



Tech Tinkerer Curriculum for ICT, AI, Coding and Robotics ICSE (Class 1 to 8)

Curriculum for the Tech Tinkerer Program in School for
Computer, Coding, Robotics & AI Education for Class 1 to 8



Authored By

Pankaj Kumar Verma

*Chief Technology Officer, STEMpedia
B. Tech, IIT Kanpur*

Khushbu Chauhan

*AI & Robotics Expert, STEMpedia
BE, Gujarat Technological University*

Dhrupal R Shah

*Chief Executive Officer, STEMpedia
M. Tech, IIT Kanpur*

Devi M

*AI & Robotics Expert, STEMpedia
ME, Anna University*

Tech Tinkerer (Class 1 to 8)






Mastering Coding, Artificial Intelligence, Robotics, and ICT with Fun Activities for ICSE Schools

Tech Tinkerers is an innovative curriculum designed for ICSE schools, targeting students from Class 1 to 8. This program is meticulously crafted to immerse students in the world of technology, covering Coding, Artificial Intelligence (AI), Robotics, and Information and Communication Technology (ICT). Through engaging activities and hands-on lab sessions, students will explore the fascinating realms of technology while developing critical thinking and problem-solving skills.




Item	Detail
Board	ICSE
Classes	Class 1 to 8
Concepts Covered	Coding, Artificial Intelligence, Physical Computing, Robotics, Computer Basics, Windows 10 Basics and Microsoft Office
Number of Lab Activities	For Class 1 to 2 – 20 Lab Activities For Class 3 to 8 – 25 Lab Activities
Lesson Plan	For Class 1 to 2 – 36 Sessions (18 for Classroom Learning & 18 for Lab Activities) For Class 3 to 8 – 50 Sessions (25 for Classroom Learning & 25 for Lab Activities) Each of the Classroom Learning and Lab Activity session is of 40 minutes
Teacher Resources	Lesson Plan – Yearlong session wise lesson plan for teachers instructing how to execute the program. Lecture Slides – Provided for every Classroom Learning and Lab Activity session
Capstone Project	All students are provided opportunity work on open projects and submit their work in Codeavour International Competition.
PictoBlox Credits	Every student enrolled in the program will get 3000 PictoBlox credits.

Tech Tinkerers curriculum offers a holistic and futuristic approach to learning technology, ensuring students are well-equipped with the necessary skills and knowledge to thrive in a rapidly evolving digital world. Through a blend of theoretical knowledge and practical application, students will develop a robust understanding of various tech domains, setting a solid foundation for their future careers in technology.







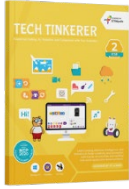





























































Tech Tinkerers Class 1 to 5 Comparative Study

Feature	Class 1	Class 2	Class 3	Class 4	Class 5
					
# of Pages	68	66	110	122	126
# of Chapters	6	6	9	9	7
# of Activities	18	18	25	25	25
Software and Hardware Used	MS Paint, Notepad, PictoBlox Jr, Quarky	Tux Paint, WordPad, PictoBlox Jr, Quarky	Windows 10, Notepad, WordPad, MS Paint, MS Word, MS Excel, PictoBlox, Quarky	Windows 10, MS Paint, Tux Paint, MS Word, MS PowerPoint, PictoBlox Block Coding, PictoBlox AI, Quarky	Windows 10, Calculator, MS Paint, WordPad, MS Word, MS PowerPoint, PictoBlox Block Coding, PictoBlox AI, Quarky
Competition	Access to Codeavour				
Technologies	Computers, Coding, Artificial Intelligence and Robotics				
Sessions Required	Total 36 – (18 Lab Activities, 18 Classroom)	Total 36 – (18 Lab Activities, 18 Classroom)	Total 50 – (25 Lab Activities, 25 Classroom)	Total 50 – (25 Lab Activities, 25 Classroom)	Total 50 – (25 Lab Activities, 25 Classroom)
Resources for Teachers	Lesson Plan, Lecture Slides (Textual, Images, Video)				
Certification	Yes (5 lab activities)	Yes (5 lab activities)	Yes (10 lab activities)	Yes (10 lab activities)	Yes (10 lab activities)
TOC Chapters	<ul style="list-style-type: none"> - Know Your Computer - Fun with Paint - Algorithmic Thinking - Into the World of Coding - Into the Robotics - Into the AI 	<ul style="list-style-type: none"> - Know Your Computer - Fun with Paint - Critical Thinking and Analysis - Into the World of Coding - Into the Robotics - Into the AI 	<ul style="list-style-type: none"> - Know Your Computer - Fun with Paint - Introduction to Algorithm and Coding - Introduction to MS Word - Introduction to MS Excel - The Internet - Fun with Robotics - Game Development - Learn About AI 	<ul style="list-style-type: none"> - Know Your Computer - Fun with Paint - Basics of Coding and Algorithm - Introduction to MS Word - Introduction to MS PowerPoint - The Internet - Fun with Robotics - Fun with AI - Stepping into the World of Game Design 	<ul style="list-style-type: none"> - Know Your Computer - Coding & Algorithmic Thinking - Explore More in MS Word - Introduction to PowerPoint - Fun with Robotics - The World of AI - Internet Connectivity

Tech Tinkerers Class 6 to 8 Comparative Study

Feature	Class 6	Class 7	Class 8
			
# of Pages	154	164	160
\$ of Chapters	10	11	8
\$ of Activities	25	25	25
Software and Hardware Used	Windows 10, Windows Media Player, MS Word, MS PowerPoint, PictoBlox Block Coding, PictoBlox AI, Quarky, HTML	Windows 10, PicsArt App, MS Excel, MS PowerPoint, PictoBlox Block Coding, PictoBlox AI, Quarky, HTML	Windows 10, Canva App, MS Excel, PictoBlox Block Coding, PictoBlox Python Coding, PictoBlox Machine Learning, PictoBlox AI, Quarky
Competition	Access to Codeavour	Access to Codeavour	Access to Codeavour
Technologies Covered	Computers, Coding, Artificial Intelligence, Web Design, and Robotics	Computers, Coding, Artificial Intelligence, Web Design and Robotics	Computers, Coding, Artificial Intelligence, Machine Learning, Robotics, App Development, and Network
Sessions Required	Total 50 – (25 Lab Activities, 25 Classroom Learnings)	Total 50 – (25 Lab Activities, 25 Classroom Learnings)	Total 50 – (25 Lab Activities, 25 Classroom Learnings)
Resources for Teachers	Lesson Plan, Lecture Slides (Textual, Images, Video)		
Certification	Yes (15 lab activities)	Yes (15 lab activities)	Yes (15 lab activities)
TOC Chapters	<ul style="list-style-type: none"> - Basics of ICT - Introduction to Coding - Variable using Block Coding - Control with Conditions - Basics of MS Word - Basics of Microsoft PowerPoint - Introduction to Robotics - Fun with AI - Online Surfing - Introduction to HTML 	<ul style="list-style-type: none"> - Basics of ICT - Coding & Variables in Real Life - Sequencing with Block Coding - Fun with Functions - Collections and Arrays - Introduction to MS Excel - Fun with AI - Mastering Robotics - Advance HTML - Computer Virus - Ethics and Safety Measures in Computing 	<ul style="list-style-type: none"> - Basics of Operating System - Algorithms and Flowchart - Basics of Python Programming - Mastering MS Excel - Artificial Intelligence and Machine Learning - Introduction to Robotics and Emerging Technologies - Basics of App Development - Computer Networking

Software and Hardware Used

									
	Windows 10	MS Paint	Notepad	PictoBlox Junior Blocks	Quarky Robot				
									
	Windows 10	Tux Paint	WordPad	PictoBlox Junior Blocks	Quarky Robot				
									
	Windows 10	MS Paint	Tux Paint	Notepad	WordPad	MS Word 16/19	MS Excel 16/19	PictoBlox Block Coding	Quarky Robot
									
	Windows 10	MS Paint	Tux Paint	MS Word 16/19	MS PowerPoint 16/19	PictoBlox Block Coding	Quarky Robot		
									
	Windows 10	MS Paint	WordPad	Calculator	MS Word 16/19	MS PowerPoint 16/19	PictoBlox Block Coding	Quarky Robot	Google Chrome
									
	Windows 10	Windows Media Player	MS Word 16/19	MS PowerPoint 16/19	PictoBlox Block Coding	PictoBlox AI	Quarky Robot	Notepad	HTML
									
	Windows 10	PicsArt	MS Excel 16/19	MS PowerPoint 16/19	PictoBlox Block Coding	PictoBlox AI	Quarky Robot	Notepad	HTML
									
	Windows 10	Canva App	MS Excel 16/19	PictoBlox Py Editor	PictoBlox AI	PictoBlox Machine Learning	Quarky Robot		

FAQs on Tech Tinkerer Program

1. What is the Tech Tinkerer Program?

The “Tech Tinkerer” program represents a significant advancement in the educational approach to technology and computing in schools. Previously, the ICSE schools operated computer labs that primarily focused on basic Information and Communication Technology (ICT). These labs provided fundamental knowledge and skills in using computers and understanding basic digital tools and software.

