scienza & gioco
TECNOLOGICA

# Laboratorio di MECCANICA

## SAFARI PARK

**Costruzioni da 1 a 3**

1 - Biella e pistone
2 - Fuoristrada
3 - Dune Buggy

Manuale da leggere e conservare per future referenze.

V46186

***Clementoni*** S.p.A.
Zona Industriale Fontenoce s.n.c.
62019 Recanati (MC) - Italy
Tel.: +39 071 75811
***www.clementoni.com***

**Assistenza clienti**
**Tel.** 02.82.52.52
**Email** - assistenza@clementoni.it

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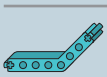
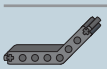
## ELENCO DEI PEZZI

| | | |
|---|---|---|
|  | Barra doppia 15 fori | pz. 2 |
|  | Barra doppia 11 fori | pz. 2 |
|  | Barra doppia 9 fori | pz. 2 |
|  | Barra doppia 7 fori | pz. 4 |
|  | Barra doppia 5 fori | pz. 4 |
|  | Barra doppia 3 fori | pz. 4 |
|  | Barra singola 7 fori | pz. 2 |
|  | Barra singola 5 fori | pz. 2 |
|  | Barra singola 3 fori | pz. 2 |
|  | Modulo ad angolo alto | pz. 2 |
|  | Modulo ad angolo basso | pz. 2 |
|  | Barra singola 7 fori | pz. 2 |
|  | Barra singola 5 fori | pz. 2 |
|  | Barra singola 3 fori | pz. 2 |
|  | Modulo ad angolo alto | pz. 2 |
|  | Modulo ad angolo basso | pz. 2 |
|  | Barra a 4 fori | pz. 2 |
|  | Barra T | pz. 2 |
|  | Barra ad angolo | pz. 4 |
|  | Barra a 4 fori | pz. 1 |
|  | Barra T | pz. 1 |
|  | Barra ad angolo | pz. 2 |
|  | Roll-bar DX | pz. 1 |
|  | Roll-bar SX | pz. 1 |

| | | |
|---|---|---|
|  | Anello corto | pz. 12 |
|  | Anello lungo | pz. 12 |
|  | Vite senza fine | pz. 1 |
|  | Gabbia portasatelliti | pz. 1 |
|  | Ruota 32 denti | pz. 1 |
|  | Ruota 24 denti | pz. 1 |
|  | Ruota 12 denti | pz. 9 |
|  | Chiodino corto doppio | pz. 16 |
|  | Chiodino corto singolo | pz. 8 |
|  | Chiodino corto libero | pz. 32 |
|  | Chiodino lungo singolo | pz. 8 |
|  | Chiodino lungo libero | pz. 16 |
|  | Barra con chiodini | pz. 2 |
|  | Barra con perni | pz. 4 |
|  | Gancio | pz. 1 |
|  | Manovella | pz. 2 |
|  | Cremagliera | pz. 1 |
|  | Asta chiodo | pz. 2 |
|  | Pannello S dx | pz. 1 |
|  | Pannello S sx | pz. 1 |

| | | |
|---|---|---|
|  | Ruota 10 denti | pz. 2 |
|  | Ruota 18 denti | pz. 5 |
|  | Ruota 26 denti | pz. 1 |
|  | Ruota 41 denti | pz. 1 |
|  | Modulo di trasmissione | pz. 1 |
|  | Astina 7 l. cm. 9,9 | pz. 1 |
|  | Astina 6 l. cm. 11,7 | pz. 1 |
|  | Astina 5 l. cm. 8,1 | pz. 1 |
|  | Astina 4 l. cm. 7,2 | pz. 1 |
|  | Astina 3 l. cm. 5,4 | pz. 5 |
|  | Astina 2 l. cm. 3,6 | pz. 2 |
|  | Astina 1 l. cm. 2,7 | pz. 1 |
|  | Connettore astine | pz. 2 |
|  | Faro rettangolare | pz. 2 |
|  | Faro rotondo | pz. 2 |
|  | Sirena | pz. 1 |
|  | Mezzo cerchio 4 fori | pz. 4 |
|  | Mezzo cerchio 8 fori | pz. 4 |
|  | Pneumatico | pz. 8 |
|  | Pannello R dx | pz. 1 |
|  | Pannello R sx | pz. 1 |

**N.B.:far eseguire da un adulto la rimozione dei pezzi dai supporti in plastica. Eventuali residui pungenti devono essere smaltiti prontamente.**



**FATTI AIUTARE DA UN ADULTO!**

## Il motore a combustione interna

Il motore a combustione interna è una macchina capace di trasformare l'energia chimica in potenza meccanica. Per generare la potenza meccanica abbiamo bisogno di:

- **Combustibile:** gas, benzina o gasolio
- **Comburente:** ossigeno
- **Camera di combustione:** il corpo metallico del motore in cui avviene la reazione

**Come funziona?** Le fasi che consentono la combustione sono in tutto 4:

| | | | |
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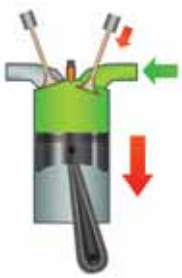
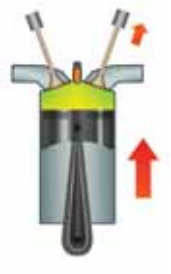
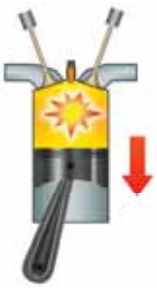
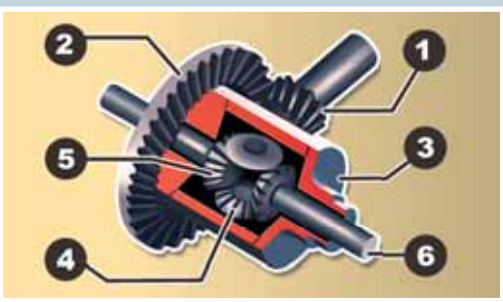
|  |  |  |  |
| **FASE 1**<br>**Aspirazione:** il pistone scende. L'aria o la miscela aria/combustibile viene risucchiata nel cilindro. | **FASE 2**<br>**Compressione:** il pistone sale. La miscela aria/combustibile viene compressa. Inizia la combustione. | **FASE 3**<br>**Accensione ed Espansione:** il pistone scende. Avviene la combustione che porta all'espansione istantanea dei gas. Il pistone viene spinto verso il basso. | **FASE 4**<br>**Scarico:** il pistone sale. I residui della combustione vengono espulsi dal cilindro. |

Ad ogni ciclo corrispondono due rotazioni dell'albero motore, che di conseguenza trasmette il moto agli altri organi meccanici del veicolo.

## Il differenziale

In meccanica, il differenziale è un organo in grado di trasferire la potenza sviluppata dal motore, alla coppia di ruote motrici.




1. **Pignone**: trasferisce potenza dal **motore** alla **corona** e in ultimo alle **ruote motrici**.
2. **Corona**: vincolata alla **gabbia porta satelliti**, è accoppiata stabilmente al **pignone**.
3. **Gabbia porta satelliti**: è la scatola che racchiude gli ingranaggi.
4. **Satelliti**: ingranaggi vincolati alla **gabbia**.
5. **Planetari**: ingranaggi vincolati ai **semiassi**.
6. **Semiasse**: asse che collega le **ruote motrici** ai **planetari**.

### Il differenziale autobloccante

Nei mezzi fuoristrada, viene montato un differenziale autobloccante. L'azione del differenziale può risultare svantaggiosa se una delle due ruote perde aderenza: in questo caso, la ruota con maggior presa tende a rimanere ferma mentre l'altra slitta. Grazie a dei meccanismi controllati elettronicamente, il differenziale autobloccante permette di distribuire equamente la potenza del motore alle due ruote, aumentando quindi la forza motrice in situazioni di scarsa aderenza.

## Sospensioni e ammortizzatori

Tutti i veicoli oggi in commercio montano un sistema di sospensioni che garantisce il massimo comfort possibile durante un viaggio. Senza le sospensioni, infatti, tutte le sollecitazioni subite dalle ruote sarebbero trasmesse direttamente all'abitacolo e il guidatore avrebbe serie difficoltà nel controllare il veicolo.

Spesso i termini **sospensione** e **ammortizzatore** vengono usati impropriamente. C'è infatti una netta differenza funzionale tra i due:

- Le sospensioni, come già accennato, collegano le parti non sospese (ruote) con le parti sospese (abitacolo, motore, ecc..) tramite elementi elastici che garantiscono il comfort ai passeggeri. Nell'immagine affianco, la molla e la guida interna (in nero) costituiscono la sospensione.
- Gli ammortizzatori, invece, sono componenti associati alle sospensioni che rallentano il movimento delle sospensioni stesse. Se comprimiamo la molla, questa ritornerà al suo stato iniziale in modo violento, vanificando così la funzione delle sospensioni. Tramite sistemi a frizione, gas o fluido, gli ammortizzatori garantiscono un ritorno più dolce della molla allo stato iniziale.

## Il safari in fuoristrada

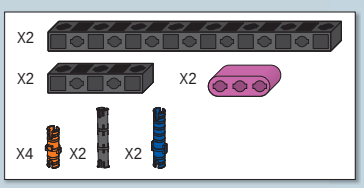
Il significato in lingua swahili della parola "safari" è "viaggio".
Il safari fotografico è infatti un avventuroso viaggio alla scoperta dei grandi parchi naturali Africani e delle creature che li abitano.
Si percorrono centinaia di km a bordo di potenti mezzi fuoristrada, con lo scopo di avvistare e fotografare animali selvatici nel loro habitat naturale.
A seconda della tipologia di safari e degli animali che si potrebbero incontrare durante il tragitto, il parco mette a disposizione dei turisti, veicoli completamente aperti o chiusi con protezioni rinforzate, per garantire la sicurezza delle persone in caso di attacchi di grandi predatori o cariche elefanti o rinoceronti.

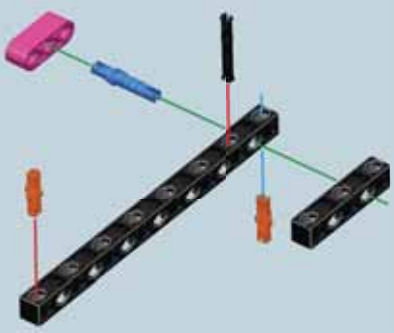
Pur con tutti gli accorgimenti e le regole istituite dai parchi, la presenza di turisti nelle aree africane pone un serio problema di impatto ambientale. Da un lato, il continuo via vai dei mezzi e la presenza umana sul territorio, influenzano negativamente le attività degli animali selvaggi, soprattutto dei grandi predatori come ghepardi e leoni. Dall'altro i parchi devono gestire il problema dei rifiuti nei campi e negli hotel dove i turisti pernottano.
Il gran numero di persone presenti nei parchi Africani non ha però solo conseguenze negative, perché contribuisce anche a tenere sotto controllo le attività bracconieri, cacciatori che uccidono illegalmente specie protette all'interno delle vaste aree del parco.

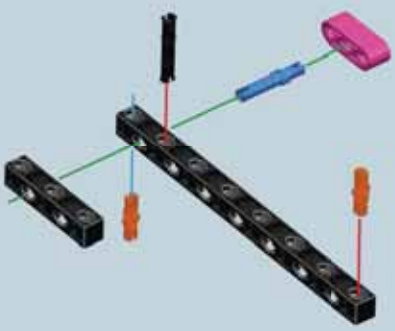
# 1 Biella e pistone

ISTRUZIONI 3D INTERATTIVE NELL'APP
LABORATORIO DI MECCANICA

1





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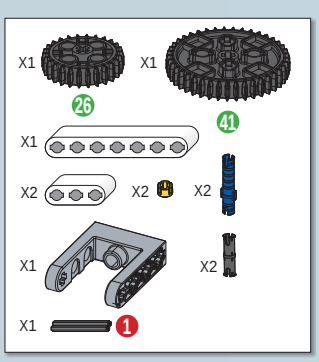


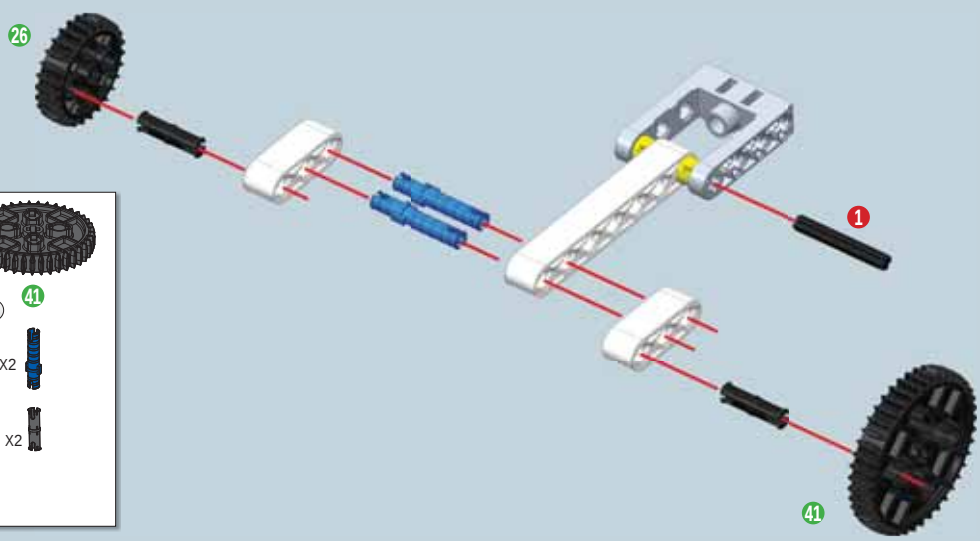


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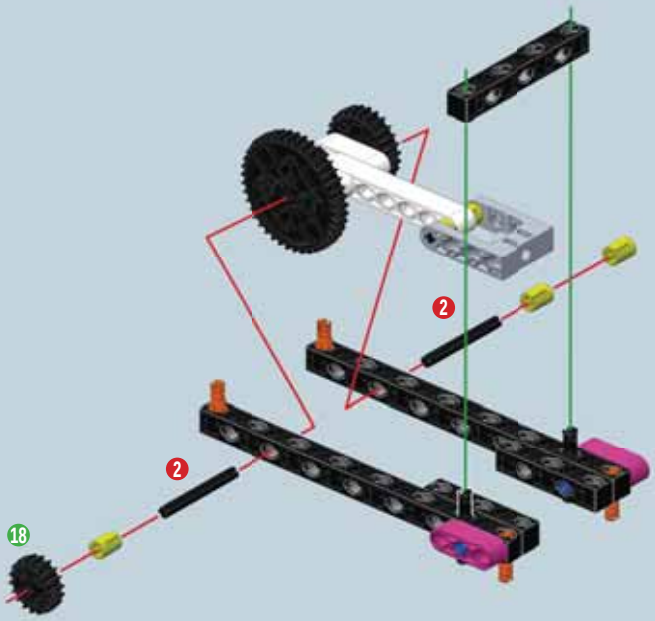


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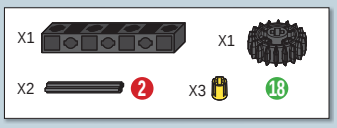


