING OUTCOMES

- Describe how push, pull, and balance affect motion.
- Apply observation and testing to improve designs.
- Use teamwork to complete motion-based challenges.
- Relate their models to real-world examples of force and movement.

NOVEMBER PROJECTS

- Dog Obstacle Course (Nov 5) : Build a track to understand motion and control.
- Get Up and Dance (Nov 8) : Learn balance and movement through dancing figures.
- Ice Hockey Practice (Nov 14) : Experiment with friction and movement.
- Push Car Derby (Nov 19) : Discover how force and slope affect motion.
- Tightrope Walker (Nov 23) : Understand balance and gravity.
- Sail Car (Nov 28) : Explore wind force and motion.
- Relay Race (Nov 30) : Apply all motion concepts in a team challenge.

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LEGO SPIKE ESSENTIAL

WHAT STUDENTS DO

Students combine LEGO building with simple coding using motors and sensors to make interactive, moving models.

WHY WE USE IT

It bridges the gap between building and programming, helping children understand how hardware and software work together.

HOW IT RELATES TO STEM

- **Science :** Motion, energy, and light
- **Technology :** Sensors and coding
- **Engineering :** Mechanisms with logic control
- **Math :** Measurement, time, and sequencing

IMPACT ON CHILDREN

Encourages logical reasoning, persistence, and creative problem-solving while building the foundation for robotics.

LEARNING OUTCOMES

- Demonstrate understanding of how sensors and motors create movement.
- Code basic movement and light responses using SPIKE Essential.
- Work collaboratively to solve challenges through coding and design.
- Explain how coding can control mechanical actions in their builds.

NOVEMBER PROJECTS

- Boat Trip (Nov 9) : Code a motorized boat that moves across water.
- Arctic Ride (Nov 11) : Create a snow adventure model with motion control.
- Cave Car (Nov 15) : Build a vehicle that moves and stops automatically.
- Animal Alarm (Nov 20) : Program sensors to detect movement and trigger sound.
- Underwater Quest (Nov 25) : Design a sea explorer with light and motion.
- Treehouse Camp (Nov 29) : Combine storytelling with functional coding.

OVERALL IMPACT (AGES 5–8)

These LEGO kits build a foundation of curiosity, teamwork, and creative confidence. Children begin understanding how science and technology connect to everyday life through play. They develop hands-on skills, early STEM vocabulary, and a love for experimenting— preparing them for deeper exploration in higher levels.