With the introduction of the “Tech Tinkerer” program, there has been a substantial upgrade in the scope and capability of computer labs. They have been transformed into AI and Robotics Labs, indicating a shift towards more advanced and contemporary areas of technology. This upgrade includes not only a complete coverage of traditional ICT subjects but also incorporates extensive training and education in Coding, Artificial Intelligence (AI), and Robotics.

This means that students are now exposed to a wider range of technological skills and knowledge. They learn programming languages and coding techniques, which are essential for creating software, apps, and websites. The AI component of the program introduces them to the principles of artificial intelligence, machine learning, and data analysis, providing them with insights into how intelligent systems are designed and function. Robotics education brings a hands-on approach to learning, where students can apply their coding and AI knowledge to build and program robots, understanding the mechanics, electronics, and software integration necessary for robotics.

Overall, the “Tech Tinkerer” program represents a modern and forward-thinking approach to technology education in schools, preparing students for a future where digital literacy, programming skills, and an understanding of AI and robotics will be increasingly important.

2. What classes does the Tech Tinkerer Program cater to?

This program is meticulously structured for students across a wide age range, specifically targeting those in Class 1 through Class 8. It is crafted to suit the learning capabilities and educational needs of each age group, gradually building complexity and depth as students progress through their school years.

3. Which concepts are covered in the Tech Tinkerer Program?

The program covers a diverse range of technological and computer science concepts. These include the basics of coding and programming languages, the fundamentals and applications of artificial intelligence, the principles of physical computing, the operation and understanding of robotics, general computer literacy, and an introduction to Windows 10 and various Microsoft Office tools. This wide range of topics ensures a well-rounded exposure to essential technology concepts.

4. What is the structure of lab activities in the program?

The program emphasizes practical learning, with a significant number of lab activities. For students in Class 1 and 2, there are 18 lab activities. This number increases to 25 for students from Class 3 to 8. These activities are designed to reinforce theoretical knowledge with hands-on experience, encouraging students to apply what they have learned in a practical, engaging environment.

6. How many sessions are included in the program for each class?

The program is comprehensive, with a total of 36 sessions for Class 1 and 2 students and 50 sessions for those in Class 3 to 8. Each session is carefully planned, splitting equally between classroom learning and lab activities to ensure a balanced educational experience.

7. What resources are provided for teachers in the Tech Tinkerer Program?

Teachers are equipped with extensive resources, including a detailed yearlong session-wise lesson plan, which guides them on how to effectively execute the program. Additionally, lecture slides are provided for every classroom learning and lab activity session, ensuring that teachers have the necessary tools and information to deliver the curriculum effectively.

8. Is there a capstone project in the Tech Tinkerer Program?

Yes, the program includes a capstone project, offering students an opportunity to work on open-ended projects. These projects are submitted in the Codeavour International Competition, providing a platform for students to showcase their creativity, problem-solving skills, and technological expertise.

9. What are PictoBlox Credits, and how many are provided to each student?

PictoBlox Credits are a unique feature of the program, acting as a currency within the PictoBlox software used for AI modules. Each student enrolled in the program receives 3000 PictoBlox credits, which can be used to access various features and tools within the software, enhancing their learning experience.

10. What certifications are available through the Tech Tinkerer Program?

Upon completing specific lab activities, students can earn digital certificates accredited by esteemed organisations like STEMpedia, STEM.org, and ARTPARK. These certifications recognise the students' achievements and mastery of the skills learned throughout the program.

11. How does the program integrate practical learning?

Tech Tinkerer is heavily focused on practical, experiential learning. It achieves this through an extensive array of lab activities that encourage students to apply theoretical concepts in real-world scenarios. This practical approach is crucial for deepening understanding and fostering a hands-on experience in technology and computer science.

12. Are there any competitions associated with the Tech Tinkerer Program?

Yes, the program offers access to the Codeavour competition, a significant platform for students to apply and test their learning in a competitive and stimulating environment. This exposure not only enhances their learning experience but also fosters a spirit of innovation and competitiveness.

13. What support is available for students and teachers in the program?

The Tech Tinkerer Program provides robust support for both students and teachers. Teachers receive detailed lesson plans and educational resources, while students are provided with engaging and interactive learning materials, access to technology tools, and opportunities to participate in competitions.

14. What is the role of PictoBlox and Quarky in Enhancing Practical Learning?

PictoBlox plays a pivotal role in demystifying Artificial Intelligence (AI) for students, serving as an accessible and engaging platform. It stands out for its user-friendly interface, making Python programming and AI concepts approachable for learners of various ages. Here's how PictoBlox enhances practical learning:

- 1. Intuitive Learning Approach:** PictoBlox simplifies the complexities of AI. It introduces students to Python, a language at the forefront of AI development, in an easy-to-understand manner. This approach helps bridge the gap between abstract AI concepts and their real-world applications.
- 2. Interactive AI Activities:** The platform offers a range of interactive activities, from image classification and object detection to natural language processing. These activities not only engage students but also provide a hands-on experience with the practical aspects of AI, enhancing their understanding and retention.
- 3. Accessible AI Concepts:** By breaking down AI into manageable components, PictoBlox makes learning AI accessible to a younger audience. It allows students to grasp fundamental AI principles and apply them in creative ways, fostering an early interest in this advanced field.
- 4. Enjoyable Learning Experience:** PictoBlox turns learning into a fun and interactive experience. Its engaging activities captivate students' attention, making the learning process enjoyable and less daunting, especially for complex topics like AI.

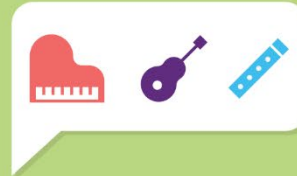
Quarky is a robotic tool that provides an invaluable hands-on experience in the world of robotics. It's an excellent educational resource, offering practical insights into robotics. The key aspects of Quarky in enhancing practical learning include:

- 1. Exploration of Robotic Movements:** Quarky allows students to delve into the mechanics of robotic movements. By programming and observing Quarky in action, students get a firsthand understanding of how robots move and operate, translating theoretical knowledge into practical skills.
- 2. Sensor Usage and Applications:** Quarky is equipped with various sensors, giving students the opportunity to learn about sensor technology and its applications in robotics. This hands-on experience is crucial in understanding how robots interact with their environment.
- 3. Control Systems Learning:** Through Quarky, students explore the different control systems used in robotics. They learn how to program and control a robot, gaining insights into the critical aspects of robotic navigation and manipulation.
- 4. Practical Understanding of Robotics:** By working with Quarky, students move beyond the theoretical aspects of robotics. They engage in practical activities, from building and programming to testing their robotic creations, which solidifies their understanding and sparks their interest in the field.

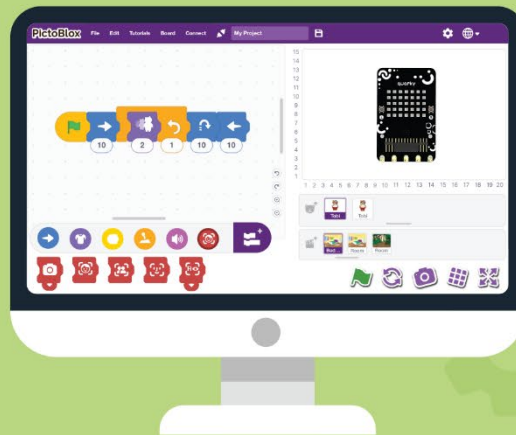
TECH TINKERER

Exploring Coding, AI, Robotics and Computers with Fun Activities

1
ICSE



Hi!



Learn Coding, Artificial Intelligence, and Robotics to foster creativity and innovation with hands-on activities and exciting real-world application-based projects.



Windows 10



PictoBlox



MS Paint

AUTHORED BY IIT ALUMNI

Tech Tinkerers - Class 1

Feature	Description
Number of Pages	66
Number of Chapters	6
Number of Activities	18
Sessions Required to Complete Course	Total 36 – (18 Lab Activities, 18 Classroom Learnings)
Software and Hardware Used	MS Paint, PictoBlox Jr, Quarky
Competition	Access to Codeavour
	Computers, Coding, Artificial Intelligence and Robotics
Resources Available for Teachers	Lesson Plan, and Lecture Slides (Containing Textual, Images, and Video based Content)
Certification	Yes. Need to submit 5 lab activities online to get digital certificate accredited by STEMpedia, STEM.org and ARTPARK.

