



# MINDSTORMS™

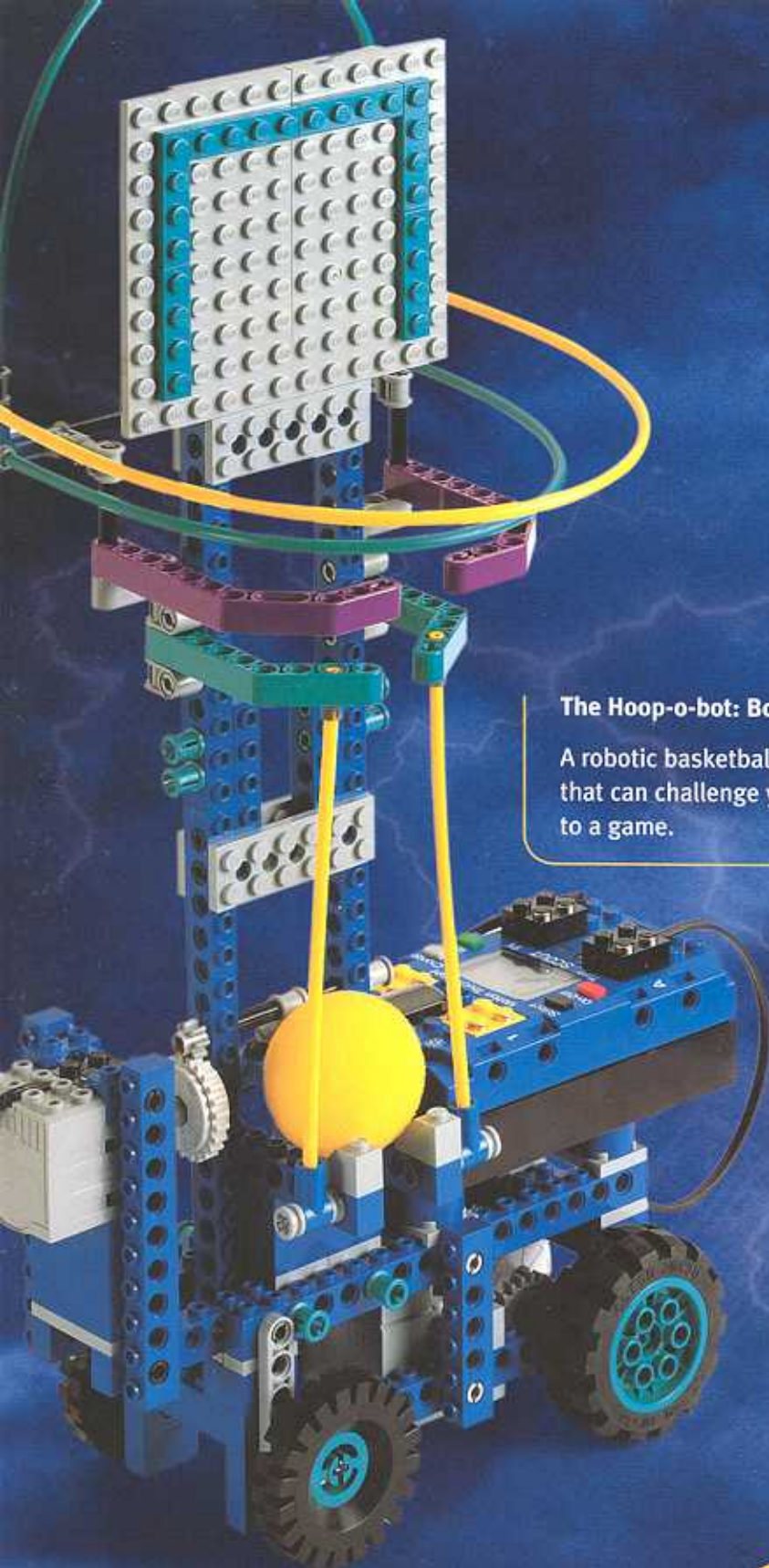
## ROBOTICS DISCOVERY SET™

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The Hoop-o-bot Book

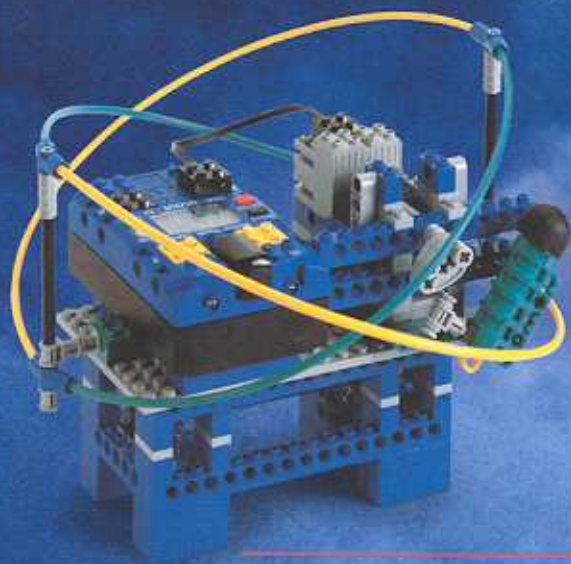
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CONSTRUCTION PEDIA



**The Hoop-o-bot: Book 3**

A robotic basketball hoop that can challenge you to a game.



**The Intruder Alarm: Book 2**

A light-triggered alarm to keep people out of your room.



**The Bug: Book 1**

A robotic insect that can explore your house.

*...and other things found only in the depths of your imagination.*

# CONTENTS

<b>Introduction</b>	<i>page 2</i>
<b>Getting Started</b> Connecting Motors, Using Loop A and Loop B, Using Loop AB	<i>page 4</i>
<b>Building Instructions</b>	<i>page 7</i>
<b>Explorations</b>	<i>page 37</i>
<i>Part 1 – Dodging the Ball</i>	<i>page 38</i>
<i>Part 2 – Returning the Ball</i>	<i>page 39</i>
<i>Part 3 – Mix it all up</i>	<i>page 40</i>
<b>Challenges</b>	<i>page 41</i>
<i>Special Features</i>	<i>page 46</i>
<i>Tips &amp; Tricks</i>	<i>page 47</i>

# The Hoop-o-bot

When you play sports, you need to think fast, move quickly, and often do more than one thing at a time.

This book will show you how to build your own sports robot called the Hoop-o-bot.

- The Hoop-o-bot is a moving basketball hoop that can dodge shots and even throw balls back.
- It will test how fast you can move and think one-on-one against the Scout.

Once you have the basics down, try some of the challenges to see how far you can take your inventions.



INTRODUCTION

GETTING STARTED

BUILDING INSTRUCTIONS

EXPLORATIONS

CHALLENGES

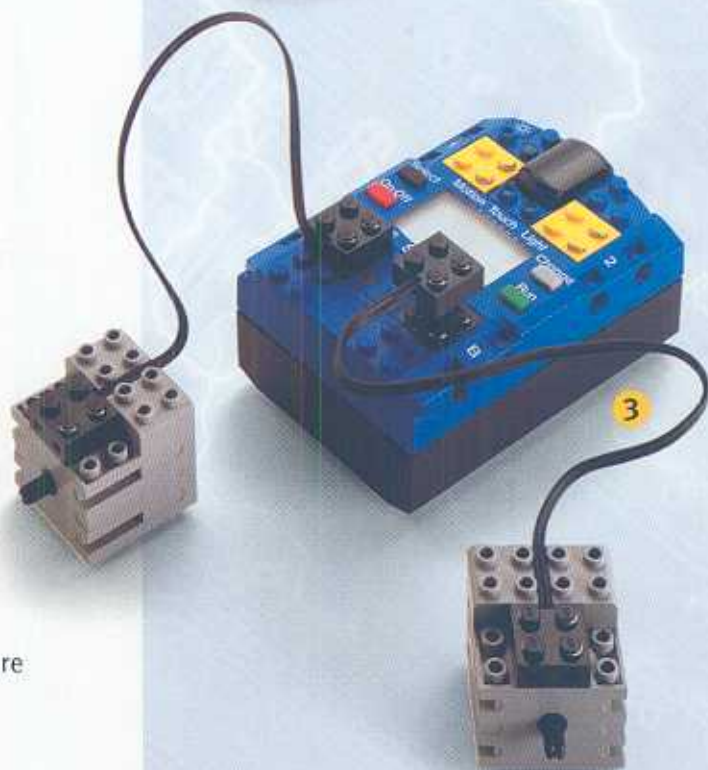
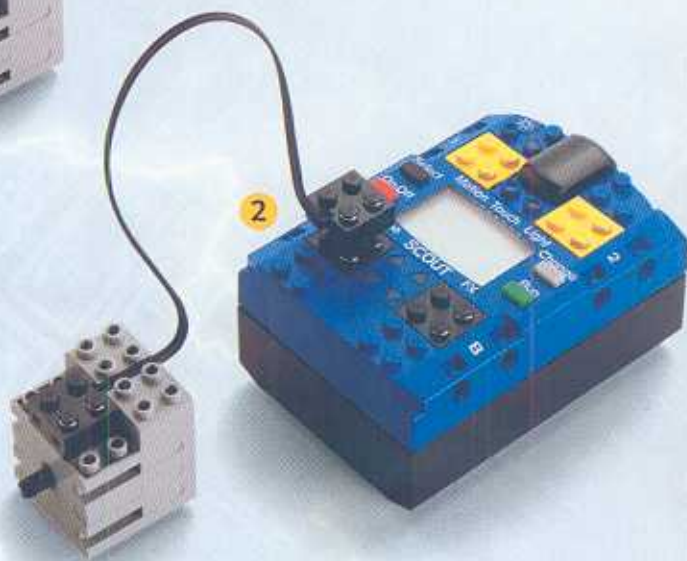




## CONNECTING MOTORS

To try out the commands for the Hoop-o-bot, first attach two motors to your Scout.

1. Attach one end of the long black wire to a motor.
2. Attach the other end of the wire to port A on the Scout.
3. Attach the other motor with a long wire to port B on the Scout.



For the Hoop-o-bot model, make sure you connect motors like this:



## USING LOOP A AND LOOP B

The Loop commands tell the motors to go backwards and forwards over and over. Loop A and Loop B are pretty simple to learn if you just watch the green arrows light up when the commands are running.

To use Loop A:

1. Make sure the Scout is turned on.
2. Use Select and Change to set the Scout's Motion to Loop A.

*The display should match the picture shown here.  
(Check out Getting Started in Book 1 if you need help using the buttons.)*

3. Press Run.

The motor connected to port A should repeat the following three steps over and over:

- Motor A forward
- Motor A backwards
- Motor A off

4. Press Run to stop.

Loop B works just like Loop A, only it controls the motor attached to port B. To try it out, follow steps 1-4 again, but change the Motion to Loop B.





## USING LOOP AB

Loop AB runs both motors back and forth instead of just one. The only difference is that A gets a head start on B. It is like when two people sing "Row, row, row your Boat" one after the other.

To use Loop AB:

1. Make sure the Scout is turned on.
2. Use Select and Change to set the Scout's Motion to Loop AB.
3. Press Run.

The motors should repeat the following steps over and over:

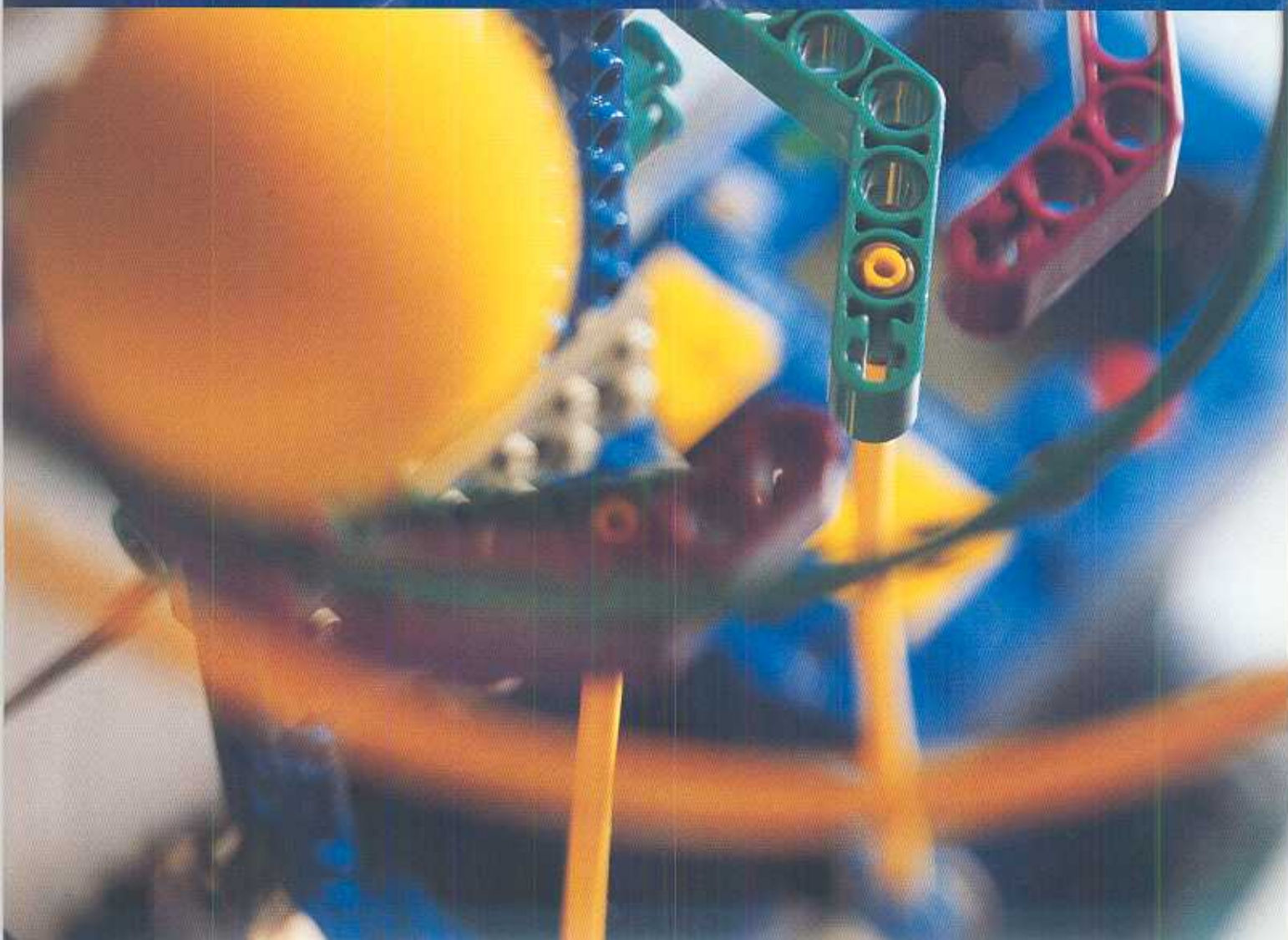
- Motor A forward
- Motor A forward and Motor B forward
- Motor A backwards and Motor B forward
- Motor A backwards and Motor B backwards
- Motor A off and Motor B backwards
- Motor A off and Motor B off

