

Robot*iQK*

PROTOTYPING THE *FUTURE* ^{Together} AT ALL AGES

York College Summer Robotics Program 2018

| **Take Apart** | **Build, Construct, Innovate** | **Program, Code** | **Use, Explore** |
Apply in Real World Challenges & Problems

Welcome

Prof. Amenyo

ORIENTATION: July 2, 2018, in AC 3D01, 6 PM – 7:30 PM

Contact: (718) 262-5358

Email: robotiq@york.cuny.edu Office: AC-2C07



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Program

Logistics

What is a Robot? (RADICAL) (Digital Technology)
Trends, Impacts: Disruptive, Opportunities, Threats
Mechanics

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Program

Program Administrator: Dr. John-Thones Amenyo

Under **Office of the Provost**, Dr. Panayiotis Meleties, VP Academic Affairs

Funded by US Department of Education

Outreach from York College, CUNY to NYC **Community**, especially Jamaica, Queens area

Use Robotics & Related Disruptive Digital Technologies to Spark K-12 Interest in STEM+Arts, Humanities, Social Sciences. Other Initiatives: NASA MAA/SEMAA; National Trend.

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Logistics

Schedule: July 9 – August 3, 2018. 4 weeks. Monday –thru- Friday, 1:00 PM – 4:00 PM

Punctuality: Drop off & Pick up. Visitor Courtesy Parking is Available.

Attendance: Mandatory. Everyday. All 4 Weeks. Organized into Teams.

Emergency: Go to or Contact Campus Public Safety: 718-262-2222. Office: 1M02

Acceptance: Application Must be Completed and Signed

Student will Need Supplies: Notebook / Lab Notebook | Post IT Notes | Markers | Pen |
Drawing Set | Dictionary | Thesaurus

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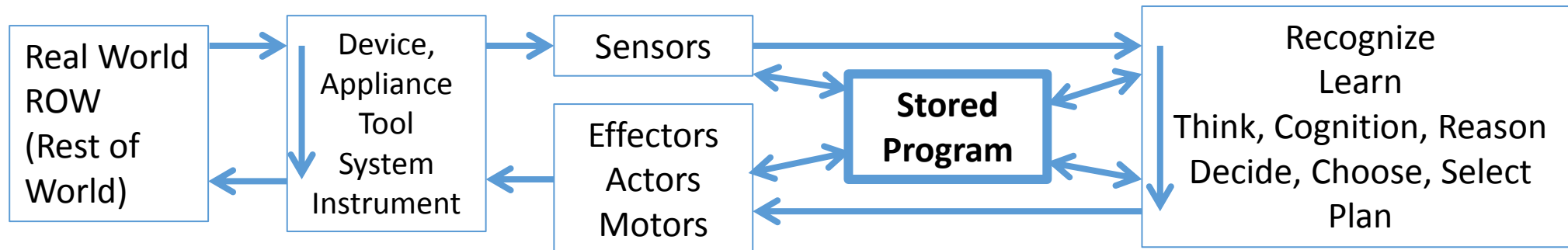
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What is a Robot? (RADICAL) Digital Technology: Physical | Virtual | Augmentation

Cognitive, Smart, Intelligent: Bot, Agent, Server, Actor: Appliance, Device, Instrument, Tool, System, Infrastructure

What → Why → Where, When → Who, Whom → How

RADICAL: Robots + Automata, Augmentation + Drones + Intelligent + Computer, Computational, Cybernetic + Autonomic, Adaptive + L (Learning) Sys



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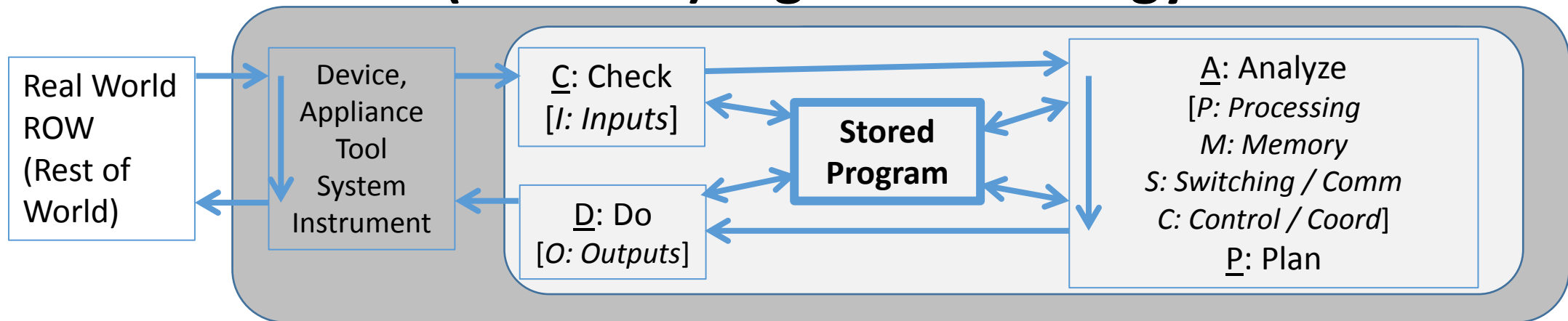
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What is a Robot? (RADICAL) Digital Technology: PDCA: PMSCIO



