DIGITAL MAKER HUB PLAYBOOK

MDEC

#mydigitalmaker
Be a Dreamer. Be a Maker.

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ABOUT #MYDIGITALMAKER MOVEMENT

Digital technologies are known to be catalyst for social and economic growth of a nation. With a movement pushing for more digital makers amongst Malaysian youth, we can better equip ourselves for the rapid changes in the world that is being dominated by digital technologies and people who creates them. Launched in 2016, #mydigitalmaker is an important milestone that will close the gap between having interest and making actions, and from passive users to confident makers.

Complement existing curriculum

#mydigitalmaker helps create complementary and supportive curriculum for students to be more digital competent

Create confident digital users

#mydigitalmaker pushes for youth to become confident and effective digital users and makers

Future proofing Malaysia's digital workforce

#mydigitalmaker helps close the digital skill gaps by providing opportunities for youth to explore, innovate and create new digital technologies
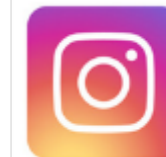
Visit https://www.mdec.my/mydigitalmaker more info on the movement and follow #mydigitalmaker social media channels for exciting updates and happenings:

f mydigitalmakermovement

▶ mydigitalmaker

📷 mydigitalmaker_my

in mydigitalmaker

Defining Digital Maker Hub

DEFINING DIGITAL MAKER HUB

1 DMH is a space build within a community to bring the community members – kids, educators, parents, industry experts together to encourage the activity of digital making. It links people from different sectors and background to come together in a community context to contribute to the spreading and mastery of digital making knowledge.

2 DMH acts as a multipurpose resource room used by different classes and teachers with the intention to build and make different kinds of digital products – ranging from making websites and apps to robotics. It should have a conducive and positive learning environment where anyone can learn new skill and to share ideas on their own digital project.

3 It is important that Digital Maker Hubs are equipped with diverse tools, materials and learning resources that is made available for its members that could help nudge them to invent and embark on a digital making project. Showcasing past projects can be crucial in giving inspiration to members that are new to the scene.

4 DMH hosts and run meaningful activities, lessons and meetups between educator, mentors and students to truly play a role in supporting the objectives of #mydigitalmaker movement.

DEFINING DIGITAL MAKER HUB

Digital Maker Hubs may be called differently but its aim should remain the same which is to create more innovative young minds and actively bringing ideas come to life

What is it?

Scheduled Programs
DMH should have a calendar prepared to ensure there are always programs available for students to participate in

Gym for the mind
DMH should be a place for collaboration and making ideas come to life – idea to product development

Workshop
DMH should be a place for active participation

SOPO lab
DMH should promote SOPO – Sense of Possibility, where all ideas are equal, and anything can be created

What is it not?

Cyber Cafe
Digital Maker Hubs should not be a place for students to use the computers for social medial, online games or YouTube videos

Storeroom
Digital Maker Hubs should not be a space to store tools and materials with no specific use

Museum
Digital Maker Hubs should not be a place merely to exhibit projects. Exhibition shelves should always be updated with new products by the students

Lecture Hall
Digital Maker Hubs should be a space for a 2-way communication

DIGITAL MAKER HUB, THE EPITOME OF CONVERGENCE

DMH is more than just a center that enables digital making to take place. It is also a center for open and collaborative network of educators, students and industry expert to converge in creating and providing the right space and exposure needed to get a #mydigitalmaker movement started. Digital Maker Hubs will be the main center that connects key players together, share resources, collaborate and reach out to the youth of Malaysia in a more systematic and efficient way.

CONNECT → **SHARE** → **COLLABORATE**

GET YOUR SPACE RECOGNISED AS DIGITAL MAKER HUB

Organisations (such as school, companies, government agencies and facilities) with existing STEM-based learning spaces may submit application to get their spaces recognised as DMH and be part of the #mydigitalmaker movement.

Visit **https://mdec.my/mydigitalmaker/dmh/** to apply.

PRIVILLEGES OF DMH

ACCESS TO CONTENT & RESOURCES

- Digital maker club modules and videos
- Teaching modules
- Digital Maker Hero badges platform

FACILITATION SERVICES

- Introduction for mutually beneficial partnerships
- MOE's approval for student programmes

BRAND AWARENESS & PROMOTION

- Via #mydigitalmaker social media channels
- Via MOE's channels
- Plaque of recognition

Infrastructure

DMH should be a space that supports creativity and test new ideas.
It should be spacious enough for students and users work comfortably and collaborate with each other.

Key components DMH:

Prototyping Studio

Creative Lab

Digital Fabrication Studio

Electronics Corner

Testing Space

Discussion Corner

Digital Maker Hub

PLAYBOOK

#mydigitalmaker
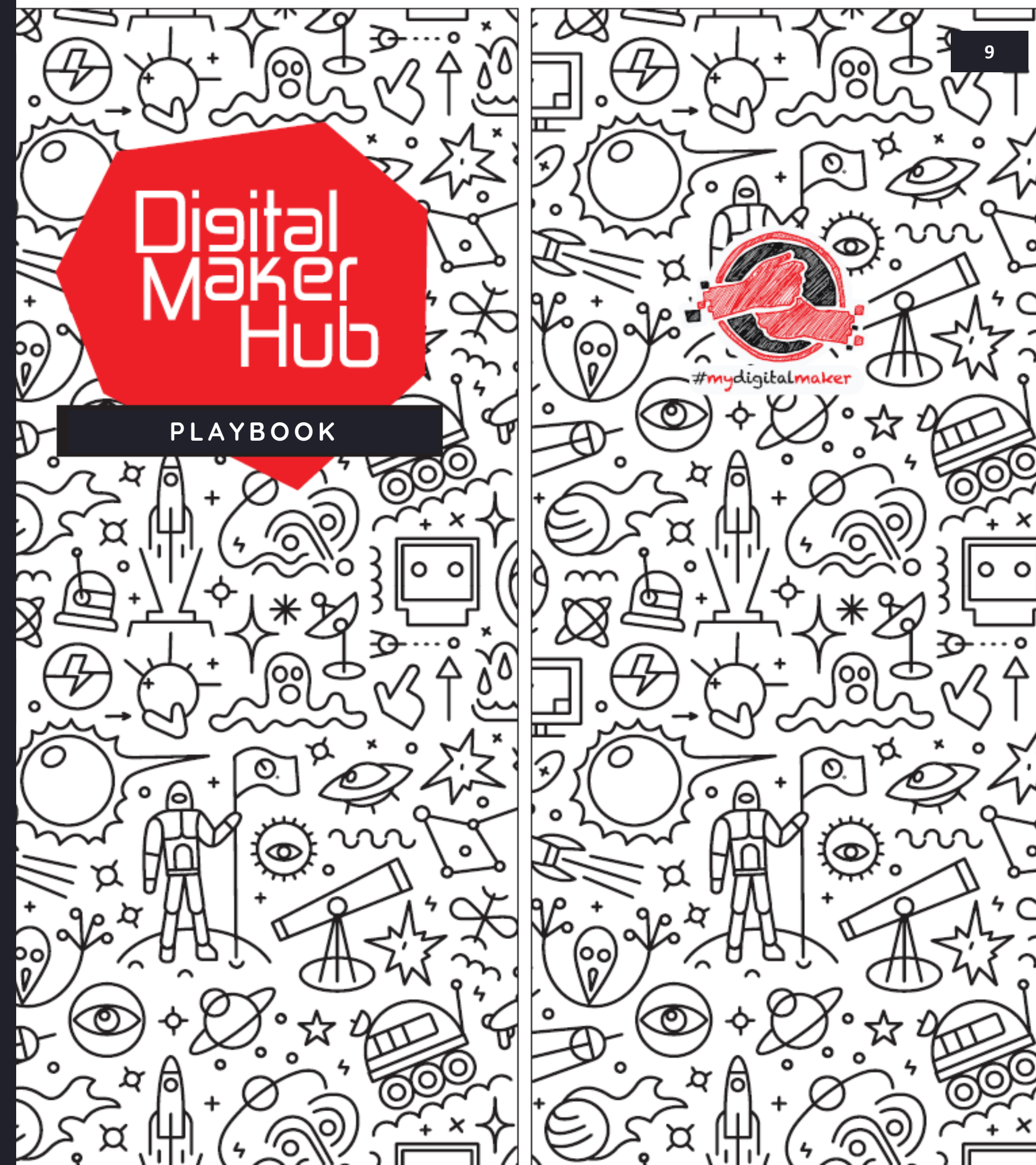
HOW CAN YOU SET UP YOUR SPACE?

DMH key features to get you started
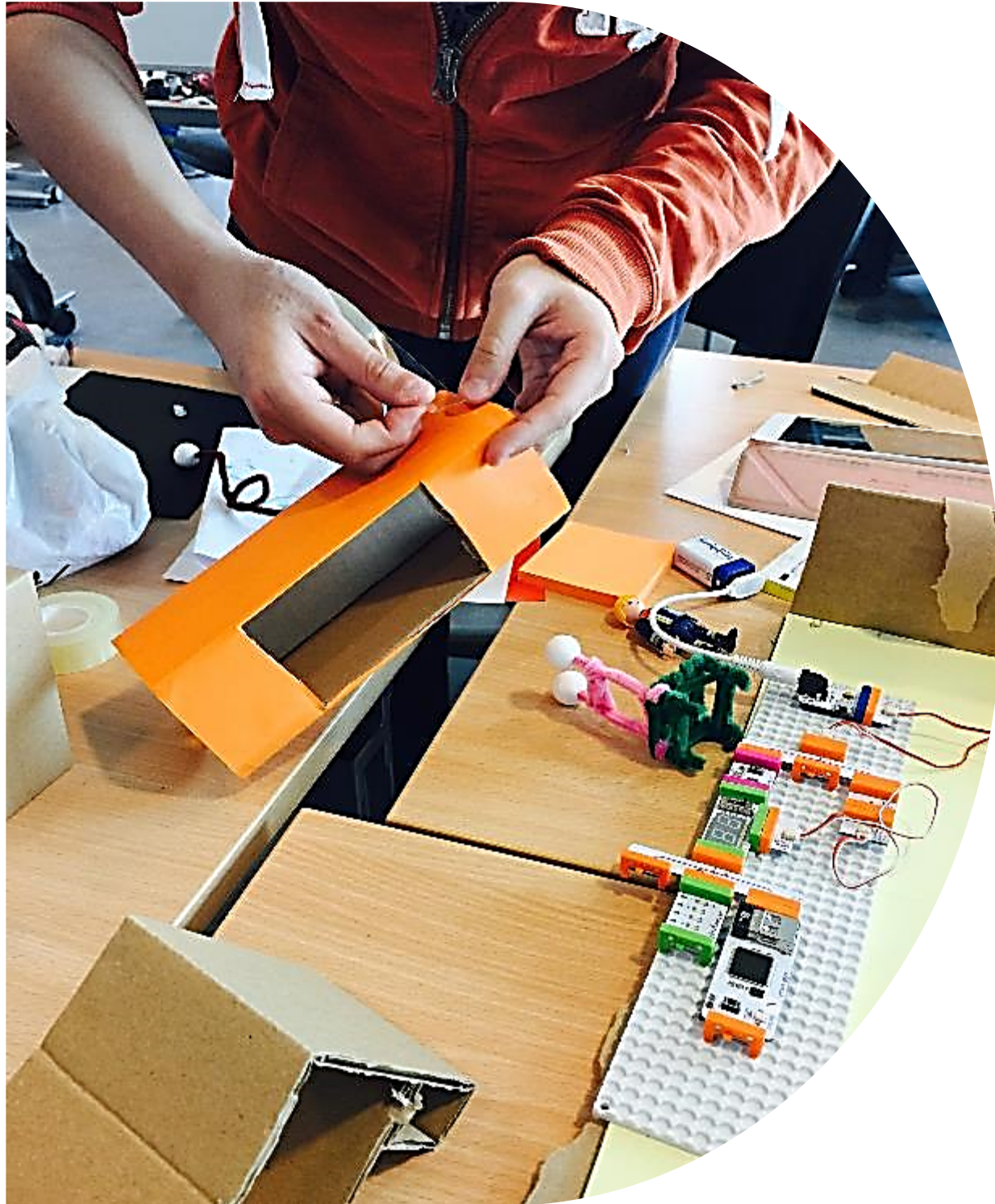
1) Prototyping Studio

A space where students get to build physical prototypes of the actual product to test every concept of their design. These prototypes use basic everyday materials. (highly recommended: recyclable materials). Students need to build physical models of their ideas. This helps students to visualise concepts and ideas

Tools:

✓ Paper / cardboard / plastic products

✓ Binding materials (tapes, adhesives, binders, fasteners)

✓ Cutting tools (scissors, blade)

HOW CAN YOU SET UP YOUR SPACE?

