


The LEGO® Technic Idea Book

SIMPLE MACHINES

Yoshihito Isogawa











no starch press

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LEGO® Inspiration for All Ages

The LEGO Technic Idea Book: Simple Machines is a collection of hundreds of working examples of simple yet fascinating Technic models that you can build based on their pictures alone. Colors distinguish each part, showing you how the models are assembled. Each photo illustrates a different principle, concept, or mechanism that will inspire your own original creations.

The Technic models in *Simple Machines* demonstrate basic configurations of gears, shafts, pulleys, turntables, connectors, and the like. You'll learn how to create small, elegant machines like cranes, operable doors, motorized cars, a rubber band–powered rocket launcher, a hand-cranked drag racer, and even musical instruments.

This visual guide, the first in the three-volume *LEGO Technic Idea Book* series, is the brainchild of master builder Yoshihito Isogawa of Tokyo, Japan. Each title is filled with photos of Isogawa's unique models, all of which are designed to fire the imaginations of LEGO builders young and old.

Imagine. Create. Invent. Now, what will you build?

Visit *http://nostarch.com/technic/* to view videos of many of this book's projects and to join the discussion!

VOLUME 1

The LEGO® Technic Idea Book
SIMPLE MACHINES

Yoshihito Isogawa

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This book is full of little seeds for ideas.
It is you who will cultivate those seeds
so they grow into wonderful masterpieces.

Yoshihito Isogawa

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INTRODUCTION

LEGO® Technic is designed to allow builders to create advanced models with moving parts, like those built with LEGO MINDSTORMS®. The *LEGO Technic Idea Book* series is a collection of unofficial LEGO building guides that offer hundreds of ideas and examples for building mechanisms with Technic. This volume focuses on gears and power transmission.

Building with LEGO

LEGO bricks aren't designed to fit in just one specific place, one particular way. Your imagination is your guide when building with LEGO, and you can put bricks and other LEGO pieces together in many ways to build an almost infinite number of creations. After building a model according to the instructions included with your set, try taking the model apart and using its pieces to create a variation of the model—or build a new one altogether. That's where the real world of LEGO begins.

My hope is that this book will give you some ideas to help you build your own original creations.

You Are the Creator

The LEGO Technic Idea Book: Simple Machines is full of photographs of mini-projects designed to show you various ways to build with LEGO gears and bricks. Combine these projects, add decorations, and change them to create your own unique masterpieces.

The Use of Color

The examples in this book are made with parts of various colors to make it easier for you to see the individual brick shapes. Judicious use of color can add real beauty to your models, and I've tried, wherever possible, to use colors in an artistic way. You don't need to use the colors I've chosen in your models; use whichever colors you want to use to make your projects your own.

Where Are the Words?

Other than this brief introduction and the table of contents, this book has almost no words. Instead, you'll find a series of photos of increasingly complex models that are designed to demonstrate building techniques. This is an idea book; it's about imagination. Rather than tell you what to see or think when you look at each photograph, I encourage you to interpret each one in your own way. If I were to tell you what to see, you would see things through my eyes. My hope is that you will see my models through your own eyes and that your interpretations will lead you to invent your own LEGO creations.

Join the Discussion!

View videos of many of this book's models, ask questions, and share your own designs at ***http://nostarch.com/technic/***.

NOTE TO PARENTS

Praise Your Child

When your child shows you their creations, take the time to really look at them together. Ask your child what they were focused on when building their model or what they wanted to accomplish. Offer your child sincere praise about their work and address aspects of the model that impress or surprise you. Talent is fostered by praise. Encourage and praise your child, and watch their talent shine through.

Express Your Feelings

Talk to your child about their creations. Ask them to show you how things move and how the parts fit together. Have them explain how they came up with their design. Your words can serve as hints or advice for your child, planting the seeds for new ideas.

Play with Your Child

Make things with your child. Offer ideas and build together. For a challenge, compete against each other to build different versions of a model. It can be inspiring for your child to see what an adult can do. When competing with your child, always encourage them and explain your creations so that they can learn from your experience.

WHERE TO FIND PARTS

There are hundreds of models in The Lego Technic Idea Books, and you may not have all of the parts you need in order to build a particular model. If you are having trouble finding a specific piece, please visit ***http://nostarch.com/technic/*** for a list of parts and answers to questions that you may have (the information on this page is dynamic so check back for changes).

The parts list includes various Technic pieces used in this series, from basic gears and pins to harder-to-find treads, springs, and electric motors. Each part is accompanied by a picture and a link to the BrickLink website, where you can easily browse for and order any part you desire. For the more unique parts, I have also included some purchasing tips as well as specific page references to where each part is used in each book.

If you prefer to purchase a LEGO Technic set, please visit ***http://nostarch.com/technic/*** for a recommended list on the parts list page. This list will change as the LEGO Group frequently replaces their Technic sets, so check back for updates.

If you still cannot find a particular piece used in one of my models, try substituting your own parts. The models in this series are meant to inspire, and there is no one right way to build. I encourage you to explore and have fun.




PART 1







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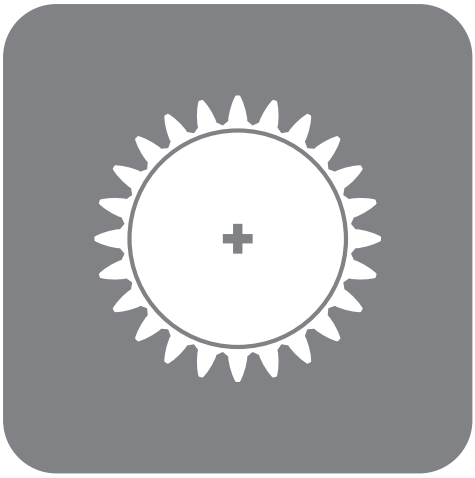

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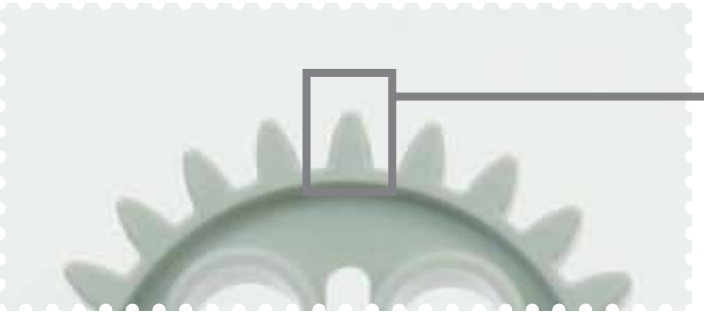

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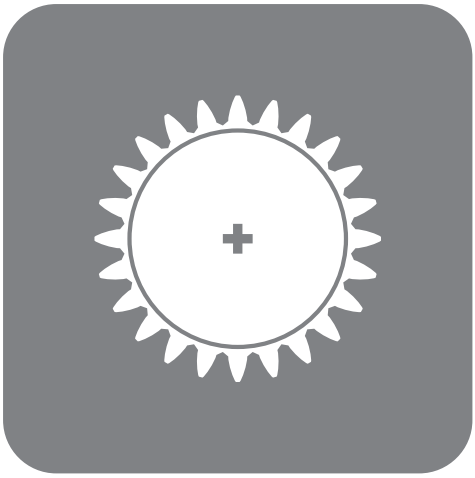