Table of Contents – Tech Tinkerers (Class 1)

<p>Chapter 1: Know Your Computer</p> <ul style="list-style-type: none"> ★ What is a Machine? ★ Parts of a Computer ★ Use of a Computer ★ Keyboard and Mouse ★ Storage Devices ★ Rules to Follow in Computer Lab ★ Start the Computer ★ Shut Down the Computer <p>Lab Activity 1 – Parts of the Computer Lab Activity 2 – Typing with Keyboard Lab Activity 3 – Playing with Mouse</p>	1	<ul style="list-style-type: none"> ★ Pattern and Loop ★ Decision Making 	
<p>Chapter 2: Fun with Paint</p> <ul style="list-style-type: none"> ★ What is MS Paint? ★ Parts of MS Paint ★ Designer Tools of MS Paint ★ Basic Shape Tools <p>Lab Activity 4 – Draw a Truck Lab Activity 5 – Draw a Christmas Tree Lab Activity 6 – Draw the Indian Flag Lab Activity 7 – Draw a Traffic Signal</p>	18	<p>Chapter 4: Into the World of Coding</p> <ul style="list-style-type: none"> ★ Introduction to PictoBlox Jr ★ Key Terms of Coding ★ Exploring Important Blocks <p>Lab Activity 8 – Look at My Aquarium Lab Activity 9 – My First Code Lab Activity 10 – Moving Sprite Around Lab Activity 11 – About Me Lab Activity 12 – Twinkling Star Lab Activity 13 – Ballerina Dance</p>	35
<p>Chapter 3: Algorithmic Thinking</p> <ul style="list-style-type: none"> ★ Instructions ★ Sequence ★ Algorithm 	26	<p>Chapter 5: Into the Robotics</p> <ul style="list-style-type: none"> ★ What is a Robot? ★ Use of Robots in 21st Century ★ Introduction to Quarky ★ Exploring Quarky Features <p>Lab Activity 14 – Quarky Emotions Lab Activity 15 – Quarky Name Badge Lab Activity 16 – Touch Movement with Quarky Lab Activity 17 – Controlling Sprite using Quarky Button</p>	51
	26	<p>Chapter 6: Into the AI</p> <ul style="list-style-type: none"> ★ What is Intelligence ★ Explore Face Detection <p>Lab Activity 18 – Clown Maker</p>	60

TECH TINKERER

Exploring Coding, AI, Robotics and Computers with Fun Activities

2

ICSE



Learn Coding, Artificial Intelligence, and Robotics to foster creativity and innovation with hands-on activities and exciting real-world application-based projects.



Windows 10



PictoBlox



Tux Paint

AUTHORED BY IIT ALUMNI

Tech Tinkerers - Class 2

Feature	Description
Number of Pages	68
Number of Chapters	6
Number of Activities	18
Software and Hardware Used	Tux Paint, PictoBlox Jr, Quarky
Competition	Access to Codeavour
Technologies Covered	Computers, Coding, Artificial Intelligence and Robotics
Sessions Required to Complete Course	Total 36 – (18 Lab Activities, 18 Classroom Learnings)
Resources Available for Teachers	Lesson Plan, and Lecture Slides (Containing Textual, Images, and Video based Content)
Certification	Yes. Need to submit 5 lab activities online to get digital certificate accredited by STEMpedia, STEM.org and ARTPARK.

Table of Contents – Tech Tinkerers (Class 2)

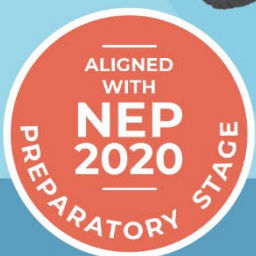
<p>Chapter 1: Know Your Computer</p> <ul style="list-style-type: none"> ★ What is a Computer ★ Human vs Computer ★ Type of Computers ★ Input and Output Devices ★ Keyboard and Special Keys ★ Introduction to File Management <p>Lab Activity 1 – Parts of the Computer</p> <p>Lab Activity 2 – Typing with Keyboard</p> <p>Lab Activity 3 – Playing with Mouse</p> <p>Chapter 2: Fun with Paint</p> <ul style="list-style-type: none"> ★ What is TUX Paint? ★ Parts of TUX Paint ★ Designer Tools of TUX Paint <p>Lab Activity 4 – Colouring Aeroplane</p> <p>Lab Activity 5 – Colouring Tractor</p> <p>Lab Activity 6 – Draw a Scenery</p> <p>Lab Activity 7 – Draw a House</p> <p>Chapter 3: Critical Thinking and Analysis</p> <ul style="list-style-type: none"> ★ Decision Making ★ Patterns and Loops ★ Decoding ★ Sequence 	<p>1</p> <p>20</p> <p>27</p>	<p>Chapter 4: Into the World of Coding</p> <ul style="list-style-type: none"> ★ Stepwise Thinking and Algorithms ★ Introduction to PictoBlox Jr ★ Key Terms of Coding ★ Exploring Important Blocks <p>Lab Activity 8 – My First Code</p> <p>Lab Activity 9 – Creating a Story</p> <p>Lab Activity 10 – Moving Sprite Around</p> <p>Lab Activity 11 – Dancing Fishes</p> <p>Lab Activity 12 – Controlling Tobit’s Height</p> <p>Lab Activity 13 – Ballerina Dance</p> <p>Chapter 5: Into the Robotics</p> <ul style="list-style-type: none"> ★ What is a Robot? ★ Use of Robots in 21st Century ★ Introduction to Quarky ★ Exploring Quarky Features <p>Lab Activity 14 – Quarky Traffic Light</p> <p>Lab Activity 15 & 16 – Quarky Robot Moves</p> <p>Chapter 6: Into the AI</p> <ul style="list-style-type: none"> ★ What is Intelligence ★ Explore Face Detection ★ Explore Hand Detection <p>Lab Activity 17 – Face Filter</p> <p>Lab Activity 18 – Balloon Popping with Hand</p>	<p>34</p> <p>52</p> <p>60</p>
---	------------------------------	---	-------------------------------

TECH TINKERER

Exploring Coding, AI, Robotics and Computers with Fun Activities

3

ICSE



Engaging learning experience for students to learn coding, artificial intelligence (AI) and robotics with integrated hands-on approach and fun projects!

AUTHORED BY IIT ALUMNI



Windows 10



PictoBlox



Office 16/19/365

Tech Tinkerers – Class 3

Feature	Description
Number of Pages	112
Number of Chapters	9
Number of Activities	25
Software and Hardware Used	Windows 10, Notepad, WordPad, MS Paint, Tux Paint, MS Word, MS Excel, PictoBlox, Quarky
Competition	Access to Codeavour
Technologies Covered	Computers, Coding, Artificial Intelligence and Robotics
Sessions Required to Complete Course	Total 50 – (25 Lab Activities, 25 Classroom Learnings)
Resources Available for Teachers	Lesson Plan, and Lecture Slides (Containing Textual, Images, and Video based Content)
Certification	Yes. Need to submit 10 lab activities online to get digital certificate accredited by STEMpedia, STEM.org and ARTPARK.

Chapter wise Learning Outcome

- 1. Chapter 1: Know Your Computer** - Gain foundational knowledge about computers, including their hardware and software components, different types, basic Windows operations, and simple text editing skills.
- 2. Chapter 2: Fun with Paint** - Explore the user interface and artistic tools of MS Paint to create digital art, focusing on brush techniques and image manipulation.
- 3. Chapter 3: Introduction to Algorithm and Coding** - Understand the basics of algorithmic thinking, stepwise problem-solving, and introductory programming concepts using PictoBlox.
- 4. Chapter 4: Introduction to MS Word** - Learn to navigate and utilize MS Word for text formatting, document creation, and efficient keyboard shortcuts.
- 5. Chapter 5: Introduction to MS Excel** - Discover the essentials of MS Excel, including its interface, cell management, and auto drag feature for data organization.
- 6. Chapter 6: The Internet** - Gain an understanding of the internet, its benefits and drawbacks, basic web navigation, and the importance of online safety.
- 7. Chapter 7: Fun with Robotics** - Explore the world of robotics with an introduction to the Quarky Robot, learning about its features and basic controls.
- 8. Chapter 8: Game Development** - Delve into the basics of game development using PictoBlox, focusing on the creation of simple games and understanding game variables.
- 9. Chapter 9: Learn About AI** - Get an introduction to Artificial Intelligence, its applications, and practical experiences with AI techniques like face detection.