DMH key features to get you started
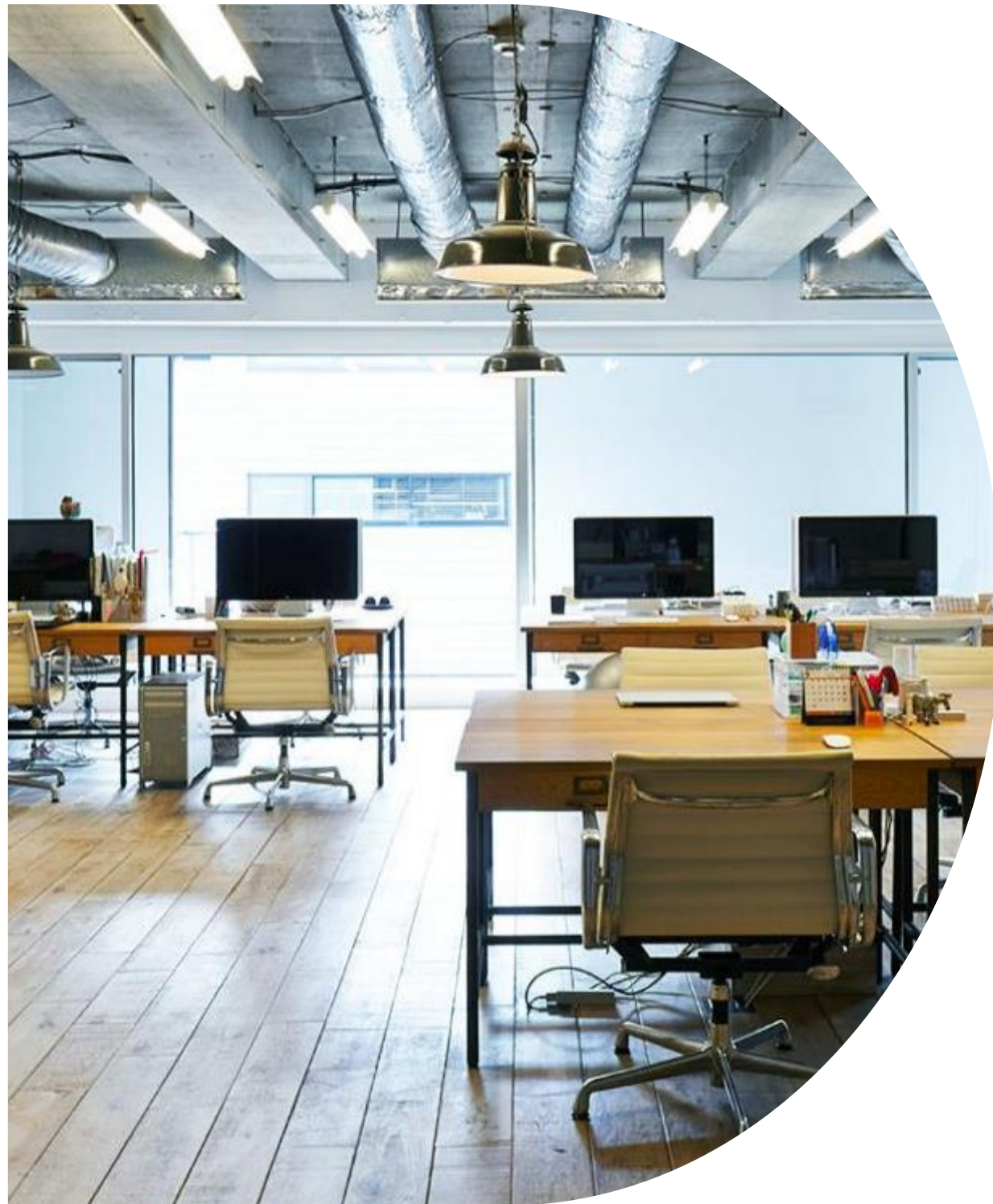
2) Creative Lab

A space where students can turn their ideas into codes using any programming language of their choice. It is also will be where students can learn how to make websites, apps, games and even programming microcontrollers to receive input and set an output. Anything that requires the use of coding and programming will be done at the creative lab.

Tools:

- ✓ Laptops/tablets
- ✓ Arduino/Raspberry Pi
- ✓ Desktop Computers
- ✓ Printer

HOW CAN YOU SET UP YOUR SPACE?