4. Press Run to stop.

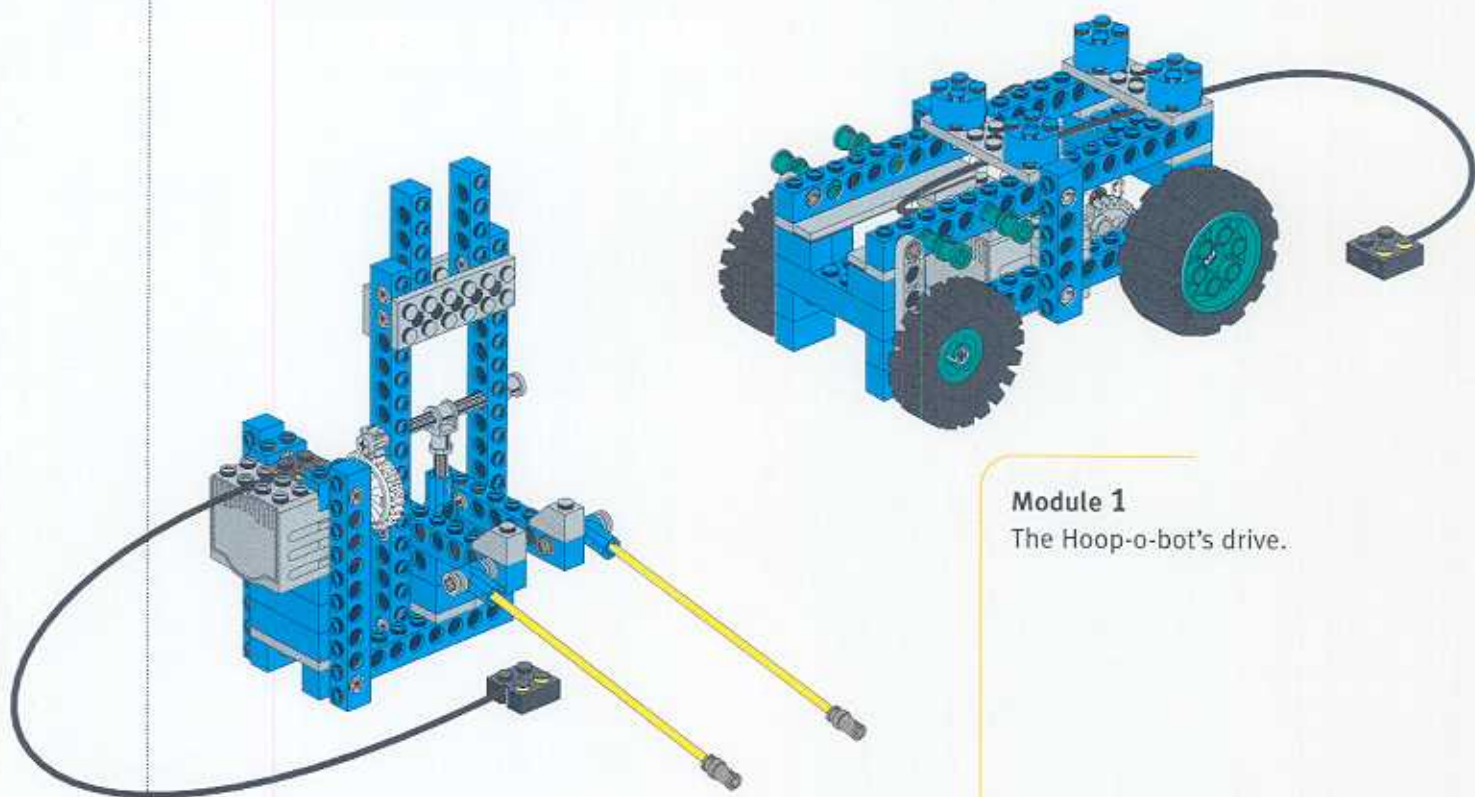




## BUILDING INSTRUCTIONS

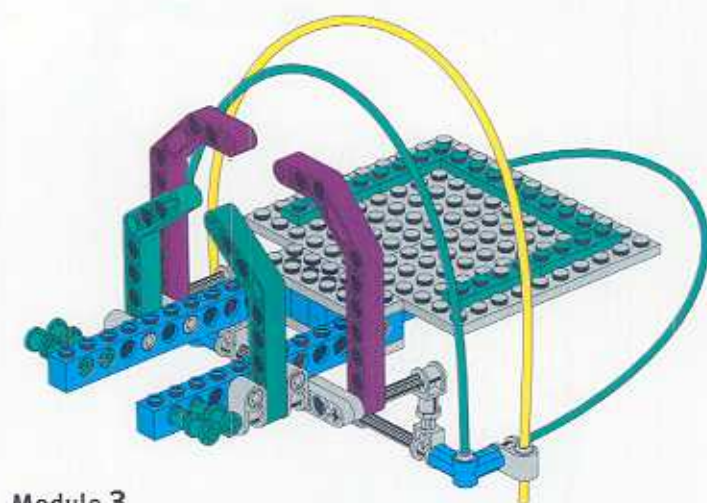


# The Hoop-o-bot



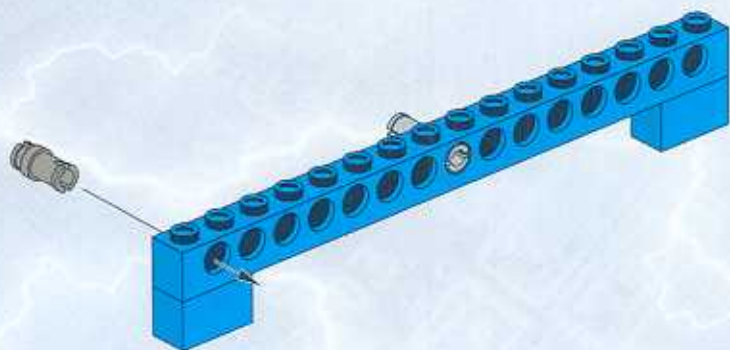
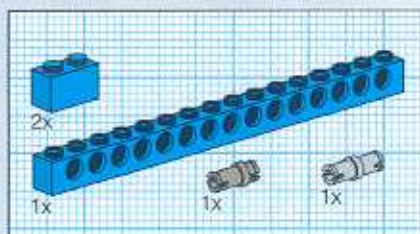
**Module 1**  
The Hoop-o-bot's drive.

**Module 2**  
The Hoop-o-bot's  
ball thrower.

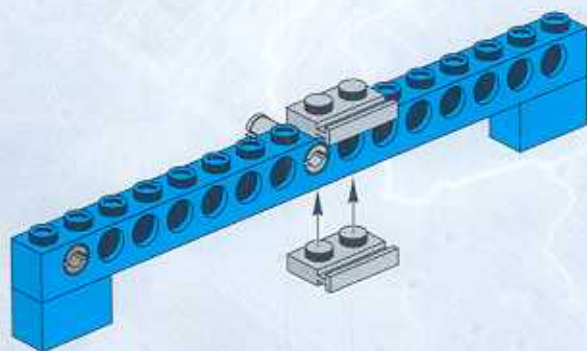


**Module 3**  
The Hoop-o-bot's hoop.

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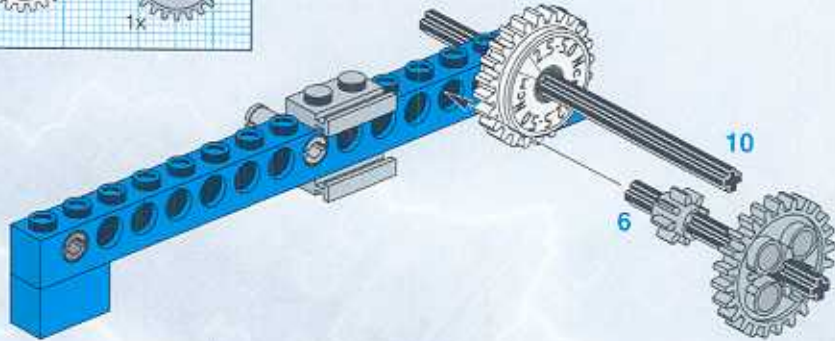
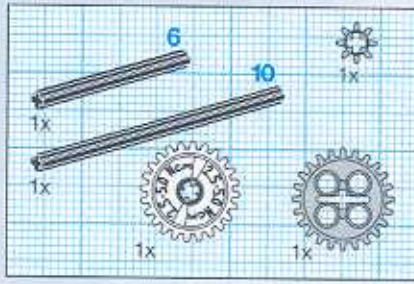


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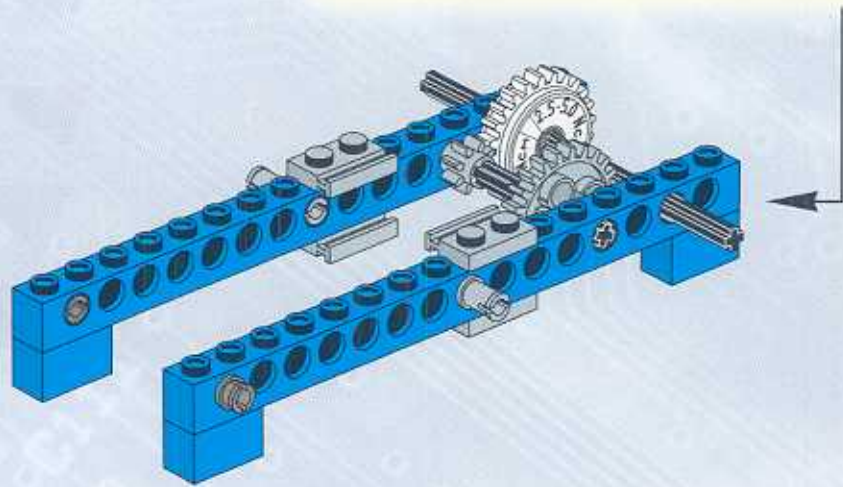
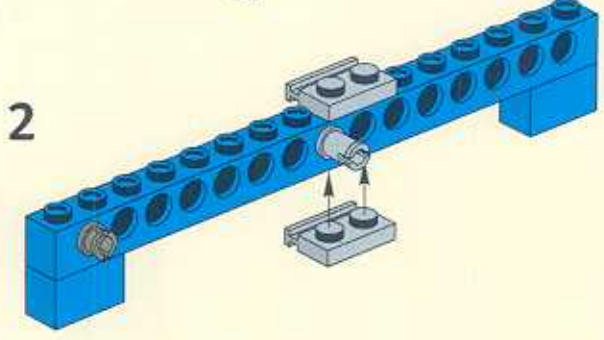
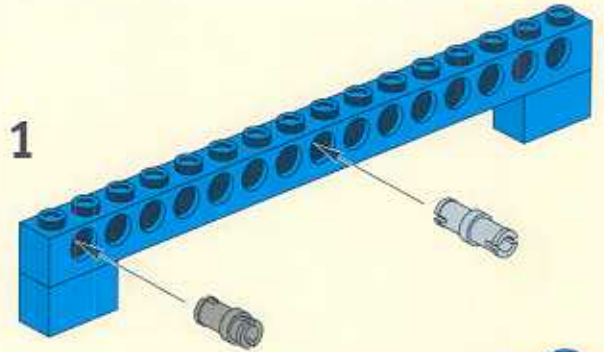
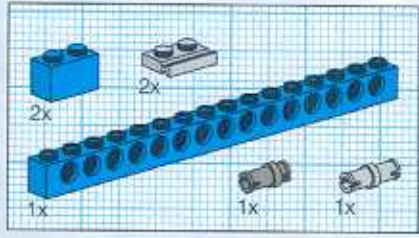




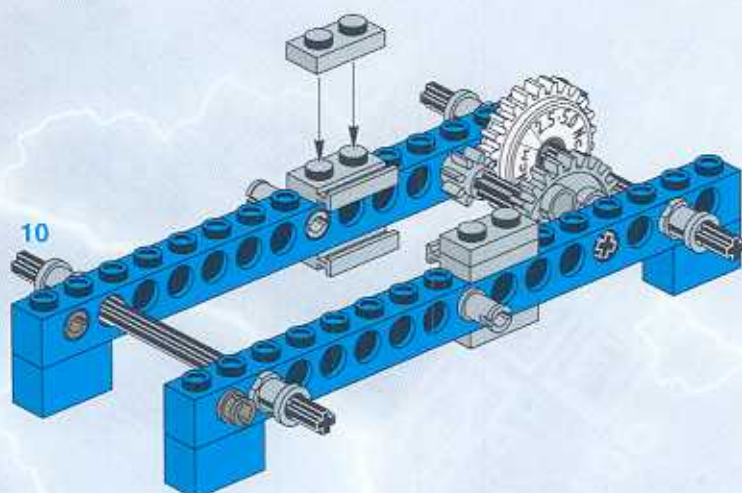
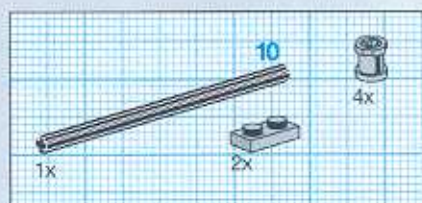
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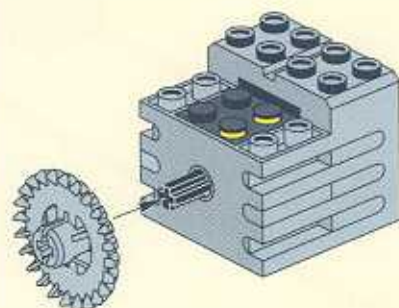
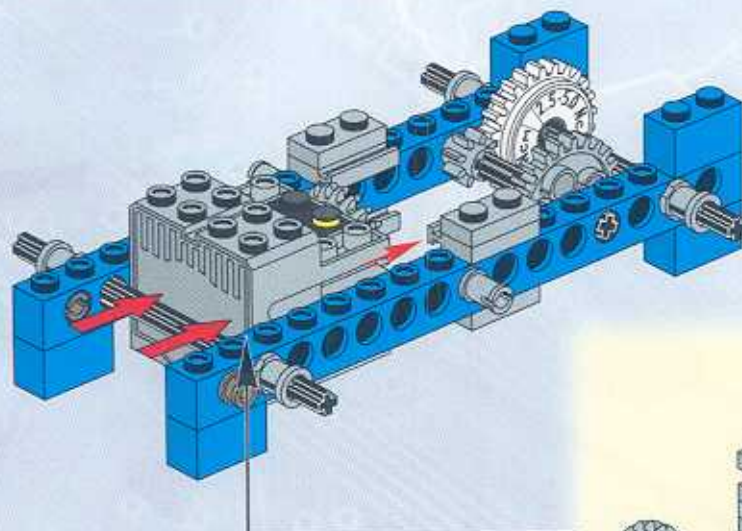
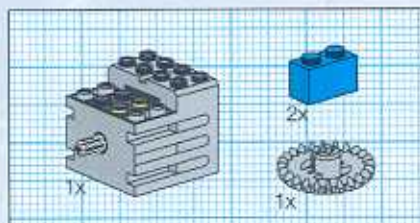
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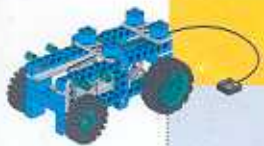


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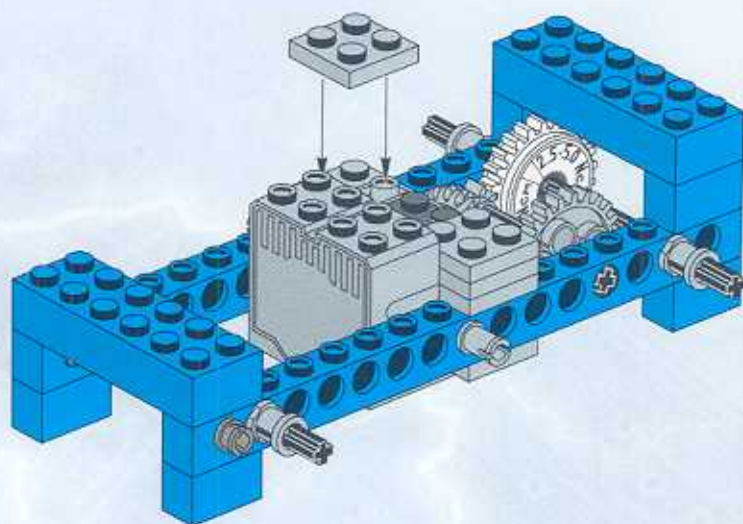
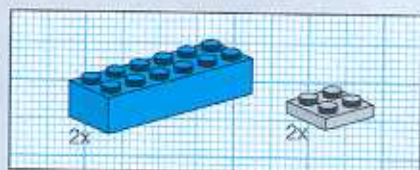


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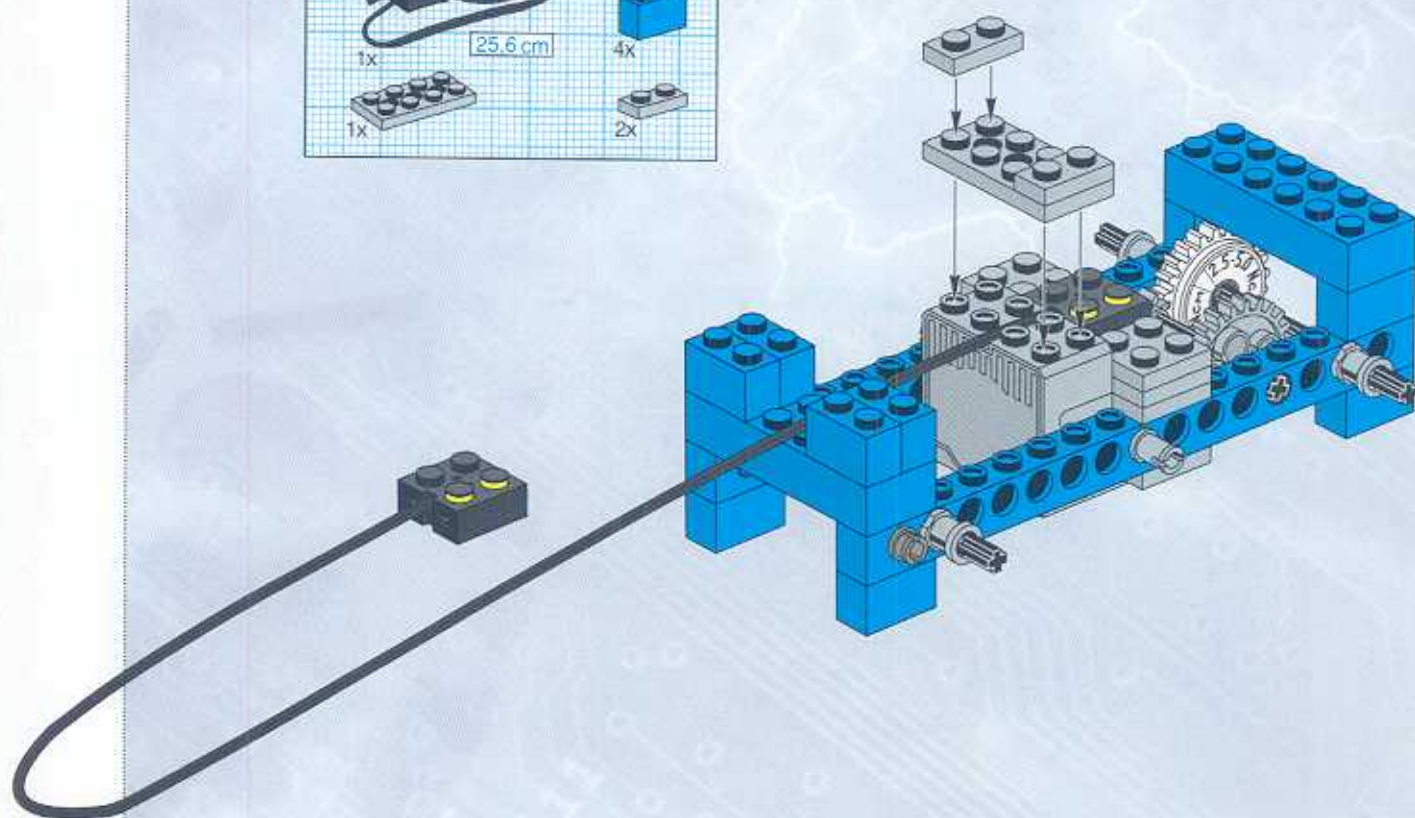
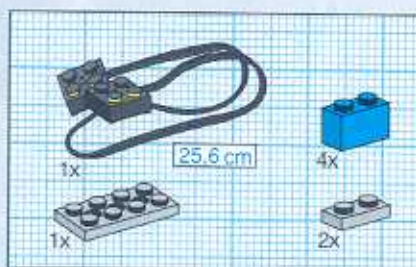


