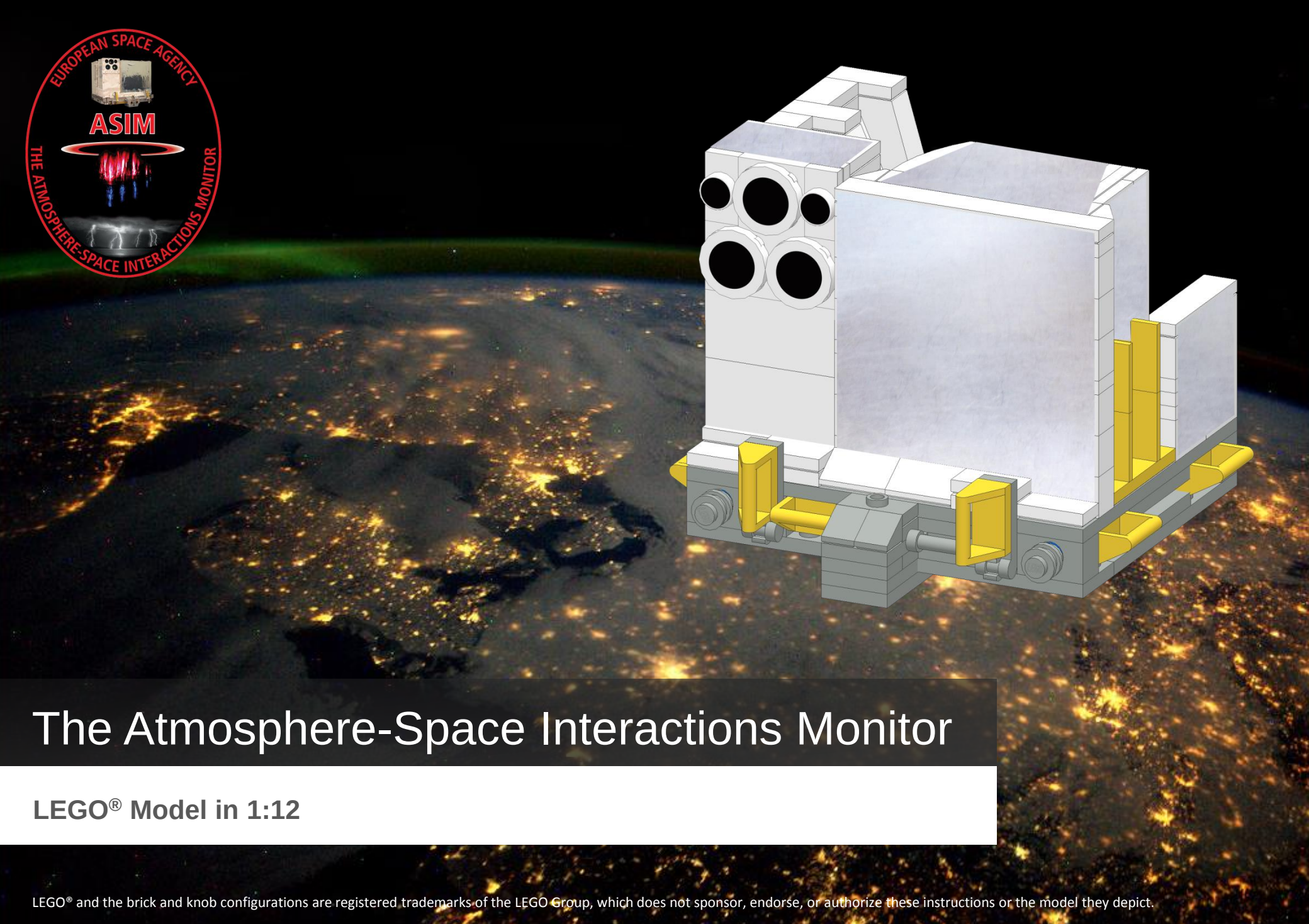


The Atmosphere-Space Interactions Monitor

LEGO® Model in 1:12

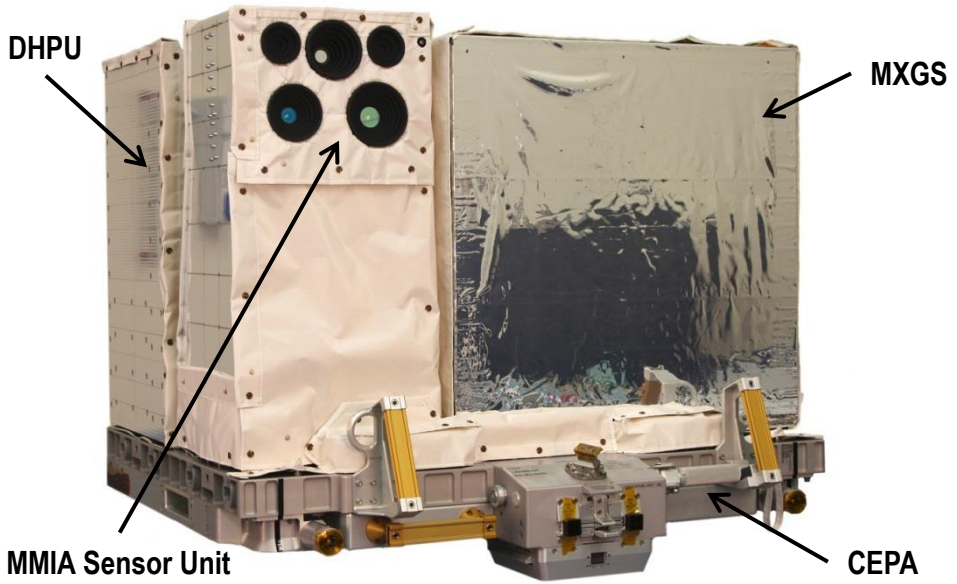
Introduction and Science

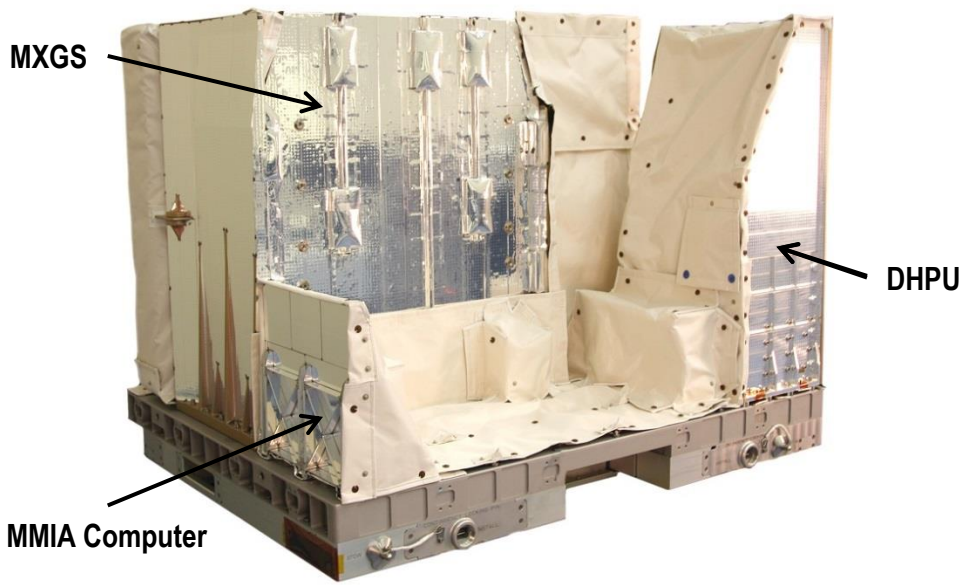
The Atmosphere-Space Interactions Monitor (ASIM) is a nadir looking observatory to be installed on the exterior of the Columbus module that houses the European Space Agency's (ESA) laboratory on the International Space Station (ISS). ASIM is scheduled to be launched in 2018 on a SpaceX Falcon9 rocket and on-orbit transportation is supported by the SpaceX Dragon spacecraft.

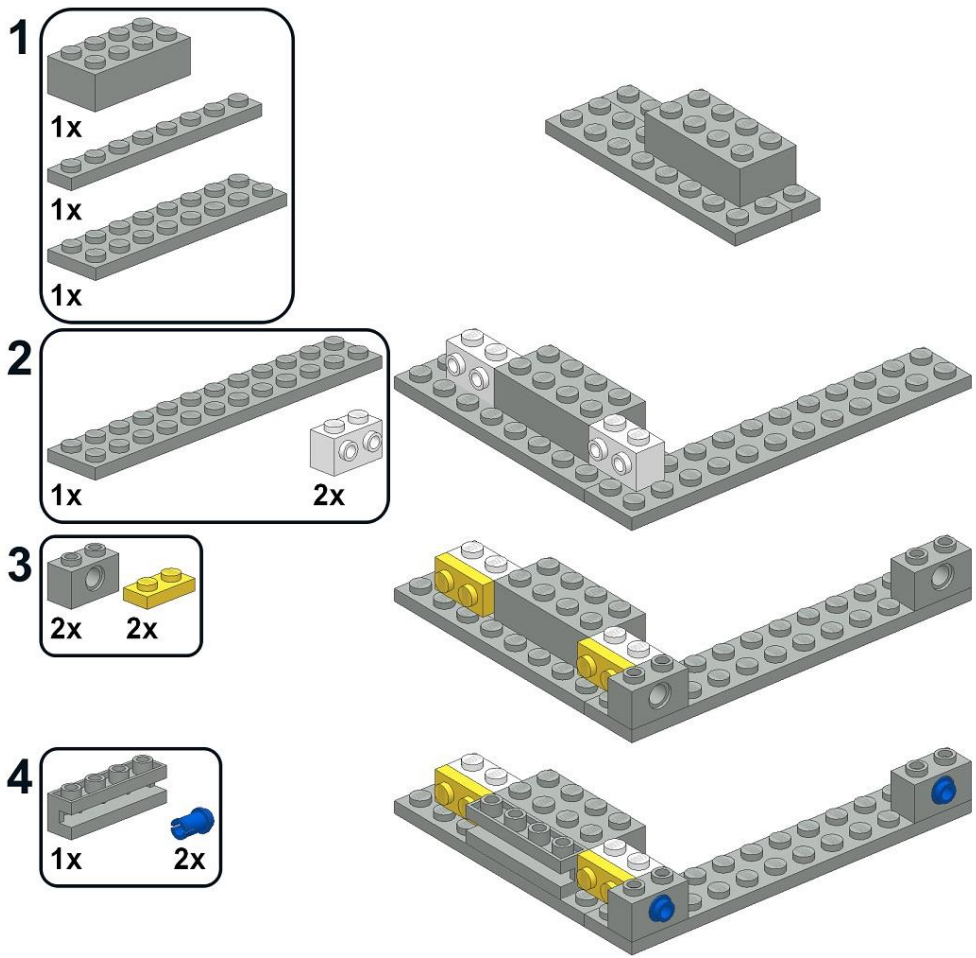
ASIM will measure high altitude lightning that is discharged from thunderclouds, stretching up to the ionosphere at altitudes of 90-100 km. These formations of lightning are known as *red sprites*, *blue jets*, and *elves*. In addition, ASIM will study the discharges observed in the form of energetic bursts of X-rays and gamma rays, likewise discharged from violent lightning. In science terms the optical events are referred to as Transient Luminous Events (TLEs), and the X- and Gamma ray events as Terrestrial Gamma Flashes (TGFs).

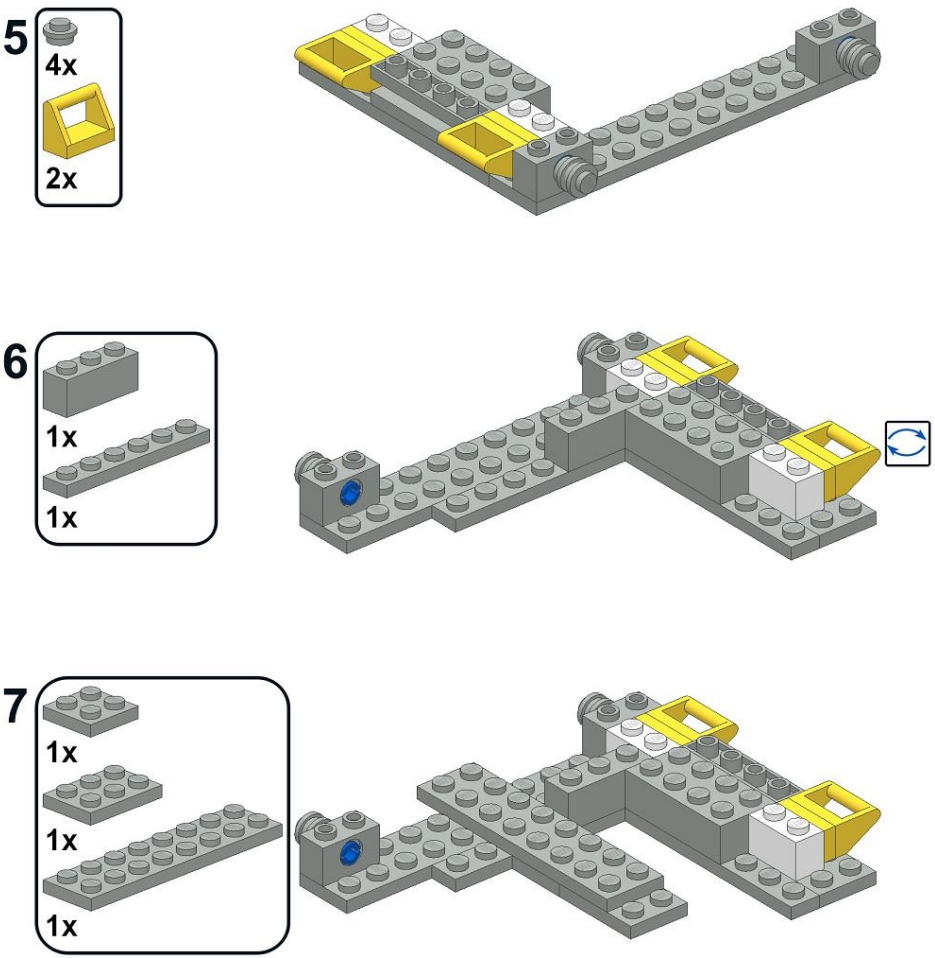
ASIM Components

- The Modular Multi-spectral Imaging Array (MMIA) comprising two optical narrow band cameras (CHUs) and three photometers (PHOTs) with related optical and signal processing capabilities, including autonomous TLE detection algorithms to identify and prioritize events for download to ground.
- The Modular X- and Gamma-ray Sensor (MXGS) comprising a detector built around a Bismuth Germanium as well as a Cadmium Zinc Telluride semiconductor detection plane of 32 cm x 32 cm with possible imaging capabilities. The MXGS is designed to detect radiation from TGFs and from lightning induced electron precipitation. Fast electronic circuitry provides time history and spectra over the course of the expected lifetime of 1-5 millisecond for each TGF.
- The Data Handling and Power Unit (DHPU) providing the communication with Columbus and including facilities for automated scheduling of ASIM operations.
- The Columbus External Payload Adapter (CEPA) providing accommodation for the observatory to be positioned on the bottom starboard platform of the Columbus External Payload Facility.









