

<TITLE OF THE LESSON/ PROGRAMME>**Programme:** P6 Fun with Science**Level:** e.g. Pri 6**Theme / Challenge** Invent it! Build it! Play it!**Statement:****Summary**

Pupils will form a toy design squad of 4 or 5 members. They will take on the role of toy makers in a toy making company (Think of Mattel and Hasbro) and design a toy that makes use of magnets and is attractive, fun and creative. This project aims to engage students in the creativity and possibility of innovation. It is meant to spark the students' investigative spirit, promote creativity, help think through problems and express their ideas through building toys. By getting students to apply scientific concepts in building the toys, it will also stimulate their interest in Science.

<Please insert a photo here that is representative of the lesson idea. This photo will be used as the thumbnail of the lesson idea when it is posted on the Digital Maker website.>

Prior Knowledge:	Students should already know: 1. 2. 3.
Learning Objectives:	By the end of the lesson, students should be able to: 1. acquire the ability to make links across different areas of knowledge and to generate, develop and evaluate ideas and information 2. acquire skills to communicate effectively and to present ideas clearly and coherently in both written and oral forms. 3. acquire collaborative skills through working as a team to meet the targets set by their group 4. learn on their own, reflect on their learning and take appropriate actions to improve it

Time	Teacher Activities	Purpose	Resources Needed
Introduction/Pre-activity			
2 Periods / 1h	(Getting Started) Project Work <u>Briefing to all pupils</u>	<ul style="list-style-type: none"> Understanding and clarifying the learning outcomes, task and requirement Go through Project Timeline Sheet with pupils 	<ul style="list-style-type: none"> Lesson Plan PW Intro Video PPT Slides Project Work Booklet – task briefing, timeline,

Lesson Plan


		<ul style="list-style-type: none"> • Explain expectations and assessment criteria (assessment rubric) to pupils clearly • Forming groups and defining roles (Suggestion: forms groups of mixed-ability and gender) 	<p>rubric, grouping</p>
Lesson development/Main activities			
2 periods	<u>Introduction to micro:bits and toys demonstrating key science concepts</u>	<ul style="list-style-type: none"> • Gathering information about micro:bits and ideas of toys demonstrating science concepts • Students are advised to use the PSLE marking days in T4W6 to search for more ideas of toys based on key science concepts learnt in primary school. <p>**Remind students to bring pictures or actual toys for their group discussion / brainstorming session in T4W7</p>	<ul style="list-style-type: none"> • Lesson Plan • Toys made using micro:bits • Toys demonstrating science concepts • PPT Slides/ Videos
4 periods	<u>Brainstorming</u>	<ul style="list-style-type: none"> • Identify a toy / toys • Generate ideas to invent or re-invent a toy using SCAMPER • Mobile carts (Tablets/Laptops) will be booked for classes for their research • Distribution of materials to individual groups 	<ul style="list-style-type: none"> • Lesson Plan • PPT Slides • Project Work Booklet – SCAMPER • Materials provided for PW
2 periods	<u>Design</u> <ul style="list-style-type: none"> • Create the toy design blueprint • Mobile carts (Tablets/Laptops) will be booked for classes for their research • Sketch the toy's design 		<ul style="list-style-type: none"> • Lesson Plan • Project Work Booklet – toy design blueprint

Lesson Plan

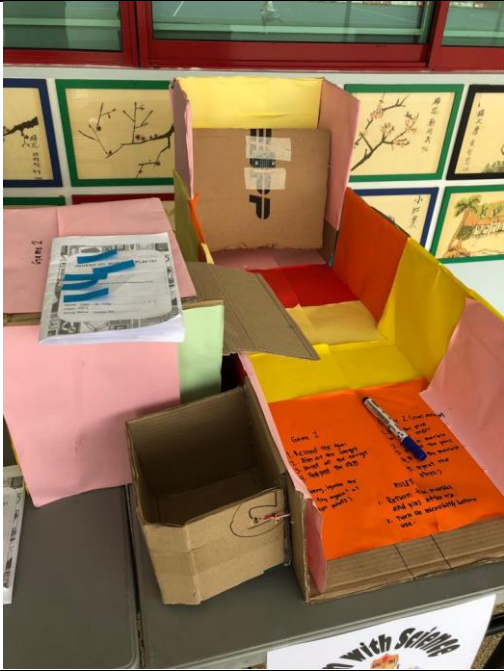
	<ul style="list-style-type: none"> • Draw and label important parts and features • Explain the scientific principles applied in the design of the toy • Explore the possibility of using the micro:bits technology in the toy • List the materials needed to make the toy • Write instructions to tell others how to play the toy 		
3 periods (after school)	<p><u>Just-in-time Skill (1) ICT Lesson: Micro:bits</u></p> <ul style="list-style-type: none"> • Understand the functions of the Micro:bits • Learn how to incorporate the Micro:bits technology into the toy • Sign out the components for the toy 		<ul style="list-style-type: none"> • PPT • Student notes
8 periods	<p><u>Build the toy</u></p> <ul style="list-style-type: none"> • Pupils will build the toy prototype. • Group leaders compile a list to request for additional materials from the lab (subject to availability) 		<ul style="list-style-type: none"> • Pupils to bring materials for making their toys
Closure and consolidation/Post-activity			
T4W9 – 10 / 4 periods	<p><u>Just-in-time Skill (2) – Effective Communication</u></p> <p><u>Sales Pitch Presentation</u></p>	<ul style="list-style-type: none"> • Pupils will read independently on how to make an effective sales pitch • Presentation and demonstrate of toys (Slide, poster or skit) • Assessment of product and presentation • The class is to vote for the top micro:bit toy and the top toy without the use of micro:bit • Each class then submits at least 2 projects for the exhibition from 13-15 Nov. 	<ul style="list-style-type: none"> • Lesson Plan • Project Work Booklet – notes of effective sales pitch • Project Work Booklet – Assessment rubrics • Peer evaluation sheet (for voting)

Lesson Plan

	<p>Reflection</p> <ul style="list-style-type: none"> 	<ul style="list-style-type: none"> • Group evaluation: Reflect on group's learning, strength(s) and area(s) for improvements using Edward De Bono 6 Thinking Hats evaluation • Reflect individually using 3-2-1 reflection • Teachers to provide opportunities for groups and individuals to share their learning experiences • Post-Project Work Survey (Mobile carts / Computer Labs will be booked for classes) 	<ul style="list-style-type: none"> • Project Work Booklet – group evaluation and individual reflection • Post-project work survey
--	---	--	---

List of Projects (5 – 10 projects if possible) created by Students			
Project 1	<p>Soccer Game: Need a counter to keep score on both sides of the goalposts.</p> 	<p>Resources Needed:</p> <p>2 Micro:bits controller, 2 Battery packs, 4 batteries.</p>	<p>Remarks / Tips to be shared</p>
Project 2	<p>Shooting game</p> <p>Sensors to keep score of the targets hit</p>	<p>Resources Needed</p> <p>1 Micro:bit, 1 battery pack, 2 batteries.</p>	<p>Remarks / Tips to be shared</p>

Lesson Plan

Please send this template, together with any additional resources, e.g. Powerpoint slides, worksheets and .hex file, to: digital_maker@imda.gov.sg.

Contributed by:

Name of School: Kong Hwa School

Name of Teacher (Optional):

Date: 18 February 2019