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FORCE FOR CHANGE

CITY SHAPER
Robot Game Review

FIRST LEGO LEAGUE JR.

FIRST LEGO LEAGUE

FIRST TECH CHALLENGE

FIRST ROBOTICS COMPETITION

FIRST LEGO LEAGUE
2019-2020

教練會議
2019-12-11

都市規劃師
CITY SHAPER℠

社團法人台灣玉山機器人協會
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Before we start

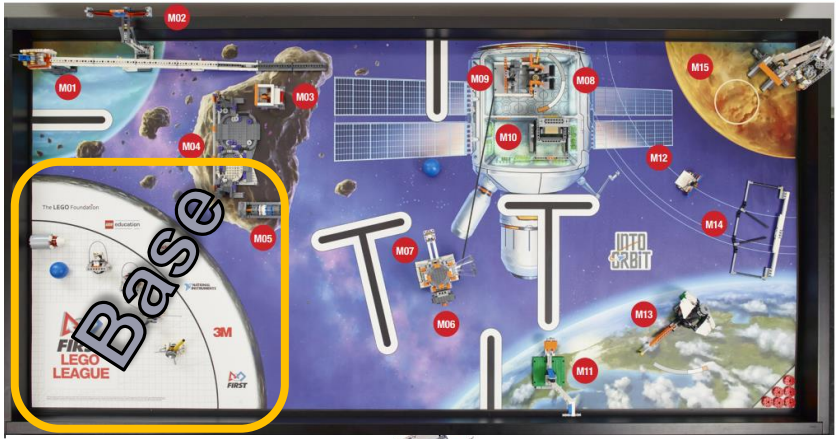
- 取消「 Base 」(基地)
- 增加「 Launch」(出發)、「Home」(基地)
- 任務 14個
- 所有裝備及機器人同時套量，尺寸完全符合小的檢查區將有額外加分優勢
- 計分方式 - 結果論：分數取決於比賽結束時的當下狀況(GR35)
- 獨立的(INDEPENDENT) - 沒有接觸任何裝備。(GR33)
- 支撐著(SUPPORTED) - 100%重量被支撐住並且防止掉落。(GR34)
- 裝備(EQUIPMENT) - 您帶來的在解任務中可能會用的到所有東西，包含機器人。(GR02)

- FLL 2019-2020【Game Guide】【競賽指南】
- FLL 2019-2020【Robot Game updates】

Base is gone….

2018
INTO ORBIT
太空漫遊

2000-2018



- 在Base區準備機器人
- 機器人從Base區出發
- 裝備或模型放在Base區內或旁邊的桌子

2019
CITY SHAPER
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2019 - future

- 在Home區準備機器人
- 機器人從Launch area出發
- 機器人返回請直接回到Home區
- 裝備或模型放在Home區內 – 無配置邊桌

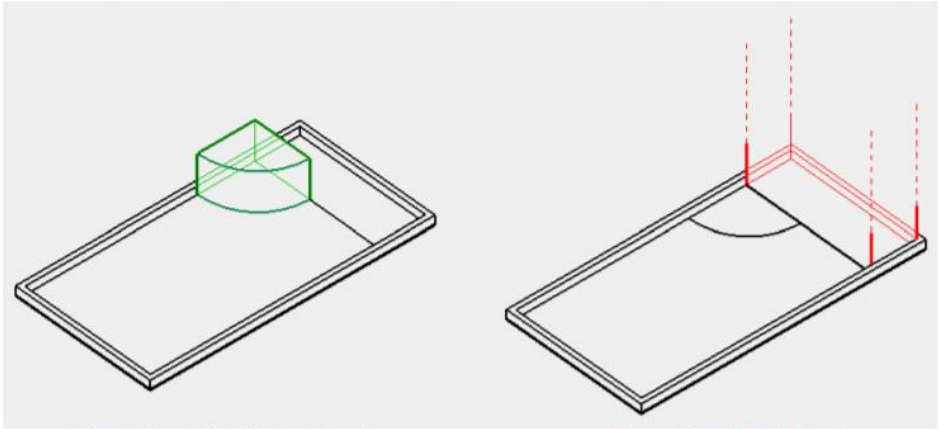
場地及道具設置

- 場地保留Home區尺寸約 1150mm x 350mm
  (**國際尺寸:1143mm x 342mm**)
- 底圖貼法:東側及南側靠牆,其餘白邊會用黑色膠帶貼覆
- 西側白色底板貼黑紙(底圖會部分覆蓋黑紙上),會用黑色膠帶貼交疊處
- 兩座場地中間會夾邊框木條1片厚度(約18mm)
- 共有18 個任務道具放在Home區,包含以下:
  4 個褐色建築體, 4 個紅色建築體, 3 個白色建築體, 3 個藍色建築體, 3 個升級永續建築, 1個蝙蝠

