

**SCIENCE  
MUSEUM** APPROVED

**CONSTRUIEȘTE**

V59458

# MECANICA

## EXPLORĂRII ANTARCTICE

- 1 - Biela și pistonul
- 2 - Diferențialul
- 3 - Snowmobilul
- 4 - Autocamionul antarctic



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**ATENȚIE!** Setul este destinat numai copiilor cu vârsta mai mare de 8 ani. Setul include instrucțiuni pentru adulți, care trebuie citite și urmate.

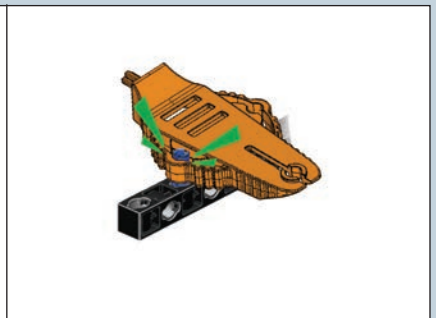
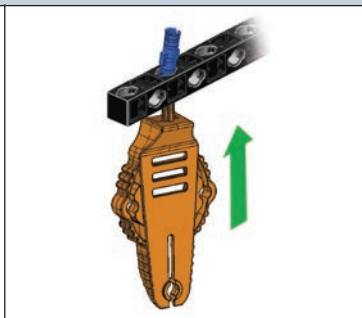
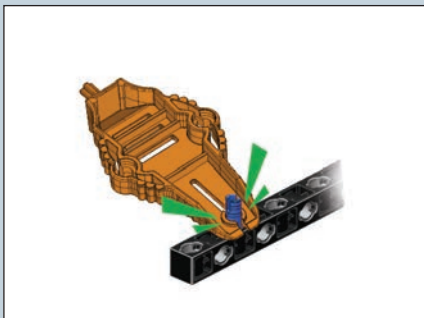
Citiți și păstrați instrucțiunile pentru referințe ulterioare.

**ATENȚIE!** pentru a asigura funcționarea adecvată a motorului electric, o cantitate mică de ulei a fost adăugată în timpul producției. În cazul unor temperaturi ridicate, este posibil ca această substanță să se topească și să devină uleioasă. Dacă motorul din set este murdar, curățați-l folosind șervețele de hârtie. Uleiul folosit nu este toxic sau periculos.

 **Clementoni**®

## LISTA COMPONENTELOR

	x 4		x 12		x 1		x 2
	x 4		x 12		x 2		x 5
	x 4		x 1		x 4		x 1
	x 8		x 1		x 4		x 1
	x 8		x 1		x 4		x 2
	x 8		x 1		x 4		x 6
	x 2		x 1		x 4		x 6
	x 2		x 1		x 4		x 1
	x 2		x 10		x 2		x 1
	x 2		x 32		x 2		x 1
	x 2		x 24		x 2		x 1
	x 2		x 48		x 2		x 1
	x 2		x 24		x 2		x 1
	x 4		x 16		x 2		x 1
	x 2		x 4		x 4		x 1
	x 2		x 2		x 2		x 1
	x 2		x 8		x 2		x 1
	x 10		x 1		x 1		x 1
	x 4		x 4		x 2		x 1
	x 2		x 1		x 2		x 1
	x 2		x 4		x 2		x 1
	x 2		x 4		x 2		x 1
	x 2		x 4		x 2		x 1



**N.B.:** cereți unui adult să îndepărteze piesele din suporturile de plastic. Orice resturi ascuțite trebuie aruncate imediat.



# MOTORUL CU COMBUSTIE INTERNĂ

Motorul cu combustie internă este un mecanism care transformă energia chimică în energie mecanică. Pentru a genera energie mecanică, ne trebuie:

**Oxidant:**  
oxigen



**Combustibil:**  
hidrocarburi



**Camera de ardere:** este un reactor chimic unde are loc reacția chimică de ardere între combustibil și oxidant.

VALVĂ

BUJIE

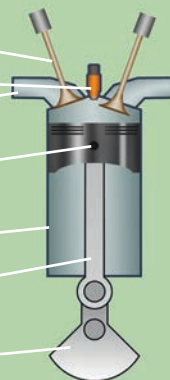
SUPAPĂ

PISTON

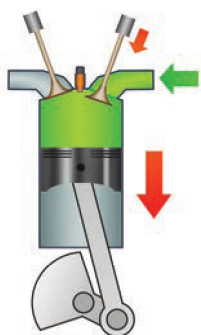
CILINDRU

BIELĂ

ARBORE COTIT



**Cum funcționează?** Pistonul unui motor în patru timpi face 4 curse simple într-un ciclu motor. Doar una generează energie:



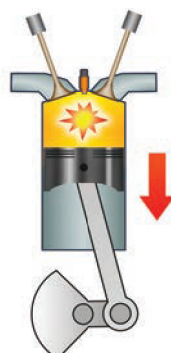
### Admisia

În timpul de admisie se întâmplă două lucruri: pistonul coboară și supapa de admisie a amestecului de combustibil /oxigen se deschide, permițând accesul acestuia în camera de ardere. Este prima coborâre a pistonului.



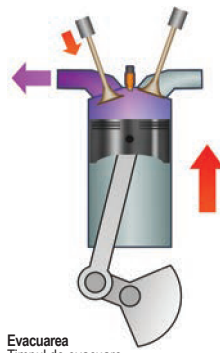
### Compresia

Timpul de compresie debutează când pistonul ajunge în capăt și începe să urce, iar supapa de admisie se închide complet. Pistonul urcă, iar amestecul de oxigen și carburant se comprimă, fiind prins în camera etanșă. Este prima urcare a pistonului.



### Arderea și destinderea

Timpul de aprindere începe când pistonul ajunge în poziția maximă de sus și combustibilul e la compresie maximă. Atunci se aprinde bujia, care face ca amestecul să explodeze și să împingă cu forță pistonul în jos. Acest timp este cel care imprimă mișcarea vîlbrochenului. Este a doua coborâre a pistonului.



### Evacuarea

Timpul de evacuare debutează când pistonul împins ajunge în poziția maximă de jos și începe să urce. Aici se întâmplă două acțiuni simultane: pistonul urcă, iar supapa de evacuare se deschide, permițând gazelor să iasă pe evacuare. Este a doua urcare a pistonului. Când pistonul ajunge în poziția de sus, ciclul se reia și începe iar timpul de admisie, urmat de celelalte.

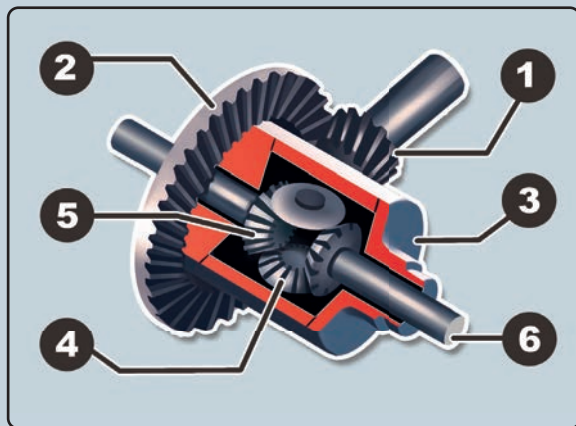
**CONSTRUIȚI MODELUL  
DE LA PAGINA 5 ȘI  
TESTAȚI MECANISMUL**





## DIFERENȚIALUL

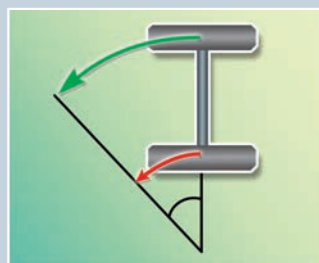
Diferențialul transmite puterea la roți și permite învârtirea roților axului pe care este montat cu viteze diferite.



### Componente:

1. **Pinion de atac:** transmite impulsul de la motor la coroana dințată și apoi la roțile mașinii.
2. **Coroana dințată a diferențialului:** transmite impulsul de la pinion la casetă.
3. **Caseta diferențialului:** cutia care cuprinde roțile.
4. **Sateți cruce:** transmite impulsul către arborele planetar.
5. **Pinioane planetare:** roțile atașate la arborele planetar.
6. **Arbore planetar:** axul care conectează roțile mașinii la sateții cruce.

Atunci când o mașină face un viraj, roata de la exterior trebuie să se întoarcă mai repede decât roata de la interior. Asta pentru că roata exterioară trebuie să acopere o distanță mai mare în același timp. Diferențialul permite celor două roți să se învârtă cu viteze diferite. Dacă mașina virează la stânga, roata dreaptă se învârtă mai rapid. Dacă mașina virează la dreapta, roata stângă se învârtă mai rapid.

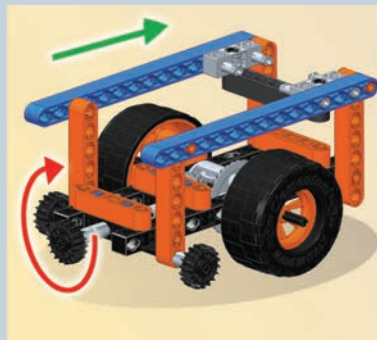


## CONSTRUIȚI MODELUL DE LA PAGINA 6 ȘI TESTAȚI MECANISMUL

Diferențialul permite roților vehiculului să se învârtă cu viteze diferite atunci când execută un viraj. Faceți un viraj cu modelul și vedeți cum diferențialul învârtă roțile cu viteze diferite.

Pinionul transmite impulsul de la motor prin diferențial până la arborele planetar, învârtind roțile. Întoarceți arborele cardanic pentru a vedea cum modelul se mișcă înainte sau înapoi, în funcție de rotirea pinionului.

Atunci când merg înainte, roțile se mișcă cu aceeași viteză. Astfel că sateții cruce nu se învârt în caseta diferențialului. Rotiți modelul și faceți cele două roți să se învârtă împreună. Veți vedea că sateții cruce și caseta diferențialului se rotesc unitar.

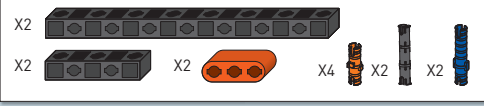




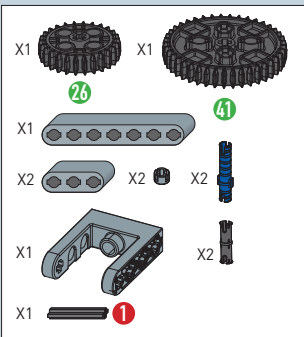
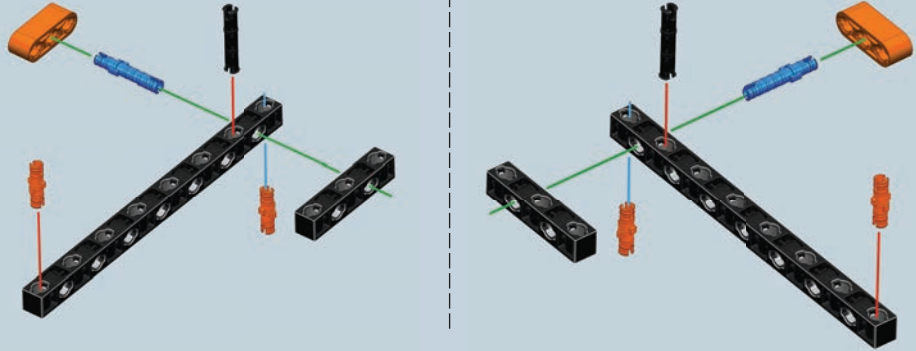
# 1 - BIELA ȘI PISTONUL



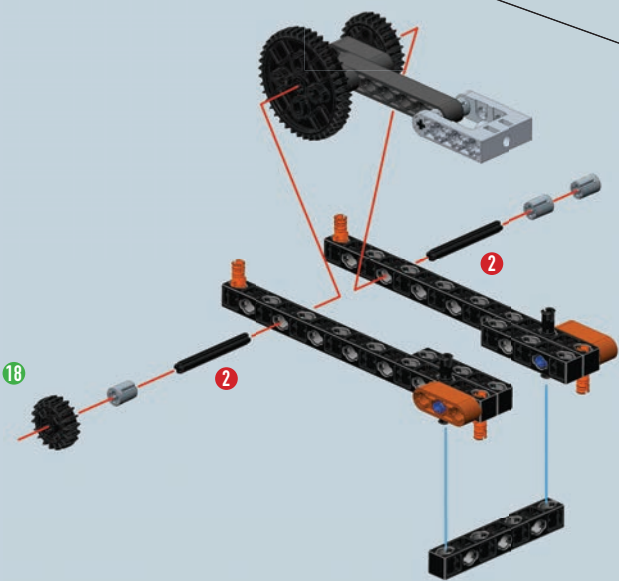
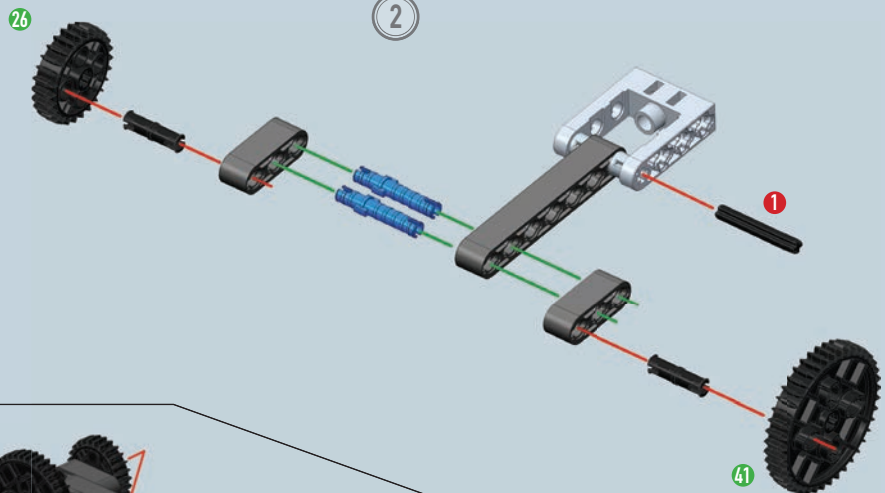
Instrucțiunile 3D interactive se găsesc în aplicația SCIENCE & PLAY BUILD.



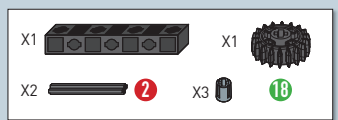
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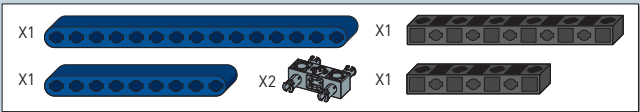
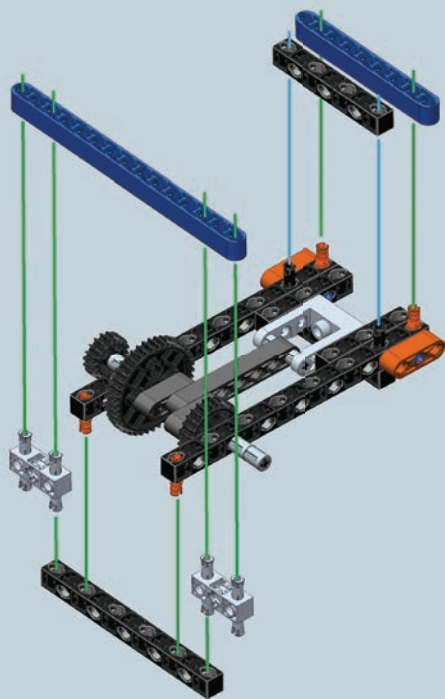


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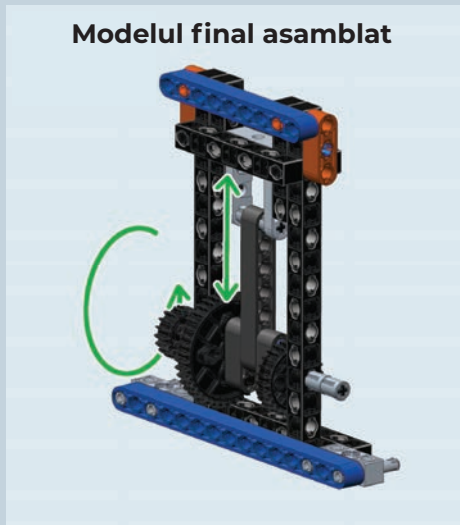


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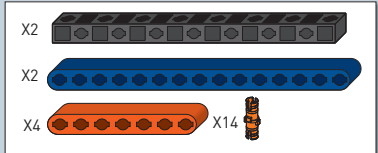
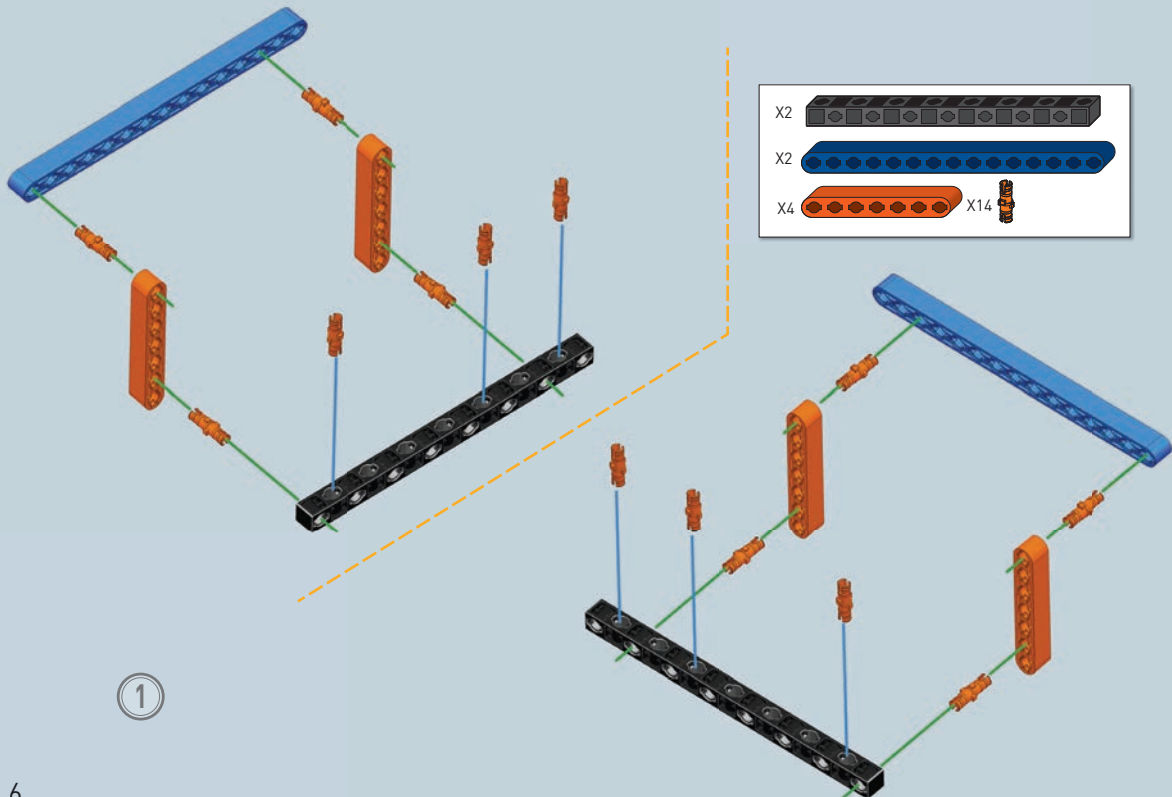
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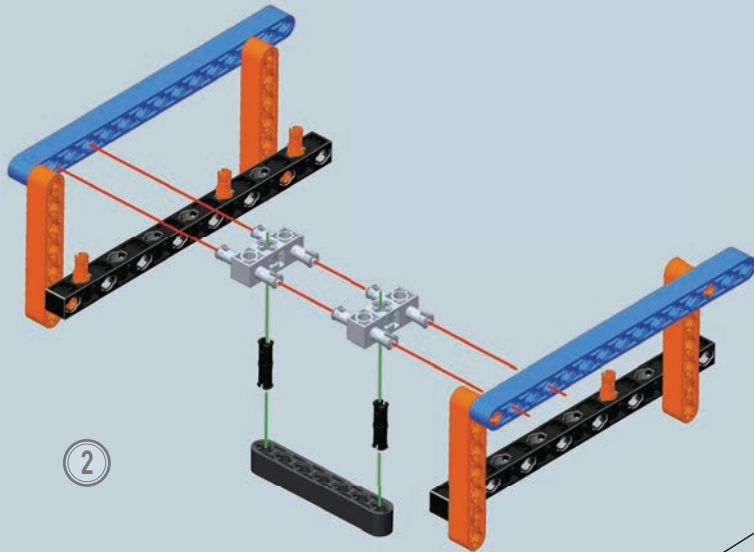
## 2 - DIFERENȚIALUL



Instrucțiunile 3D interactive se găsesc în aplicația SCIENCE & PLAY BUILD.