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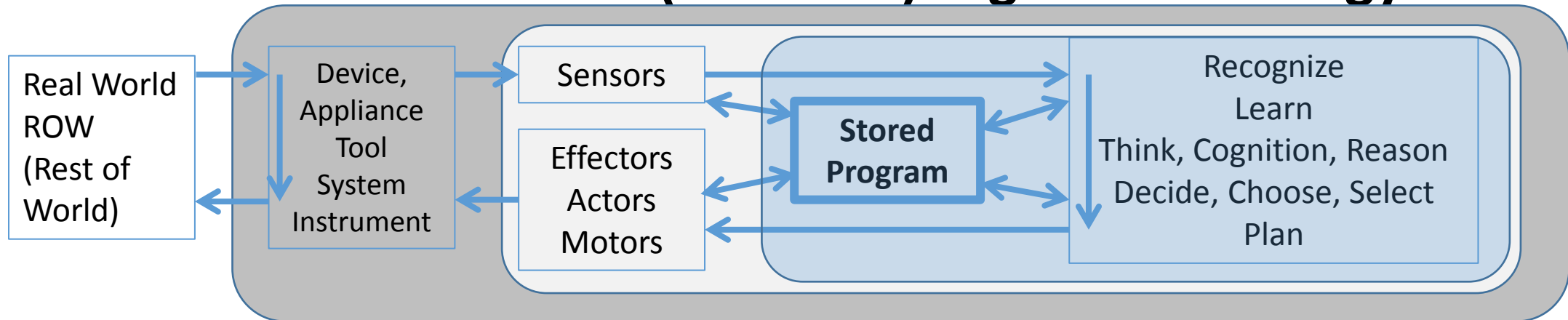
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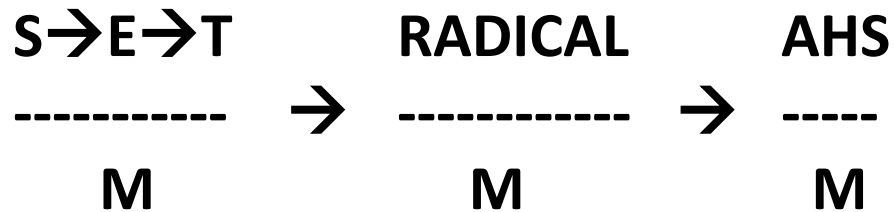
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What is a Robot? (RADICAL) Digital Technology

STEM + AHS in Digital Technology: Robots, RADICAL:



Digital Technology | Robots | RADICAL in STEM + AHS: Impacts, Future-of-X: Question Everything!!!

Re-Imagine Everything!!!

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Digital Technology:

Transformations, Transitions, Trends, Impacts: Disruptive, Opportunities, Threats

Future of-X:

Personal (Implantable, Wearable), (Food, Diet, Nutrition, Exercise, Sleep, Health, Medicine, Healthcare, Lifestyle, Self-Actualization, Work, Jobs, Employment, Career, Profession, Trade), Family, Household, Residential, Community, Town, City, Municipality, State, Province, Nation, Country, International, Global, Worldwide, Social, Society, Cultural, Economic, Industrial, Commercial Religious, Environmental, Ecological (Water, Climate, Energy, Fuel, Waste, Pollution, Deep Sea)

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Mechanics

Parent: What do you want your children to achieve? Student: What do you want to achieve?

Learning, Learn something: What? (Topics, Themes, Concepts) How? (Learning Styles)

Explore, Familiarize, Gain Experience, Mastery, Expertise, Deep Learning

Innovation, Creativity, Ingenuity, Problem-Solving, Disruptive, Active, Life-long Educ.

