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Physical Computing	Division	Team	Building
	JuniorL / JuniorH	1~2 Member	On-Site
	Senior	1~ Robot	

1. Description

Physical Computing is expressing visual stories and constituting physical based on various physical(hardware) and computing(software) conforming the given theme. Physical computing is usage of proper algorithm coding using program commonly used

2. Robot

2-1. Types of robot No restriction if the embedded board is controlled using Scratch and Entry. However, materials threatening others are prohibited.

2-2. Constitution

2-2-1. Production Robot must be made on site. However, non-movable props connected to the driving parts are allowed to be pre-made.

2-2-2. Robot Sensor and Driving (Output)

Division	Sensor (Input)	Driving (Output)
Junior L	Within 2	
Junior H	2~4	
Senior	Over 4	

2-2-2. Types of Robot Sensor and Driving (Output)

Sensor (Input): Sensor accepting input such as infrared sensor or ultrasonic sensor

Driving (Ouput): Motor, Buzzer (Not limit on LED)

2-3 Power of the Robot Power must be given by connecting to laptop using USB or independent power

2-4. Size of the Robot Robot that can be developed and presented within the limited presenting area. However, responsibility on all problems caused while developing and

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presenting by its size is on participant.

2-5. Movement of the robot Robot must move according to the purpose of the production plan.

2-6. Internet Usage Usage or internet and wi-fi is prohibited. If using internet, the participant may be prohibited.

3. **Field**

3-1. Field Extra field is not used, but extra space outside the field may be used unless it bothers other participants. Table size may change depending on field situation.

3-2. Field Usage Field may be used freely depending on the participant's decision.

4. **Competition progress**

4-1. Theme Given Main theme will be noticed through website, and sub themes will be given on the day. Production plan and movie must be made based on one of the sub themes given.

4-1-1. Example of the Theme

Main Theme	Sub Theme
Biomimetic	- Robot that helps human life affluent and joyful. - Robot that increases workers' efficiency in workplace. - Robot that works for the place where human can't live. - Robot that helps disabled people or patients' recovery.
The robot for the womankind	- Robots for elderly - Robots for housewives - Robots for sisters - Robots for mom - Robots for pregnant woman

4-1-2. 2023 Main theme **The Olympics**

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4-2. Inspection on Robot and Computer

4-2-1. Inspection on Robot All parts of robot must be disassembled.

4-2-2. Inspection on Computer All programs are not allowed to made in advance, and must be made on-site.

4-3. Time for Development Maximum 4hours will be given.

4-3-1. Each team must use the producing time as planning, producing, and editing. If going over the limited time, 10% of total score will be deducted in every 5 minutes, and if going over 30 minutes, the producing is considered invalid.

4-3-2. Usage of blueprint, circuit diagram, and manual that may help producing hardware or software may be considered cheating and be disqualified.

4-4. Hand In

The participant must hand in the clip and production in USB to the host. The USB will be given back after copying the flies. If handing in more than 5 minutes late from the time notified on site, points may be deducted.

4-5. Project Description

4-5-1. Judges can move freely during presentation to assess presentation ability and robot's moving ability.

4-5-2. When presenting, participant cannot modify the robot. However, if permitted by judges, the participants may change battery or fix parts under observation of judge.

4-5-3. If not cleaning up or participating insincerely, points may be lost based on judges' decision.

4-5-4. Judges can ask questions to participants or request certain things. If participating and answering insincerely, points may be deducted based on judges' decision.

4-5-5. Presenting order is decided by judges' lottery. Judges may judge participants by asking questions based on the examination guidelines, and participant not participating sincerely may get points deduction.

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5. Examination Guidelines and Ranking Decision

5-1. Examination guidelines Presenting order is decided by judges' lottery. Rankings are decided by comparing points from the examination guidelines.

Examination guideline

Theme Suitability	Creativity (20)		Physical (30)			Computing (30)		Presentation (20)
	Problem Solving	Storyboard	Sensor Usage	Robot Movement	Completeness	Problem Solving	Coding Skill (Usage of variables and Function)	
O / X	2/4/6/8/10	2/4/6/8/10	2/4/6/8/10	2/4/6/8/10	2/4/6/8/10	2/4/6/8/10	4/8/12/16/20	4/8/12/16/20

5-2. Tie-breakers administration criteria If tied, examined by the criteria below.

5-2-1. 1st criterion: Robot with reduction in less fields.

5-2-2. 2nd criterion: Robot with higher coding skills.

5-2-3. 3rd criterion: Robot with better storyboard.

5-2-4. If still tied after the three criterions, the participants are accepted as the same ranking.