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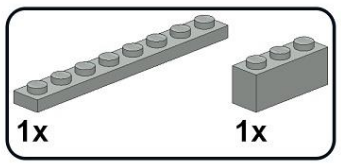

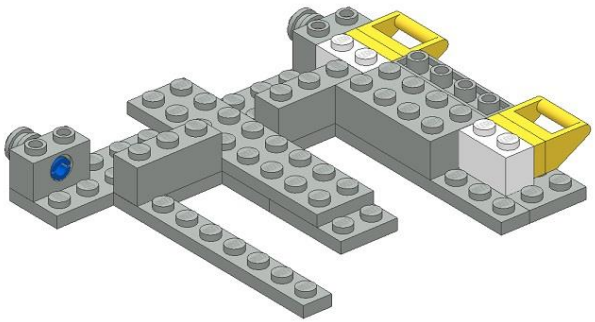

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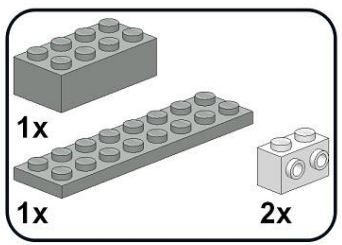

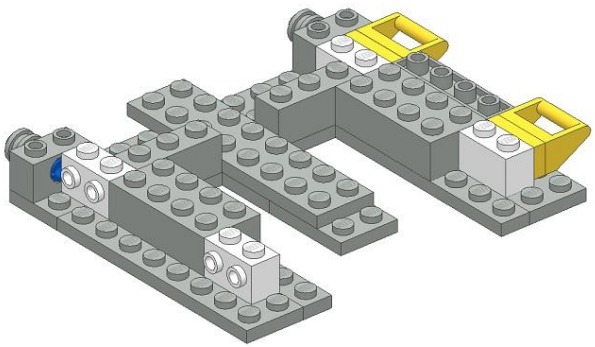

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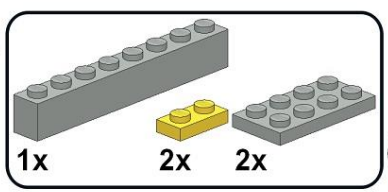

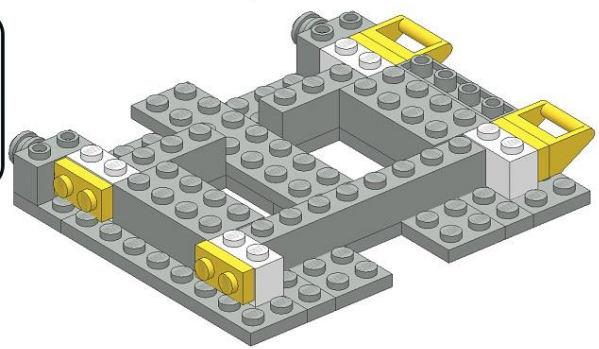

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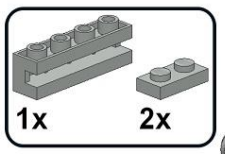

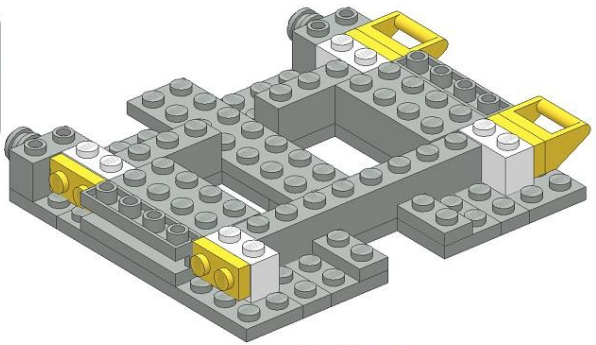

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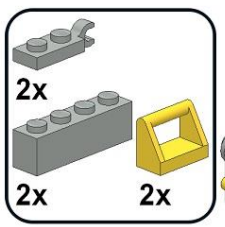

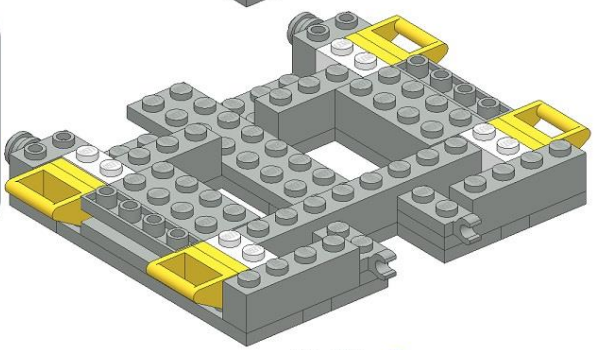

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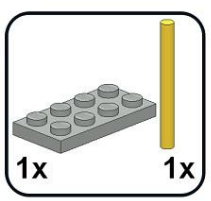

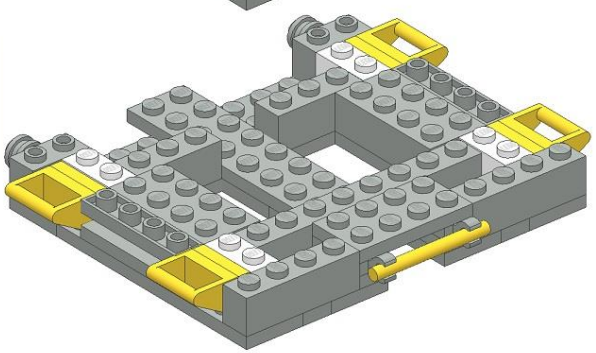

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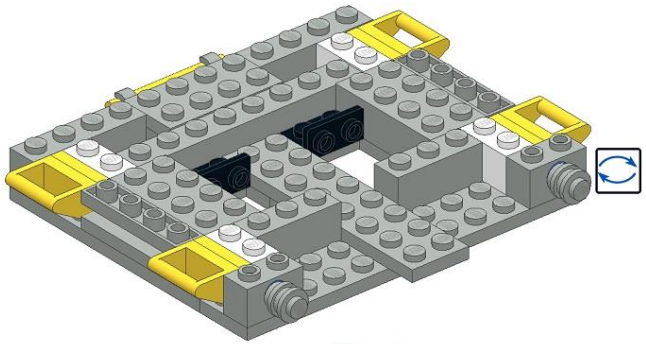

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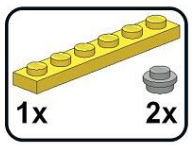

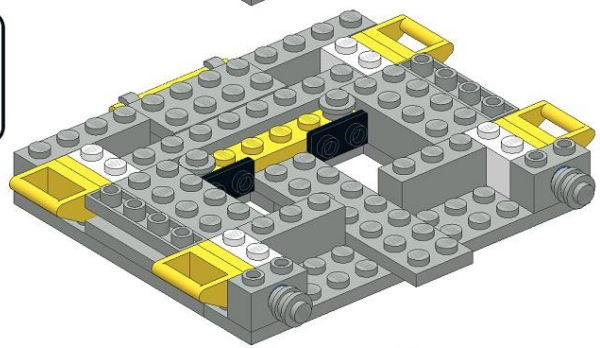

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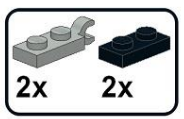

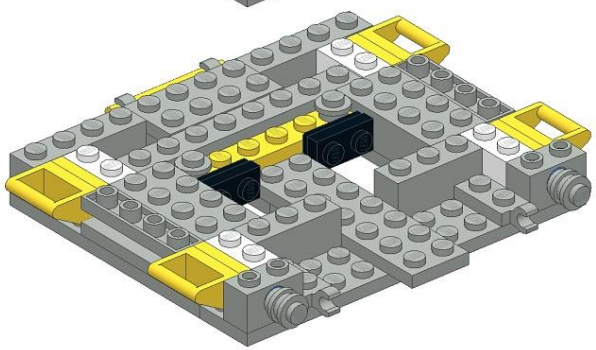

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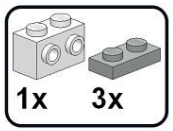

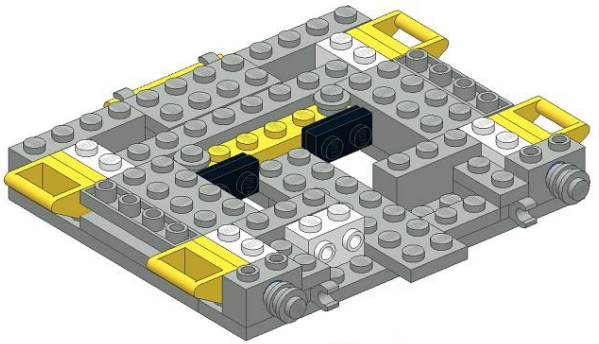

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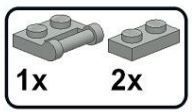

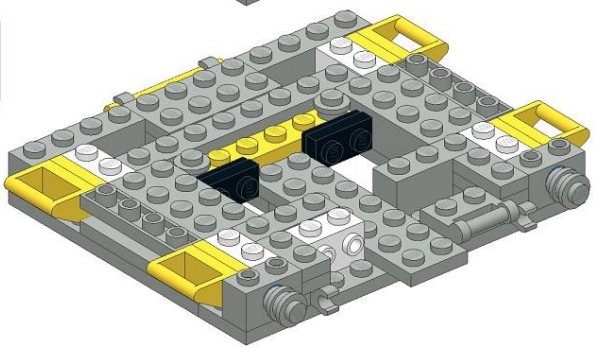

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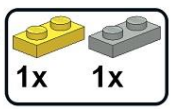

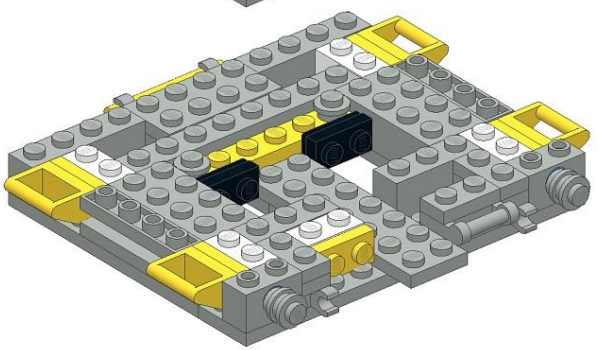

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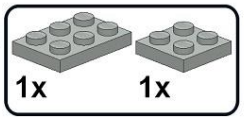

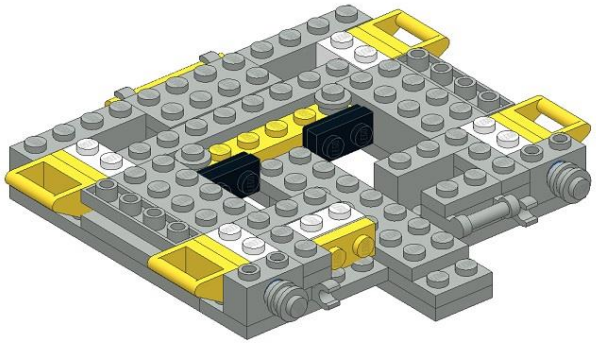

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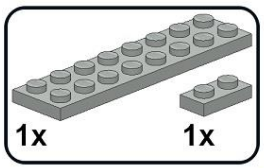

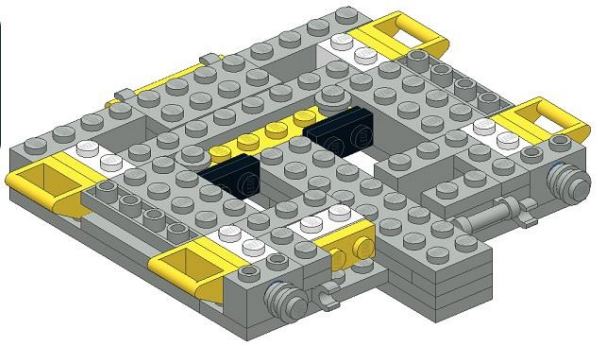

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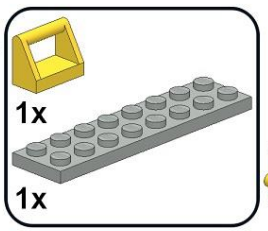

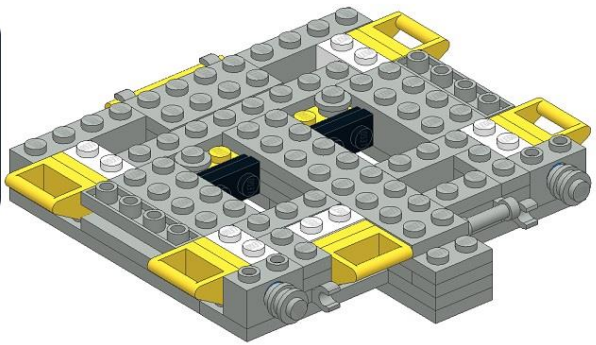

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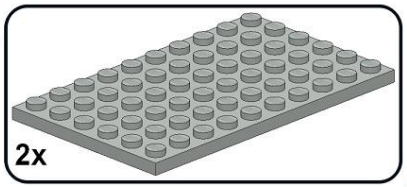

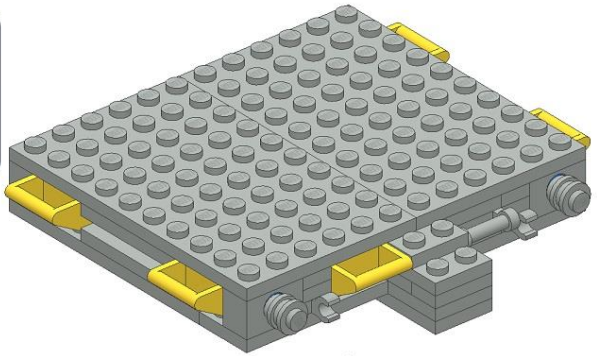

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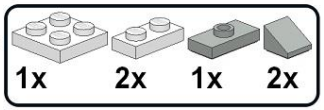

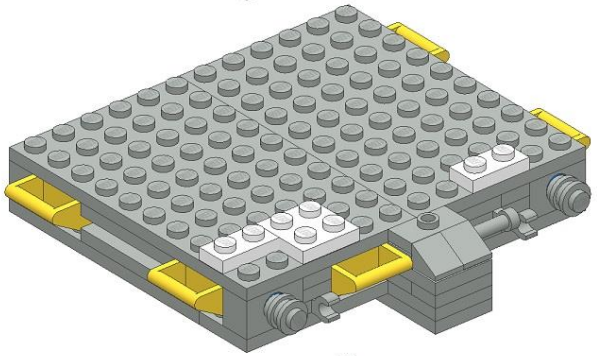

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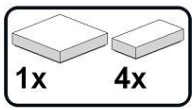