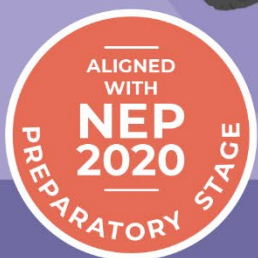
Capstone Project: Apply the accumulated skills in a comprehensive project, showcasing proficiency in computer science, coding, AI, and robotics.

Table of Contents – Tech Tinkerers (Class 3)

<p>Chapter 1: Know Your Computer</p> <ul style="list-style-type: none"> ★ IPO Cycle ★ Hardware and Software ★ Type of Computers ★ Introduction to Windows GUI ★ File Management in Windows ★ Safe and Normal Mode in Windows ★ Notepad and WordPad App <p>Lab Activity 1 - Playing with Windows GUI</p> <p>Lab Activity 2 - Type about Myself in Notepad</p> <p>Lab Activity 3 - About My School in WordPad</p> <p>Lab Activity 4 – Practicing File Management</p> <p>Chapter 2: Fun with Paint</p> <ul style="list-style-type: none"> ★ User Interface of MS Paint ★ Designer Tools of MS Paint ★ Brush Size and Style ★ Copy and Paste in MS Paint <p>Lab Activity 5 - My Snowman - MS Paint</p> <p>Lab Activity 6 - My Nature Scenery - MS Paint</p> <p>Chapter 3: Introduction to Algorithm and Coding</p> <ul style="list-style-type: none"> ★ Stepwise Thinking ★ Sequence and Decomposition ★ Algorithmic Thinking ★ Introduction to Programming ★ Decision-Making and Loops in Coding ★ Introduction to PictoBlox ★ Sprite and Stage in PictoBlox ★ Block Palette in PictoBlox ★ How can Sprite Communicate? <p>Lab Activity 7 - Tobi Walking</p> <p>Lab Activity 8 - Look at My Jungle</p> <p>Lab Activity 9 - Creating Animation - Flying Cat</p> <p>Lab Activity 10 - Barking Dog</p> <p>Lab Activity 11 - Story Making - Once Upon a Time</p> <p>Chapter 4: Introduction to MS Word</p> <ul style="list-style-type: none"> ★ Interface of MS Word ★ Font Manipulation in MS Word ★ Bullets and Numbering ★ Save and Print in MS Word ★ Shortcuts in MS Word <p>Lab Activity 12 - My Favourite Cartoon - MS Word</p>	<p>1</p> <p>23</p> <p>32</p> <p>55</p>	<p>Lab Activity 13 - Exploring MS Word</p> <p>Chapter 5: Introduction to MS Excel</p> <ul style="list-style-type: none"> ★ Interface of MS Excel ★ Cell, Rows, and Columns ★ Auto Drag in MS Excel <p>Lab Activity 14 - My Class List in MS Excel</p> <p>Chapter 6: The Internet</p> <ul style="list-style-type: none"> ★ Introduction to Internet ★ Advantages and Disadvantages of Internet ★ Opening Webpage and URL ★ Introduction to Online Safety <p>Lab Activity 15 – Exploring the Internet to Learn about Virat Kohli</p> <p>Chapter 7: Fun with Robotics</p> <ul style="list-style-type: none"> ★ Robots and their use in the 21st Century ★ Introduction to Quarky Robot ★ Quarky RGB LED Display ★ Quarky Touch Sensor & Quarky Buttons ★ Quarky Robot Control <p>Lab Activity 17 – Quarky Emotions</p> <p>Lab Activity 18 – Beating Heart Animation on Quarky</p> <p>Lab Activity 19 – Touch Piano with Quarky</p> <p>Lab Activity 20 – Controlling Sprite with Quarky Switches</p> <p>Lab Activity 21 – Wirelessly Controlled Quarky Robot</p> <p>Chapter 8: Game Development</p> <ul style="list-style-type: none"> ★ What is Game Development? ★ PictoBlox as Game Development Software ★ Variables in Games <p>Lab Activity 22 – Fruit Game</p> <p>Lab Activity 23 – Fruit Catching Game</p> <p>Chapter 9: Learn About AI</p> <ul style="list-style-type: none"> ★ What is Artificial Intelligence? ★ Application and Advantages of AI ★ Face Detection Technique in AI <p>Lab Activity 24 - Face Expression Detector</p> <p>Lab Activity 25 - Face Filter</p> <p>Capstone Project</p> <p>Sample Projects Built by Community</p> <p>Answer Key</p>	<p>66</p> <p>73</p> <p>79</p> <p>91</p> <p>100</p> <p>108</p> <p>109</p> <p>110</p>
--	--	--	---

TECH TINKERER

Exploring Coding, AI, Robotics and Computers with Fun Activities



Engaging learning experience for students to learn coding, artificial intelligence (AI) and robotics with integrated hands-on approach and fun projects!

AUTHORED BY IIT ALUMNI



Windows 10



PictoBlox



Office 16/19/365

Tech Tinkerers – Class 4

Feature	Description
Number of Pages	122
Number of Chapters	9
Number of Activities	25
Software and Hardware Used	Windows 10, MS Paint, Tux Paint, MS Word, MS Excel, PictoBlox Block Coding, PictoBlox AI, Quarky
Competition	Access to Codeavour
Technologies Covered	Computers, Coding, Artificial Intelligence and Robotics
Sessions Required to Complete Course	Total 50 – (25 Lab Activities, 25 Classroom Learnings)
Resources Available for Teachers	Lesson Plan, and Lecture Slides (Containing Textual, Images, and Video based Content)
Certification	Yes. Need to submit 10 lab activities online to get digital certificate accredited by STEMpedia, STEM.org and ARTPARK.

Chapter wise Learning Outcome

- 1. Chapter 1: Know Your Computer** - Understand data and information, learn about different types of memory and data storage units, and get acquainted with Windows 10 and file management basics.
- 2. Chapter 2: Fun with Paint** - Gain skills in using MS Paint and Tux Paint, including working with designer tools, editing shapes, importing images, and creating digital art.
- 3. Chapter 3: Basics of Coding and Algorithm** - Learn the fundamentals of algorithms, programming basics with PictoBlox, decision-making, loops, variables, operators, and debugging.
- 4. Chapter 4: Introduction to MS Word** - Explore the interface of MS Word, learn text formatting, thesaurus usage, and create artistic text with WordArt.
- 5. Chapter 5: Introduction to PowerPoint** - Understand the PowerPoint interface, learn how to choose themes, add slides, insert pictures, and present slides effectively.
- 6. Chapter 6: The Internet** - Learn about internet connectivity, network roles, essential internet terms, web browsers, and the importance of internet safety.
- 7. Chapter 7: Fun with Robotics** - Discover the world of robotics, learn about Quarky, explore tactile switches, RGB LED displays, and principles of colour and light mixing.
- 8. Chapter 8: Fun with AI** - Understand the basics of Artificial Intelligence, explore AI robots, and engage in practical AI applications like human body detection.
- 9. Chapter 9: Stepping into Game Design** - Delve into game design principles, understand the importance of rules in game design, and learn about variables in gaming contexts.