DMH key features to get you started
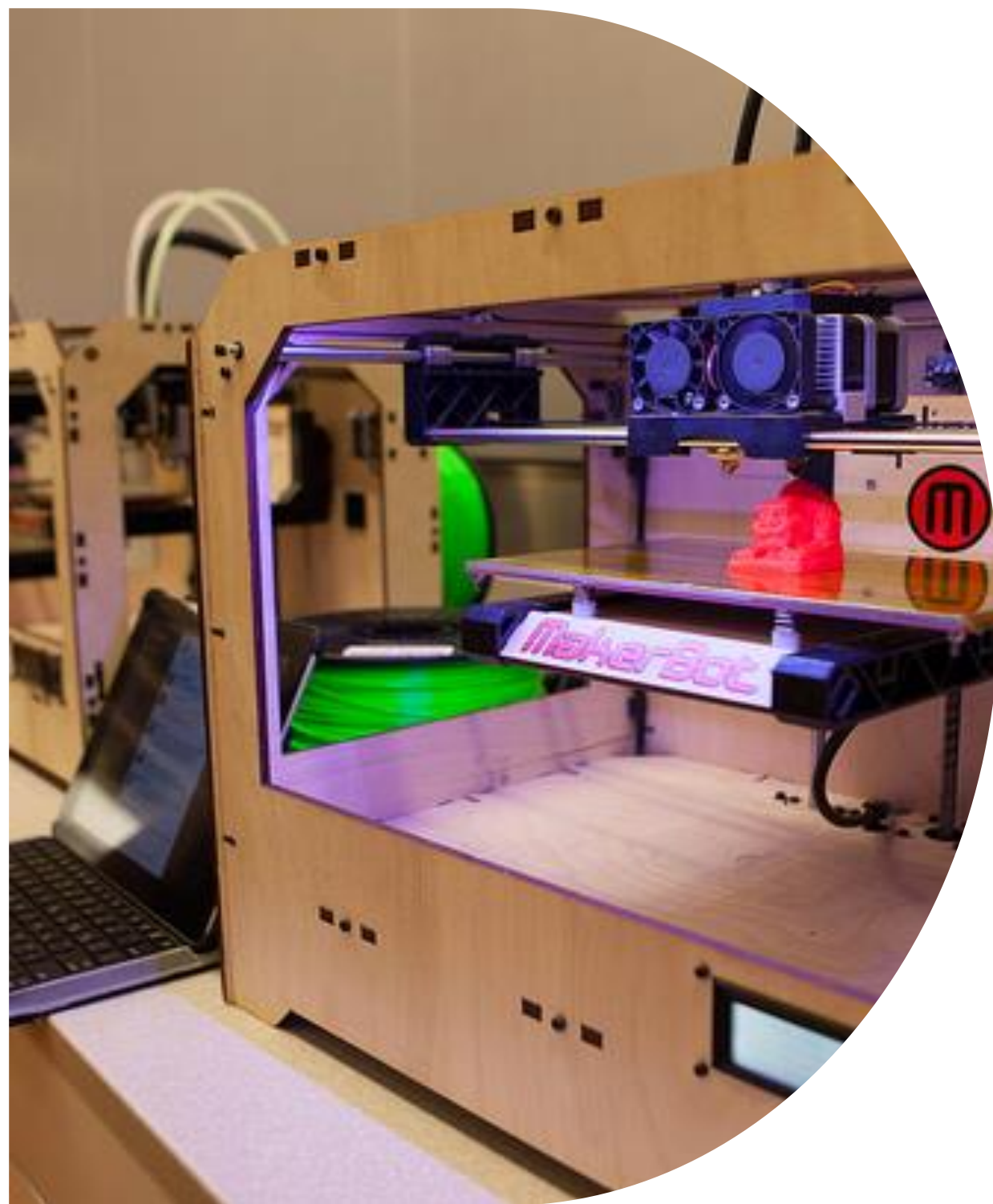
3) Digital Fabrication Studio

A space providing fabrication services to allow students to integrate digital modeling into fabricated physical objects. It is a place to help students make their designs come to life and turns passive users into active creators. 3D printing is now becoming important as it gives a whole different power in the field of creating.

Tools:

✓ 3D-Printer

✓ Mini laser cutter

✓ Desktop

HOW CAN YOU SET UP YOUR SPACE?

DMH key features to get you started

4) Testing Space

A testing space should be open enough for students to test ideas, prototypes or projects with minimal obstructions. Students need an open space which allows them to test the full functional and operational features of their designs. Students can also readily make any adjustments to their projects in this space.

Tools:

✓ Basic hand tools

✓ Prototyping materials

HOW CAN YOU SET UP YOUR SPACE?

DMH key features to get you started

5) Electronics Corner

A corner in the hub designated to electronic building activities. Students use this space to solder their circuits and test their circuitry with testing equipment like multi-meters. This area should be equipped with basic electronic tools, soldering equipment and general components for students to utilised. Please note that this corner should have ventilation for fumes from soldering activities.

Tools:

✓ Soldering Iron, Soldering tips, Solder pump & solder flux

✓ Wire stripper, Wire cutter

✓ Multimeter, Power supply

✓ Breadboard, Donut board, Strip Board

✓ Electronic Components & Microcontrollers

HOW CAN YOU SET UP YOUR SPACE?

DMH key features to get you started

6) Discussion Corner

A place where students can meet and have meaningful brainstorming sessions and quality discussions among themselves. Students can also conduct their research on their ideas. The need for a collaborative environment stimulates innovative ideas, improve student's argumentative skills and managing differing opinions in a discussion.

Tools:

✓ Soldering Iron, Soldering tips, Solder pump & solder flux

✓ Wire stripper, Wire cutter

✓ Multimeter, Power supply

✓ Breadboard, Donut board, Strip Board

✓ Electronic Components & Microcontrollers

Offerings

What Can You Do at Digital Maker Hub?

1) PHYSICAL COMPUTING

ARDUINO

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical and programmable circuit board and a piece of software that runs on the computer, used to write and upload computer code to the physical board.
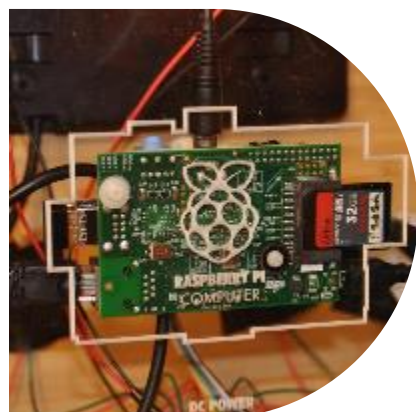
RASPBERRY PI

The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python.

LEGO ROBOTICS

Lego Robotics involve software and hardware to create customizable, programmable robots. They include an intelligent brick computer that controls the system, a set of modular sensors and motors, and Lego parts to create the mechanical systems.

2) SOFTWARE DEVELOPMENT

PHYTON PROGRAMMING

Python is an open source programming language. It was designed to emphasize code readability and its syntax allows programmers to express concepts in fewer lines of codes. The language enables coding of clear programs on both small and large scales.

WEB DEVELOPMENT

Web development refers to the creation of content managing systems, specifically developing a website for the World Wide Web or a private network. Web development can range from developing the simplest static single page of plain text to the most complex web-based internet applications, electronic businesses, and social network services.