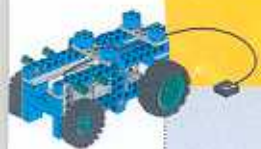


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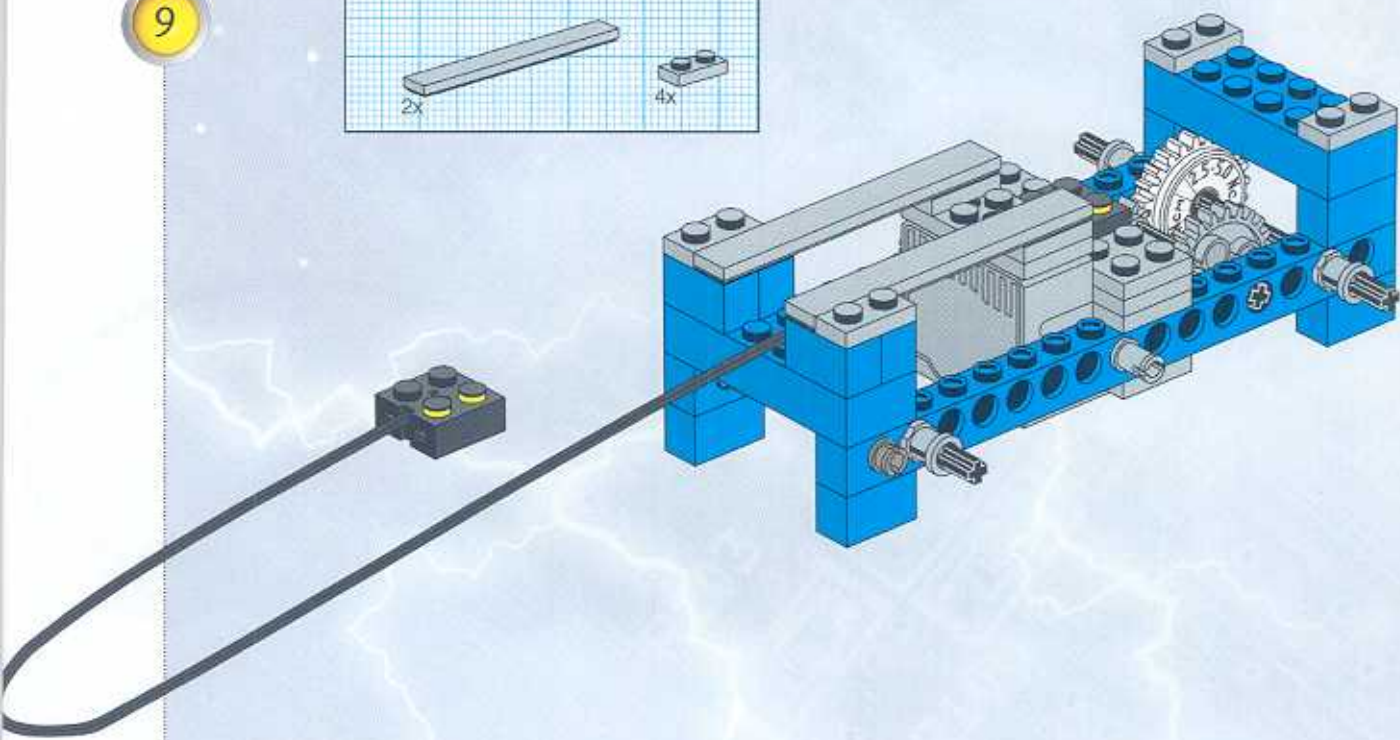
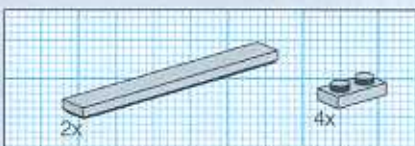


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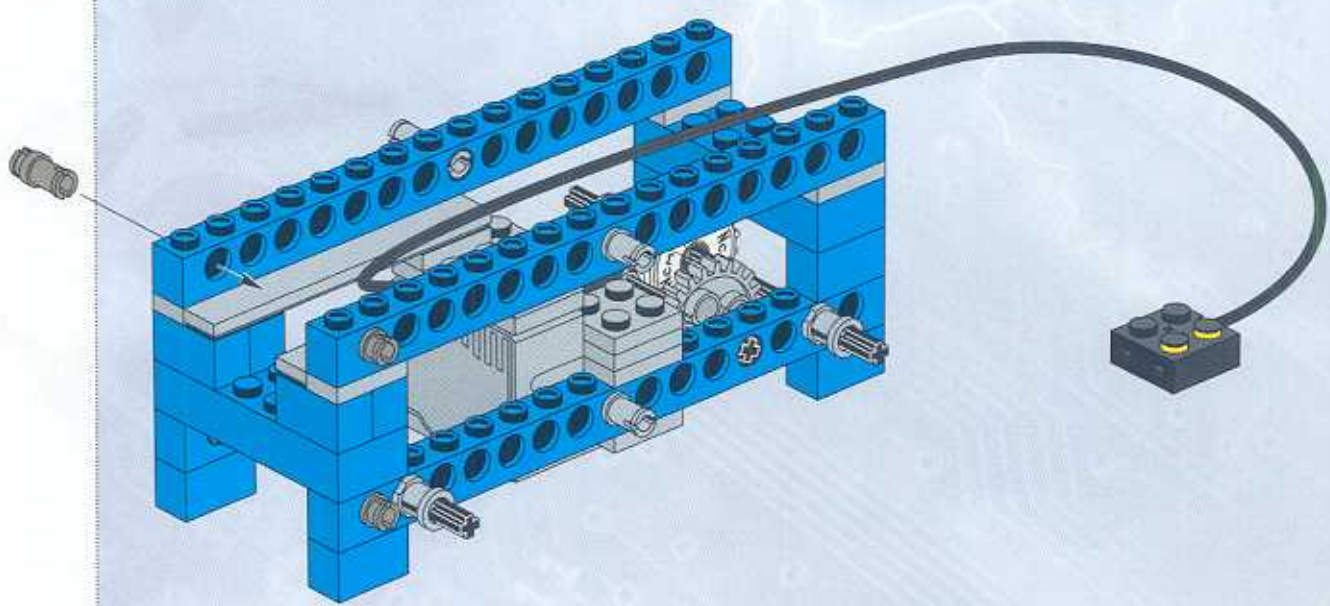
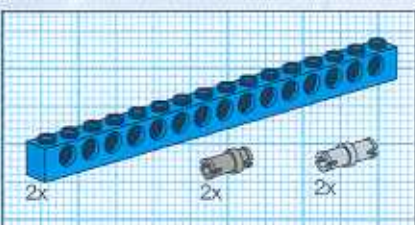




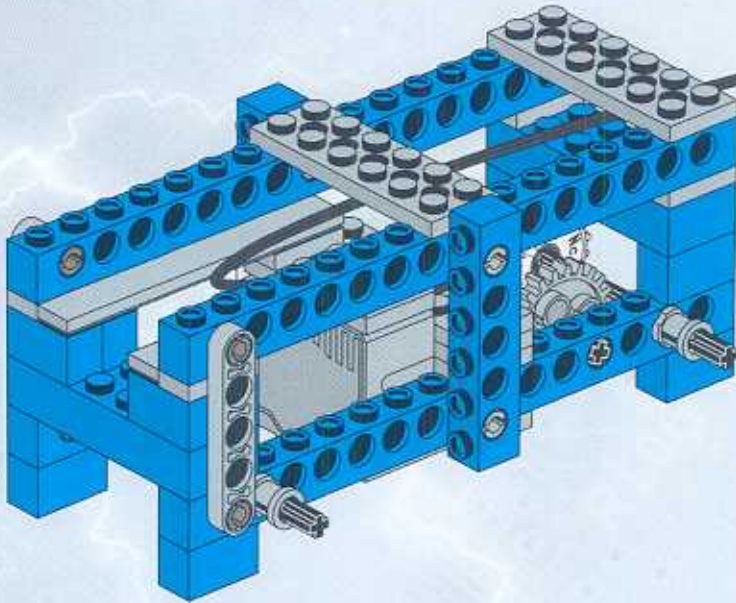
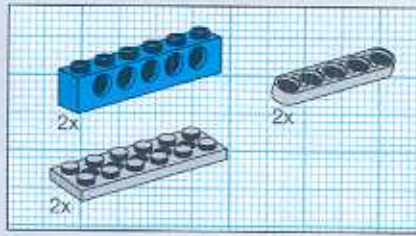
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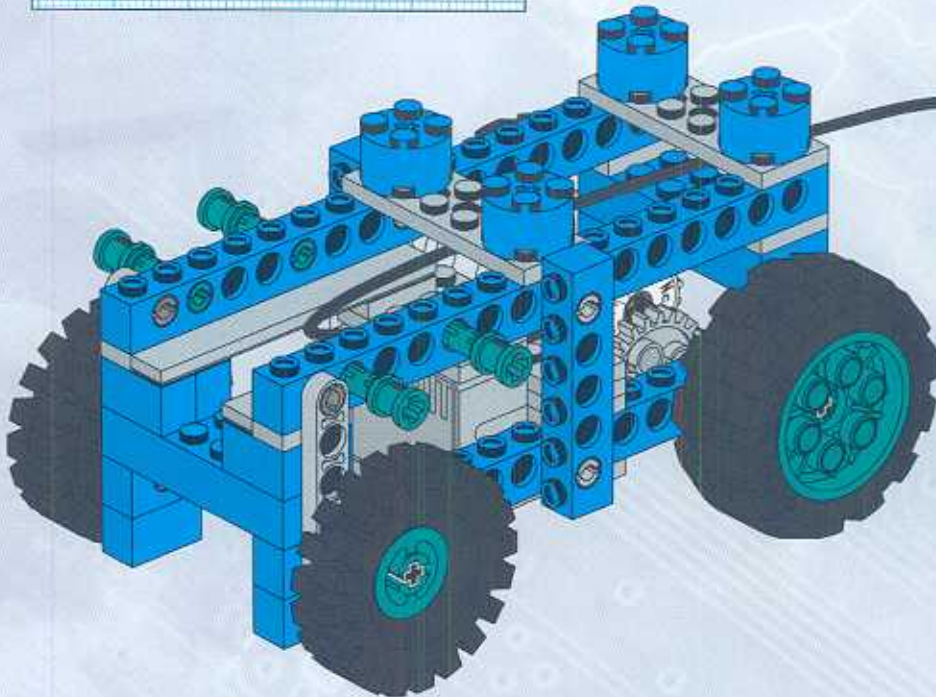
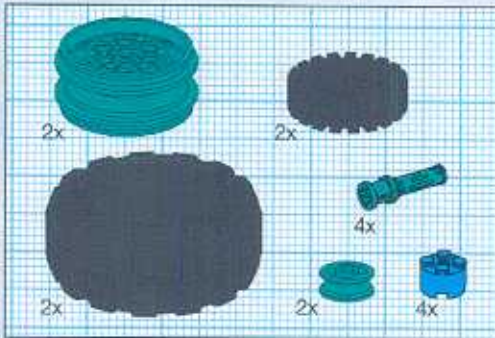
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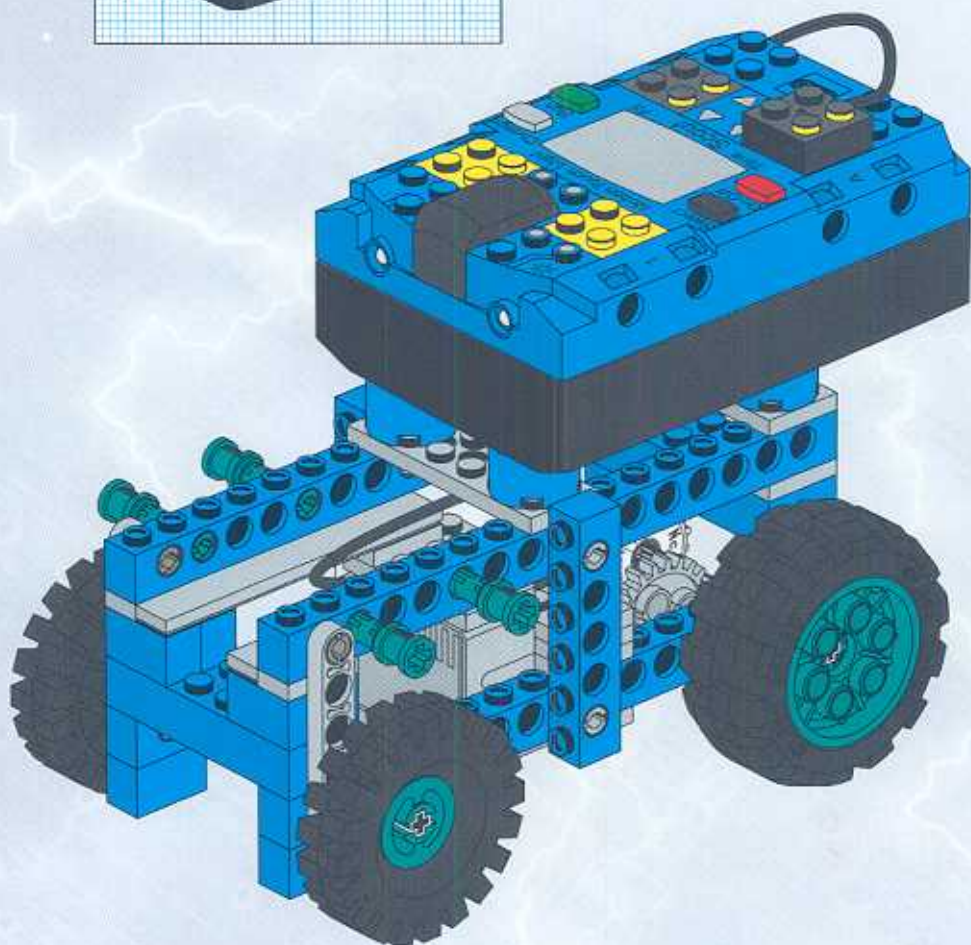
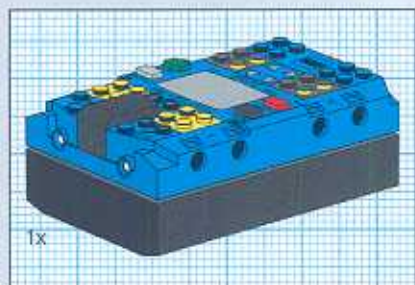


12





13



### Checkpoint 1: Testing your Hoop-o-bot's Drive

1. Place your Hoop-o-bot on a smooth floor.
  2. Make sure the Scout is turned on.
  3. Set the Motion to Forward.
  4. Press Run.
- Your Hoop-o-bot should move forward.*
5. Press Run to stop.

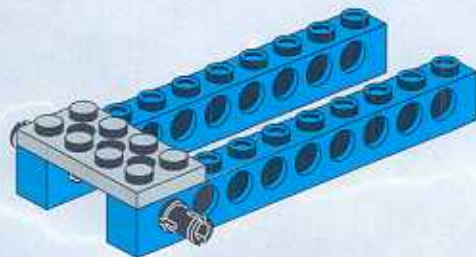
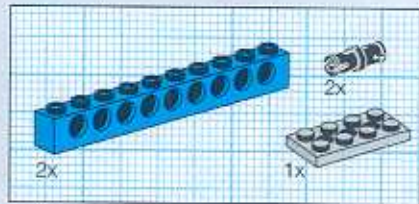
*If your Hoop-o-bot backed up, make sure the wires are connected to the Scout as shown in the Building Instructions.*



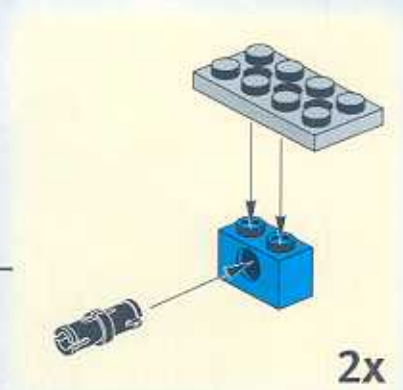
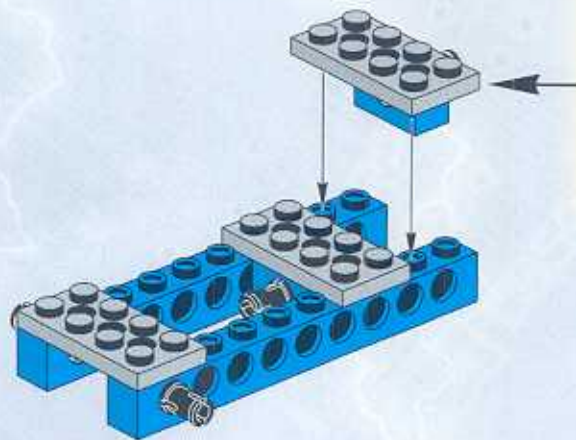
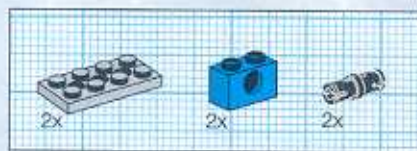
# Module 2



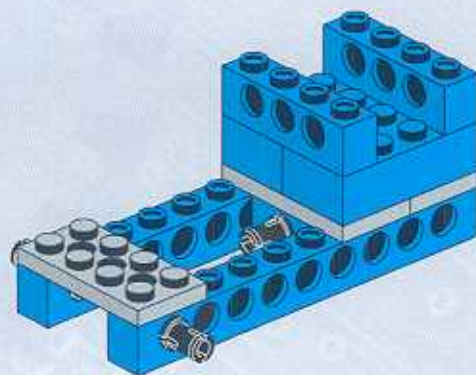
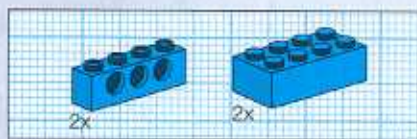
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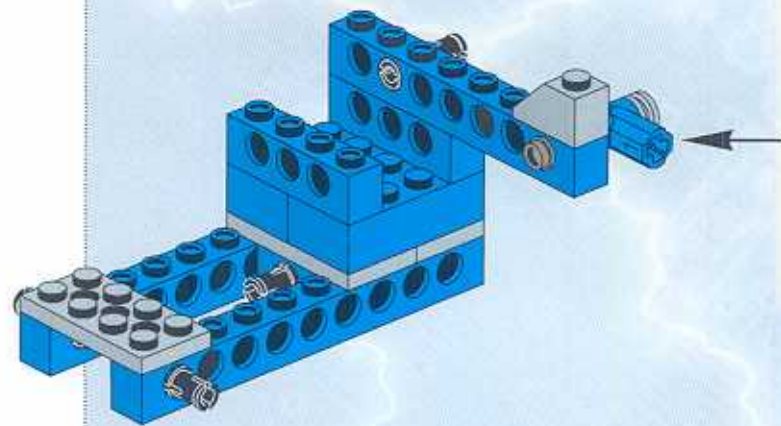
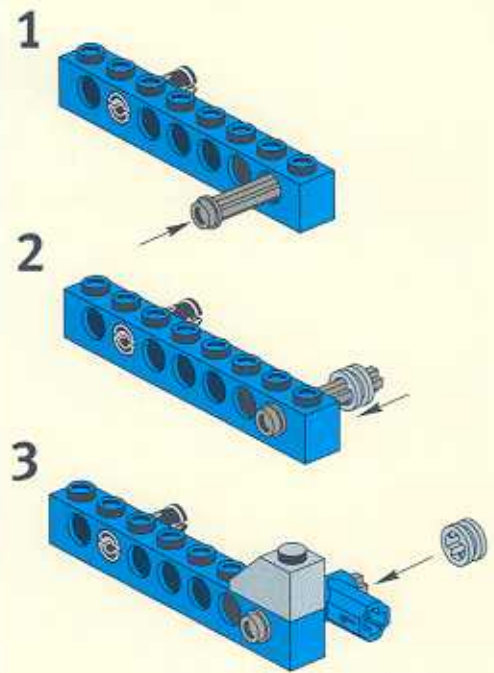
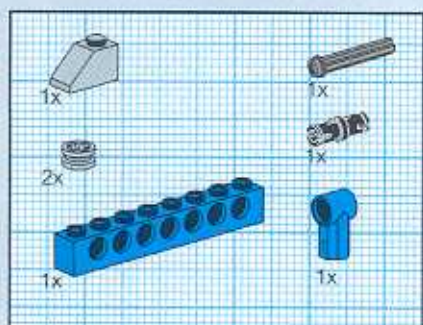


