# Atal Tinkering Lab

## The Tinkering Marathon – 28th July 2017

### A. Introduction:

Technology in the present era is so dynamic and ever changing that yesterday's innovation looks passé and every day a new idea is born to challenge the status quo. It has never been like this earlier. In fact every start-up in this fast paced world is born with a spirit of innovation and creativity. **IT ALL BEGINS WITH AN IDEA**. An idea to change the world.

**The launch of the Atal Tinkering Lab initiative will be kick started by way of a Tinkering Marathon scheduled for 28th July 2017.**

The objective for the day long marathon is to provide opportunities for the students to showcase their potential in a fun filled environment and create a positive attitude towards Making, Tinkering and Innovating. The focus would be to bring about both powerful and impactful outcomes and contribute to an Innovative India.

The Marathon will be **open for all ATL schools pan-India** who dream to create something new, aspire to make a difference and contribute to the school's success towards becoming an Innovation Hub.

### B. What is 'I Can Tinker' Tinkering Marathon?

**'I Can Tinker'** is a one day marathon packed with fun-filled activities that would encourage and motivate students to showcase their creative, analytical, critical & problem solving skills. It is an amalgamation of several events where innovation, creativity, technology advancement and resourcefulness meet. It aims to promote and educate the young minds how innovation, as an empowering tool, is relevant to their lives and future. It will serve as a platform for young creative minds to apply their skills to -

- *Show their unique talent: students can present creative and innovative ideas.*
- *Challenge themselves; students can challenge themselves by coming up with high rigour ideation*
- *Identify local and global problems: students come up with feasible solutions for the problems in and around them.*
- *Nurture their school as an Innovation Hub: students challenge themselves and get in competition mode to help get their schools recognition at a national level.*

It will not only provide schools an exposure & leverage the technology resources available as a part of ATL space but also develop problem- solving skills, creativity, and collaboration among students and help them to get an intuitive grasp of STEM principles and the confidence that goes along with it.

The idea of the marathon is to kick-start the Atal Tinkering Labs in a way that it creates enthusiasm in students for them to create brilliant ideas in the lab in future.

## C. When will 'I Can Tinker' Tinkering Marathon happen?

**'I Can Tinker'** will be a day long festival organized by NITI Aayog in collaboration with the schools. The date of the one day Marathon will be **July 28th, 2017** and it will be organised in the individual school's ATLs.

The timings can be decided by the school as per their convenience.

## How will the 'I Can Tinker' Tinkering Marathon pan out?

### i. Pre-event:

- ✓ The school will make announcement at least 25 days in advance both within the school for children to be aware of the forthcoming program as well as inform their parents. A special meeting of teachers with the principal is recommended before the same.
- ✓ The school will publish and display the poster (as attached in the e-mail) at multiple locations in their school premises at-least 25 days before the event.
- ✓ The school would also send invitations to parents and other schools in the vicinity and encourage participation for the D day event i.e 28th July 2017.
- ✓ After the first step of sending invitations is over, the school can form a committee of teachers to decide on how to go about organising the event- to organise single activity or multiple activities (suggestions can be found in the document as you scroll below). As it is a daylong event the schools have the liberty to conduct multiple events in the day to keep the spirit of innovation going.
- ✓ Schools need to choose dedicated staff members to help in successful implementation of the marathon.
- ✓ Schools are encouraged to reach out to industries, Higher Ed institutions and solicit volunteers to be a part of the Marathon.
- ✓ Schools are suggested to create a buzz around the kick-off event, create School Facebook pages, and keep posting the developments and hashtag it to NITI's ATL page.

**As the objective is to engage as many students from the school and the surrounding communities, the schools should gear up towards organizing a multitude of activities and plan it out well in advance. They are also encouraged to reach out to the experts from communities/ industries well in advance and seek their support in making the Marathon fruitful and successful.**

### ii. Participation process:

The **'I Can Tinker! Marathon'** is open for all ATL schools. The schools need to plan in advance the details of the activities they plan to conduct on the Marathon day.

**The funds for organising the event can be used from the grant money meant for operation received from NITI.** A maximum of Rs 50,000 (Fifty Thousand only) can be utilized from the operational amount of Rs 2 Lacs INR of the grant money.

To help the schools with their planning process, a suggestive list of activities is given below, however the final decision remains with the schools to conduct any other activity as per the convenience keeping the essence of tinkering alive. **Some of the activities that are recommended to the schools are as follows:**

**1. Workshops** – Organise various **fun filled creative, hands on interactive workshops** by experts to engage students in developing key skills of tinkering & making.

Workshops can be of a duration of min 1 hr and beyond. It can be conducted by teachers or experts from the community/industry on topics related to tinkering and making. The workshops can be face to face or even conducted virtually (over skype/webinar/google hangout etc).

Workshops can be organized on:

- Robotics - Hexapod, Humanoid, WiFi controlled, Voice controlled, Sensor guided robots, Swarm robots, gesture based robots etc...
- Electronics - Circuit design and debugging, image processing, Haptic arm
- Electrical - Smart lighting system, solar trackers.
- Aeromodelling - Quadcopters, Tri-copters
- Embedded Systems - 8051/52 systems.
- Automobile Engine Mechanics - IC engine design

**2. Road shows** – Initiate **Road Shows/ Rallies** by the schools, students, teachers in collaboration with subject matter experts from the communities / industries to create awareness on varied topics that might kindle curiosity, creativity among the youth and motivate them to join hands in solving community issues.

The Road shows / Rallies can **screen videos of Innovation in STEM fields (Science, Technology, Engineering & Mathematics) happening around the world, some innovative projects developed by the school students, TED talks on new technologies or the school's ÁTL initiative.** The topic for the Road Show/ Rally should emphasise on **Innovation and how it is or can be developed among the younger generation.**

**3. Hour of Tinkering** – Organize hands on **1 hour cyclic sessions** where students tinker and make simple /complex projects. The projects can be an extension of the school curriculum or could be a technology solutions related to real life issues.