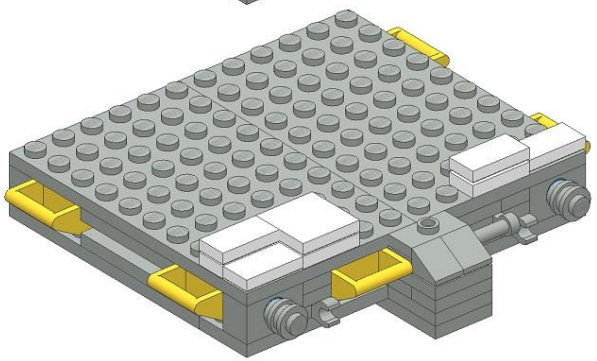

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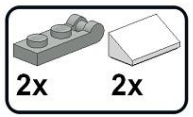

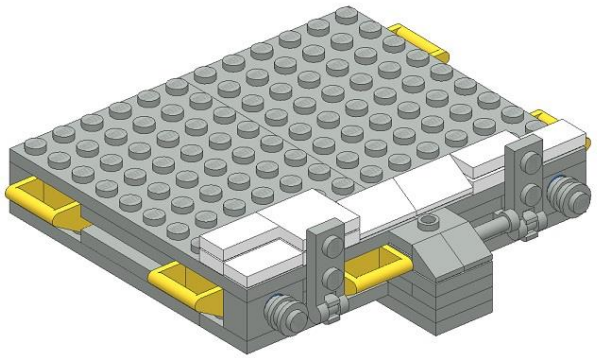

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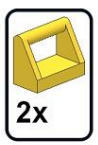

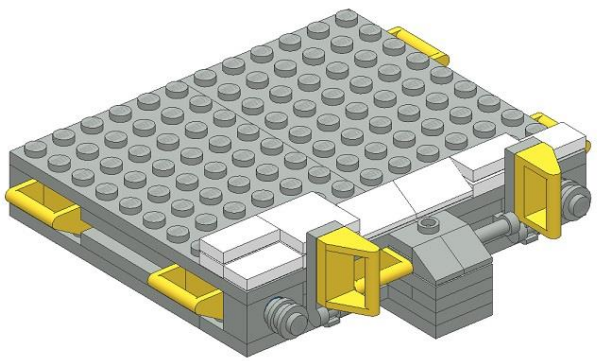

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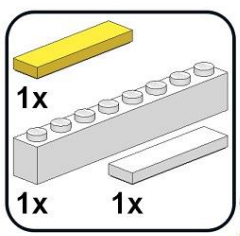

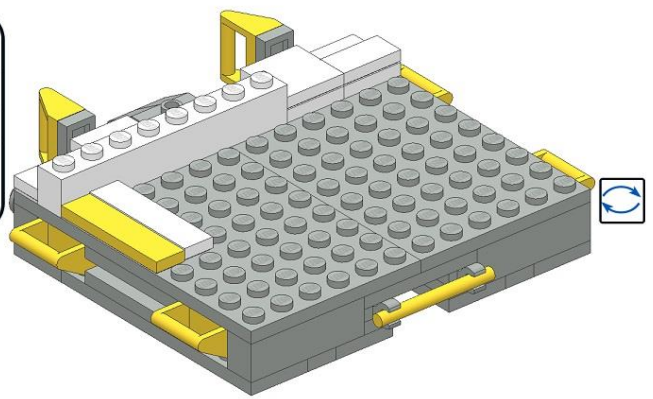

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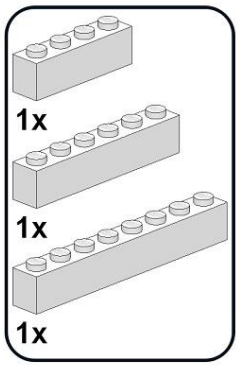

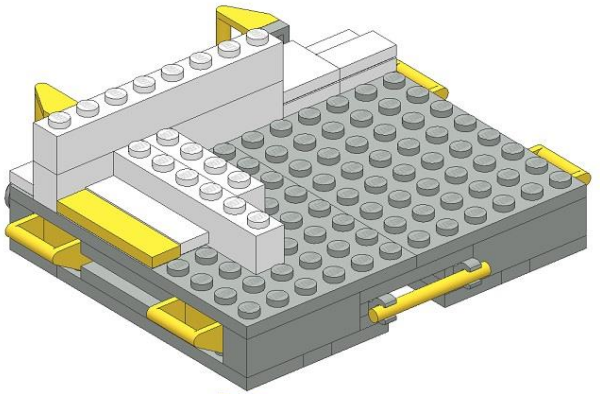

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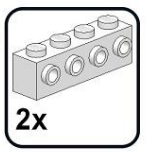

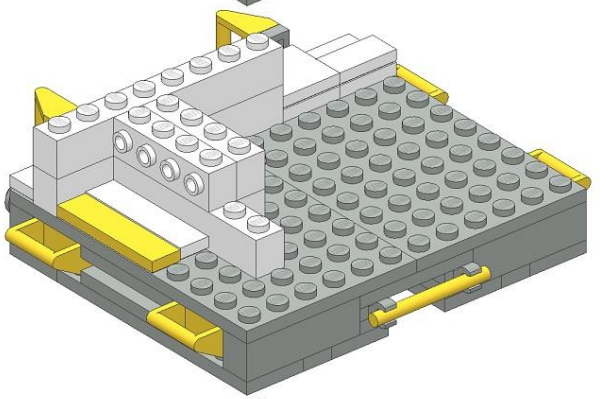

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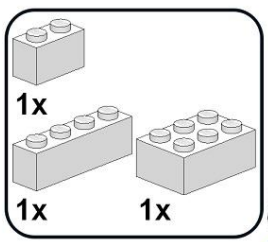

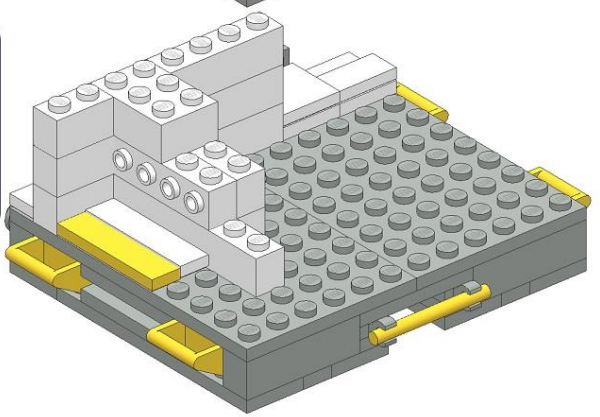

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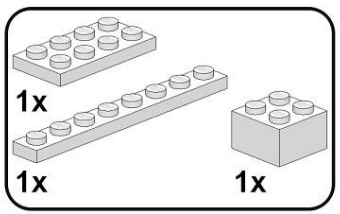

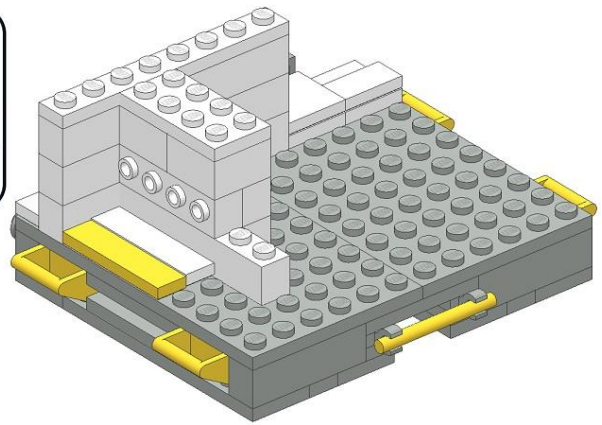

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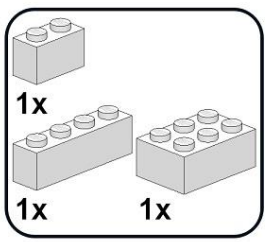

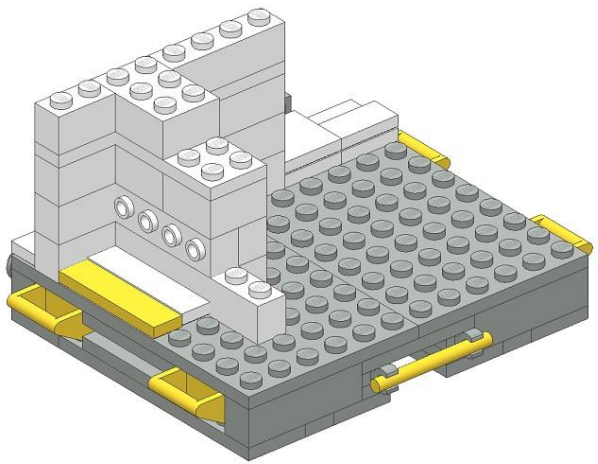

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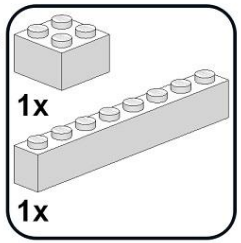

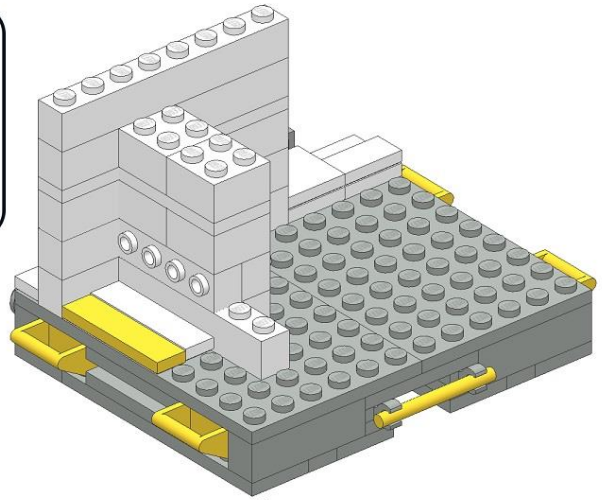

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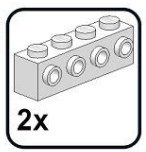

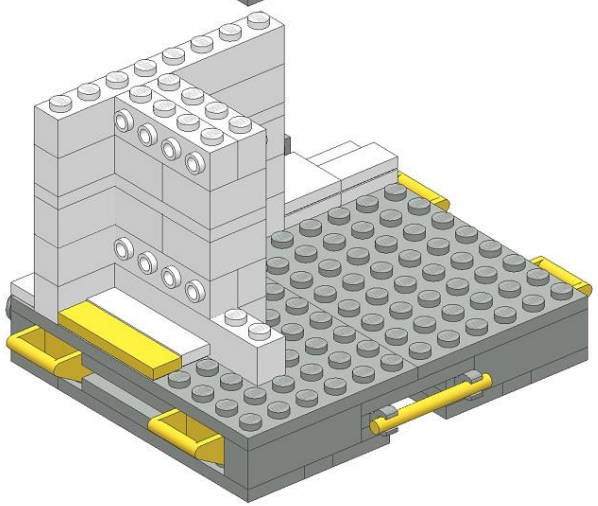

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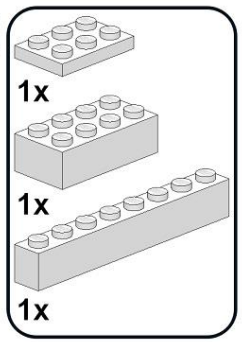

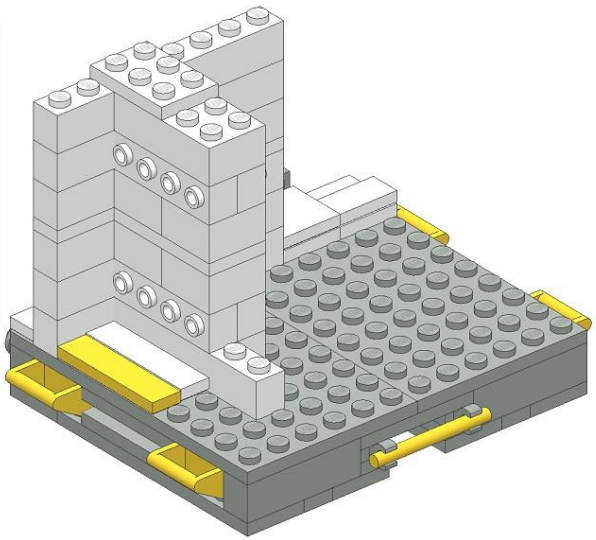

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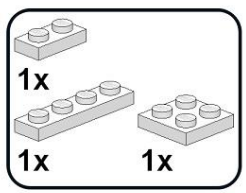

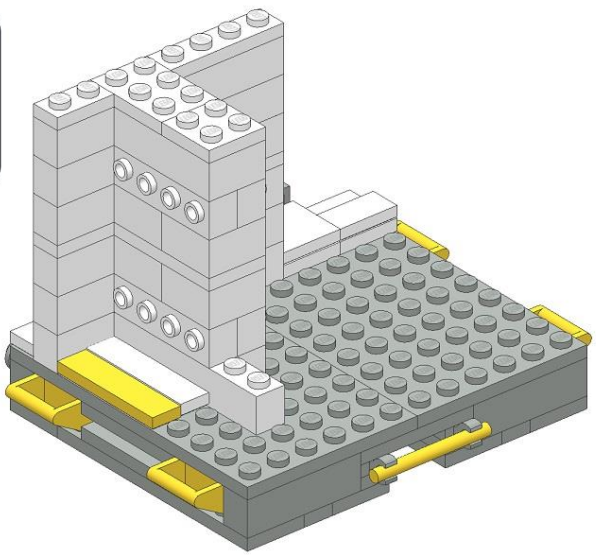

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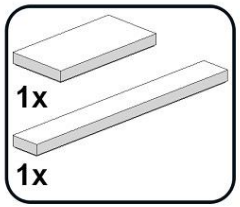

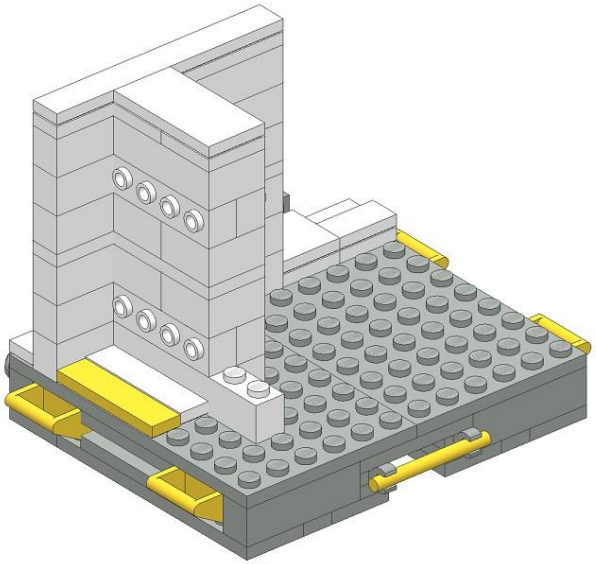

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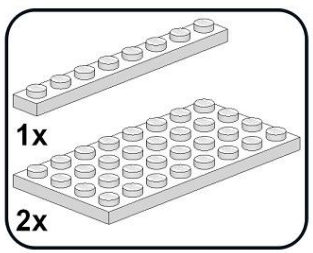