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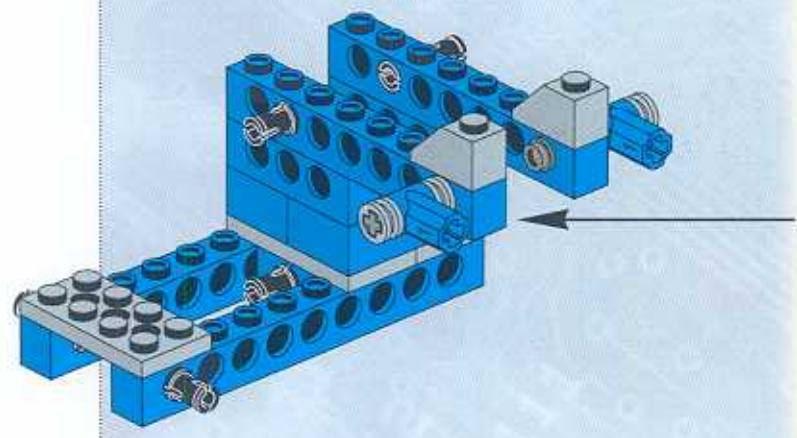
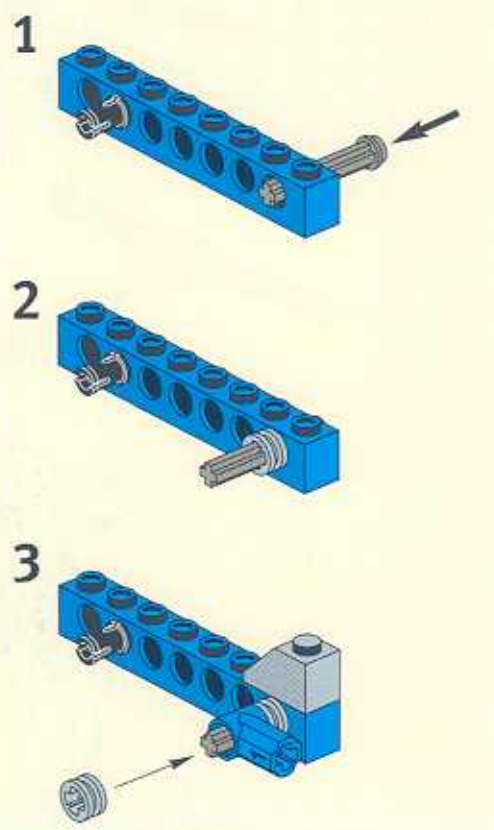
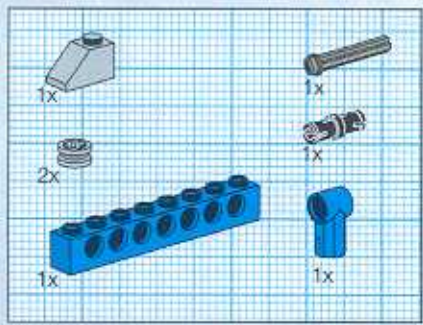


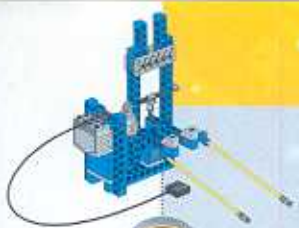


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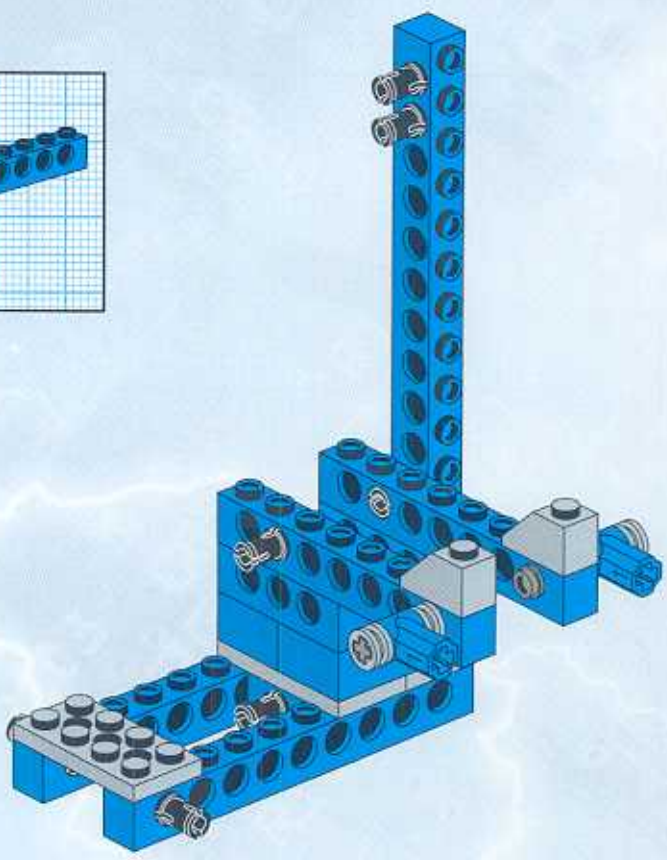
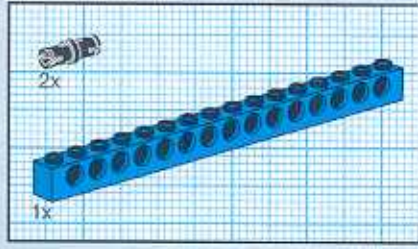


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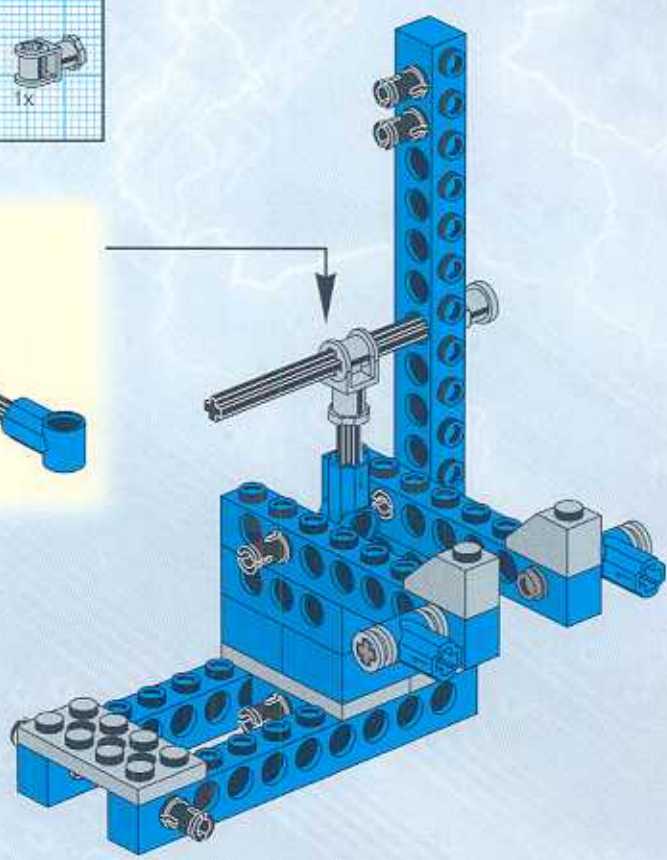
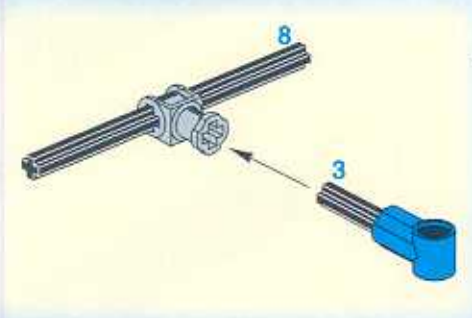
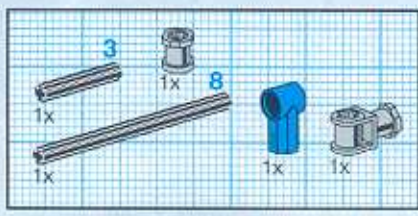




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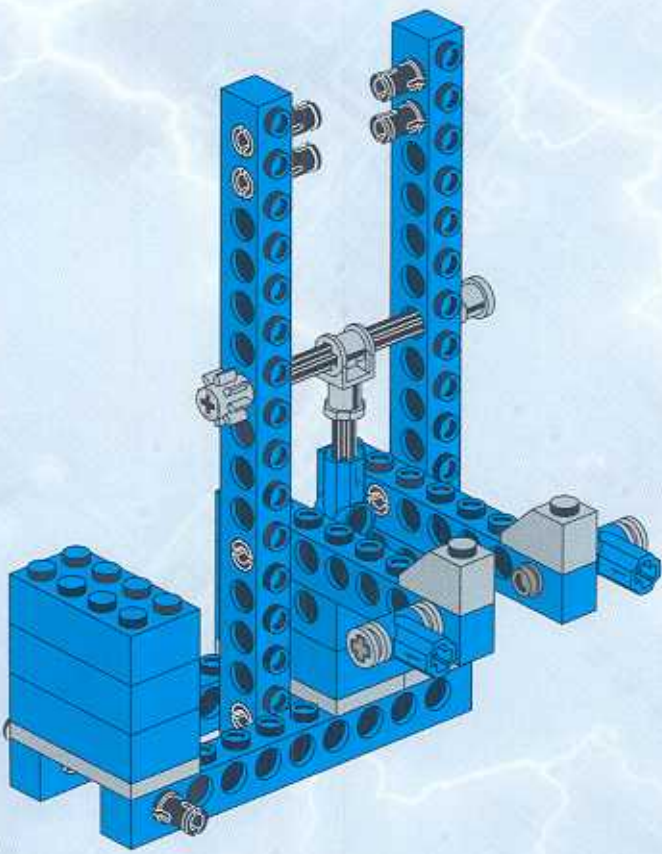
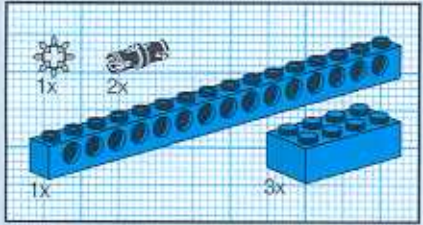


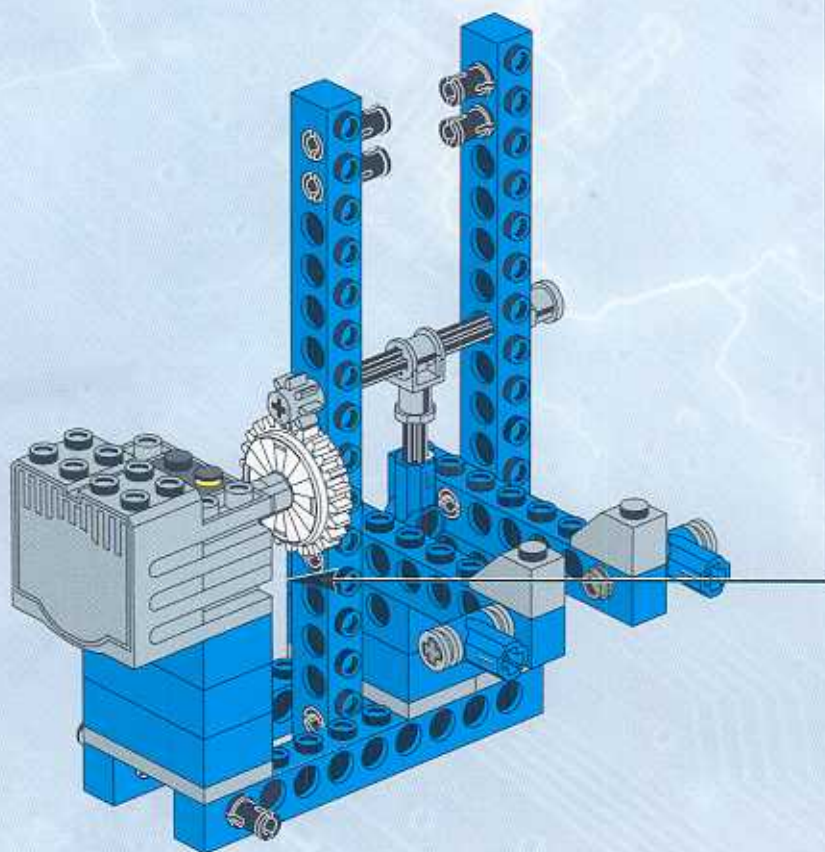
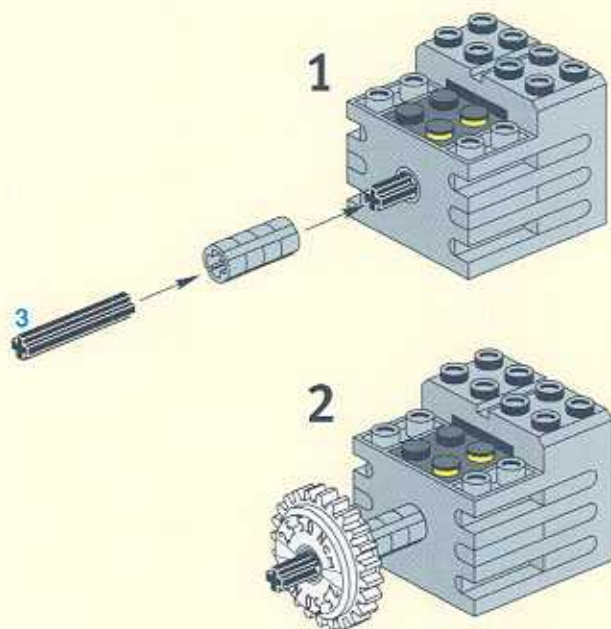
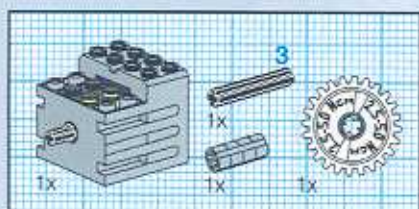
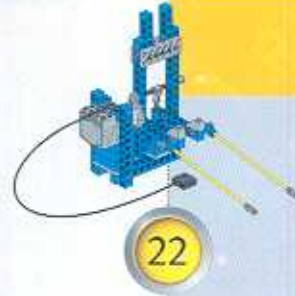
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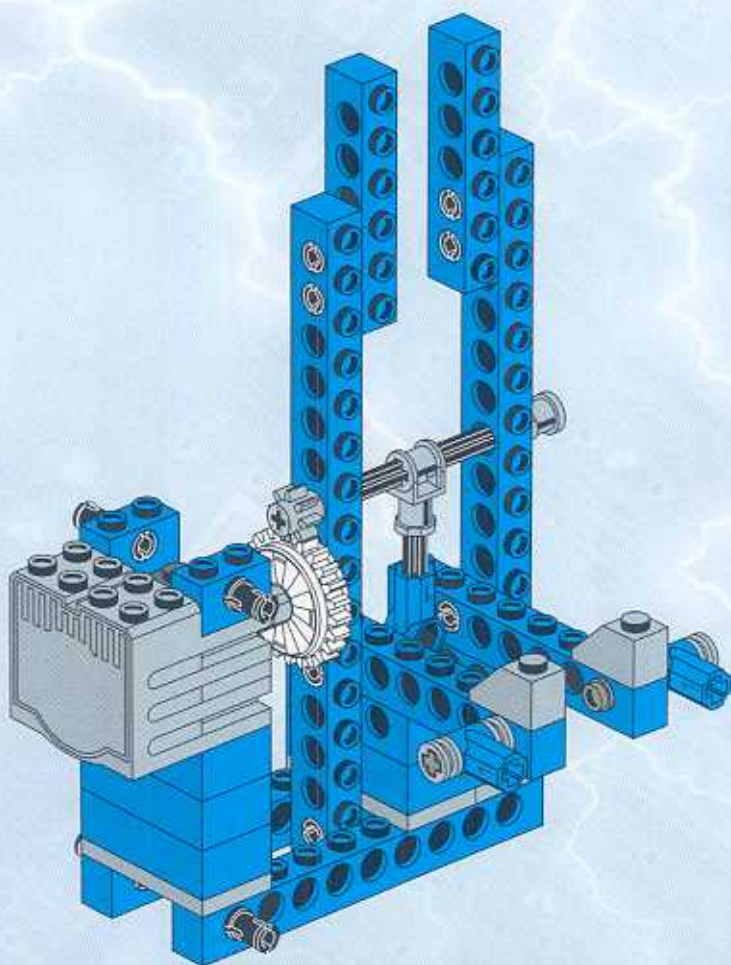
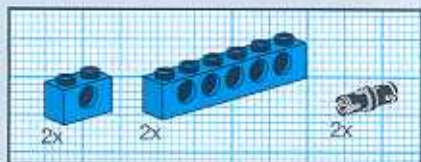