APP DEVELOPMENT

App development is an application development system. It involves a programming language and associated utility programs that allow for the creation, development and running of application programs. App development consists of mobile app development, web app development and software app development.

3) CREATIVE MEDIA

SCRATCH PROGRAMMING

Scratch is a free programming language and online community where users can create their own interactive stories, games, and animations and share with the rest of the community. Scratch helps young people learn to think creatively, reason systematically, and work collaboratively — essential skills for life in the 21st century.

MUSIC/VIDEO/IMAGE EDITING

Software editing involves editing of written programs, procedures or rules and pertaining to the operation of a computer system. Several different software can be edited on computer such as music, video and images. Most of these editing are done to improve the quality and reduce the size of the files to enable storage.

MINECRAFT

Minecraft is a game about breaking and placing blocks. It involves a series of levels from building constructions out of textured cubes in a 3D procedurally generated world to exploration, resource gathering, crafting, and combat. It was developed to help users think and imagine to solve problems in a virtual world.

4) ENGINEERING DESIGN
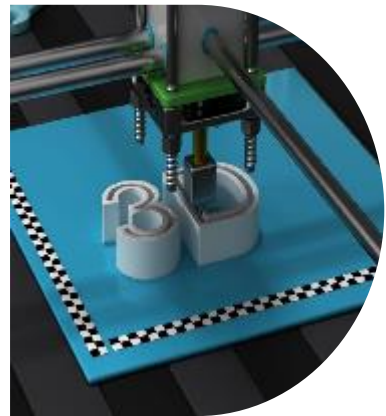
3D PRINTING

3D printing is a process of making three dimensional solid objects from a digital file. The creation of a 3D printed object is achieved using additive processes. In an additive process an object is created by laying down successive layers of material until the entire object is created. Each of these layers can be seen as a thinly sliced horizontal cross-section of the eventual object.

For resources related to the offerings,

please refer to **Resources** section or **CLICK HERE**.

DMH Network & Opportunities

DIGITAL MAKER HUB PARTNERS

01 **Ministry of Education**
MOE is constantly working on updating their curriculum to be digital friendly and at par with international syllabus

02 **Schools**
Schools with enough facilities (laptop and internet connection) can apply to be a maker center

03 **Government Agencies**
Government agencies like MDEC and MCMC have developed various programs that promotes the use of digital technologies

04 **Institute of Higher Learning**
IHL recognizes the demand for more digital competent graduates to fill up the future workforce

05 **Social Enterprises**
Many STEM Education related SEs have arisen to help expose more students to the potential of digital knowledge

06 **Corporates**
Corporates that support digital literacy have also produced various programs in school to promote digital literacy

