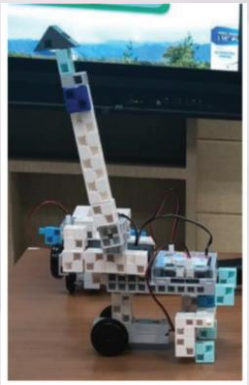
Let's Develop Machine

Activity from Chapter 5, Activity name 'Let's Develop Your Robot', Task 1-5

Let's Develop Your Robot



In minimum, to develop the car needs the following as well as blocks:

- DC Motor
- Three Tires: Two of them are rubber tires which are possible to rotate but one does not have rubber.
- Micro Computer (Studuino) & Battery

And

- Servomotor

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Task 1

What Robot such as machine cars would you like to develop?
Let's draw the image of your robot.
What function do you embed in your robots?

Name of Your Robot

Designing

Task 2

Let's see the parts of ArTeC Robo. When you develop your car by using the parts of ArTeC Robo, which parts are necessary to realise it?

1. In minimum:

2. For the better car, it needs more:

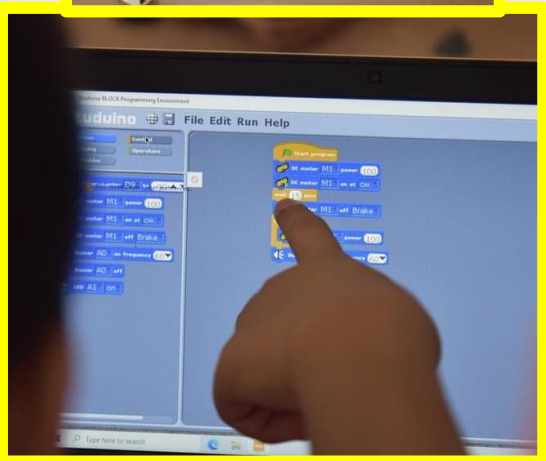
3. Let's plan the possible steps to develop your car such as Robot-version I for step 1, Robot-version II for step 2, and so on.

If you do not know how to programme, do Task 3 and 4. Otherwise, programme it by yourself.

Task 3

Let's develop Robot-Version I.

1. On your imaged robot, let's assemble it with a combination of blocks.
2. Let's develop the programme to move the car by using the commands on Motion and Control!

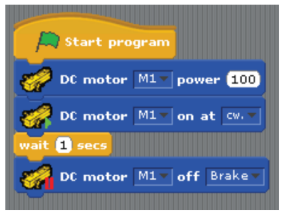


Task 4

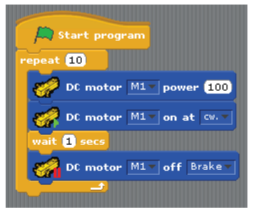
Read the programme at first, imagine and explain how it works.

1. Explain a), b) & c) how it moves the car.

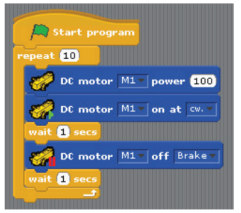
a)



b)



c)

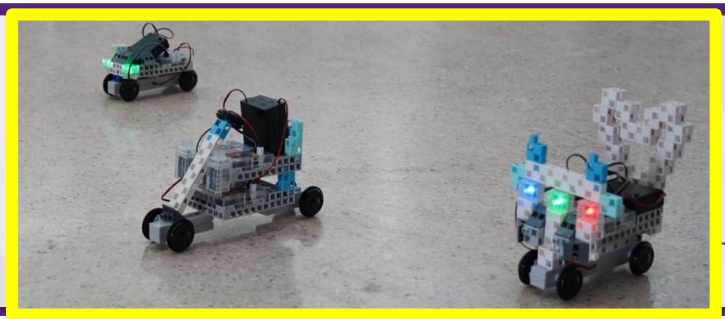


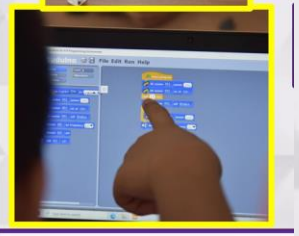
2. Which parameters would you like to change for what?
3. What is the possible on this minimum setting and what are the limitations.

What will happen ?
If I change the parameters.

Task 5

Let's present your robot-version I to others and discuss what robot you would like to develop, what is difficult to challenge and how you overcome it.





Let's reflect on what we learned!

Generalize and extend

Algorithm

Pattern, Recursion and Invariant, Ordering

Exploration and Enquiry, Mathematical Modeling, Mathematisation, and Programming

Mathematical Values, Attitudes and Habits for Human Character

Mathematical Values
Seeking -
- Generality and expandability
- Reasonableness and harmony
- [illegible] and efficiency
- Simpler and easier
- Beautifulness

Mathematical Attitude
Attempting to -
- See and think mathematically
- Pose questions and develop explanations
- Generalise and extend
- Appreciate others' ideas and change representations for meaningful elaborations

Mathematical Habits of Mind
For living -
- Reasonably and critically while respecting and appreciating others
- Autonomously and socially
- Creatively, innovatively and harmoniously to develop citizenship
- Judiciously in using various tools
- With empowerment in predicting the future through lifelong learning

Mathematical Thinking and Processes

Mathematical Ideas of:
[illegible], Comparison, Operation, Algorithm, Fundamental Principles, Permanence of Form, Various Representations and Translation, Pattern, Recursion and Invariant, Ordering, Symmetry.

Mathematical Ways of Thinking:
- Generalisation and Specialisation
- Extension and Integration
- Inductive, Analogical and Deductive Reasoning
- Abstracting, Concretising and Embodiment
- Objectifying by [illegible]presentation and symboli[illegible]
- [illegible]ational and functional thinking
- Thinking Forward and Backward

Mathematical Activities:
- Problem Solving
- Exploration and Enquiry
- Mathematical Modeling, Mathematisation and Programming
- Conjecturing, Justifying and Proving
- Conceptualisation and Proceduralisation
- Representation and Sharing

Contents

Key Stage 1
- Numbers & Operations
- Quantity & Measurement
- Shapes, Figures & Solids
- Pattern & Data Representations

Key Stage 2
- Extension of Numbers & Operations
- Measurement & Relations
- Plane Figures & Space Figures
- Data Handling & Graphs

Key Stage 3
- Numbers & Algebra
- Relations & Functions
- Space & Geometry
- Statistics & Probability

Revised CCRLS Framework for Mathematics