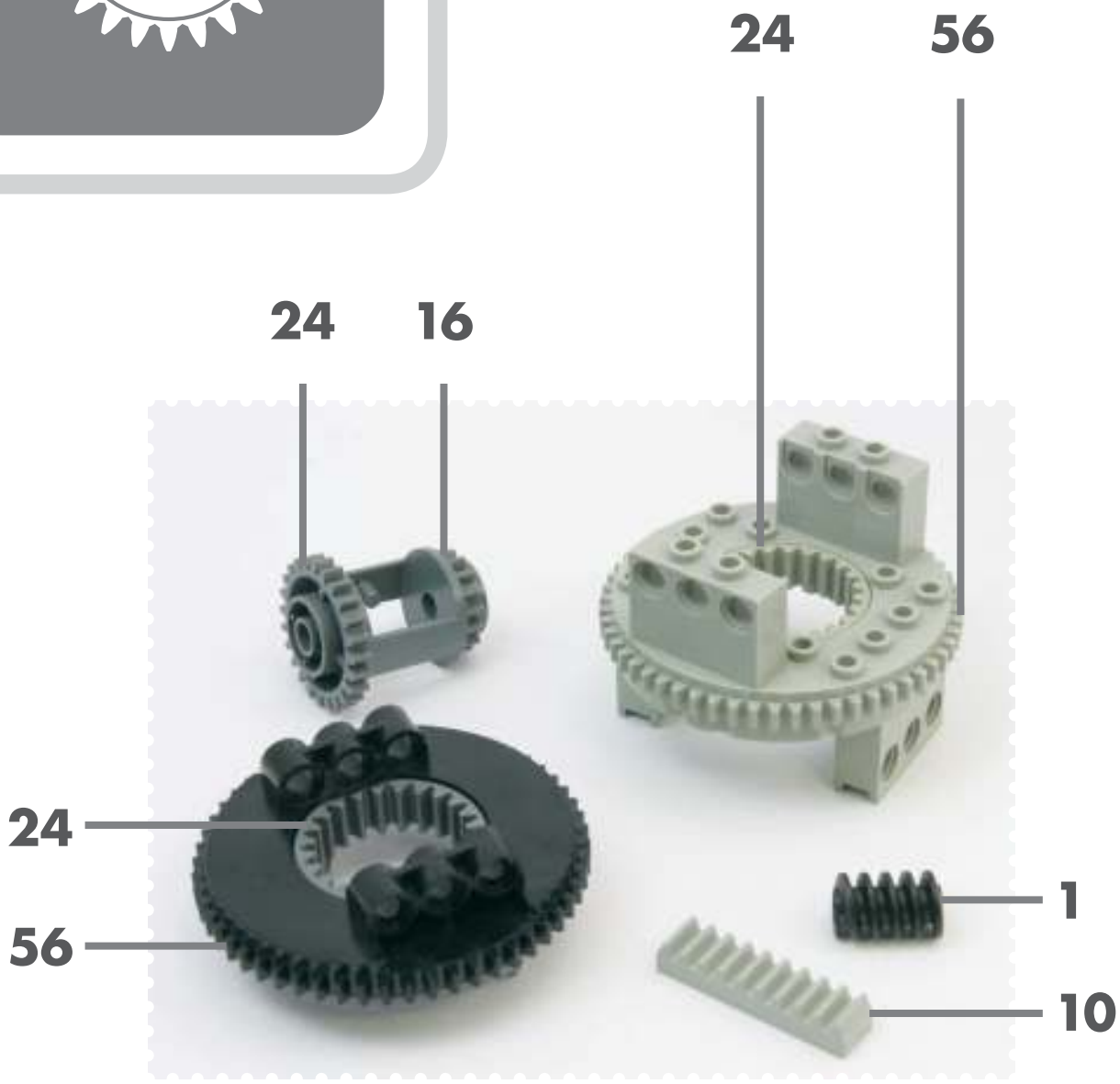
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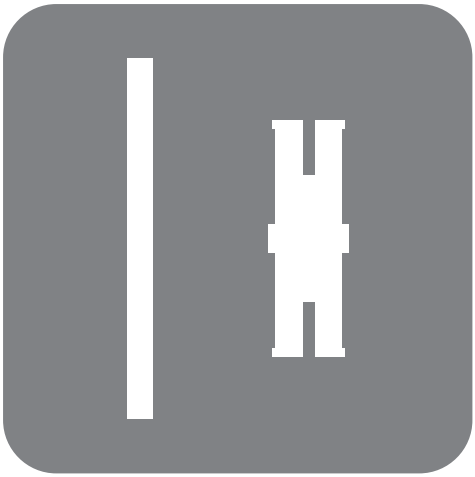

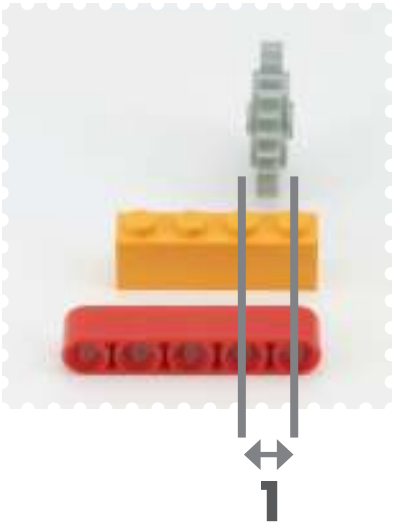
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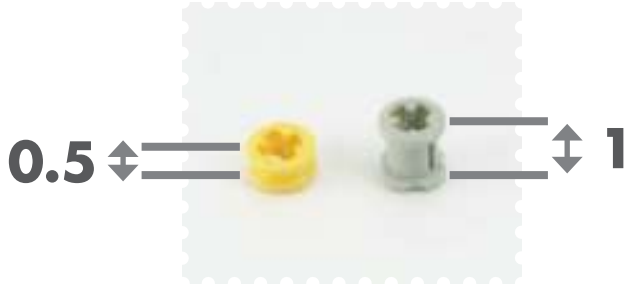
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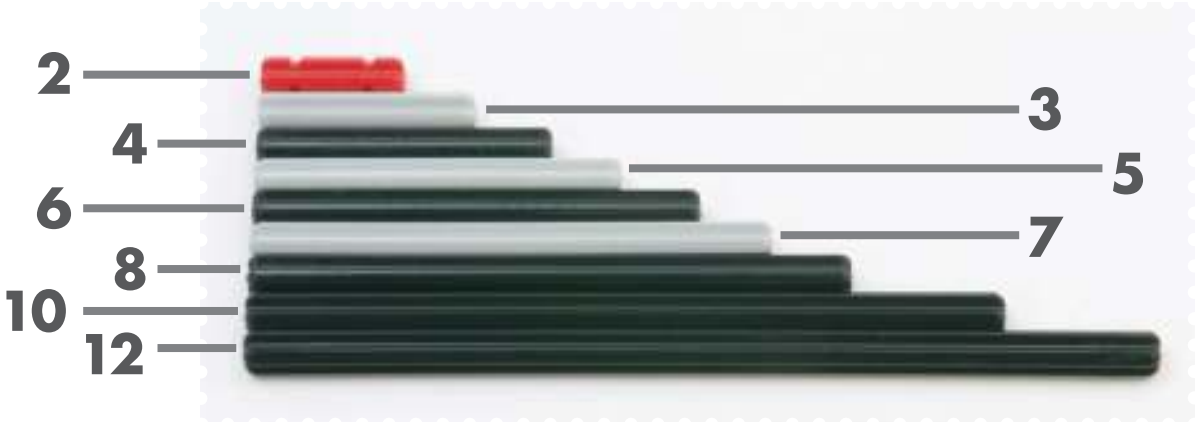
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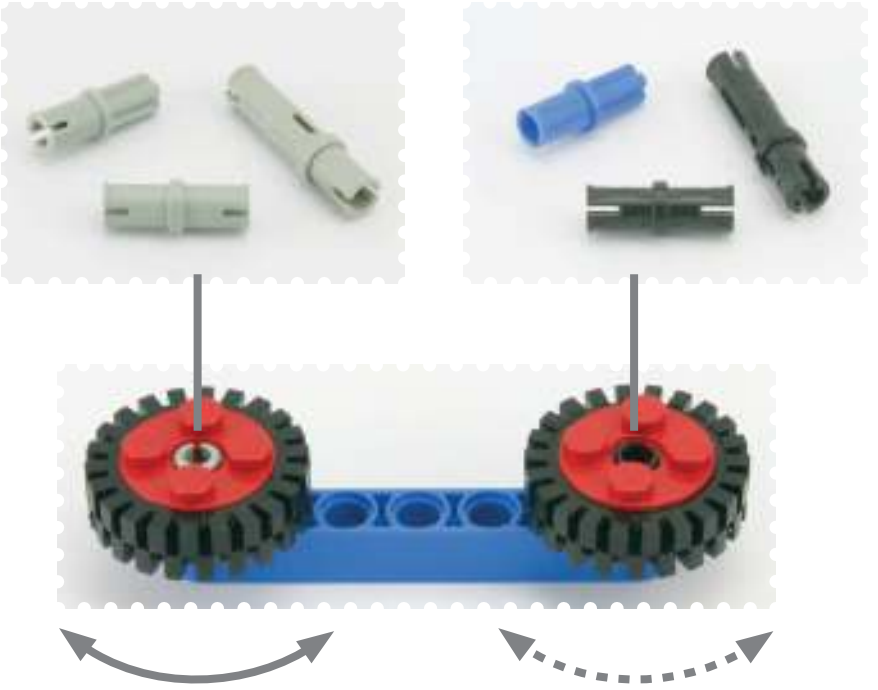

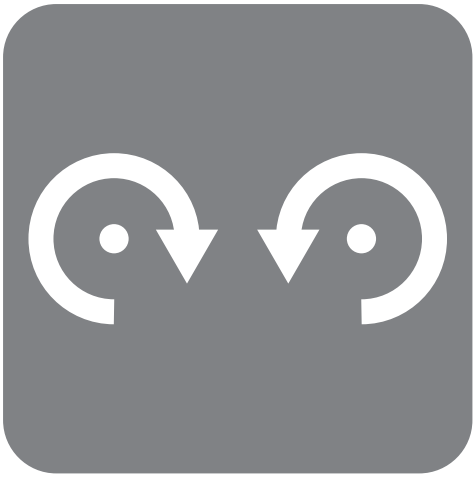

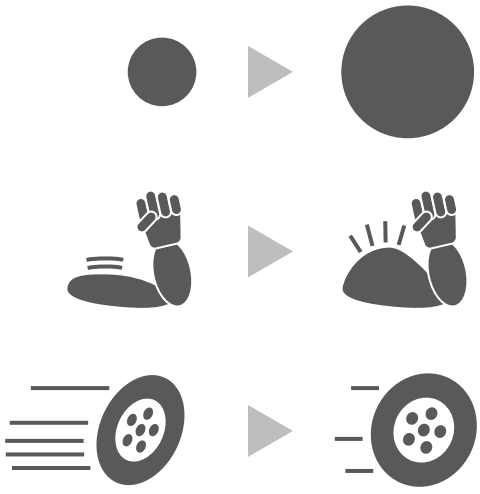

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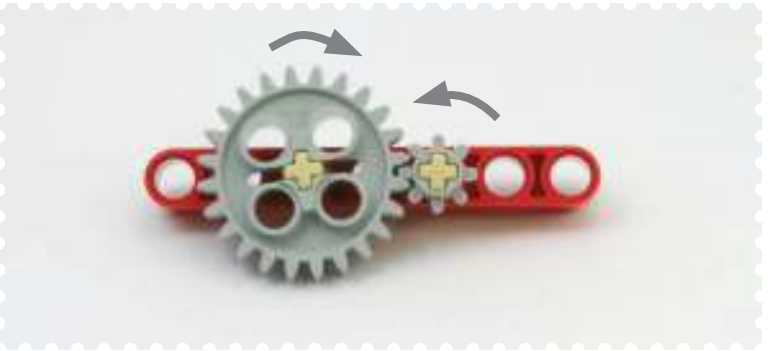