Multi-paradigm Learning: Hands-on, Constructivist, Inquiry-based, Goal-driven

Game-Like: Easy Fun | Hard Fun | Social Fun | Epic, Serious Fun (N. Lazzaro)

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Mechanics: Thinking: Scientific | Engineering | Other

Computational Thinking, Integration, Systems Thinking, Design Thinking, Disruptive, Re-Imagined, Creative Destruction, Re-Engineering Thinking, Self-*, Autonomic Thinking, Engineering, Terra-forming Thinking, Visual Thinking, Reflection, Practice, Prototyping, Meta-Cognition, Scenario, Case-Based Thinking, Multiple Intelligences
Analytic Thinking, Synthetic Thinking, Logic Thinking

Cope with: Volume, Scale, Variety, Diversity, Complexity, Multi-Scale, Order, Hierarchy, Velocity, Veracity, Efficiency, Change, Evolution, Adaptation, Migration, Variation, Continuous Total Quality Improvement

Approaches: Simulations + Games + Models + Play + Animations + Visualizations + Prototyping + Storytelling+Ideation (Generation.Of.Diversity→Compare, Grade,Optimize → Selection)+ Augmentation

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Mechanics: Project-Driven

**Projects: Mini-problems from Real-World: Fetch; Pick-&-Place; Sweep; Inspect;
Navigate, Traverse thru Barriers, Obstacles; Recruit, Tandem Running; Follow
Me; Fly With Me;**

Project Canvas Method

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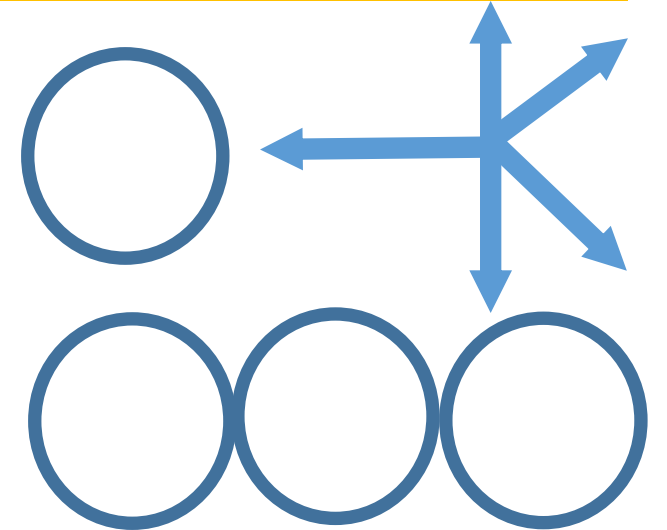
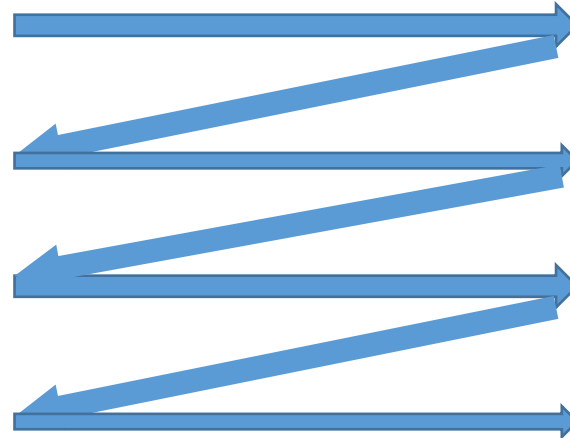
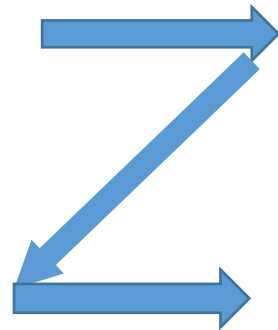
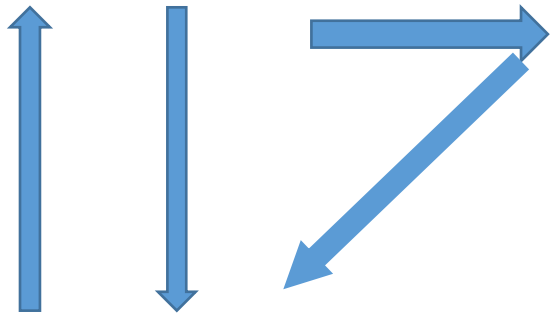
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Mechanics: Projects



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Mechanics: Computational Control Structures

Sequential	Advanced	Parallel, Distributed
Sequencing	Recursion, Recurrence	Functional combinators
Conditional Branching	Recurrence	Algorithmic Skeletons
Looping, Iteration	Tele-operation, Remote oper.	Communicating Processes