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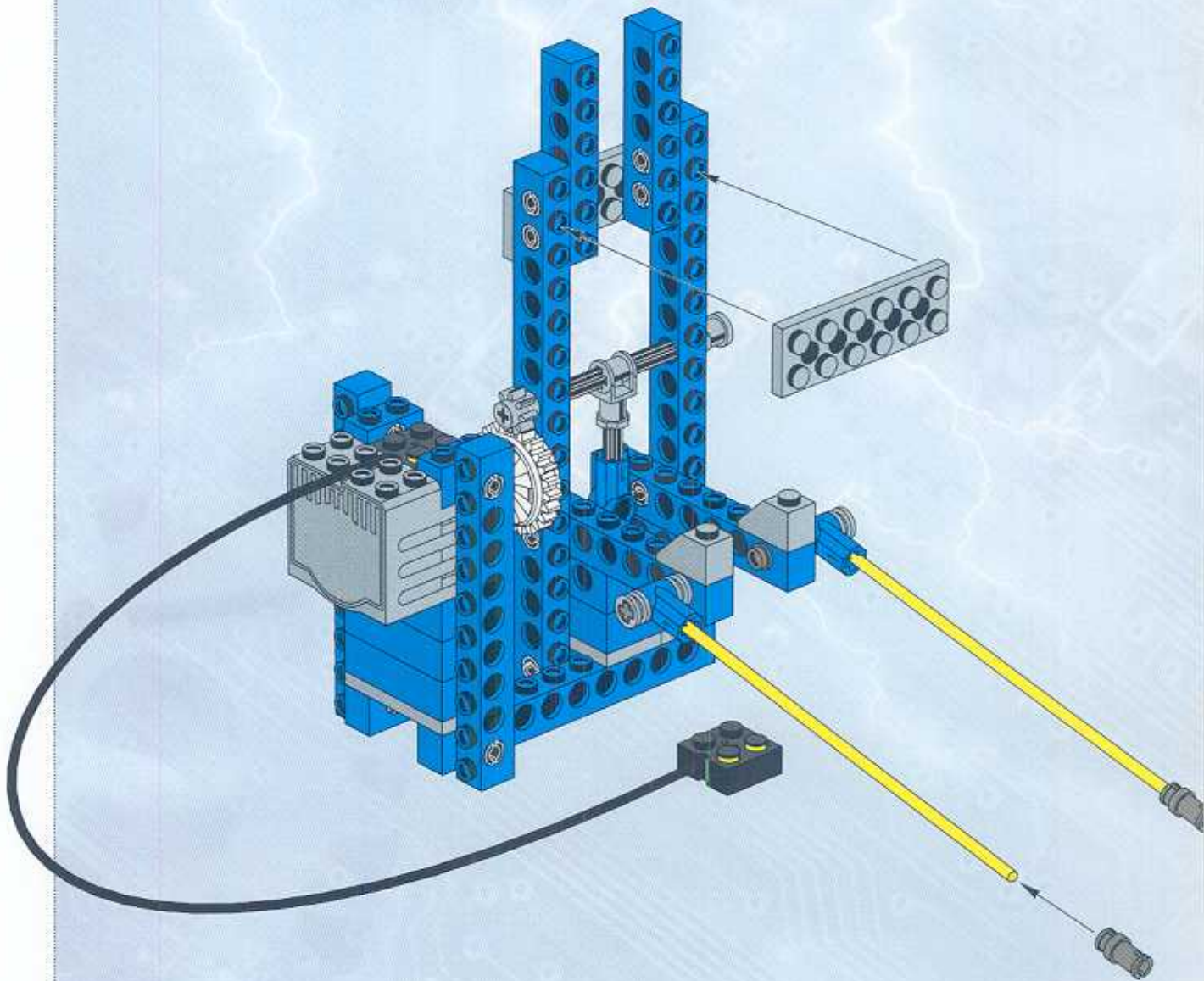
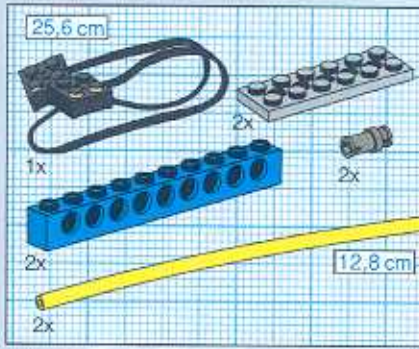




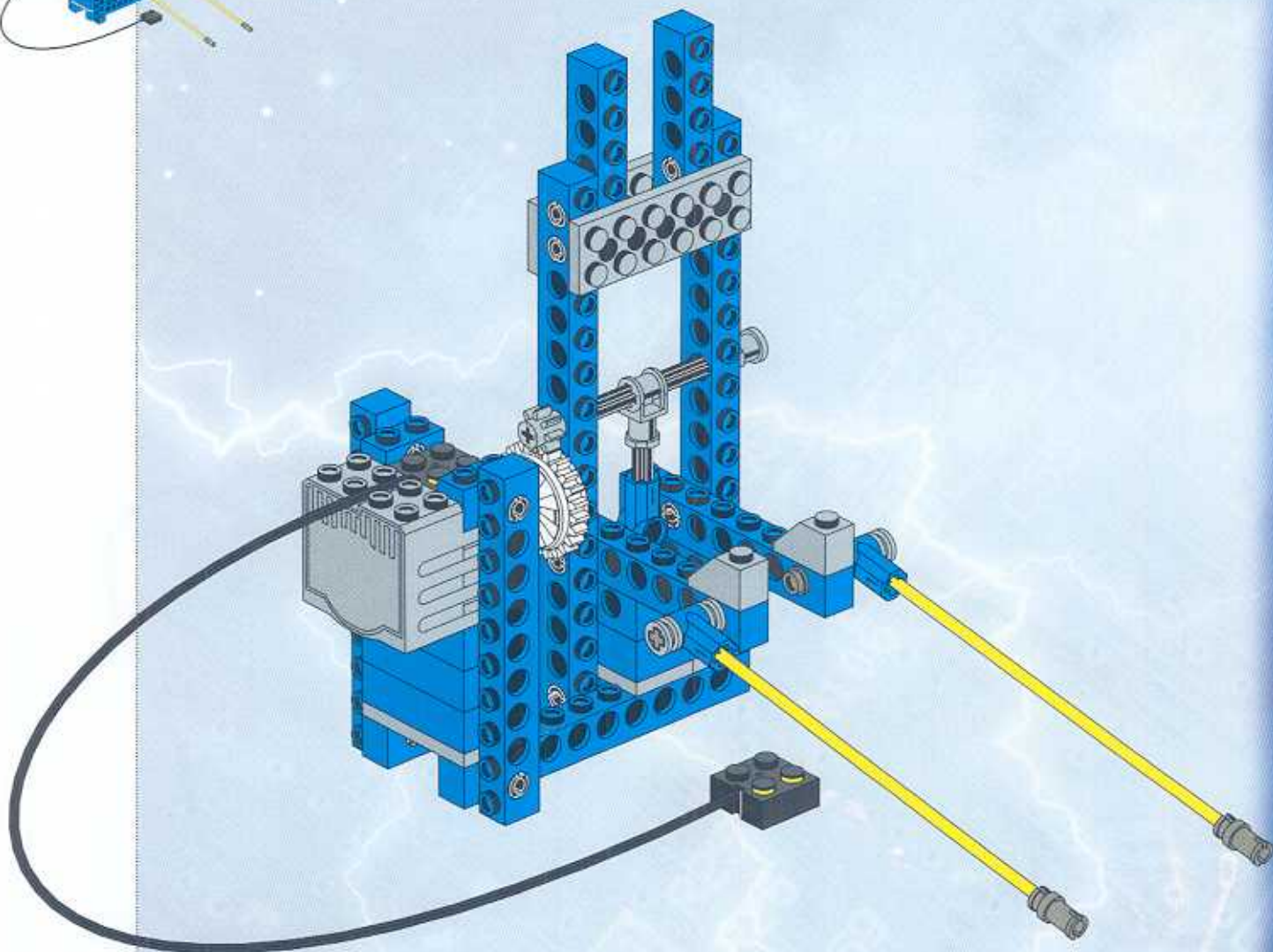
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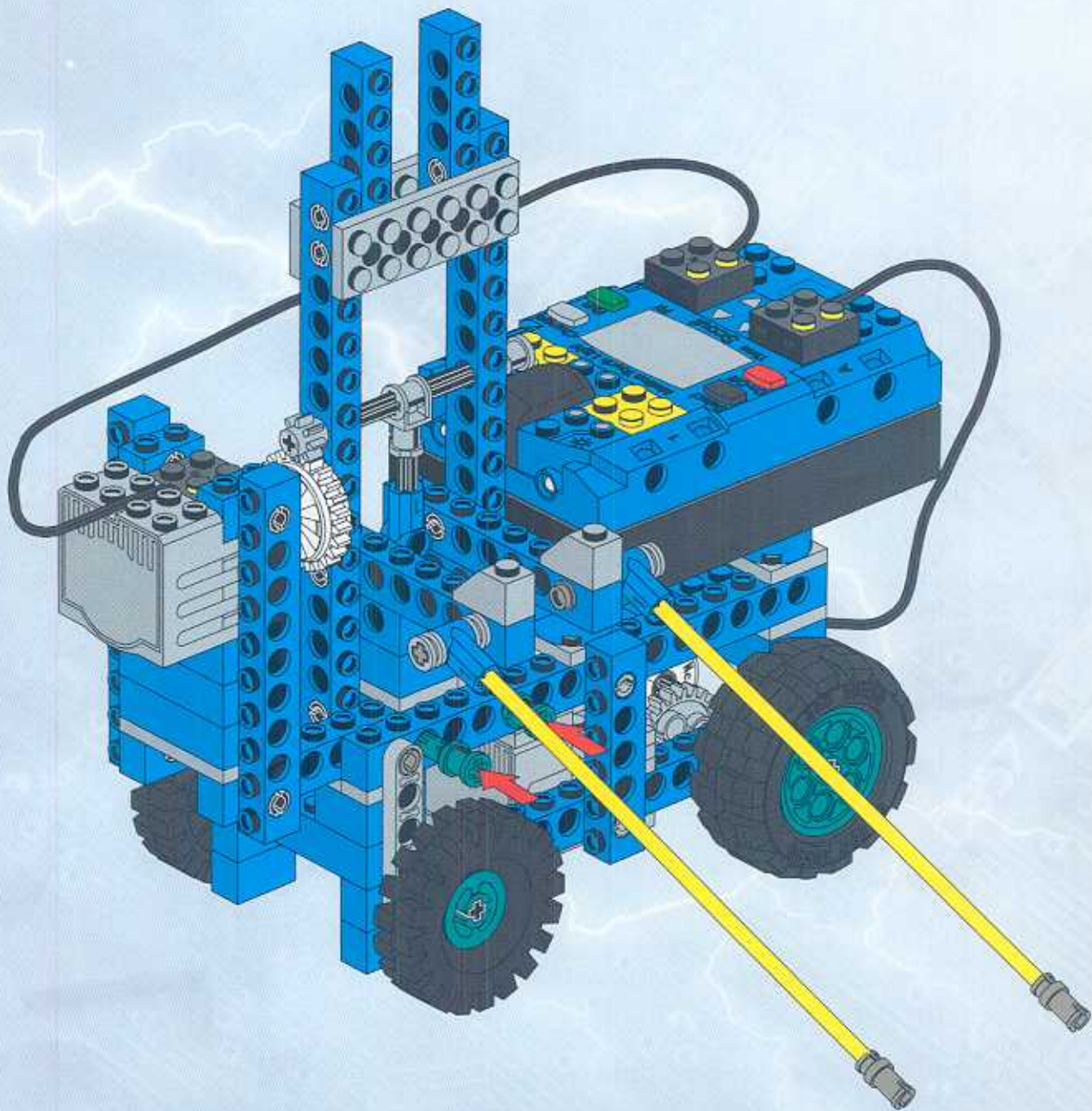
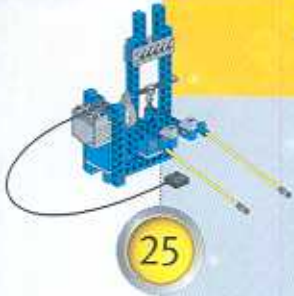




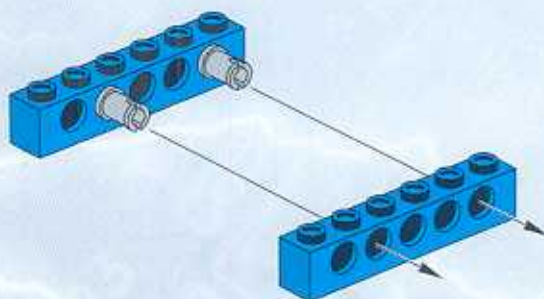
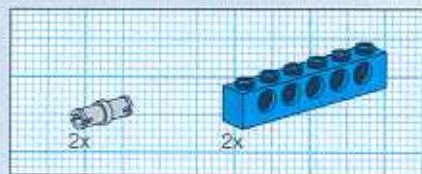
### Checkpoint 2: Testing the Ball Thrower

1. Hold the ball thrower module on a flat surface.
2. Attach the wire from the ball thrower to port B on the Scout.
3. Put a ball in the ball thrower as shown in the picture.
4. Set Motion to Loop B.
5. Press Run.  
*Your Hoop-o-bot should throw the ball back to you.*
6. Press Run to stop.

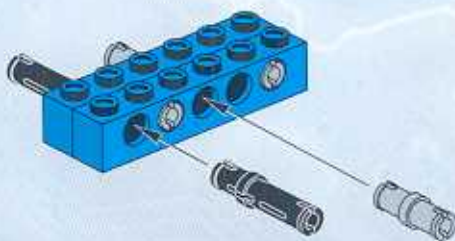
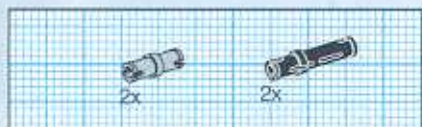




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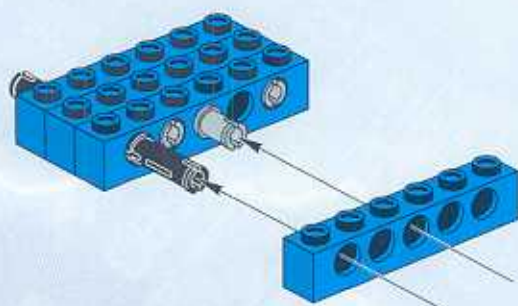
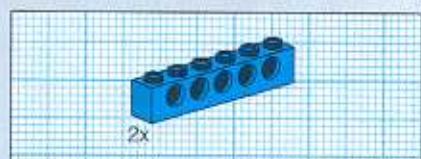


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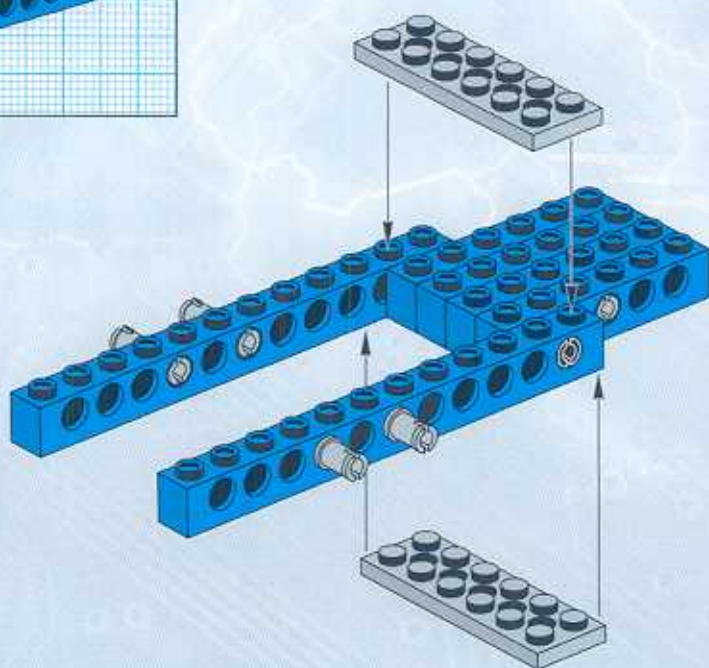
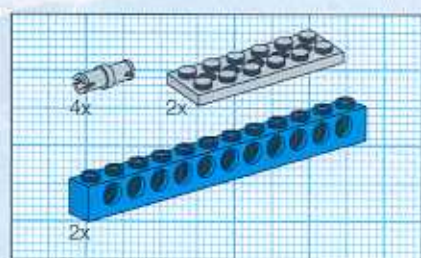




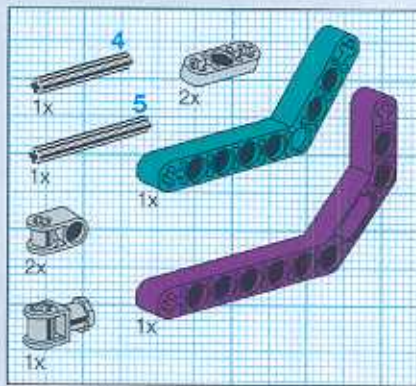
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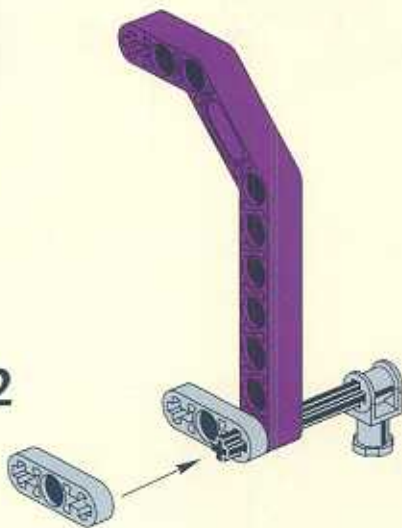