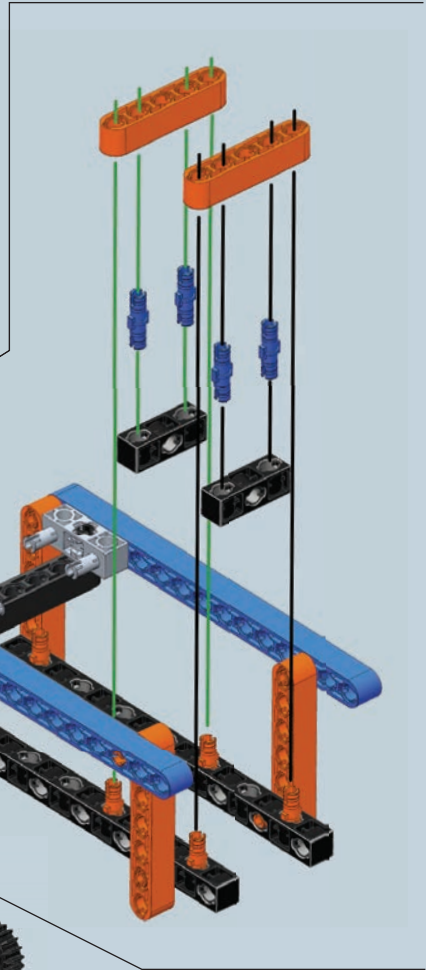


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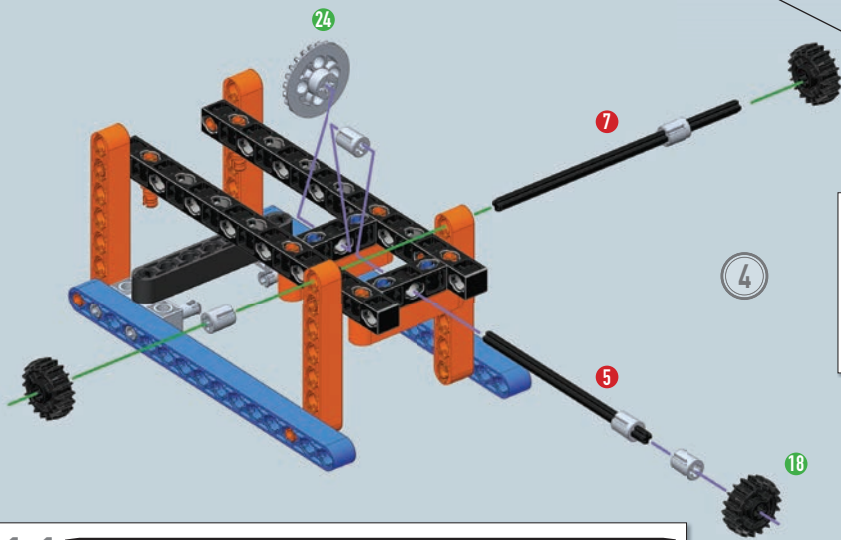
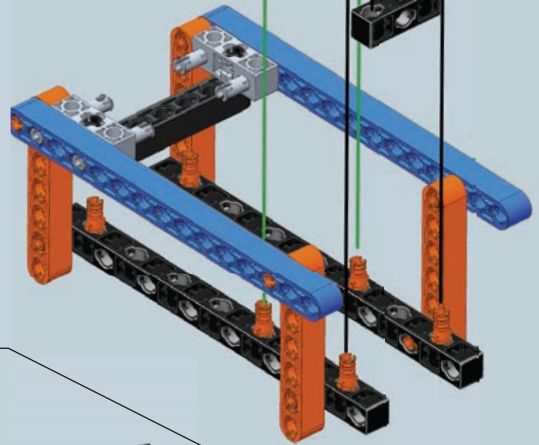
2

- X1
- X2
- X2



3

- X2
- X2
- X4



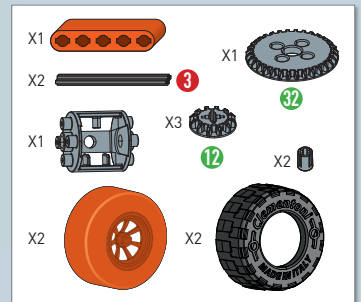
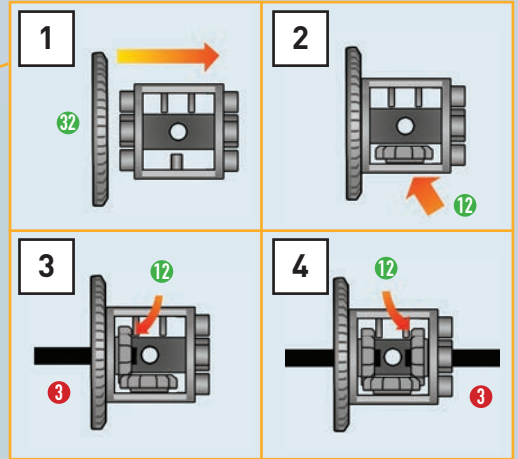
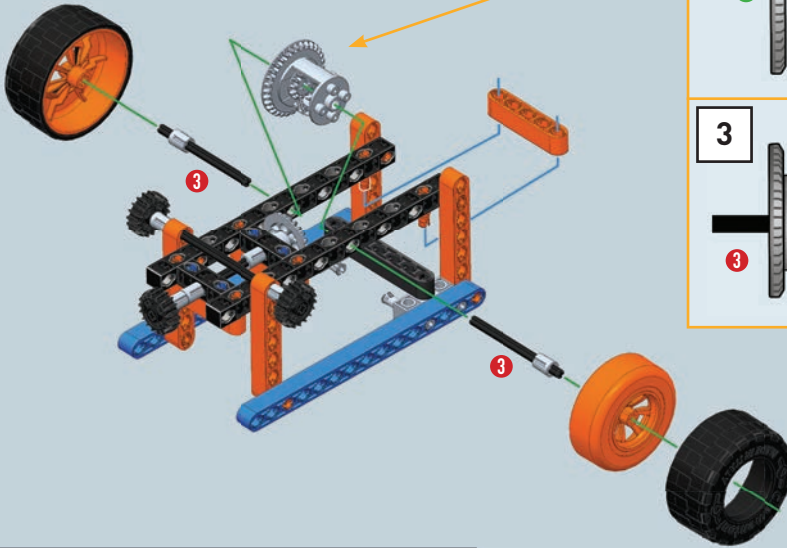
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- X1
- X1
- X1
- X3
- X5





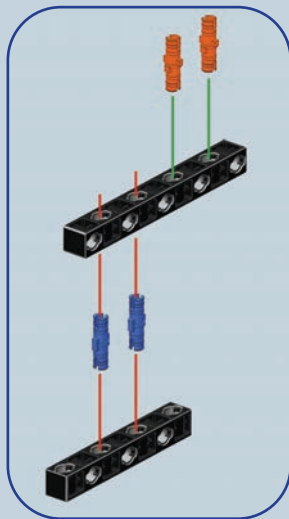
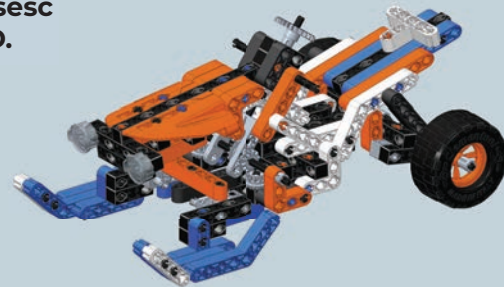
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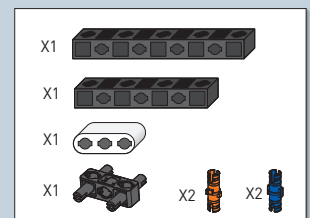
### 3 – SNOWMOBILUL

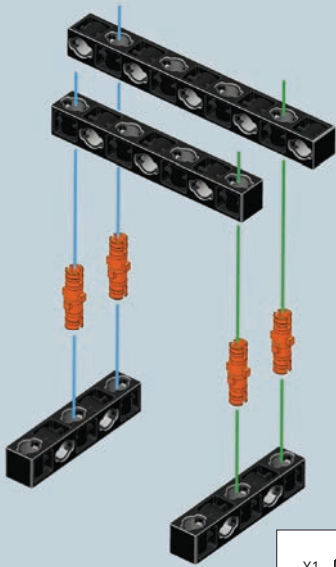


Instrucțiunile 3D interactive se găsesc în aplicația SCIENCE & PLAY BUILD.



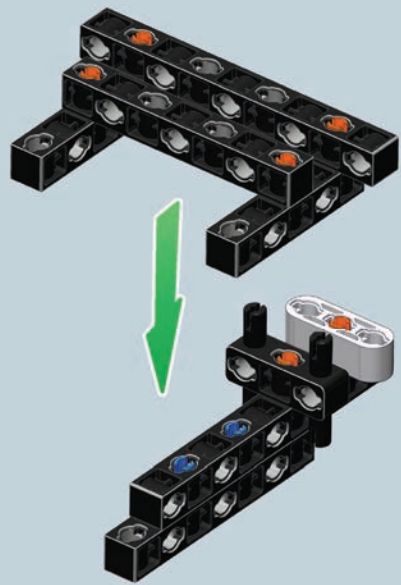
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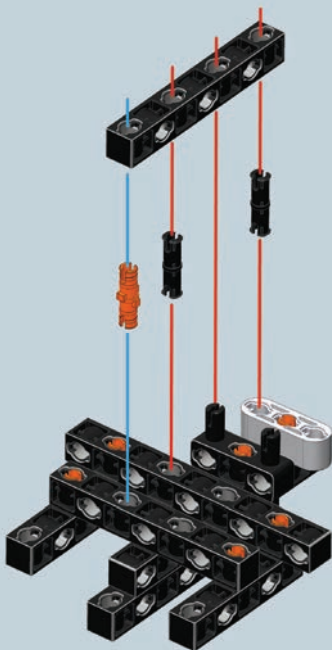


2

- X1
- X1
- X2 X4

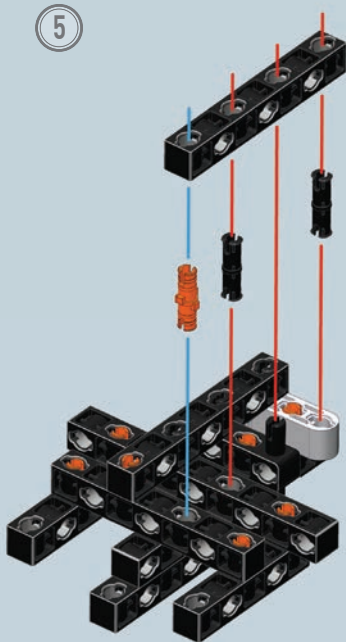


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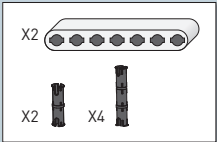
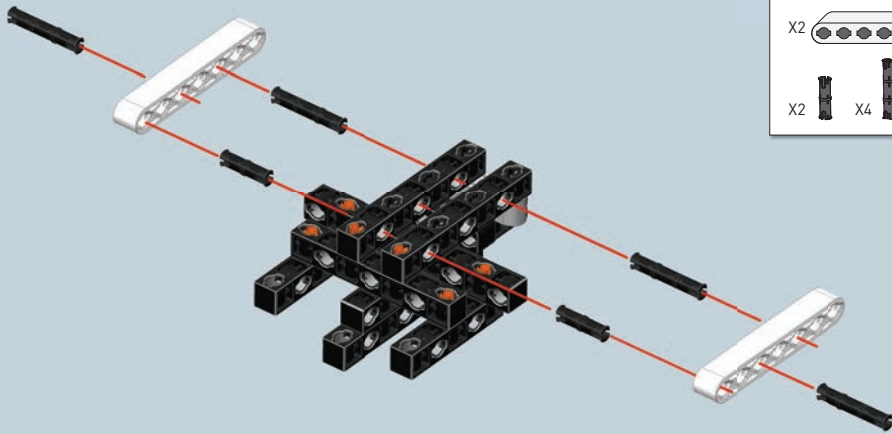
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- X1
- X2 X1

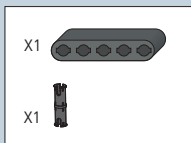
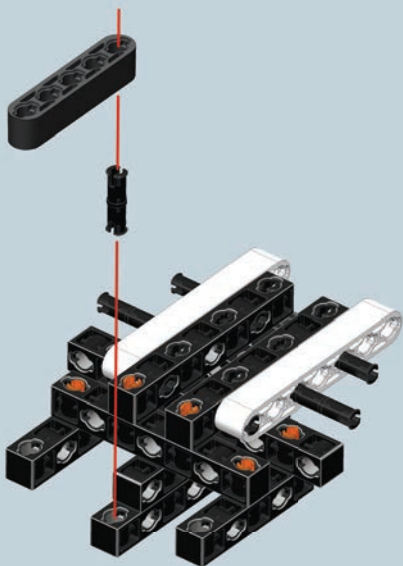


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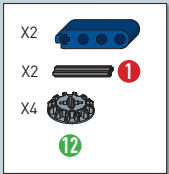
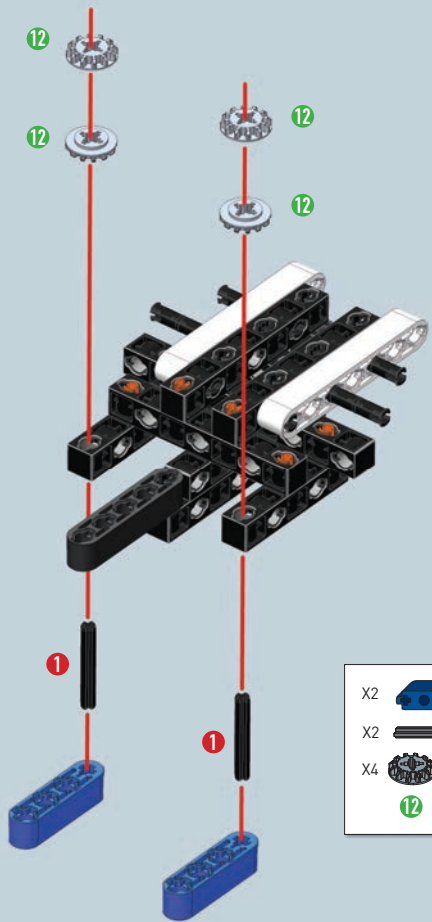
- X1
- X2 X1



6

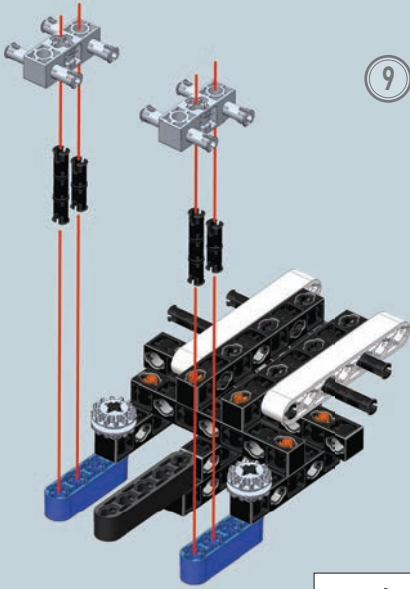


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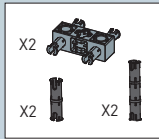


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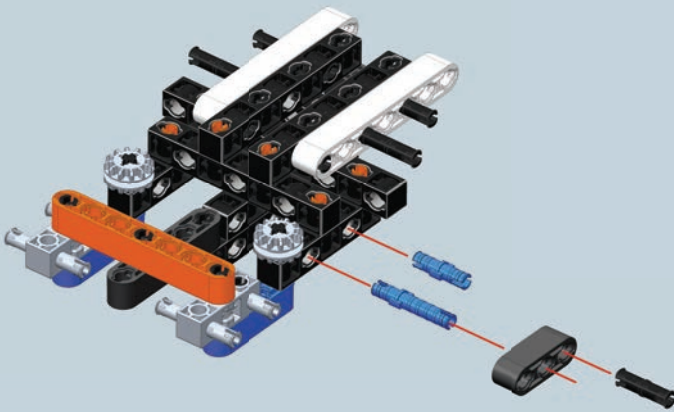
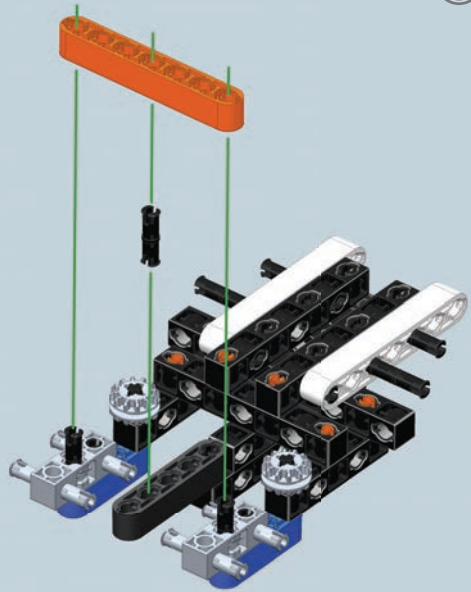




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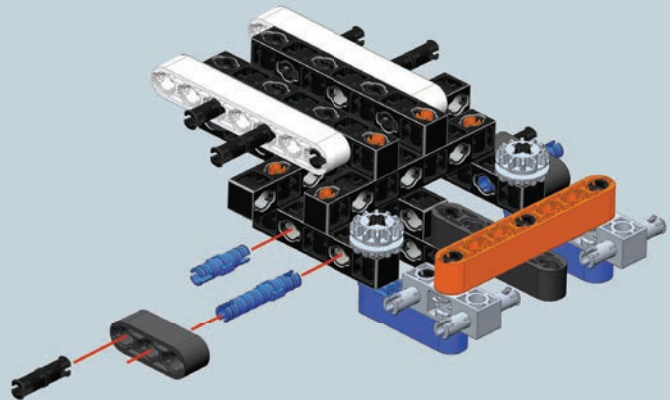
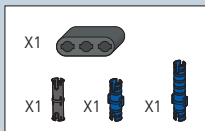
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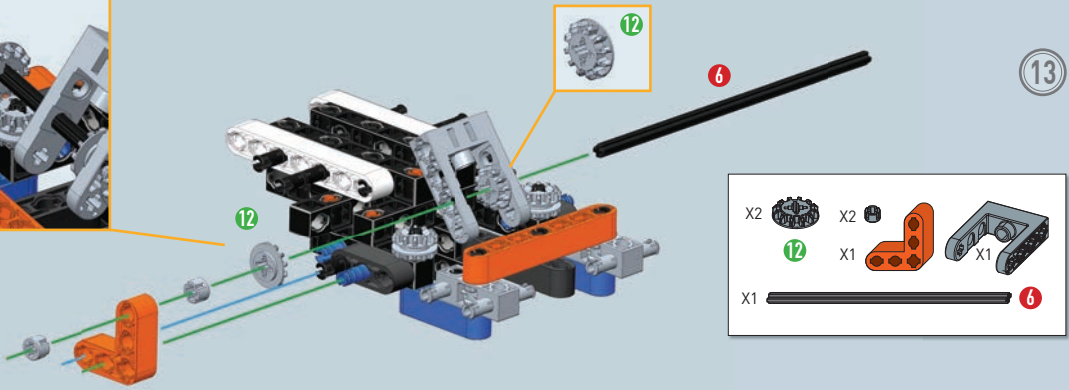
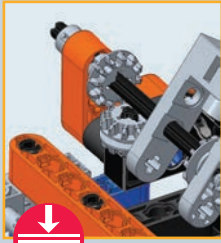


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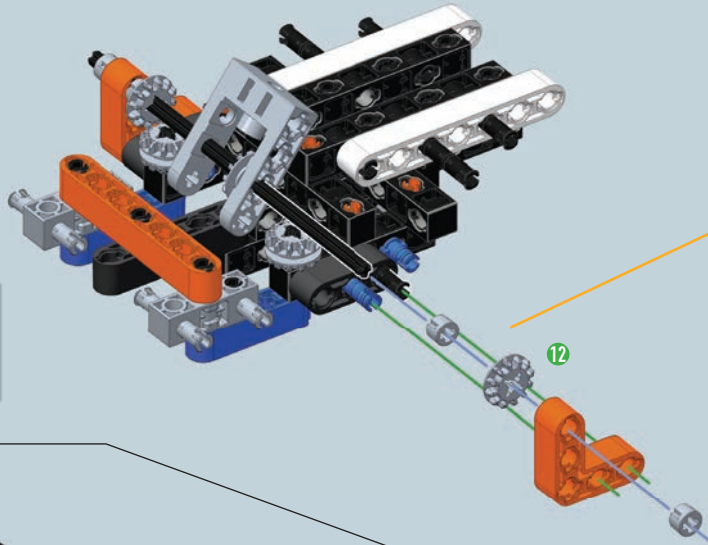




X2		X2			
	12			X1	X1
X1					
					6

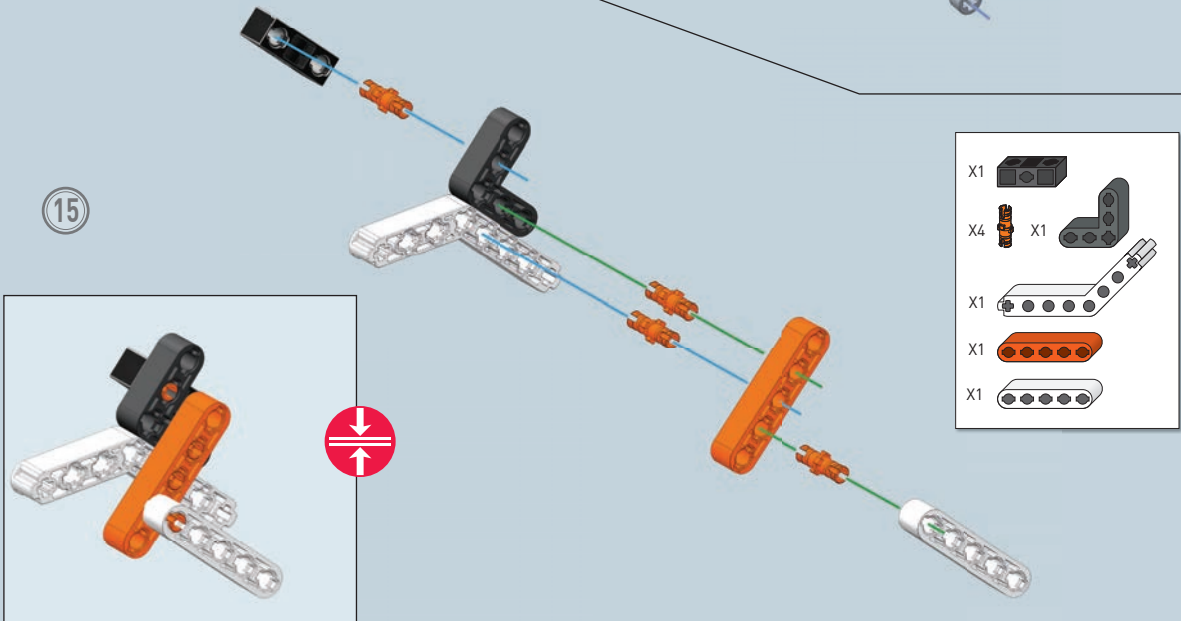


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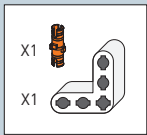


X1		X2	
	12		
X1			

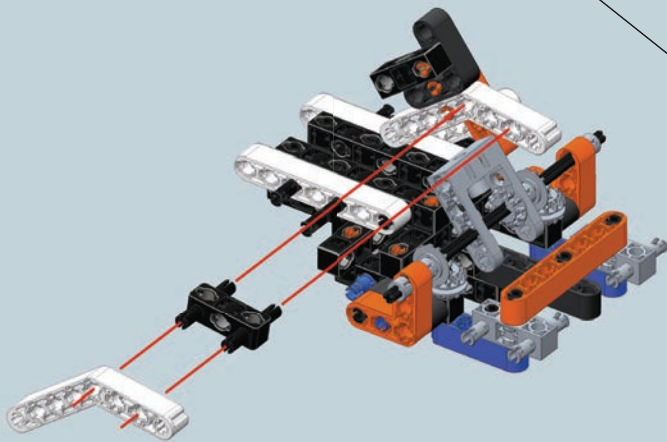
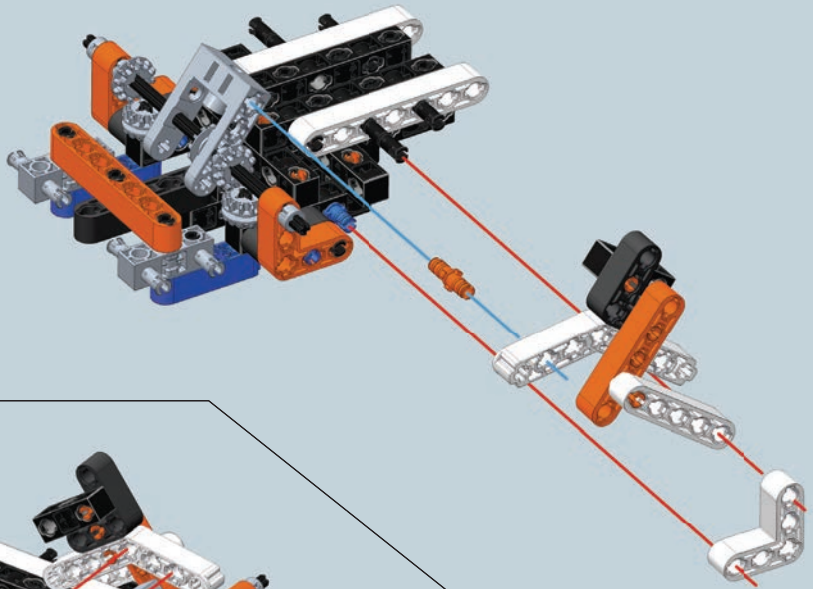
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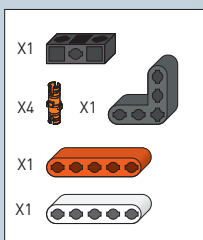
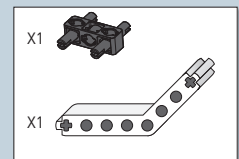
X1			
X4		X1	
X1			
X1			
X1			



