



## TECHNICAL WORKSHOPS SERIES – 2016

Summer Activity Club <b>Math Gaming Club</b> <i>- Organized by Tinkering Lab, Venture Center -</i>	
<b>Potential gains</b>	<ul style="list-style-type: none"> <li>• Improve logical, analytical and strategic thinking in children through games</li> <li>• Learning while having fun playing games that use mathematical principles and strategies</li> <li>• Bring together a peer group of young people with interest in math-based games</li> </ul>
<b>Workshop Director</b>	Subhojit Basu, Advisor, Tinkering Lab, Venture Center
<b>Organized by</b>	<ul style="list-style-type: none"> <li>• Tinkering Lab, Venture Center</li> </ul>
<b>Supported by</b>	<ul style="list-style-type: none"> <li>• Venture Center</li> </ul>
<b>For whom</b>	<ul style="list-style-type: none"> <li>• Age group 10-18 yrs old</li> <li>• Familiarity with English required</li> </ul>
<b>When</b>	<b>Start date: Saturday, 9 April 2016 onwards</b> <b>Every Saturday: 3 PM to 6.15 PM</b> <b>For 10 Saturdays</b>
<b>Where</b>	Lecture Theatre, Venture Center, 900 NCL Innovation Park, Dr. Homi Bhabha Road, Pune
<b>Contact</b>	Ms Lipika Biswas   Phone: 91-20-25865877; Email: <a href="mailto:eventsdesk@venturecenter.co.in">eventsdesk@venturecenter.co.in</a>
<b>Cost</b>	Cost: Rs 5000 for 10 sessions  For registration please contact: <a href="mailto:sjip@venturecenter.co.in">sjip@venturecenter.co.in</a>  Seats limited to 20  Few scholarships available for deserving and meritorious students who cannot afford costs. Please write to Lipika Biswas at <a href="mailto:eventsdesk@venturecenter.co.in">eventsdesk@venturecenter.co.in</a> to request scholarship support.  Note:- <ul style="list-style-type: none"> <li>• Attendance only after confirmation of registration by organizers.</li> <li>• Organizers reserve the right to accept or refuse or delay registrations so to optimize the composition of the group and hence maximize learning for all participants.</li> <li>• Fees paid is not refundable and non transferable under any circumstances.</li> </ul>



## Introduction

Math is an abstraction of logical thinking. By putting structure to thinking and developing methods to deal with complexity, math enables the human mind to stretch its limits. But most children learn Math as a series of boring procedures without any context and fun. At the same time, most kids love games – physical or virtual. Can math gaming bring together both fun and learning.

This club intends to bring together children and encourage them to “learn” math and logical/analytical thinking through fun activities and games. A series of group interactions is planned where children can compete and collaborate around these activities/ games while also analyzing and thinking through the strategy behind the games.

## Workshop Outline

A typical session will have:

- Review of take-home game
- Grouping the participants (5 groups of 4 each)
- Introduction to a competitive/ collaborative activity or board game. Learning the rules.
- Participants will be allowed to play the game as per the rules.
- Analysis of the game with focus on basic elements of the game and strategies

Listen to selected examples of how math was used to solve important and not-so-important real-world problems.

Puzzles/games to play at home.

## Workshop includes

- Workshop includes refreshment break with snacks
- Membership in mailing list of all participants
- Board games used shall be provided by Venture Center and retained by Venture Center after the session.
- Tour of the Tinkering Lab and Venture Center’s labs
- Participation Certificate (for more than 79% attendance)

## Workshop does not provide

- No ranking or scoring shall be provided. Idea is to enjoy math via games and encourage analytical/ strategic thinking.
- Lunch is not planned under this workshop

## Call for volunteers

- The workshop needs volunteers (minimum 5 numbers) to help in operating the club
- Volunteers need to:
  - Themselves enjoy board games and math activity
  - Enjoy guiding children and enjoy the company of children
  - Maintain decorum
  - Be the observer/score keeper for the game
  - Contribute to analysis of the game
  - Generalize learning and share with children

- Good at reasoning/analytical skills
- Volunteers will receive:
  - Free ticket to the club and its sessions
  - The Club T-Shirt
  - Honorarium
- Commitment required:
  - Attendance in planning sessions preceding the club sessions
  - Attendance in at least 80% of the club sessions
- Interested persons can contact Ms Lipika Biswas, Phone: 91-20-25865877, Email: [eventsdesk@venturecenter.co.in](mailto:eventsdesk@venturecenter.co.in)