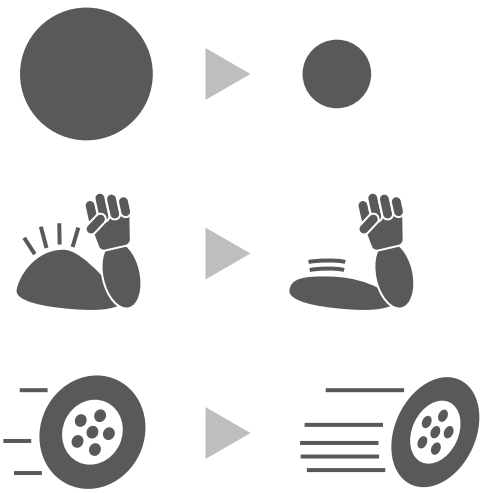

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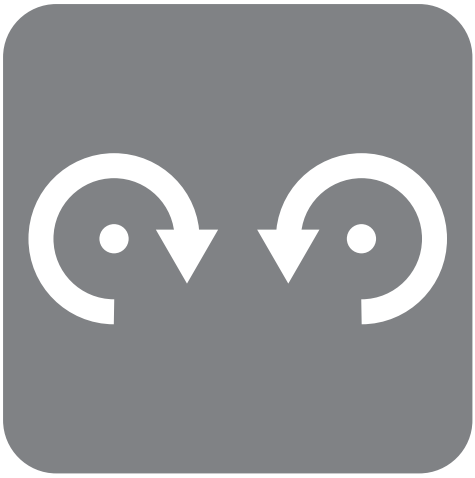

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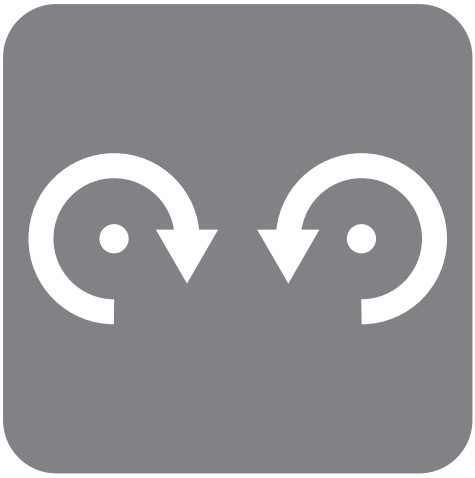

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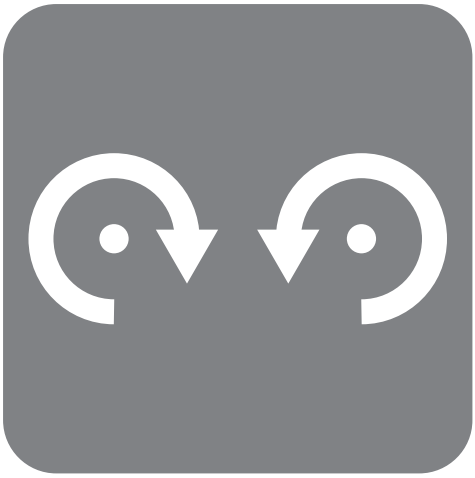

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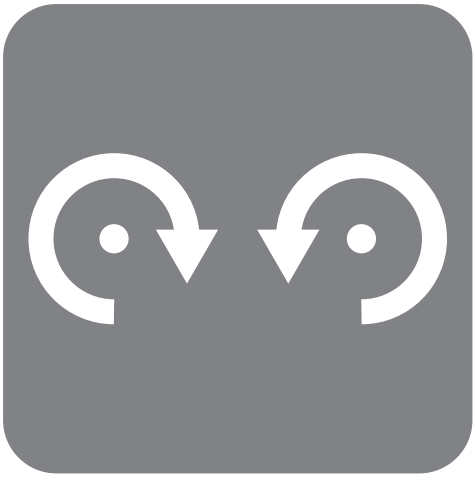

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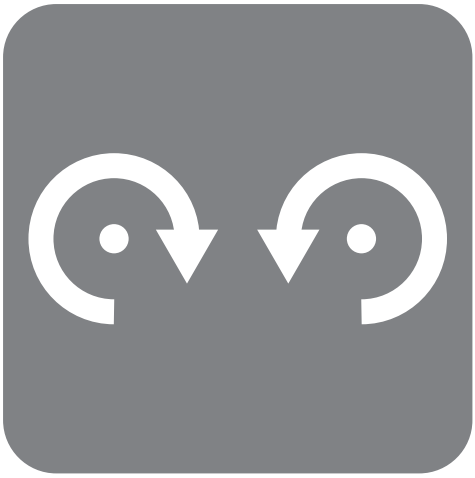

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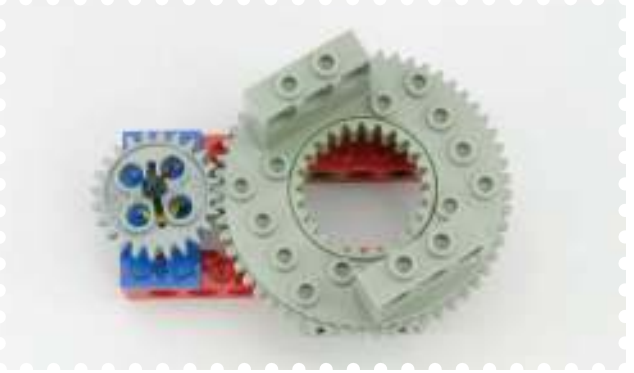

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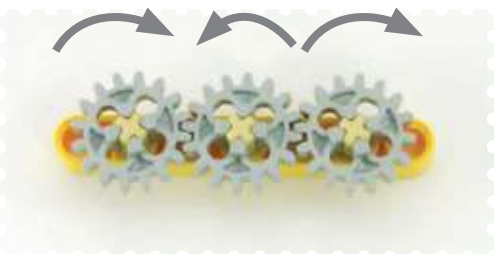

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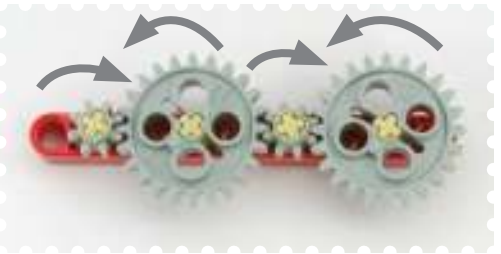

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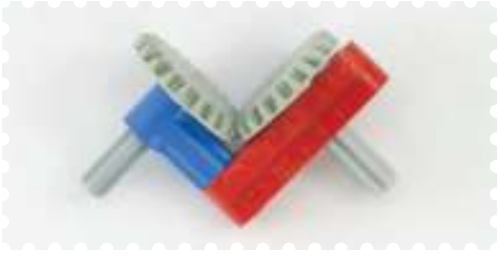

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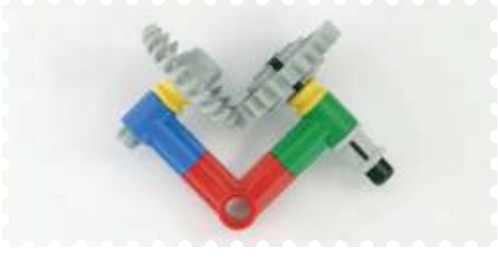

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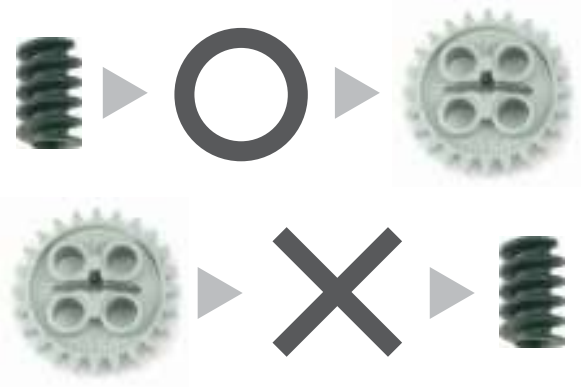

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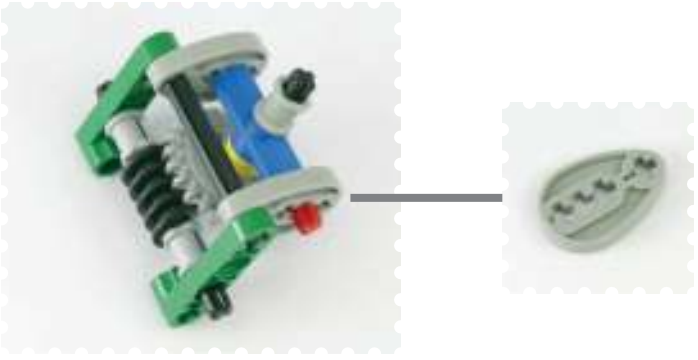