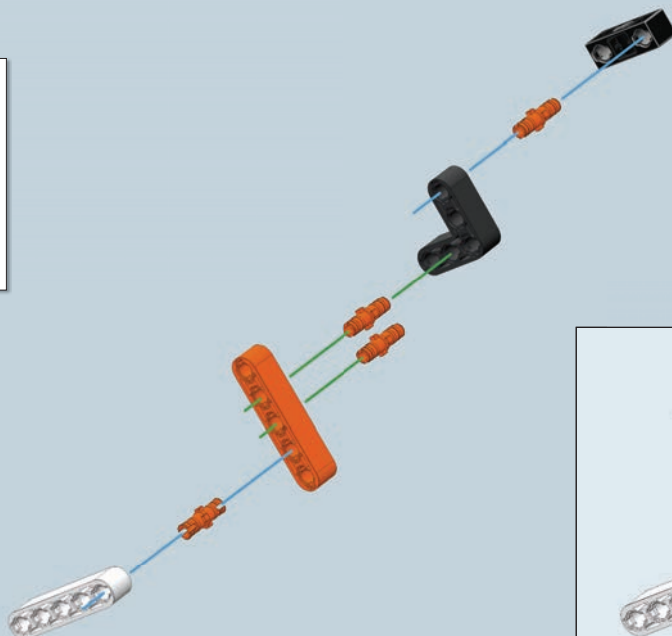
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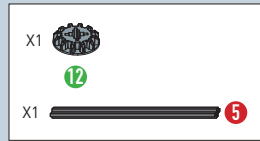
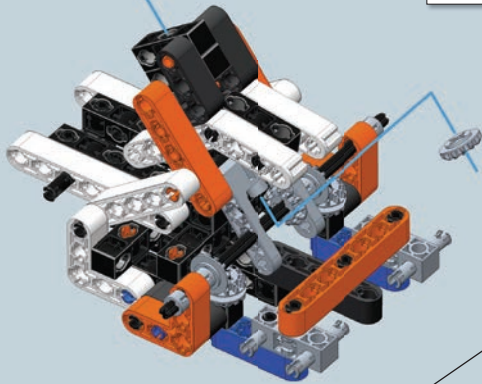
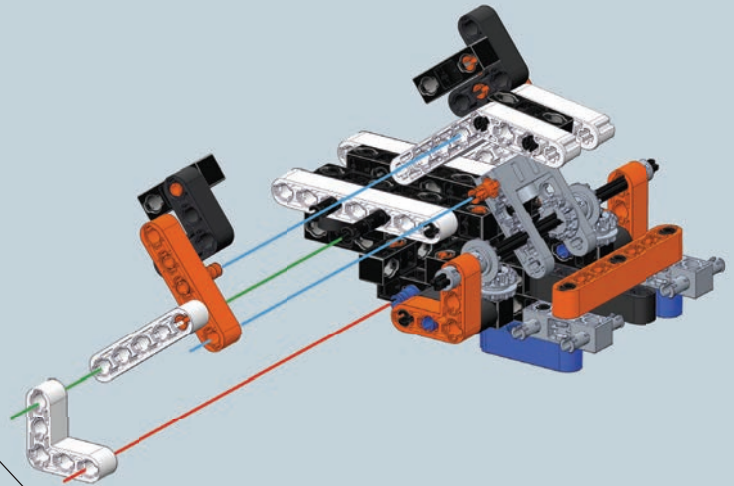
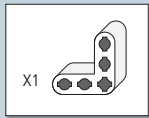


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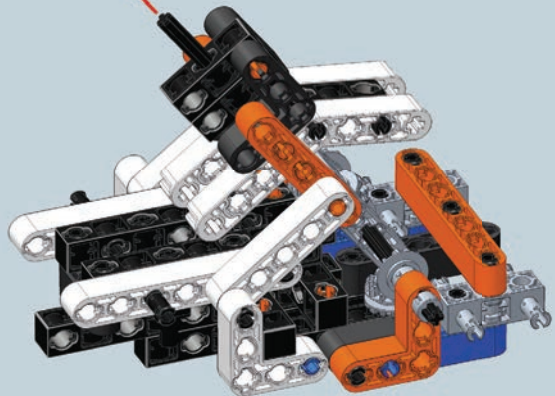
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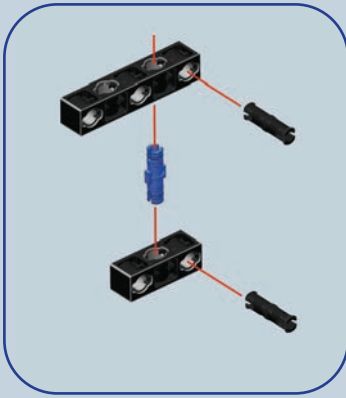


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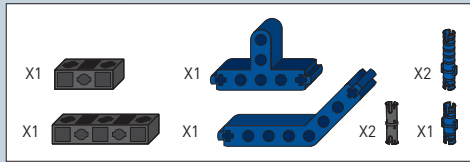
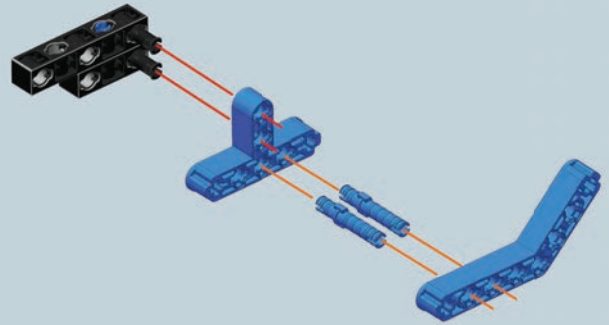


21

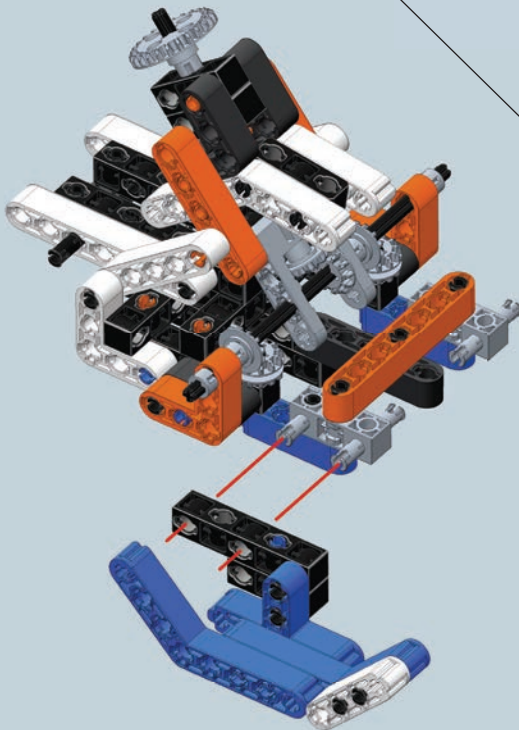
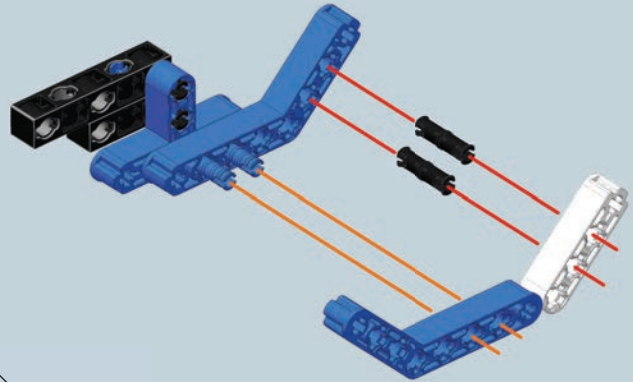
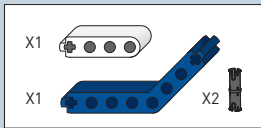




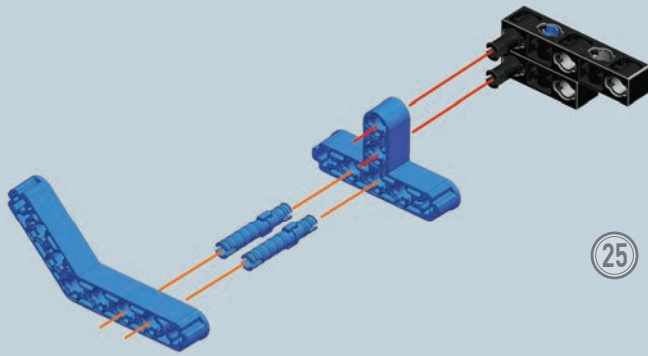
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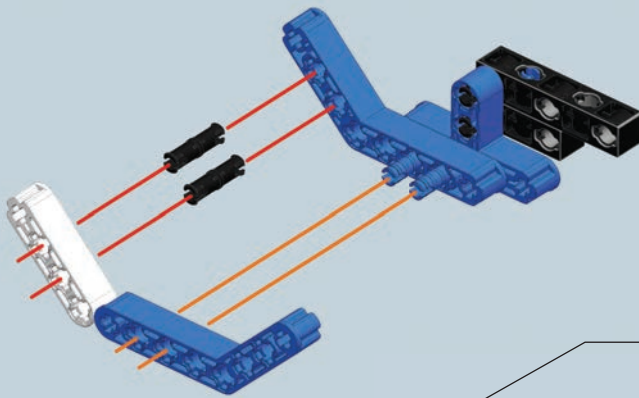
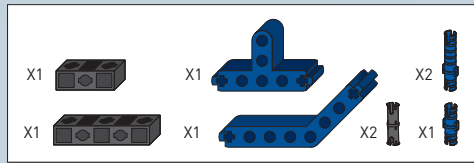
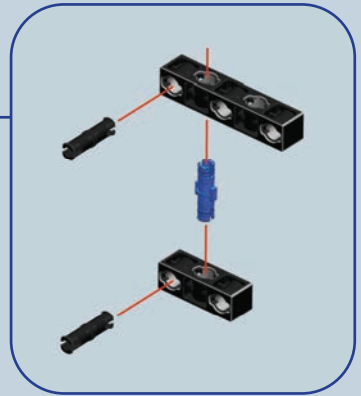
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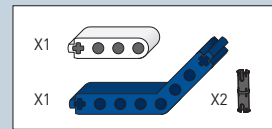
24



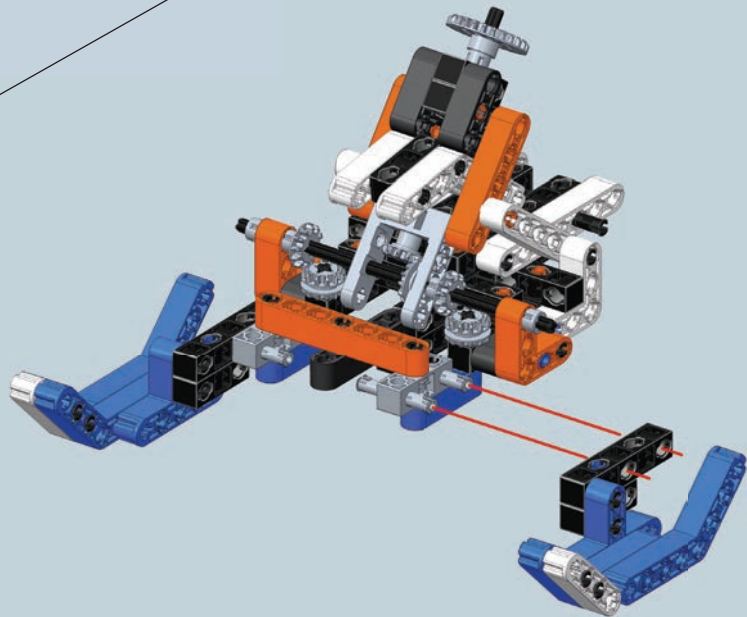
25



26

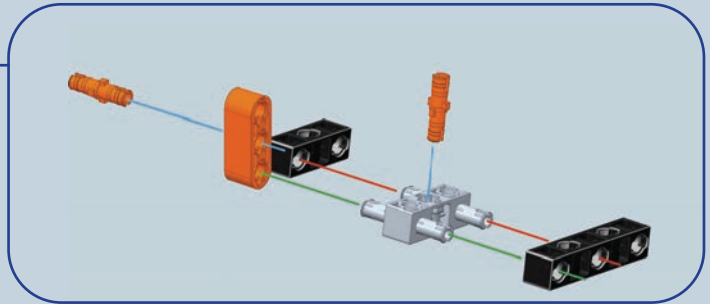
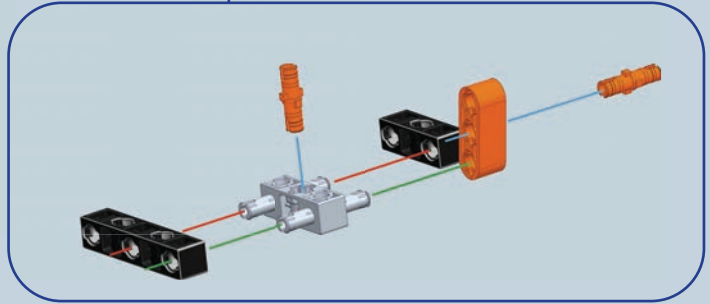
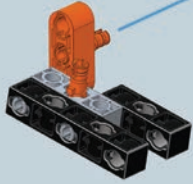
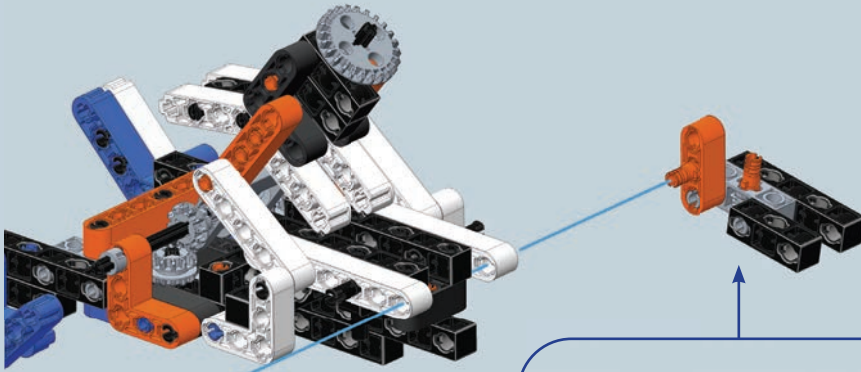


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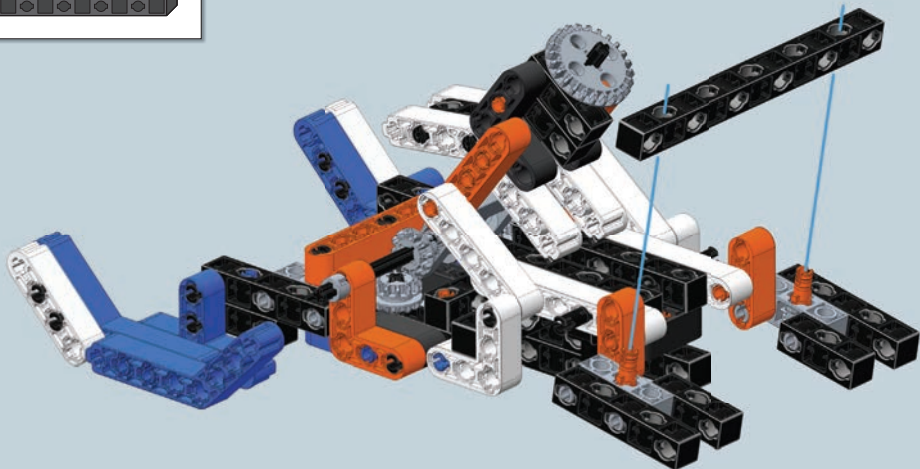
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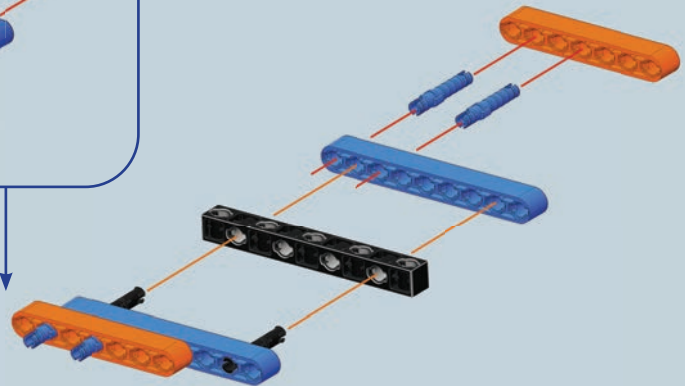
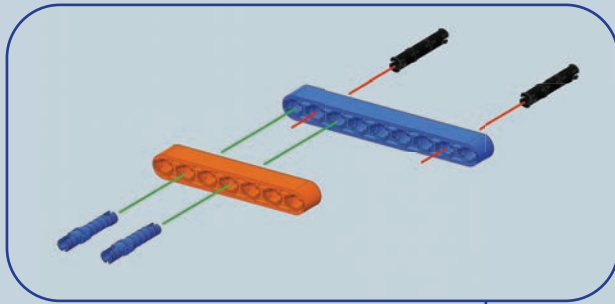


- |    |  |    |  |
|----|--|----|--|
| X2 |  | X2 |  |
| X2 |  |    |  |
| X2 |  | X4 |  |

- |    |  |
|----|--|
| X1 |  |
|----|--|

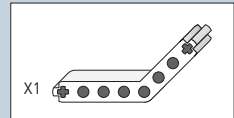
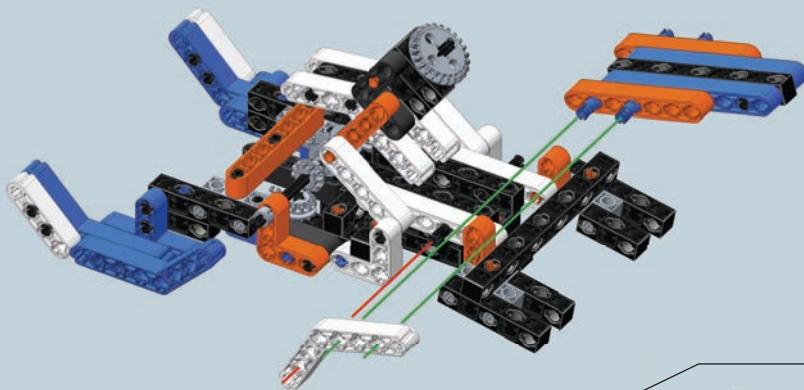
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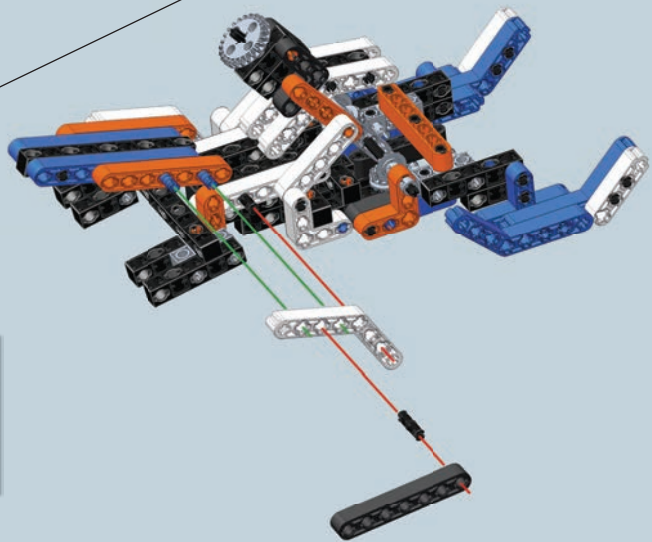


- |    |  |    |  |
|----|--|----|--|
| X1 |  | X2 |  |
| X2 |  | X4 |  |
| X2 |  |    |  |

30

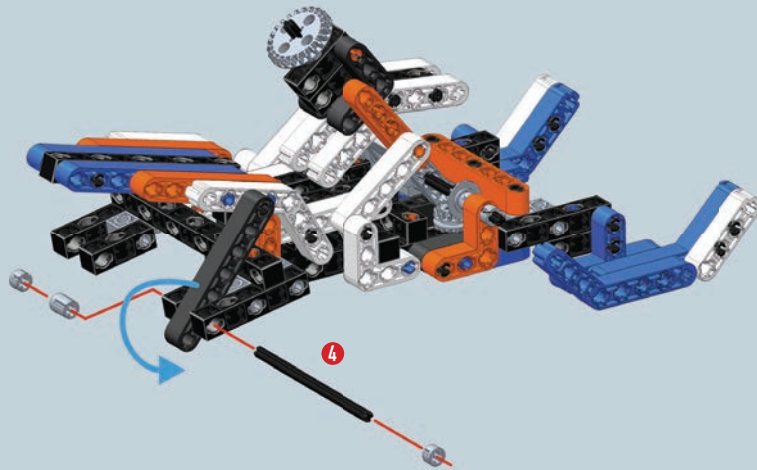


31



- |    |  |    |  |
|----|--|----|--|
| X1 |  | X1 |  |
| X1 |  |    |  |

32



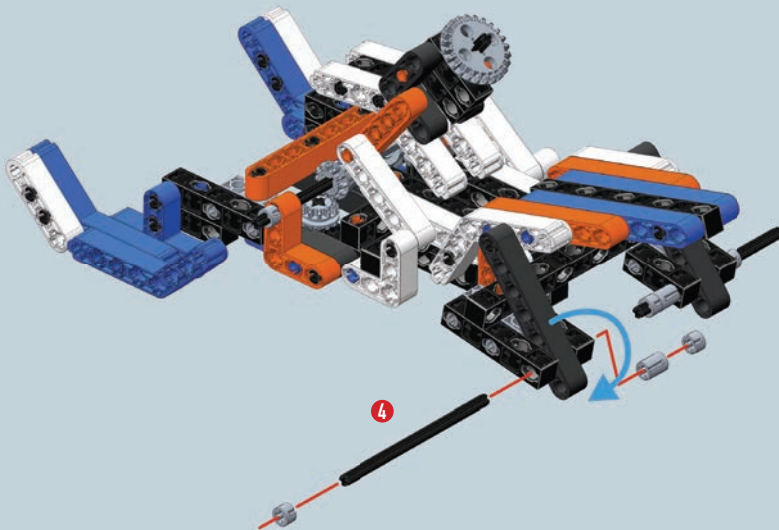
33

X2		X1	
X1			

34



X1	
X1	



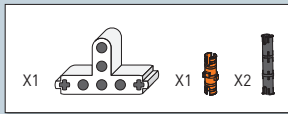
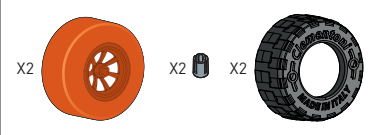
X2		X1	
X1			

35

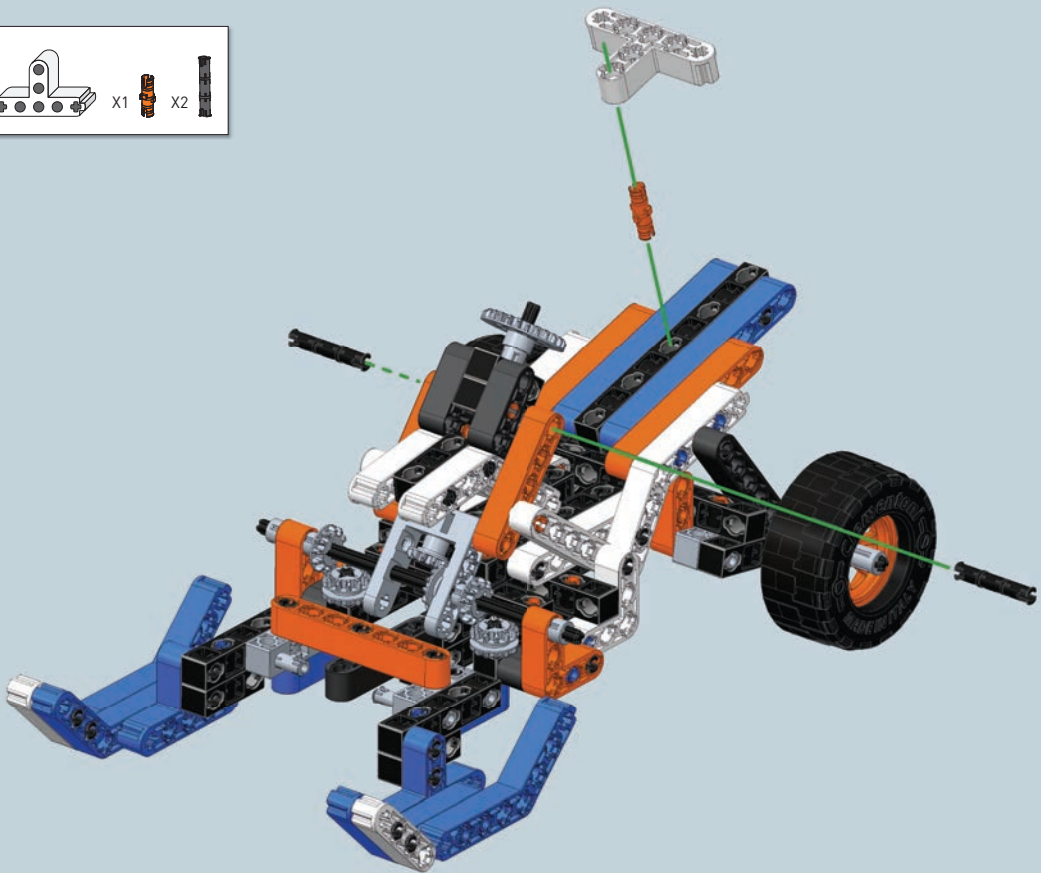
1:1	
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36