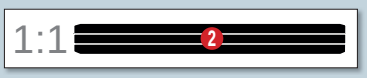


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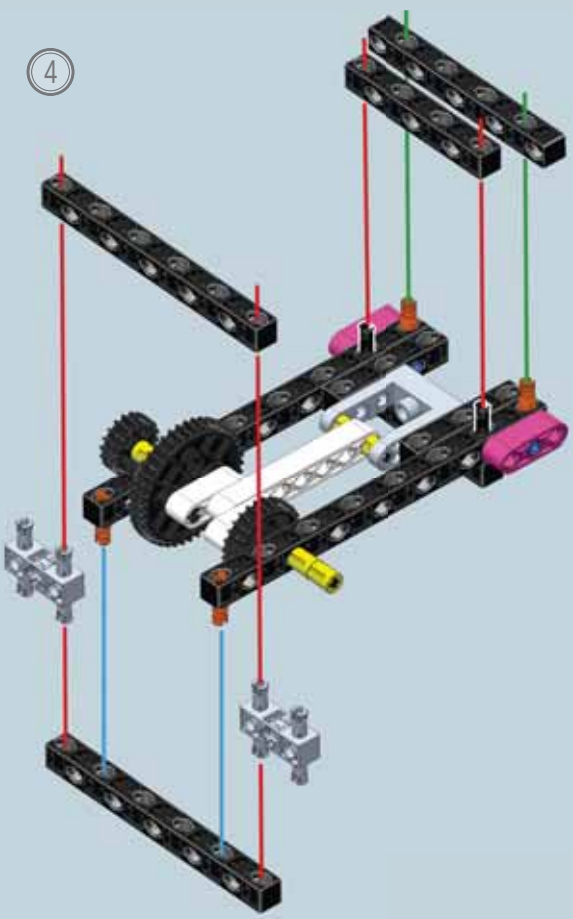
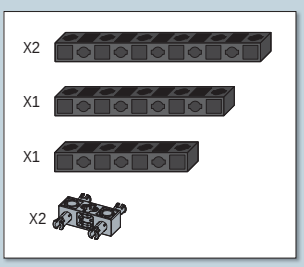
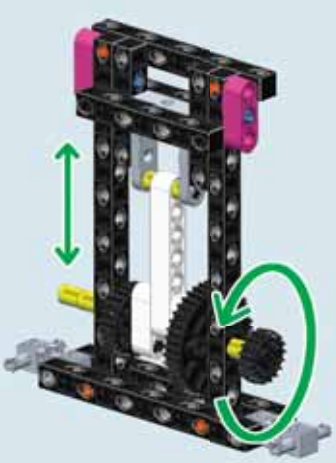


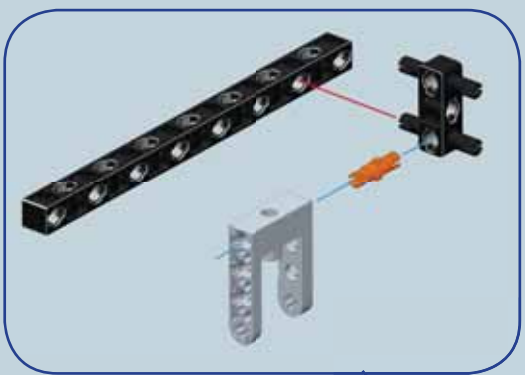


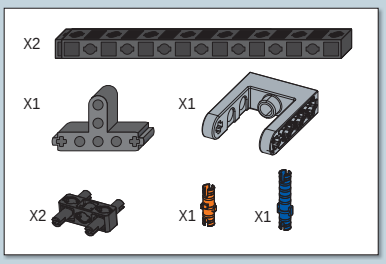

Modello finale



# 2 Fuoristrada

ISTRUZIONI 3D INTERATTIVE NELL'APP
LABORATORIO DI MECCANICA



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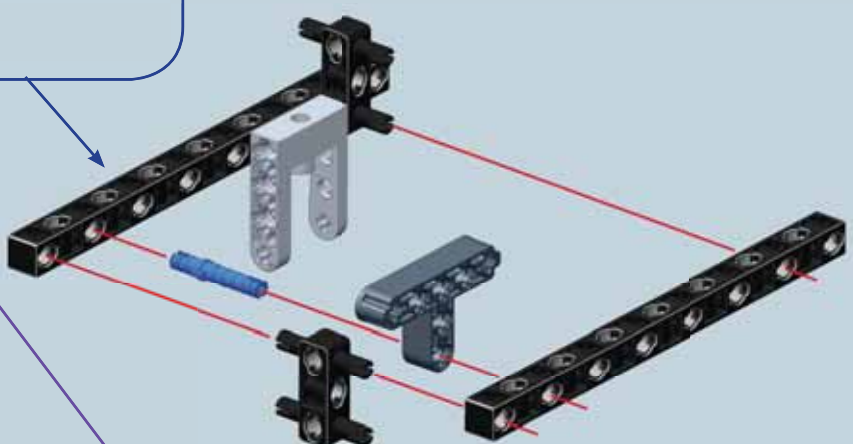

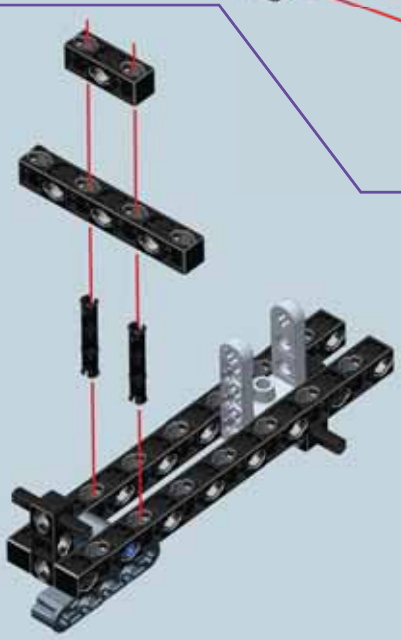

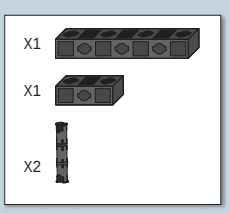


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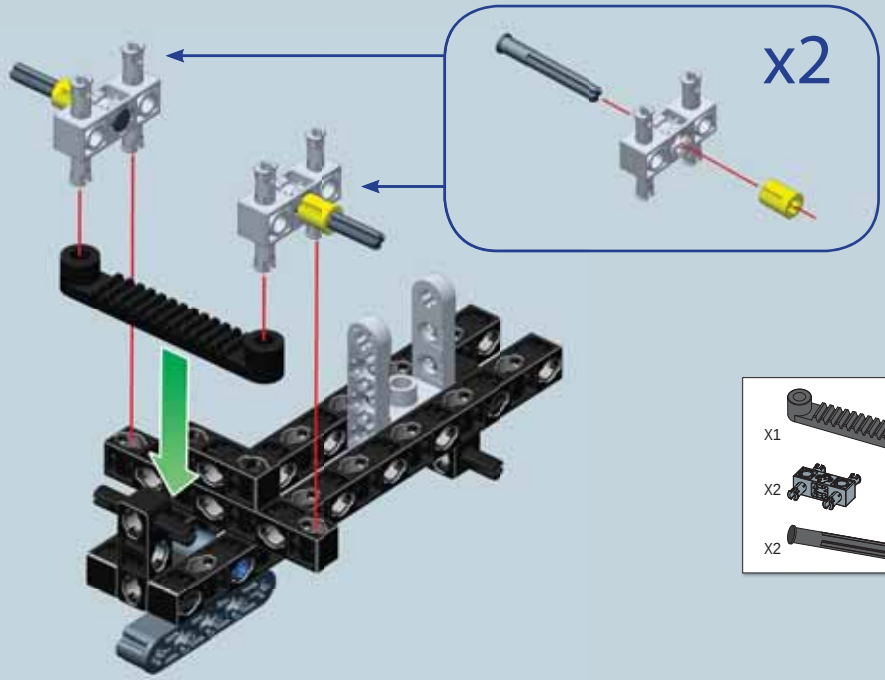





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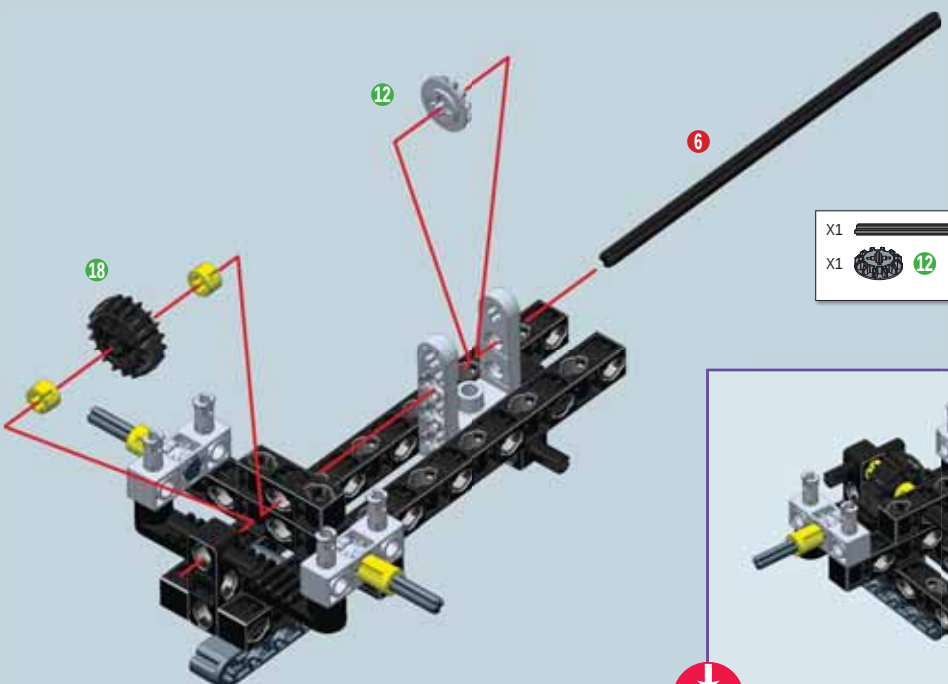


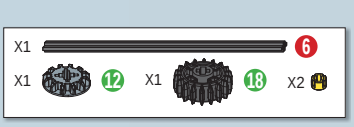


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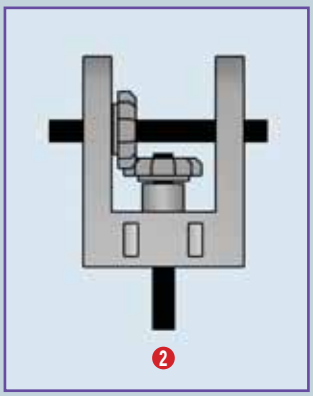


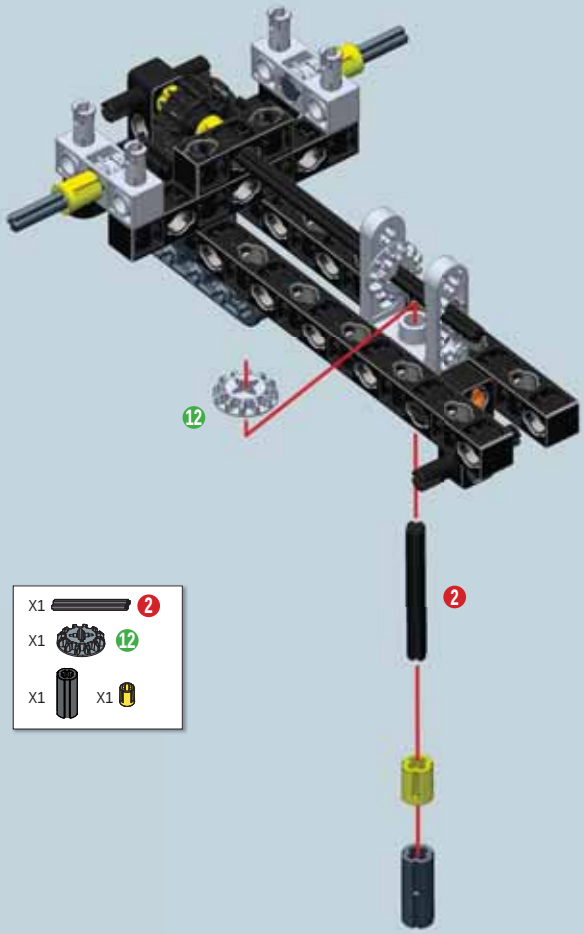





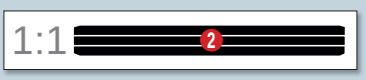


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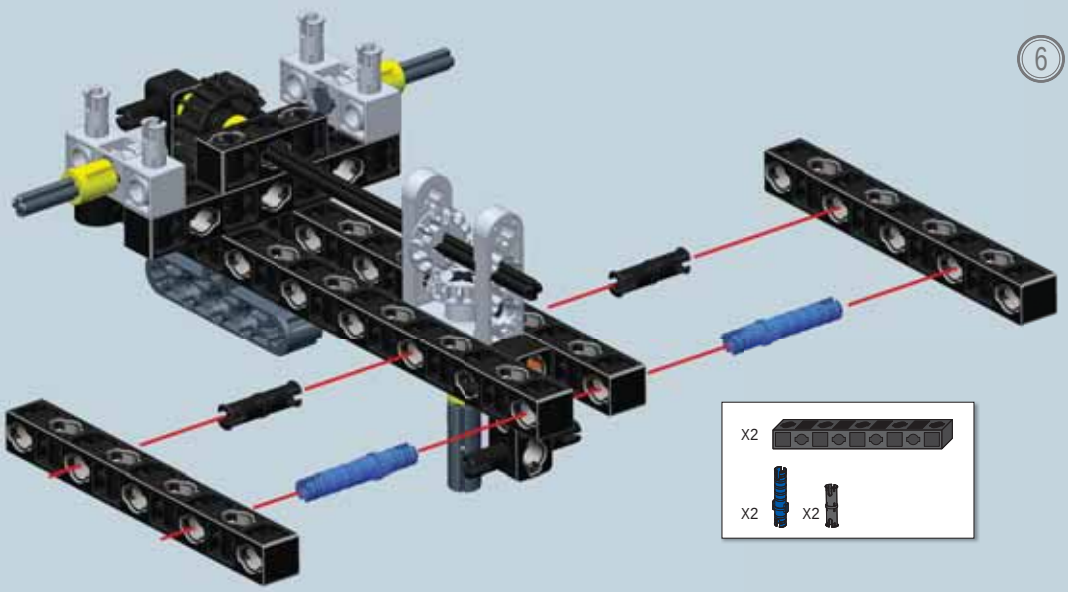

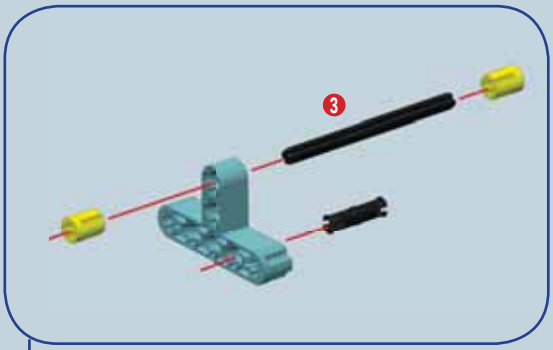


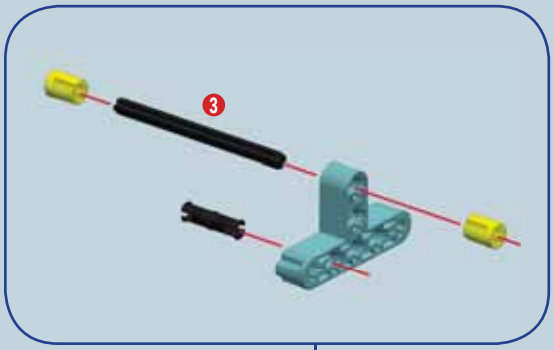


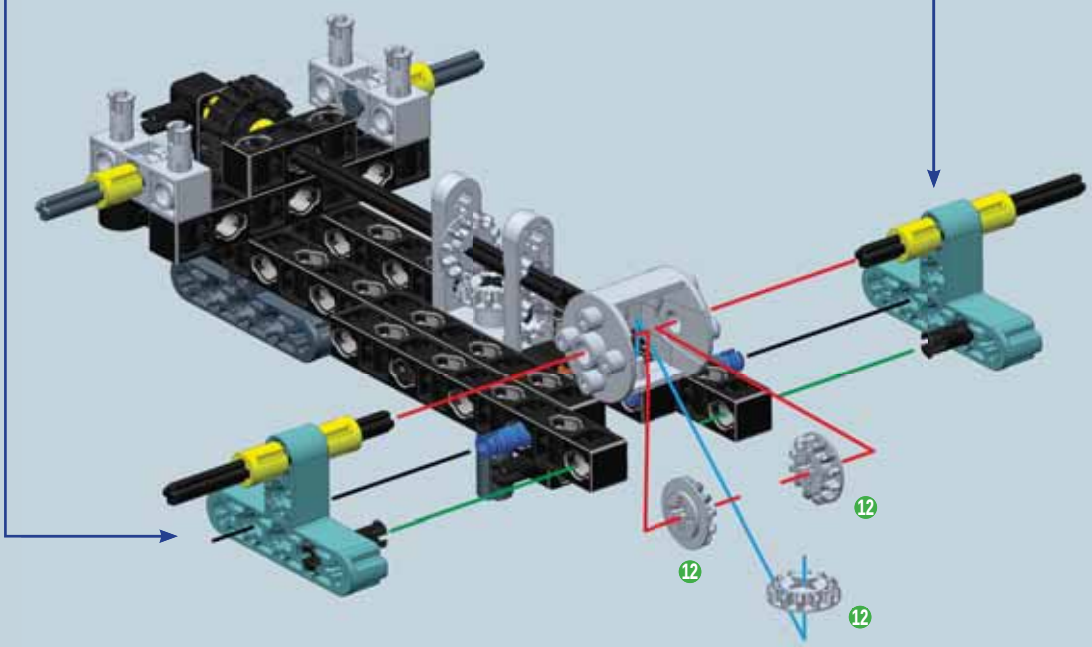


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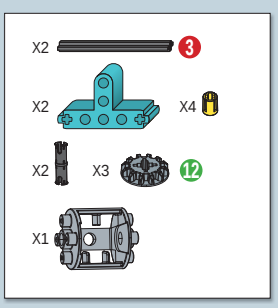