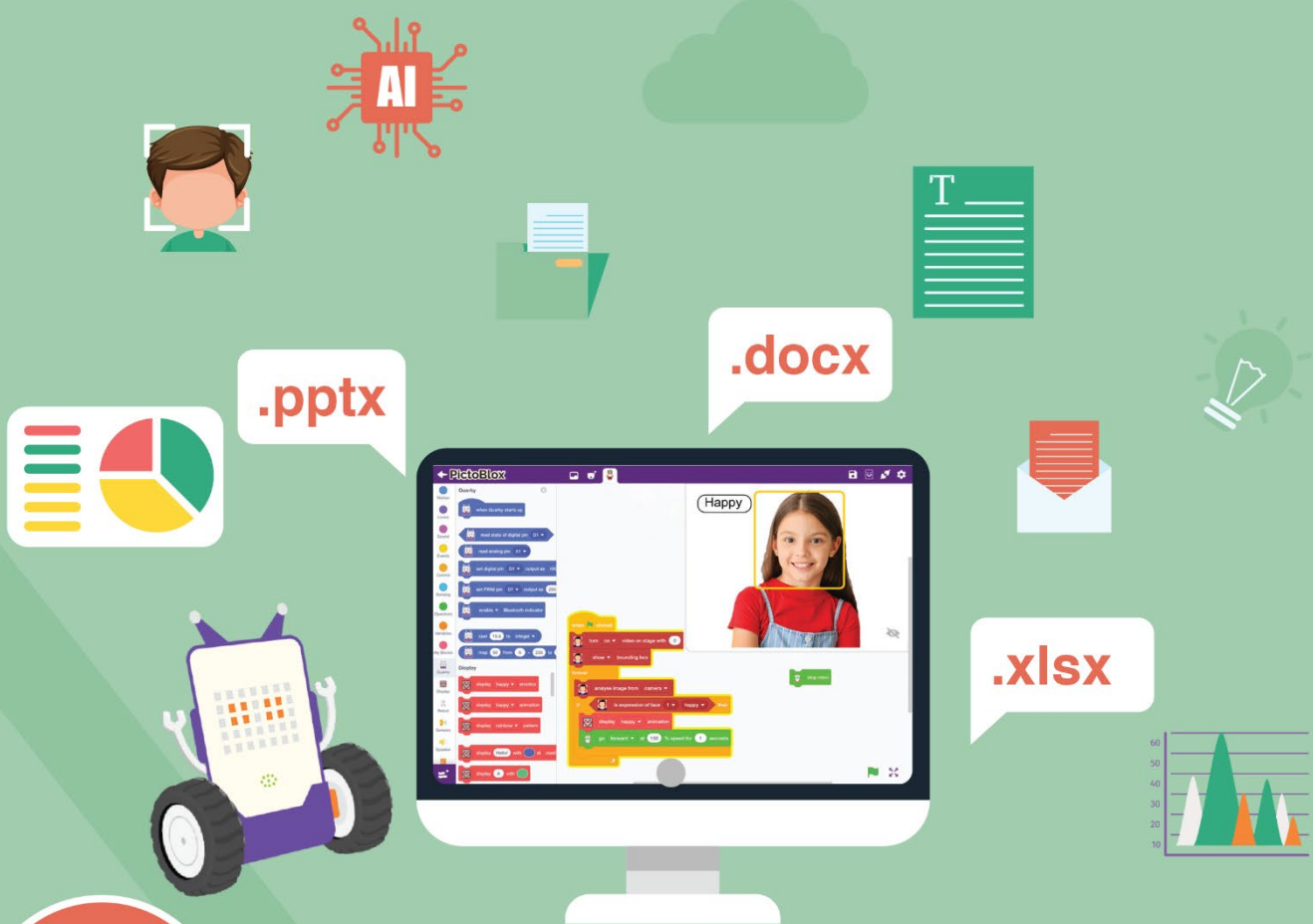
Capstone Project: Apply the accumulated skills in a comprehensive project, showcasing proficiency in computer science, coding, AI, and robotics.

Table of Contents – Tech Tinkerers (Class 4)

<p>Chapter 1: Know Your Computer 1</p> <ul style="list-style-type: none"> ★ Data and Information ★ Data Storage Units: The Basics ★ Types of Memory: Internal and External ★ Working with Windows 10 ★ Features of File Management <p>Lab Activity 1 - Playing with Windows GUI</p> <p>Lab Activity 2 - Manage My Folder</p> <p>Chapter 2: Fun with Paint 15</p> <ul style="list-style-type: none"> ★ Working with MS Paint ★ Designer Tools of MS Paint ★ Editing Shapes in MS Paint ★ Importing Image in MS Paint ★ Getting Started with Tux Paint ★ Important Tools in Tux Paint <p>Lab Activity 3 - Painting A Story in MS Paint</p> <p>Lab Activity 4 - Animal Collage in Paint</p> <p>Lab Activity 5 - My School Bus – TUX Paint</p> <p>Chapter 3: Basics of Coding and Algorithm 31</p> <ul style="list-style-type: none"> ★ What is an Algorithm? ★ Introduction to Programming and PictoBlox ★ Palette Explanation in PictoBlox – Events, Motion, Sensing, and Looks ★ Decision Making ★ Loops ★ Introduction to Variables ★ Operators in Programming ★ Introduction to Debugging <p>Lab Activity 6 - Bringing Tobi to Life with Animation</p> <p>Lab Activity 7 - Working with Conditions</p> <p>Lab Activity 8 - Grade Calculator</p> <p>Lab Activity 9 - Reciting Tables with Loop</p> <p>Lab Activity 10 - Addition Bot</p> <p>Lab Activity 11 - Bouncing Tobi</p> <p>Chapter 4: Introduction to MS Word 51</p> <ul style="list-style-type: none"> ★ Interface of MS Word ★ Text Formatting Options in MS Word ★ Thesaurus in MS Word ★ WordArt in MS Word <p>Lab Activity 12 & 13 - Practicing Word with Monkeys</p> <p>Chapter 5: Introduction to PowerPoint 61</p> <ul style="list-style-type: none"> ★ Interface of PowerPoint ★ Choosing a Theme 	<ul style="list-style-type: none"> ★ Adding Slides ★ Inserting a Picture ★ Adding Text ★ Saving the Presentation ★ Presenting The Slides <p>Lab Activity 14 & 15 - MS PowerPoint Presentation</p> <p>Chapter 6: The Internet 70</p> <ul style="list-style-type: none"> ★ Introduction to Internet Connectivity ★ Understanding Network in Terms of Internet ★ Role of Networks in Internet Functionality ★ Basic Requirements for an Internet Connection ★ Key Internet Terms ★ Exploring Web Browsers ★ Internet Safety <p>Chapter 7: Fun with Robotics 80</p> <ul style="list-style-type: none"> ★ What is a Robot? ★ Robots Around Us ★ Advantages of Robots ★ Introduction to Quarky ★ Tactile Switch in Quarky ★ Quarky RGB LED Display and RGB Mixing <p>Lab Activity 16 - Traffic Light with Quarky</p> <p>Lab Activity 17 - Digital Dice with Quarky</p> <p>Lab Activity 18 - Fun with Music – Dance Party</p> <p>Lab Activity 19 - Principles of Colour and Light Mixing</p> <p>Lab Activity 20 - LED Looping Pattern with Quarky</p> <p>Chapter 8: Fun with AI 96</p> <ul style="list-style-type: none"> ★ What is Artificial Intelligence? ★ AI Robots Around Us ★ Human Body Detection – Pose and Hand Detection <p>Lab Activity 21 - Finger Tracing with AI</p> <p>Lab Activity 22 - Clown Maker with Human Detection</p> <p>Chapter 9: Stepping into Game Design 104</p> <ul style="list-style-type: none"> ★ Introduction to Game Design ★ Rules While Designing a Game ★ Introduction to Level Up Games ★ Variables and Their Types <p>Lab Activity 23 - Beetle in the Maze</p> <p>Lab Activity 24 & 25 - Coin Collector Game</p> <p>Capstone Project 119</p> <p>Sample Projects Built by Community 120</p> <p>Answer Key 121</p>
--	---

TECH TINKERER

Exploring Coding, AI, Robotics and Computers with Fun Activities



Engaging learning experience for students to learn coding, artificial intelligence (AI) and robotics with integrated hands-on approach and fun projects!

AUTHORED BY IIT ALUMNI



Windows 10



PictoBlox



Office 16/19/365

Tech Tinkerers – Class 5

Feature	Description
Number of Pages	126
Number of Chapters	7
Number of Activities	25
Software and Hardware Used	Windows 10, Calculator, MS Paint, WordPad, MS Word, MS PowerPoint, PictoBlox Block Coding, PictoBlox AI, Quarky
Competition	Access to Codeavour
Technologies Covered	Computers, Coding, Artificial Intelligence and Robotics
Sessions Required to Complete Course	Total 50 – (25 Lab Activities, 25 Classroom Learnings)
Resources Available for Teachers	Lesson Plan, and Lecture Slides (Containing Textual, Images, and Video based Content)
Certification	Yes. Need to submit 10 lab activities online to get digital certificate accredited by STEMpedia, STEM.org and ARTPARK.

Chapter wise Learning Outcome

- 1. Chapter 1: Know Your Computer** - Understand the evolution and generations of computers, learn about their characteristics, operating systems, common Windows 10 programs, and distinguish between system and application software.
- 2. Chapter 2: Coding & Algorithmic Thinking** - Grasp the concept of algorithms, flowcharts, algorithmic thinking, and engage in various coding activities using PictoBlox, including QR code reading and game development.
- 3. Chapter 3: Explore More in MS Word** - Learn advanced MS Word features like tables, spell check, find and replace, headers and footers, text effects, and working with shapes.
- 4. Chapter 4: Introduction to PowerPoint** - Discover how to use PowerPoint, including its interface, themes, slide editing, and presentation techniques.
- 5. Chapter 5: Fun with Robotics** - Explore the fundamentals of robotics with Quarky, learning about robot movement, servo motors, IR sensors, and creating interactive robot projects.
- 6. Chapter 6: The World of AI** - Delve into Artificial Intelligence, covering speech recognition, text-to-speech, AI in road safety, and practical AI projects like weather monitoring systems.
- 7. Chapter 7: Internet Connectivity** - Understand internet connectivity, various connection methods, online etiquette, and effective participation in online discussions.

Capstone Project: Apply the accumulated knowledge and skills in a comprehensive project, showcasing proficiency in all the areas covered in the chapters.