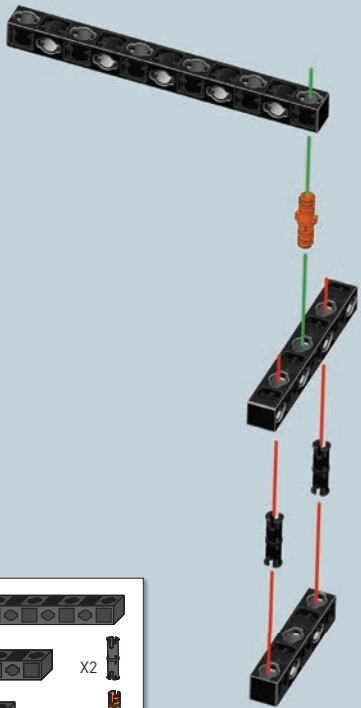
37





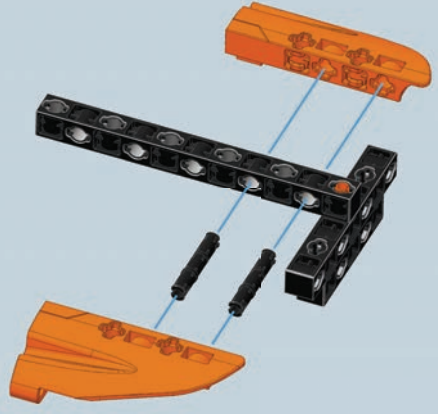
38

- X1
- X1 X2
- X1 X1



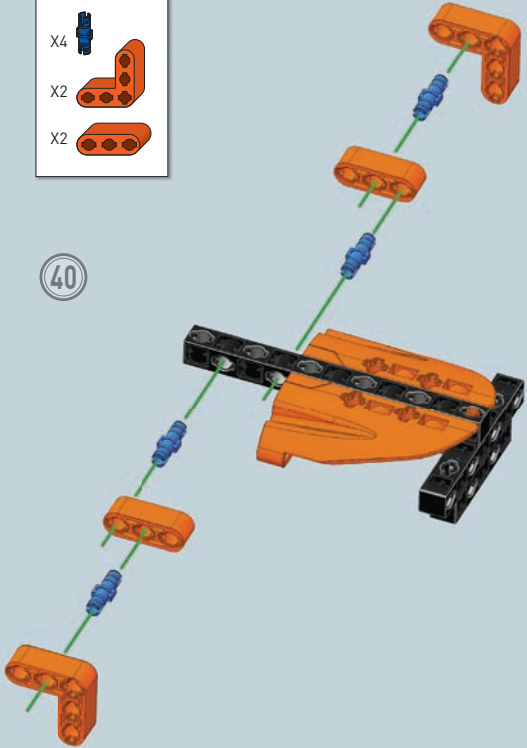
39

- X1
- X1 X2



- X4
- X2
- X2

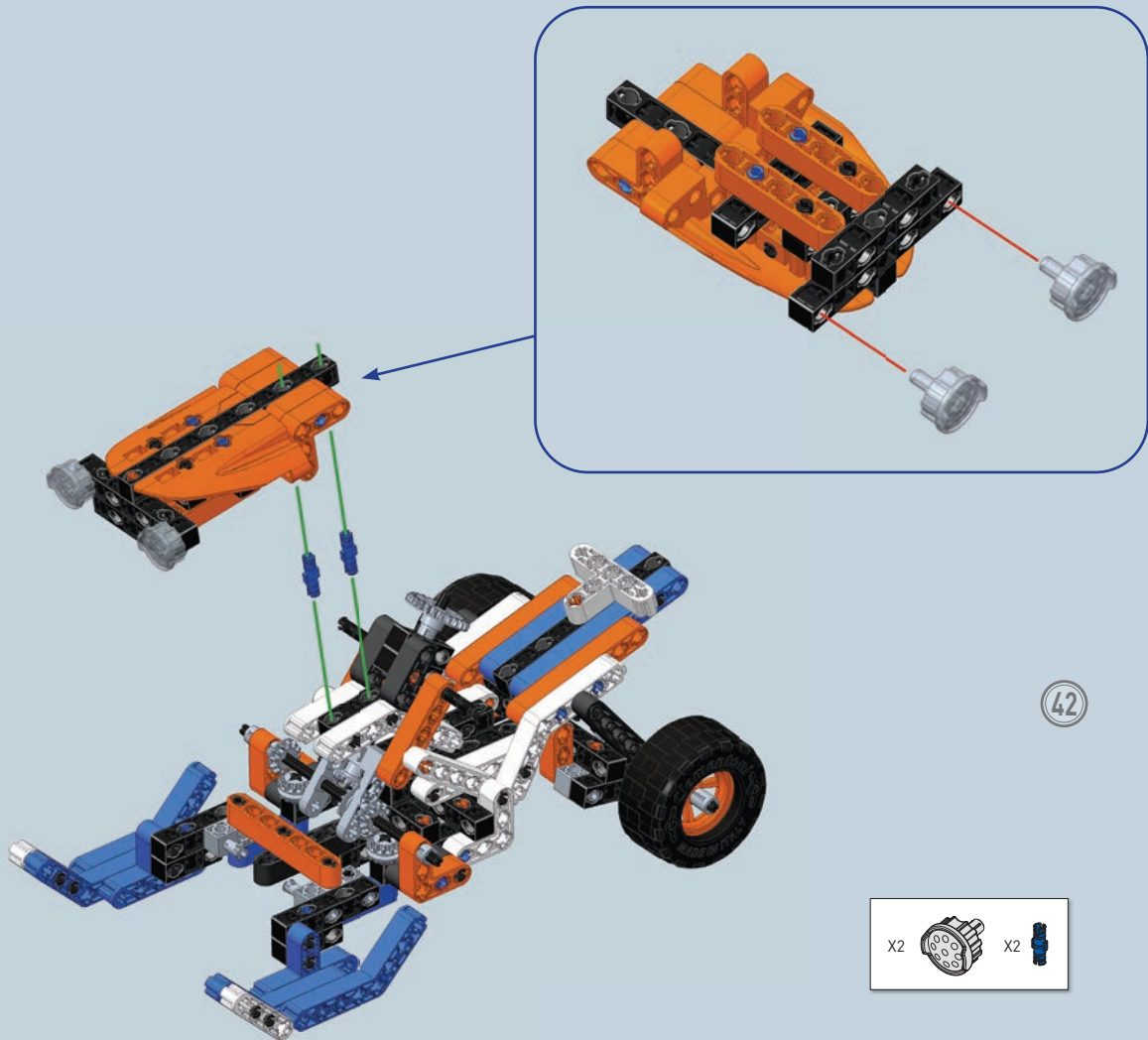
40



41

- X2
- X1
- X1 X2





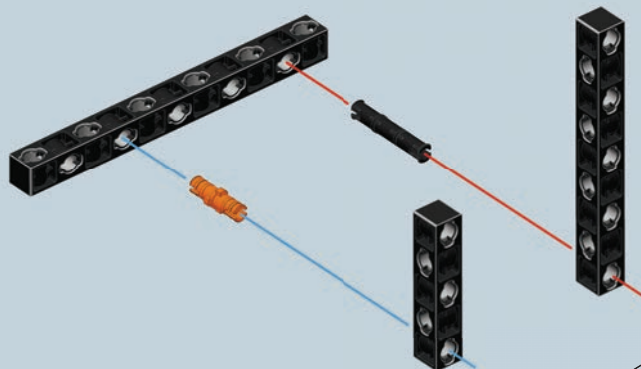
## MODELUL FINAL ASAMBLAT



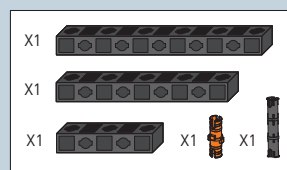
## 4 - AUTOCAMIONUL ANTARCTIC



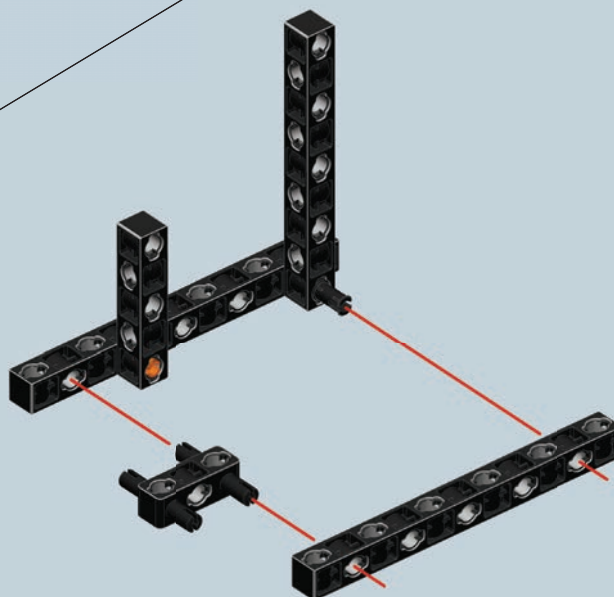
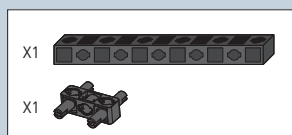
Instrucțiunile 3D interactive se găsesc în aplicația SCIENCE & PLAY BUILD.



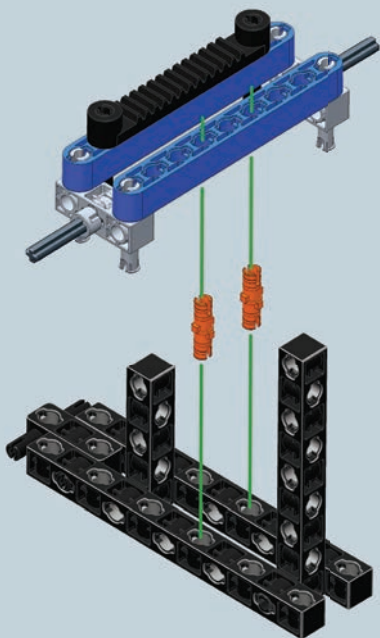
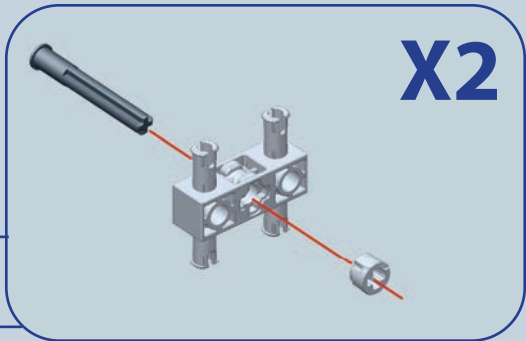
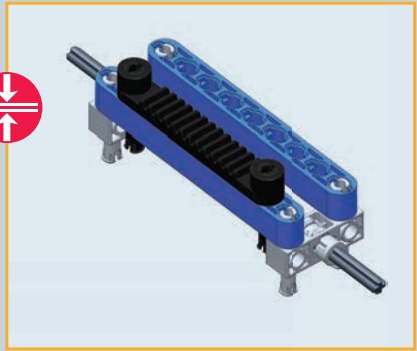
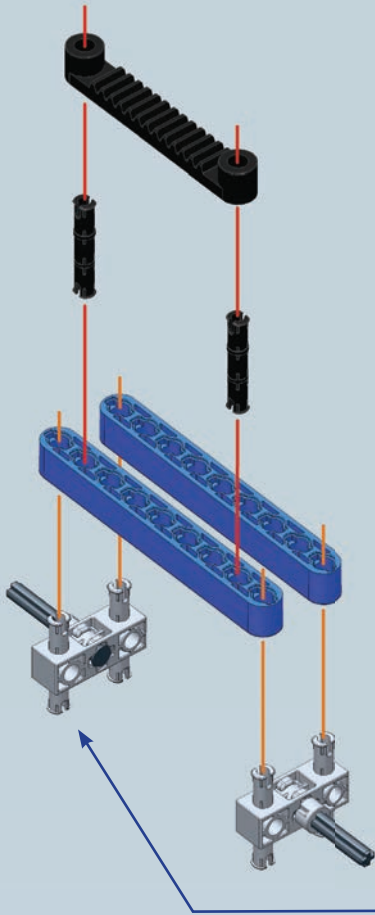
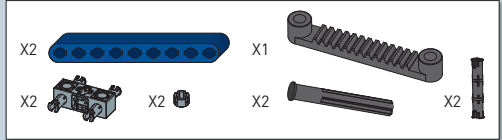
1



2



3

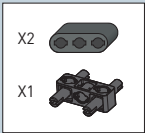
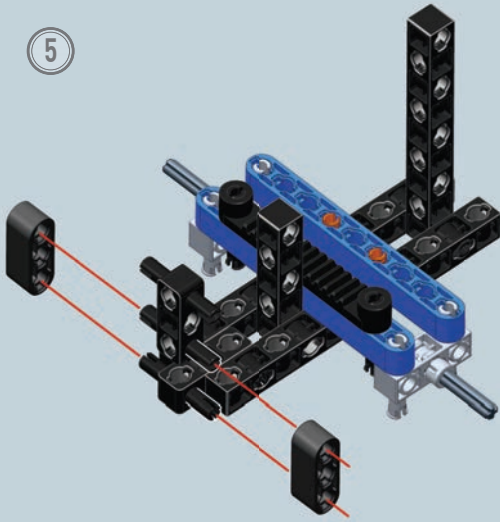


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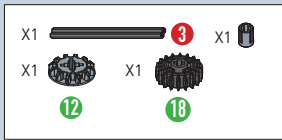
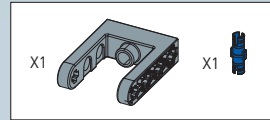
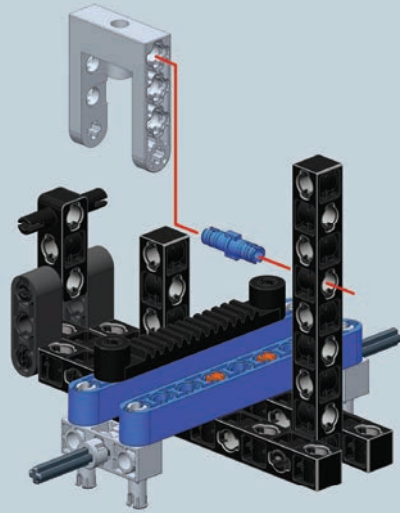




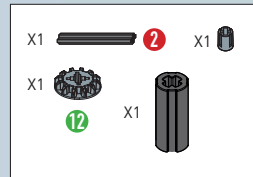
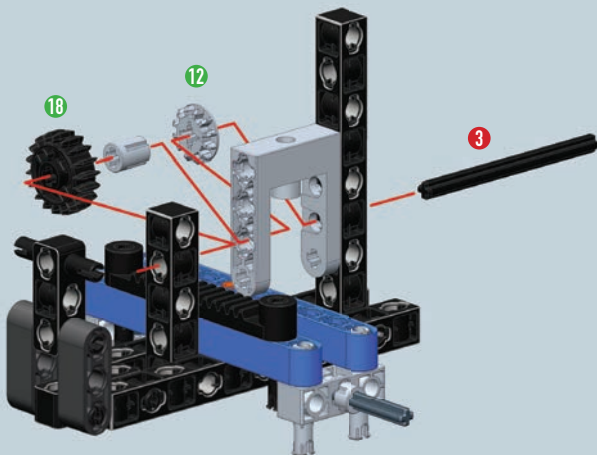
5



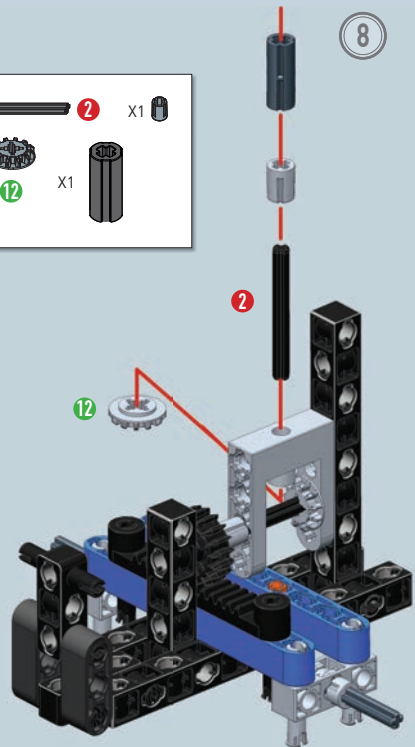
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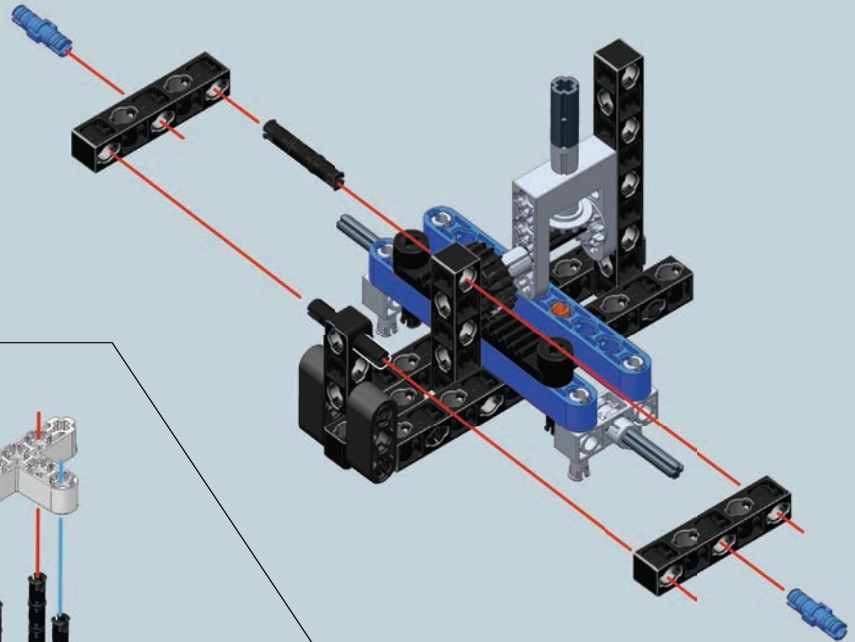
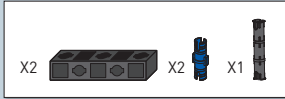
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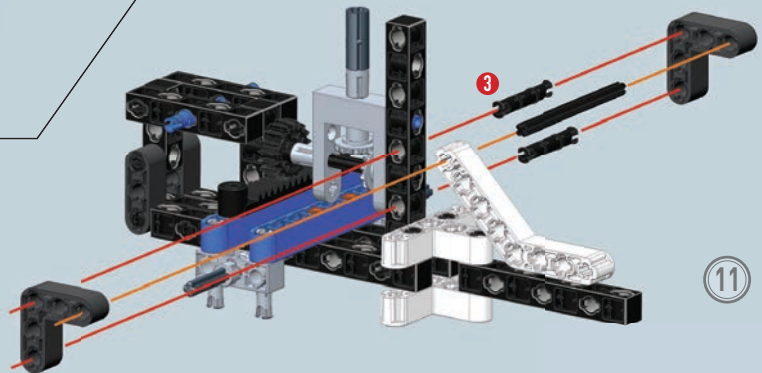
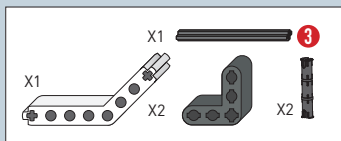
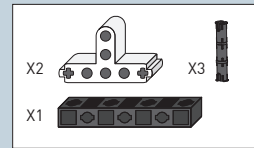
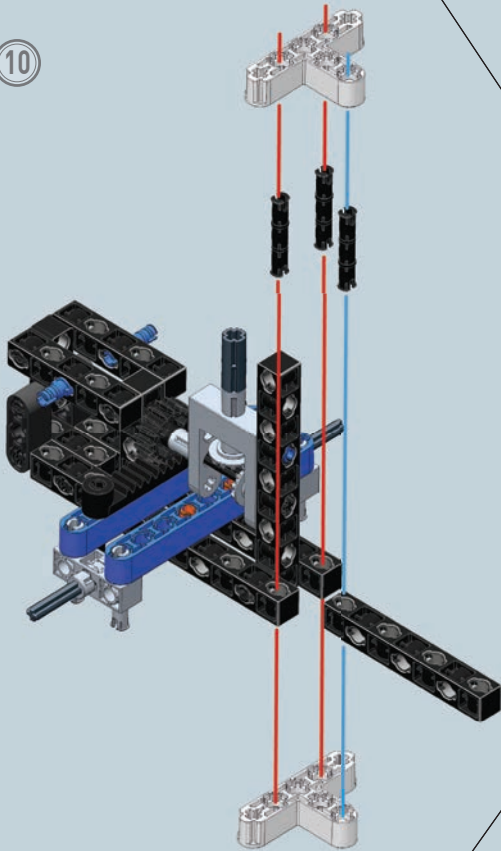
8



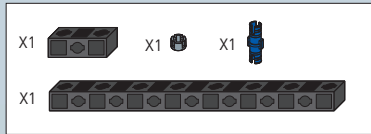
9



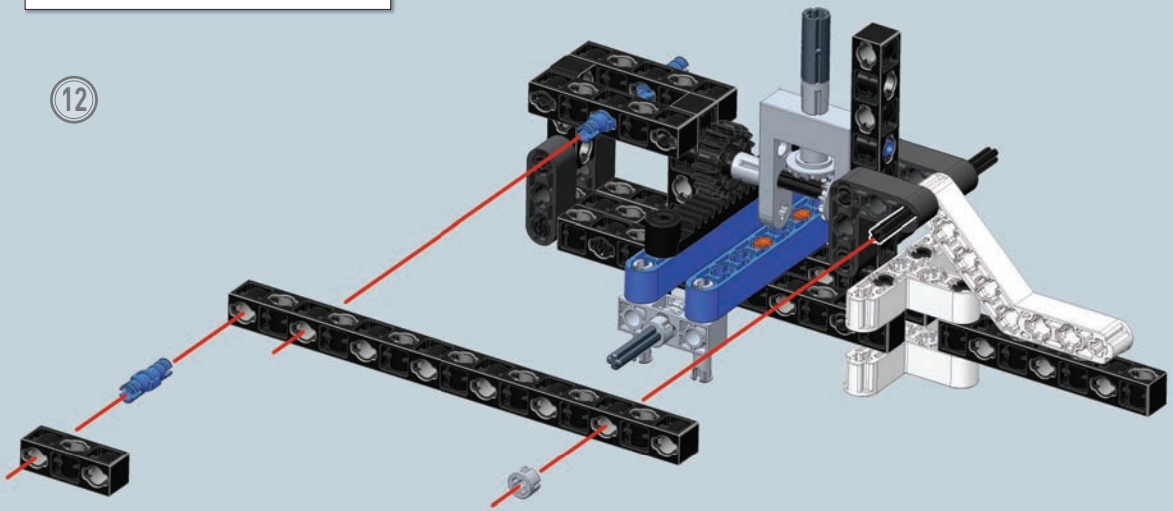
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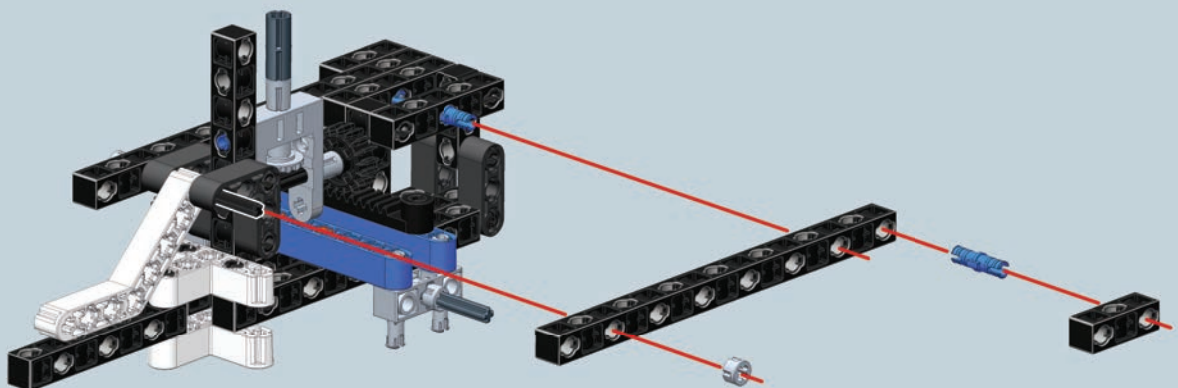
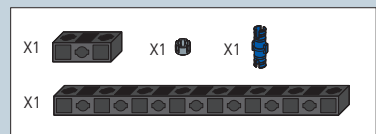
11



