



# FLL Indonesia Category

## Mission Details



# 1. Background

The TRASH TREK Challenge is about what happens to things when we think we're done with them, or when we think they're no good any more. The truth is that with some imagination, we can get much more use out of them, or the materials they're made from. A really smart time to think about this is before we even make or buy them! Recycling is great, but that's only one part of a very big picture. As you work on the Missions, imagine how we might be able to innovate our way toward ZERO WASTE one day...

# 2. Mission Overview

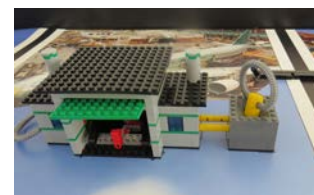
This segment will explain what missions that are needed to complete during the competition. Participants can choose any mission that they would like to complete to gain as much point as possible according to the category he/she partake.

The following table shows in a glance how much points to get from each mission and grade

Mission	Visible condition at the end of the match	Point	Elementary	Junior High	Senior High
Methane	Methane on truck	+40			✓
	Methane on Sorter Power Station *Exact placement is not a must	+40			
Transport	Truck supports the yellow brick completely	+50	✓	✓	✓
	The Yellow Bin is completely east of the Truck's Guide.	+60			
Sorting	<b>Yellow/Green Bar</b> Bar completely in the west transfer area.	+7 x n			✓
	Bar was never completely in your West Transfer Area	+6 x n			
	* Bars have to be in their corresponding green bin				
	<b>Black Bar</b> Part of a scoring Flower Box, or in their original Setup position.	+8 x n			
	Is in their matching Green Bin, or in the Landfill Bin.	+3 x n			
	Is anywhere else.	-8 x n			
Careers	At least one Person is completely in the Sorter Area.	+60	✓	✓	✓
Scrap Cars	The Engine/Windshield unit is installed in the unfolded Car in the proper space and direction.	+65		✓	✓
	* Engine/Windshield placement doesn't have to be exact.				
	The Car is completely folded and completely in the East Transfer Area. * The Car must never cross into Safety, even partly.	+50			
Cleanup	Plastic Bags are completely in Safety.	+30 x n		✓	✓
	Animals are completely in any circle which is completely empty of Plastic Bags.	+20 x n			
	The Chicken is completely in the small circle.	n			
		+35 x n			
Composting	The Compost is ejected, but not completely in Safety.	+60	✓	✓	✓
	The Compost is completely in Safety	+80			
Salvage	The Valuables are completely in Safety	+60	✓	✓	✓
Demolition	None of the Building's twelve beams is left standing in Setup position	+85	✓	✓	✓
Purchasing Decision	Toy Planes are completely in Safety	+40 x n	✓	✓	✓
Repurposing	The Compost is perfectly nested inside one of the Packages from which a Toy Plane has been removed. The Package is in original condition	+40	✓	✓	✓
Penalty	For each offense, the ref will place one black bar in a negative scoring position.	-8 x n	✓	✓	✓
	Number of missions		7	9	11
	Maximum Points		515	735	940
	Time Limit		1:30	2:00	2:30

### 3. Mission in Details

**M01 – Methane (Senior)** – We want to avoid Landfills, but existing Landfills do produce Methane, which can be converted into energy.



- Basic Mission Description: Collect Methane from the Landfill Area and use it to help run the Truck and/or the Factory.
- Specific physical requirement, visible at the end of the match: Methane is in the Truck's engine compartment, and/or the Factory's Power Station.
  - Value: 40 per methane.
- Leniency: Full/Exact nesting is not required.

**M02 – Transport (Elementary, Junior, Senior)** – The distance a discarded material may need to travel is an important part of the equation when deciding what to do with that material.



Initial Position



Truck support the bin

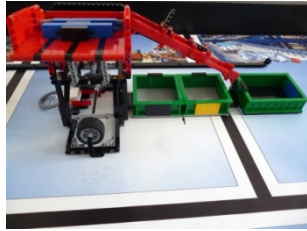


Bin east of the truck guide

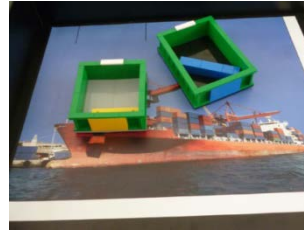
- Basic Mission Description: Load the all-Yellow Material Bin onto the Truck to be transported east/unloaded.
- Specific physical requirement, visible at the end of the match (score one or both):
  - Value: 50 The Truck supports all of the Yellow Bin's weight.
  - Value: 60 The Yellow Bin is completely east of the Truck's Guide.

**M03 – Sorting (Senior)** – As we strive toward zero waste, one of the most urgent needs for innovation is in the area of sorting. Current separation technology and processing can be difficult, expensive, limited, and error-prone.