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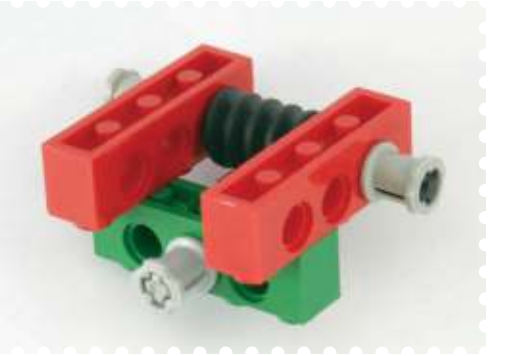

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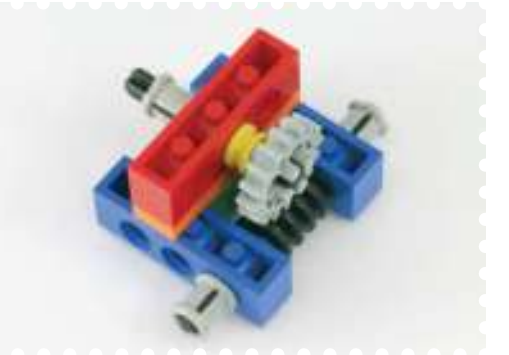

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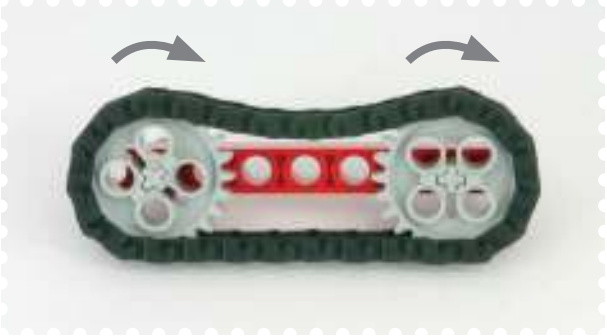
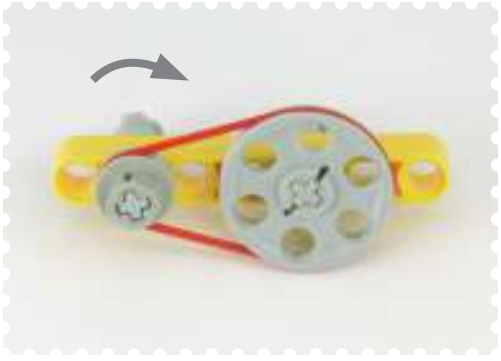
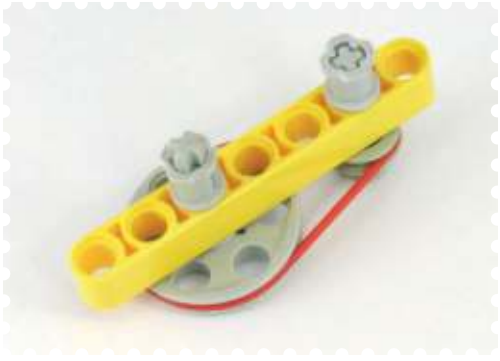
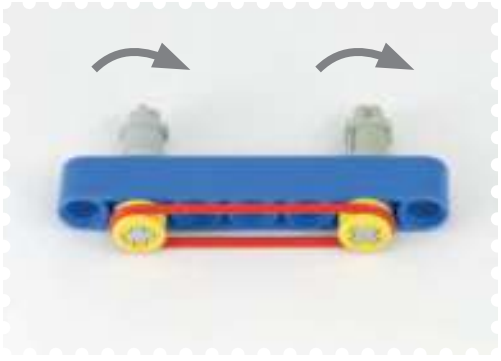
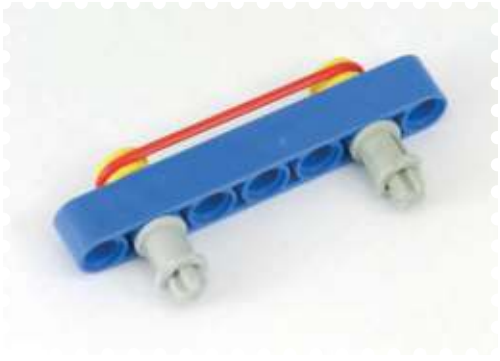
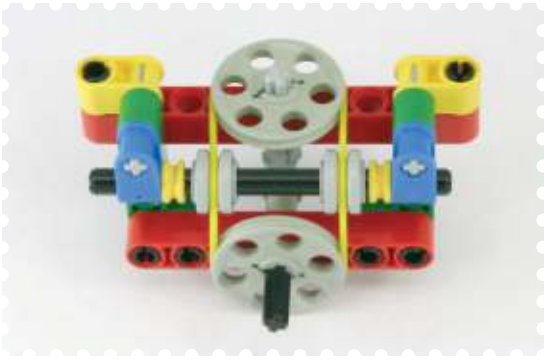