Leave and Return

RG22 - HOME SAFETY

Be sure you know Rule 27. Interrupting the Robot even partly in the Launch Area can cause you to lose a Precision Token. To avoid losing a Token, Interrupt the Robot completely in Home only.
(Experienced teams are not experienced with this year's Rules. The Launch Area is not the same as "BASE" from past years.)



All mention of the "Launch Area" means here and only here, especially Rule 21

"Leave from here"

All mention of the "Home" means here and only here, especially Rule 27

"Return to here"

Mission Details

北

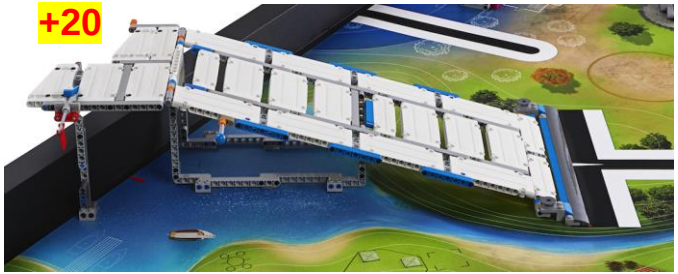
西

東

南

Missions - Sample Video

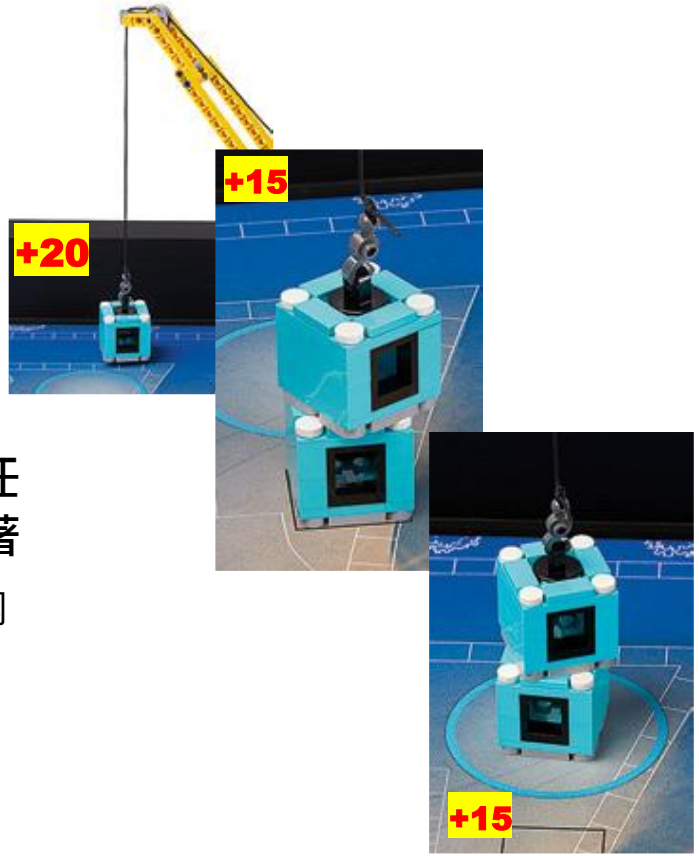
任務01:高架位置



- ▻任務額外加分 **+5分**
- ▻得分狀態條件
  - 機器人僅被高架橋支撐住
  - 旗子僅由機器人舉起
- ▻特別說明:
  - 舉旗過程機器人相互碰撞是允許的
  - 不可使用障礙物阻擋對方機器人上橋(RG12)
  - 獲得高架橋樑支撐的分數才可獲得旗幟分數

