First 4 sessions are at University of Luxembourg Incubator **Belval**

Last 4 sessions are at Luxembourg Science Center Differdange

Age 9 up to 14 years

Saturdays : 13.00 to 16.00 hours

- 19 March – 07 May 2022 (no sessions during Easter holidays)

(or)

- 07 May – 18 June 2022

LEARNING BY DOING

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LEARNING BY PLAYING

Learning is fun

Car is a perfect multi-disciplinary invention that is more fascinated by children especially at younger age. **Building a car** involves **Physics** (for example linear and angular motions, force, work, energy, friction, magnetism and so on), **Chemistry** (fuel cells, chemical reaction of fuel with oxygen during combustion process, battery and so on), electrical, electronics, and what not it consists of 100s of computers – **Programming**. Today we are in an era that the cars are autonomously driven and consists of numerous machine learning algorithms.

You build and You Learn

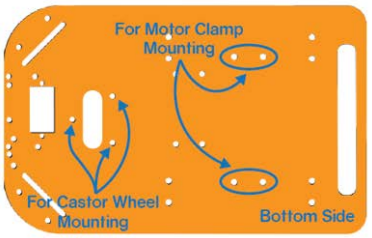
What you build / do

1. Creativity to understand how to make a **Car ?** – build your own Rolls-Royce
2. What makes **Car** to move (Force, work, energy concepts) **?**
3. Why is the chemistry between physics and the programming in a **Car ?**
4. What can drive a **Car** (wind energy, solar energy, electric energy etc.) **?**
5. How can you program and control your **Car ?** and many more questions to be demystified

