



# START SMART AT GEMS

Gems STEM based programs teaches kids,

**ENGINEERING**

**SCIENCE**

**CODING**

**ROBOTICS**

**MATH**

**TECHNOLOGY**



**GEMS Junior  
Robotics**

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**GEMS Youth  
Robotics**

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**GEMS Junior  
Engineers**

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**GEMS Youth  
Engineers**

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**Coding  
Programming  
Robotics  
Engineering  
Technology  
STEM programs at  
GEMS**

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## **GEMS LEARNING INSTITUTE**

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# GEMS Junior Robotics - For Grade 1 to 3

Our coding program introduces children from basic to advance level of programing concepts, algorithm, loops, conditional statements, sequences, events, and sensors and debugging of the programs. Kids will plan, program, and execute an adventure while learning fundamental concepts of computational thinking.

Our customized GEMS lessons will have the theoretical aspects and kids will be introduced to different IT fields, as well as hardware and software concepts.

Level 1: 8 weeks	Level 2: 8 weeks	Level 3: 8 weeks	Level 4: 8 weeks
Children will get introduced to basic concepts for Robotics and programming, and will learn algorithms, sequences and will write basic codes.	Children will continue learning algorithms, sequences and will be introduced to conditional statements, loops and debugging.	Children will learn conditional statement, sensors and will be introduced to Nested loops and variables.	Children will program robots by using conditional statements, loops, variables and nested loops.

***Kids will learn coding and sequencing concepts in a fun way by making the robot race, dance, sing, and even respond to their own voice.***

***They will make them move around, blink the lights, and keep on wheels squealing through the apps.***

***Programming lets them turn their silliest or most ambitious ideas into reality!***



# GEMS Youth Robotics - For Grade 4 to 8

Our coding program introduces children from basic to advance level of programing concepts, algorithm, loops, conditional statements, sequences, events, and sensors and debugging of the programs. Kids will plan, program, and execute an adventure while learning fundamental concepts of computational thinking.

Our customized GEMS lessons will have the theoretical aspects and kids will be introduced to different IT fields, as well as hardware and software concepts. Kids will learn coding and sequencing concepts in a fun way by making the robot race, dance, sing, and even respond to their own voice. They will make them move around, blink the lights, and keep on wheels squealing through the apps. Programming lets them turn their silliest or most ambitious ideas into reality!

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<i><b>Level 5: 8 weeks</b></i>	<i><b>Level 6: 8 weeks</b></i>	<i><b>Level 7: 8 weeks</b></i>	
Students will built the robot themselves. They will further program the robot to perform basic movements.	Students will further code and program their already built robots while applying the programming concepts that they had learned in the prior levels.	Students will do problem solving, while getting engaged in real world problems to perform different tasks using MATH, Science and Coding concepts.	

# GEMS Junior Engineers - For Grade 1 to 3



*Discover how  
Machine works*



*Engage in real world  
Engineering problems*

Children will be exploring essential **STEM** concepts through building fun simple machines just like an Engineer! Learning **Physics concepts of Simple machines**, gears, energy and matter, stability and change, construction, kids will be building structures like Wind Turbines , Jet Airplanes, Helicopters, Merry Go round.

<i>Level 1: 8 weeks</i>	<i>Level 2: 8 weeks</i>	<i>Level 3: 8 weeks</i>	<i>Level 4: 8 weeks</i>
Children will build simple real world machines, learning basic science concepts.	Children will further learn the mechanism of simple machines that they had built. For example, gears, pulleys etc.	Children will develop engineering skills through building, learning and analyzing real life structures and further introduced how to program them.	Children will program their personal built machines to bring them to life performing and solving real world tasks.

Sample topics covered, includes:

1. Gears and pulleys
2. Energy and Motion
3. Constructing Structures
4. Stability and Change
5. Cause and Effect



# GEMS Youth Engineers - For Grade 4 to 8



*Discover how  
Machine works*



*Engage in real world  
Engineering problems*

**Engineering:** Children will be exploring essential STEM concepts through building fun simple machines just like an Engineer! Learning Physics concepts with a system approaches to Electronics, Control and Sensing, kids will be learning how is the movement of a windshield produced? How do you design a stable structure? Kids will build structures like Light House, Merry Go round, Wind Shield wipers, Wind mill etc. learning Energy and motion, gears, Stability and Change, cause and effect, Ohm's law.

**Robotics and Coding:** Kids will bring their creations to life through learning coding and programming. They will learn and have an hands on experience through interaction between hardware and software.

<i>Level 1: 8 weeks</i>	<i>Level 2: 8 weeks</i>	<i>Level 3: 8 weeks</i>	<i>Level 4: 8 weeks</i>
Children will build simple real world machines, learning science concepts . They will connect motor, switches to the controller.	Children will further learn the mechanism of simple machines that they had built, while writing a control program.	Children will develop engineering skills through building, learning and analyzing real life structures and further learning circuits through Ohm's Law.	Children will program their personal built machines to bring them to life performing and solving real world tasks.