DIGITAL MAKER HUB NETWORK

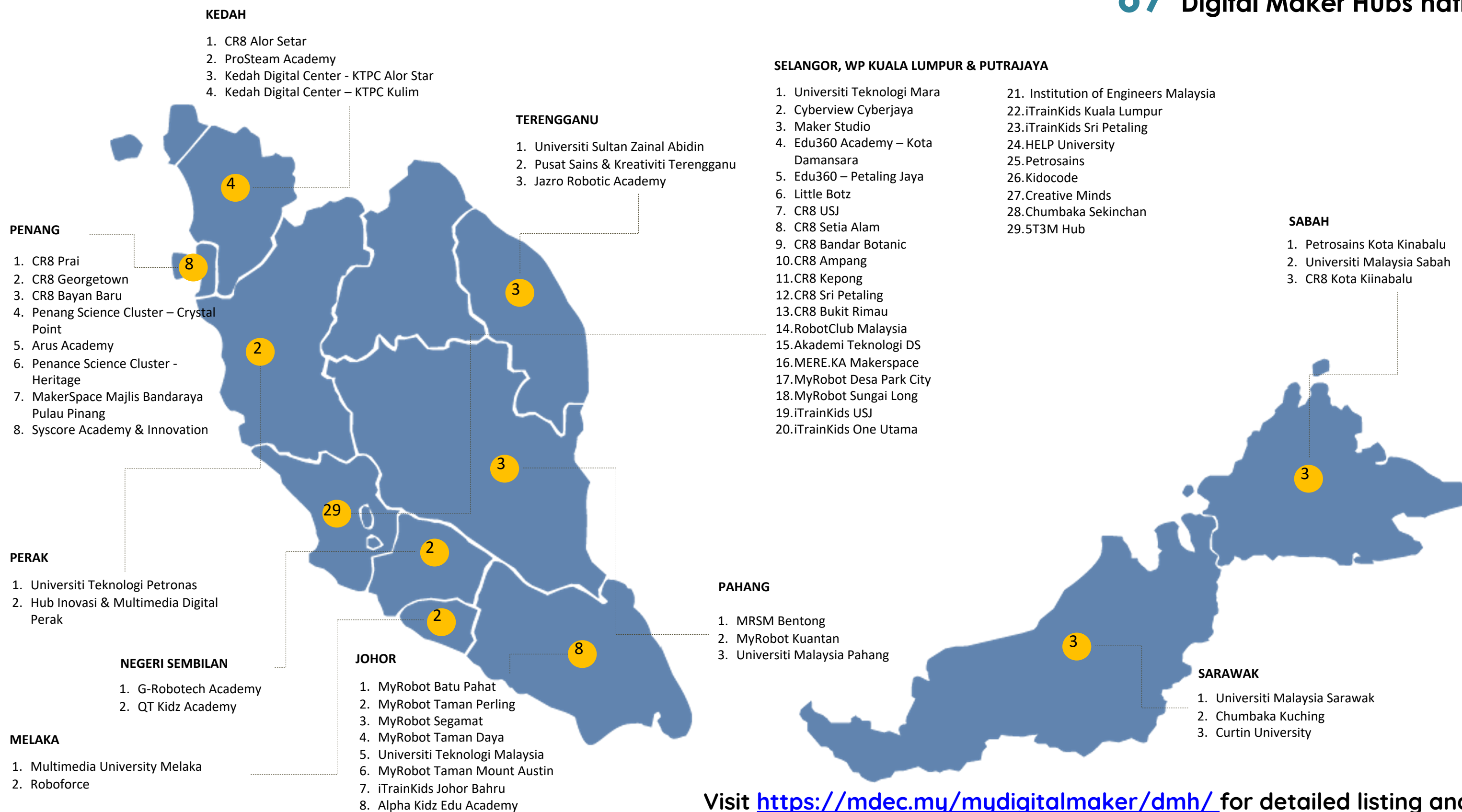**67** Digital Maker Hubs nationwide

KEDAH

1. CR8 Alor Setar
2. ProSteam Academy
3. Kedah Digital Center - KTPC Alor Star
4. Kedah Digital Center – KTPC Kulim

TERENGGANU

1. Universiti Sultan Zainal Abidin
2. Pusat Sains & Kreativiti Terengganu
3. Jazro Robotic Academy

SELANGOR, WP KUALA LUMPUR & PUTRAJAYA

1. Universiti Teknologi Mara
2. Cyberview Cyberjaya
3. Maker Studio
4. Edu360 Academy – Kota Damansara
5. Edu360 – Petaling Jaya
6. Little Botz
7. CR8 USJ
8. CR8 Setia Alam
9. CR8 Bandar Botanic
10. CR8 Ampang
11. CR8 Kepong
12. CR8 Sri Petaling
13. CR8 Bukit Rimau
14. RobotClub Malaysia
15. Akademi Teknologi DS
16. MERE.KA Makerspace
17. MyRobot Desa Park City
18. MyRobot Sungai Long
19. iTrainKids USJ
20. iTrainKids One Utama
21. Institution of Engineers Malaysia
22. iTrainKids Kuala Lumpur
23. iTrainKids Sri Petaling
24. HELP University
25. Petrosains
26. Kidocode
27. Creative Minds
28. Chumbaka Sekinchan
29. 5T3M Hub

SABAH

1. Petrosains Kota Kinabalu
2. Universiti Malaysia Sabah
3. CR8 Kota Kiinabalu

PENANG

1. CR8 Prai
2. CR8 Georgetown
3. CR8 Bayan Baru
4. Penang Science Cluster – Crystal Point
5. Arus Academy
6. Penance Science Cluster - Heritage
7. MakerSpace Majlis Bandaraya Pulau Pinang
8. Syscore Academy & Innovation

PERAK

1. Universiti Teknologi Petronas
2. Hub Inovasi & Multimedia Digital Perak

NEGERI SEMBILAN

1. G-Robotech Academy
2. QT Kidz Academy

MELAKA

1. Multimedia University Melaka
2. Roboforce

JOHOR

1. MyRobot Batu Pahat
2. MyRobot Taman Perling
3. MyRobot Segamat
4. MyRobot Taman Daya
5. Universiti Teknologi Malaysia
6. MyRobot Taman Mount Austin
7. iTrainKids Johor Bahru
8. Alpha Kidz Edu Academy

PAHANG

1. MRSM Bentong
2. MyRobot Kuantan
3. Universiti Malaysia Pahang

SARAWAK

1. Universiti Malaysia Sarawak
2. Chumbaka Kuching
3. Curtin University

Visit https://mdec.my/mydigitalmaker/dmh/ for detailed listing and join our network!

DIGITAL MAKER COMPETITIONS

There are many open competitions available in Malaysia for our young citizens to explore and further improve their digital making skills they have developed at a DMH. Competitions available ranges from building physical solutions, video editing to making their very own robots. Visit https://mdec.my/mydigitalmaker/competitions/ for more info.