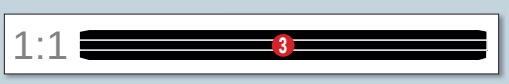


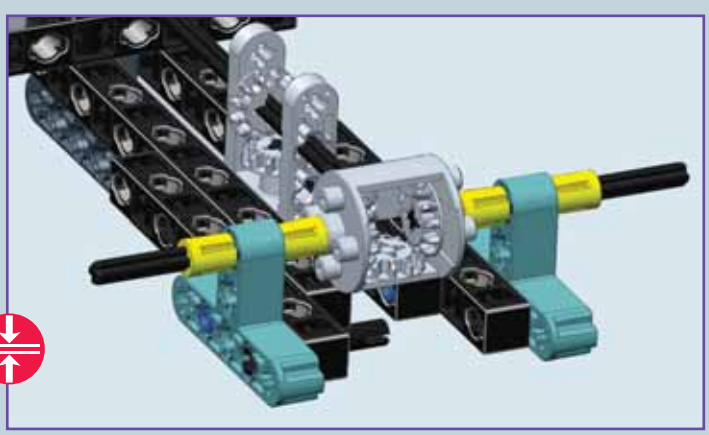

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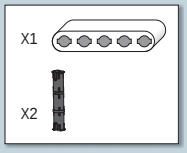


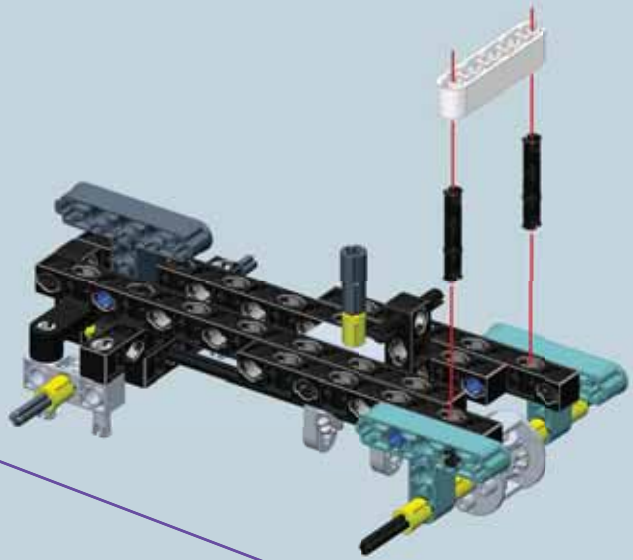

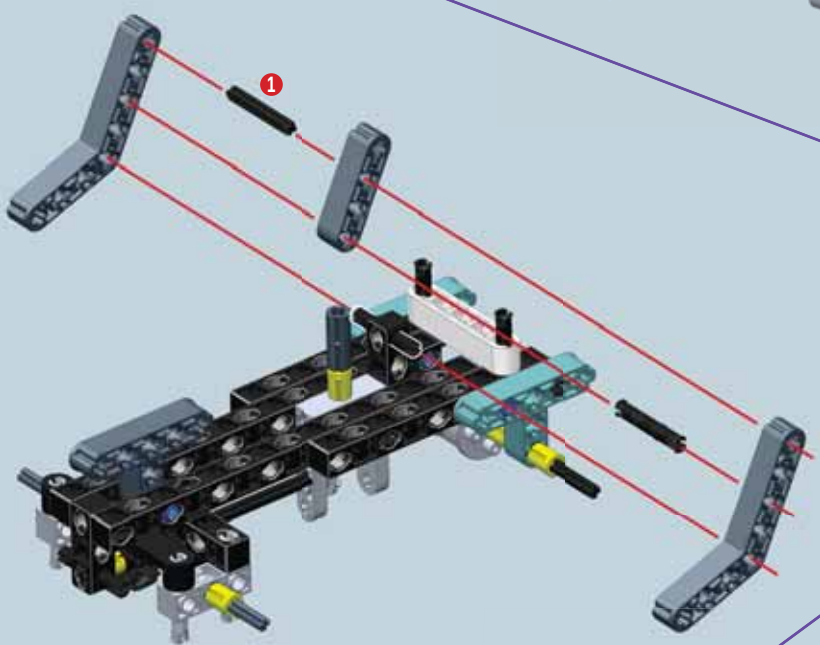


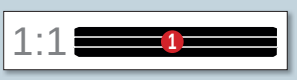


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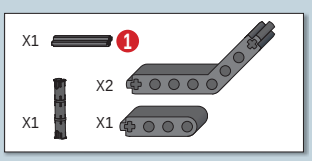


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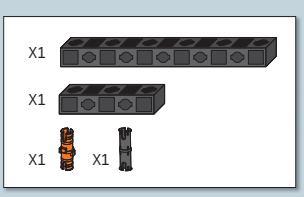


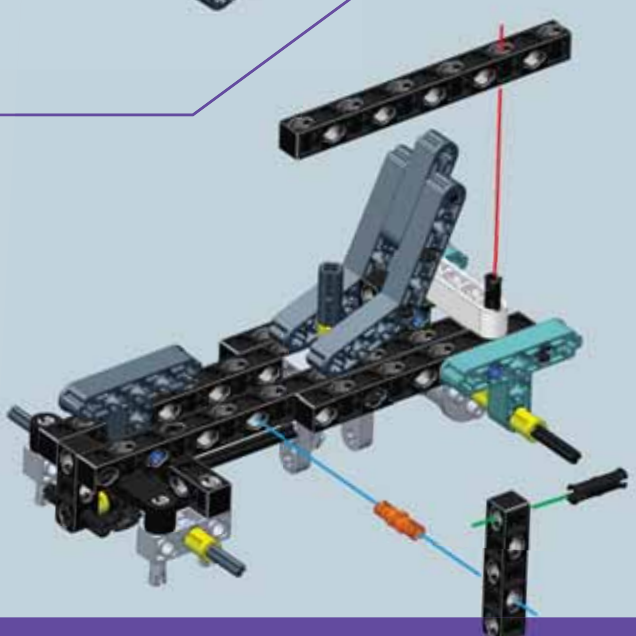

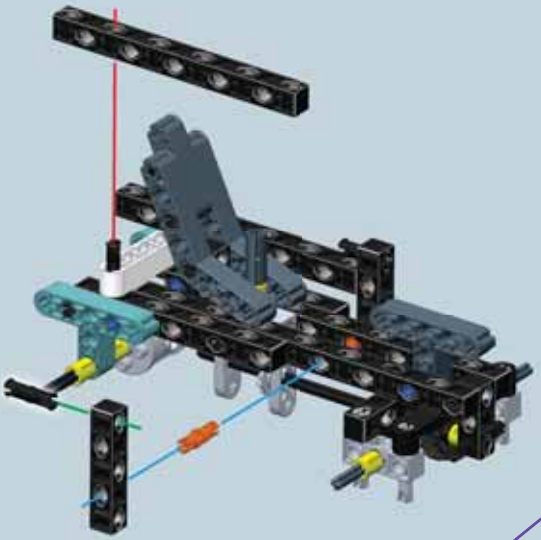

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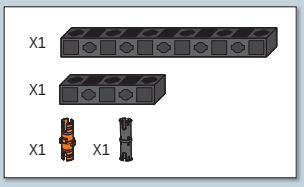


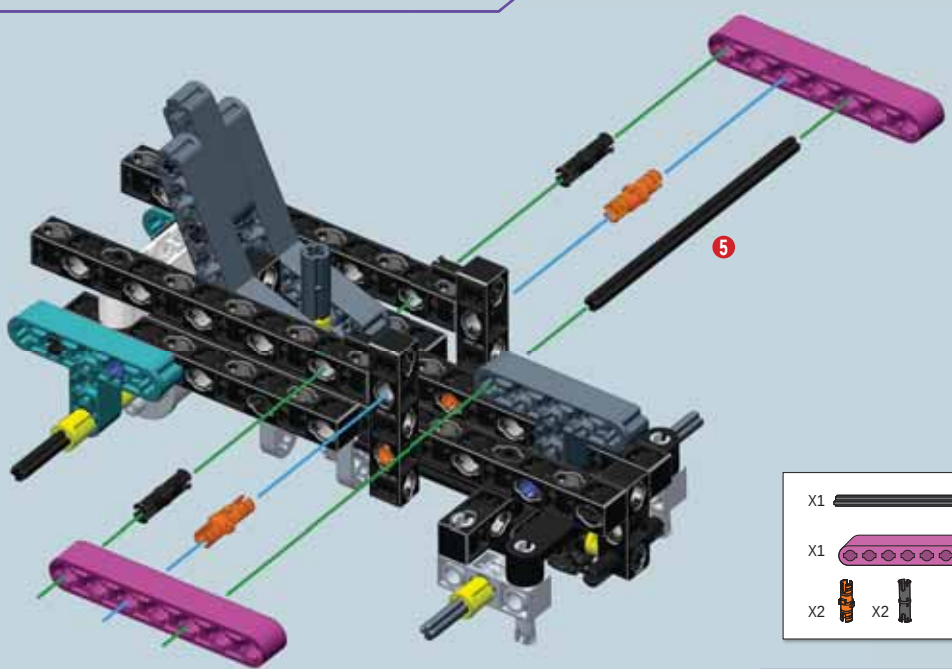


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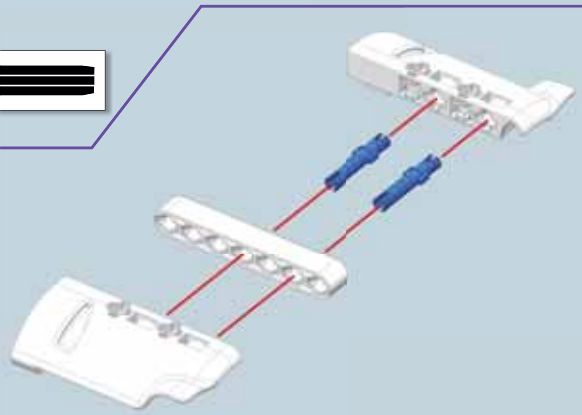

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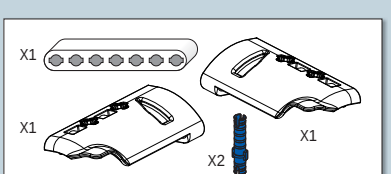

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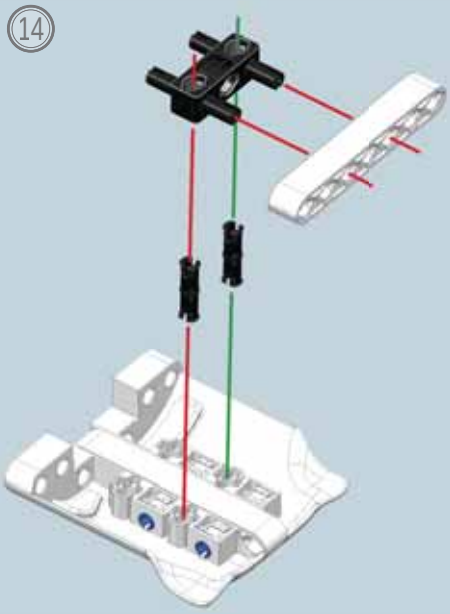

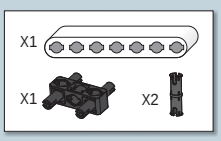


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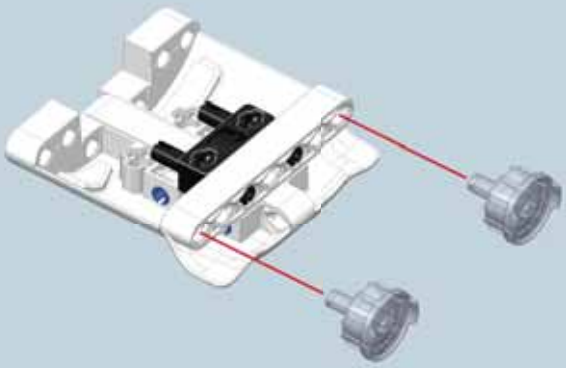


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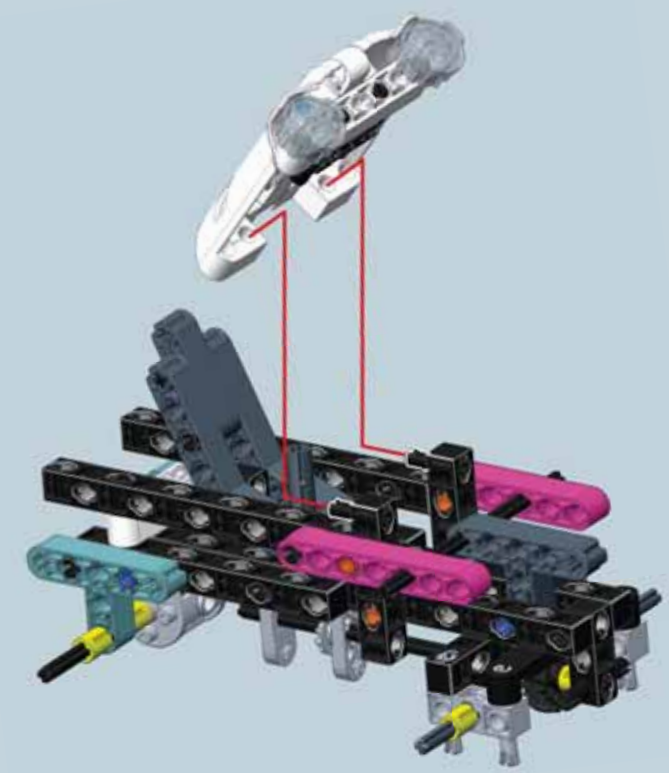

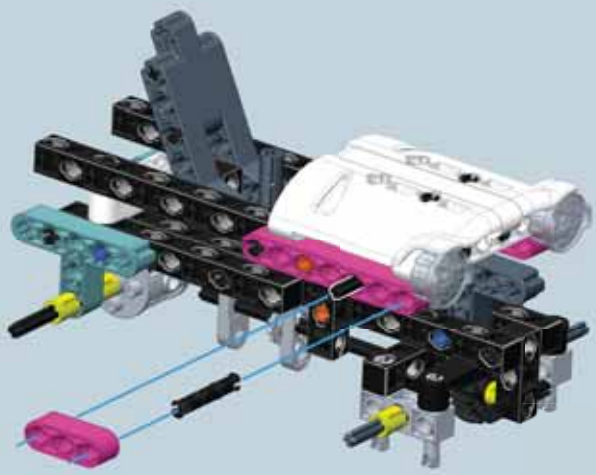

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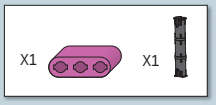