Wheel

DC Motor

Motor Bracket



Base Plate

Bolt

Nut

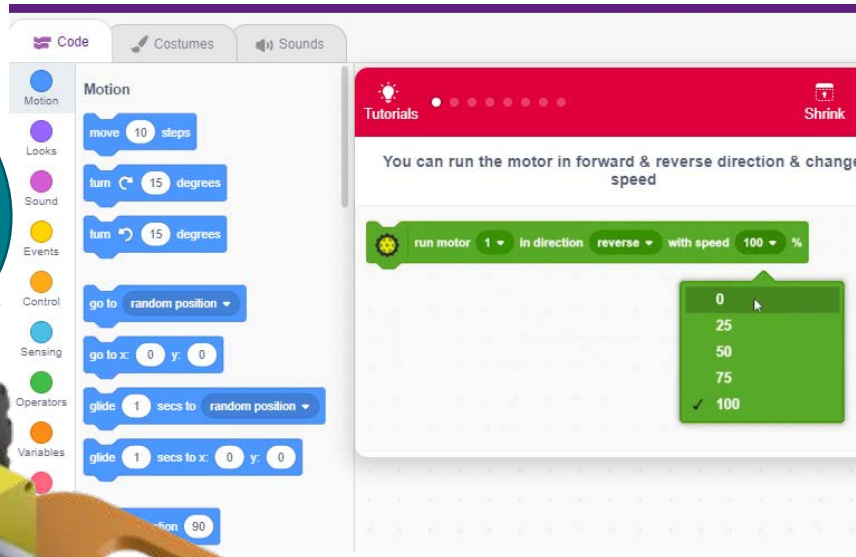
Screwdriver

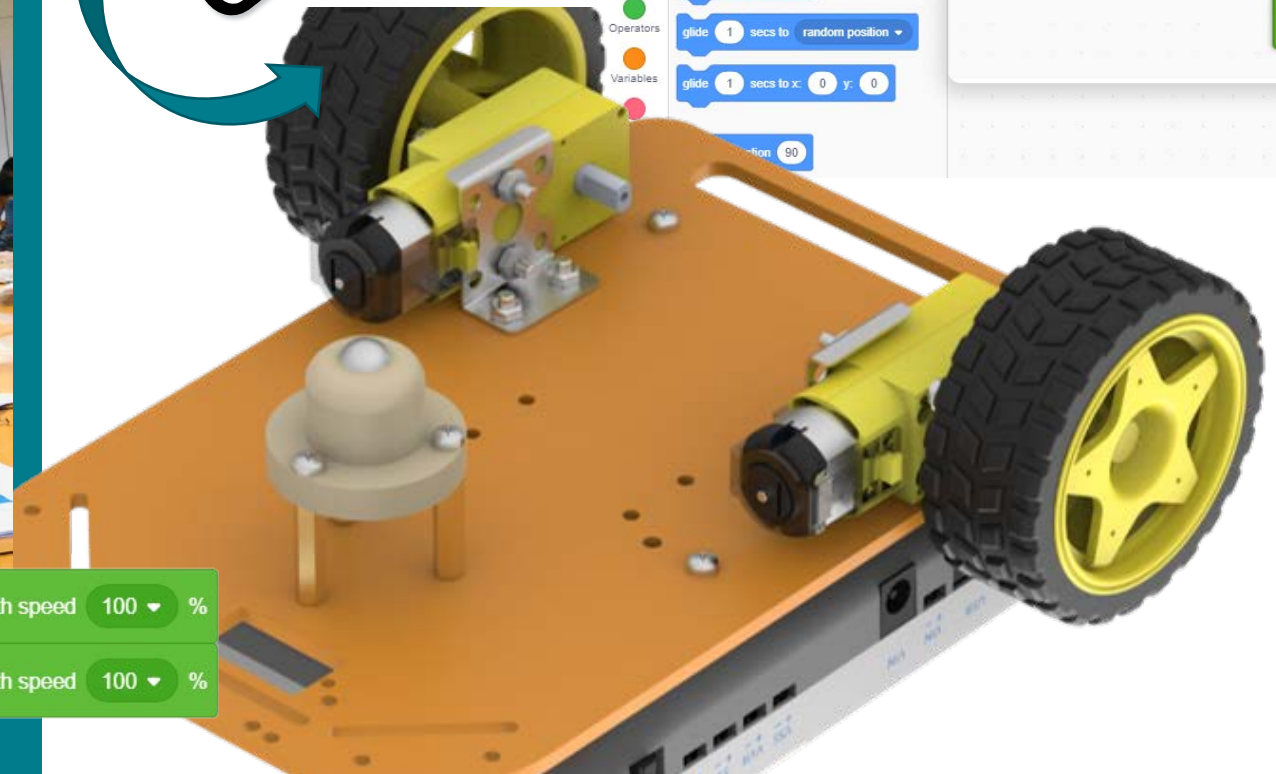
Approach

Children and the parents would use DYI components to build **Cars.** The materials required to build will be provided during the workshop. How to build "something" itself a "creativity" task, and while building, the child will have "n" number of scientific questions which could be explored and answered.

Science Behind the Wheels

doing





Schedule

Both Uni Lux Incubator and Science Center accommodate 50 people, we follow necessary COVID 19 protocol

The fee 80 Euros to be paid to LU58 0030 0321 9626 0000 Parents as Trainers Luxembourg

PATLUX Learning By Doing Workshops : 2022

S No	Experiment	Outcome	Batch 1
1	Building a first Car using ballon, cardboard, plastic bottle caps, legos, rubber band and etc.	1. Creativity to understand how to make a Car 2. What makes Car to move (Force, work, energy concepts) 3. Various forms of energy stored in a Car, introducing chemical, thermal, and mechanical, and electrical energy forms. 4. Learning physical laws of motion (for example ballon car is just exhibits Newtons 3rd law of motion).	19-Mar
2	Building energy sources electrical, chemical, simple motors by copper wire and cells.	1. The energy sources are important for vehicle to move 2. Simple electro magnetic experiments that propel wheels to rotate 3. Various laws of electricity and magentism explored with the help of experiments 4. Energy conversion and transmission (linear motion to angular motions)	19-Mar
3	Building a DC motor (Motor is everwhere for example electric cars, CD/DVD players, RC Vehicles, Handheld power tools, blenders, vacuum cleaners, fans etc..)	1.DC electric motor model DIY assemble kit, working principle demonstration teaching. 2.Permanent magnet DC motor model to DC electric motor, simple design easy to assemble and disassembled ideal for school scientific projects or teaching. 3. Demo motor equipped with power cable after connected to the 3-6V power supply, it will rotate like a real motor.	26-Mar
4	Wind energy car (Wind energy drives the car)	1. What else can drive a vehicle (Wind energy, solar energy etc.) 2. How can we produce wind (wind mill how it works) 3. How do I convert wind energy to motion? 4. DC motor application that we have learnt in the experiment (3)	26-Mar
5	Solar enery car (In summer or under more Sun, let Sun drives the Car, this will be arranged for Phase 2 bit earlier in September, may be the second experiment)	1. What else can drive a vehicle (Wind energy, solar energy etc.) 2. How can we produce Solar energy (Solar panel - how it works) 3. How do I convert Solar energy to motion? 4. DC motor application that we have learnt in the experiment (3)	23-Apr
6	**Building a line follower robot car (uh! kind of an autonomous vehicle)**	1. Introducing basic electrical / electronic components (Resistor, capacitor, sensor, IC etc.) 2. DC motor application that we have learnt in previous experiment (3) 3. Basic principles and operations in a Robot	23-Apr
7	**Programming the car**	1. Introducing simple programming to control the motion of the Car 2. Sensors (ultrasonic, infrared, motion) introduced in (6) to be experimented along with micrcontroller that drives and controls the Car 3. Programming of controller in a graphical and creative way	30-Apr
8	Presentation and Projects by Children		7-May