**Tinkering** means to improve something in a casual or desultory way. In this event, the school teacher can facilitate tinkering sessions in the ATL Labs. Students can be given 1

hour where they have the chance to create projects of their choice either individually or groups of 2-3 students. The planning for the projects can be done earlier and the tinkering can be done on the D day in cyclic sessions. The projects can be DIY (do-it-yourself) activities that help in kindling curiosity and enhance their interest in STEM fields.

**4. Hackathon –** Organize a hack day wherein students engage and collaborate to create technology solutions that can solve day to day problems

Hackathon is an event in which a large number of people meet to engage in collaborative computer programming. This event can be facilitated by the computer teacher who can give problems /puzzles/games for students to create technology applications for the same. Another way is to have students create algorithms (process for solving a problem) for a puzzle/game.

The applications can be solutions to real world problems, games linked to the curriculum for better understanding or self-learning modules for students.

**5. Tinker Mini Fair** - Invite neighbouring schools, parents, volunteers and **organize a Mini Fair** where student projects developed in the ATL space are displayed so as to develop the culture of innovation in the school.

This event would be similar to conventional science fairs in schools where students create STEM based DIY projects and showcase them in front of a larger audience. Parents can be invited and different class students can come, see and ask questions from project creators.

The schools can also felicitate the students who create the best projects among all.

**6. Ideation to Designing - Thinking Series** – Conduct sessions on **ideating and design thinking** process to **stimulate the mind to think outside the box** and develop creative ideas. The ideas can then be explored and a blue print designed.

Design Thinking is a methodology used to solve complex problems, and find desirable solutions for the same. Design Thinking draws upon logic, imagination, intuition, and systemic reasoning, to explore possibilities of what could be and to create desired outcomes that benefit the end user. It includes "building up" ideas during a "brainstorming" phase.

The session can be organized by inviting an expert on 'Design Thinking' and encouraging students to brainstorm out of the box ideas so that it can be further developed in the ATL space at a later stage.

**7. Green Science** –Identify **environmental problems** and develop eco-friendly solutions/projects that provide **green solutions**.

In this event, the students can first identify the environmental problems around them, then find/ suggest solutions for the same. Set of students can be taken on an external

field visit where it helps them look at the problems better. The solutions can be in a written document way or video or a skit presentation describing the solutions.

**8. Poster making and slogan writing – Design posters and write slogans** to pledge support for the making of an Innovative India.

The students can brainstorm and design a poster or write slogan and pledge their support to be the torch bearers of Innovation. It can done in groups' class wise. The most creative ones can be displayed in the school's Atal Tinkering Lab.

Additionally the best posters/ slogans will also be showcased nationally by NITI.

**9. Tear Down Sessions** – Organize sessions on **disassembling and assembling** of machines & systems.

Experts from industry / science centres can be roped in and sessions can be organized wherein systems/ products can be broken down and then re assembled again. This would help the students in understanding the know-how of the internal mechanism of the products. Students studying in grades 9-12 can help support the experts in organising these events.

**10. Community Empowerment** - Organise **peer teaching by students** and empower the community at large.

The students can reach out to surrounding communities and peer teach children from the communities and bridge the digital divide. The community empowerment sessions can be held in the ATL School or in the neighbourhood schools/ community centres etc. The sessions can be held on a periodic basis and the ATL schools can invite the community children to share their experiences on the D day.

**11. Techno Talks** – Initiate **discussions on millennium inventions**.

Students can be asked to research about the greatest inventions of the millennium and then share with their peers. Alternatively can invite experts and engage in talks with the students. A quiz competition can be organised for the same.

### iii. Experience Sharing:

The schools will leverage social media and create traction about the Marathon. All the activities undertaken by the school will be posted on the ATL social media and schools will invite likes from the public.

**ATL Facebook Page - https://www.facebook.com/Atal-Innovation-Mission-1269534143131857/?ref=bookmarks**

**ATL Twitter Handle - @AIMtoInnovate/@NITIAayog**

In addition the activities will also be updated on the school websites and their Facebook pages/twitter.

**The schools will send a brief report in the following format latest by 1st August 2017 5 pm to ATLhelpline@learninglinksindia.org and the details required are:**

a. **Name of the School:**
b. **No of students engaged:**
c. **No of teachers engaged:**
d. **No of activities conducted:**
e. **Total number of hours engaged**

**The schools will also share a detailed report with proof points (pictures, videos, testimonials etc) within a period of 20 days. The report should reach ATLhelpline@learninglinksindia.org latest by 21st August 2017 5 pm.**

They are also suggested to **create a short 3 min video** capturing all the events conducted during the Tinkering Marathon and share it on ATL's Facebook page.

It is also suggested that schools organise a follow up Parent Teacher Meetings in their schools and showcase the Marathon outcome.

## iv. WHAT IS IN IT FOR THE PARTICIPATING SCHOOLS

1) ***The top 10 schools with the most engaging activities would be awarded with Digital Innovation Badges.***
2) All participating schools will be awarded with an **e certificate**.

## v. Support system:

To make sure that the whole event works out smoothly and to answer any queries related to the Tinkering Marathon, a dedicated e-mail support has been provided. It will be accessible on all days.

We will also have helpline numbers for each of the zones.

Please find below the numbers for the same:

- **Delhi: +918588041201**
- **Hyderabad: +9177231539**
- **Chennai: +918220734379**
- **Bengaluru: +917022205884**

**Email:** ATLhelpline@learninglinksindia.org

To further help you in the participation process, a FAQ document is attached with the guideline.