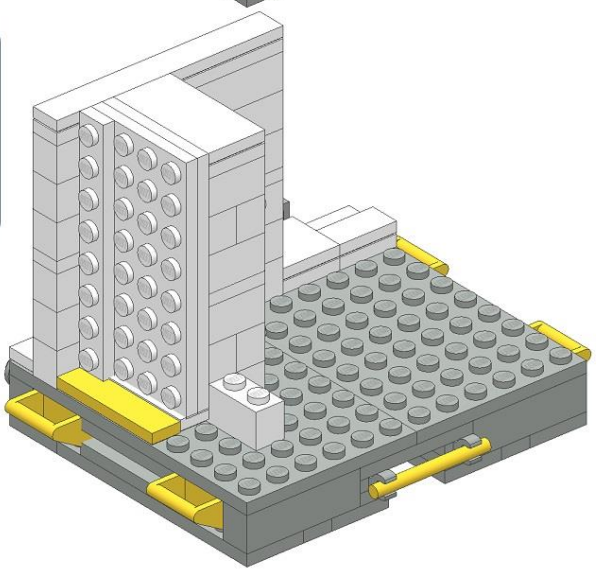

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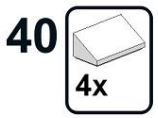

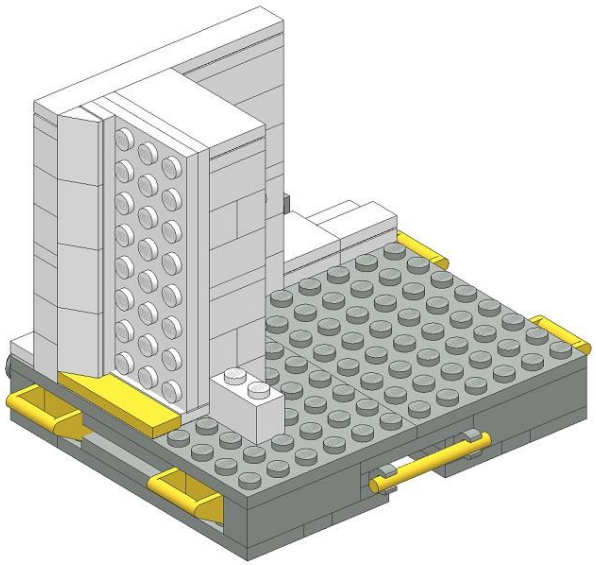

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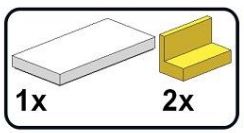

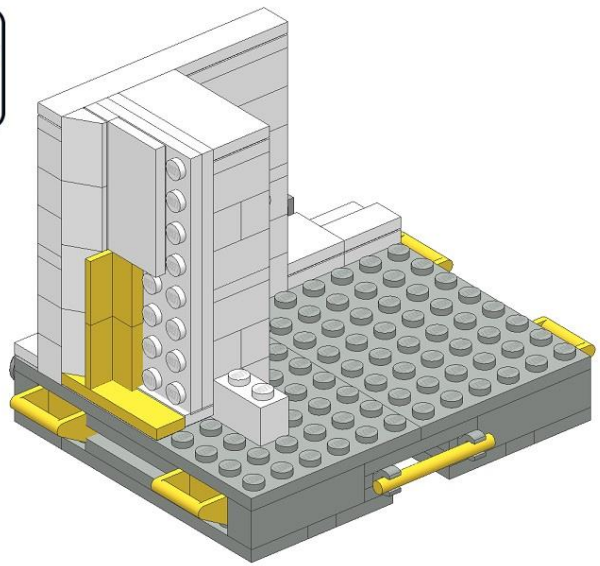

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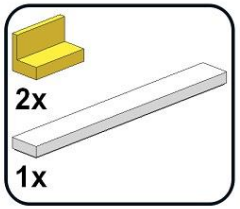

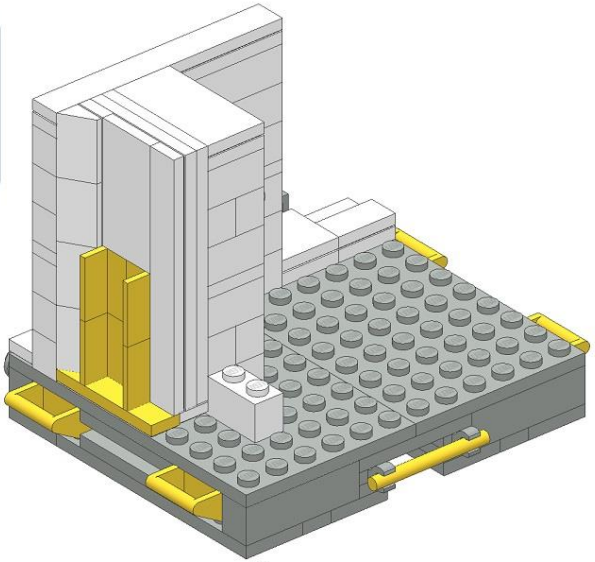

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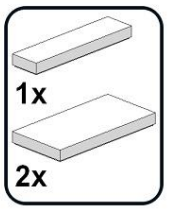

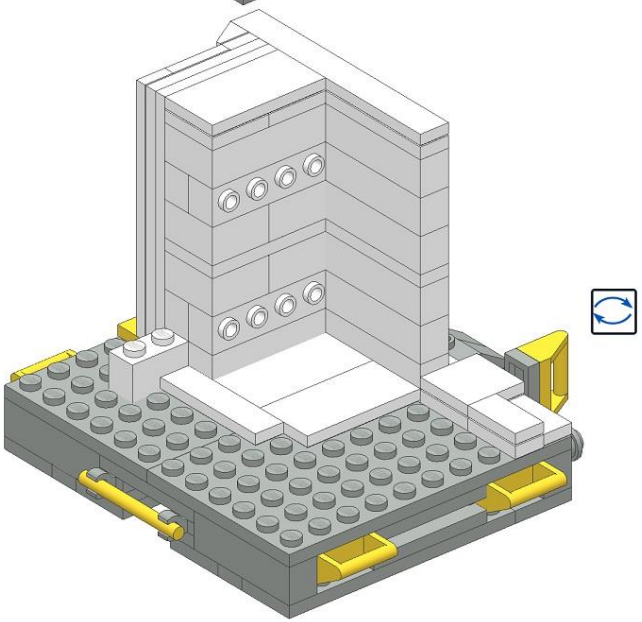

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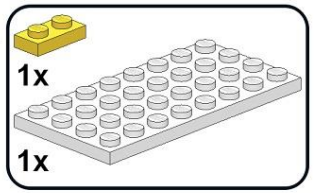

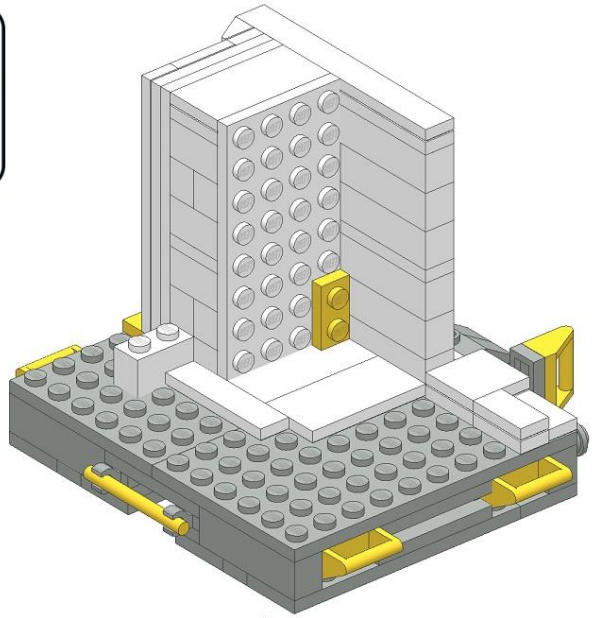

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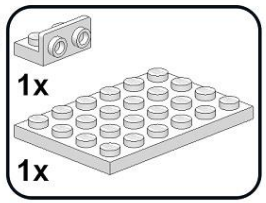

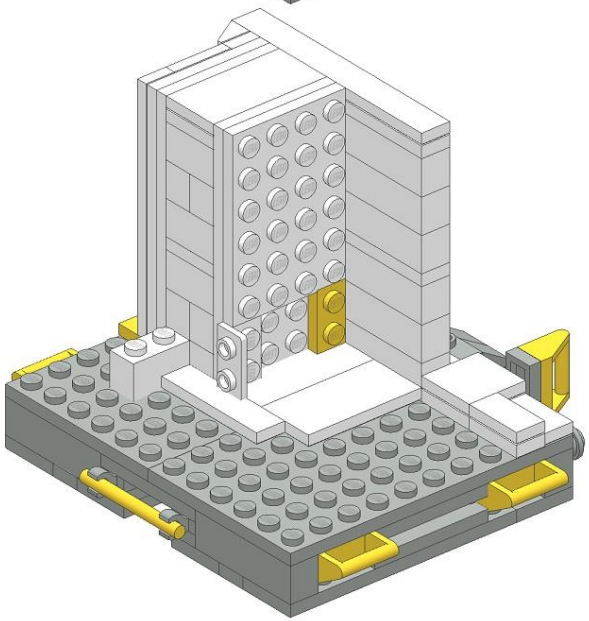

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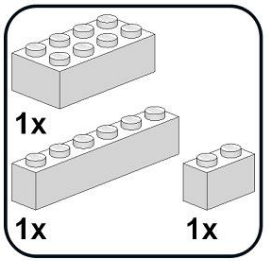

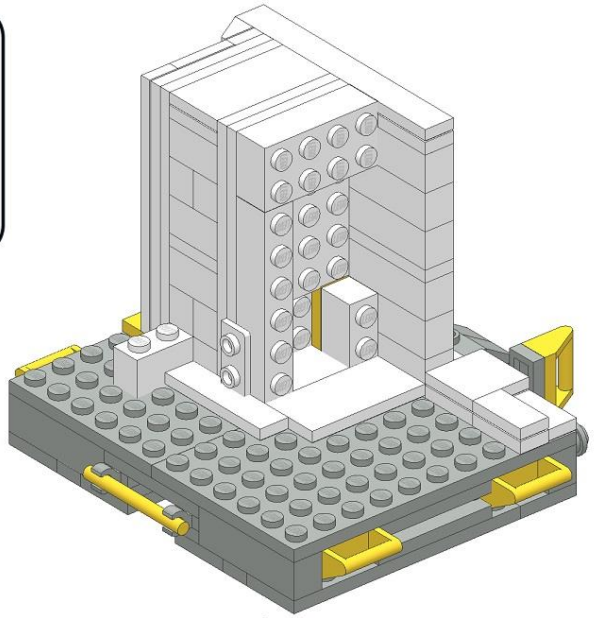

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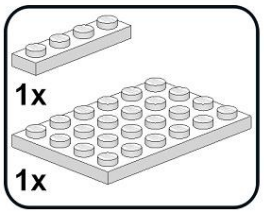

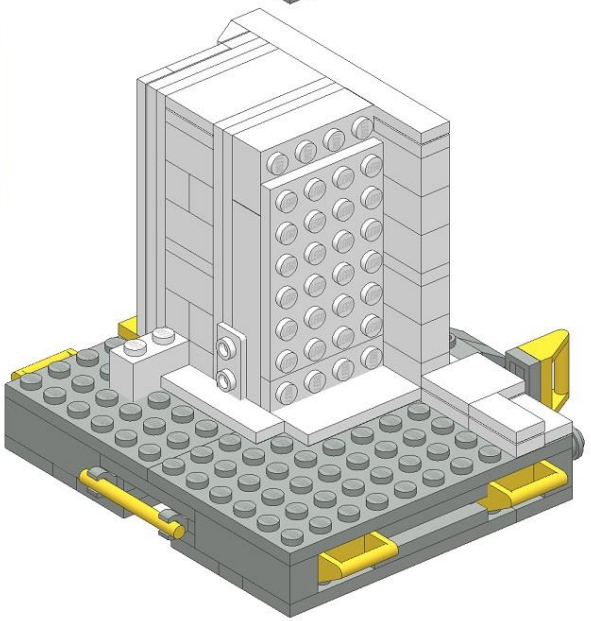

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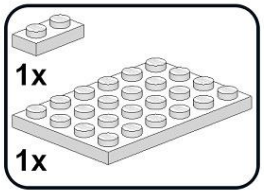

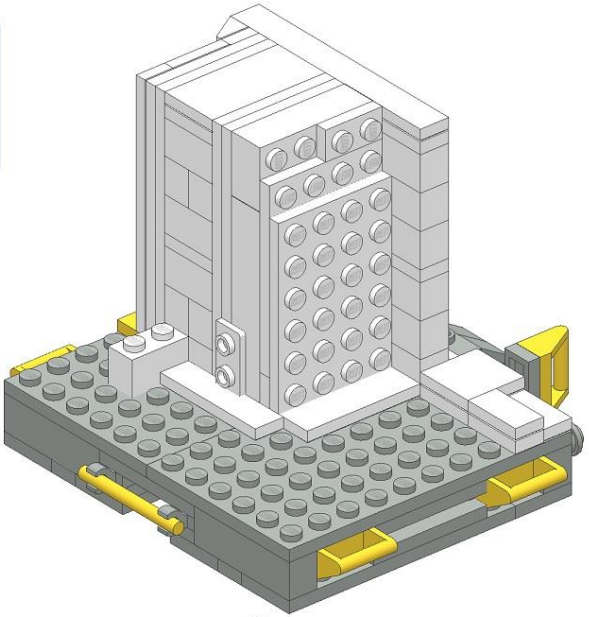

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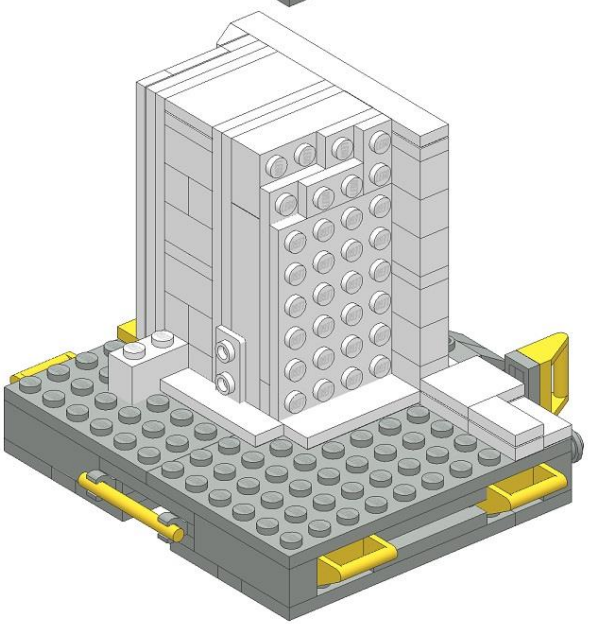

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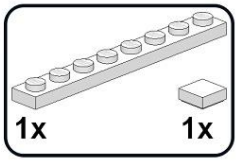