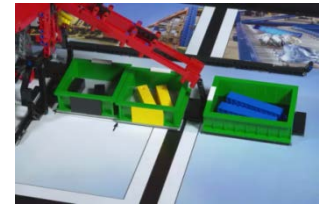
- Basic Mission Description: Yellow/Blue Bars are recyclable. Black Bars are impurities we have no current way to use. Process Bars through the Sorter. Bars sorted into their matching Green Bins have positive potential.
- Specific physical requirement, visible at the end of the match:



Initial Position



Bar in West Transfer Area



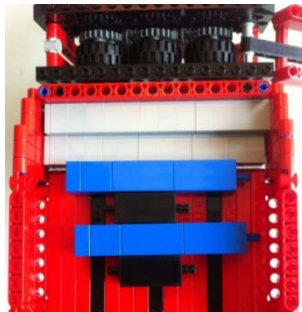
Bar was never in West Transfer Area

Yellow/blue bars are in their matching green bin and the bin (bins score independently)...

- Value: 7 Per Bar is completely in your West Transfer Area.
- Value: 6 Per Bar was never completely in your West Transfer Area.

Black bars are (bars score independently)...

- Value: 8 Per Bar part of a scoring Flower Box, or in their original Setup position.

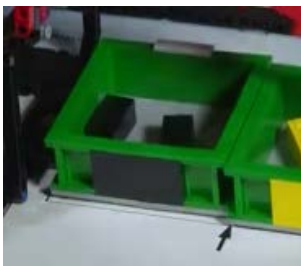


Bar in their original position (including penalty bars)



Bar in Flower Box

- Value: 3 Per Bar in their matching Green Bin, or in the Landfill Bin
- Value: Minus 8 Per Bar anywhere else.



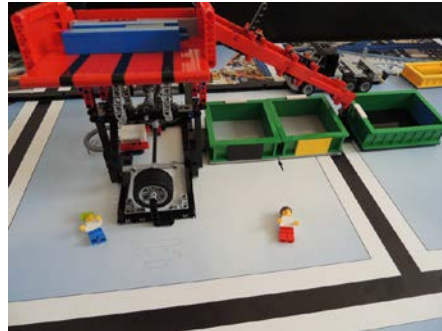
Bar in corresponding green bin or landfill.



Bars anywhere else

- Method Constraint: Bars must only enter Green Bins directly from the Sorter's east chute or CAREERS BONUS...

**M04 – Careers (Elementary, Junior, Senior) –** Many scientists, engineers, and technicians are needed to keep up with today's trends in waste reduction.



- Basic Mission Description: Move at least one person to the Sorter Area to earn a helpful exception to the Rules.
- Specific physical requirement, visible at the end of the match as needed: At least one Person is completely in the Sorter Area.
  - Value: 60 Plus this Leniency Bonus: Team technicians and/or the ref (if needed/asked) are allowed to unclog any west chute blockage by hand, and/or put mis-sorted bars into their correct bin, including bars that didn't land in any bin.

Do note that to make physical change by hand, at least one person has to be in the sorter area AT THE TIME.

**M05 – Scrap Cars (Junior, Senior) –** There are hundreds of millions of Cars worldwide, made from an enormous variety of materials. Are we making the best use of Cars at the end of their lives? How much of a scrapped Car really gets re-used?



Car with Engine/Windshield



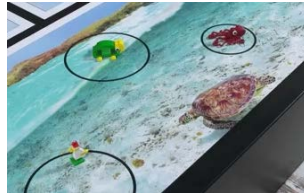
Car folded in East Transfer Area

- Basic Mission Description: Fix the old Car by installing the Engine/Windshield, or fold the Car and sell it for scrap.
- Specific physical requirement, visible at the end of the match as needed (Score Only One Way):
  - Value: 65 The Engine/Windshield unit is installed in the unfolded Car in the proper space and direction (Full/exact nesting is not required).
  - Value: 50 The Car is completely folded and completely in the East Transfer Area.
- Method Constraint: The Car must never cross into Safety, even partly

**M06 – Cleanup (Junior, Senior)** – For discarded material, the only outcome worse than waste is pollution. Plastic Bags for example, seem to be everywhere, causing a variety of problems – jamming Equipment, threatening Animals, etc.



Plastic Bags in safety



Animals completely in circle



Chicken in its favourite space

- Basic Mission Description: Move Bags from the Sorter and/or the Beach, and return Animals to their favorite spots.
- Specific physical requirement, visible at the end of the match as needed (Score Any That Apply):
  - Value: 30 Per Bag Plastic Bags are completely in Safety.
  - Value: 20 Per Animal \*Animals are completely in any circle which is completely empty of Plastic Bags.
  - Value: 35 The Chicken is completely in the small circle.