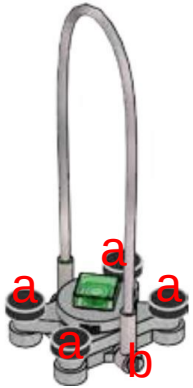
任務02: 起重機

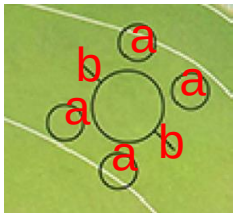
- ▻任務額外加分 **+10分**
- ▻得分狀態條件
  - 掛勾勾住的藍色方形塊明顯下降
  - 掛勾勾住的藍色方形塊**獨立(沒有接觸任何裝備)**被另一個相同的**藍色方塊支撐著**
  - 底層(Level 1) 藍色方塊完全在藍色圈內



任務03: 監測無人機

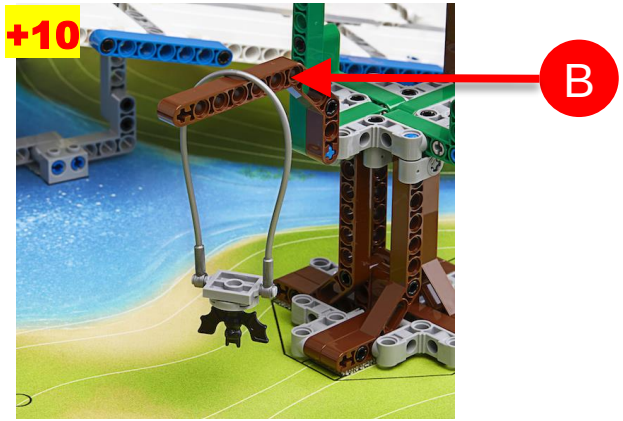
- ▻任務額外加分 **+5分**
- ▻得分狀態條件
  - 無人機被懸掛在高架橋邊的軸 (如右圖示)
- ▻設置
  - 環狀開口朝向**Launch Area**
  - 無人機結構更新 (RG02)





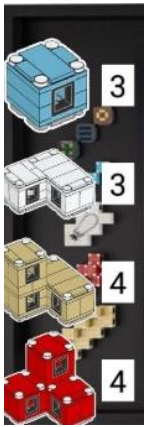
任務04: 幫野生動物設計棲息地

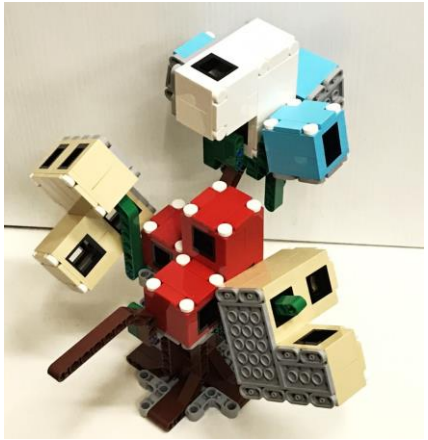
- ▻任務額外加分 **+5分**
- ▻得分狀態條件
  - 蝙蝠僅被如圖示B的樹枝支撐著
- ▻設置
  - 蝙蝠一開始放在Home區



任務05: 樹屋

- ▻任務額外加分 **+5分**
- ▻得分狀態條件
  - 建築物體**獨立**且僅被大的樹枝支撐住
  - 建築物體**獨立**且僅被小的樹枝支撐住
- ▻建築物體:
  - 放在Home 區的3 個藍色, 3 個白色, 4 個棕褐色, 4 個紅色 (如圖示)



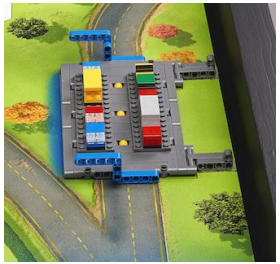


任務06: 交通堵塞

▻任務額外加分 **+5分**

▻得分狀態條件

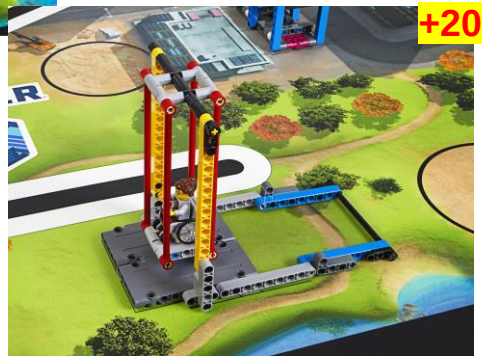
- 解決交通堵塞; 該道具是獨立被本體結構支撐住



任務07: 鞦韆

- ▻任務額外加分 **+5分**
- ▻得分狀態條件
  - 鞦韆被釋放

SETUP



SCORING CONDITION

任務08: 電梯

- 任務額外加分 **+5分**
- 得分狀態條件

  電梯能動作的零件需獨立且由電梯本體結構支撐著,不接觸任何裝備

  - 藍色電梯車廂在下方
  - 電梯車廂平衡

- 設置:

  - 藍色電梯車廂在上方

  (RG03)

Blue Car Down

Balanced

任務09: 安全係數

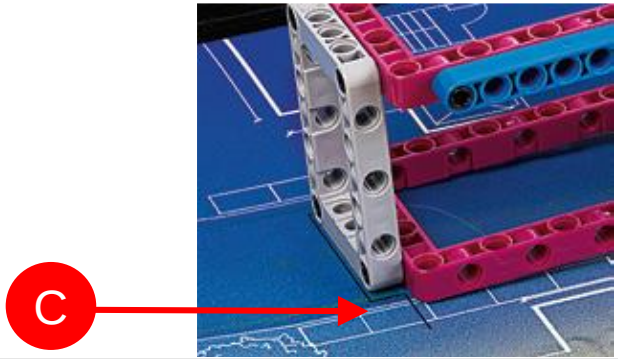
▻任務額外加分 **+5分**

▻得分狀態條件

- 測試建築獨立且僅被藍色梁支撐著
- 一些直立的藍色梁被推倒45度或以上

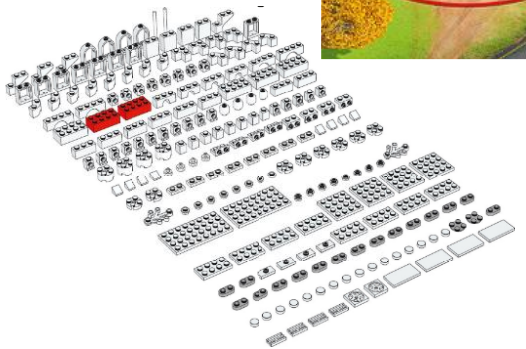
任務10: 鋼骨結構

- ▻任務額外加分 **+5分**
- ▻得分狀態條件
  - 站立著,獨立且僅由本體結構底座支撐著
- ▻設置
  - 如圖示狀態及標示 C 對齊線



任務11: 創新建築

- ▻任務額外加分 **+5分**
- ▻得分狀態條件
  - 尺寸需大於4x4 藍色立方體
  - 至少部分在圓圈內
- ▻設置
  - 只能用bag10零件包內的零件組裝 (不需要使用全部的零件)
  - 團隊必須事先組裝好帶至比賽會場
  - 此建築在規則裡屬於**裝備** (GR02)



任務12: 設計與建造

- ▻任務額外加分 **+5分**
- ▻得分狀態條件
  - 依位置: 建築體正投影完全在圈內,底層的平坦面與底圖相接觸,且與底圖接觸的建築體顏色與紅色、褐色或白色圈相符合, **+10分/ each circle** (藍色圈不屬於此範圍)
  - 依高度: 獨立且部分在圈內,堆疊高度相加,「正投影是否交疊」判斷同一棟或多棟 **+5分/ each Level**

任務12: 設計與建造 <補充>

相符顏色 = 無
褐色建築 = 2 層 (+5)x2
白色建築 = 1 層 +5
獲得15分

相符顏色 = 無
建築體 = 4 層(因為正投影交疊)
獲得20分 (+5)x4

相符顏色 = 紅色.....+10
建築體 = 2 層(色).....+10
其他建築體 = 4 層.....+20
獲得40分

任務13: 升級永續建築

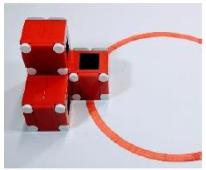
- ▻任務額外加分 **+5分**
- ▻得分狀態條件
  - 獨立且被建築體支撐著,同時建築堆疊體至少部分在圓圈內
  - 每個升級永續建築僅能用於一棟建築堆疊