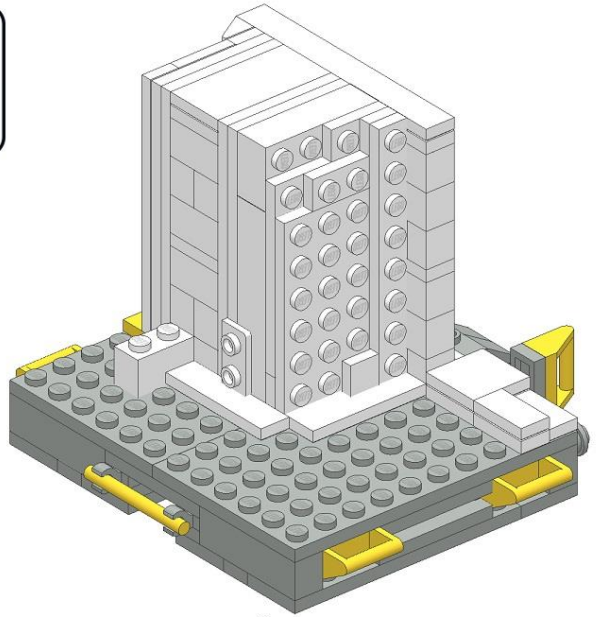

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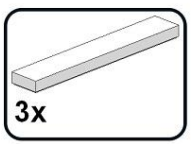

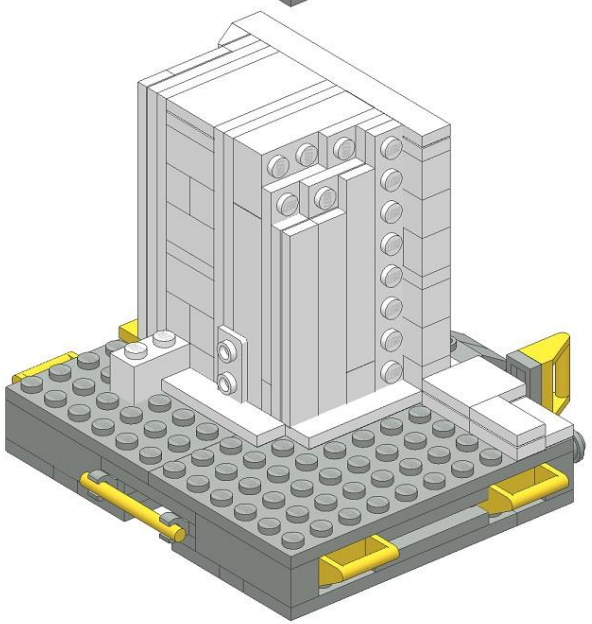

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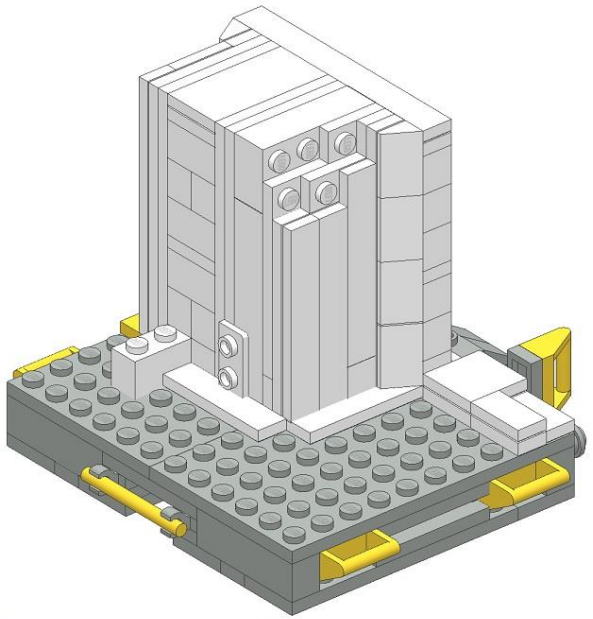

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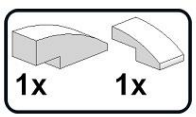

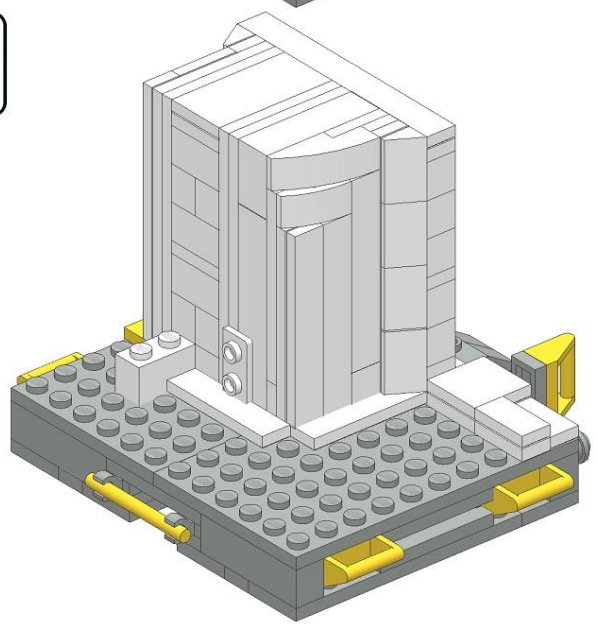

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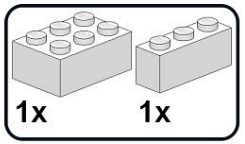

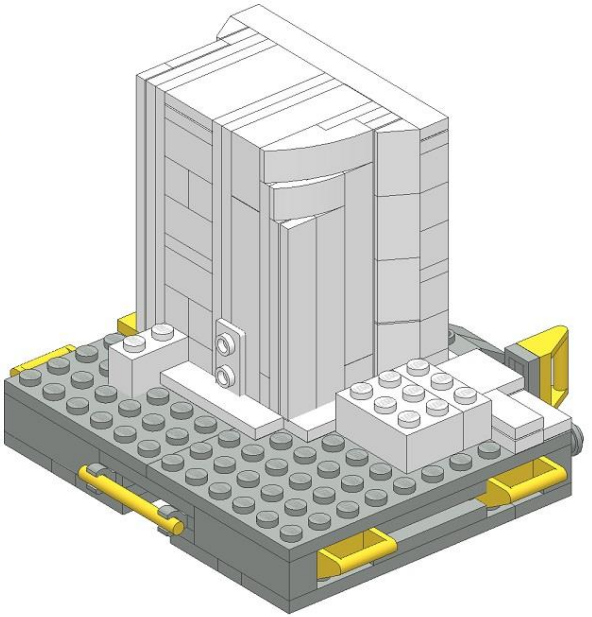

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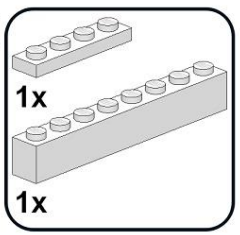

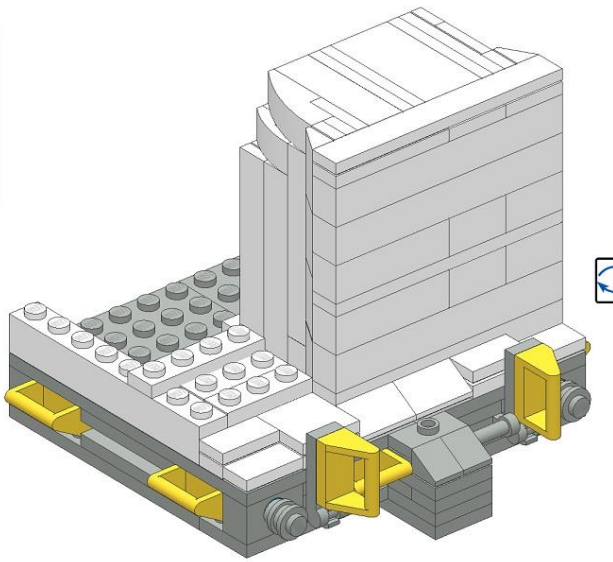

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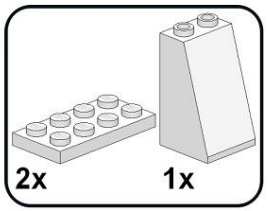

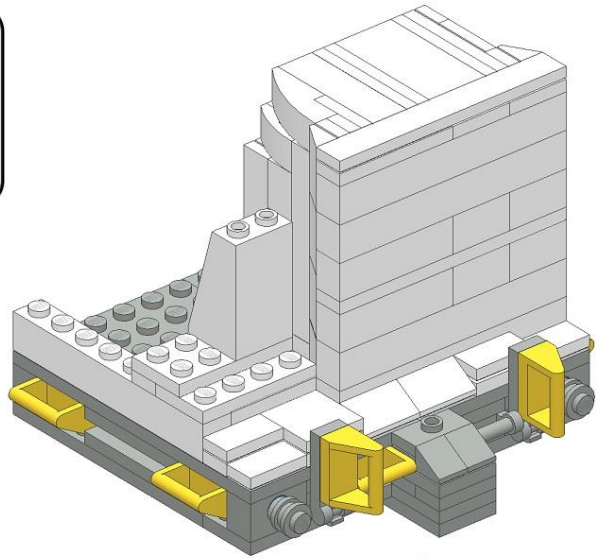

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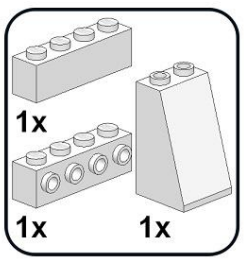

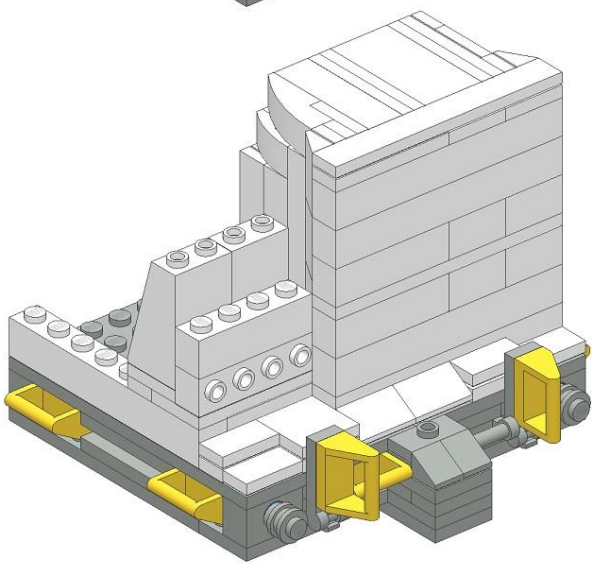

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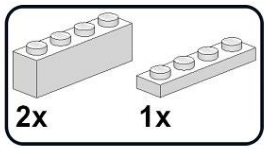

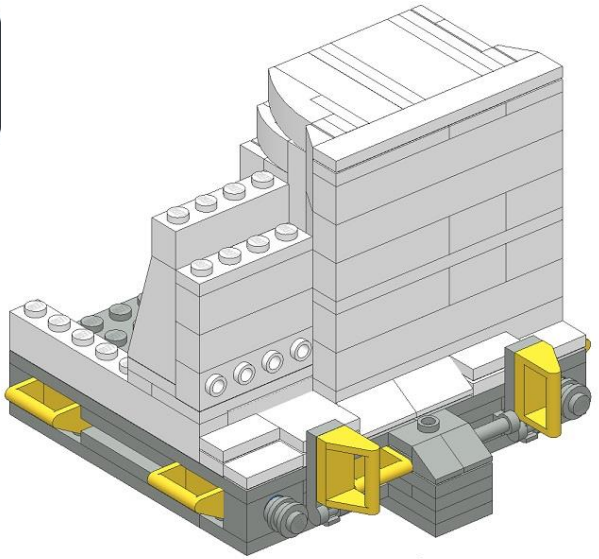

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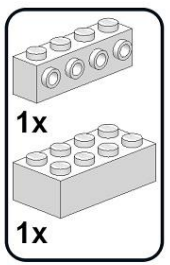

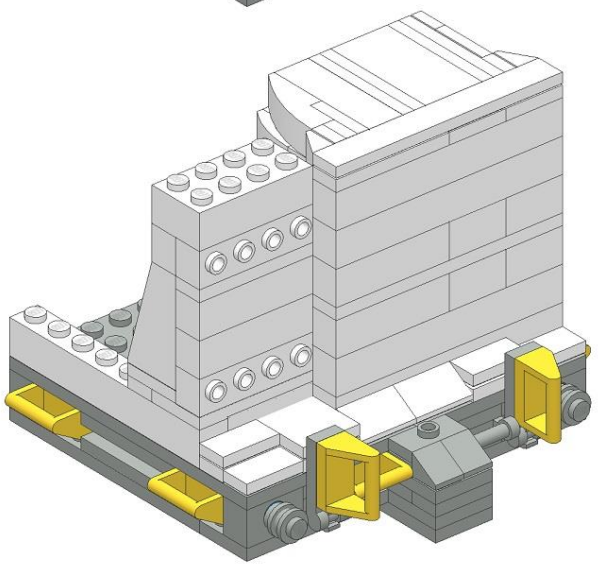

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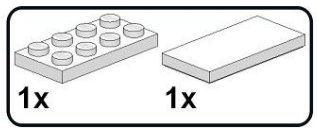

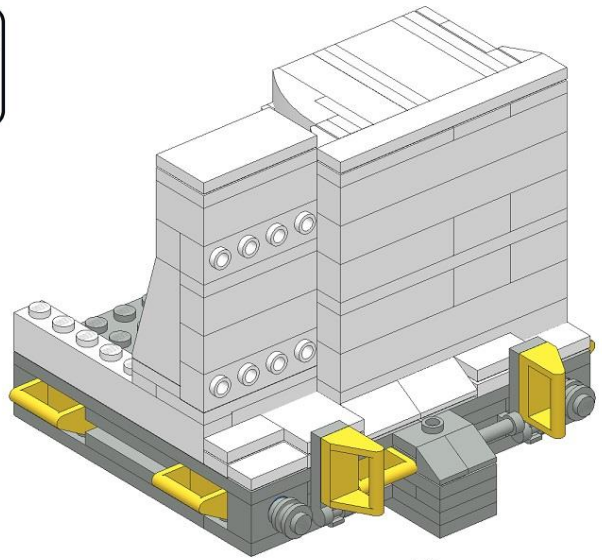

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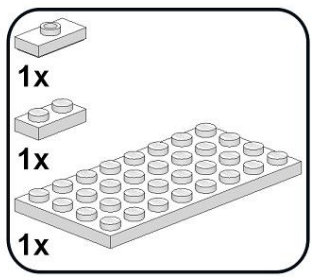