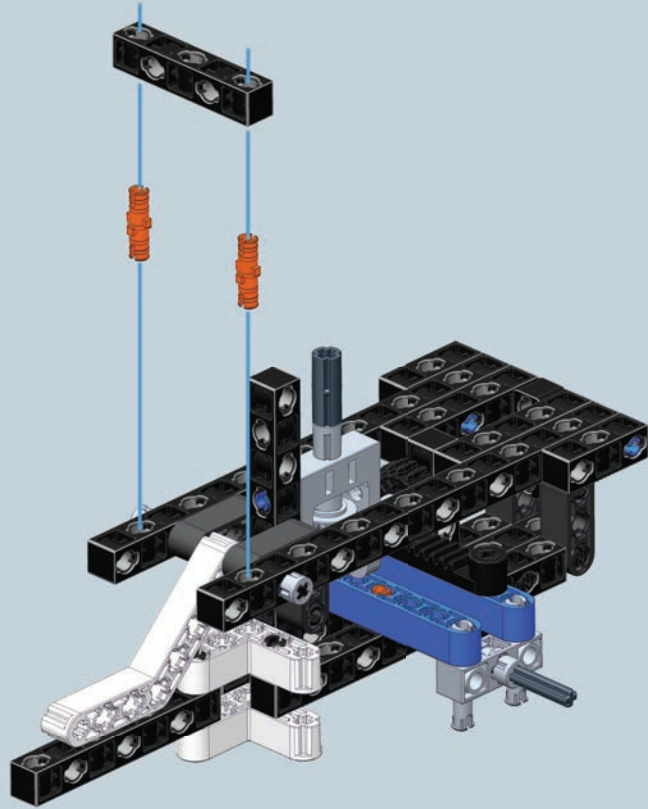
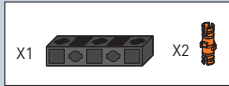
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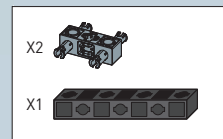
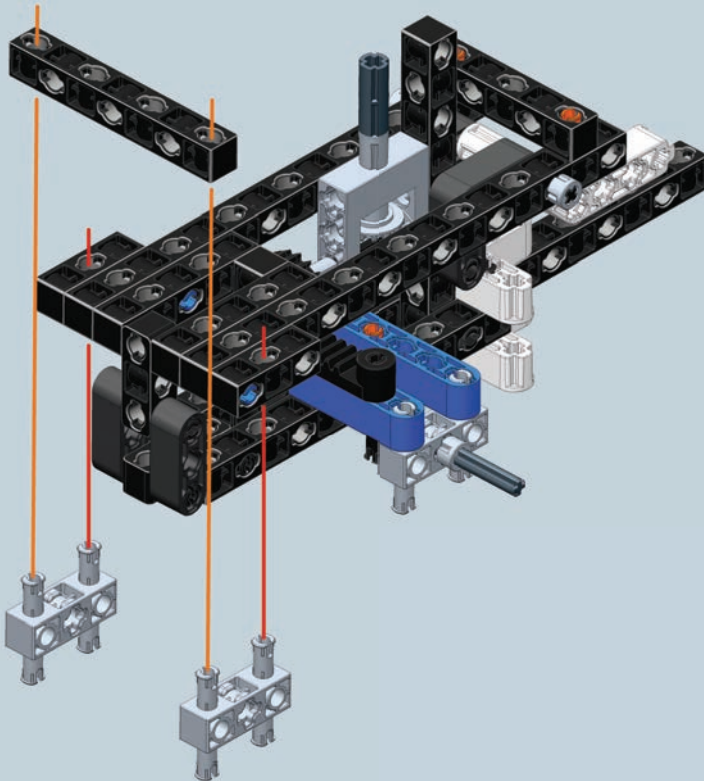
13



14









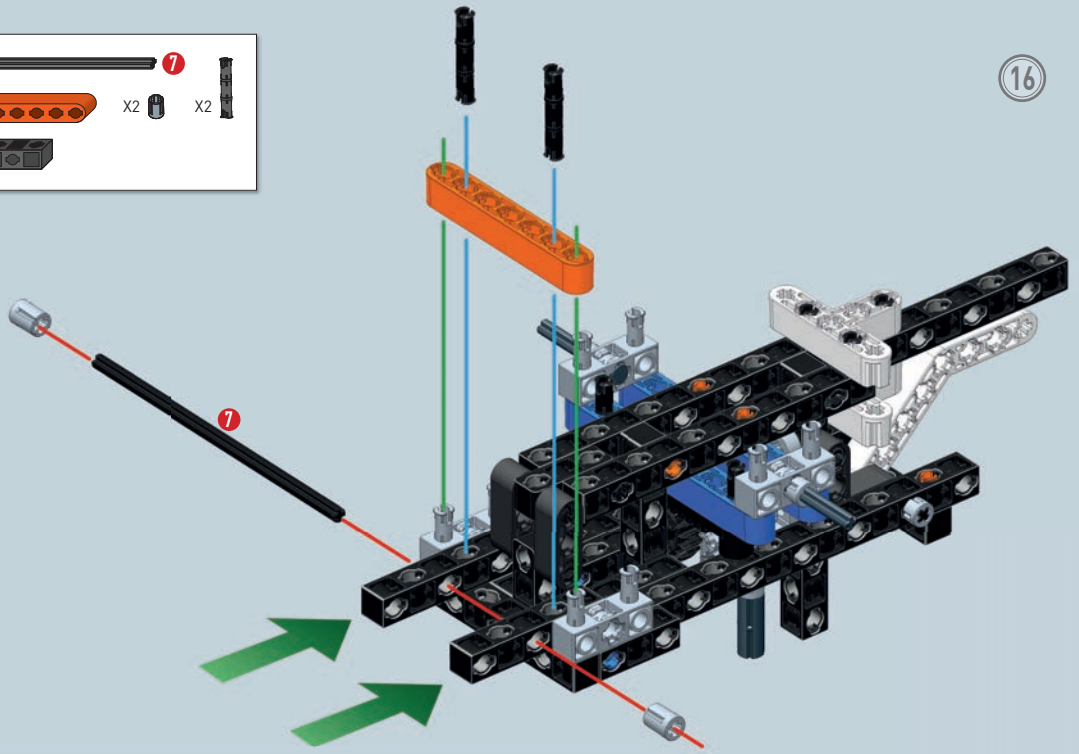
15



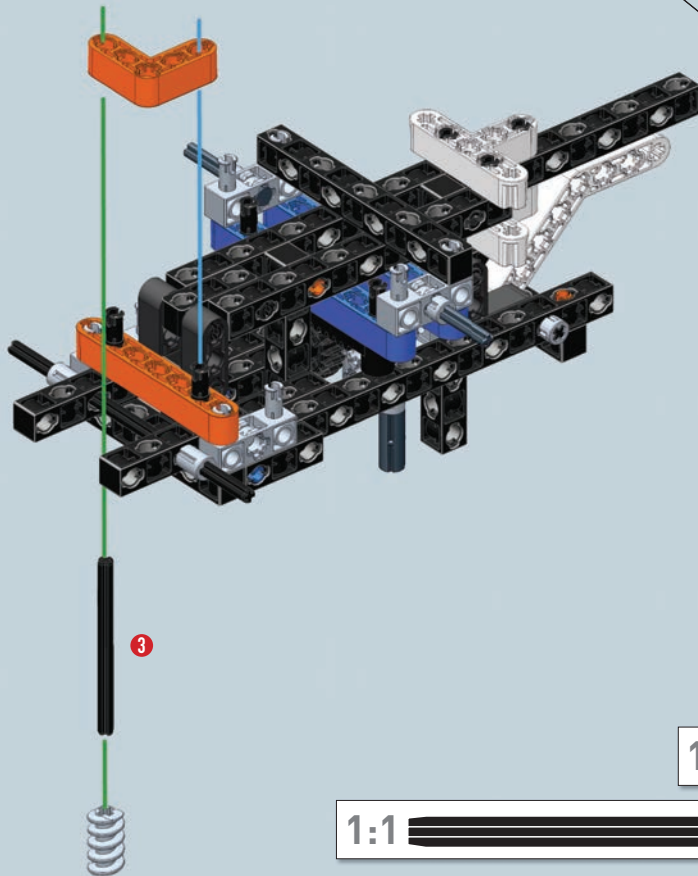





16

- X1  7 
- X1  X2  X2 
- X2 



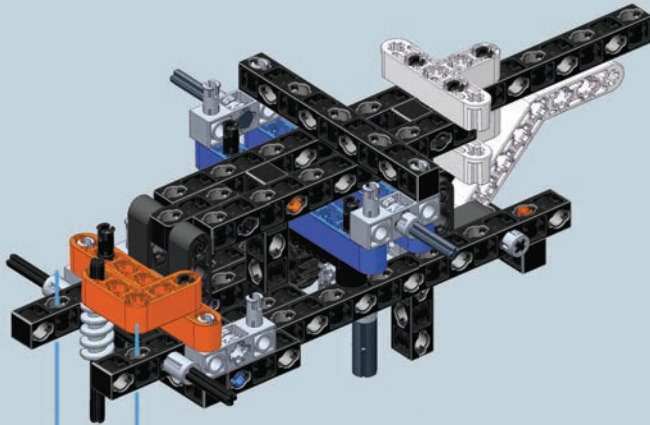
17



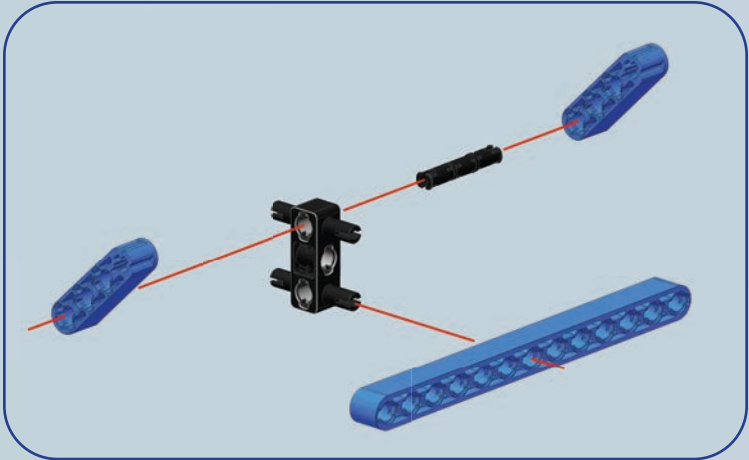
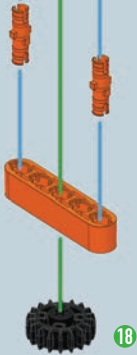
- X1  X1 
- X1  3



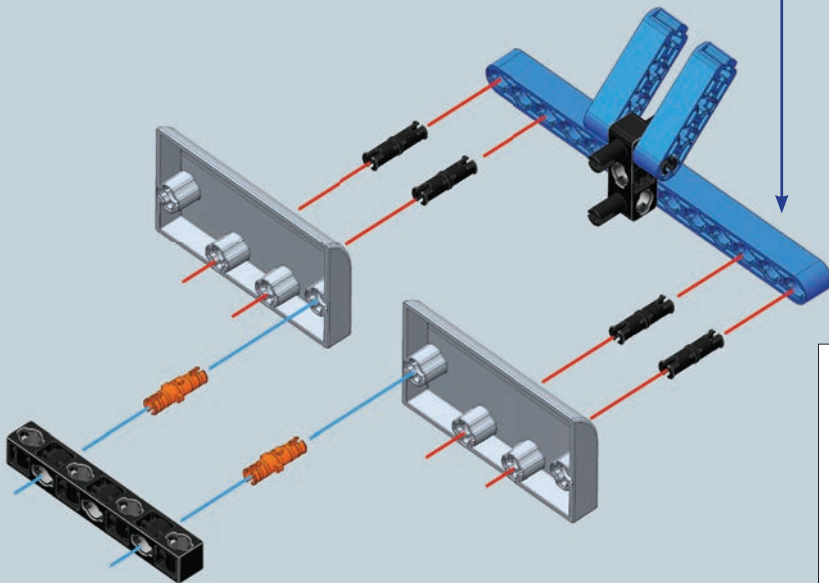
18







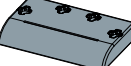



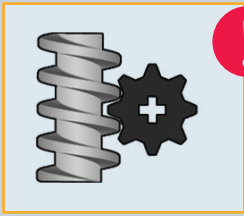
- X1  18 X2 
- X1 



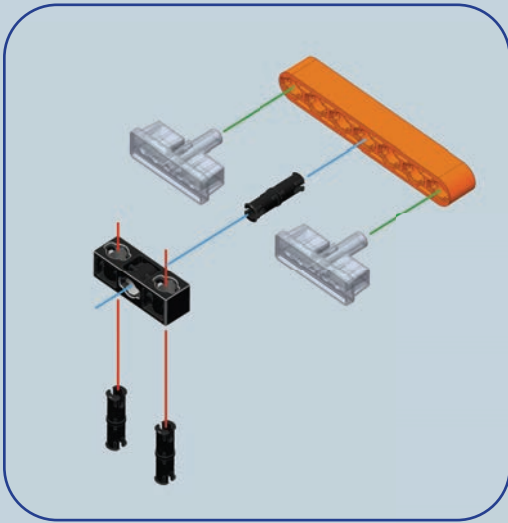
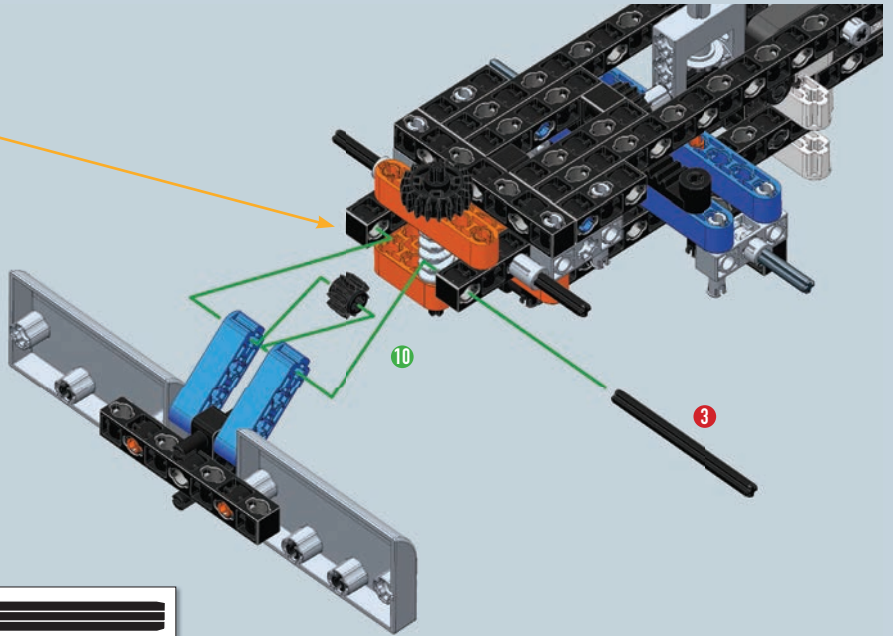
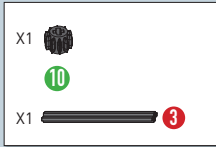
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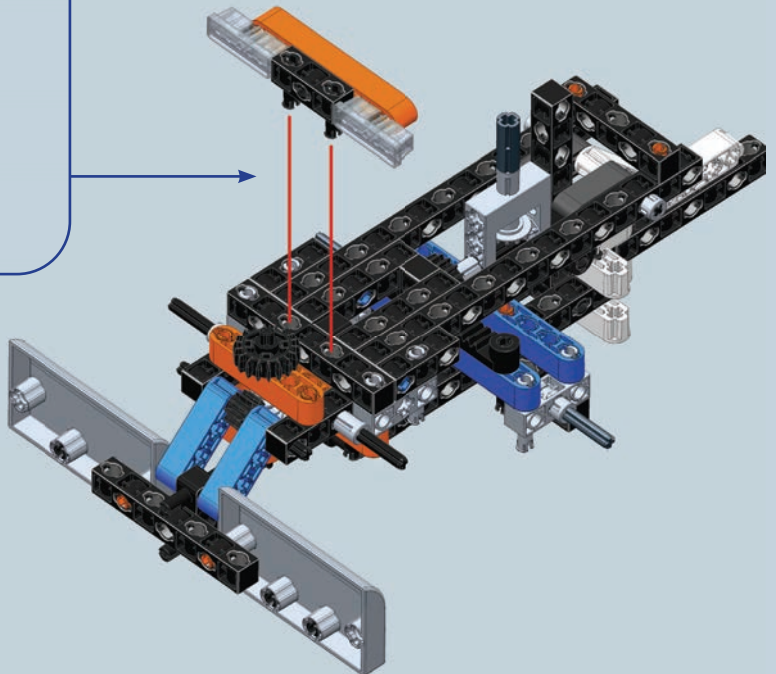
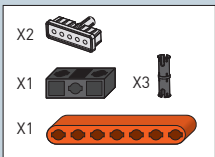
- X1 
- X1 
- X2  X4  X1  X2 
- X2  X1 



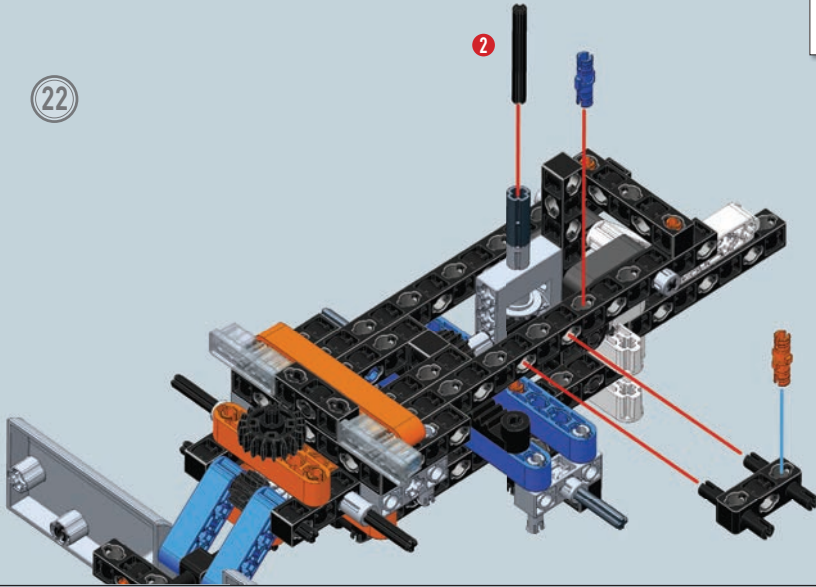
20



21



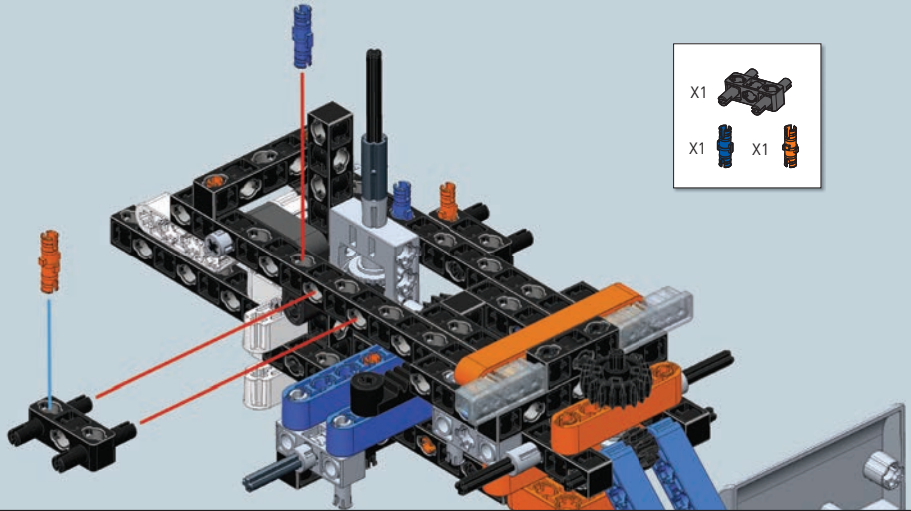
22



1:1 **2**

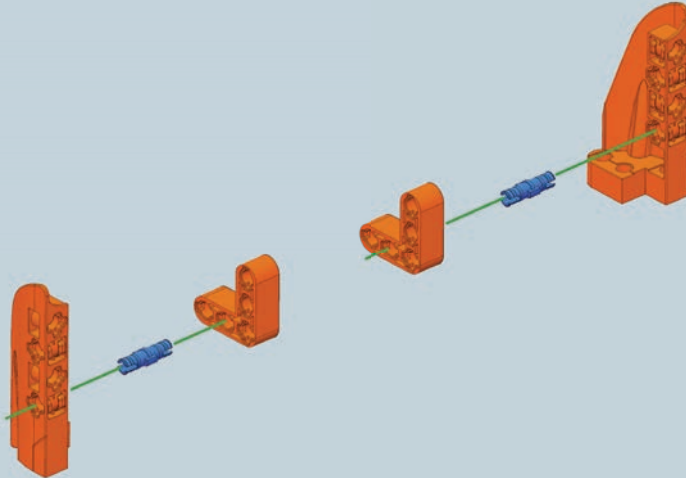
- X1
- X1
- X1
- X1

23



- X1
- X1
- X1

24

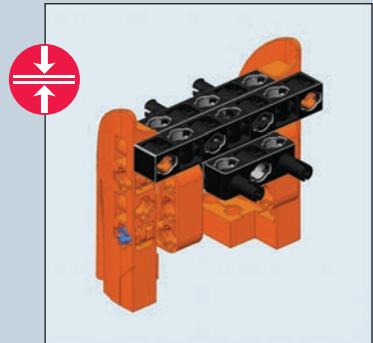
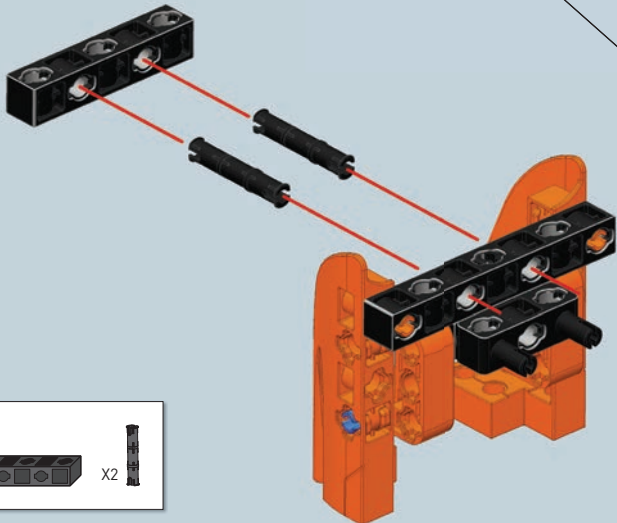
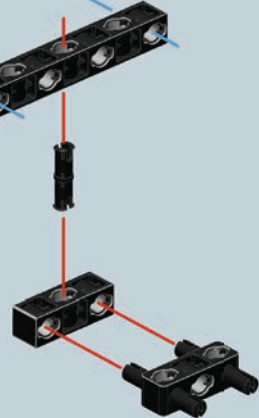
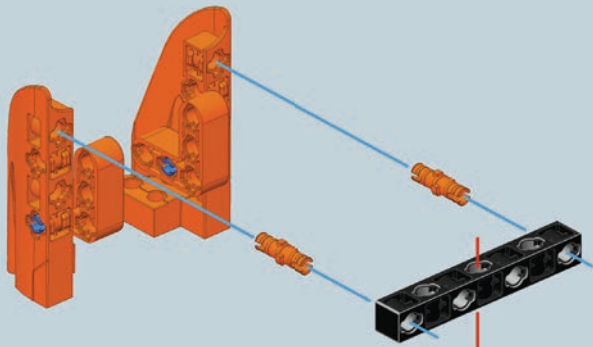