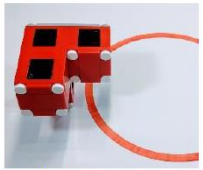
任務12 & 13 <補充>

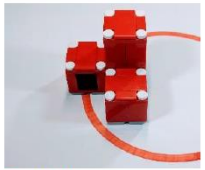
RG17 - PARTLY IN / COMPLETELY IN

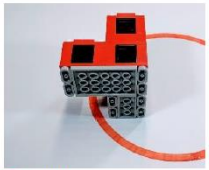
For M12 and M13, look at the whole Stack, not just Level 1, to decide if it is “in.” A Stack is

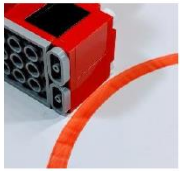
---in (partly in) a Circle if ANY bit of the Stack is in the space above the Circle’s interior or line.
---Completely In a Circle if EVERY bit of the Stack is in the space above the Circle’s interior or line.


Partly In.
10 points shown.


Partly In.
10 points shown.


Partly In.
10 points shown.


Partly In.
10 points shown.


Partly In (Benefit Of The Doubt).
10 points shown.

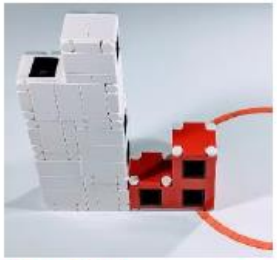
Completely In.
20 points shown.
(Includes Circle Color Match.)

Completely In (Benefit Of The Doubt.)
20 points shown.
(Includes Circle Color Match.)

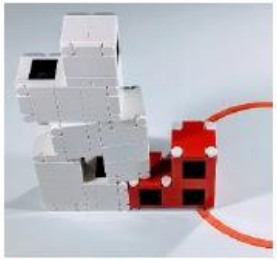
任務12 & 13 <補充>

RG16 - BRIDGED, EXAMPLES

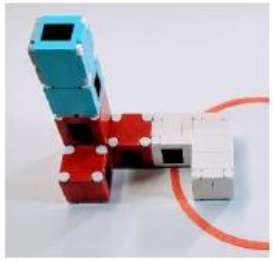
Notice how Bridging to a Circle can affect Height Score.



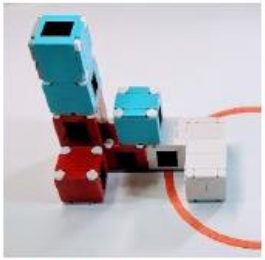
Two Stacks.
10 points shown.
(Not Bridged.)



One Stack.
25 points shown.
(Bridged.)



Two Stacks.
5 points shown.
(Not Bridged.)

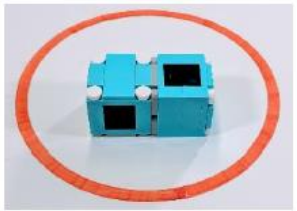


One Stack.
20 points shown.
(Bridged.)

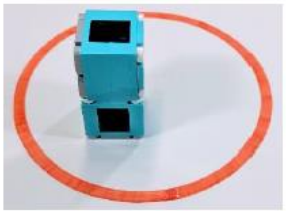
任務12 & 13 <補充>

RG15 - "BRIDGED" STACK COMBINATIONS

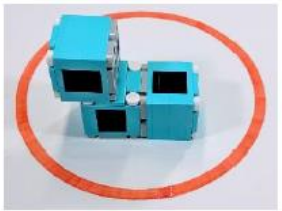
Stacks touching only each other's sides are separate. But if one Unit touches Flat Down on multiple Stacks, they are "Bridged" and all count as one Stack. Notice how Bridging Completely In a Circle can affect Height score.



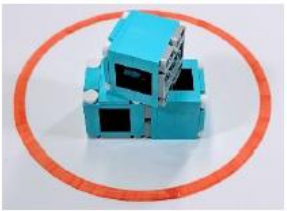
Two Stacks.
10 points shown.



One Stack.
10 points shown.



Two Stacks.
15 points shown.
(Not "Bridged.")

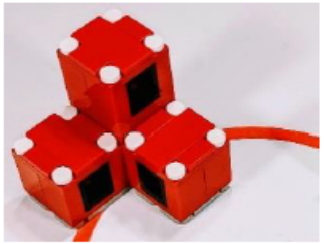


One Stack.
10 points shown.
("Bridged.")