### Dates for Club Sessions

Dates	Illustrative themes and games	Lead
Saturday 9 April 2016	Two player games. (Ex) Tic Tac Toe and Graph Theory	SB
Saturday 16 April 2016	Puzzles. (Ex) Chessboard/cards based. Dealing with invariance	SK
Saturday 23 April 2016	Two player games. (Ex) Othello and Graph Theory	SB
Saturday 30 April 2016	Puzzles. (Ex) Nim. Probability. Game theory Tangram and geometry.	SK
Saturday 7 May 2016	Two player games. (Ex) Battleship. Rules of elimination. Deterministic vs probabilistic methods.	SB
Saturday 14 May 2016	Puzzles. (Ex) Pigeon Hole Principle. Combinatorial methods	SK
Saturday 21 May 2016	Multi-player games. (Ex) Monopoly. Probability and calculated financial risk taking	SB
Saturday 28 May 2016	Multi-player games. (Ex) Risk. Graph theory and probability	SK
Saturday 4 June 2016	Single player games. (Ex) Sudoku. Tree expansion	SK
Saturday 11 June 2016	Single player games. (Ex) Rubik cubes. Topology	SB

Schedule		
Time (hrs)	TOPIC	Lead
1500-1630	Session A <ul style="list-style-type: none"> <li>○ Math in action</li> <li>○ Introduction to game</li> <li>○ Playing session</li> </ul>	<ul style="list-style-type: none"> <li>○ Guest speaker</li> <li>○ SB/SK</li> </ul>
1630-1645	Refreshment break	
1645-1815	Session B <ul style="list-style-type: none"> <li>○ Analysis, pointers and strategy</li> <li>○ Continued playing sessions</li> <li>○ Closing analysis</li> </ul>	<ul style="list-style-type: none"> <li>○ Volunteers</li> <li>○ SB/SK</li> </ul>

#### Faculty and volunteers (in alphabetical order of last names)

 <p>Subhojit Basu</p>	<p>Subhojit is currently working on a Myoelectric Prosthetic Limb at Venture Center, Pune. He is B. Tech (Electrical Engg.), M. Tech (Instrumentation) from IIT, Kharagpur. He has experience in VLSI Design, EDA and Multicore Processor Design and Multicore Computing, Analog and Digital Domains and Embedded systems. He is passionate about doing low power designs to solve the impending energy crisis and reducing e-waste.</p>
 <p>Sarang Kulkarni</p>	<p>Sarang is an electrical engineer by training from MIT, Boston, USA. He wants to put his education to use for developing low-cost sensors, biomedical monitors and other technologies that can be used widely in India. He is particularly interested in low-power electronics and his current long term interest is in developing sensors that give an insight into the workings of the human body in response to various stimuli. When he is not working, Sarang enjoys swimming and playing badminton. He also likes to travel to new places and take photographs.</p>

#### About the Organizers

	<p>The Tinkering Lab is a facility developed and managed by Venture Center, NCL Innovation Park, Pune, India. The main aim of the Tinkering Lab is to help inventors and entrepreneurs to build prototypes of their ideas and generally “tinker” around exploring new ideas. The focus is on electronics, instrumentation and optics besides related prototyping and design.</p> <p>For more information, visit <a href="http://www.venturecenter.co.in/tinkeringlab/index.php">http://www.venturecenter.co.in/tinkeringlab/index.php</a></p>
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#### Supported by

	<p>Entrepreneurship Development Center (Venture Center) – a CSIR initiative – is a Section 25 company hosted by the National Chemical Laboratory, Pune. Venture Center strives to nucleate and nurture technology and knowledge-based enterprises by leveraging the scientific and engineering competencies of the institutions in the Pune region in India. The Venture Center is a technology business incubator supported by the Department of Science &amp; Technology’s National Science &amp; Technology Entrepreneurship Development Board (DST-NSTEDB). Venture Center’s focuses on technology enterprises offering products and services exploiting scientific expertise in the areas of materials, chemicals and biological sciences &amp; engineering.</p> <p>For more information, visit <a href="http://www.venturecenter.co.in/">http://www.venturecenter.co.in/</a></p>
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