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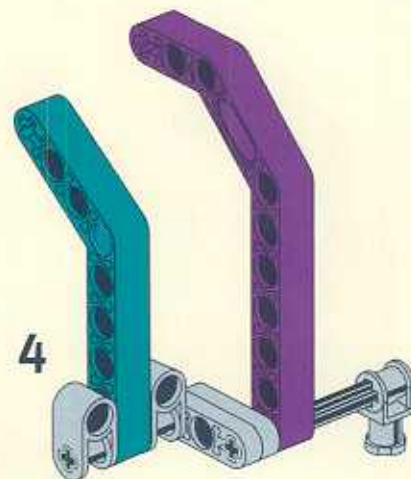
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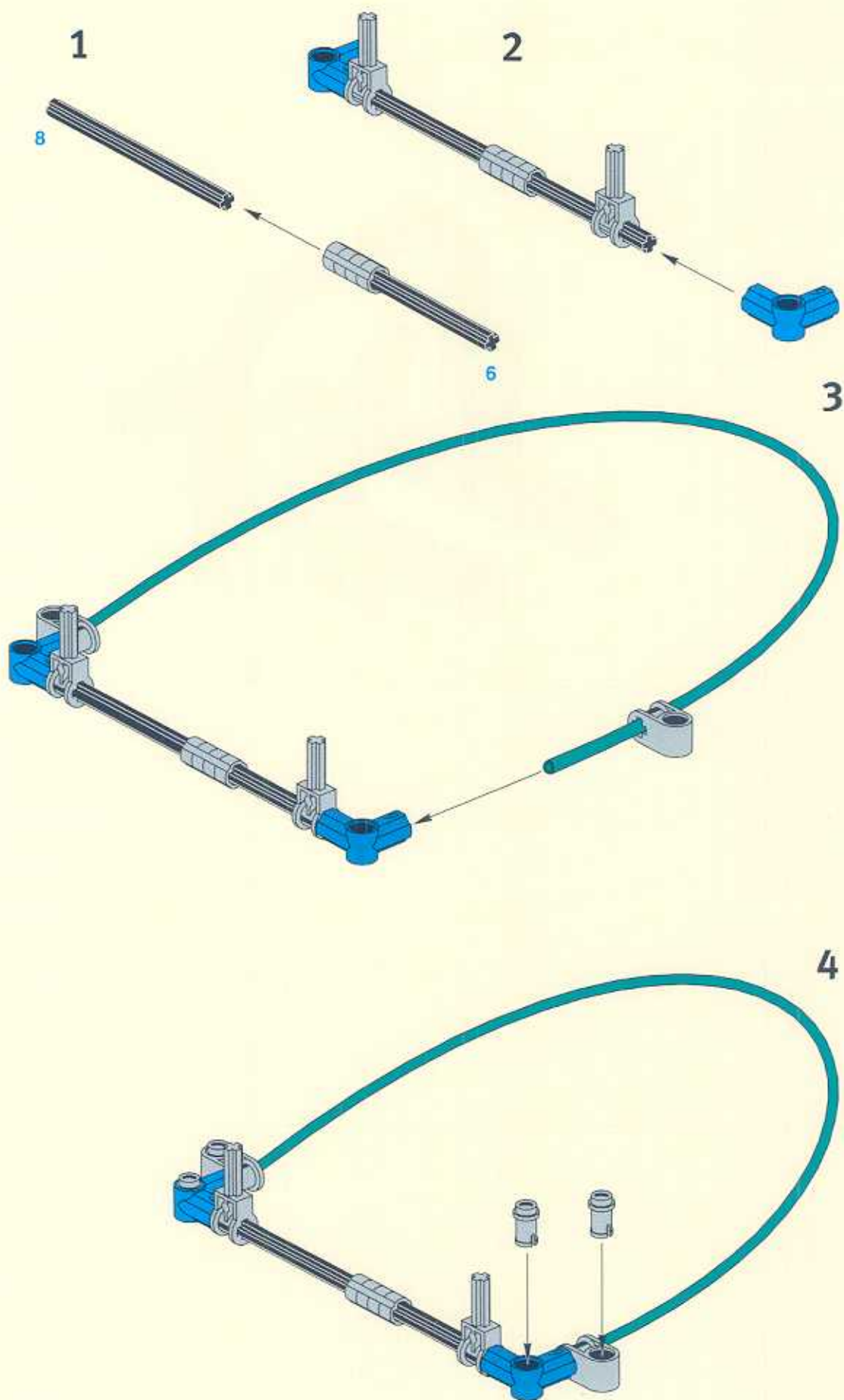
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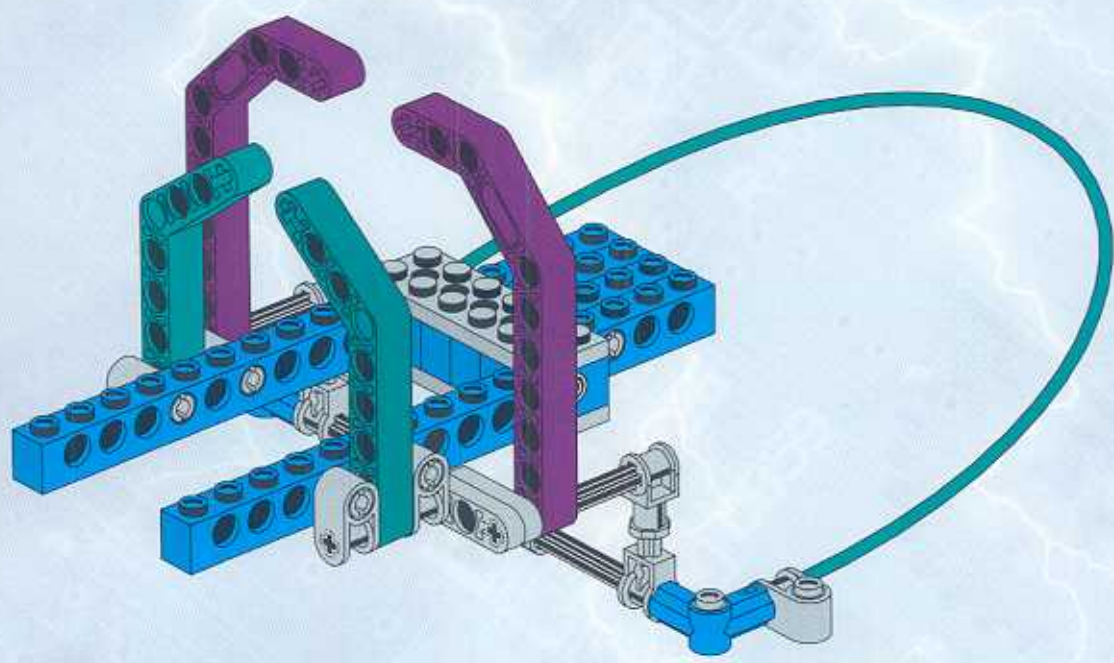
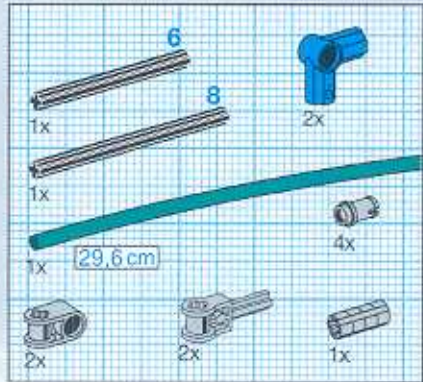
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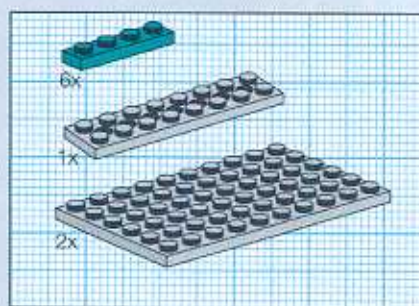




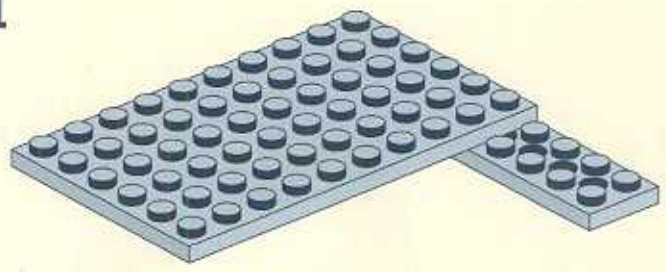




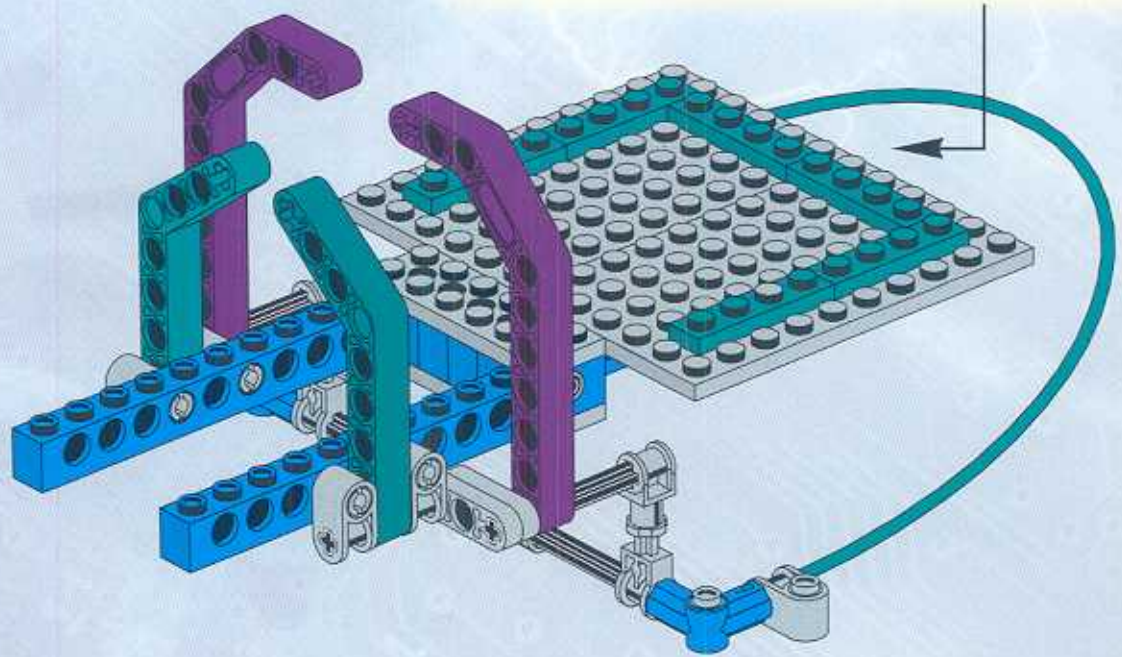
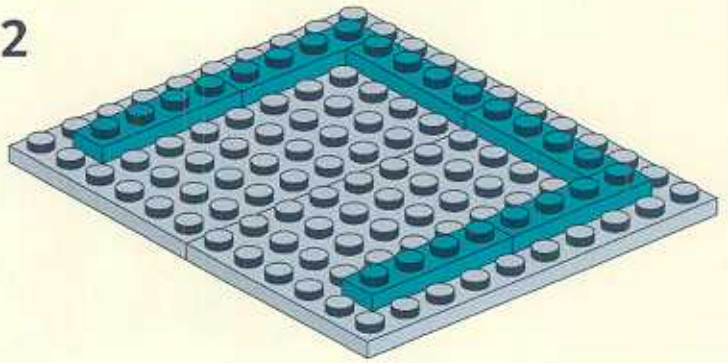
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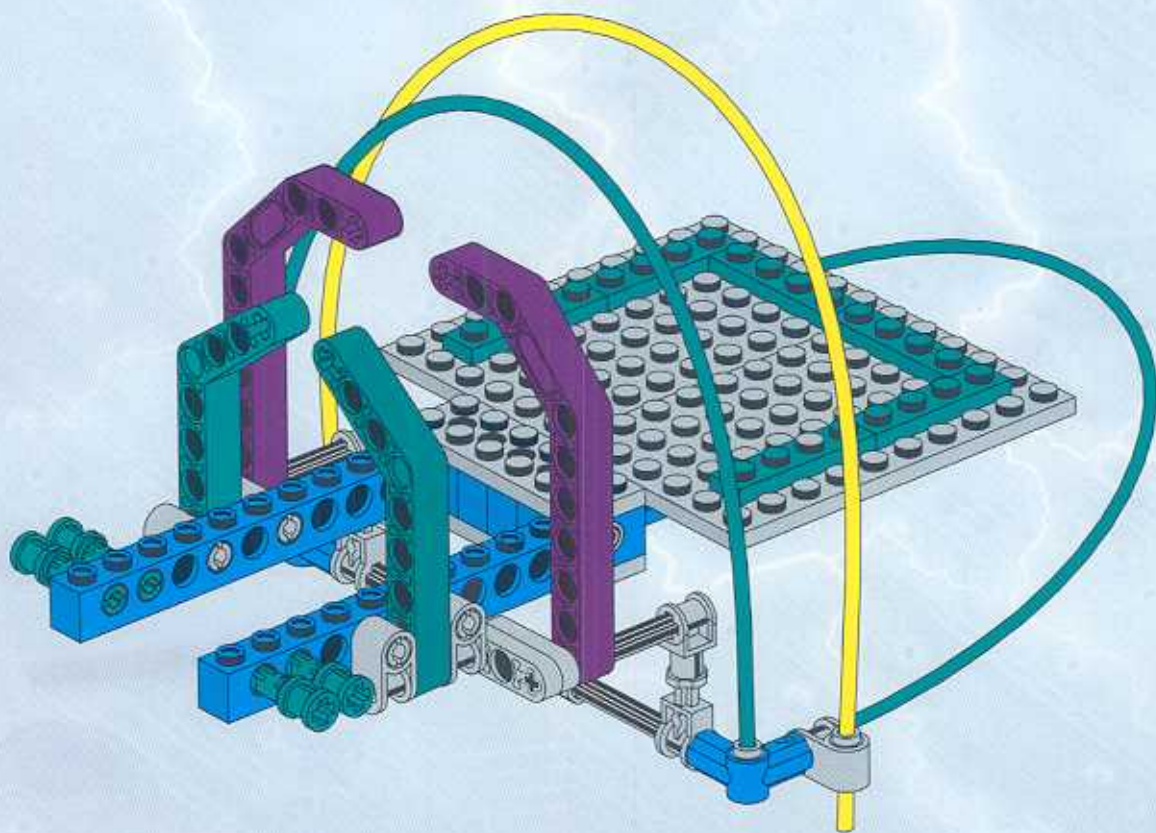
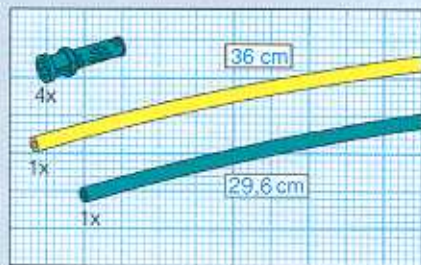
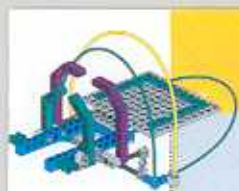


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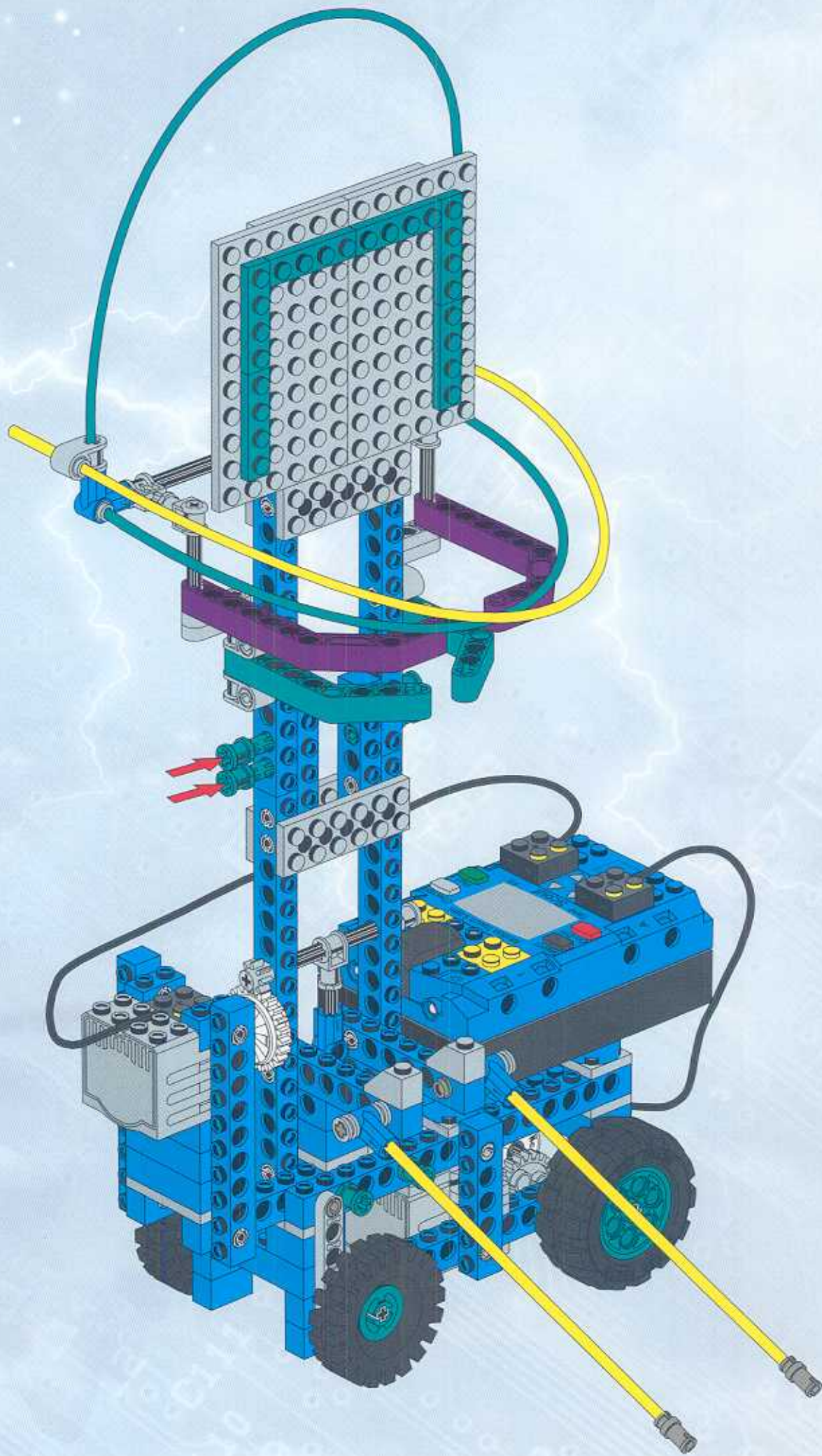
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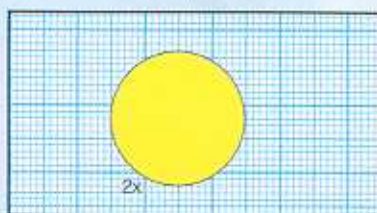
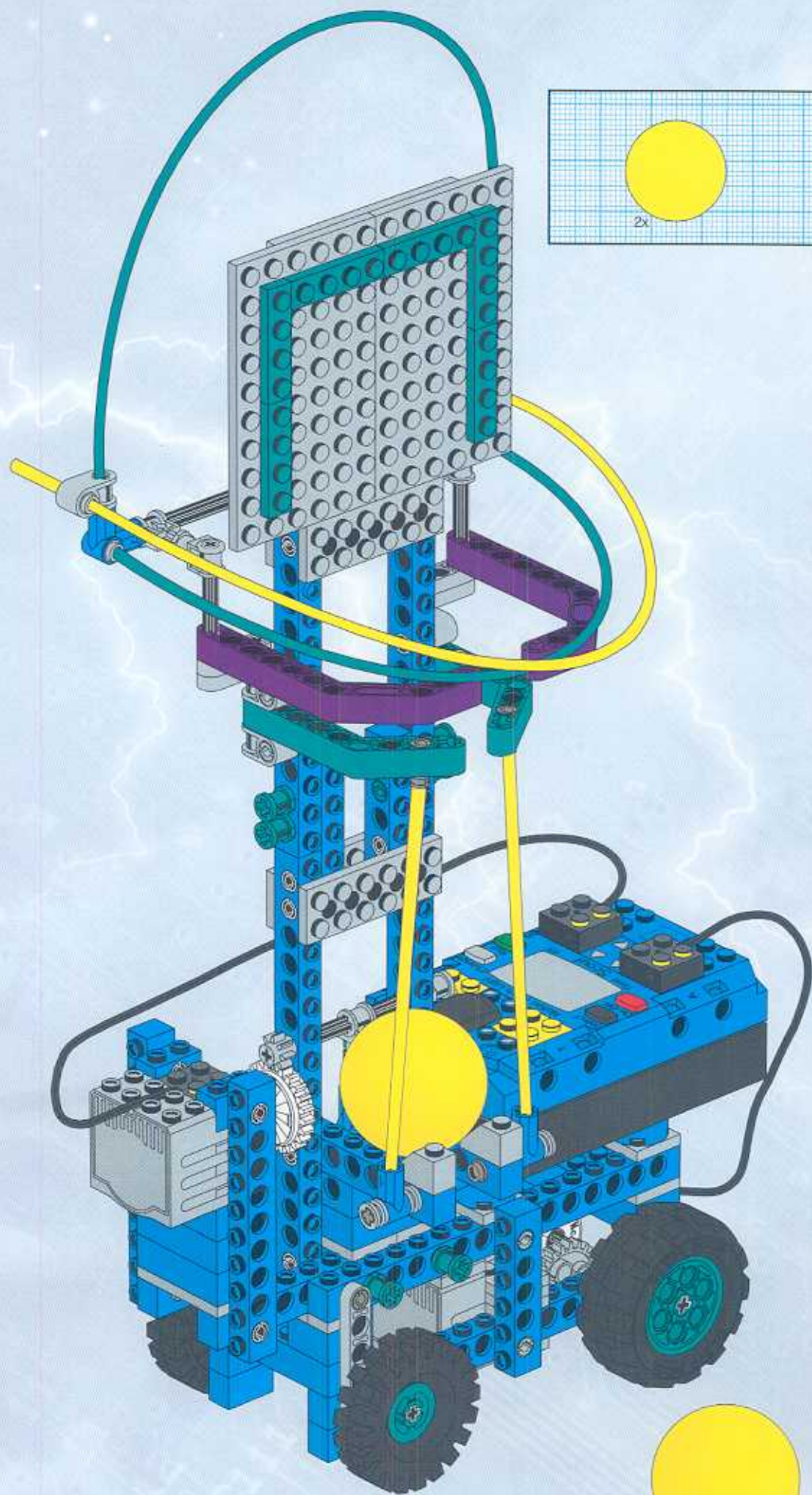