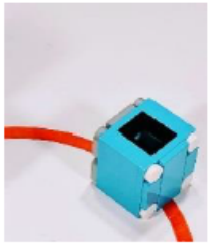
任務12 & 13 <補充>

RG14 - BUILDING UNITS, GENERAL

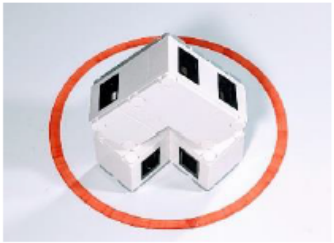
---A Building Unit is the whole Model, not the individual rooms (left picture).
---It's not required for windows to face sides, or gray bases to face the Mat (center picture).
---Stacked Building Units require surface-to-surface contact, like floors and ceilings (right picture).



This is 1 Building Unit, not 4.
10 points shown.

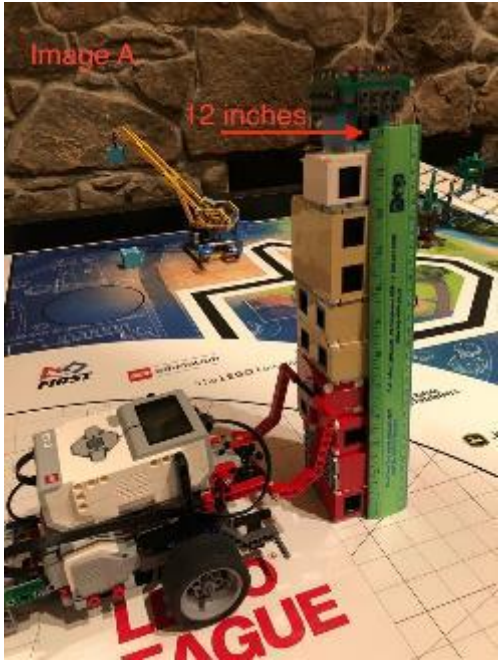


This scores as a Stack.
5 points shown.



This top Unit doesn't count.
5 points shown.

任務12 & 13 <範例補充>



圖A

裝備及得分道具

出發前，高度規定不能超過12 inches (約30.5 cm) <GR19>，此狀態不可出發

圖D_30分

(M13)每個升級永續建築僅能用於一棟建築堆疊，此狀態永續建築分數只計一次(+10)

+10....永續建築

+20....建築堆疊體

任務12 & 13 <範例補充>

任務11的道具.....該道具屬於「裝備」

任務12 .....規定堆疊的得分物件不可接觸裝備

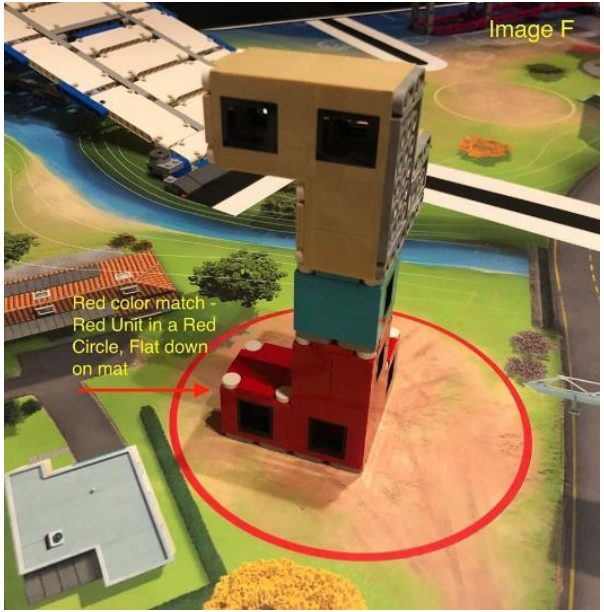
圖示B : M11計分, M12 & M13不計分

圖示C : M11計分

接觸 : M12建築體無效堆疊不計分 & M13不計分

未接觸 : M12建築體有效堆疊計分 & M13計分

任務12 & 13 <範例補充>



圖F_35分

+10....紅色圓圈

+25....建築堆疊體(5層)

圖E

M11 ...計分

M12...不計分

M13...不計分

任務12 & 13 <範例補充>

圖G_25分

紅色圓圈不計分

+25....建築堆疊體(5層)

圖H_15分

+10....白色圓圈

+5....建築堆疊體(1層)