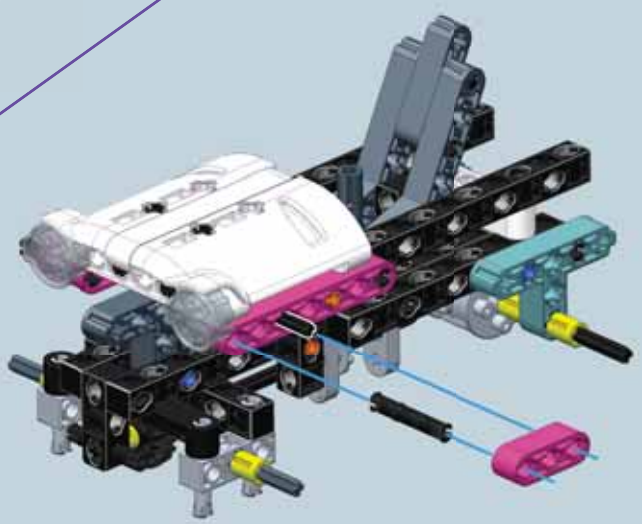

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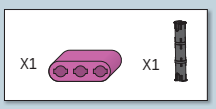


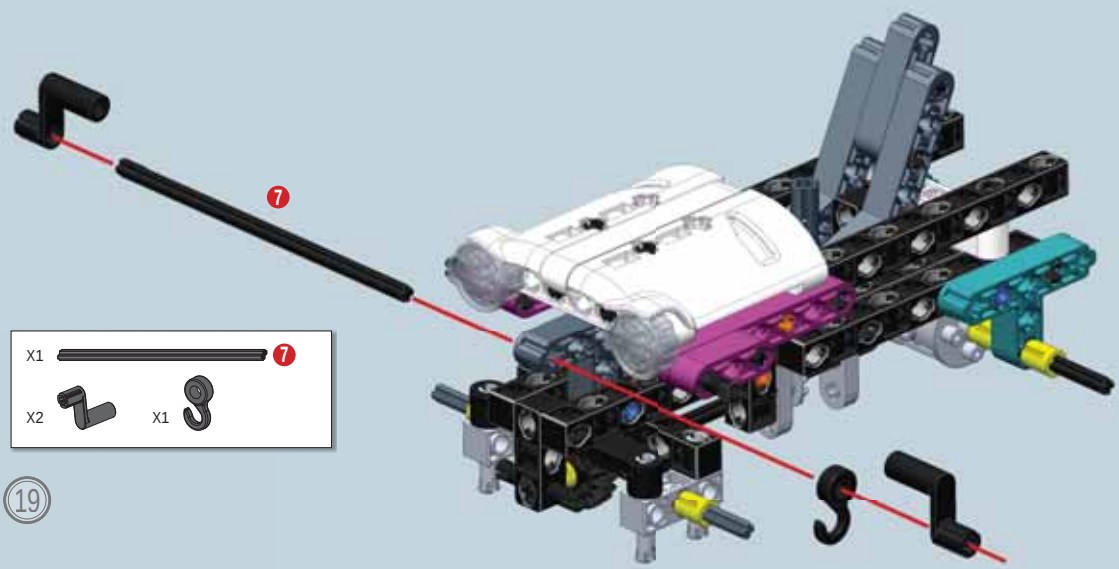





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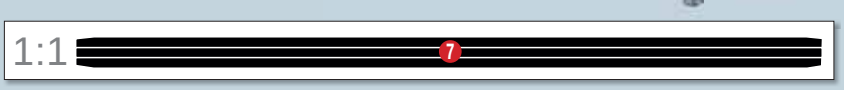

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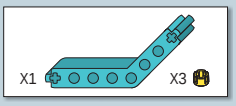


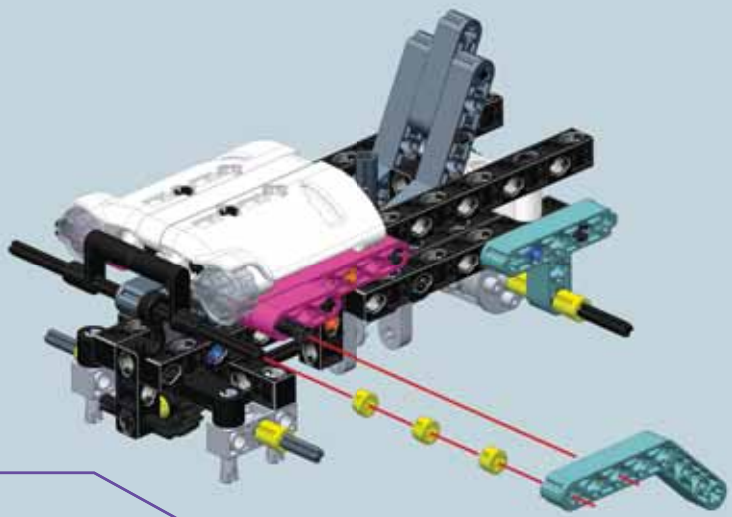

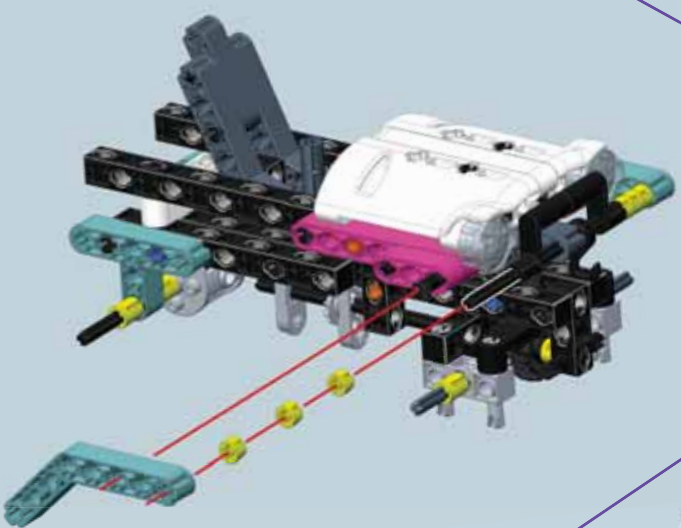

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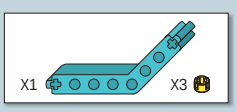


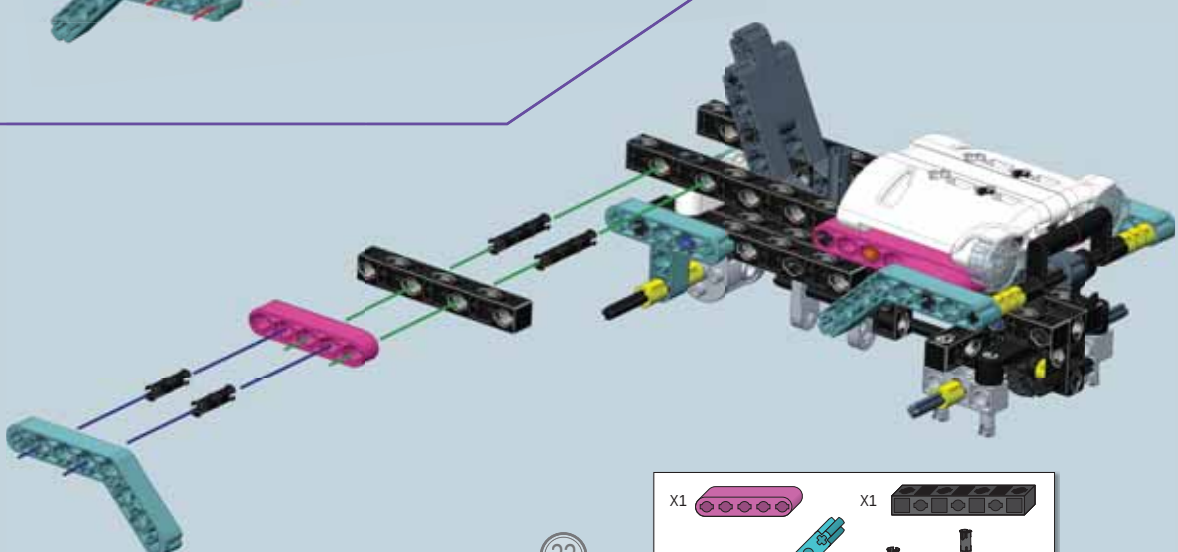

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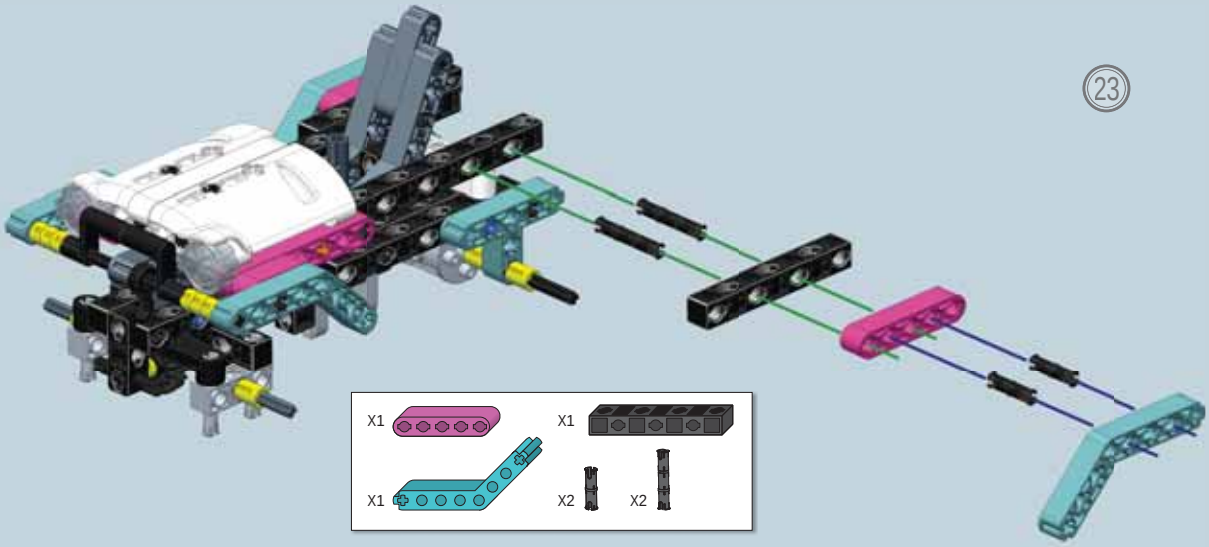
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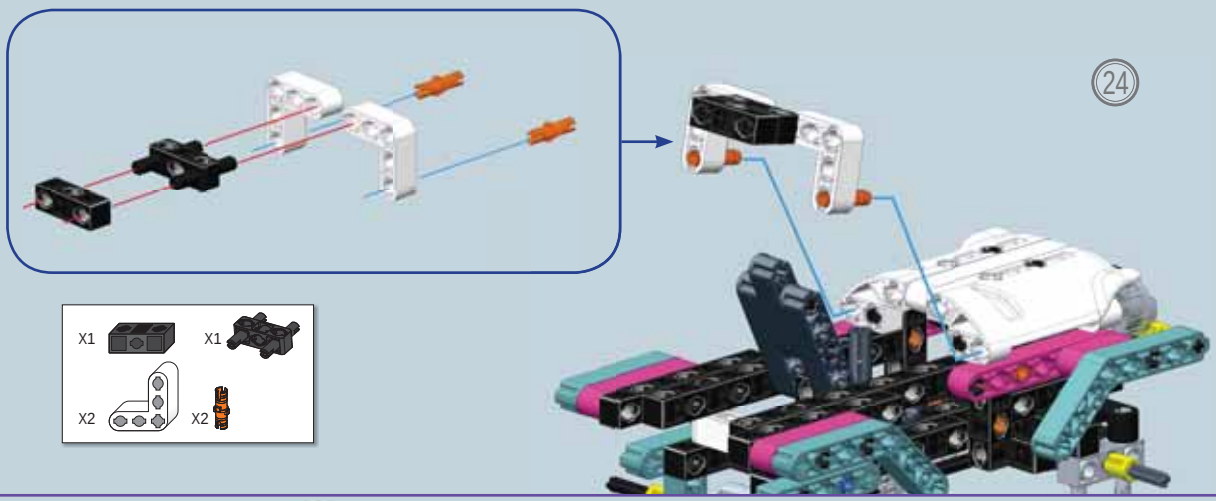
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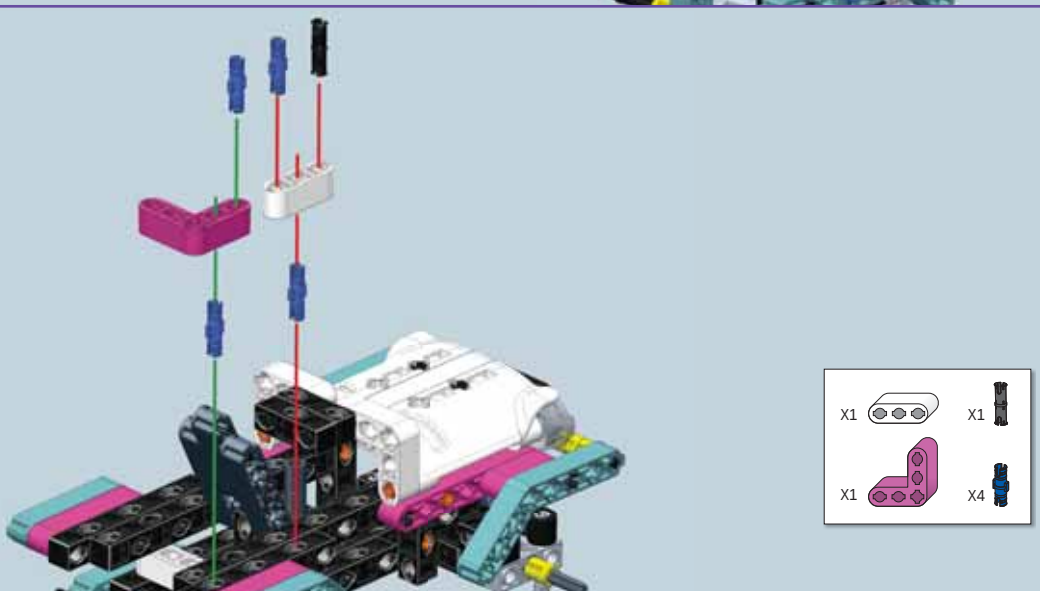
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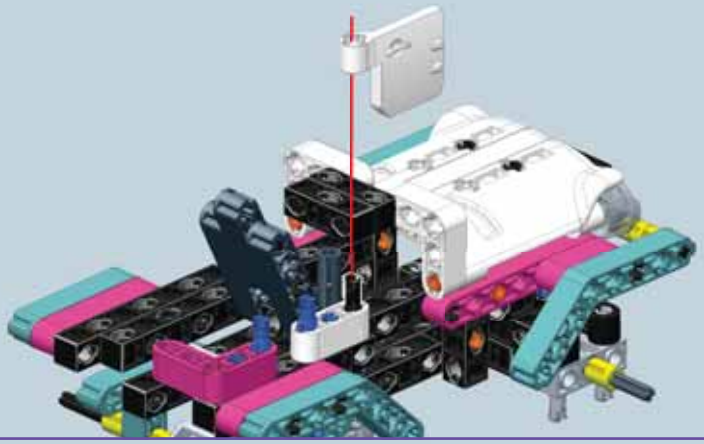

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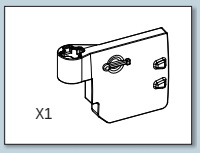