- X2
- X1
- X2
- X1



25

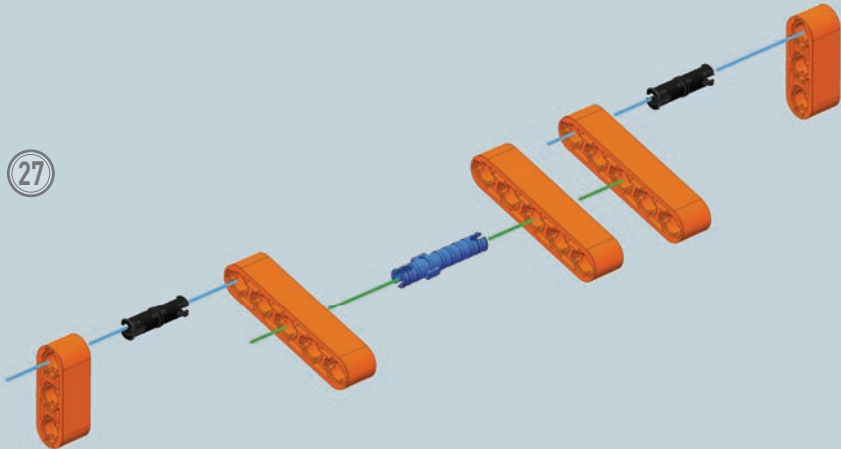
- X1
- X1
- X1
- X2
- X1



26

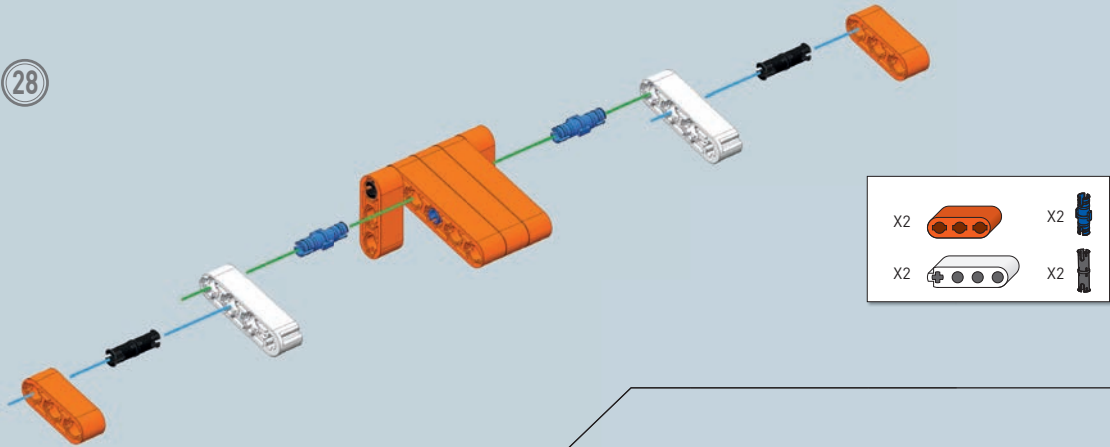
- X1
- X2

27



- X2
- X3
- X1
- X2

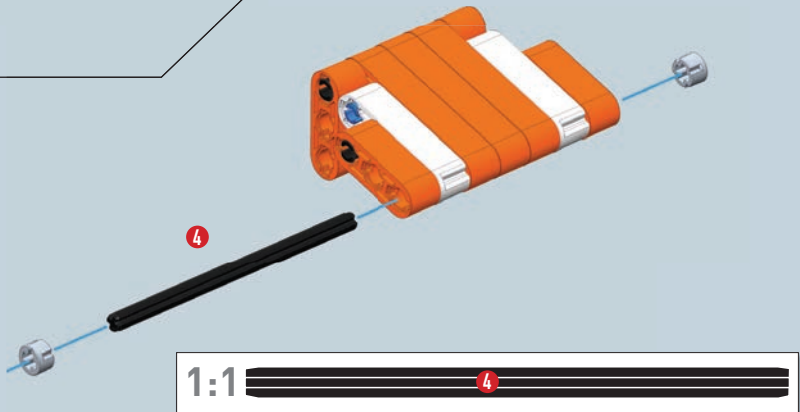
28



- |    |  |    |  |
|----|--|----|--|
| X2 |  | X2 |  |
| X2 |  | X2 |  |

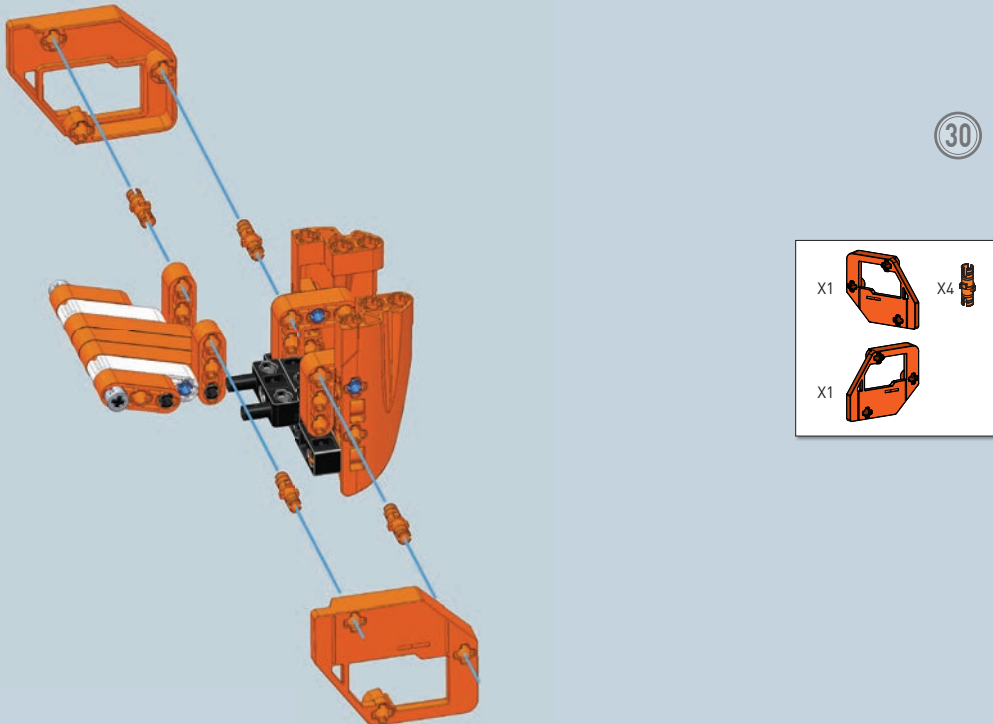
29

- |    |  |
|----|--|
| X2 |  |
| X1 |  |



- |     |  |
|-----|--|
| 1:1 |  |
|-----|--|

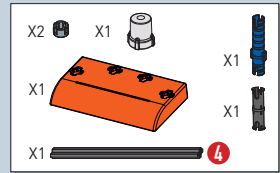
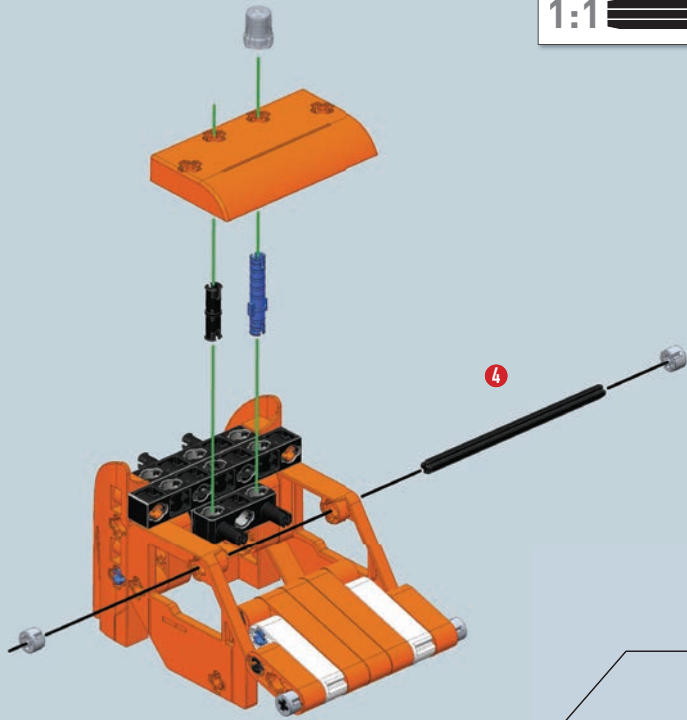
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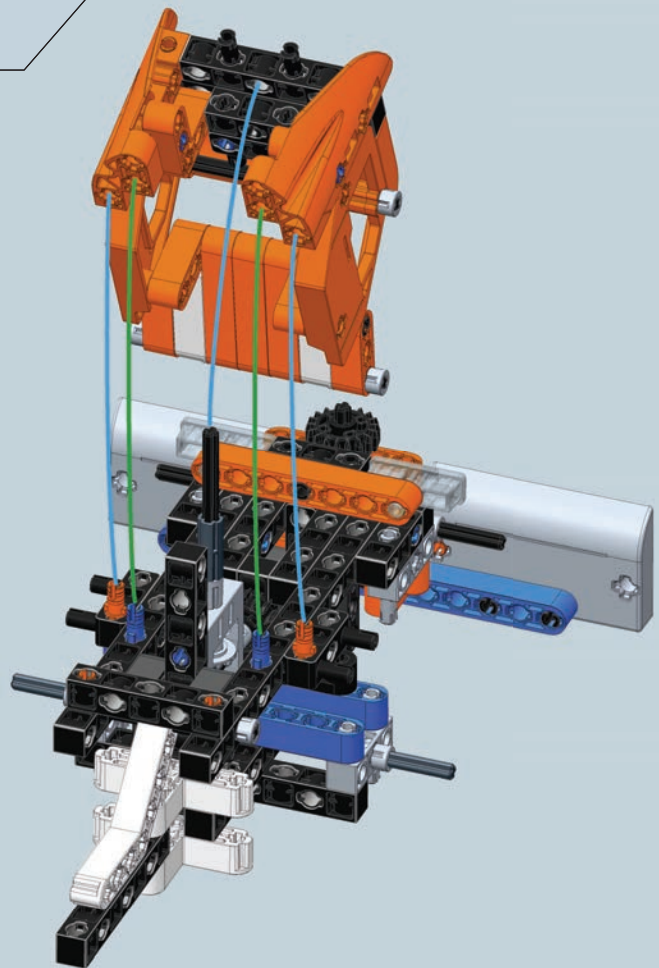
- |    |  |    |  |
|----|--|----|--|
| X1 |  | X4 |  |
| X1 |  |    |  |

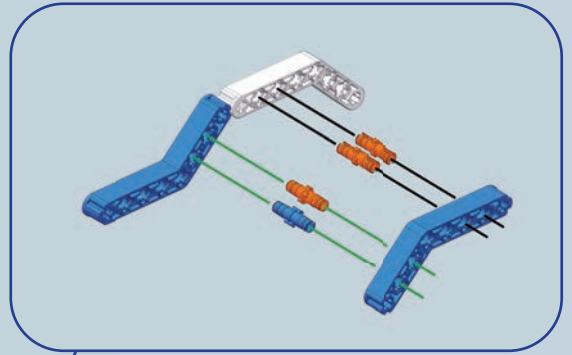
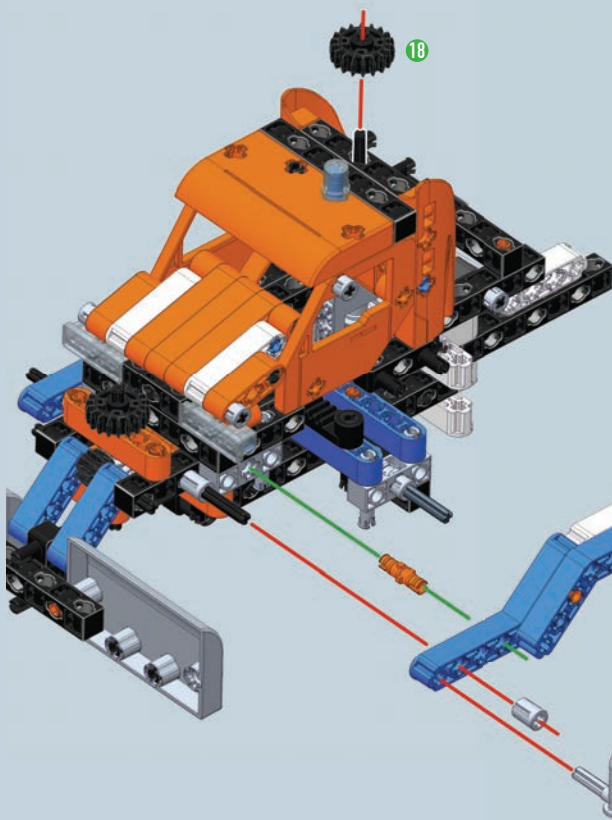
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31

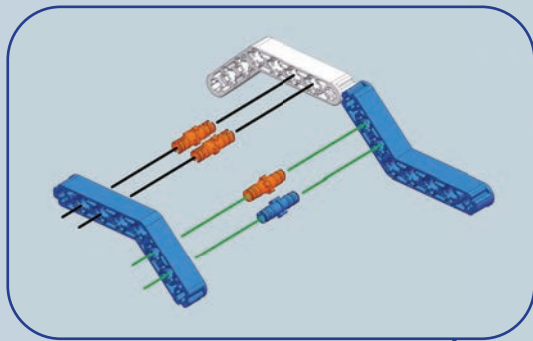
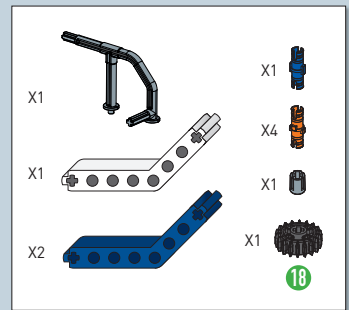


32

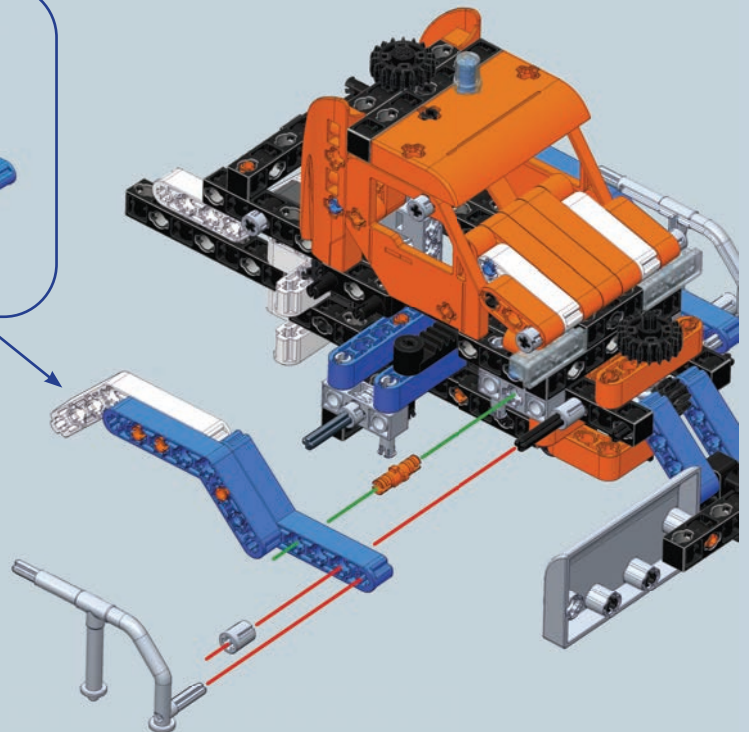
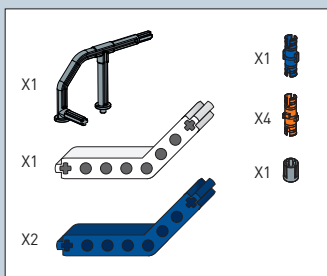




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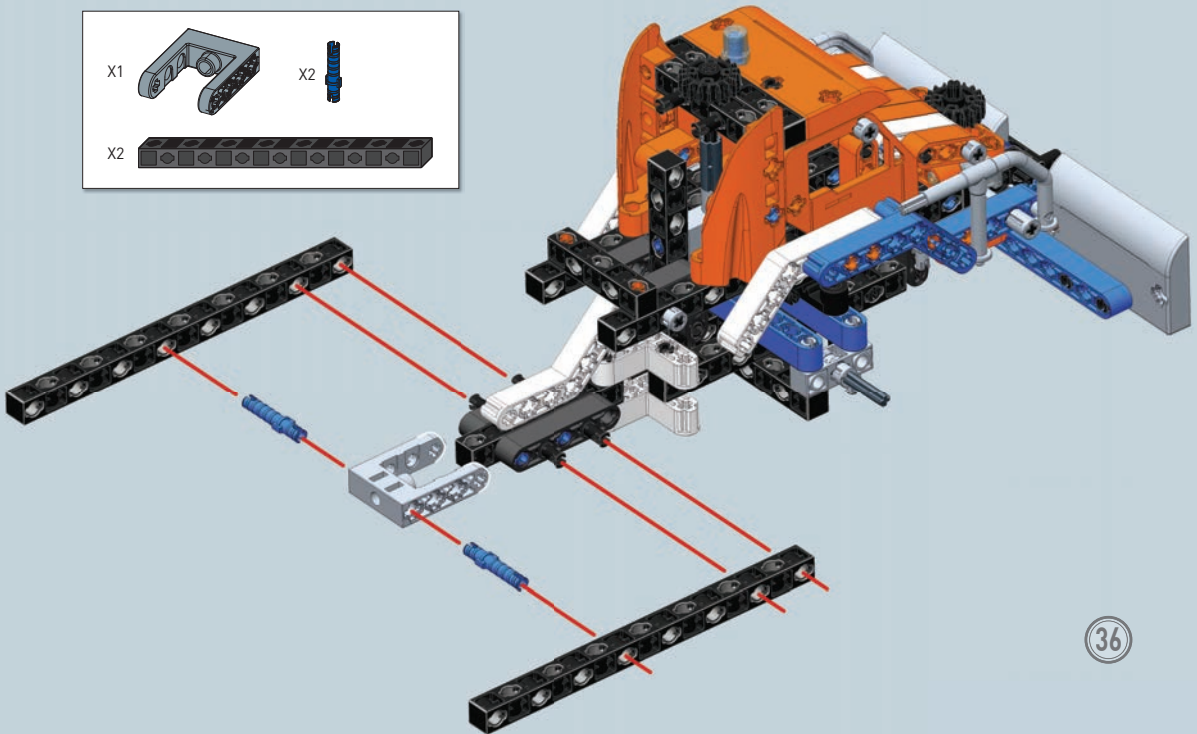
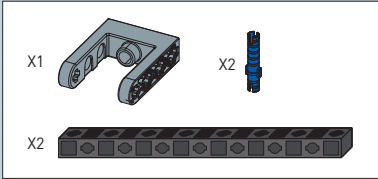
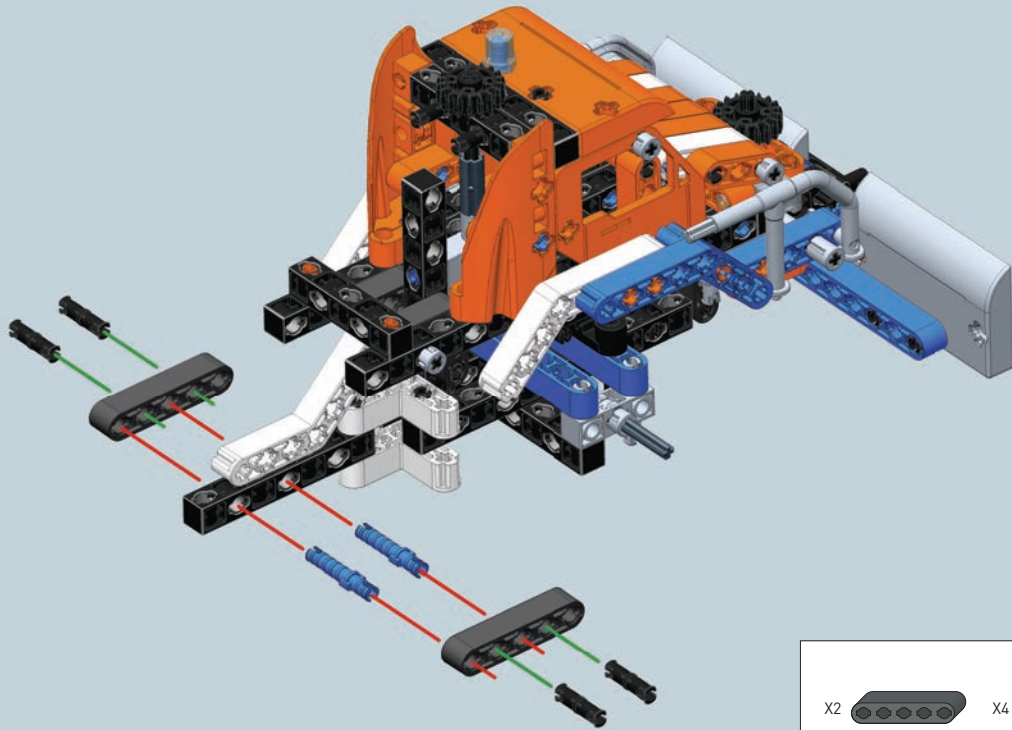