任務12 & 13 <範例補充>

圖I_30分

紅色圈僅計分一次

+10….red circle

+10….2 level

+10….2 red units

圖J_30分

+30….6 level

任務14: 精準度籌碼

▻得分狀態條件

- 每回合結束後,桌上剩餘的精確籌碼積木可再獲得額外的分數

▻說明:

- 各桌裁判會依隊伍精確度來決定是否扣除籌碼積木

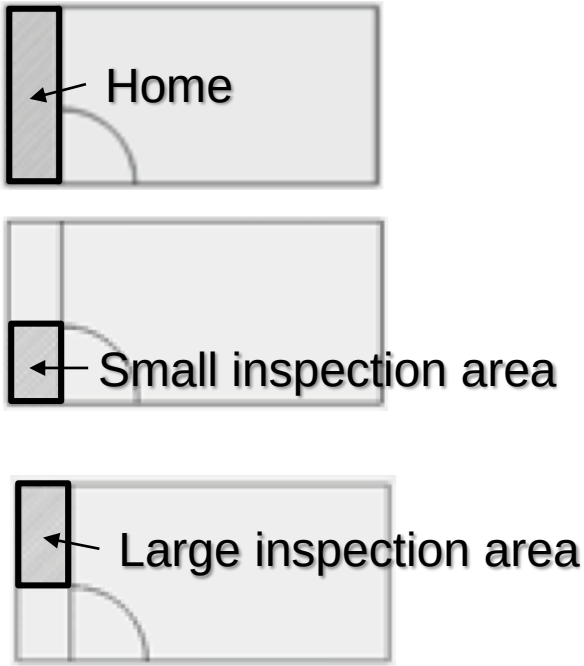
(1) 機器人在場內運作過程中,選手接觸機器人

(2) 機器人**尚未完全**回到Home區選手接觸機器人

Definitions

- Home and Inspection
- Launching ,Launch Area, and Storage
- Interruptions and Stranding
- Other

Home and Inspection 基地區及檢查區



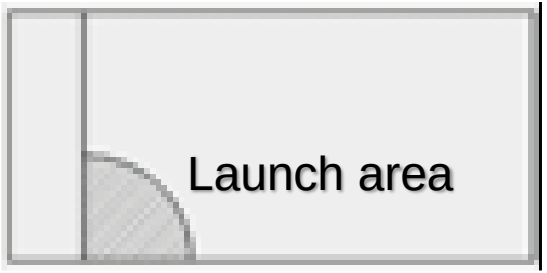
When the Team arrives at the Field for a Match, perform Inspection:

- ALL Team Equipment fits in either the Large or Small Inspection Area, under an imaginary ceiling 30.5 cm high (R19)

  Exceptions: Mission 1,3~13 (+5) ; mission 2 (+10)

- Teams may use their hands to restrain/confine Equipment in the Inspection Area (RG08)
- After Inspection, Teams may arrange objects in Home any way they like

Launching (R21) , Launch Area



Launches and Re-Launches (R21)

- Robot and everything (in control of the team) that it is about to move or use is completely within Launch Area
- **Launch height limit is 12 inches (≒ 30.5 cm)**
- Nothing on the Field is moving!
- The Technicians aren't touching anything (*but we know that we have to allow leniency for Robot button*)
- Make Robot GO by touching button or signaling sensor

Match start—beginning of the last word/sound in the countdown ("3-2-1-***L***ego!)

Storage (R19, RG13)

Teams may store objects in Home

- No off-Field Storage of Equipment or Mission Models
- Team Equipment may be held by Technicians but not other team members
- Technicians may handle objects Completely In Home at any time

- Non-LEGO containers that the Team uses to bring Equipment to the Match should be stored away from the Table

Storage (R19, RG13)

Strategic actions may be done to items in Home by team Technicians.

- R22 only says don't touch stuff on the Field outside Home.
- Launch Area is not part of Home. Team should not touch items in Launch Area while the Robot is running.
- When Robot is Interrupted, there is a new Launch preparation period. Technicians may touch items in Launch Area during Launch preparation.