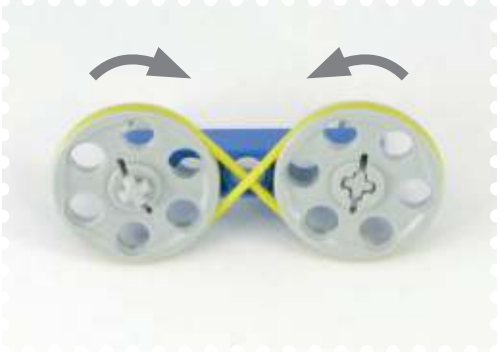


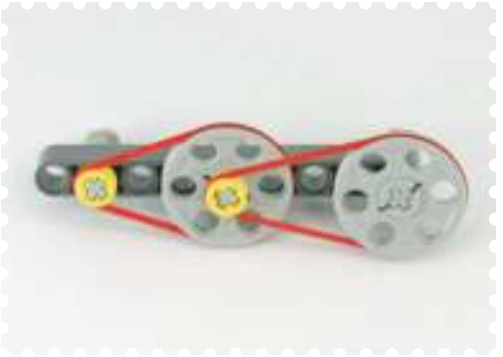


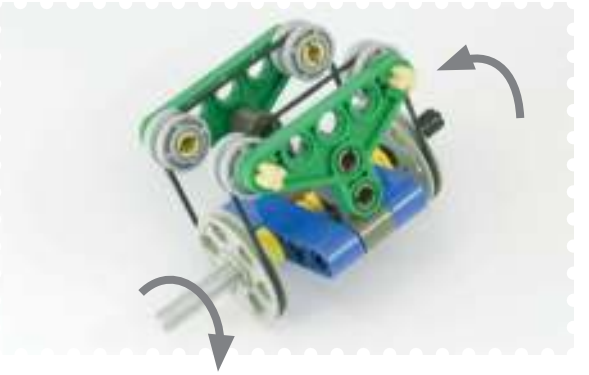


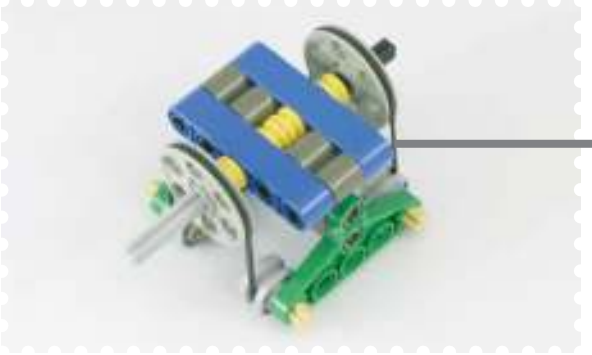


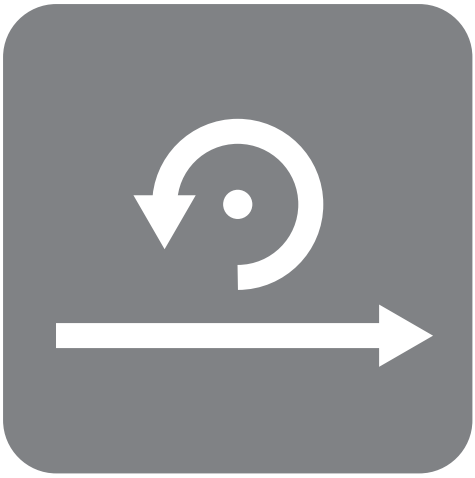


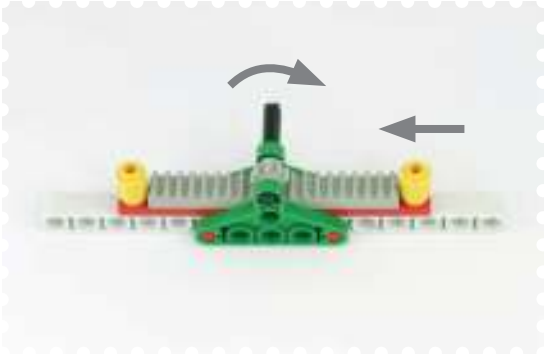


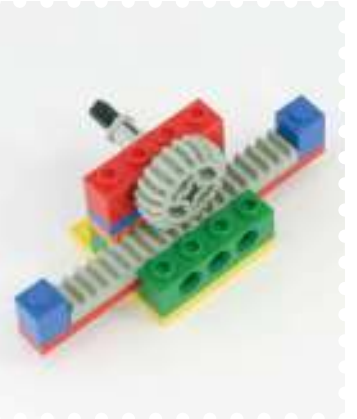


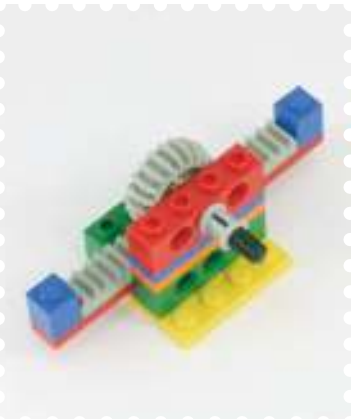


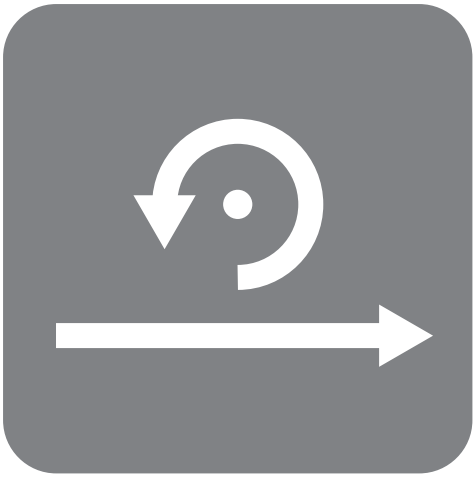


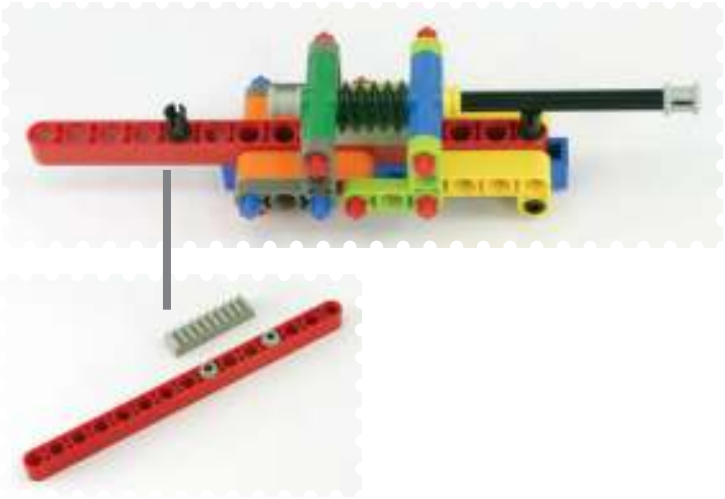


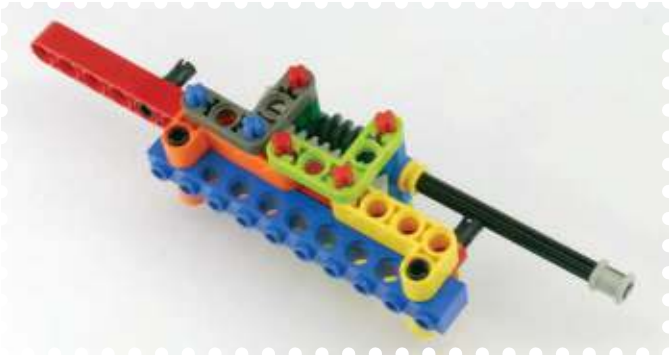


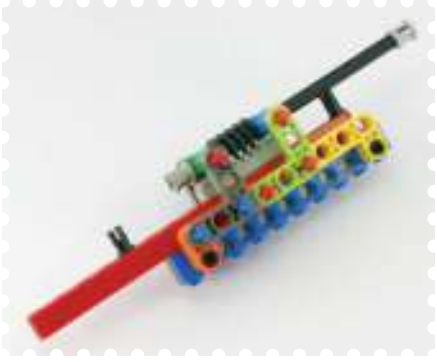


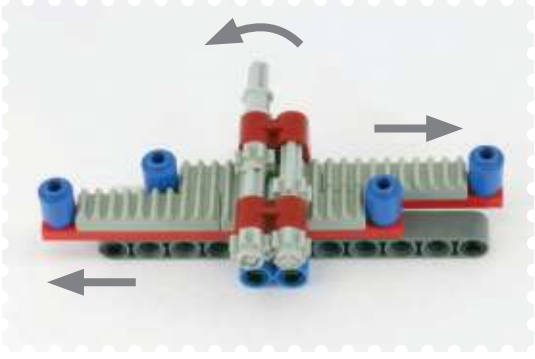


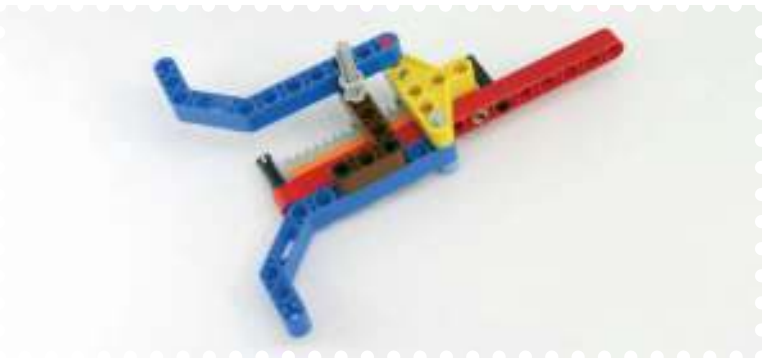


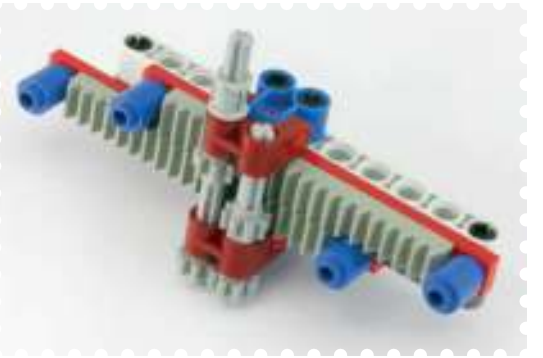


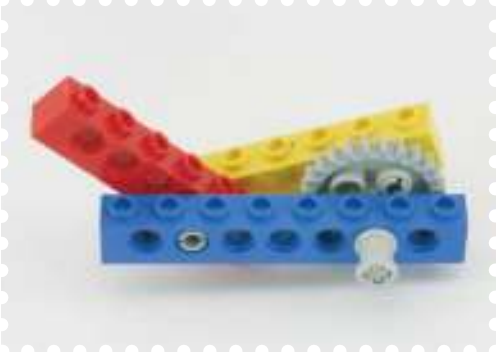