34



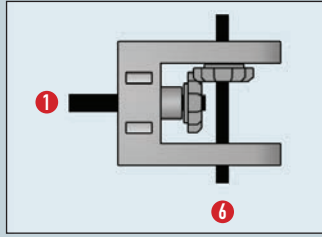







35

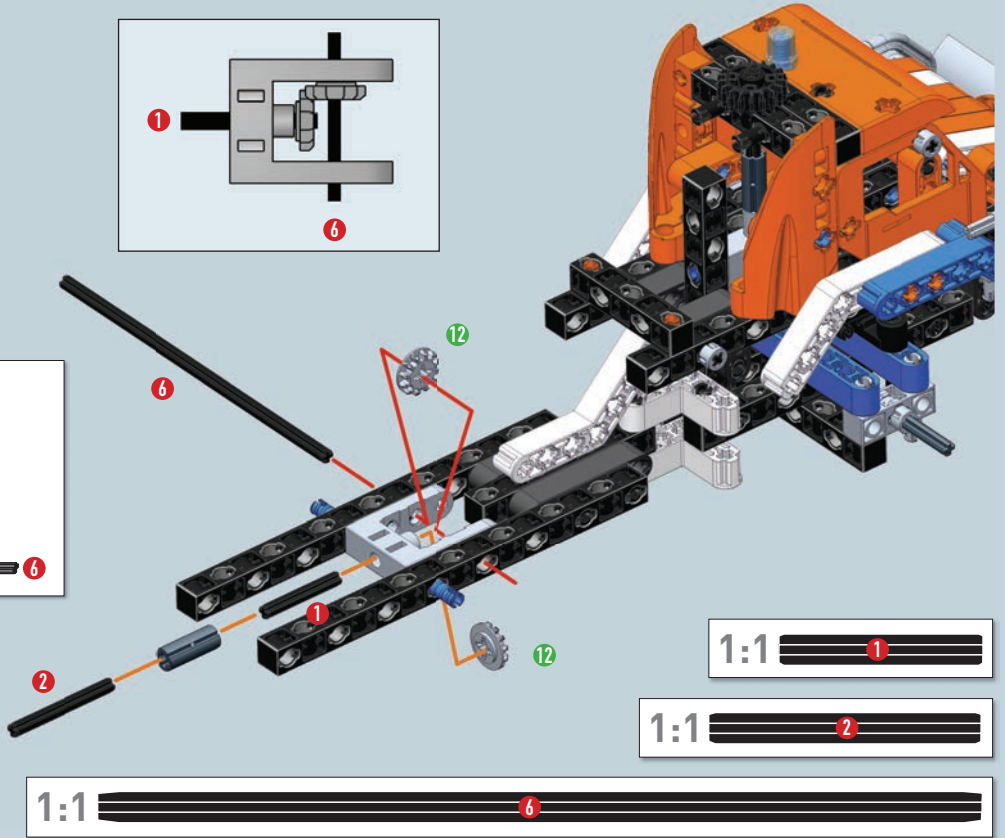


36

37

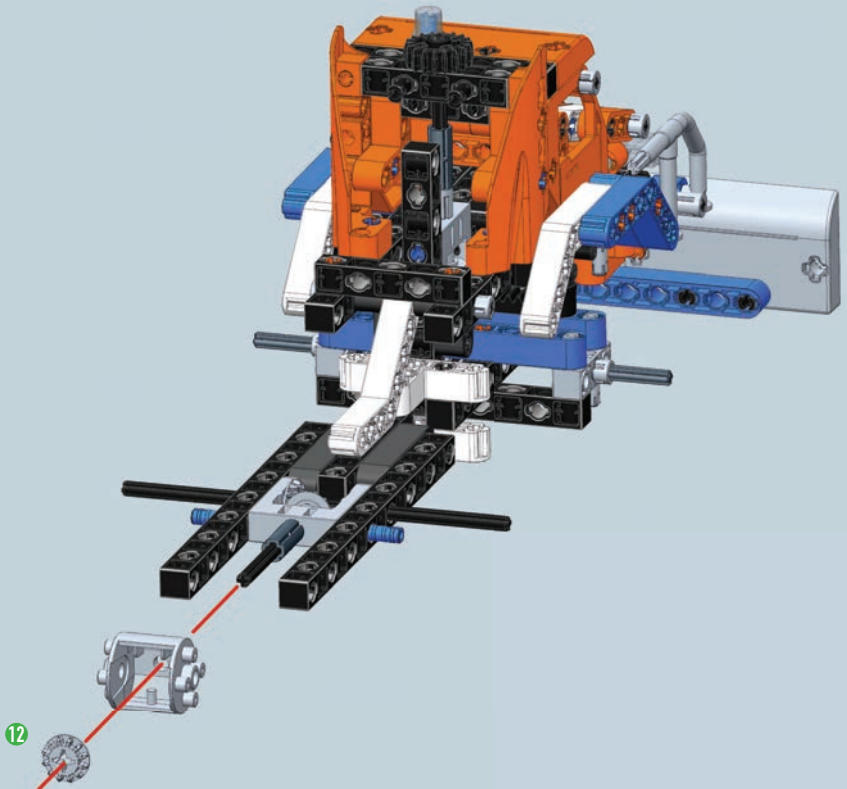


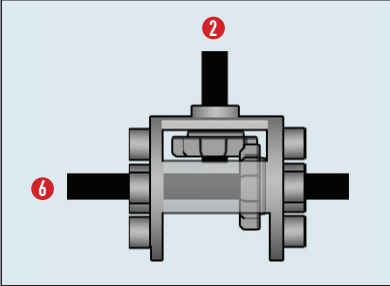
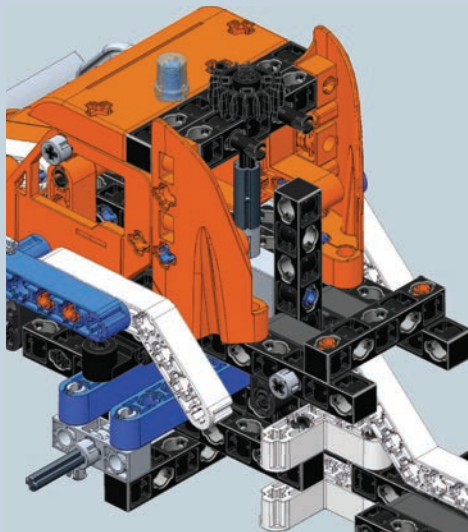
- X2  X1 
- X1  1
- X1  2
- X1  6



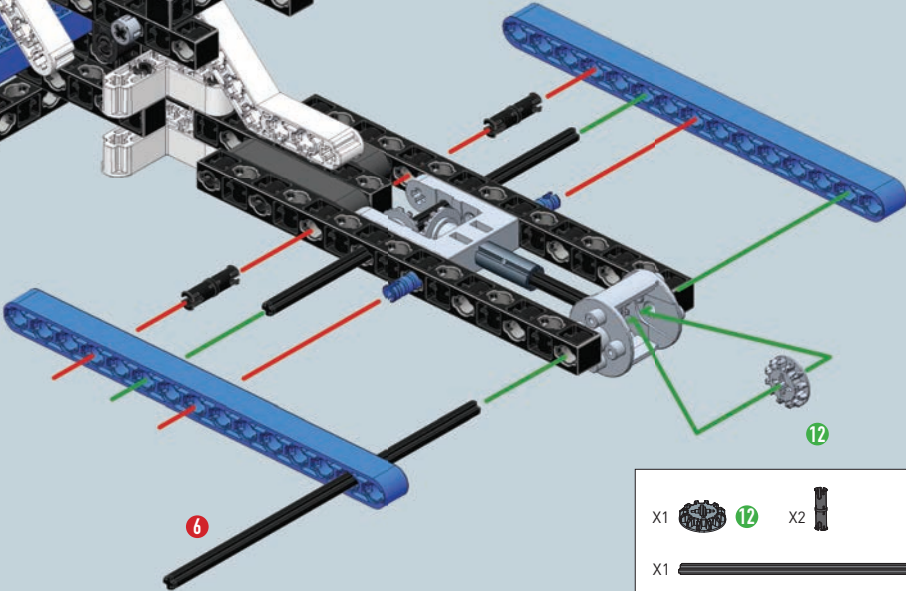
38





- X1  X1 
- X1  12

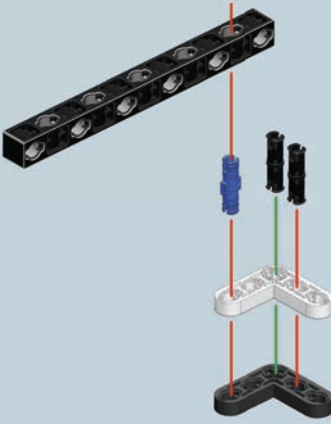
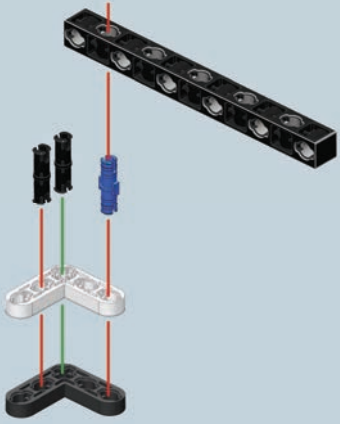









39

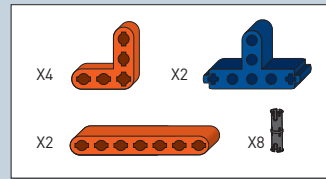
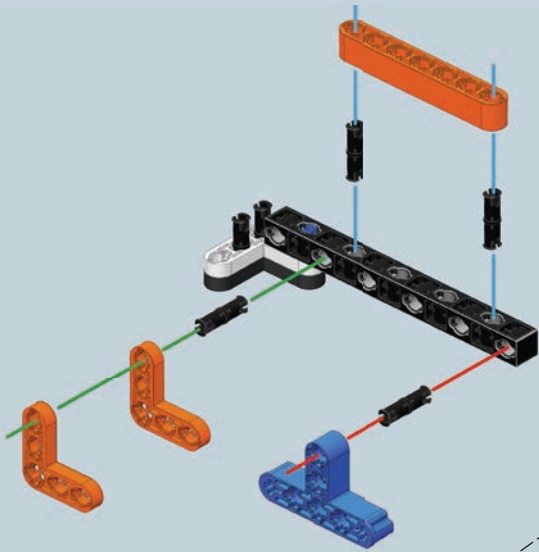


- X1  12 X2 
- X1  6
- X2 

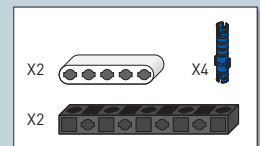
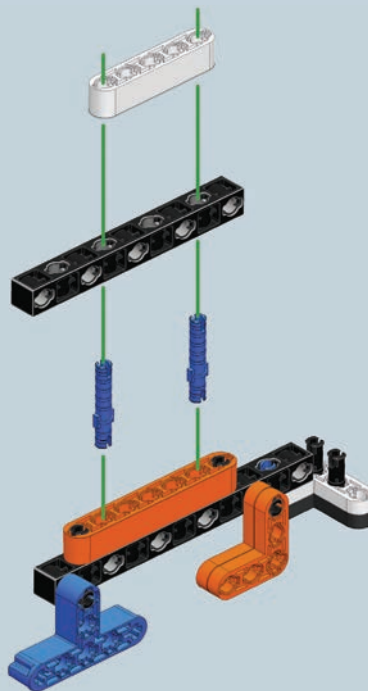
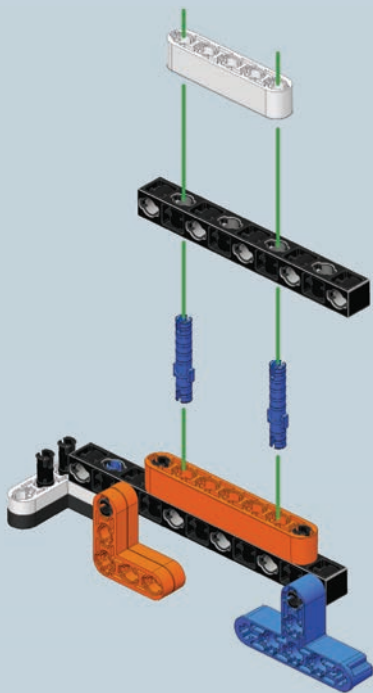
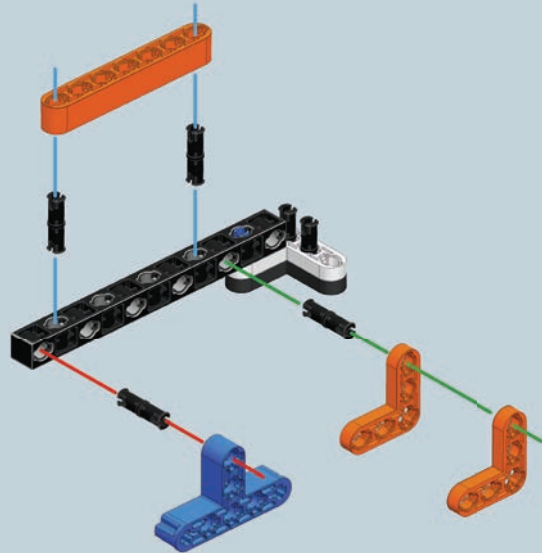


40

- X2 
- X2  X2 
- X2  X4 

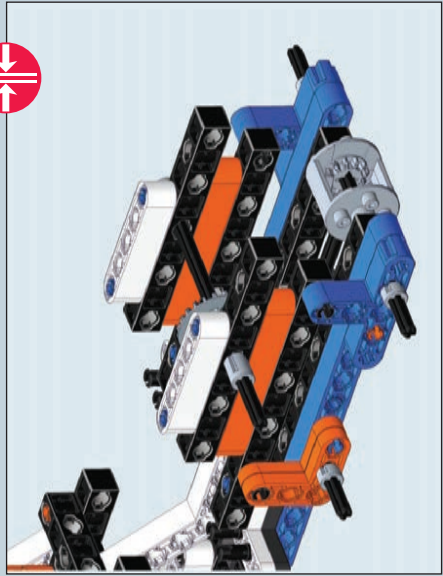
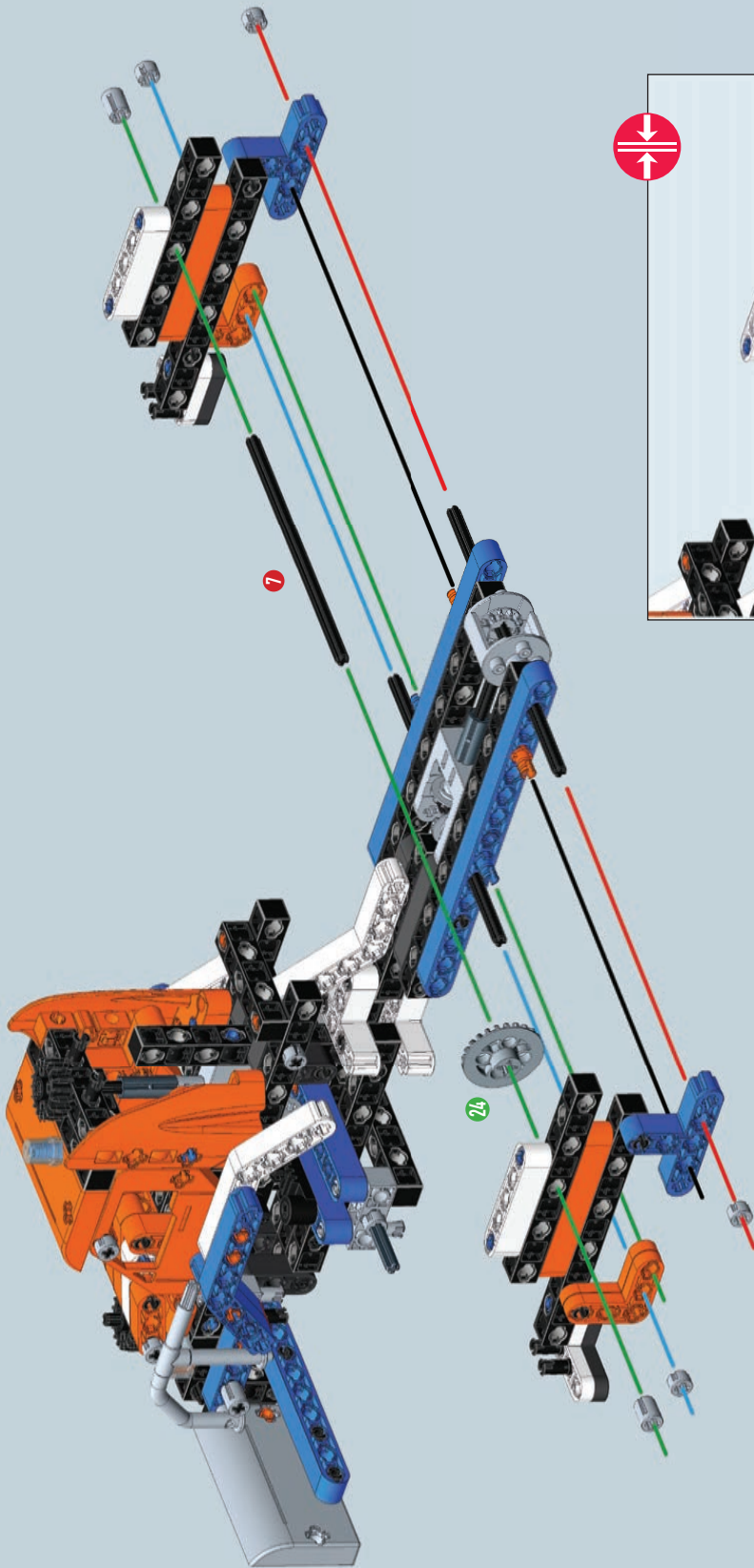


41



42

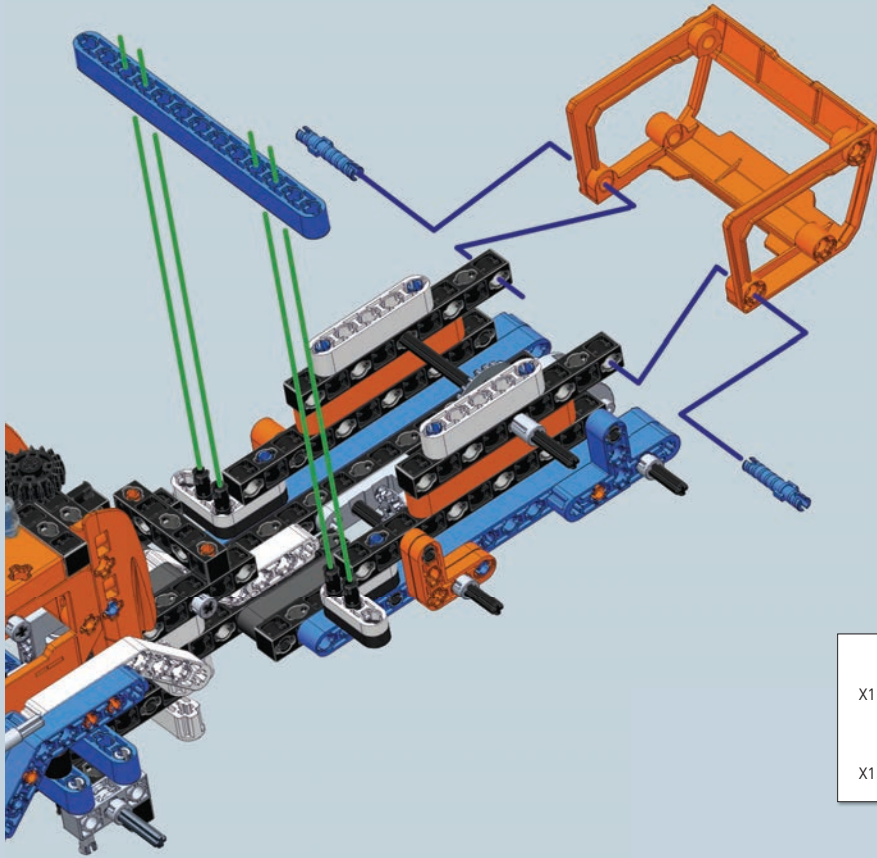




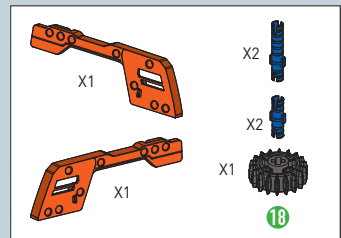
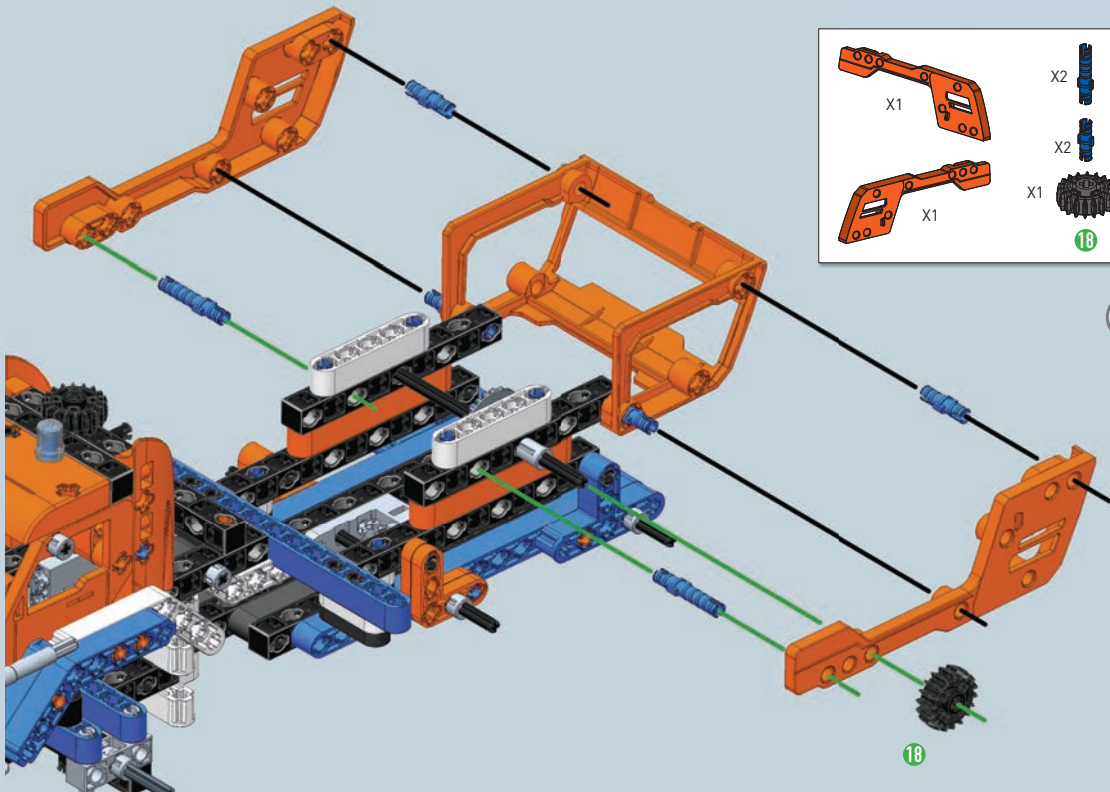
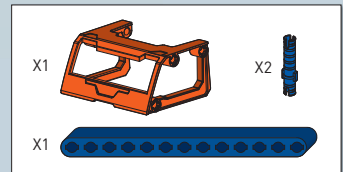
43

- |  |    |  |    |  |    |
|--|----|--|----|--|----|
|  | X1 |  | X1 |  | X4 |
|  | X2 |  | X2 |  | X2 |





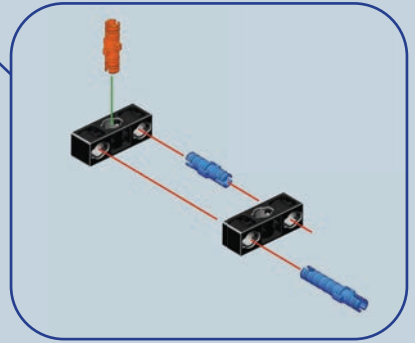
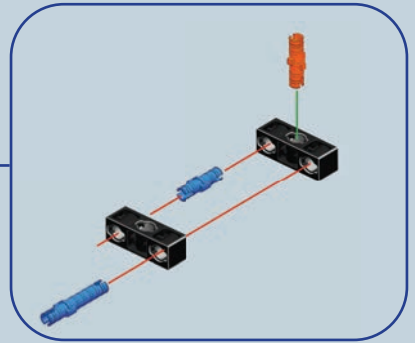
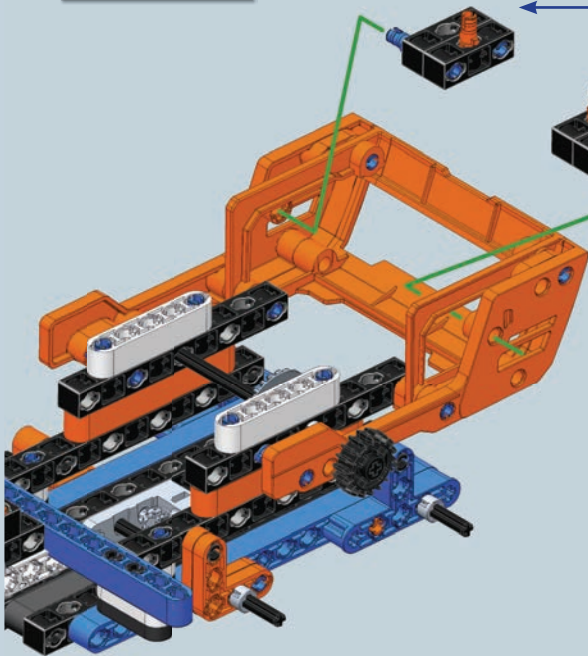
44