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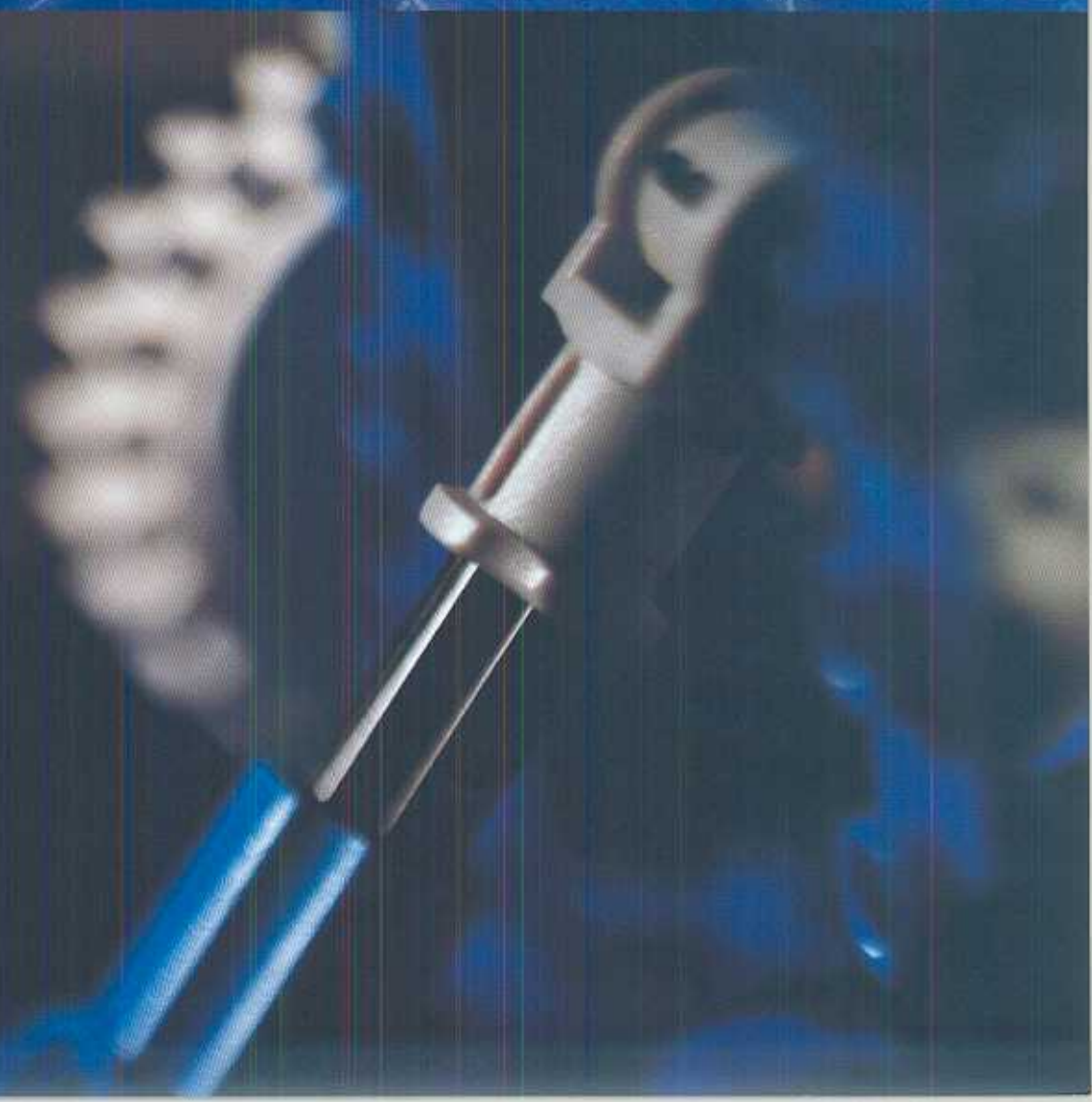


## EXPLORATIONS

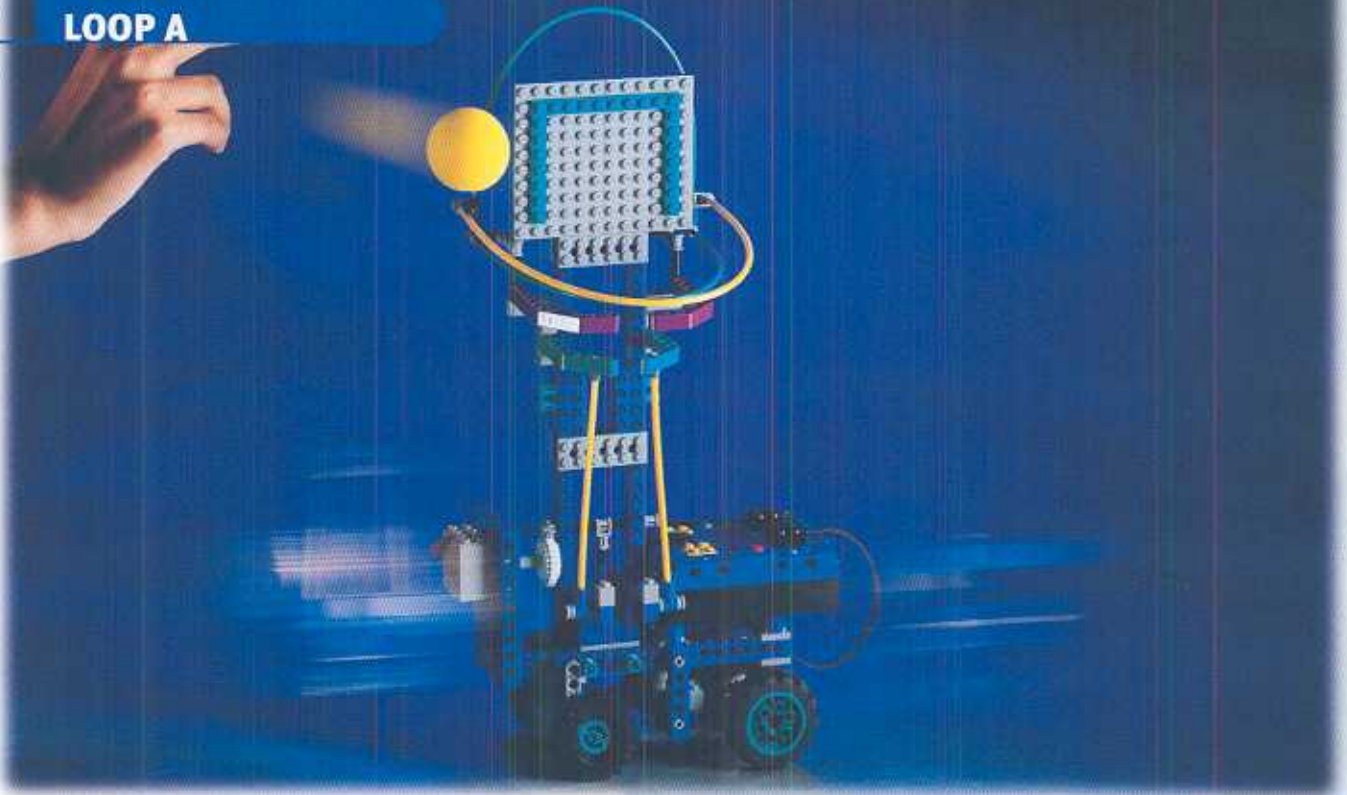
*Part 1 – Dodging the Ball*

*Part 2 – Returning the Ball*

*Part 3 – Mix it all up*



### LOOP A



The Loop A command will tell your Hoop-o-bot to drive from side to side.

1. Set the Scout's Motion to Loop A.

*If you need help, see the Getting Started chapter of the Bug Book.*

2. Press Run.

Your Hoop-o-bot should:

- drive to one side
- drive to the other side
- stop for a little bit
- and repeat

3. Try getting the ball into your Hoop-o-bot as it moves.

4. Press Run to stop.





## LOOP B



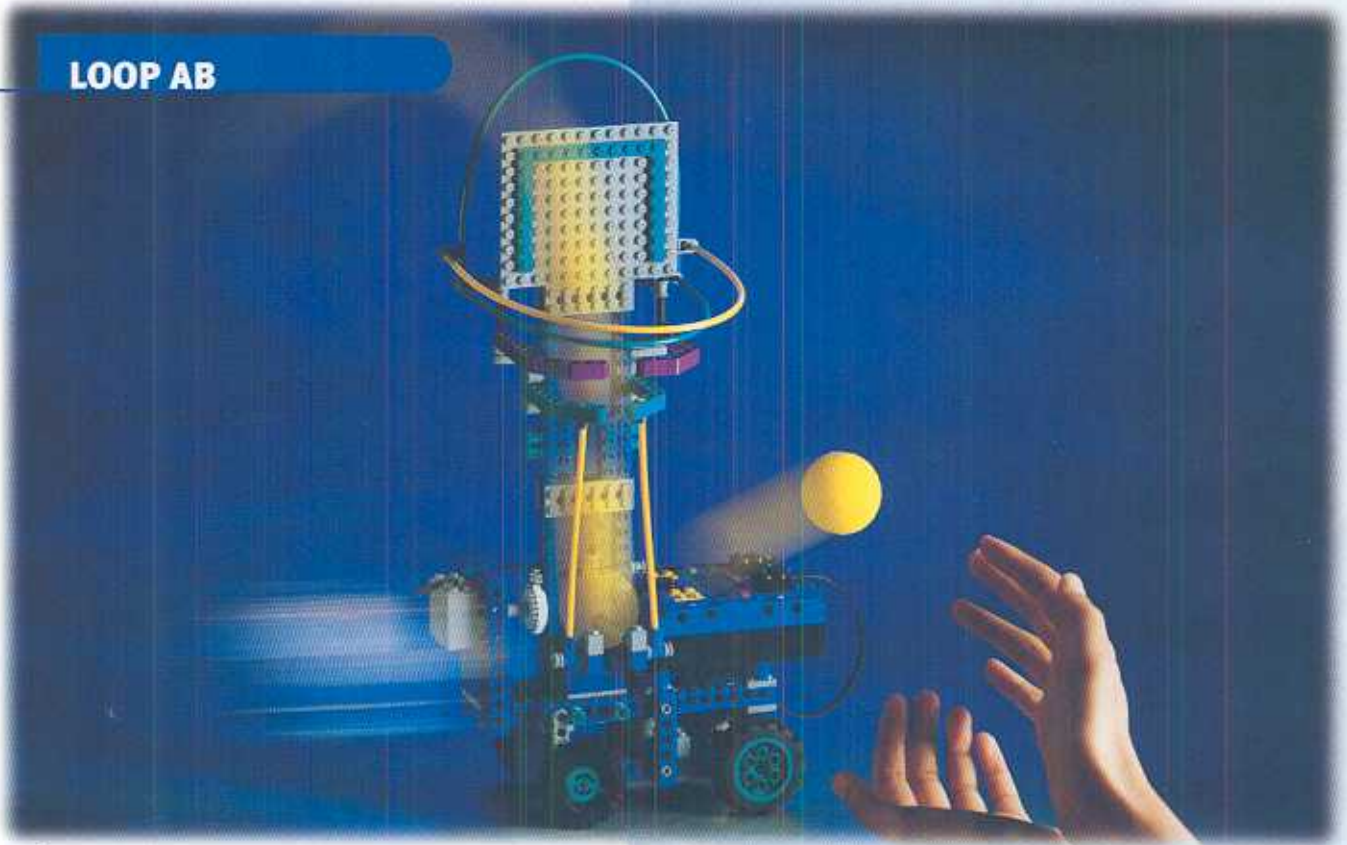
Ever have a friend who didn't give your ball back? Loop B makes the Hoop-o-bot throw the ball back to you.

1. Set Motion to Loop B.
2. Press Run.
  - The thrower arm should:
    - turn one way
    - turn the other way
    - and repeat
3. Try shooting the ball so that your Hoop-o-bot throws the ball back to you.
 

*The throwing arm has to be all the way back for the ball to go in.*
4. Press Run to stop.



LOOP AB



Try the Hoop-o-bot with both of the motors looping back and forth.

1. Set Motion to Loop AB.
2. Press Run.  
Your Hoop-o-bot should drive from side to side while the thrower arm spins back and forth.
3. Try getting the ball in now.
4. Press Run to stop.





## CHALLENGES

*Special Features*

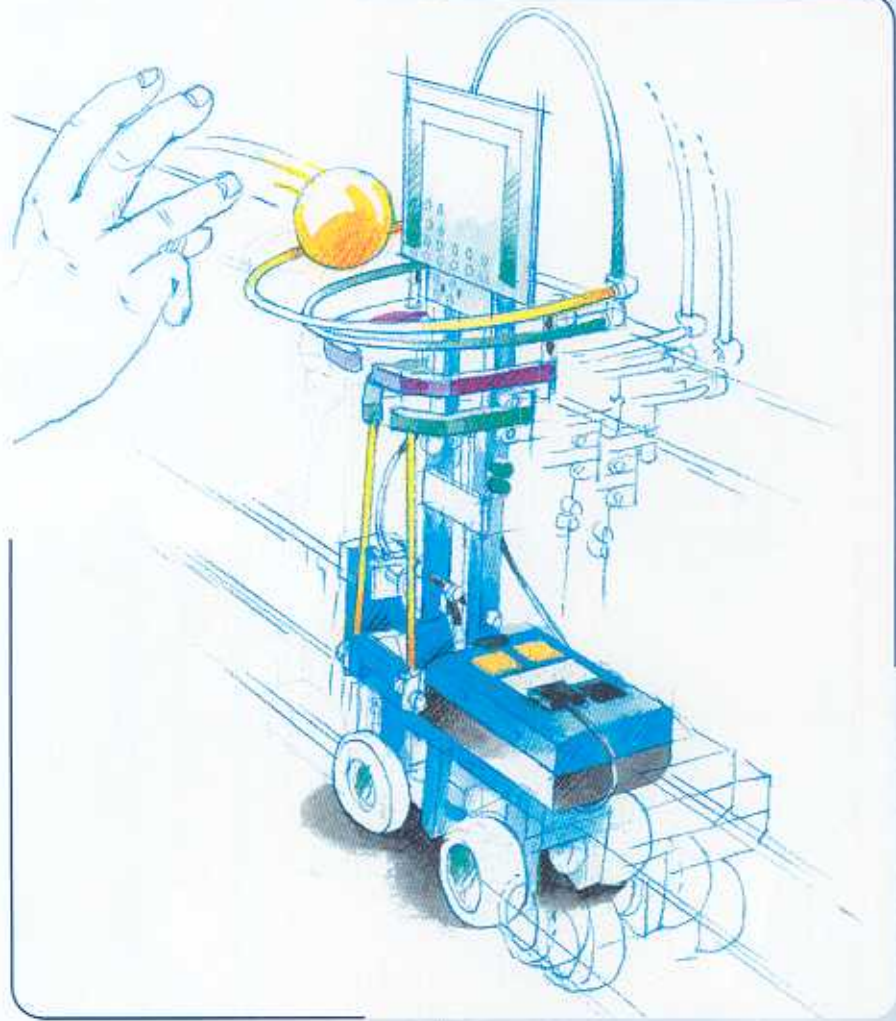
*Tips & Tricks*



## 1: TAKE IT TO THE NEXT LEVEL

Add new moves to your Hoop-o-bot. See how challenging you can make the game by:

- Changing the Motion commands.
- Changing the Time Dots.
- Adding different special effects with the FX commands.