Young Innovate Competition
—

International Computing Olympiad
—

Liga Remaja Kreatif
—

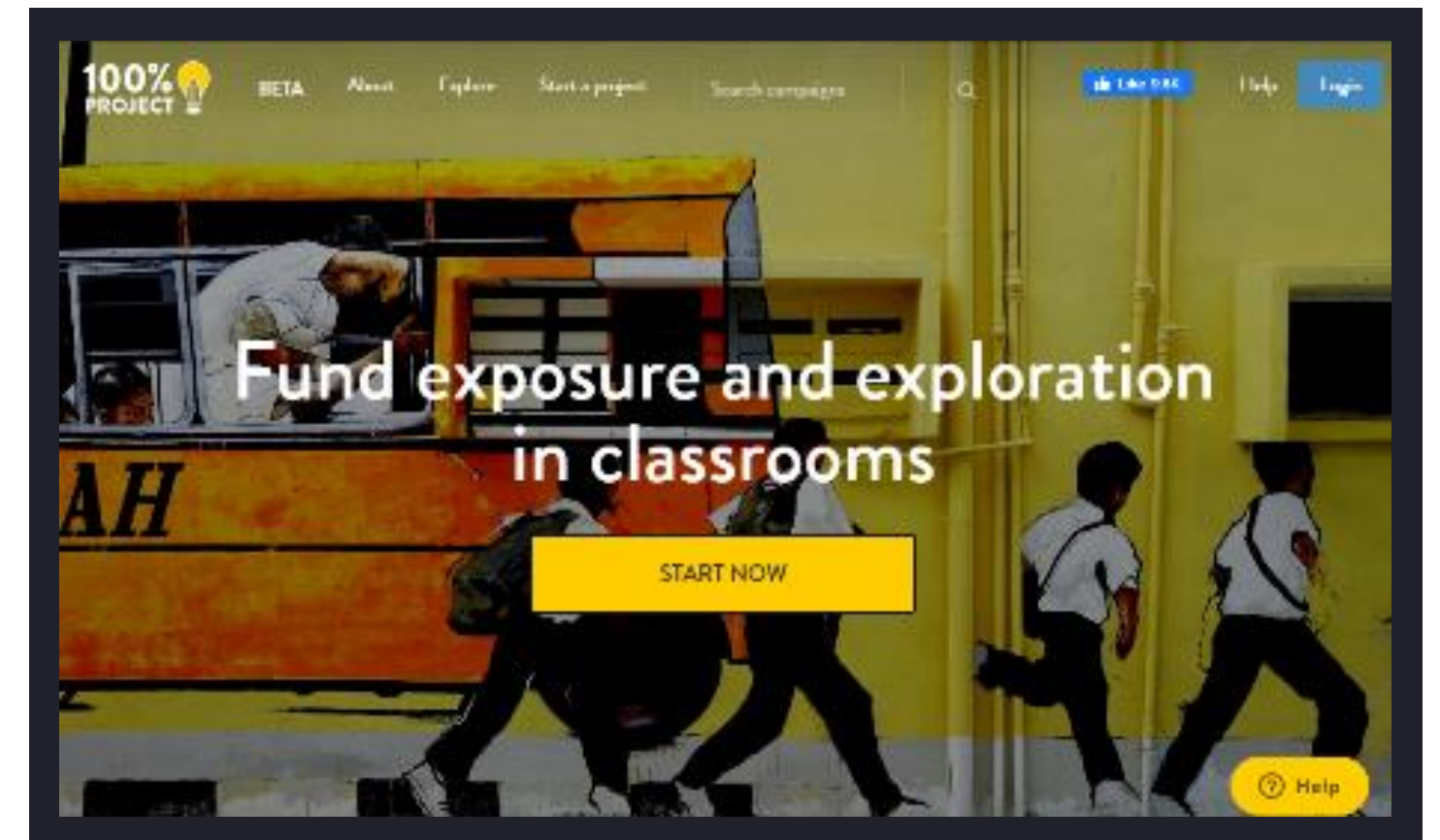**Lego Robotics**
—

Young Inventors Challenge
—

INTEL ISEF
—

CROWDFUNDING FOR EDUCATION

With the focus on 21st century learning techniques, some schools still do not have the appropriate facilities to conduct stimulating lessons in the classrooms. Check out the below Malaysian based education crowdfunding platform to kickstart the journey.

https://www.100percentproject.org/

100% Project is a crowdfunding platform targeted for education, which gives 100% of the collected funds to the pitched projects. Their vision is to be a community platform that collectively empowers educators in Malaysia. With the believe that education deserves 100% impact, this platform works with corporations, foundations, start-ups, social enterprises, schools, parents, teachers and individuals to enhance the educational opportunities in Malaysia. Teachers with the desire to create change in their classrooms and schools are given opportunities to submit their projects for funding. A majority of projects that strive to provide conducive learning, exposure/exploration and innovative teaching, have been funded by the public and have been implemented in their respective schools.

Resources

PLAYBOOK

#mydigitalmaker

DIGITAL MAKING RESOURCES

ARDUINO

Arduino Crash Course
https://programmingelectronics.com/thearduinocourse/
Starting with Arduino
http://www.schoox.com/15372/starting-with-arduino/about
Arduino free online courses
https://www.class-central.com/tag/arduino

RASPBERRY PI

Raspberry Pi course and products
https://www.raspberrypi.org/
Raspberry Pi online tutorials
http://www.suntimebox.com/
Raspberry Pi videos and tutorials
http://www.theraspberrypiguy.com/tutorials/

PHYTON PROGRAMMING

Everything about Python
https://www.python.org/
Online tutorials
https://www.codecademy.com/learn/python
Free Interactive Python tutorial
http://www.learnpython.org/

SCRATCH PROGRAMMING

Scratch tutorials for users
https://cdn.scratch.mit.edu/scratchr2/static/__6fc1c81d1c5
36d64cab16bd429100958__/pdfs/help/Getting-Started-
Guide-Scratch2.pdf
Scratch lesson plans for teachers
http://scratch.ie/home

LEGO ROBOTICS

All about Lego Robotics
http://www.lego.com/en-
us/mindstorms/?domainredir=mindstorms.lego.com
Lego Education Malaysia
http://lego.sasbadi.com/lego-edu.php
Lego Mindstorms Online Tutorial-
http://www.education.rec.ri.cmu.edu/content/lego/ev3/preview/

DIGITAL MAKING RESOURCES

CREATIVE MEDIA

Online image editor
https://pixlr.com/editor/
Free music editor
http://www.audacityteam.org/
Online video editor
https://www.wevideo.com/

APP DEVELOPMENT

Developing android apps
http://developer.android.com/training/basics/firstapp/index.html
Developing iOS apps
https://developer.apple.com/library/ios/referencelibrary/Getting
Started/DevelopiOSAppsSwift/

WEB DEVELOPMENT

Web development framework
http://searchcontentmanagement.techtarget.com/definition/web-development-framework-WDF
Free Web development app
https://chrome.google.com/webstore/detail/web-developer/bfbameneiokkgbdmiekhjnmfkcnldhhm

MINECRAFT

All about Minecraft and the online community
https://minecraft.net/
Online tutorials
https://studio.code.org/s/mc/stage/1/puzzle/1

3D PRINTING

All about 3D Printing
http://3dprinting.com/what-is-3d-printing/
3D Printer Products
http://www.3dprinter.com.my/index.php?route=common/home

ONLINE PLATFORMS FOR INDEPENDENT LEARNING

Khan Academy

Provides micro lectures on various topics in the form of YouTube videos.

Scratch Tutorial

Provides many tutorials on various projects as well as a platform for users to share and give feedback on each other's' projects.