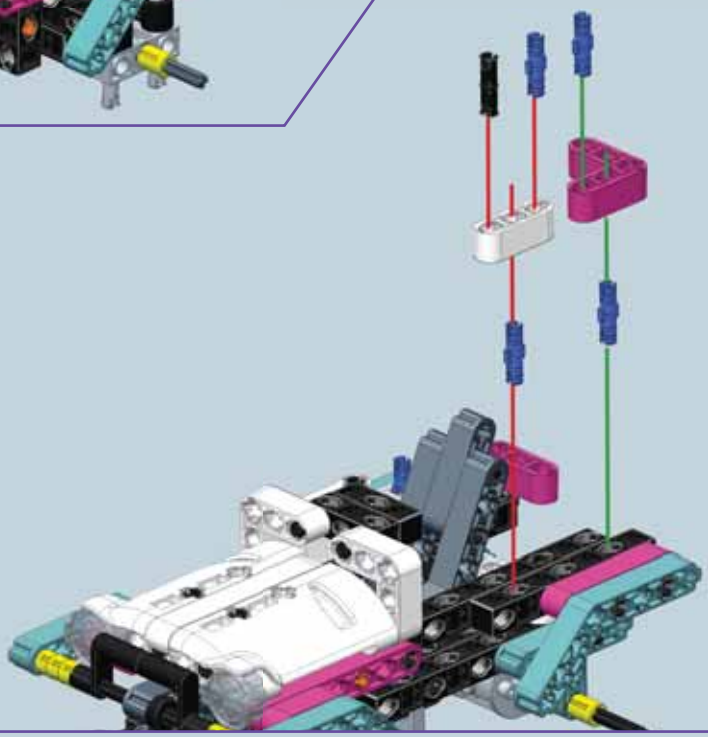

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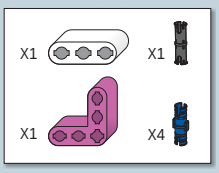


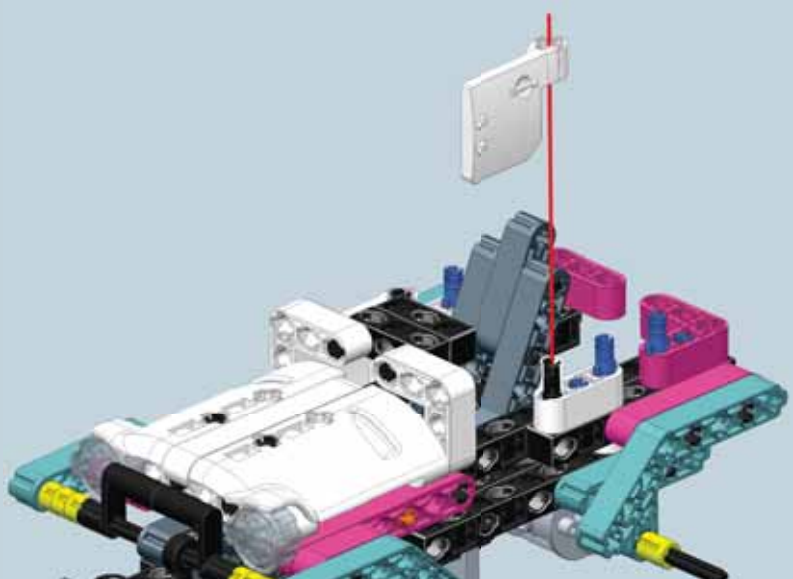

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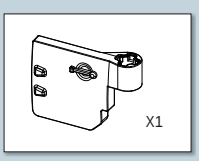

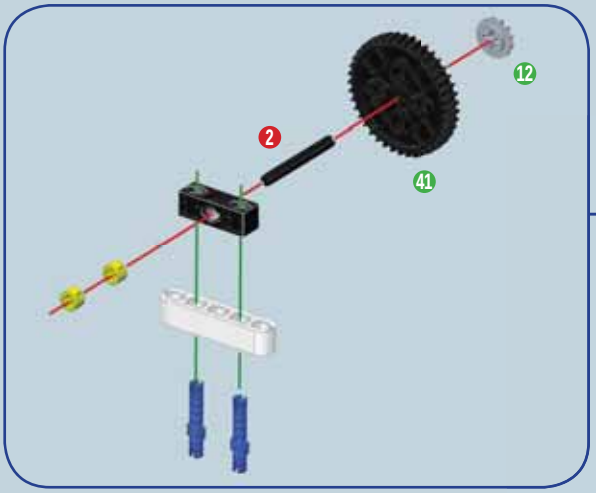


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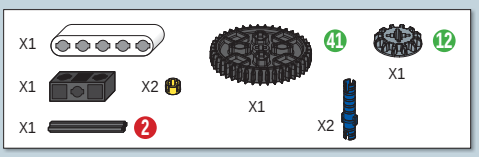


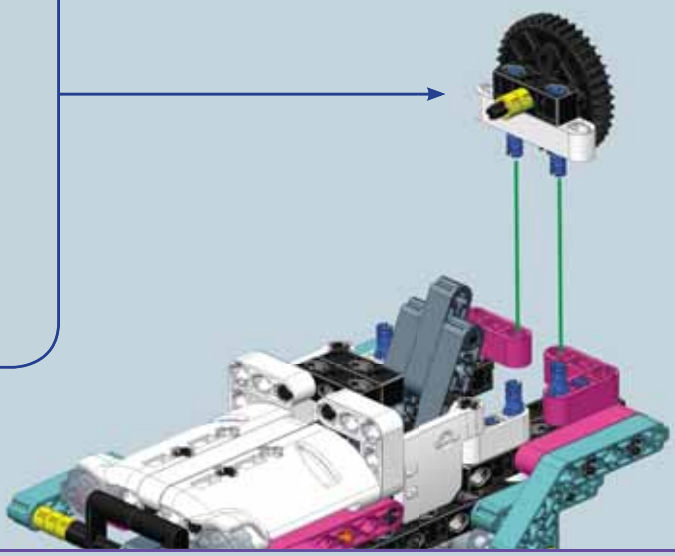

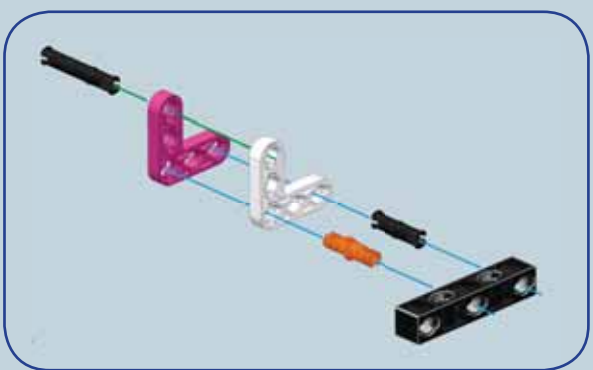

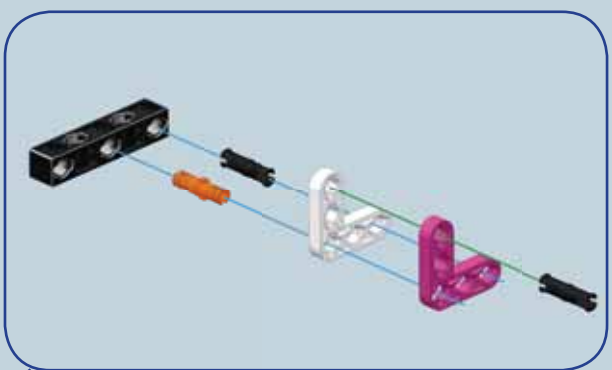

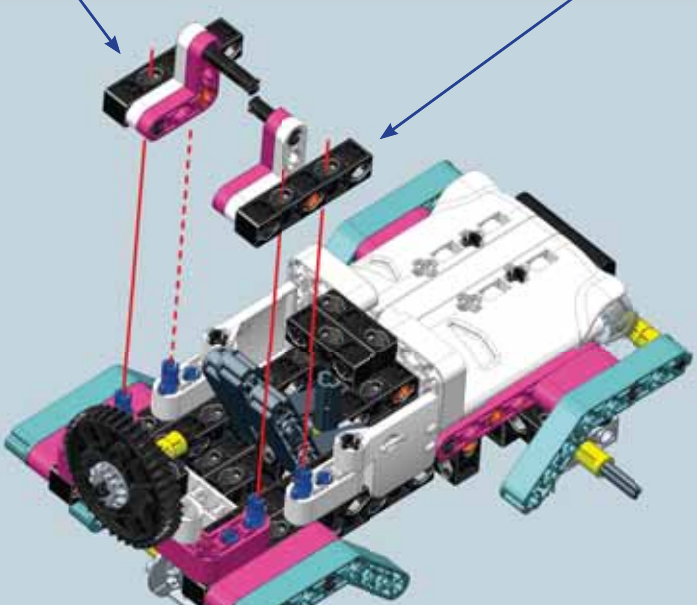

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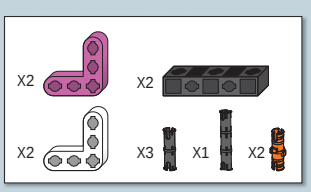

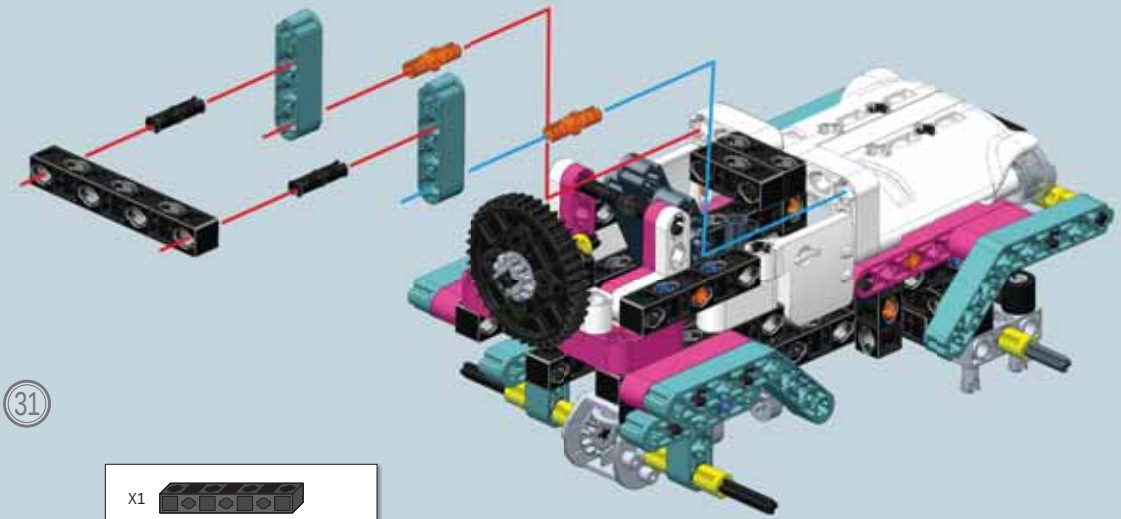

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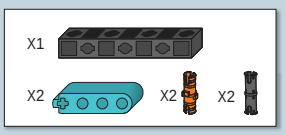


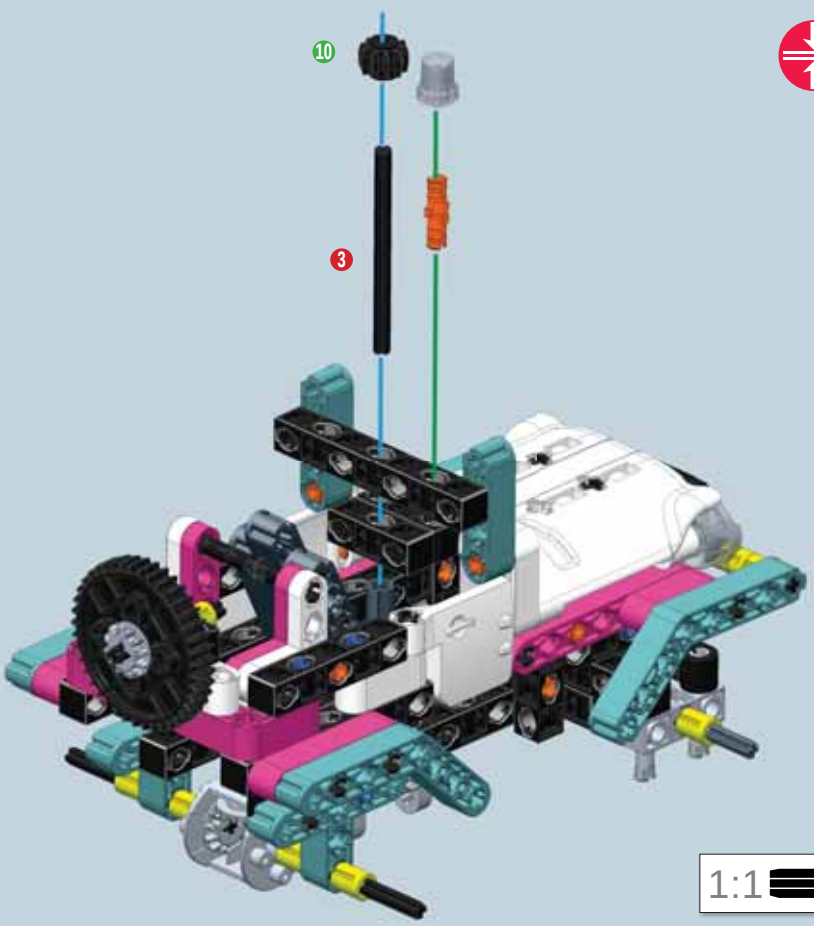


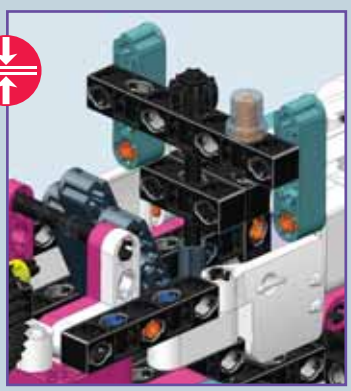

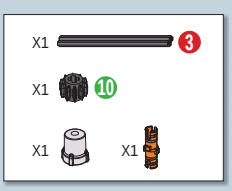


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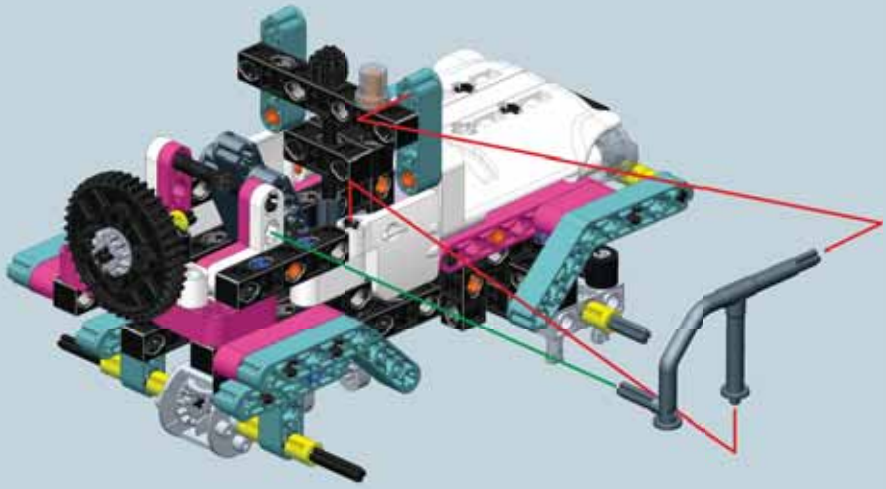