45

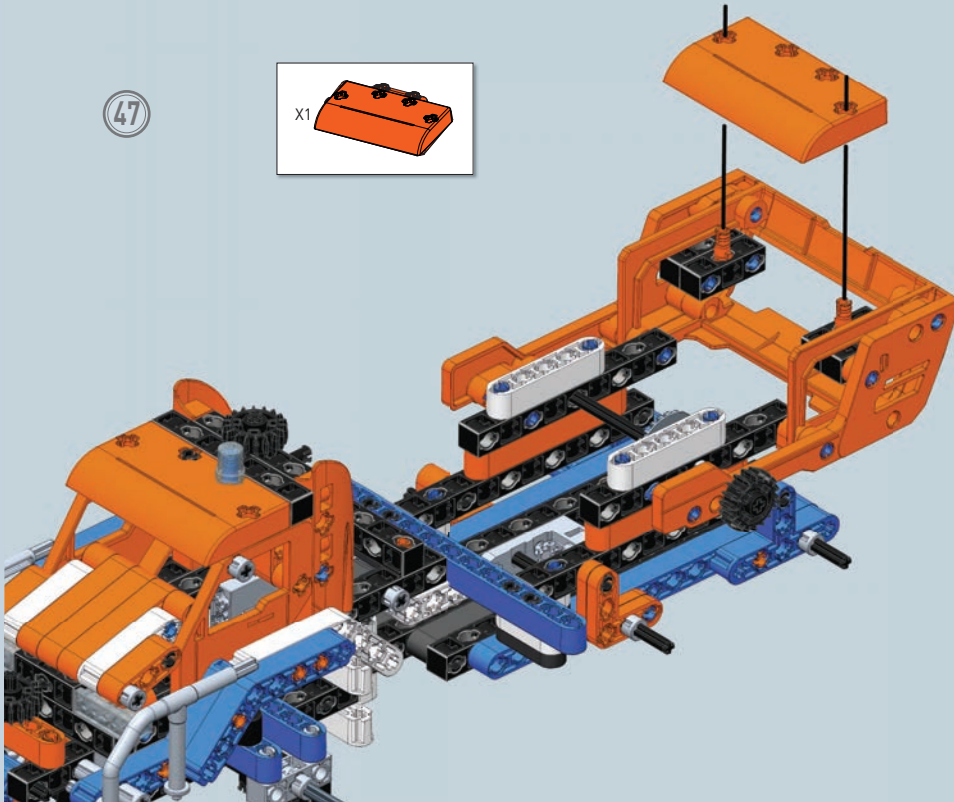
46

- X4
- X2
- X2
- X2



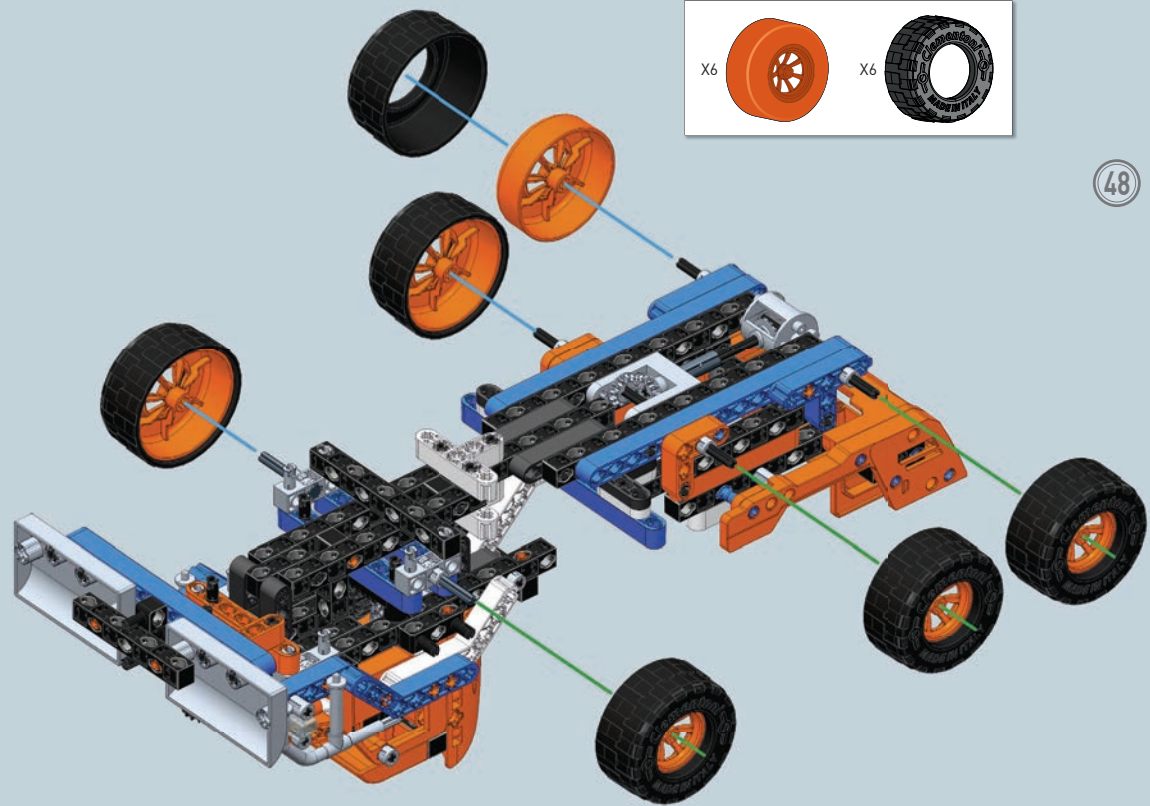
47

- X1

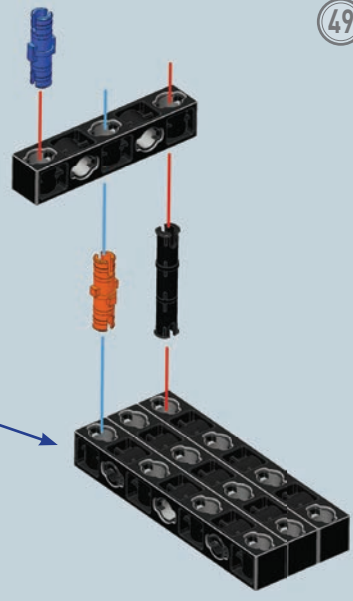
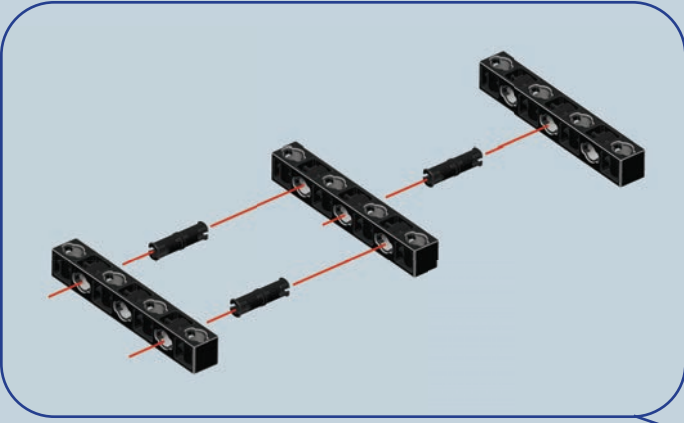




48

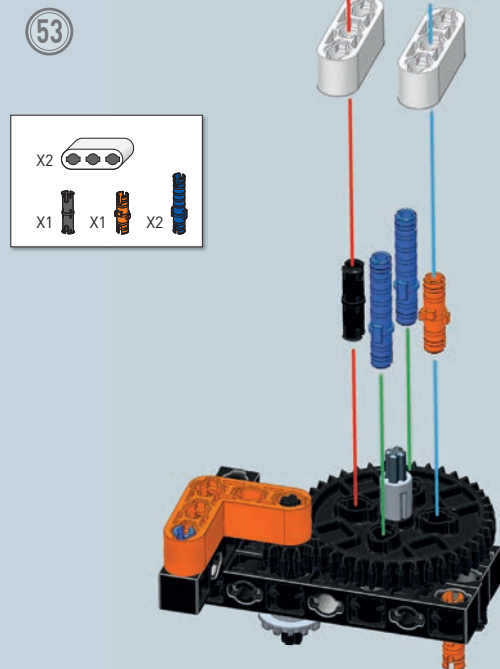
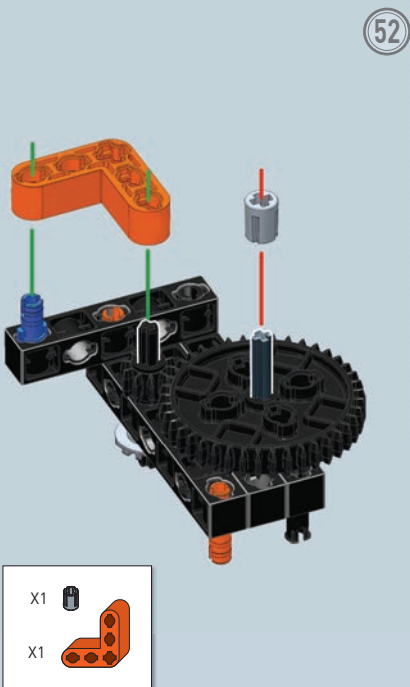
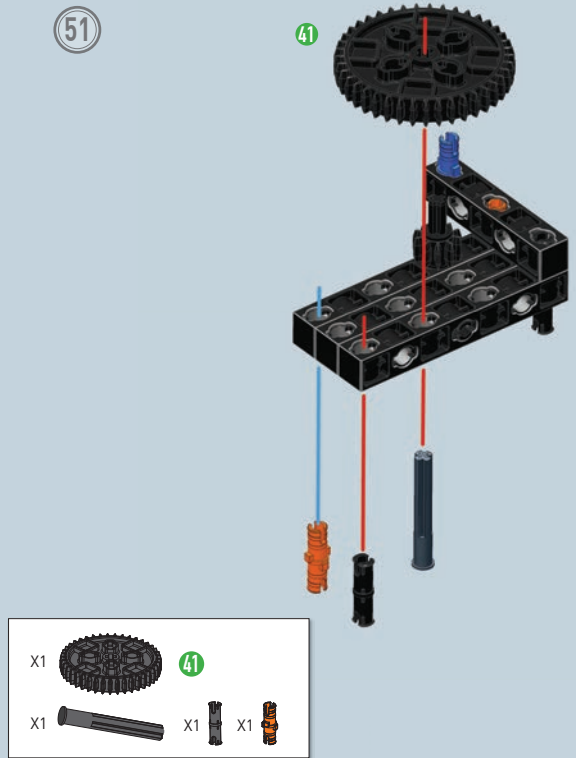
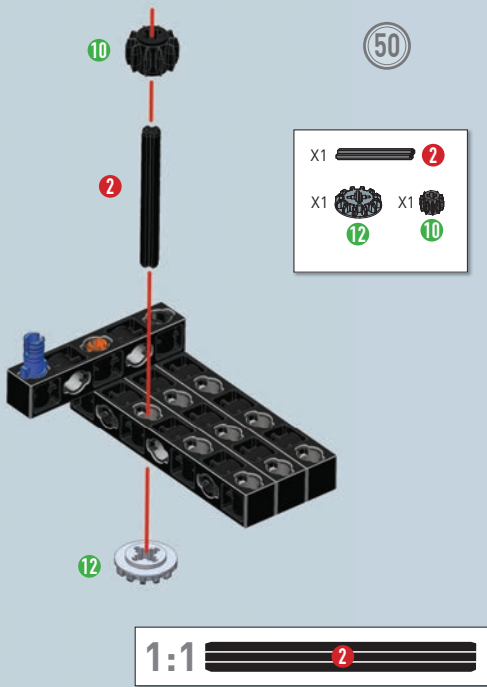


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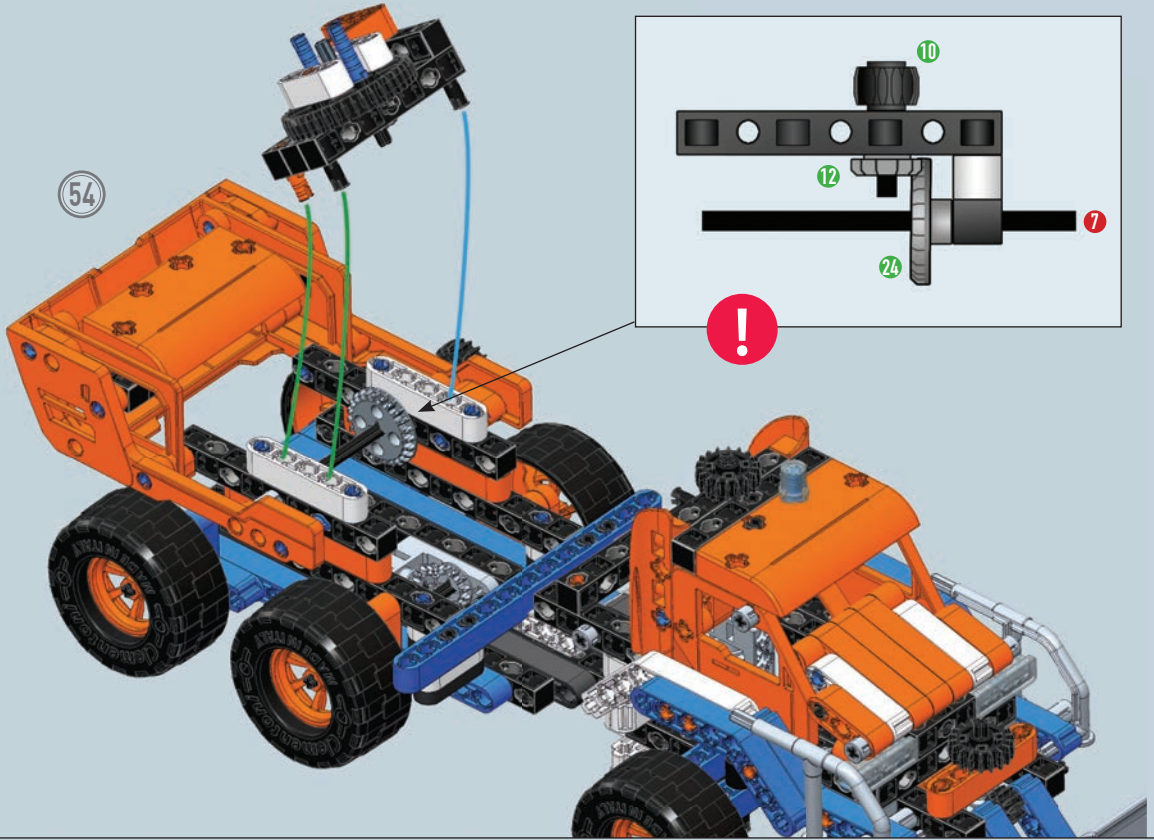


- X1
- X3
- X3
- X1
- X1
- X1
- X1

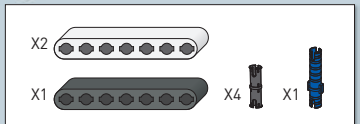
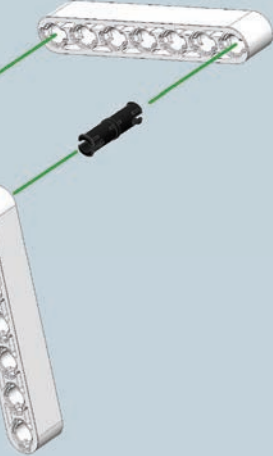
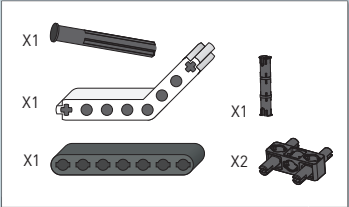
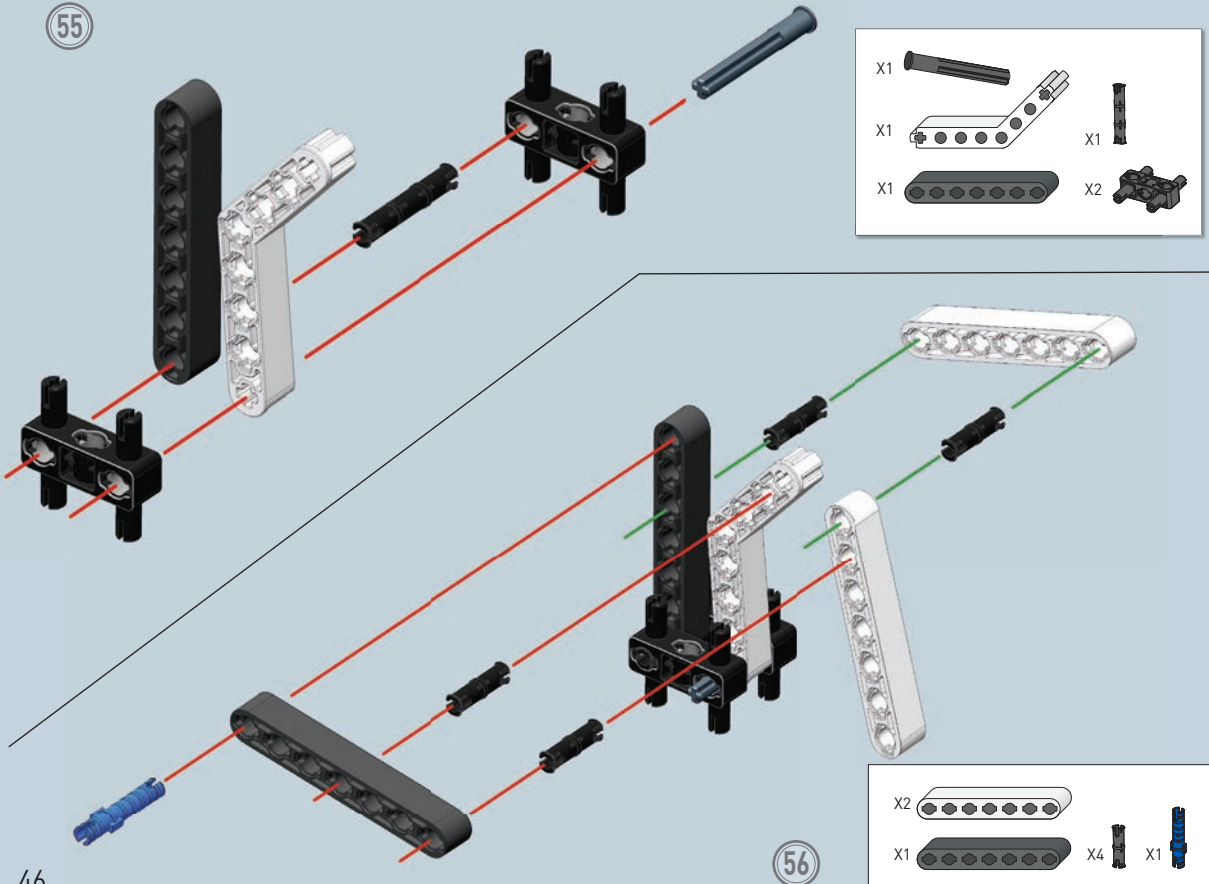




54

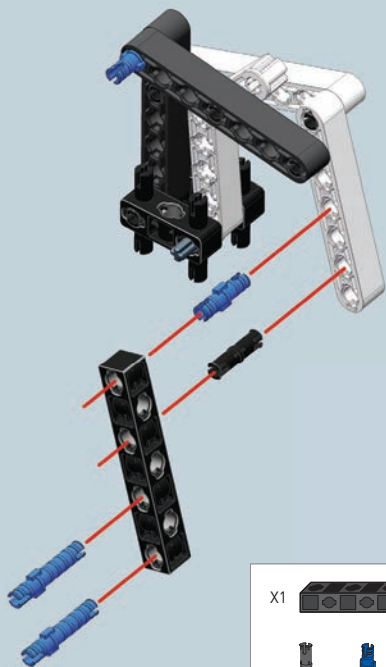


55



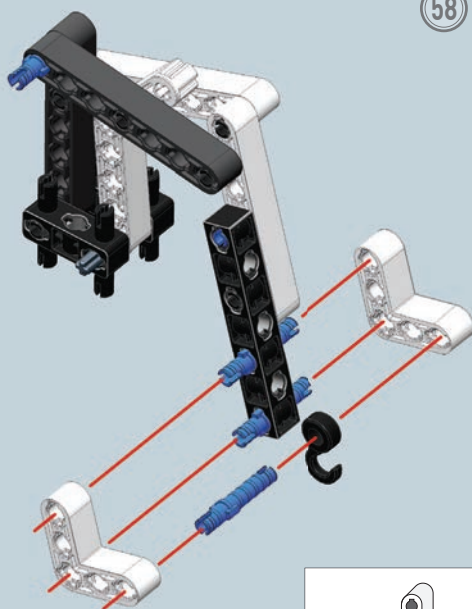
56

57

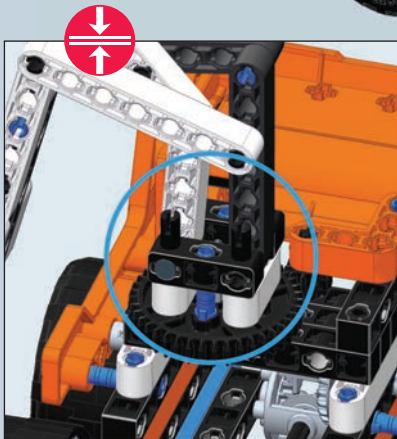
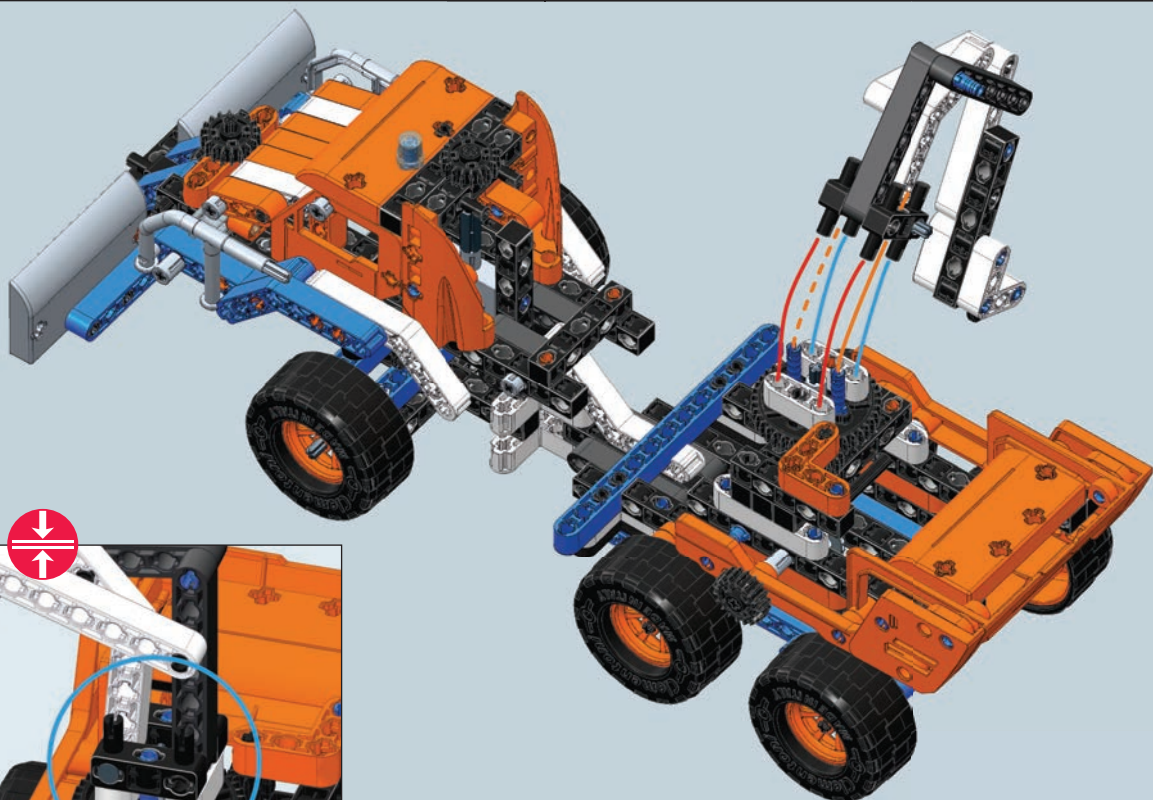


- X1
- X1
- X1
- X2

58



- X2
- X1
- X1



59



## MODELUL FINAL ASAMBLAT



Descarcă gratuit aplicația  
**Science & Play BUILD.**

Animațiile interactive vă  
ghidează în procesul de  
asamblare a **10 modele  
fantastice**, într-un mod  
simplu și rapid.

## COMPATIBILITATEA APLICAȚIEI

Aplicația este  
compatibilă cu  
**ANDROID™, APPLE®**  
și **AMAZON®**.

**Nu este compatibilă**  
cu sistemul de  
operare **WINDOWS®**.



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înregistrate în S.U.A. și alte țări. App  
Store este un serviciu marca Apple  
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Google Play și sigla Google Play sunt  
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