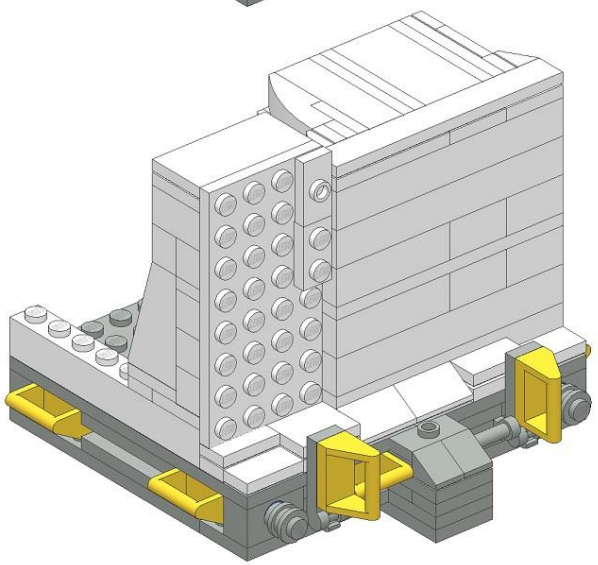

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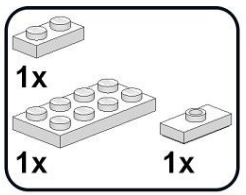

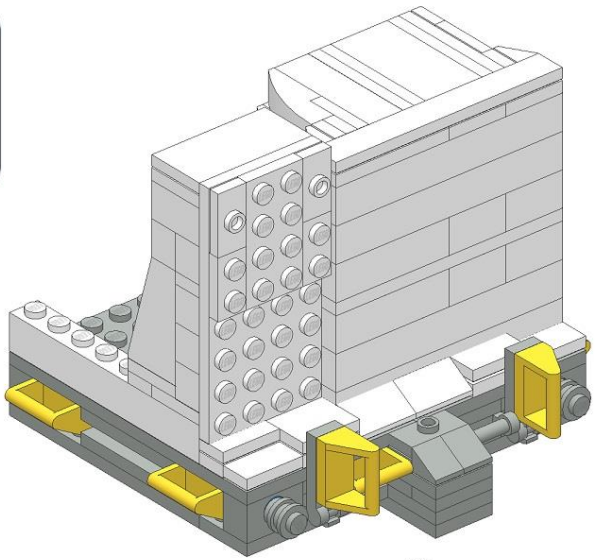

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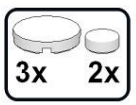

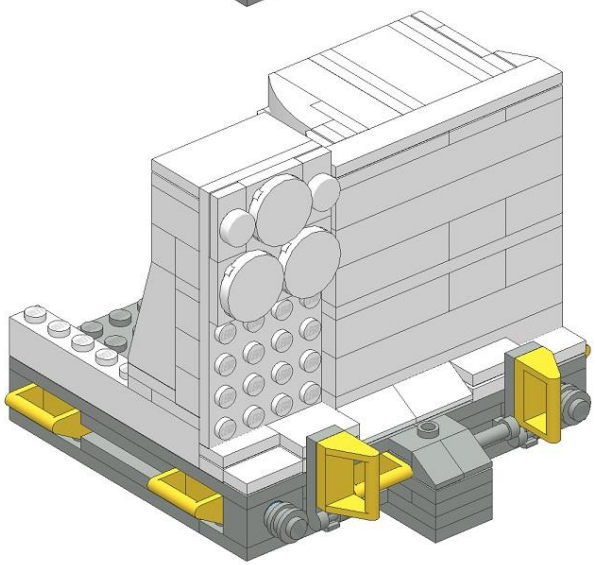

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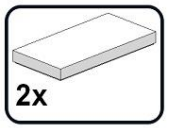

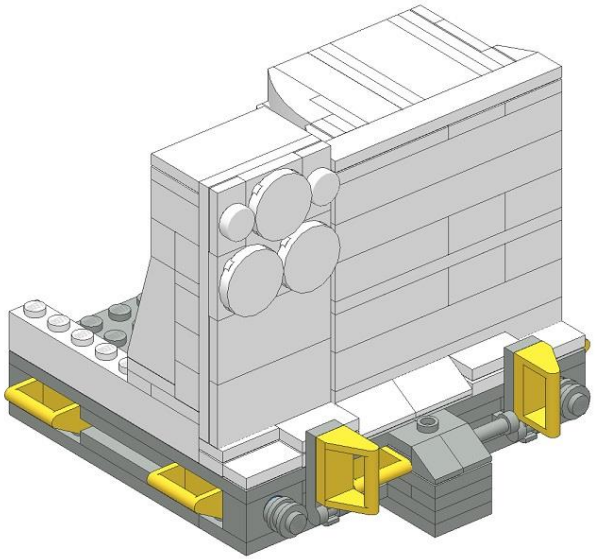

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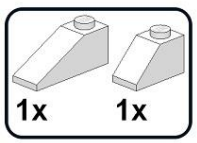

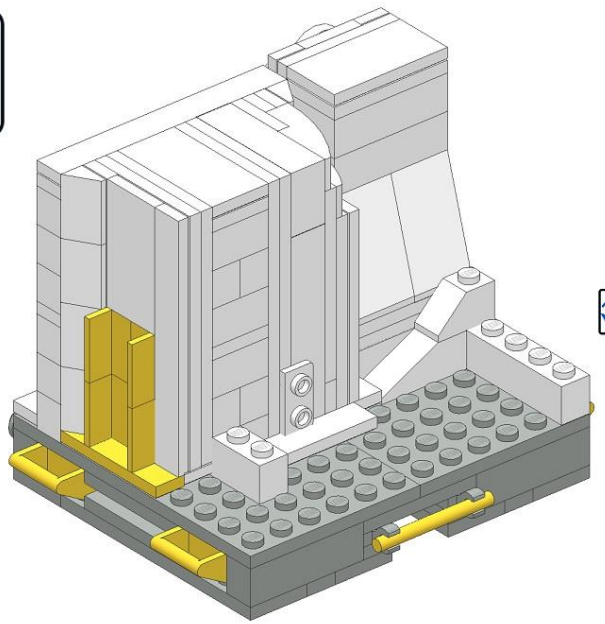

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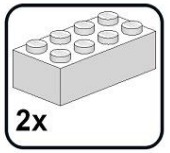

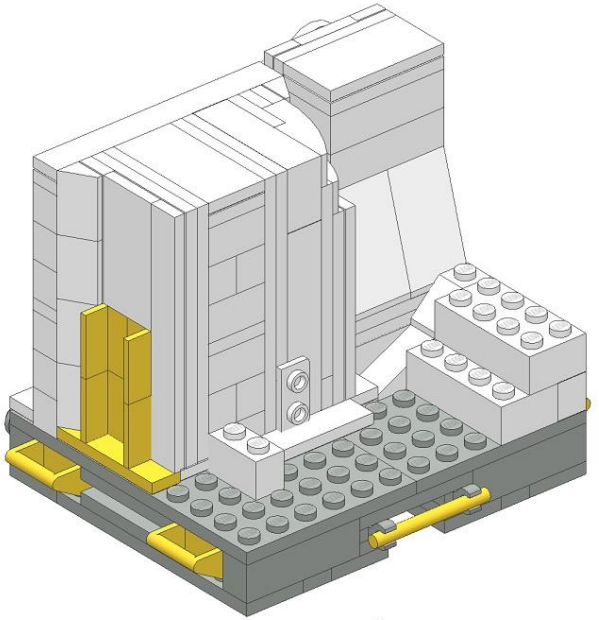

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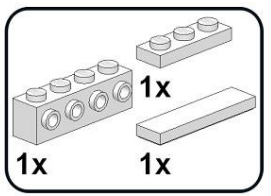

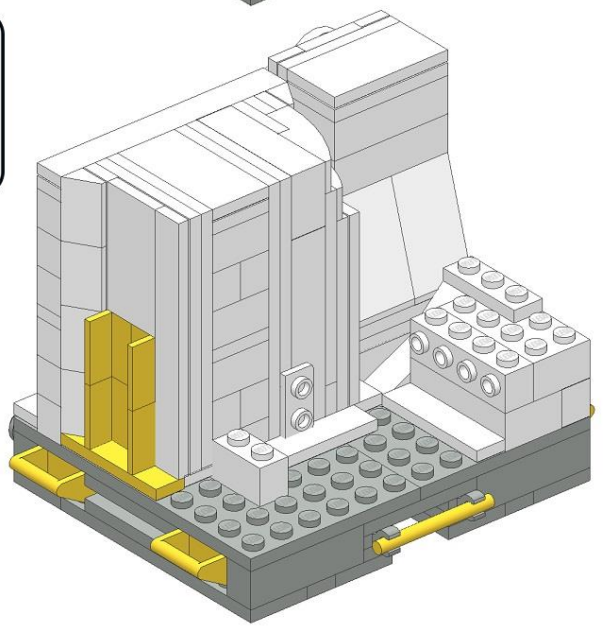

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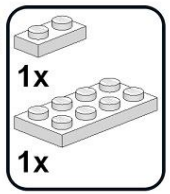

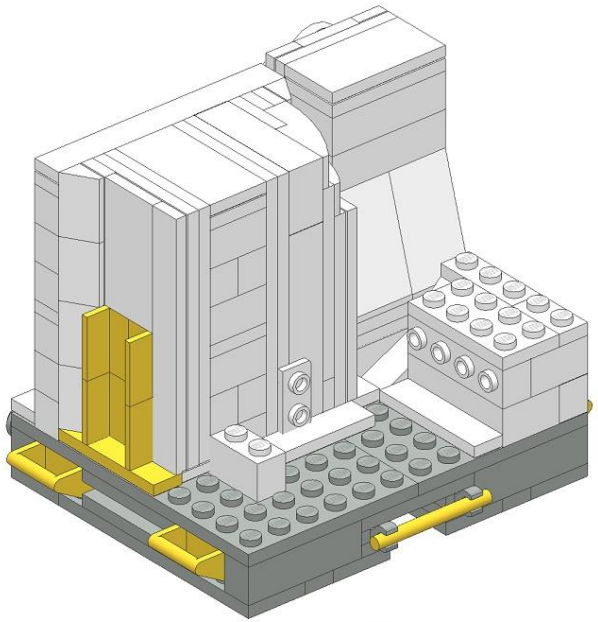

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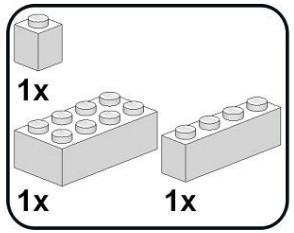

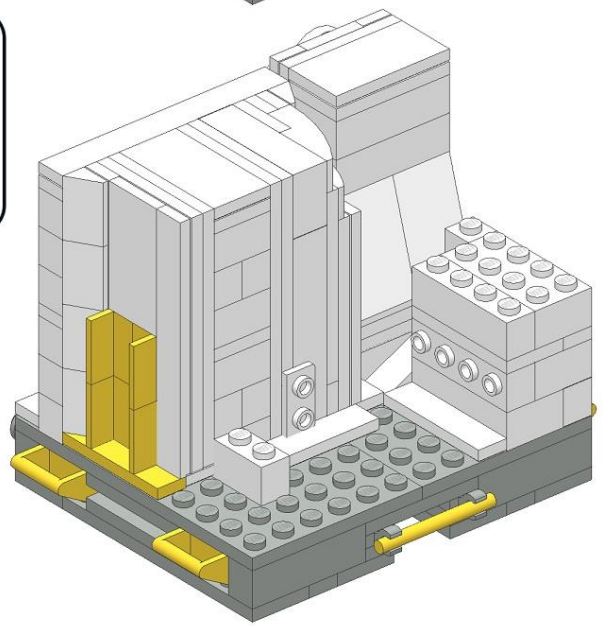

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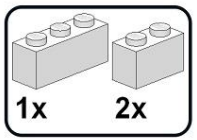

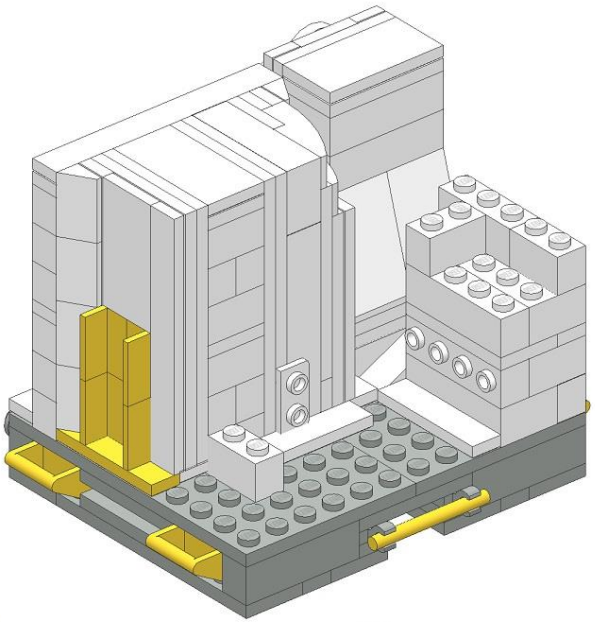

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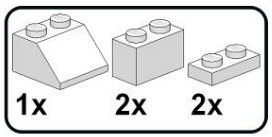

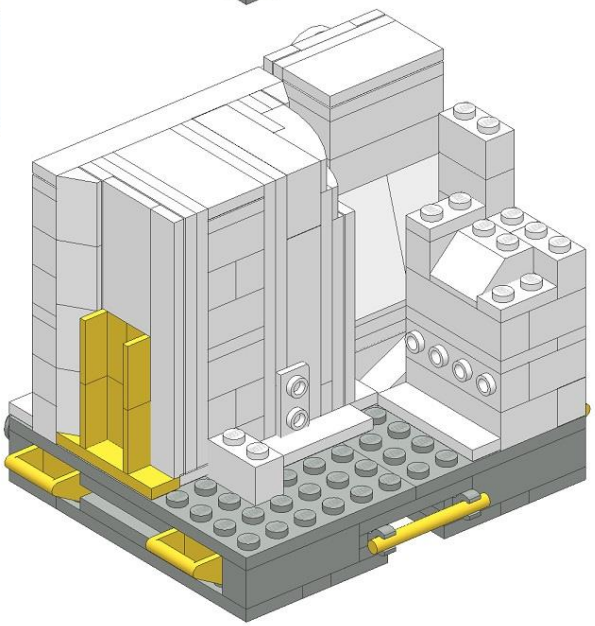

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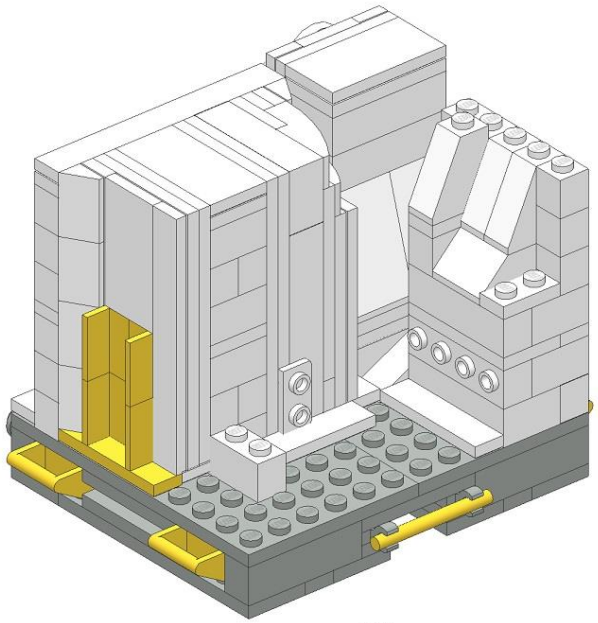