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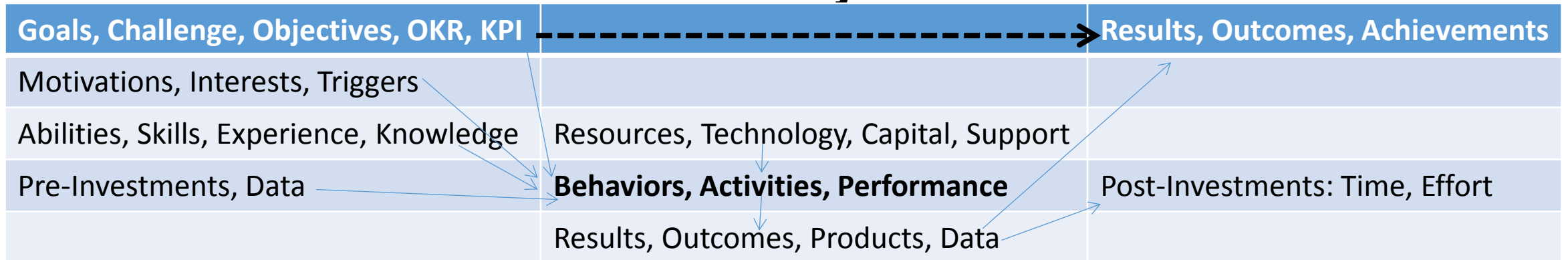
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Mechanics: Project-Canvas



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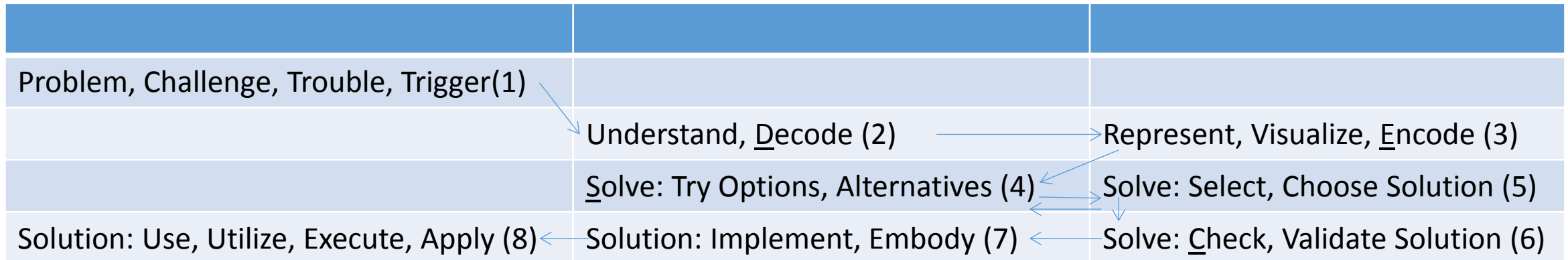
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Mechanics: Problem-Solving Canvas



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Mechanics: Dual Process Canvas

Activity	Reflection, Meta	Symbolization
Processes, Behaviors, Dynamics	Linguistic, Verbalizations, Record, Log	Algebra
Manipulations of Patterns, Schemas, Structures	Terms, Terminology, Words, Concepts: clusters, Maps	Symbols, Icons, Indexes, Emojis, Glyphs, Viz, Graphics
Computations, Calculus, Calculi	Glossary, Dictionary, Thesaurus	Notations

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Mechanics

Week	Focus	Day 1	Day 2	Day 3	Day 4	Day 5
Week 1	Build, Explore	Welcome	Pick Projects	Pick Projects	Pick Projects	Recap
Week 2	Program, Explore	Build	Program	Program	Program	Recap
Week 3	Use, Explore	Use	Teach Parents	Use	Use	Teach Parents?
Week 4	Apply	Project	Project	Demo Prep	Demo Day	Finish

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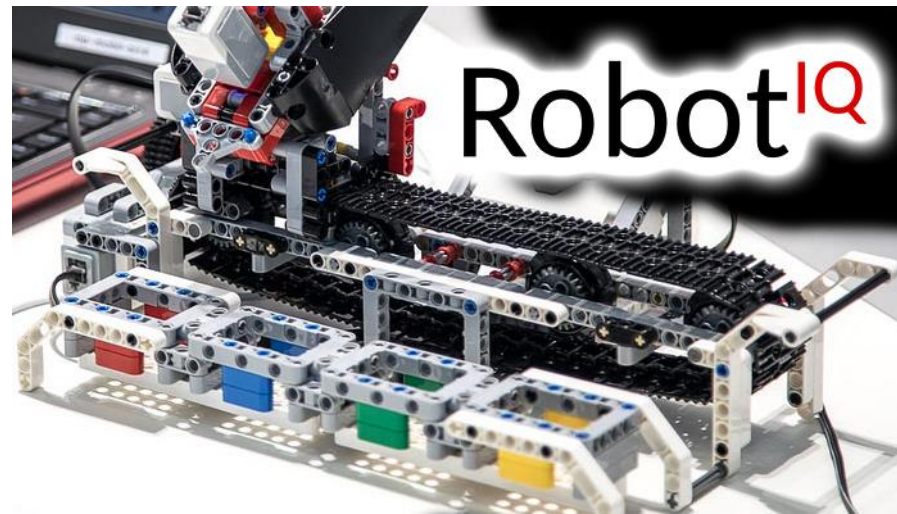


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Thank You

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