



RoboLAB is a year-long robotics program aimed at implementing technology enhanced learning in classrooms. It aims to promote robotics as a tool for application of concepts learnt by students in classroom using STEM (Science, technology, Engineering and Mathematics) integration by creating multiple intelligence based learning environment. RoboLAB provides an opportunity to rediscover and redesign learning by engaging students in an inquiry based approach to collaborate and be creative in solving open ended robotic challenges.

### Curriculum Coverage for March:

#### Grade 4:

| Topic Name                            | Description   | Science, Technology, Engineering & Mathematics Relevance  | Key Words                                  |
|---------------------------------------|---|---|--|
| <b>Play with a tricycle.</b>          | Construction of a remote controlled tricycle and observing the use of gears in it.  | <b>Science:</b> Identification of gears as simple machines.   | Simple machine<br>Gears<br>Design<br>Build |
| <b>Let's sort things into groups.</b> | Construction of a remote controlled robot to sort objects into groups.  | <b>Science:</b> Identification of gears as simple machines.<br><b>Technology:</b> Relating to real world examples through technology.   | Problem solving<br>energy                  |
| <b>Challenge Day II</b>               | Students will apply their learning about simple machines to design and construct an innovative machine that can help them in performing a task of their choice. | <b>Science:</b> Integration of simple machines to construct a complex machine.<br><b>Mathematics:</b> Build new knowledge through problem solving, Apply and adapt a variety of appropriate strategies to solve problems. |  |

#### Grade 5:

| Topic Name                     | Activity Description  | Science, Technology, Engineering & Mathematics Relevance  | Key Words  |
|--------------------------------|---|---|--|
| <b>Let's water the plants.</b> | Construction of a remote controlled robot to help water the plants and observing the difference between fixed and movable joints. | <b>Science:</b> Differentiation between fixed and movable joints, Identification of movable joint in a structure.<br><b>Technology:</b> Relating to real world examples through technology. | Design<br>Motors<br>Build<br>Problem solving<br>Simple machine |
| <b>From here to there</b>      | Construction of a folding bridge.   | Moderate, remote control  |  |
| <b>Magnifying shapes</b>       | Construction of pantograph.   | <b>Technology:</b> Role of society in development and use of technology.<br><b>Mathematics:</b> Ratio & Proportion.   |  |

**The Core Competency Focus:** Problem solving, creativity, cooperation, critical thinking

**How Can You Help?** Please could you make sure your children bring; robotics book, pen (black or blue) and pencil for all Robotics lessons and help your children to learn the meanings of the key words.

**Homework:** Students will carry out an independent research task to enable them to come up with a design solution.

**Useful Website:** Here is a useful website to help the student in robotics: [www.thinklabs.in](http://www.thinklabs.in)

### **Grade 6:**

| Topic Name              | Activity Description  | Science, Technology, Engineering & Mathematics Relevance  | Key Words   |
|-------------------------|---|---|---|
| <b>Conductivity fan</b> | Construction of a fan and programming it to rotate with different speeds depending on the conductivity of the material. | <b>Science:</b> Differentiation of conductors and insulators.<br><b>Technology:</b> Algorithm development, use of conditional construct IF.<br><b>Mathematics:</b> Represent and analyse mathematical situations using algebraic symbols, analyse change in various contexts (Algebra). | Design<br>Motors<br>Build<br>Think<br>Problem solving<br>Simple machine<br>Programming<br>Forward |

|                         |  |   |                                       |
|-------------------------|--|---|---------------------------------------|
| <b>Drop by drop</b>     | Construction of water wheel well.  | Moderate, remote control  | Backward Block<br>Buzzer<br>Algorithm |
| <b>Energy saver</b>     | Construction & programming of an autonomous LED candle.                            | <b>Science:</b> Conservation of Energy.<br><b>Mathematics:</b> Represent and analyse mathematical situations using algebraic symbols, Analyse change in various contexts (Algebra). Apply appropriate techniques to determine measurements (Measurement). |                                       |
| <b>Challenge Day II</b> | Construction of an autonomous car and programming it to chase the source of light. | <b>Engineering:</b> Reinforcement of engineering design process.<br><b>Mathematics:</b> Apply and adapt a variety of appropriate strategies to solve problems (Problem Solving).  |                                       |

## Grade 7

| Topic Name  | Activity Description  | Science, Technology, Engineering & Mathematics Relevance  | Key Words   |
|---|---|---|---|
| <b>I respond to different materials differently</b> | Classifying materials as conductors and insulators using conductivity sensor.                     | <b>Science:</b> Differentiation of conductors and insulators.<br><b>Technology:</b> Algorithm development, use of conditional construct IF.   | Design<br>Build<br>Problem solving<br>Programming<br>Algorithm<br>Conductors<br>Insulators<br>Algebra<br>Measurement<br>Light sensor<br>IR Sensor<br>Sound Sensor |
| <b>I follow the line</b>                            | Construction of an autonomous car and programming it to follow a black line on the white surface. | <b>Science:</b> Reflection of light.<br><b>Technology:</b> Algorithm development, use of multiple IF statements.<br><b>Mathematics:</b> Represent and Analyze mathematical situations using algebraic symbols, Analyse change in various contexts (Algebra).  |   |
| <b>I respond to only sound.</b>                     | Constructing an autonomous car and programming it to take left turn on the sound of a clap.       | <b>Science:</b> Measurement of sound.<br><b>Technology:</b> Algorithm development, Use of IF Else decision construct.<br><b>Mathematics:</b> Represent and Analyze mathematical situations using algebraic symbols, Analyse change in various contexts (Algebra). Understand measurable attributes of object (Measurement). |   |

|                        |  |   |  |
|------------------------|--|---|--|
| <b>Challenge Day 2</b> | Construction of a helper robot using any sensor learnt so far. | <b>Technology:</b> Algorithm Development, Use multiple IF statements.<br><b>Engineering:</b> Reinforcement of the Engineering Design Process.<br><b>Mathematics-</b> Build new knowledge through problem solving. |  |
|------------------------|--|---|--|

### Grade 8:

| Session Name                    | Activity Description  | Science, Technology, Engineering & Mathematics Relevance   | Key Words  |
|---------------------------------|---|--|--|
| <b>I respond to only sound.</b> | Constructing an autonomous car and programming it to take left turn on the sound of a clap. | <b>Science:</b> Measurement of sound.<br><b>Technology:</b> Algorithm development, use of IF Else decision construct.<br><b>Mathematics:</b> Represent and analyse mathematical situations using algebraic symbols, analyse change in various contexts (Algebra). Understand measurable attributes of object (Measurement).    | Design<br>Build<br>Problem solving<br>Programming<br>Algorithm<br>Measurement<br>Analog sensor |
| <b>Edge detector</b>            | Construction of an autonomous car that does not fall off the table.                         | <b>Science:</b> Reflection of light.<br><b>Technology:</b> Use of analog sensor (IR sensor).<br><b>Mathematics:</b> Represent and analyse mathematical situations using algebraic symbols (Algebra), apply appropriate techniques to determine measurements (Measurement), make reasonable estimates (Numbers and operations). | Light sensor<br>IR Sensor<br>Sound Sensor  |
| <b>Challenge Day 2</b>          | Construction of a helper robot using any sensor learnt so far.                              | <b>Technology:</b> Algorithm Development, Use multiple IF statements.<br><b>Engineering:</b> Reinforcement of the Engineering Design Process.<br><b>Mathematics:</b> Build new knowledge through problem solving.  |  |

Kind regards

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