### Hint...

All Motion commands are simple patterns. Watch the green arrows to see the pattern as you try different commands with the Hoop-o-bot.

Check out Technical Stuff in Book 1 for more information on the commands.

## 2: SHINING LIGHT ON THE GAME

Try to use the light sensor to get the Hoop-o-bot to throw the ball back to you. This can be tricky, so start with the steps below.

1. Detach the wire from Motor A.

*The Hoop-o-bot has to stand still for this to work!*

2. Set up a light to shine right onto the light sensor.

*The ball should cast a shadow on the light sensor when it falls in.*

3. Set the Light command to Avoid and press Run.

- 💡 Try throwing the ball into the hoop to see if it throws it back.

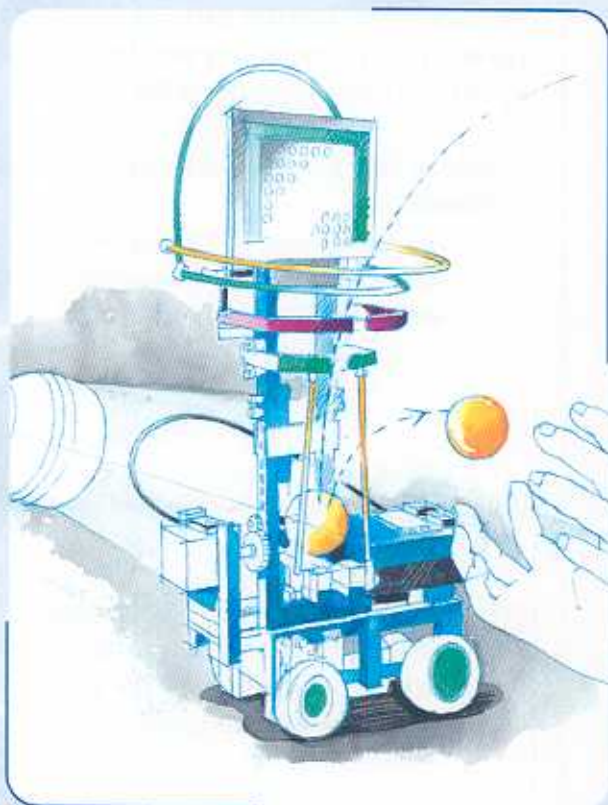
*You may need to move the light to get it just right.*

Can you think of other commands and uses for the thrower arm?

- 💡 Use a touch sensor and Touch commands to control the thrower arm.

- 💡 Use the thrower arm to protect your valuables.

*Put your finger near the light sensor while the Avoid Light command is running to see what happens.*



### 3: BUILD A NEW BOT

The Hoop-o-bot drive (the part with the wheels) makes a pretty good driving part for a robot. Try to build a new robot using the base.

1. Start by taking off the basketball hoop and thrower.

*You may need to take these apart for extra pieces.*

*Your robot should now look like the model in the photo.*

- 💡 Add decorations to the base to make your own personal robot.

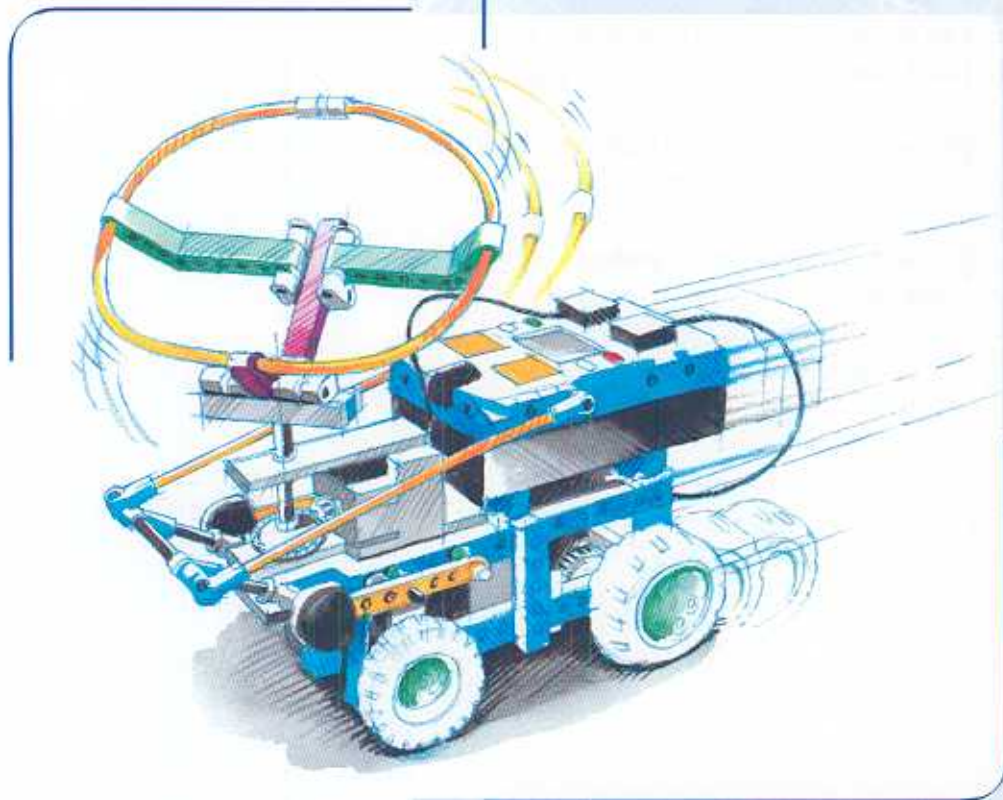
- 💡 You can use the second motor to make something that moves, like an arm, a head that turns, or whatever you think up.

*Check out the Tips & Tricks and Special Features for ideas.*

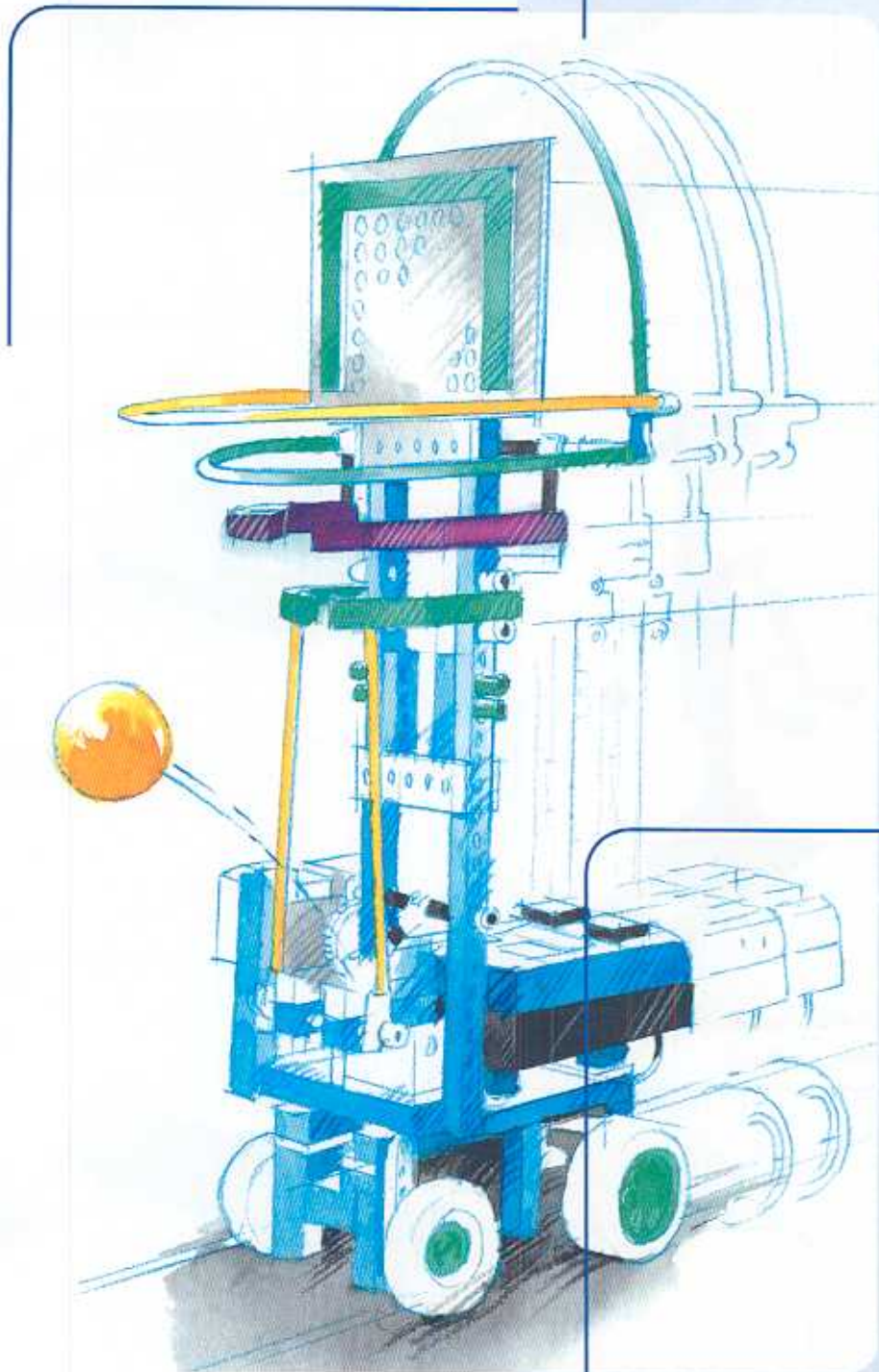
*And remember, Your Imagination Rules...*



Radar Runner



Shooter-bot



Here are some ideas for additional features for your Hoop-o-bot.



1. A stand for the Basketball Hoop



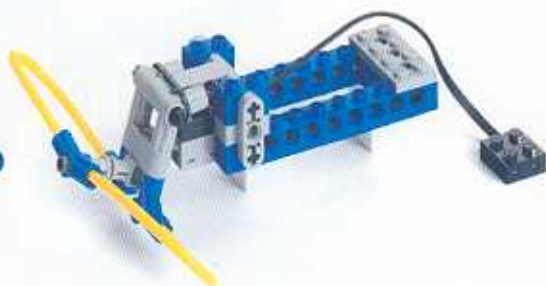
2. A Radar



4. A Basketball player.  
Well...we tried!



3. A Turntable

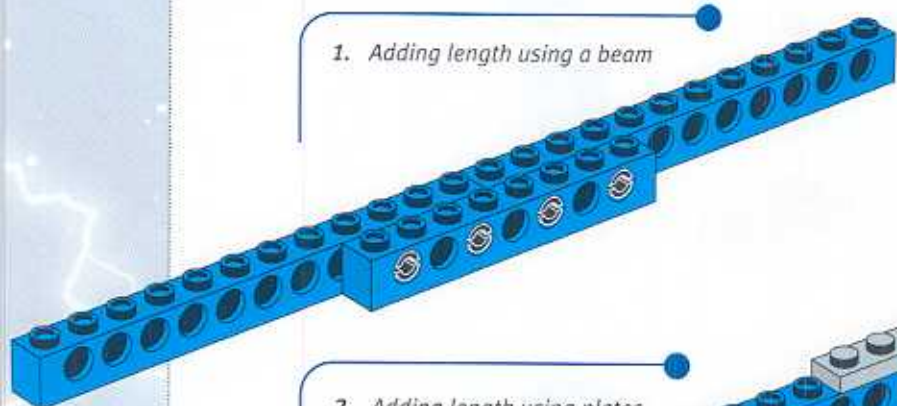


5. A Bumper

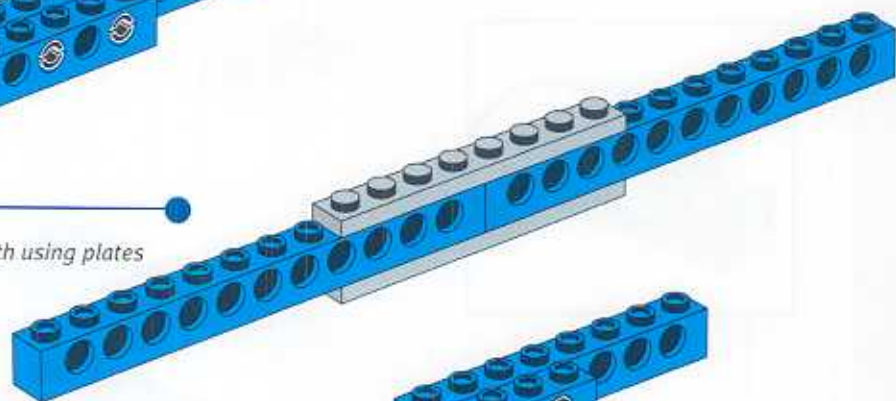


Try using these tips and tricks to modify your Hoop-o-bot.

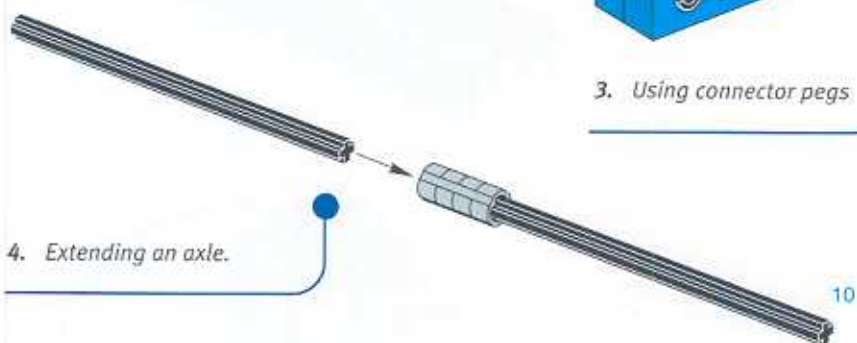
1. Adding length using a beam



2. Adding length using plates



10

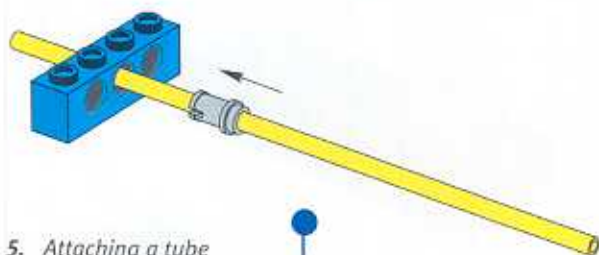


3. Using connector pegs

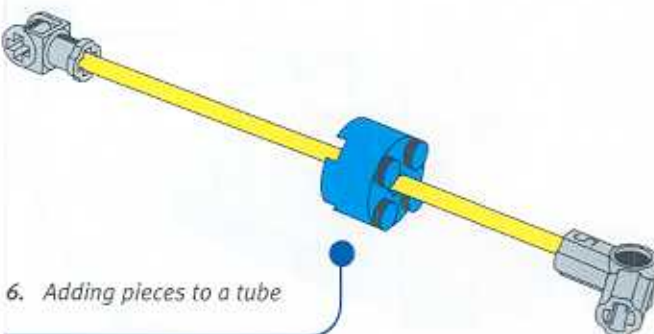
4. Extending an axle.



5. Attaching a tube



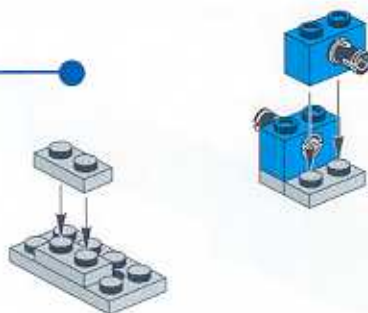
6. Adding pieces to a tube



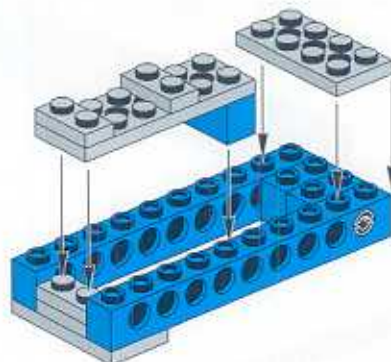
7. Adding height



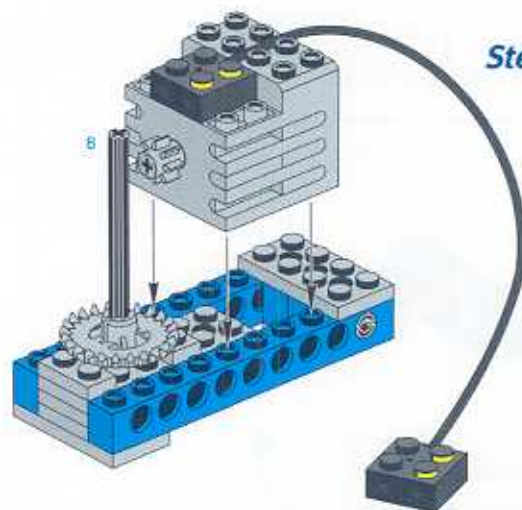
8. Turntable



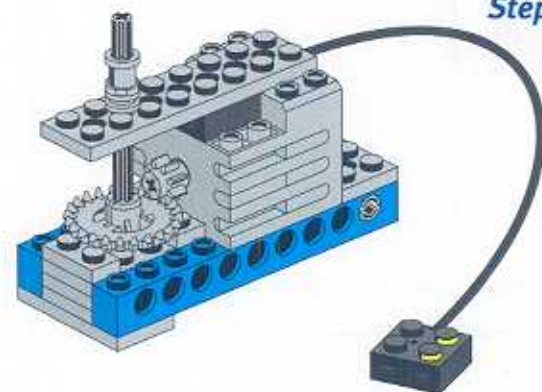
Step 1



Step 2



Step 3



Step 4