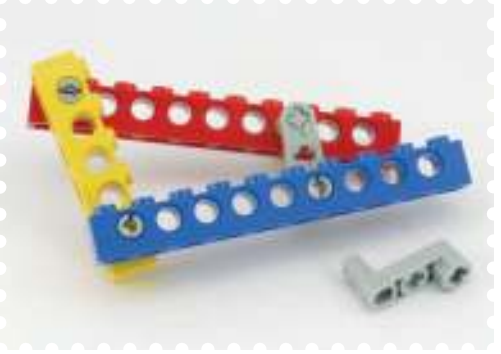


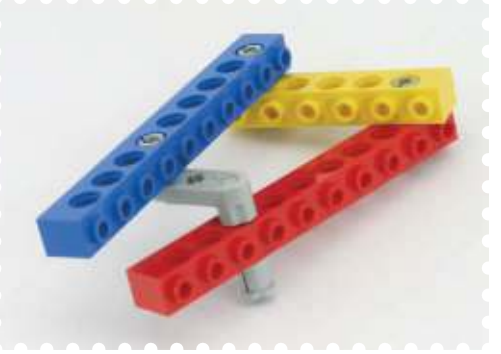


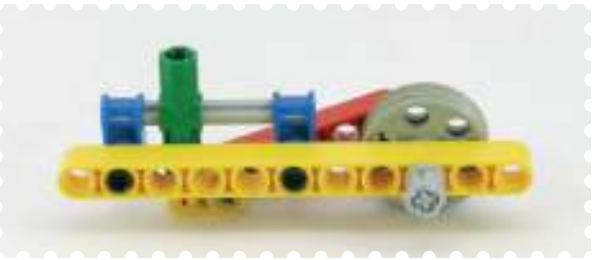


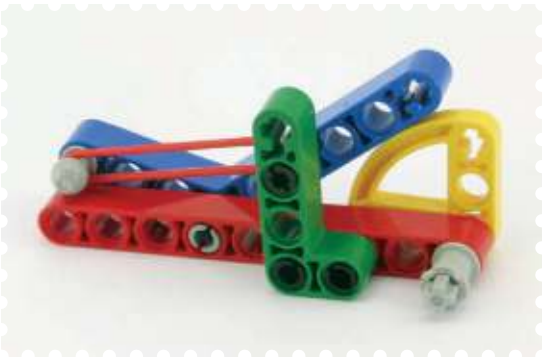


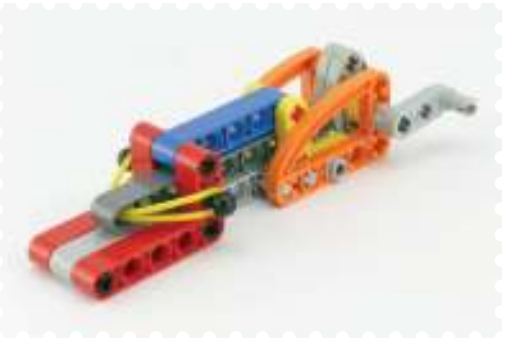


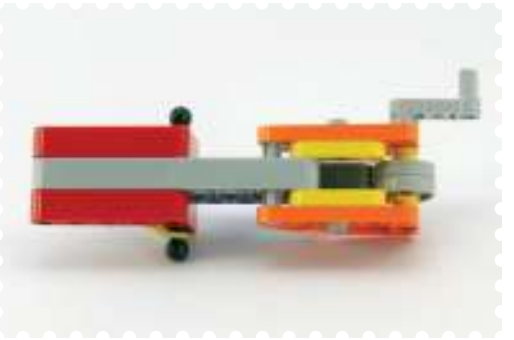


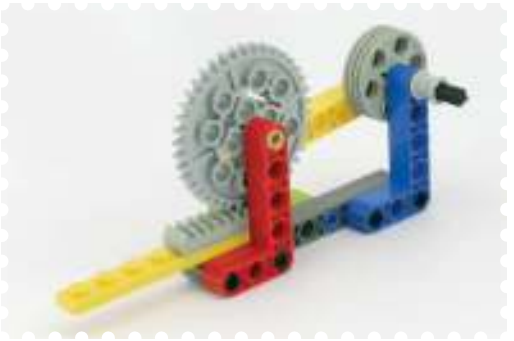


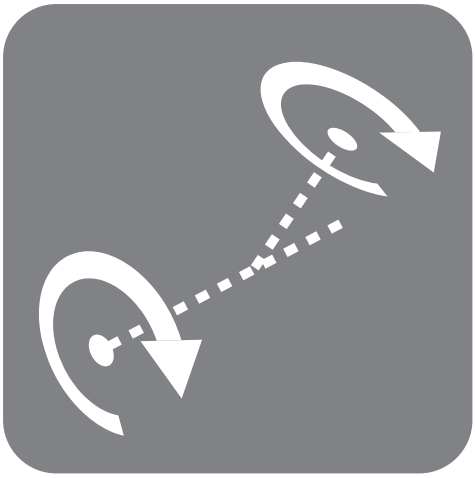


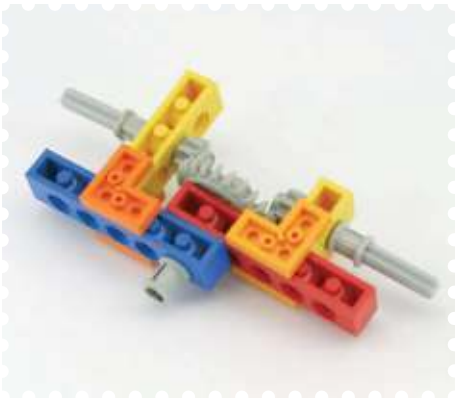


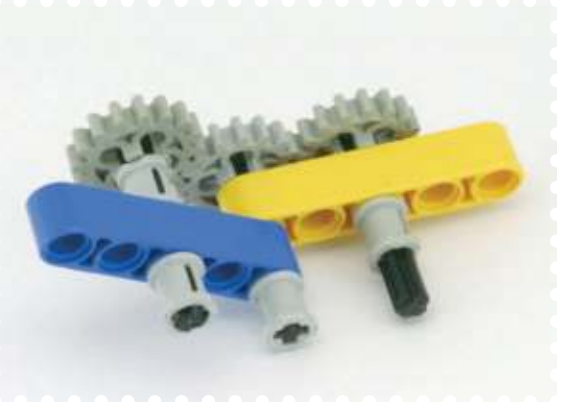


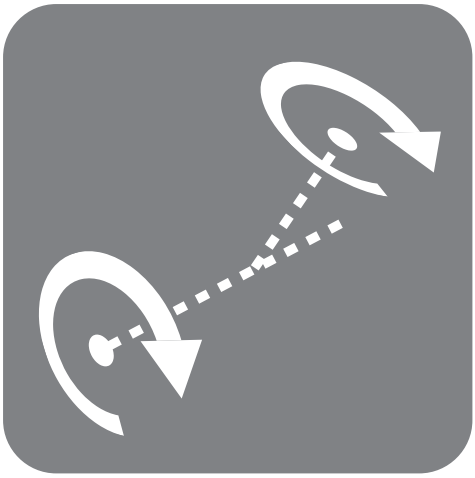


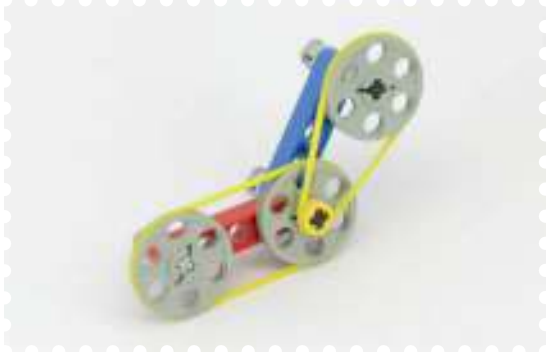


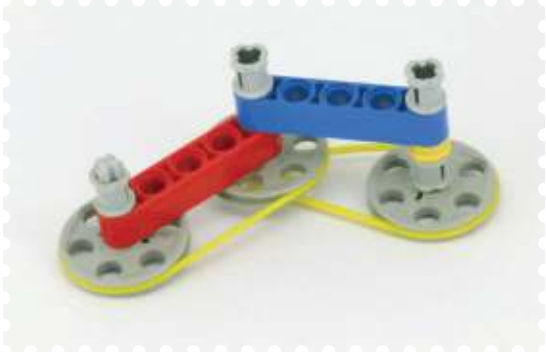


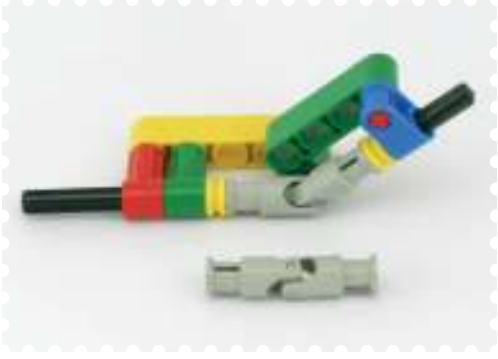


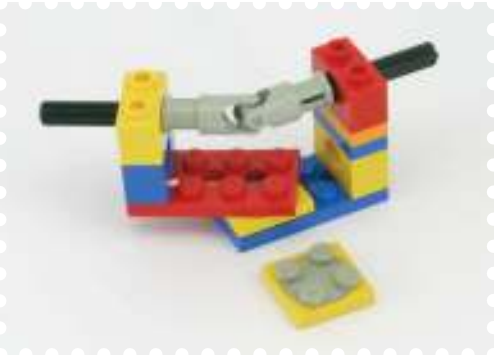


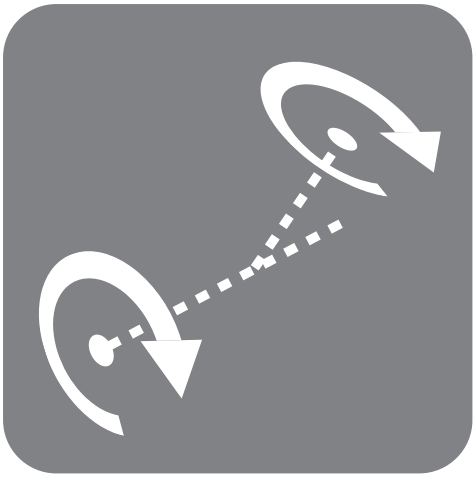