**M07 – Composting (Elementary, Junior, Senior)** – Discarded organic material doesn't have to become waste. It can be converted into fertilizer.



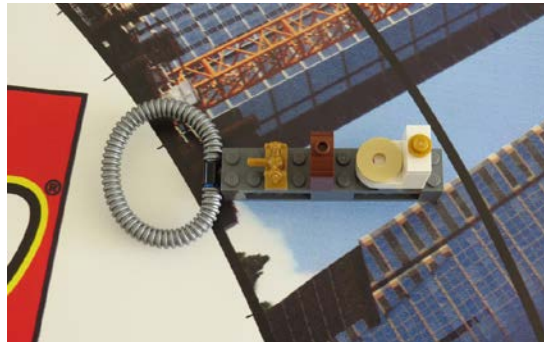
Compost is ejected but not in safety



Compost is ejected and in safety

- Basic Mission Description: Start the Composting process. After some time, it will eject Compost.
- Specific physical requirement, visible at the end of the match (Score Only One Way):
  - Value: 60 The Compost is ejected, but not completely in Safety.
  - Value: 80 The Compost is completely in Safety.

**M08 – Salvage (Elementary, Junior, Senior)** – A building being demolished should only be a shell of its former self. Many tons of valuable materials and objects can be salvaged first.



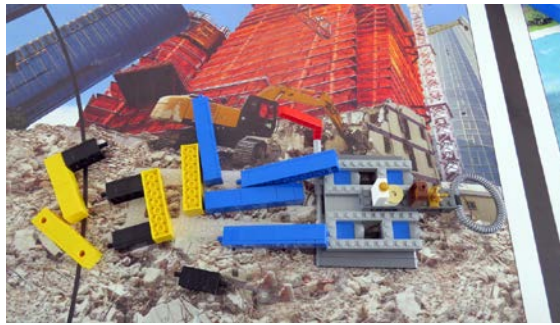
Valuable in safety

- Basic Mission Description: Move the Valuables to Safety.
- Specific physical requirement, visible at the end of the match:
  - Value: 60 The Valuables are completely in Safety

**M09 – Demolition (Elementary, Junior, Senior)** – Compared to the amount of material discarded by a family every week, the



amount of material discarded from a demolition site is unbelievable. Where does it all go? Where SHOULD it all go?



Tidak ada balok yang berdiri

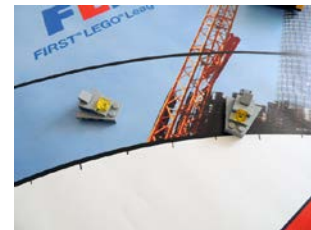
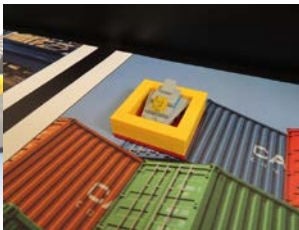
- Basic Mission Description: Demolish the Building and decide what to do with the materials.
- Specific physical requirement, visible at the end of the match:
  - Value: 85 None of the Building's twelve beams is left standing in Setup position.

### **M10 – Purchasing Decisions (Elementary, Junior, Senior) –**

Some manufacturers put products in packaging which is hard or impossible to divide into pure sorted recyclables. What choices do you have when you see that?



Toy Plane Initial Position



Toy Plane completely di Safety

- Basic Mission Description: Decide about buying Toy Planes based on their Packaging.
- Specific physical requirement, visible at the end of the match:
  - Value: 40 Per Plane Toy Planes are completely in Safety.

**M11 – Repurposing (Elementary, Junior, Senior) –** Recycling gives new life to the materials an object is made from, but the

process does take time and energy. Instead, is there a way to give new life to the object itself?



Compost in the big package



Compost in the small package

- Basic Mission Description: Use the packaging from a Toy Plane as a flower box by putting compost in it.
- Specific physical requirement, visible at the end of the match:
  - Value: 40 The Compost is perfectly nested inside one of the Packages from which a Toy Plane has been removed. The Package is in original condition.

**Penalties** – For each Penalty as described in Rule D09, the Ref will place one Black Bar on the Mat in a convenient out-of-the-way place, not to exceed four Bars. The Ref may shift them out of the Robot's way as needed, but they must always stay in a negative scoring position.



4 Penalty Bar at its initial position



4 Black Bars location example if 4 offenses occurred. Placement may shift during the match.

**“Areas”** – Where the Missions refers to the Landfill Area, Sorter Area, or East Transfer Area, those areas are defined by the inner white strips, colored red below. Each area is defined as only the space above and inward from those white strips. Anything still partly above the adjacent thick black line doesn't count as being in the area.