EdX

Provides online university-level courses on a wide range of disciplines using short tutorial videos that are paired with interactive learning exercises.
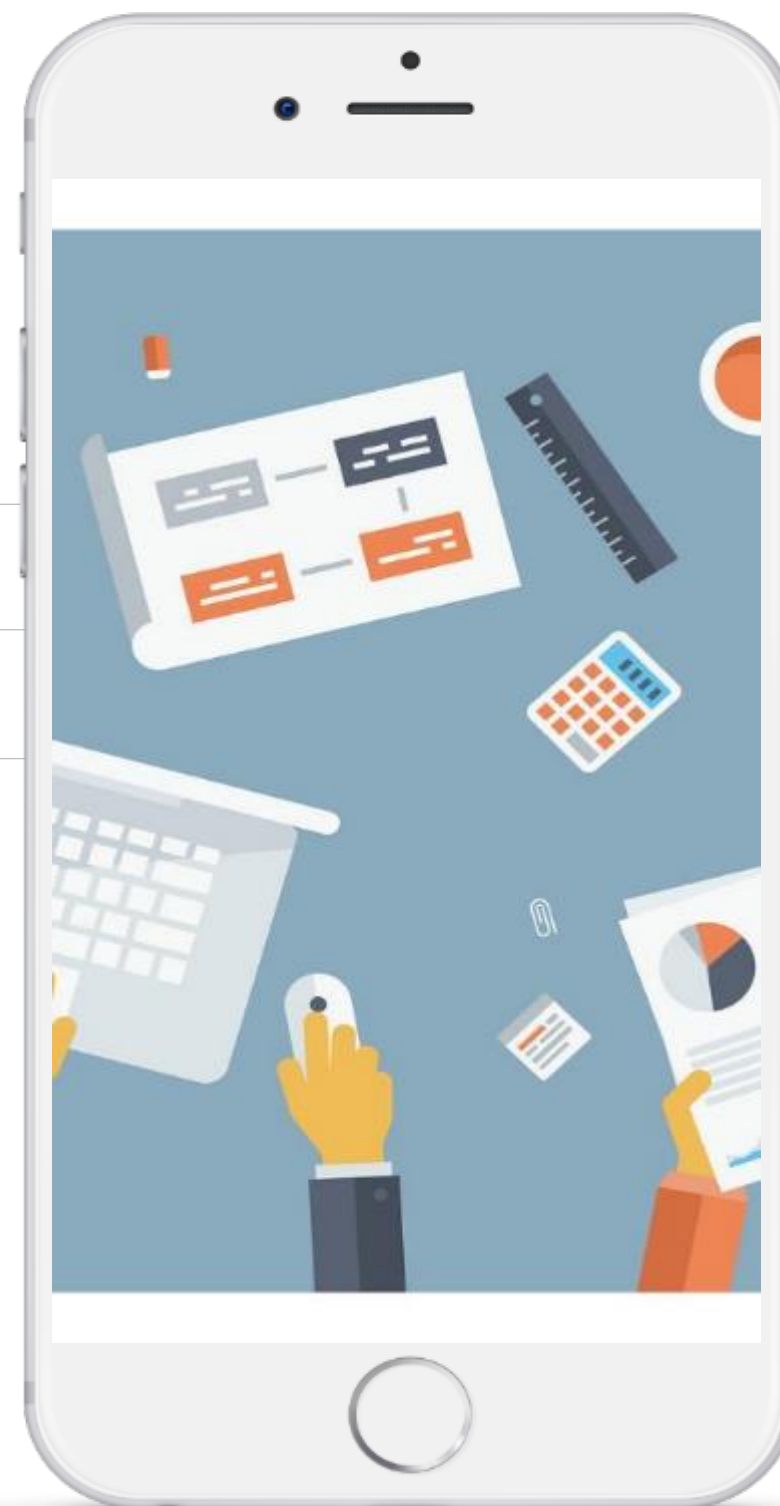
Lightbot

Educational video game for learning software programming and important concepts like loops and if-then statements.

Codeacademy

Online interactive platform that offers free coding classes in 8 different programming languages.

Coursera

Offers courses in physics, engineering, humanities, medicine, biology, sciences, mathematics, business, computer science, and other subjects where each lessons are accompanied by short video lectures and online assignments

CONTACT US

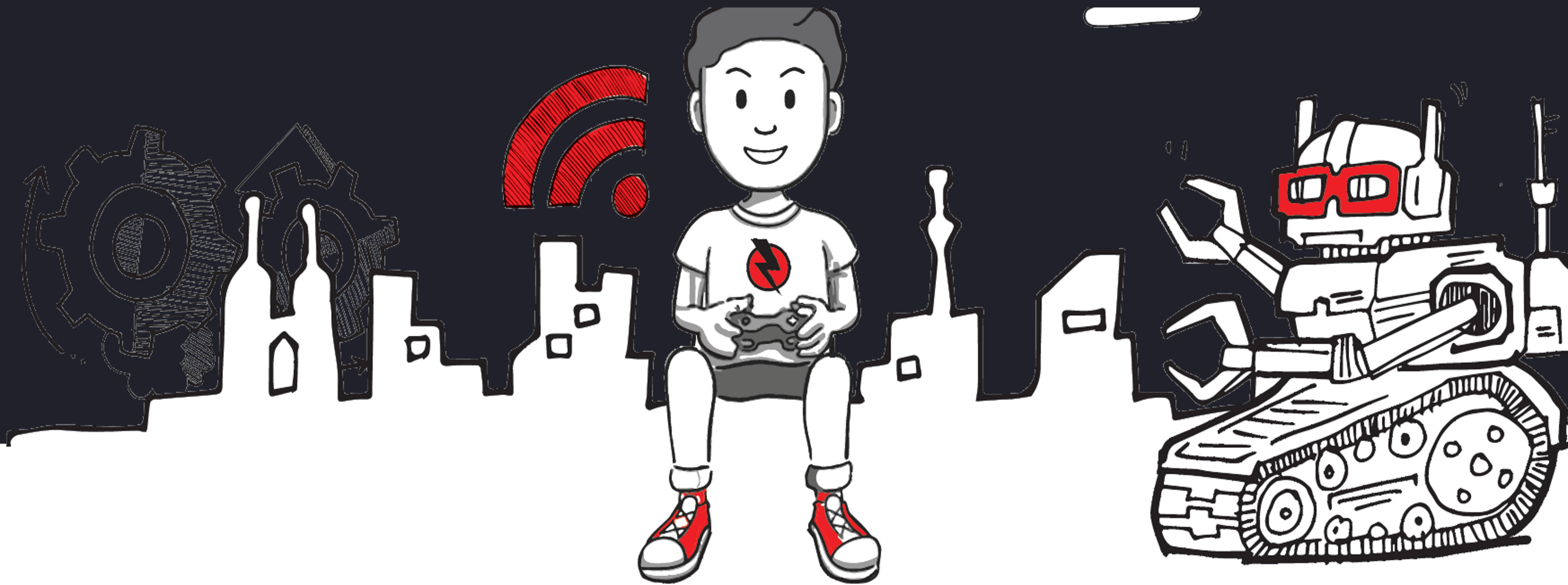**f** mydigitalmakermovement

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CAN'T FIND WHAT YOU'RE LOOKING FOR?

Email us at **mydigitalmaker@mdec.com.my**
or drop us a message via #mydigitalmaker
social media channels

#mydigitalmaker
Be a Dreamer. Be a Maker.