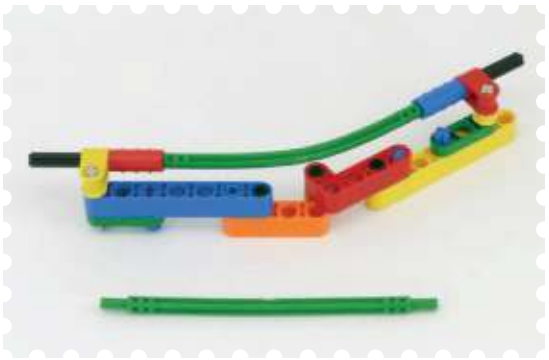


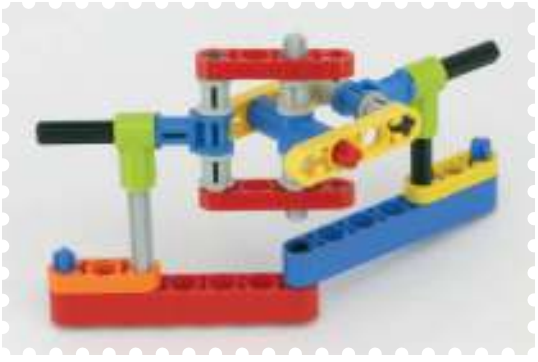


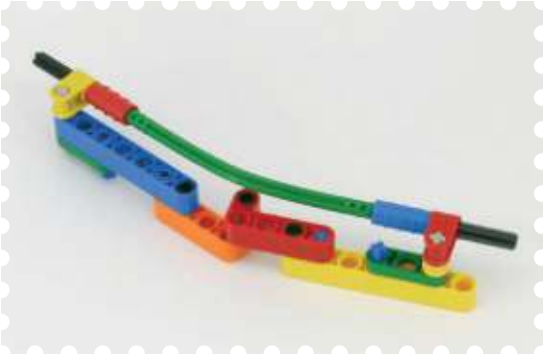


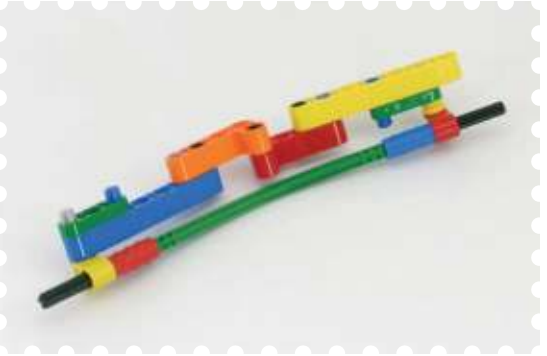


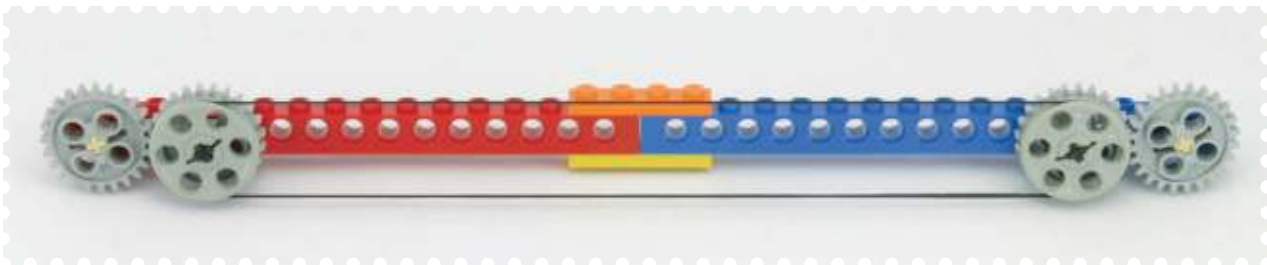


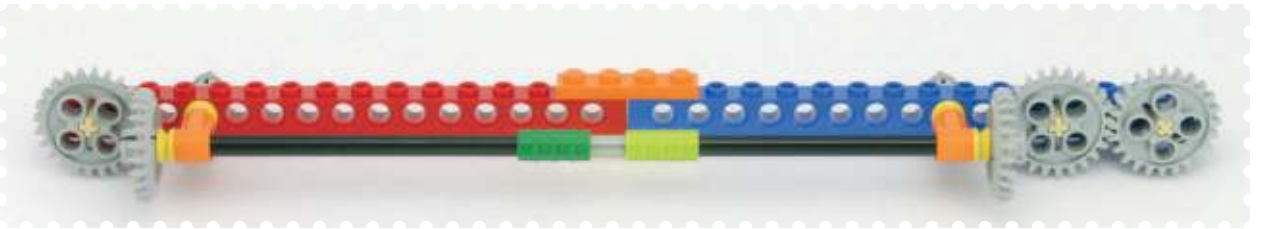


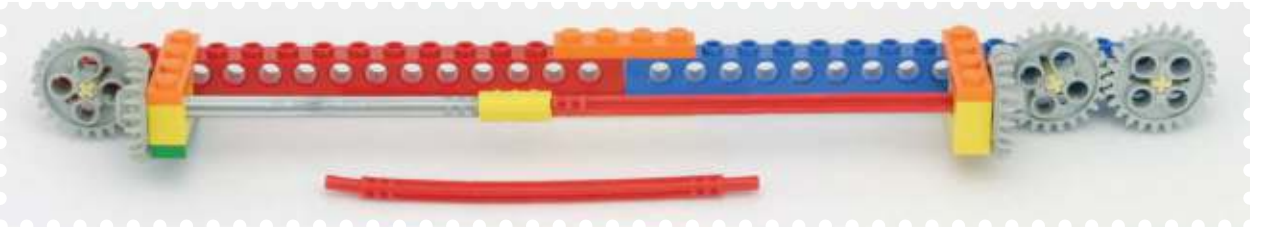


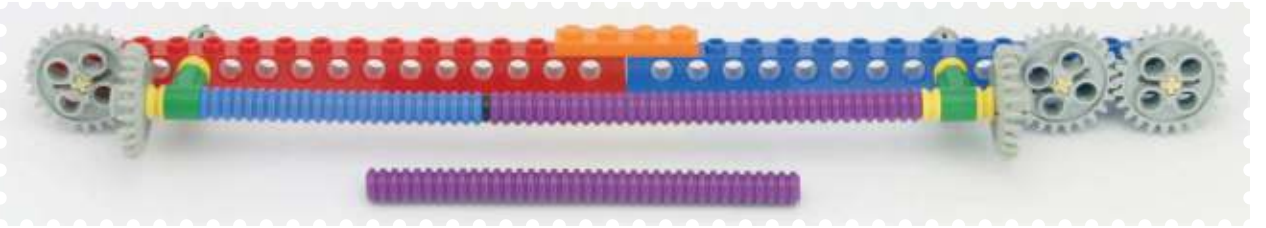














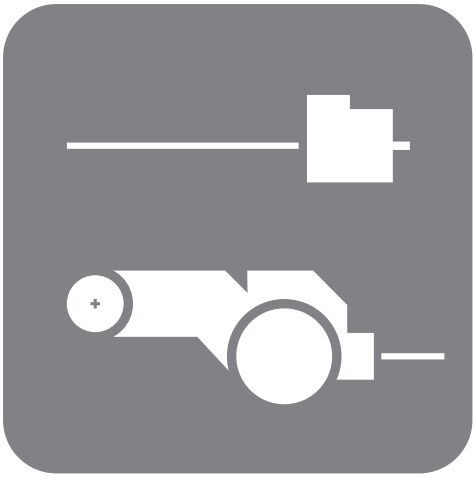

PART 3

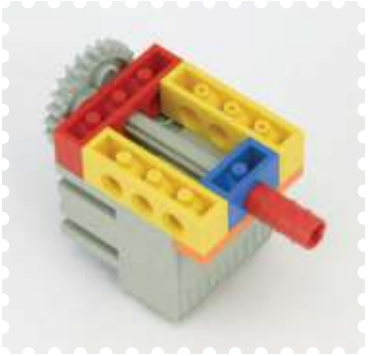


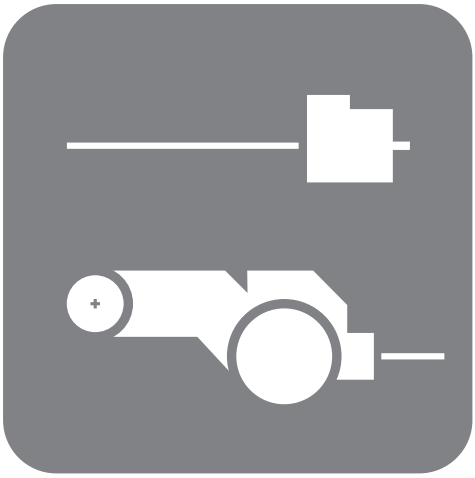


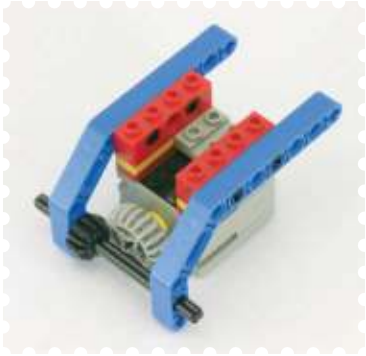


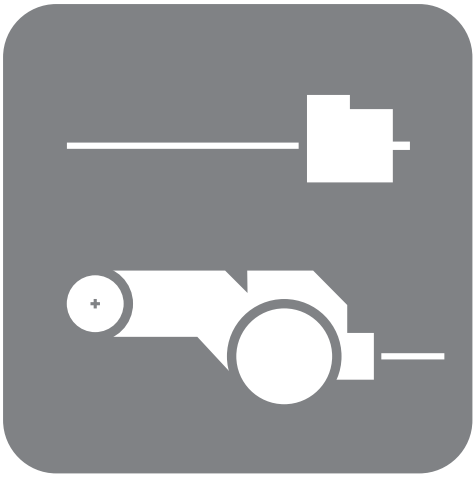


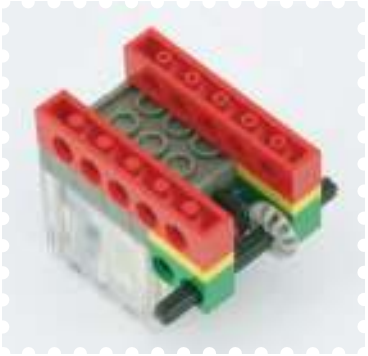



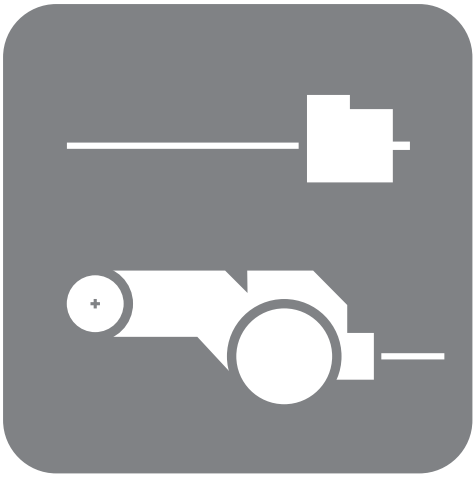