Table of Contents – Tech Tinkerers (Class 5)

<p>Chapter 1: Know Your Computer</p> <ul style="list-style-type: none"> ★ History of Computers ★ Generation of Computers ★ Characteristics of Computers ★ Introduction to Operating System ★ Basics of Snipping Tool and Character Map ★ Introduction to Software ★ System and Application Software ★ System Vs Application Software ★ Common Programs in Windows 10 <p>Lab Activity 1 - Working with Calculator in Windows Lab Activity 2 - Working with MS Paint and WordPad</p> <p>Chapter 2: Coding & Algorithmic Thinking</p> <ul style="list-style-type: none"> ★ What is an Algorithm? ★ Understanding Flowchart and Symbols ★ Exploring Algorithmic Thinking ★ Understanding Decomposition ★ Introduction to Coding ★ Costume Editor in PictoBlox ★ Block Palettes in PictoBlox ★ Coordinate System of Stage ★ Cloning in PictoBlox ★ Reading QR Code with PictoBlox ★ Effects in Looks Palette <p>Lab Activity 3 - Animating Tobi's Walk in PictoBlox Lab Activity 4 - Taco Chase: Evading the Beetle Lab Activity 5 - Colourful Tobi Tracing with PictoBlox Lab Activity 6 - Star Scribbler Lab Activity 7 - Space Battle Game – Part 1 Lab Activity 8 - Space Battle Game – Part 2 Lab Activity 9 - QR Code Reader Lab Activity 10 - QR Code-Based Shopping Cart Lab Activity 11 - QR Code Book Scanner</p> <p>Chapter 3: Explore More in MS Word</p> <ul style="list-style-type: none"> ★ Tables and Tools Used in MS Word ★ Correcting Spelling and Grammar ★ Find and Replace Text ★ Header and Footer ★ Superscript and Subscript ★ Apply Shadow to Text ★ Working with Shapes <p>Lab Activity 12 - Creating and Managing Tables Lab Activity 13 – Formatting Documents in MS Word</p>	<p>1 Chapter 4: Introduction to PowerPoint 66</p> <ul style="list-style-type: none"> ★ What is PowerPoint and its Interface ★ Choosing a Theme ★ Adding and Editing Slides ★ Inserting Pictures and Text ★ Saving and Presenting the Slides <p>Lab Activity 14 & 15 - MS PowerPoint Presentation</p> <p>Chapter 5: Fun with Robotics 76</p> <ul style="list-style-type: none"> ★ Introduction to Robotics and Quarky ★ How a Robot Moves? ★ Quarky Gripper Robot ★ Servo Motor Control with Quarky ★ Making a Robot Pet ★ Understanding IR Sensors <p>Lab Activity 16 - Wirelessly Controlled Quarky Robot Lab Activity 17 - Gripper Robot Controls Lab Activity 18 - Coding the Robot Pet Lab Activity 19 & 20 - LED Chase Game with Quarky Lab Activity 21 - Bright Lamp with Quarky</p> <p>Chapter 6: The World of AI 98</p> <ul style="list-style-type: none"> ★ What is Artificial Intelligence? ★ Speech Recognition AI Technique ★ Text to Speech with PictoBlox ★ AI for Road Safety ★ Types of Road Signs in India ★ Recognition Card for PictoBlox ★ Self-Driving Car ★ Weather Monitoring System <p>Lab Activity 22 - Smart Lamp with Speech Recognition Lab Activity 23 - Detecting Signs & Landmarks with PictoBlox Lab Activity 24 - Self-Driving Car Lab Activity 25 - Weather Monitoring System</p> <p>Chapter 7: Internet Connectivity 117</p> <ul style="list-style-type: none"> ★ Introduction to Internet Connectivity ★ Different Ways to Connect to the Internet ★ Netiquette: The Etiquette of Online Communication ★ Organizing and Participating in Online Discussions <p>Capstone Project 123 Sample Projects Built by Community 124 Answer Key 126</p>
--	---

TECH TINKERER

Exploring Coding, AI, Robotics and Computers with Fun Activities

6

ICSE



Learn Coding, Artificial Intelligence, and Robotics to foster creativity and innovation with hands-on activities and exciting real-world application-based projects.

AUTHORED BY IIT ALUMNI



Windows 10



PictoBlox



Office 16/19/365

Tech Tinkerers – Class 6

Feature	Description
Number of Pages	154
Number of Chapters	10
Number of Activities	25
Software and Hardware Used	Windows 10, Windows Media Player, MS Word, MS PowerPoint, PictoBlox Block Coding, PictoBlox AI, Quarky, HTML
Competition	Access to Codeavour
Technologies Covered	Computers, Coding, Artificial Intelligence and Robotics
Sessions Required to Complete Course	Total 50 – (25 Lab Activities, 25 Classroom Learnings)
Resources Available for Teachers	Lesson Plan, and Lecture Slides (Containing Textual, Images, and Video based Content)
Certification	Yes. Need to submit 10 lab activities online to get digital certificate accredited by STEMpedia, STEM.org and ARTPARK.

Chapter wise Learning Outcome

- 1. Chapter 1: Basics of ICT** - Understand the computer system, different computer categories, programming languages, file management in Windows, and file formats.
- 2. Chapter 2: Introduction to Coding** - Learn the basics of coding, its applications, and explore PictoBlox for creating animations.
- 3. Chapter 3: Variable using Block Coding** - Understand variables in coding, their naming rules, data types, and operations using block coding in PictoBlox.
- 4. Chapter 4: Control with Conditions** - Master conditional programming, relational and logical operators, and nested conditional statements in coding.
- 5. Chapter 5: Basics of MS Word** - Explore MS Word's interface, text formatting tools, table creation, and mail merge function.
- 6. Chapter 6: Basics of Microsoft PowerPoint** - Learn about PowerPoint's interface, slide design, adding text and images, and presenting slideshows.
- 7. Chapter 7: Introduction to Robotics** - Discover different types of robots, their advantages, and basic programming using Quarky.
- 8. Chapter 8: Fun with AI** - Explore the basics of Artificial Intelligence, human vs. AI intelligence, and face detection techniques.
- 9. Chapter 9: Online Surfing** - Understand internet basics, web browsing, search engines, email, online storage, e-commerce, and digital content creation.
- 10. Chapter 10: Introduction to HTML** - Learn HTML basics, including tags, document structure, styles, images, and creating HTML documents.

Capstone Project: Apply the accumulated knowledge and skills in a comprehensive project, showcasing proficiency in all the areas covered in the chapters.

Table of Contents – Tech Tinkerers (Class 6)

<p>Chapter 1: Basics of ICT</p> <ul style="list-style-type: none"> ★ The Computer System ★ Categories of Computers ★ Computer Programming Languages ★ Generations of Programming Language ★ Translators and their Types ★ Working With Windows ★ Windows Explorer ★ Searching Files using Wildcard Characters ★ File Management to Organize Data ★ File Transfer ★ Understanding File Formats <p>Lab Activity 1 - Practice Search & File Management in Windows 10</p> <p>Lab Activity 2 - Practice Data Transfer in Windows</p> <p>Lab Activity 3 - Practice File Compression in Windows</p> <p>Chapter 2: Introduction to Coding</p> <ul style="list-style-type: none"> ★ How do Traffic Lights work? ★ What is Coding? ★ Application of Coding ★ Programming Language ★ Introduction to PictoBlox and its Interface ★ Block Palettes in PictoBlox <p>Lab Activity 4 - Tobi Walking Animation</p> <p>Chapter 3: Variable using Block Coding</p> <ul style="list-style-type: none"> ★ What are Variables? ★ Naming Rules for Variables ★ Data Types in Variables ★ Performing Operations on Variables ★ Arithmetic Operators ★ Assignment Operators ★ Increment Decrement Operators <p>Lab Activity 5 - Tracking Sprite using Variables</p> <p>Lab Activity 6 - Addition Bot</p> <p>Lab Activity 7 - Playing with Quarky</p> <p>Lab Activity 8 - Traffic Light with Quarky</p> <p>Chapter 4: Control with Conditions</p> <ul style="list-style-type: none"> ★ Conditional Programming ★ Relational Operators ★ Logical Operators - AND, OR, and NOT ★ Combining Logical Operators 	<p>1</p> <p>21</p> <p>30</p> <p>44</p>	<ul style="list-style-type: none"> ★ Nested Conditional Statements <p>Lab Activity 9 - Logical Operators with Quarky</p> <p>Lab Activity 10 - Profit and Loss Calculator</p> <p>Lab Activity 11 - Nested Conditional Statement</p> <p>Chapter 5: Basics of MS Word</p> <ul style="list-style-type: none"> ★ Interface of MS Word ★ Formatting Text Tools ★ The table in Microsoft Word ★ Mail Merge in Word <p>Lab Activity 12 - Practice MS Word - Working with Tables</p> <p>Lab Activity 13 - Practice Mail Merge with MS Word</p> <p>Chapter 6: Basics of Microsoft PowerPoint</p> <ul style="list-style-type: none"> ★ Interface of MS PowerPoint ★ Slide Design and Layouts ★ Adding Text, Images, and Shapes to Slides ★ Presenting Your Slideshow <p>Lab Activity 14 & 15 - Practice MS PowerPoint - Present Yourself</p> <p>Chapter 7: Introduction to Robotics</p> <ul style="list-style-type: none"> ★ Types of Robots ★ Advantages and Application of Robots ★ Introduction to Quarky ★ Introduction to Sensors ★ Introduction to Actuators ★ Obstacle Avoidance Robot <p>Lab Activity 16 - Discovering Robot Controls</p> <p>Lab Activity 17 - Wirelessly Controlled Robot</p> <p>Lab Activity 18 - Controlling Servo Motor</p> <p>Lab Activity 19 - Obstacle Avoidance Robot</p> <p>Chapter 8: Fun with AI</p> <ul style="list-style-type: none"> ★ Human and Animal Intelligence ★ Introduction to Artificial Intelligence ★ Current Trends of AI ★ AI vs. Human Intelligence ★ Face Detection Technique ★ Generative AI: ChatGPT <p>Lab Activity 20 - Face Detection with PictoBlox</p> <p>Lab Activity 21 - Creating a Face Filter App</p> <p>Lab Activity 22 - Transform Word in Colourful Emojis</p>	<p>58</p> <p>72</p> <p>82</p> <p>103</p>
---	--	---	--