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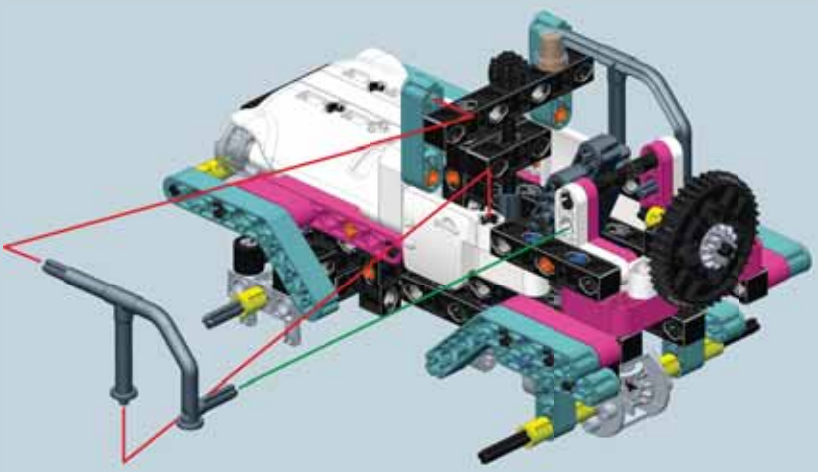

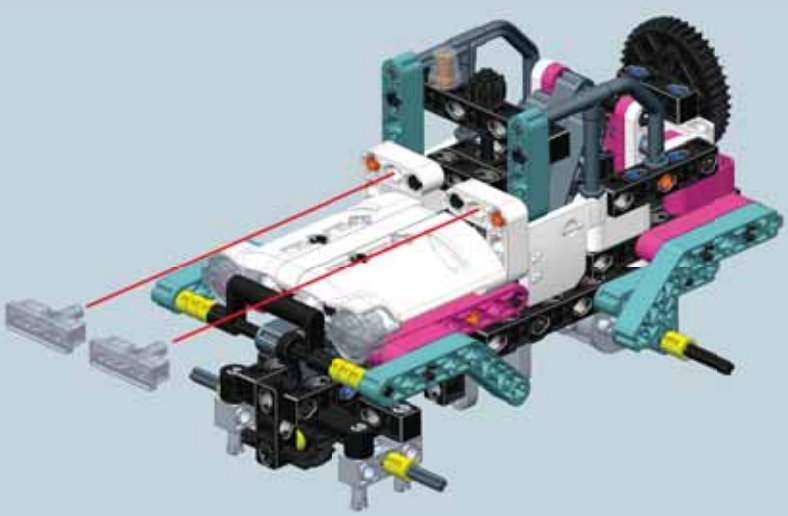

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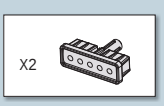

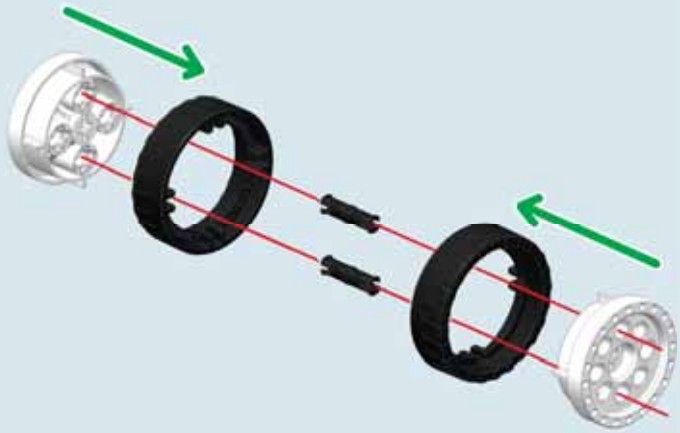

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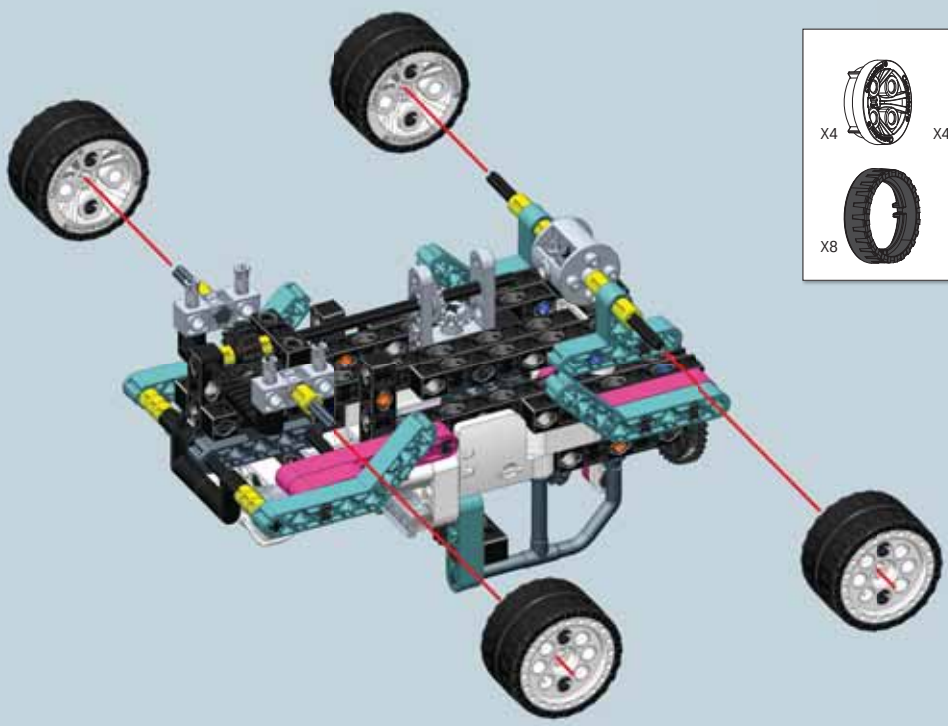




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Modello finale

# 3 Dune buggy

ISTRUZIONI 3D INTERATTIVE NELL'APP
LABORATORIO DI MECCANICA

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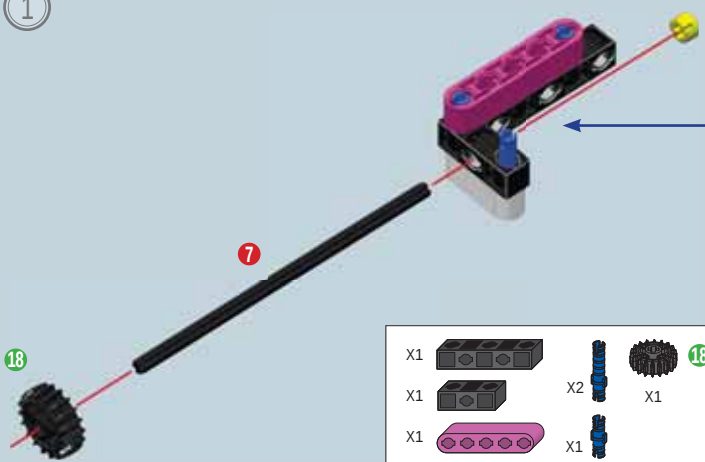





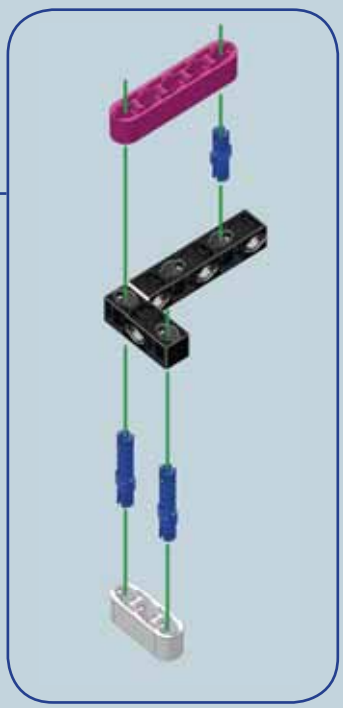

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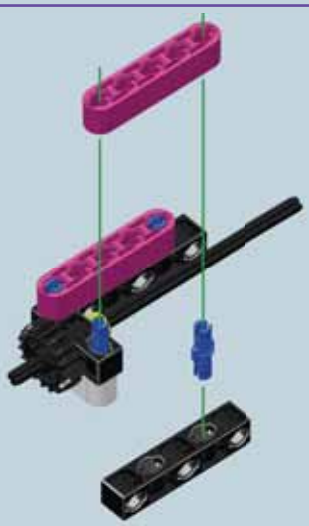

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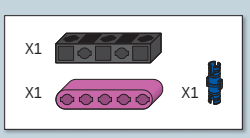

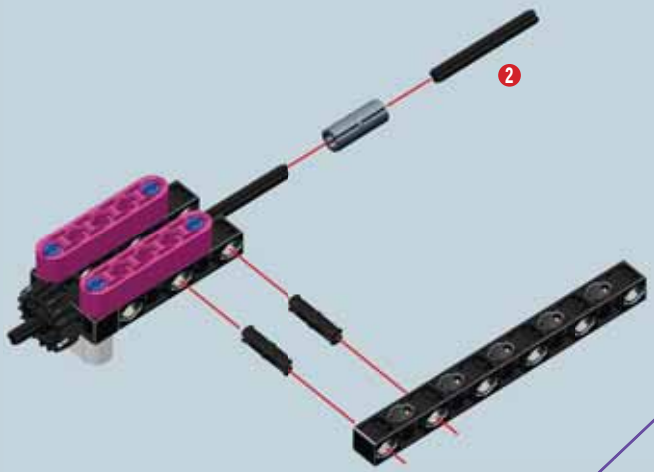


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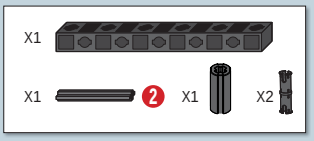


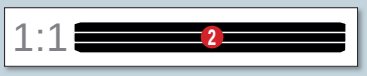


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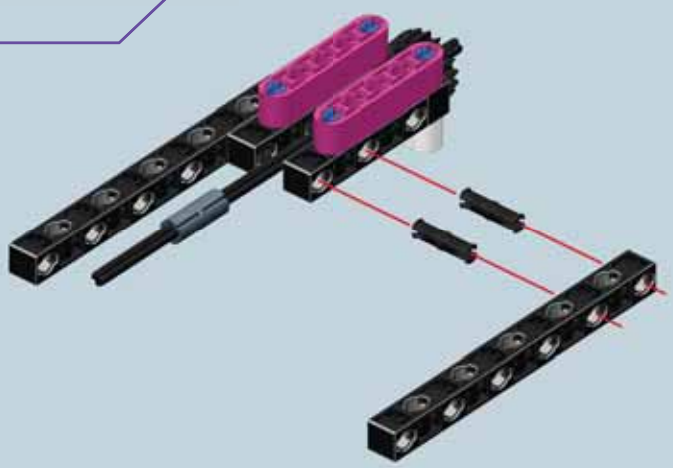

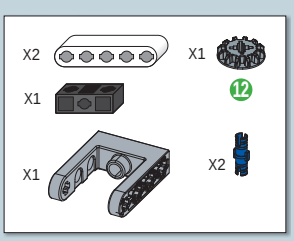


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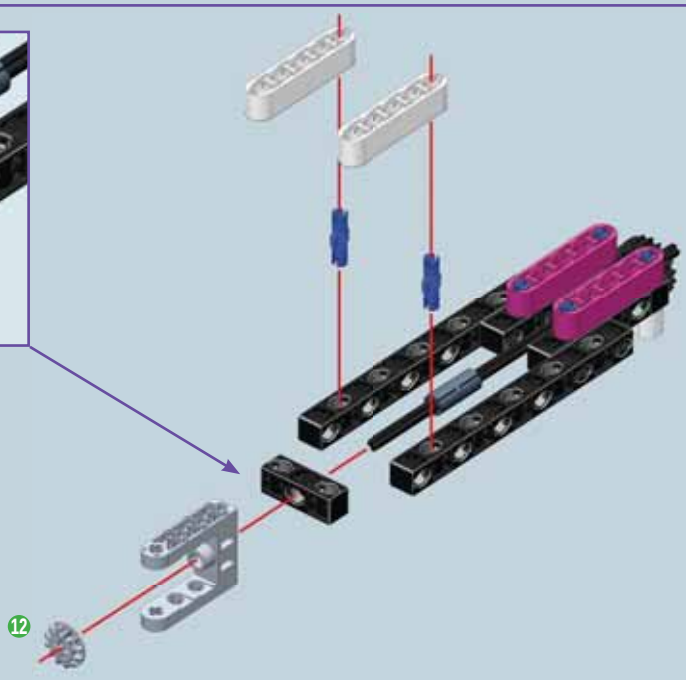

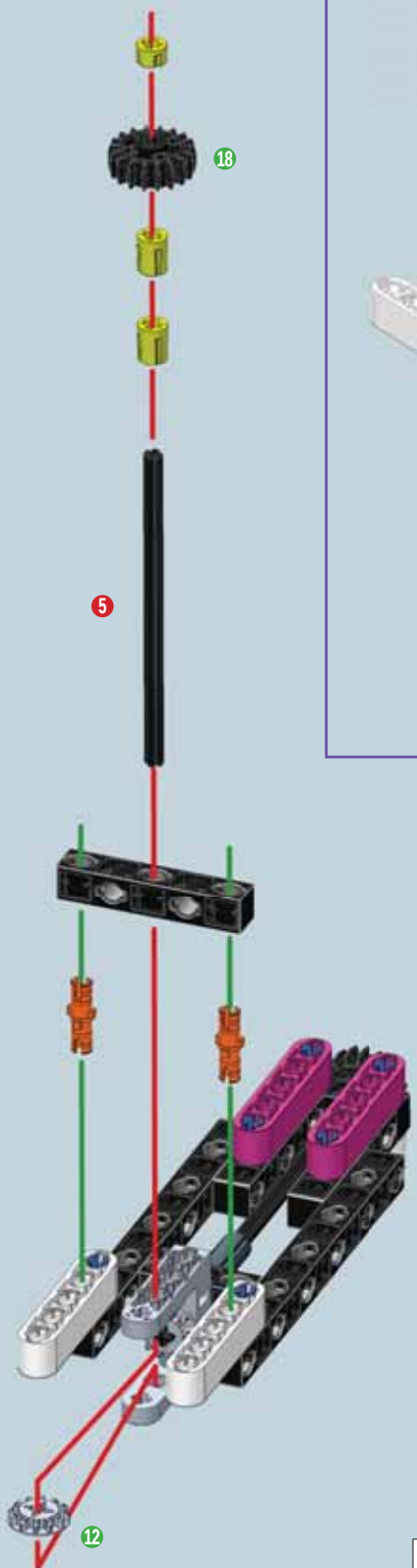


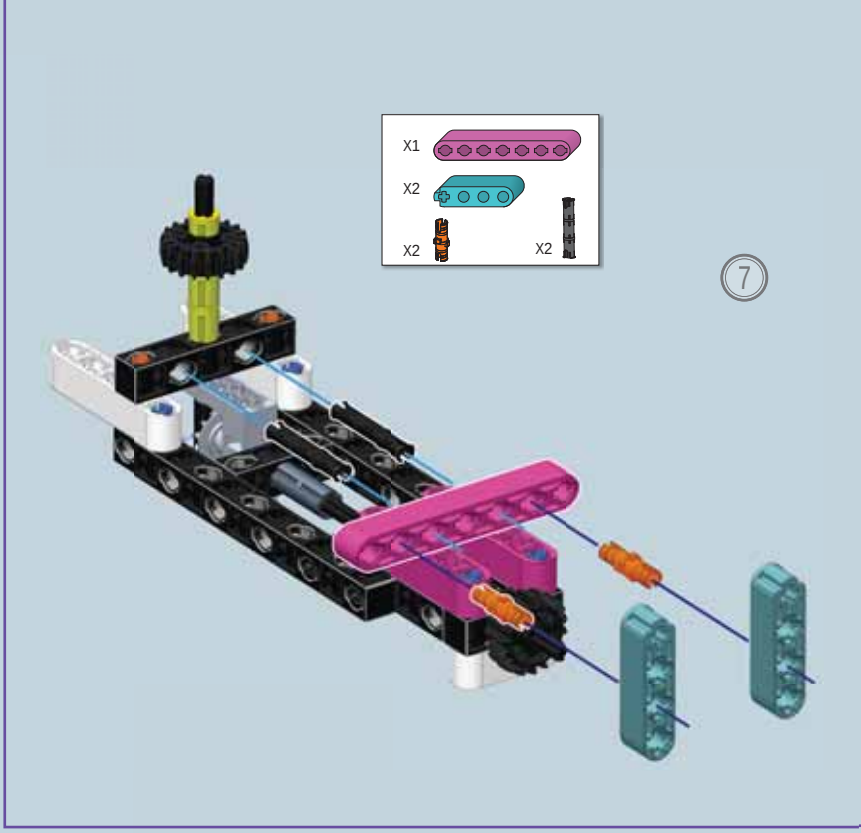


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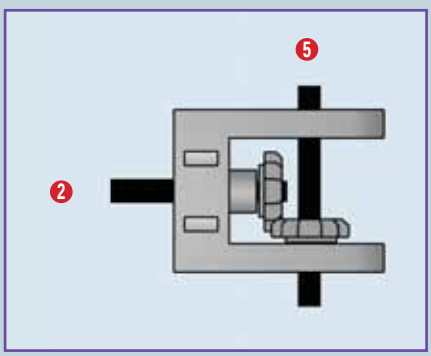