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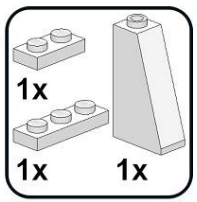

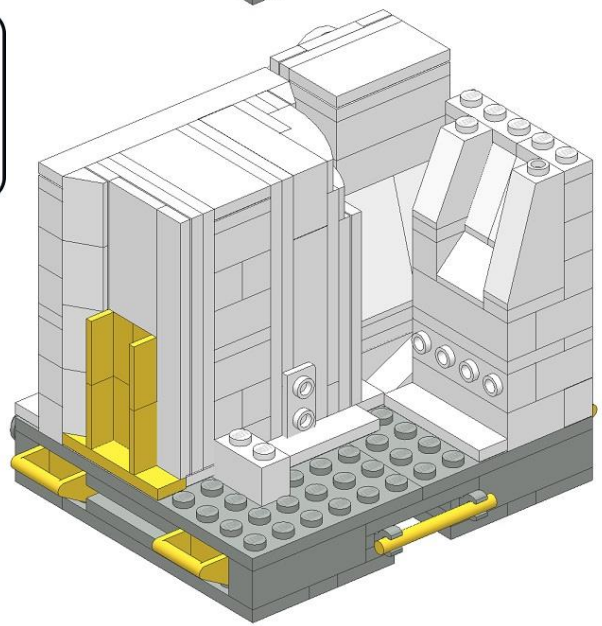

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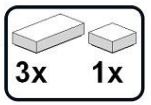

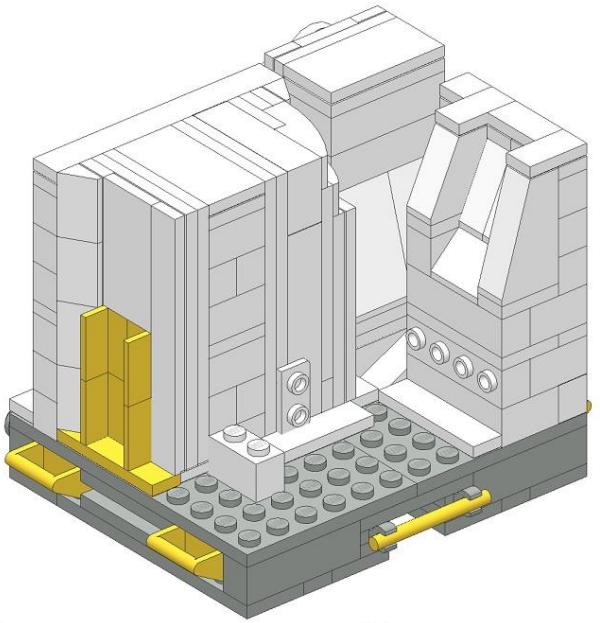

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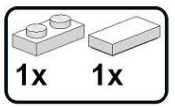

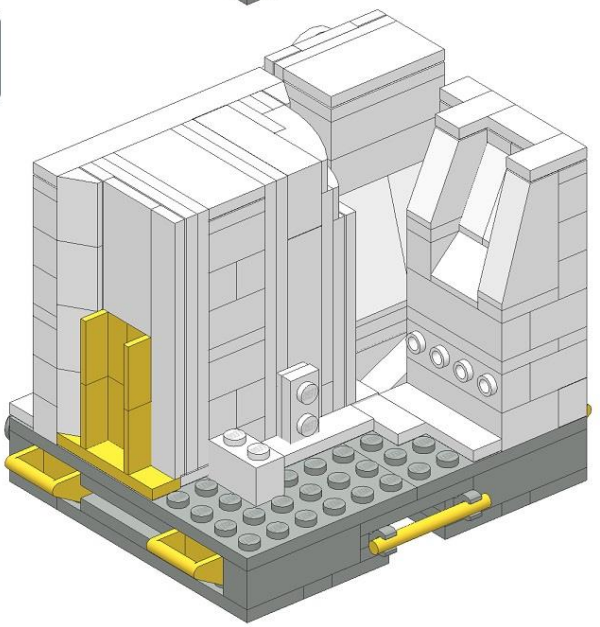

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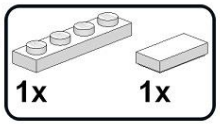

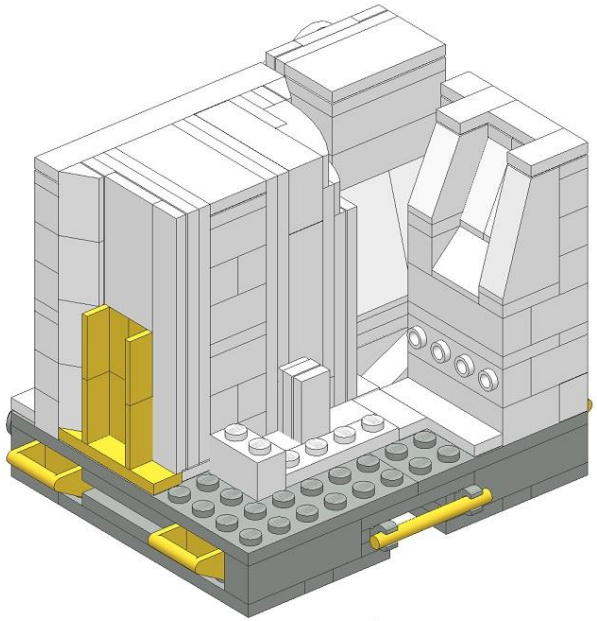

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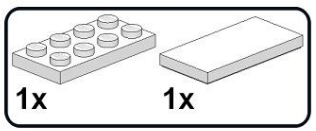

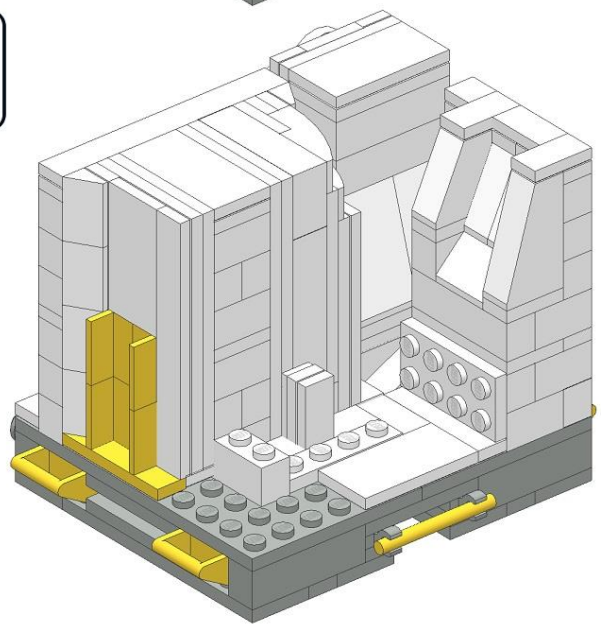

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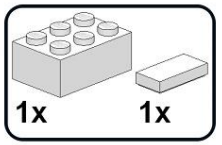

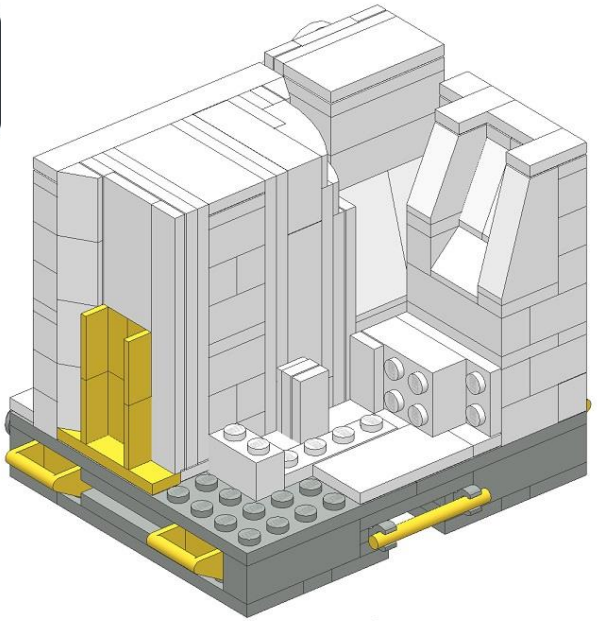

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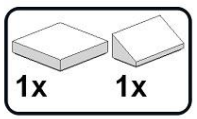

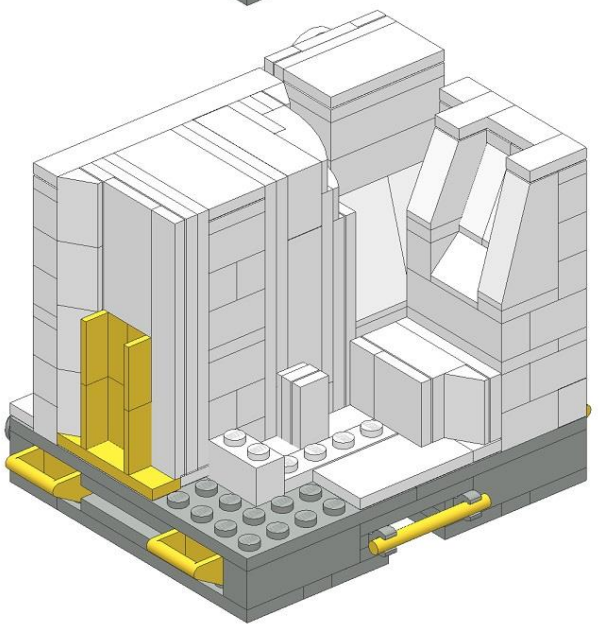

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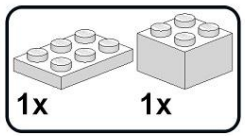

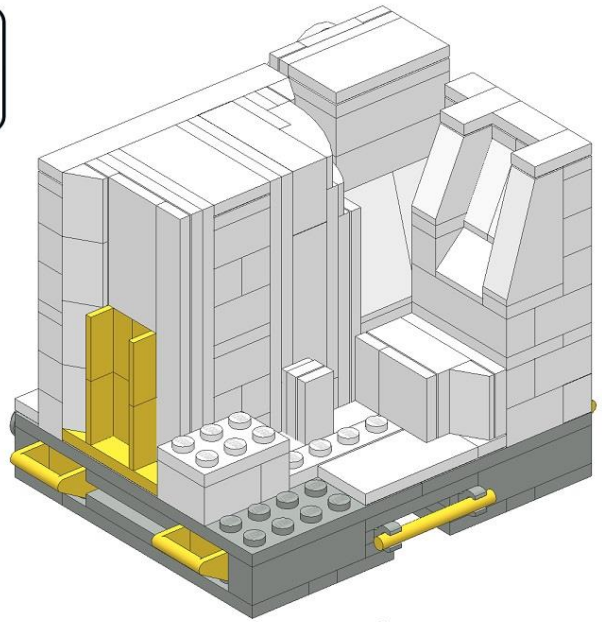

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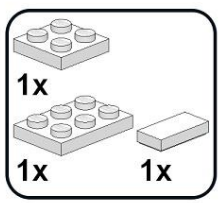

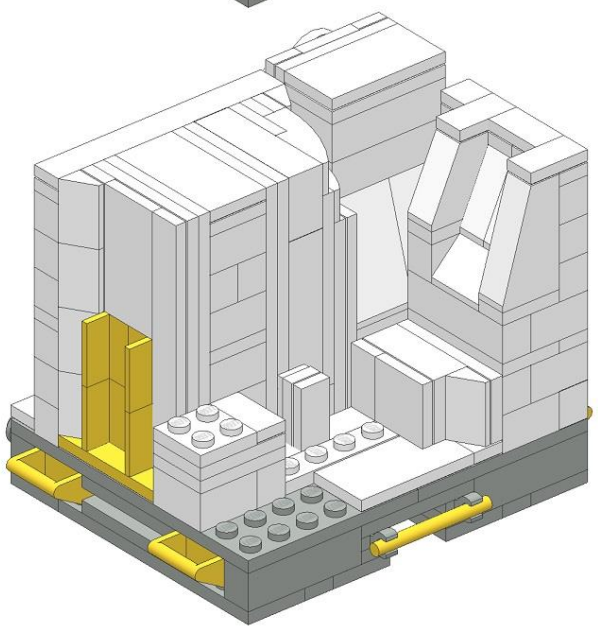

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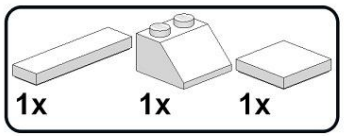