Chapter 9: Online Surfing
120
Chapter 10: Introduction to HTML
137

- ★ Internet and Web Browsing
- ★ Web Browsers
- ★ Search Engine
- ★ Introduction to Email
- ★ Format of the Email Message
- ★ Fake Emails
- ★ Google Drive
- ★ E-Commerce
- ★ Online Modes of Payment
- ★ Blogging and Podcast
- Lab Activity 23** - Writing an Email to a Friend

- ★ HTML Tags and Attributes
- ★ Rules for Tags
- ★ HTML Document Structure
- ★ Titles and Footers
- ★ HTML Styles
- ★ HTML Images
- ★ Creating and Saving Document
- Lab Activity 24 & 25** - HTML Basic - A Space Exploration Journey
- Capstone Project** **150**
- Sample Projects Built by Community** **151**
- Answer Key** **152**

TECH TINKERER

Exploring Coding, AI, Robotics and Computers with Fun Activities

7

ICSE



Learn Coding, Artificial Intelligence, and Robotics to foster creativity and innovation with hands-on activities and exciting real-world application-based projects.

AUTHORED BY IIT ALUMNI



Windows 10



PictoBlox



Office 16/19/365

Tech Tinkerers – Class 7

Feature	Description
Number of Pages	164
Number of Chapters	11
Number of Activities	25
Software and Hardware Used	Windows 10, PicsArt App, MS Excel, PictoBlox Block Coding, PictoBlox AI, Quarky, HTML
Competition	Access to Codeavour
Technologies Covered	Computers, Coding, Artificial Intelligence and Robotics
Sessions Required to Complete Course	Total 50 – (25 Lab Activities, 25 Classroom Learnings)
Resources Available for Teachers	Lesson Plan, and Lecture Slides (Containing Textual, Images, and Video based Content)
Certification	Yes. Need to submit 10 lab activities online to get digital certificate accredited by STEMpedia, STEM.org and ARTPARK.

Chapter wise Learning Outcome

1. **Chapter 1: Basics of ICT** - Learn about computer hardware, software, Windows OS, file management, number systems, and digital creativity with PicsArt.
2. **Chapter 2: Coding & Variables in Real Life** - Recap coding basics, explore PictoBlox, understand variables, arithmetic operators, and expressions in programming.
3. **Chapter 3: Sequencing with Block Coding** - Review loops, learn sequencing, selection, iteration in programming, and understand bugs and conditional statements.
4. **Chapter 4: Fun with Functions** - Understand functions in programming, their parameters, return values, and event handling in PictoBlox.
5. **Chapter 5: Collections and Arrays** - Learn about collections, arrays in Python and block coding, iterating over collections, and sorting lists using arrays.
6. **Chapter 6: Introduction to MS Excel** - Get acquainted with MS Excel's interface, data sorting, filtering, chart creation, and worksheet printing.
7. **Chapter 7: Fun with AI** - Recap AI fundamentals, explore AI techniques like face detection, computer vision, speech recognition, and NLP with PictoBlox.
8. **Chapter 8: Mastering Robotics** - Understand robotics, applications of robots, line following robots, self-driving cars, and AI in robotics.
9. **Chapter 9: Advance HTML** - Recap HTML basics, learn about inserting images, links, creating tables, and forms in web pages.
10. **Chapter 10: Computer Virus** - Understand what a computer virus is, its types, antivirus software, and preventative measures against virus attacks.
11. **Chapter 11: Ethics and Safety Measures in Computing** - Learn the pros and cons of internet usage, computing ethics, preventing unethical practices, and managing digital footprints.

Capstone Project: Apply the accumulated knowledge and skills in a comprehensive project, showcasing proficiency in all the areas covered in the chapters.

Table of Contents – Tech Tinkerers (Class 7)

<p>Chapter 1: Basics of ICT</p> <ul style="list-style-type: none"> ★ Parts of a Computer – Internal and External Hardware ★ Computer Software ★ Windows OS ★ File Explorer in Windows ★ Basics of File Management ★ Data Representation and Number Systems ★ Converting Decimal Numbers to Binary ★ Conversion from Decimal to Octal Number ★ Conversion from Decimal to Hexadecimal Number ★ PicsArt Application <p>Lab Activity 1 - Practice Files and Folders Lab Activity 2 - Digital Collage with PicsArt</p>	<p>1</p>	<ul style="list-style-type: none"> ★ Arranging the Books ★ What is an Event and Event Handler? <p>Lab Activity 9 - Properties of a Circle</p>	
<p>Chapter 2: Coding & Variables in Real Life</p> <ul style="list-style-type: none"> ★ Recap of Coding ★ Introduction to PictoBlox ★ Variables ★ Arithmetic Operators ★ Expressions in Programming ★ Validating User Input in Programming <p>Lab Activity 3 - Tobi Walking Animation Lab Activity 4 - Beetle in the Maze Lab Activity 5 - Drawing Patterns with Variables Lab Activity 6 - Playing with Quarky</p>	<p>21</p>	<p>Chapter 5: Collections and Arrays</p> <ul style="list-style-type: none"> ★ What is a Collection? ★ Collections in PictoBlox ★ Algorithm for a Perfect Square ★ What are Arrays? ★ Array In Python and Block Coding ★ Iteration Over the Collection ★ Types of Collections ★ Low-Level vs. High-Level Programming Language ★ Sorting List using Array <p>Lab Activity 10 - Building a Zoo Lab Activity 11 - Fun with Array Lab Activity 12 - Perfect Squares Lab Activity 13 - Sorting a List</p>	<p>60</p>
<p>Chapter 3: Sequencing with Block Coding</p> <ul style="list-style-type: none"> ★ Recap of Loops ★ Elements of Programming – Sequencing, Selection, and Iteration ★ What is a Bug? ★ Types of Loops - While Loop, For Loop, and Nested Loop ★ Introduction to Conditional Statements ★ Distributing Birthday Sweets <p>Lab Activity 7 - Reciting Table Lab Activity 8 - Reflex Game with Quarky</p>	<p>38</p>	<p>Chapter 6: Introduction to MS Excel</p> <ul style="list-style-type: none"> ★ Sorting Data in Excel ★ Filter Data in Excel & Advanced Filtering ★ Introduction of Chart ★ Creating a Chart ★ Printing a Worksheet <p>Lab Activity 14 - Excel Practical Exercise: Sales Data Analysis Lab Activity 15 - Mastering Excel Charts</p>	<p>78</p>
<p>Chapter 4: Fun with Functions</p> <ul style="list-style-type: none"> ★ What Exactly are Functions? ★ How to Reduce Redundancy using Functions? ★ Parameters in Functions ★ Functions in PictoBlox ★ Can the Function Return a Value? 	<p>49</p>	<p>Chapter 7: Fun with AI</p> <ul style="list-style-type: none"> ★ Recap of Artificial Intelligence ★ AI Contributes to National Development ★ AI Technique - Face Detection ★ Face Detection with PictoBlox ★ AI Technique - Computer Vision ★ Object Detection in PictoBlox ★ AI Technique - Speech Recognition ★ Speech Recognition in PictoBlox ★ AI Technique - Natural Language Processing ★ NLP with PictoBlox ML Environment ★ Ethics in AI <p>Lab Activity 16 - Face Expression Recognizer Lab Activity 17 - Object Detection with Computer Vision Lab Activity 18 - Making Alexa with Speech Recognition</p>	<p>94</p>