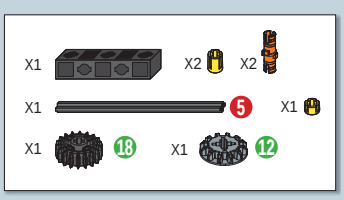


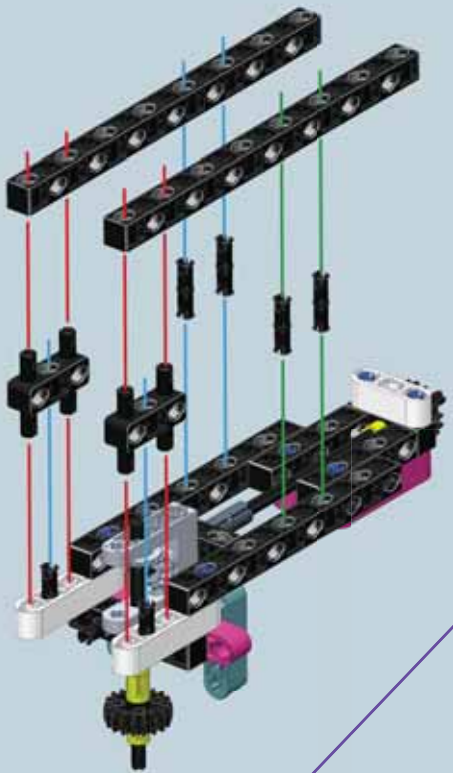

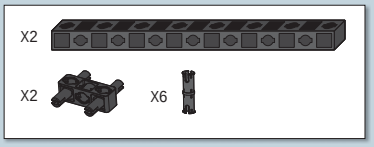


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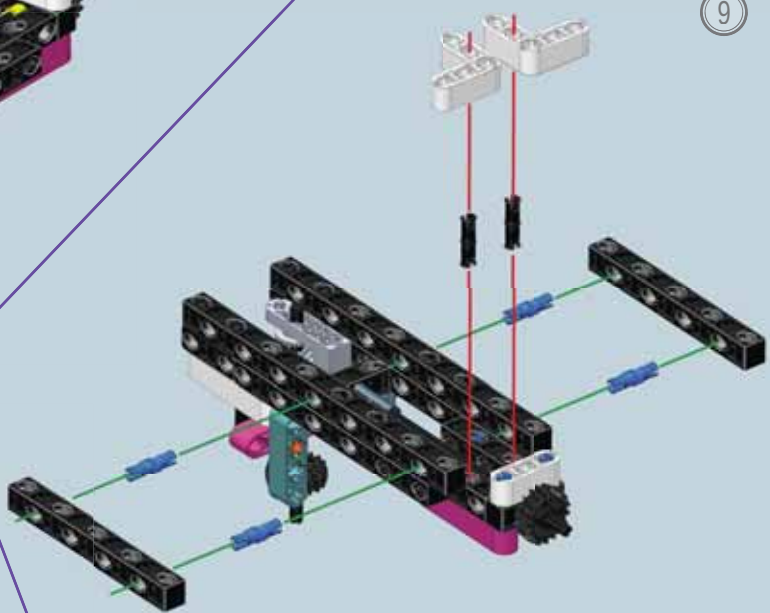

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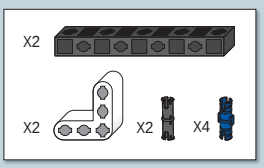


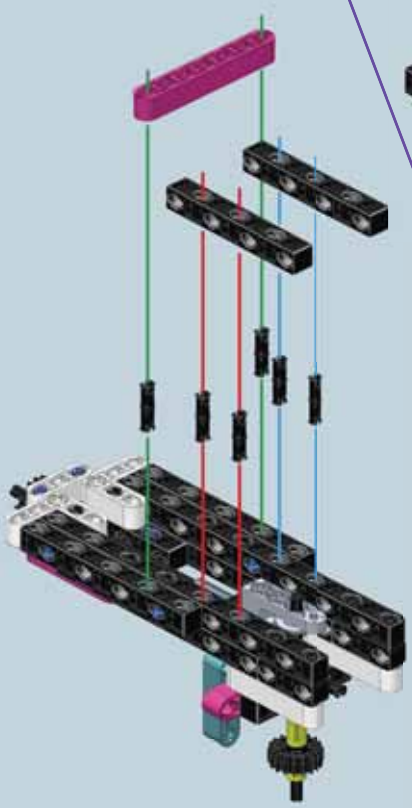

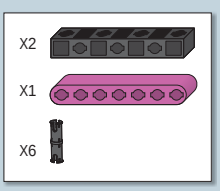


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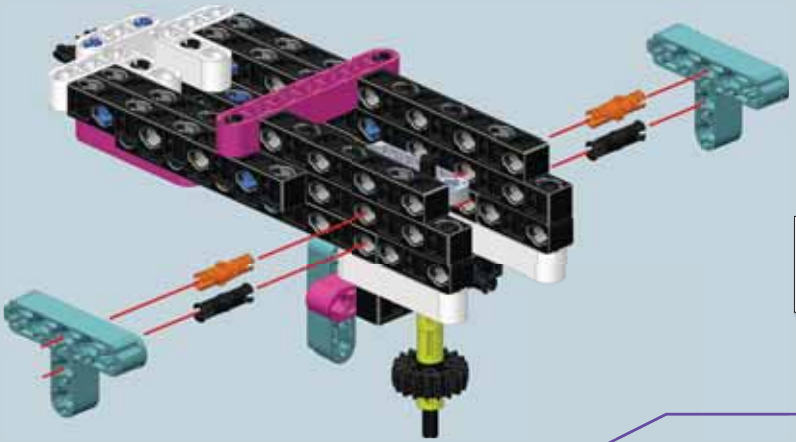

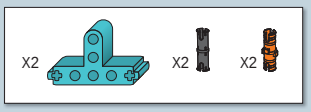


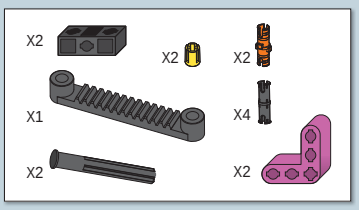


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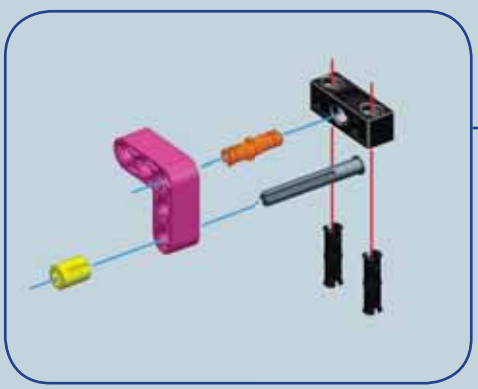

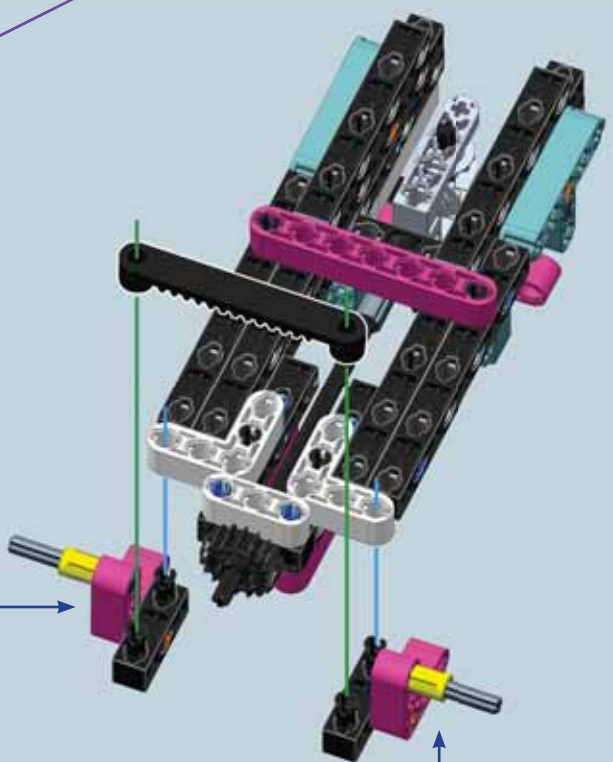

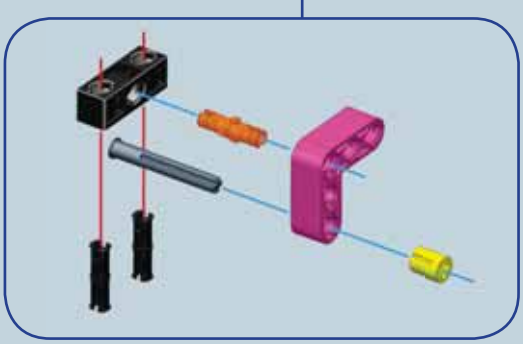

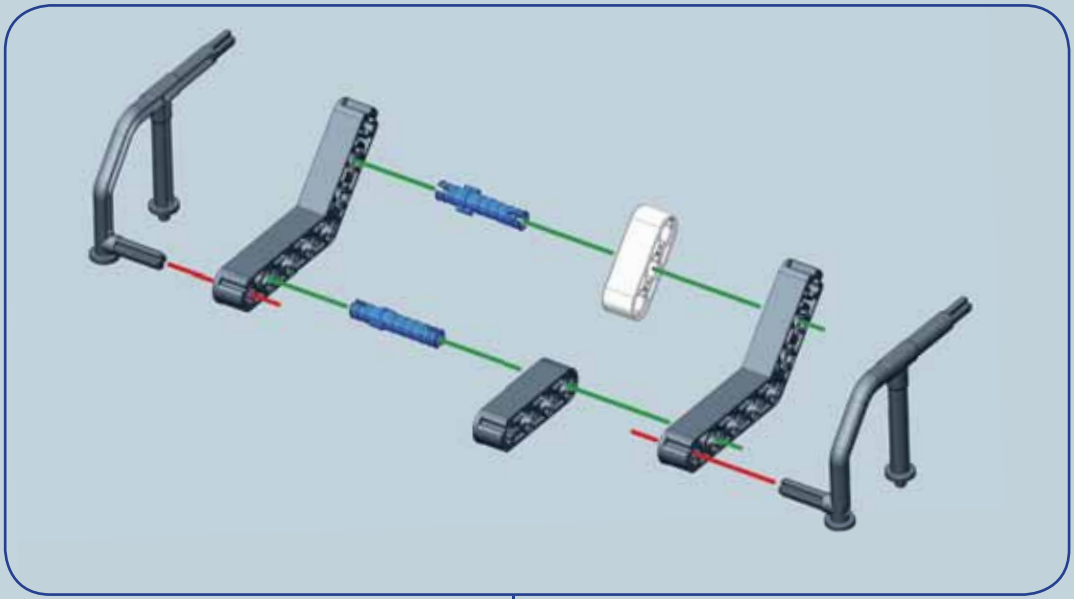

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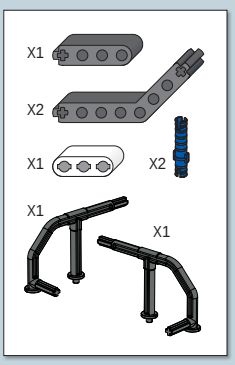