Interruptions

Determine where objects go after they are moved

- ▻Robot touched/interacted (D09) with (R27/28)

	Robot	Model/Equipment
Completely in Home	OK—no penalty	OK—keep it
Not Completely in Home	Interruption – lose Precision Token	Launched with Robot – Keep it
		Not Launched – Take out of play

- ▻Exception – re-Launch if hasn't left Launch Area (RG07)
- ▻"In Home" – Robot, Models, and Equipment are assessed independently of each other

Stranding

Determine where objects go after they are moved

- Stranding (R29) – Robot loses contact with something it was Transporting (Mission Model –or – Equipment)

	Model/Equipment
Completely in Home	OK—keep it
Not Completely in Home	Leave where it is

Other

R01 – Robot

- Controller (EV3 / NXT / RCX)
- Equipment combined by hand, not intended to separate, except by hand

HARDWARE			
Required	**Equipment**	**Number allowed**	**EV3 (also NXT and RCX equivalents)**
X	Controller	1 per Match	
X	Motors	Any combination, maximum of 4 in total.	Medium Large
	Sensors	Unlimited	
SOFTWARE			
You can use any software that allows the Robot to move autonomously – meaning it moves on its own.			
No form of remote control is allowed.			

Other

RG23 - REMINDER NOTES

You can bring notes to the Match, on one sheet of paper, to remind you of Robot position and program specifics. Maximum paper size is 9 in. by 12 in. (229 mm by 305 mm) - “Letter” and “A4” both qualify. The paper can have no other purpose, and will not count as Equipment.

SCORE SHEET

TEAM #: _____ REFEREE: _____

ROUND: _____ TABLE: _____

(please circle one selection or fill in the blank for each item)

ADVANTAGE
Your Robot and Equipment fit in the Small Inspection Area: No Yes

1. **M01 – ELEVATED PLACES**
   The Robot is Supported by the Bridge: No Yes
   Number of flags that are clearly raised any distance, only by the Robot: 0 1 2

2. **M02 – CRANE**
   The Hooked Blue Unit is clearly lowered any distance from the Guide Hole: No Yes
   The Hooked Blue Unit is Independent and Supported by another Blue Unit: No Yes
   AND Level 1 is Completely in the Blue Circle: No Yes

3. **M03 – INSPECTION DRONE**
   The Inspection Drone is Supported by the axle on the Bridge: No Yes

4. **M04 – DESIGN FOR WILDLIFE**
   The Bat is Supported by the branch on the Tree: No Yes

5. **M05 – TREEHOUSE**
   Number of Units Independent and Supported by the Tree's Large Branches: _____
   Number of Units Independent and Supported by the Tree's Small Branches: _____

6. **M06 – TRAFFIC JAM**
   The Traffic Jam is lifted, its moving part is Independent, and it is Supported only by its hinges: No Yes

7. **M07 – SWING**
   The Swing is released: No Yes

8. **M08 – ELEVATOR**
   The Elevator's moving parts are Independent and Supported only by its hinges, in the following position: Neither Blue Car Down Balanced

9. **M09 – SAFETY FACTOR**
   The Test Building is Independent and Supported only by the blue beams: No Yes
   Number of blue beams knocked out at least half way: 0 1 2 3 4 5 6

10. **M10 – STEEL CONSTRUCTION**
    The Steel Structure is standing, and is Independent and Supported only by its hinges: No Yes

11. **M11 – INNOVATIVE ARCHITECTURE**
    The Structure is bigger than a Blue Building Unit and built from the team's white LEGO bricks: No Yes
    The Structure is in any Circle: No Partly Completely

12. **M12 – DESIGN & BUILD**
    Number of Circles with a color-matching Unit, flat down on the Mat, and Completely in Circle: 0 1 2 3
    Sum of height Levels of Independent Stacks at least partly in any Circle: _____

13. **M13 – SUSTAINABILITY UPGRADES**
    Number of Upgrades that are Independent and Supported only by a Stack which is at least partly in a Circle: 0 1 2 3

14. **M14 – PRECISION**
    Number of Precision Tokens left on the field: 0 1 2 3 4 5 6

RETURN LOOSE ITEMS
(4x) Blue Units, (4x) White Units, (4x) Red Units, (4x) Tan Units, (1x) Bat, (1x) Drone, (1x) Solar Panel Upgrade, (1x) Insulation Upgrade, (1x) Garden Upgrade, (1x) Hooked Blue Unit, (1x) Test Building, and (6x) Precision Tokens

TEAM INITIALS: _____

EROBOT
台灣玉山機器人協會

FIRST LEGO LEAGUE