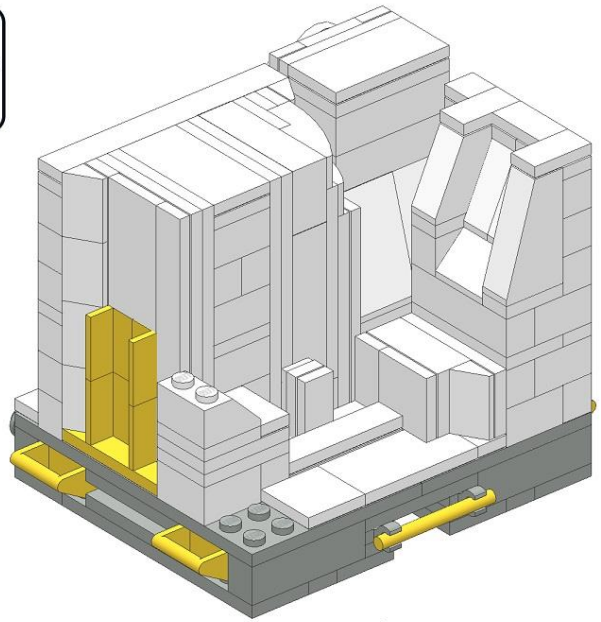

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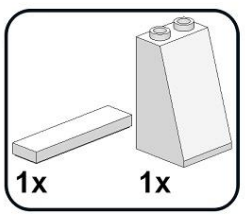
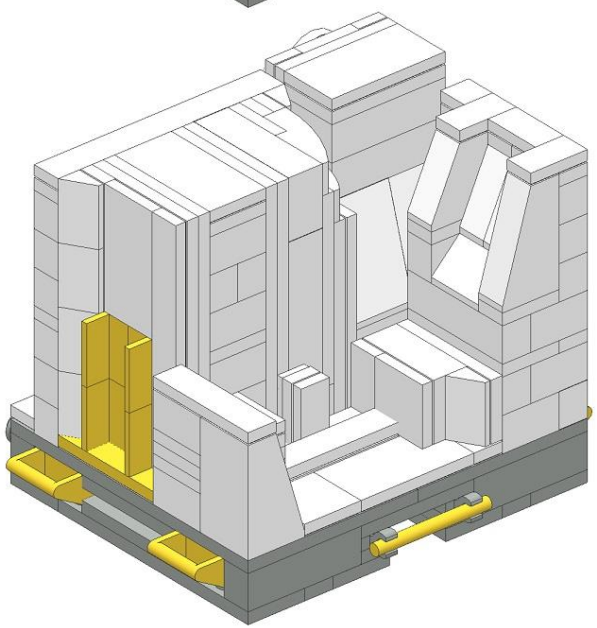
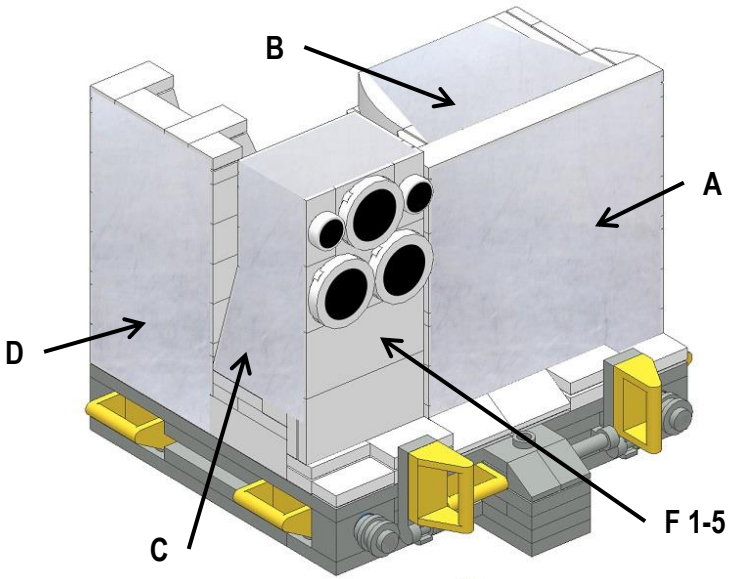
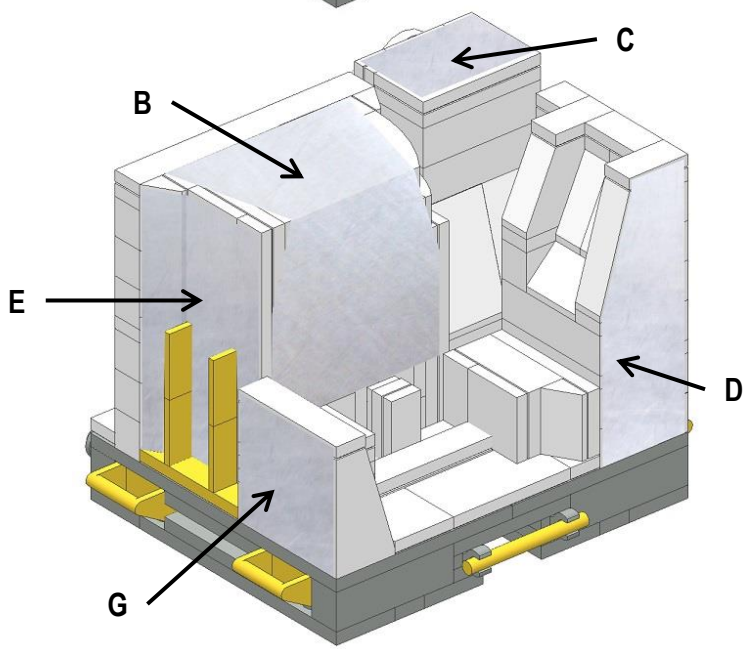
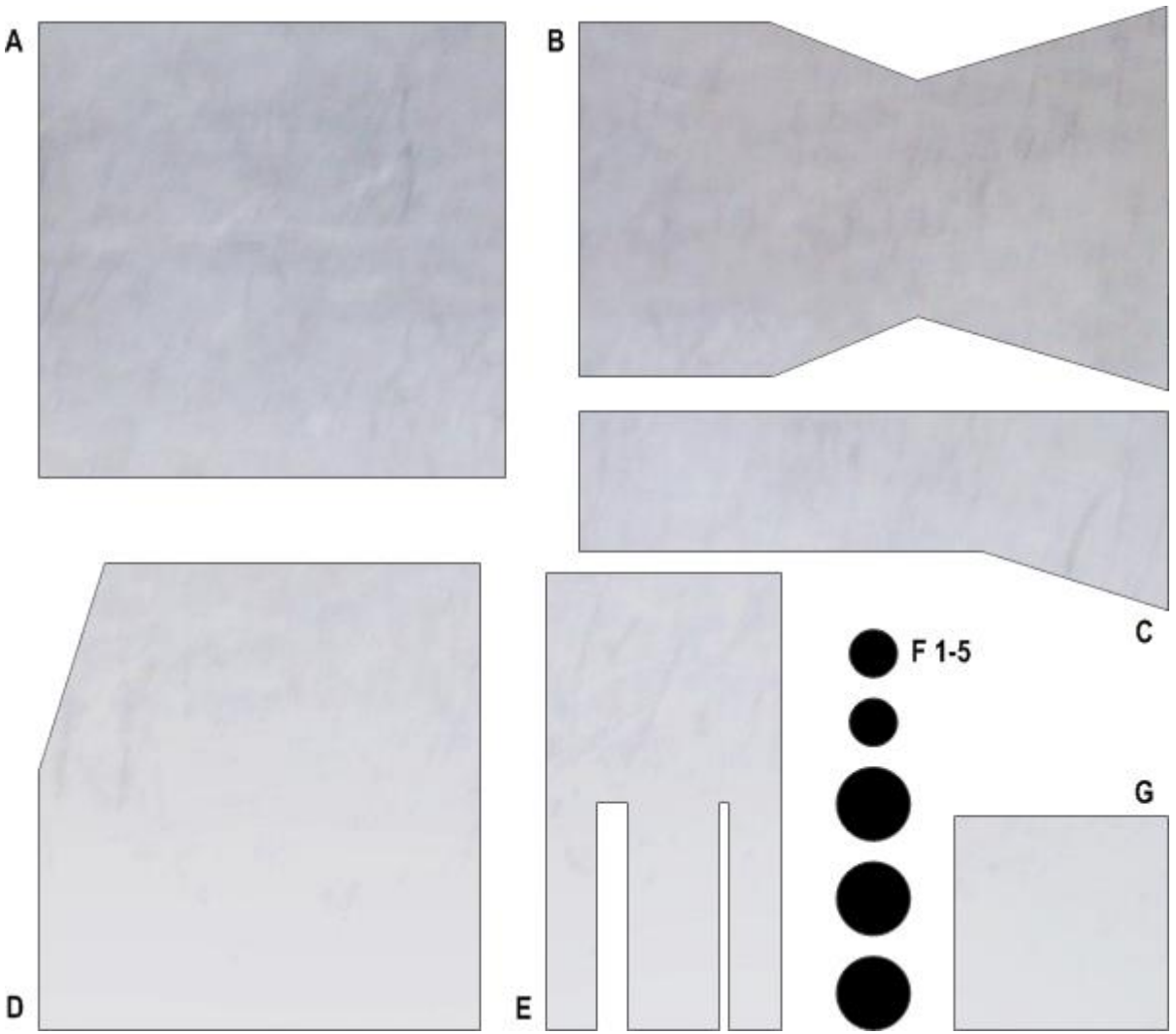






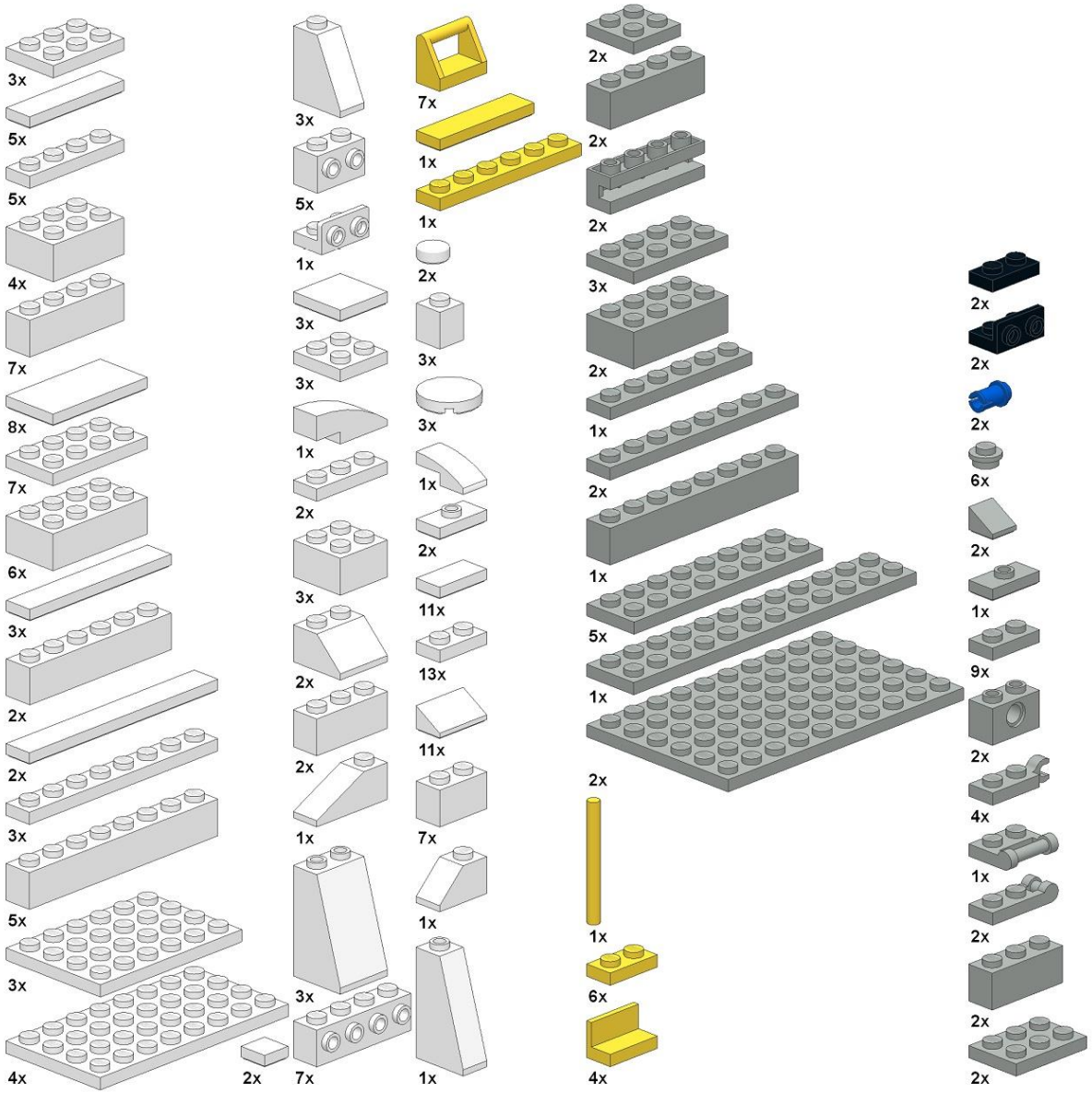


Aluminum foil may be used for a more authentic look. Mount with double sided adhesive tape.



	Color	Design No.	Part Name
1	Yellow	21462	Bar 4L Light Sabre Blade
2	Black	99780	Bracket 1 x 2 - 1 x 2 Up
1	White	99780	Bracket 1 x 2 - 1 x 2 Up
3	White	3005	Brick 1 x 1
7	White	3004	Brick 1 x 2
5	White	11211	Brick 1 x 2 with Two Studs on One Side
2	Light Gray	3622	Brick 1 x 3
2	White	3622	Brick 1 x 3
2	Light Gray	3010	Brick 1 x 4
7	White	3010	Brick 1 x 4
2	Light Gray	2653	Brick 1 x 4 with Groove
7	White	30414	Brick 1 x 4 with Studs on Side
2	White	3009	Brick 1 x 6
1	Light Gray	3008	Brick 1 x 8
5	White	3008	Brick 1 x 8
3	White	3003	Brick 2 x 2
4	White	3002	Brick 2 x 3
2	Light Gray	3001	Brick 2 x 4
6	White	3001	Brick 2 x 4
4	Yellow	4865	Panel 1 x 2 x 1 with Round Corners
6	Light Gray	6141	Plate 1 x 1 Round
2	Black	3023	Plate 1 x 2
9	Light Gray	3023	Plate 1 x 2
6	Yellow	3023	Plate 1 x 2
13	White	3023	Plate 1 x 2
4	Light Gray	63868	Plate 1 x 2 with Clip Horizontal on End
1	Light Gray	15573	Plate 1 x 2 with Groove with 1 Centre Stud
2	White	15573	Plate 1 x 2 with Groove with 1 Centre Stud
1	Light Gray	48336	Plate 1 x 2 with Handle
2	Light Gray	60478	Plate 1 x 2 with Handle on End
2	White	3623	Plate 1 x 3
5	White	3710	Plate 1 x 4
1	Light Gray	3666	Plate 1 x 6
1	Yellow	3666	Plate 1 x 6
2	Light Gray	3460	Plate 1 x 8

	Color	Design No.	Part Name
3	White	3460	Plate 1 x 8
2	Light Gray	3022	Plate 2 x 2
3	White	3022	Plate 2 x 2
2	Light Gray	3021	Plate 2 x 3
3	White	3021	Plate 2 x 3
3	Light Gray	3020	Plate 2 x 4
7	White	3020	Plate 2 x 4
5	Light Gray	3034	Plate 2 x 8
1	Light Gray	2445	Plate 2 x 12
3	White	3032	Plate 4 x 6
4	White	3035	Plate 4 x 8
2	Light Gray	3033	Plate 6 x 10
2	Light Gray	54200	Slope Brick 31 1 x 1 x 0.667
11	White	85984	Slope Brick 31 1 x 2 x 0.667
1	White	4286	Slope Brick 33 3 x 1
1	White	3040	Slope Brick 45 2 x 1
2	White	3039	Slope Brick 45 2 x 2
3	White	60481	Slope Brick 65 2 x 1 x 2
1	White	4460	Slope Brick 75 2 x 1 x 3 with Hollow Stud
3	White	98560	Slope Brick 75 2 x 2 x 3 with Hollow Stud
1	White	11477	Slope Brick Curved 2 x 1
1	White	50950	Slope Brick Curved 3 x 1
2	Light Gray	3700	Technic Brick 1 x 2 with Hole
2	Blue	4274	Technic Pin 1/2
2	White	13360	Tile 1 x 1 Round with Groove (with Eye)
2	White	3070	Tile 1 x 1 with Groove
11	White	3069	Tile 1 x 2 with Groove
7	Yellow	2432	Tile 1 x 2 with Handle
1	Yellow	2431	Tile 1 x 4 with Groove
5	White	2431	Tile 1 x 4 with Groove
3	White	6636	Tile 1 x 6 with Groove
2	White	4162	Tile 1 x 8 with Groove
3	White	14769	Tile 2 x 2 Round with Round Underside Stud
3	White	3068	Tile 2 x 2 with Groove
8	White	87079	Tile 2 x 4 with Groove



Purchasing LEGO® Parts

All LEGO® parts used for the ASIM model can, per April 2017, be purchased using the applicable Design No. and Color at the online Danish Pick A Brick LEGO® Shop:

https://shop.lego.com/da-DK/Pick-a-Brick

Pick A Brick LEGO® Shops also exists in other countries. However, the availability of the used parts have not been verified.

Photos

Page 1: ESA/NASA (Denmark seen from ISS)
Page 2: Terma A/S