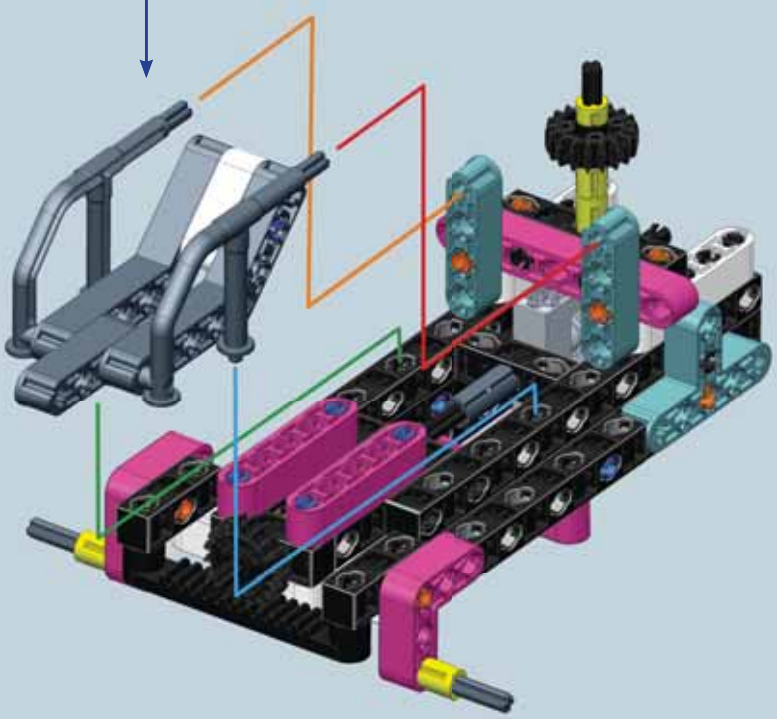

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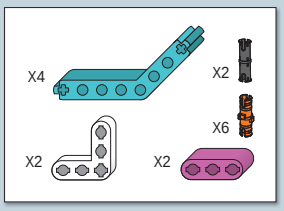
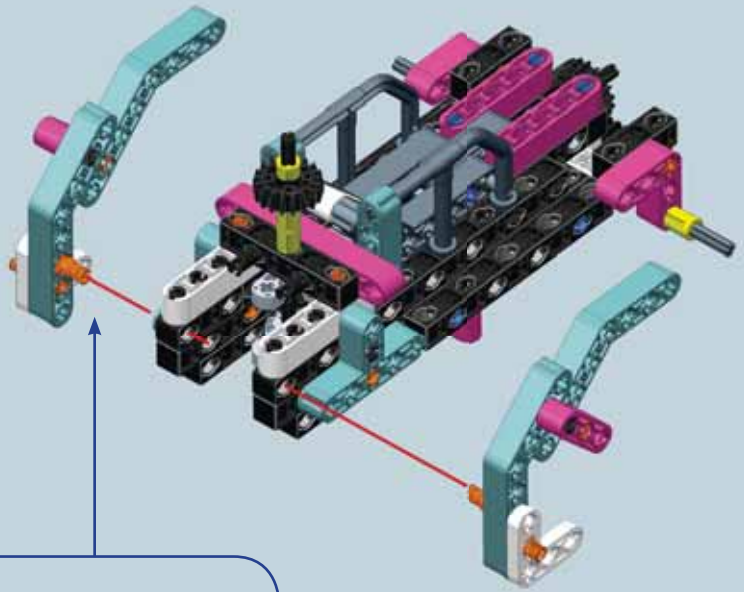
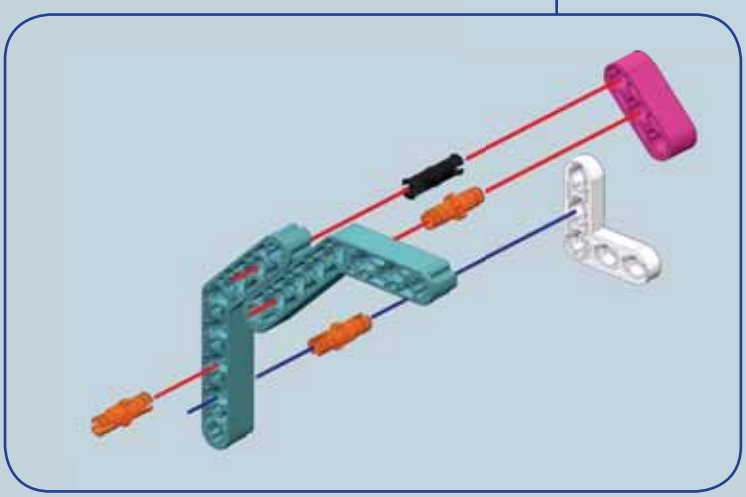
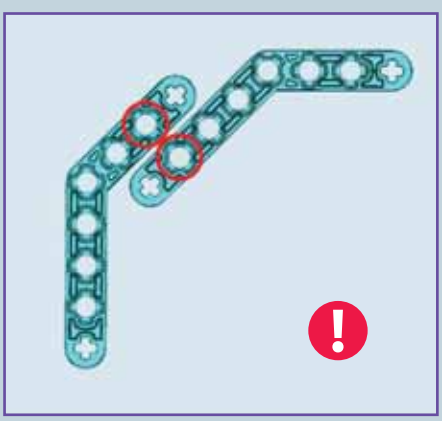
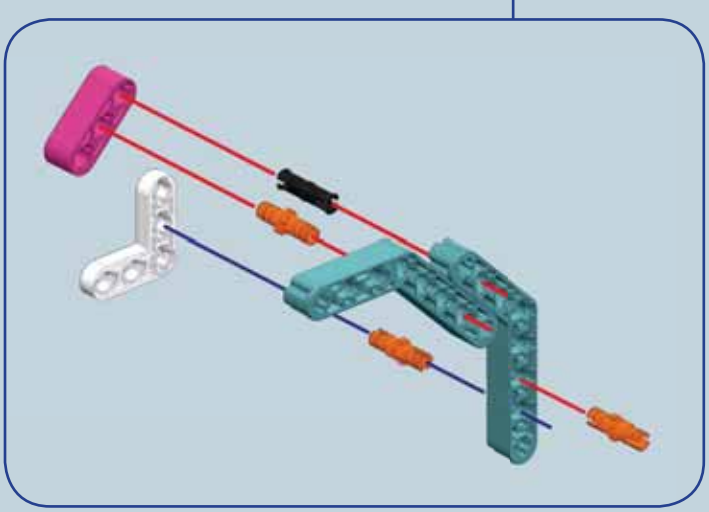








1:1 6

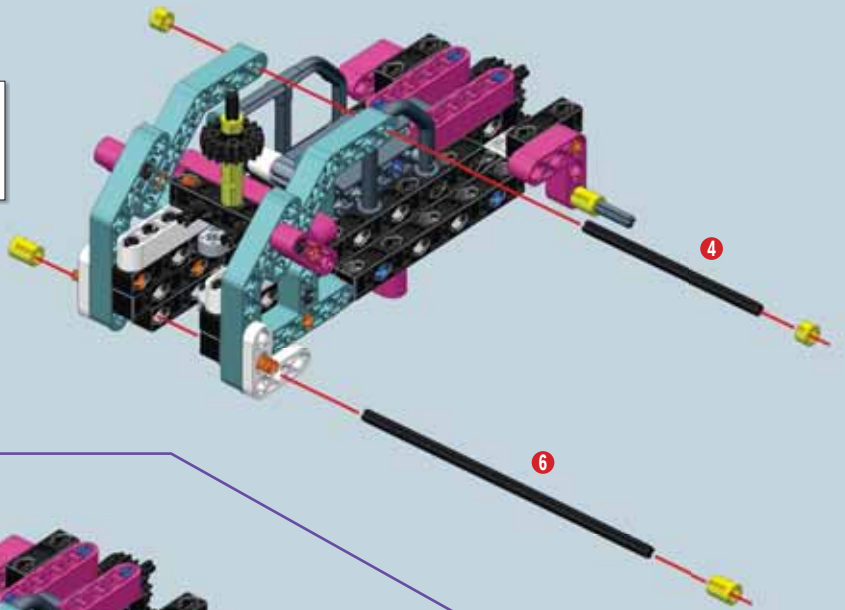
1:1 4

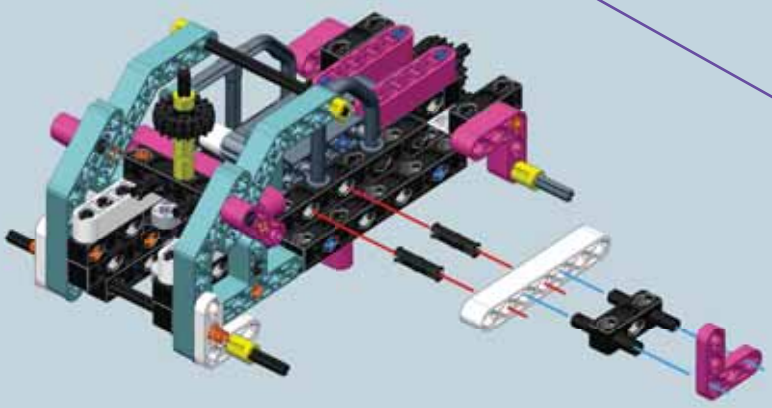
15

X1 6

X1 4

X2 X2



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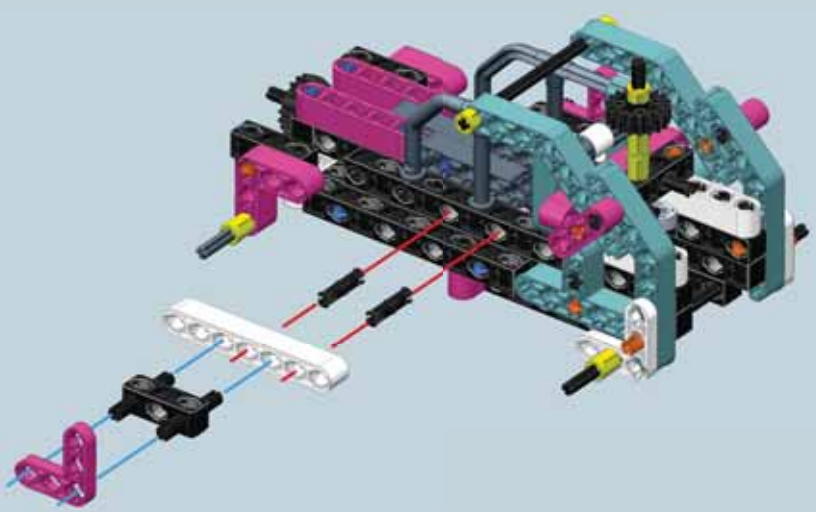
X1 X1

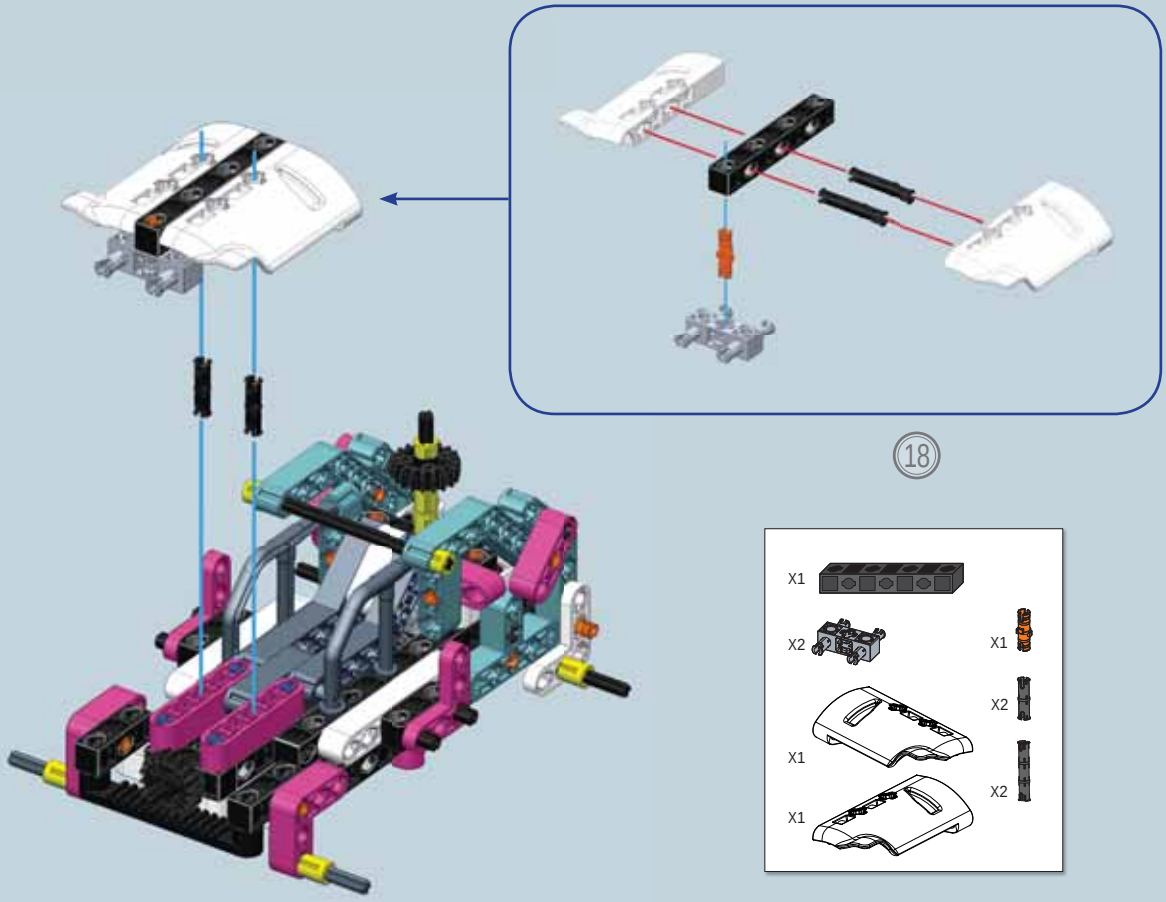
X1 X2

17

X1 X1

X1 X2





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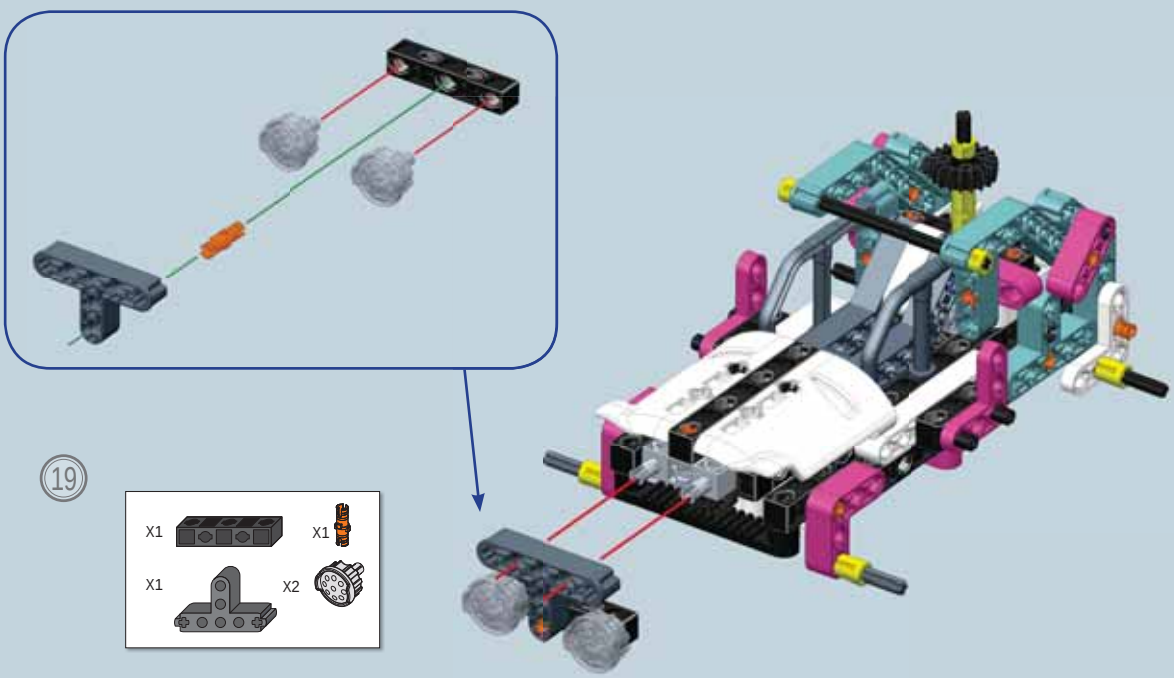

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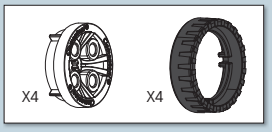


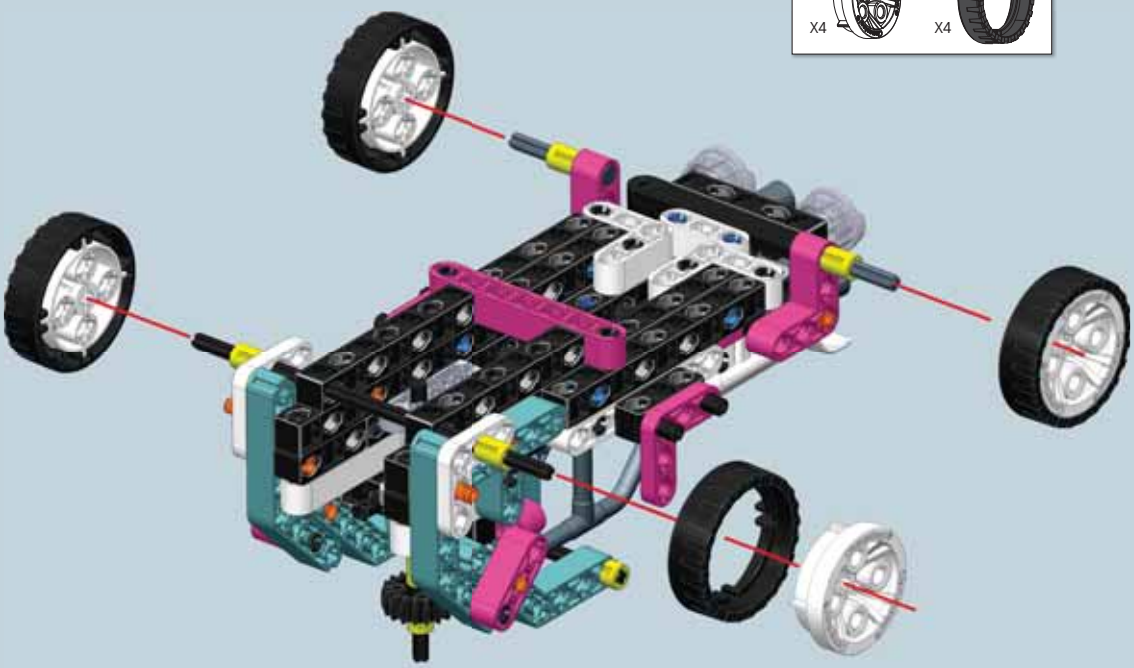

Modello finale

## SCARICA L'APP GRATUITA LABORATORIO DI MECCANICA PER REALIZZARE I 10 FANTASTICI MODELLI

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