Lab Activity 19 - Text Classifier with NLP			
Chapter 8: Mastering Robotics	112		
★ Introduction to Robotics Advantages and Application of Robots			
★ Quarky Robot			
★ Line Following Robots			
★ Self-Driving Car			
★ AI Delivery Robot			
Lab Activity 20 - Wirelessly Controlled Robot			
Lab Activity 21 - Line Following Robot			
Lab Activity 22 - Self-Driving Car			
Chapter 9: Advance HTML	129		
★ Recap of HTML			
★ Inserting Images in Web Pages			
★ Inserting Links in Web Pages			
★ Creating Tables in HTML			
★ Creating Forms			
Lab Activity 23 - Building and Styling a Personal Webpage			
Lab Activity 24 - Creating a List-Based Menu			
Lab Activity 25 - Constructing a Contact Form			
		Chapter 10: Computer Virus	146
		★ What is a Computer Virus?	
		★ Types of Computer Viruses	
		★ What is Antivirus Software	
		★ Preventative Measures Against Viruses	
		★ Different Forms of Virus Attacks	
		Chapter 11: Ethics and Safety Measures in Computing	153
		★ Advantages and Disadvantages of Using the Internet	
		★ Ethics in Computing	
		★ Understanding and Preventing Unethical Practices	
		★ Digital Footprints: Understanding and Managing Your Online Presence	
		Capstone Project	160
		Sample Projects Built by Community	161
		Answer Key	162

TECH TINKERER

Exploring Coding, AI, Robotics and Computers with Fun Activities

8

ICSE



Learn Coding, Artificial Intelligence, and Robotics to foster creativity and innovation with hands-on activities and exciting real-world application-based projects.



Windows 10



PictoBlox



Office 16/19/365

AUTHORED BY IIT ALUMNI

Tech Tinkerers – Class 8

Feature	Description
Number of Pages	160
Number of Chapters	8
Number of Activities	25
Software and Hardware Used	Windows 10, Canva App, MS Excel, PictoBlox Block Coding, PictoBlox Python Coding, PictoBlox Machine Learning, PictoBlox AI, Quarky
Competition	Access to Codeavour
Technologies Covered	Computers, Coding, Artificial Intelligence and Robotics
Sessions Required to Complete Course	Total 50 – (25 Lab Activities, 25 Classroom Learnings)
Resources Available for Teachers	Lesson Plan, and Lecture Slides (Containing Textual, Images, and Video based Content)
Certification	Yes. Need to submit 10 lab activities online to get digital certificate accredited by STEMpedia, STEM.org and ARTPARK.

Chapter wise Learning Outcome

- 1. Chapter 1: Basics of Operating System** - Learn about operating systems, their necessity, functions, features, types, user interfaces, and design using Canva.
- 2. Chapter 2: Algorithms and Flowchart** - Understand algorithms, flowcharts, their benefits, and pseudocode.
- 3. Chapter 3: Basics of Python Programming** - Grasp Python programming fundamentals, including syntax, variables, operators, lists, and control flow.
- 4. Chapter 4: Introduction to MS Excel** - Explore MS Excel's interface, data sorting, filtering, chart creation, and printing worksheets.
- 5. Chapter 5: Artificial Intelligence and Machine Learning** - Recap AI, understand machine learning types, model types in machine learning, neural networks, and NLP.
- 6. Chapter 6: Introduction to Robotics and Emerging Technologies** - Learn about the advantages of robots, augmented reality, virtual reality, mixed reality, and blockchain technology.
- 7. Chapter 7: Basics of App Development** - Understand the importance of apps, their basic architecture, and the development of simple apps.
- 8. Chapter 8: Computer Networking** - Learn about network types, internet-related terms, networking protocols, and cloud computing.

Capstone Project: Crown the learning journey by applying the accumulated knowledge and skills in a comprehensive project, showcasing proficiency in all the areas covered in the chapters.

Table of Contents – Tech Tinkerers (Class 8)

<p>Chapter 1: Basics of Operating System</p> <ul style="list-style-type: none"> ★ Introduction to Operating Systems ★ The Need for Operating Systems ★ Functions of Operating Systems ★ Features of Operating Systems ★ Single-User Operating Systems ★ Multi-User Operating Systems ★ Understanding User Interfaces ★ Command-Line Interface (CLI) ★ Graphical User Interface (GUI) ★ Canva Application <p>Lab Activity 1 - Designing with Canva</p> <p>Chapter 2: Algorithms and Flowchart</p> <ul style="list-style-type: none"> ★ What is an Algorithm? ★ What is a Flowchart? ★ The Benefit of Using a Flowchart ★ What is Pseudocode? <p>Lab Activity 2 - Algorithm and Flowcharts</p> <p>Chapter 3: Basics of Python Programming</p> <ul style="list-style-type: none"> ★ Introduction to Python ★ PictoBlox Python Interface ★ Python Statements ★ Python Comments ★ Keywords, Identifiers, and Indentation ★ Variables and Data Types ★ Python Operators – Arithmetic, Comparison, Logical, Assignment ★ Lists ★ Flow of Control and Conditions <p>Lab Activity 3 - First Python Code</p> <p>Lab Activity 4 - Addition Bot with Python</p> <p>Lab Activity 5 & 6 - Operators in Python</p> <p>Lab Activity 7 & 8 - Lists in Python</p> <p>Lab Activity 9 - Working with Conditions in Python</p> <p>Lab Activity 10 - Nested Conditional Statements in Python</p> <p>Lab Activity 11 - For Loop in Python</p> <p>Lab Activity 12 - While Loop in Python</p> <p>Lab Activity 13 - Combining Conditional and Loop Programming in Python</p> <p>Lab Activity 14 & 15 - Prime Numbers with Python</p>	<p>1</p> <p>21</p> <p>29</p>	<p>Chapter 4: Introduction to MS Excel</p> <ul style="list-style-type: none"> ★ The Interface of MS Excel ★ Sorting Data in Excel ★ Filter Data in Excel ★ Advanced Filtering ★ Introduction of Chart ★ Components of a Chart ★ Creating a Chart ★ Printing a Worksheet <p>Lab Activity 16 - Excel Practical Exercise: Sales Data Analysis</p> <p>Lab Activity 17 - Mastering Excel Charts</p> <p>Chapter 5: Artificial Intelligence and Machine Learning</p> <ul style="list-style-type: none"> ★ Recap of Artificial Intelligence ★ How AI Contributes to National Development and Building ★ Sustainable Development Goals ★ AI Project Cycle ★ Risks and Barriers to Artificial Intelligence ★ Machine Learning ★ Types of Machine Learning ★ Model Types in Machine Learning ★ Machine Learning in PictoBlox – Image, Pose, Hand Pose, Object Detection, Text, Audio and Numbers ML Models ★ Neural Network ★ Natural Language Processing <p>Lab Activity 18 - Mask Detection with Image Classifier (ML)</p> <p>Lab Activity 19 - Making Alexa with Speech Recognition</p> <p>Lab Activity 20 & 21 - Gesture-Controlled Beetle in the Maze Game</p> <p>Lab Activity 22 - Yoga Pose Detector with Pose Classifier</p> <p>Lab Activity 23 - Text Classifier with NLP</p> <p>Chapter 6: Introduction to Robotics and Emerging Technologies</p> <ul style="list-style-type: none"> ★ Advantages of Robots ★ Quarky Robot Movement ★ Augmented Reality 	<p>73</p> <p>89</p> <p>123</p>
--	---	--	---

★ Virtual Reality		
★ Mixed Reality		
★ Blockchain Technology		
Lab Activity 24 - Wirelessly Controlled Robot		
Lab Activity 25 - Gesture Controlled Robot		
Chapter 7: Basics of App Development	135	
★ Introduction to Apps		
★ Importance in Modern Life		
★ Working of Apps - Basic Architecture		
★ Uses of Commonly Known Apps		
★ Development of Simple Apps		
		Chapter 8: Computer Networking 144
		★ Understanding the Concept of a Network in Computing
		★ Types of Networks – LAN, MAN, WAN, PAN, CAN
		★ Internet and Related Terms
		★ Networking Protocols – HTTP, FTP, TCP/IP, IMAP, SMTP
		★ Cloud Computing
		Capstone Project 157
		Sample Projects Built by Community 158
		Answer Key 159