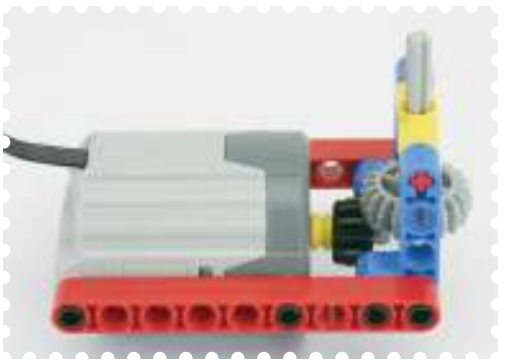


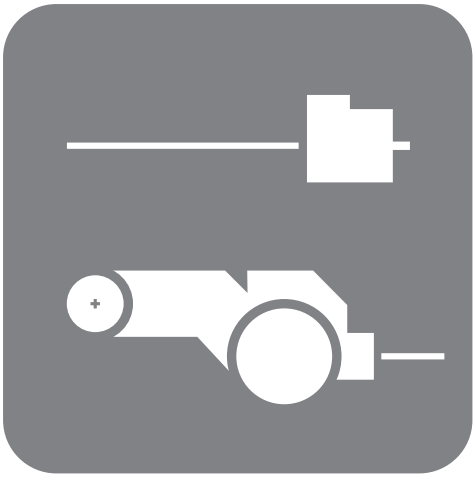


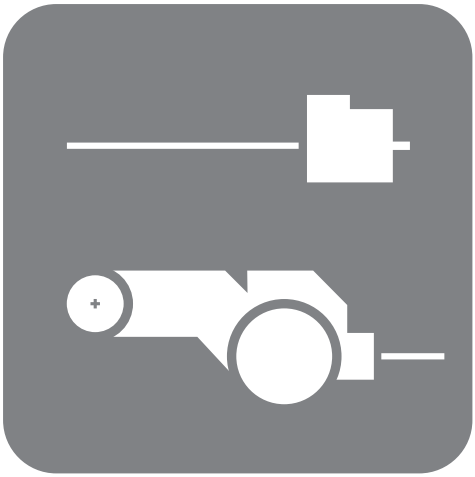


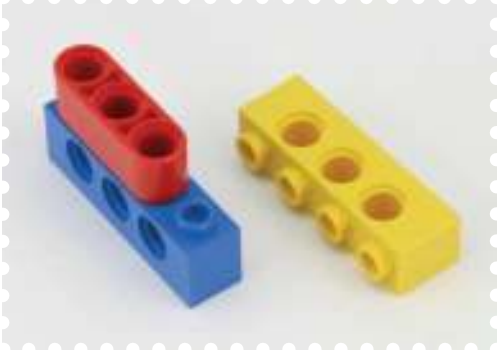


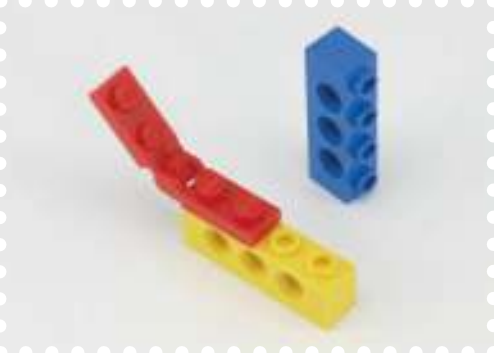


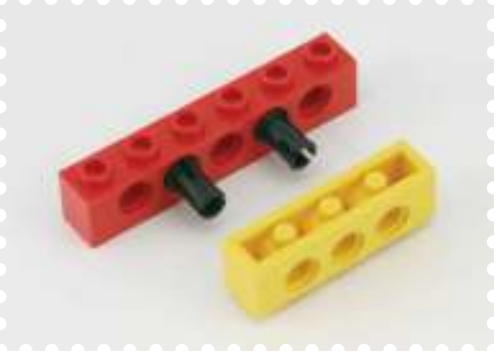


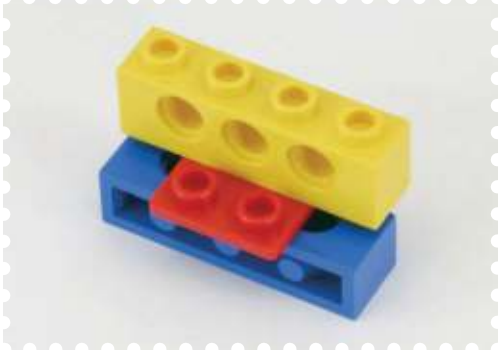


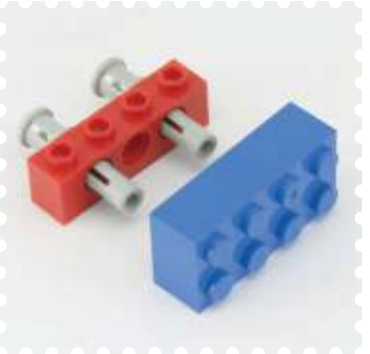


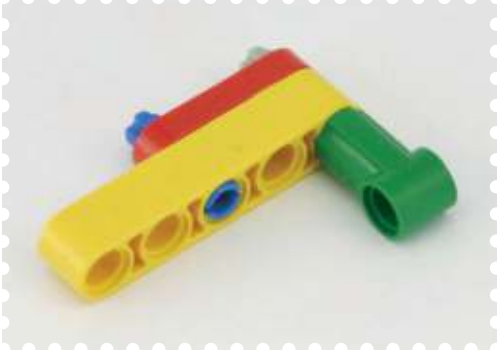


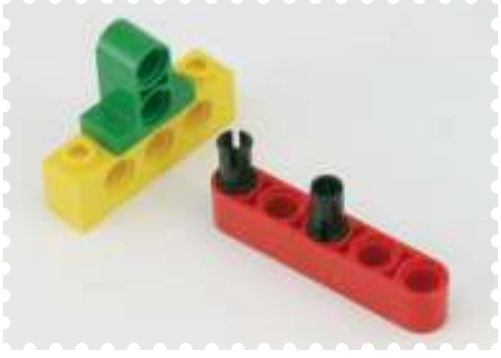


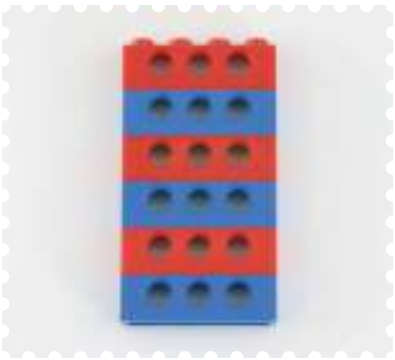


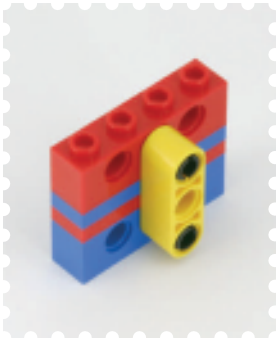




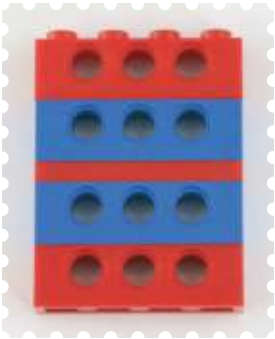




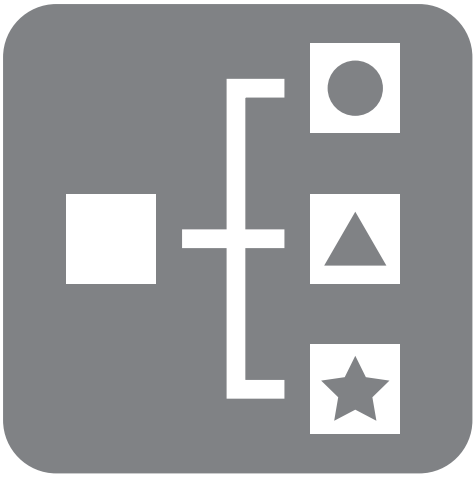


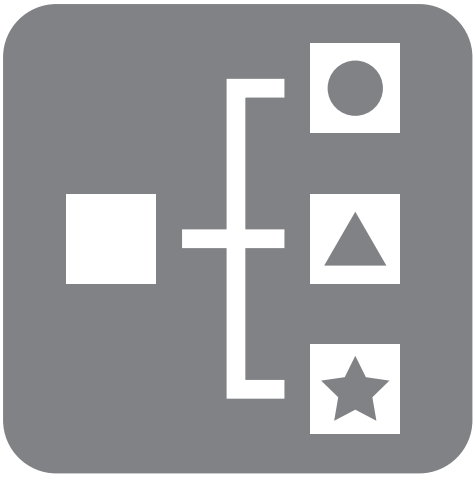












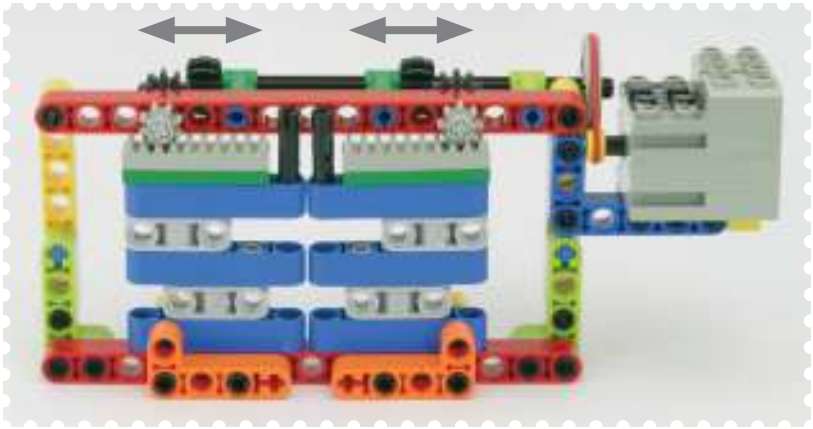

PART 4

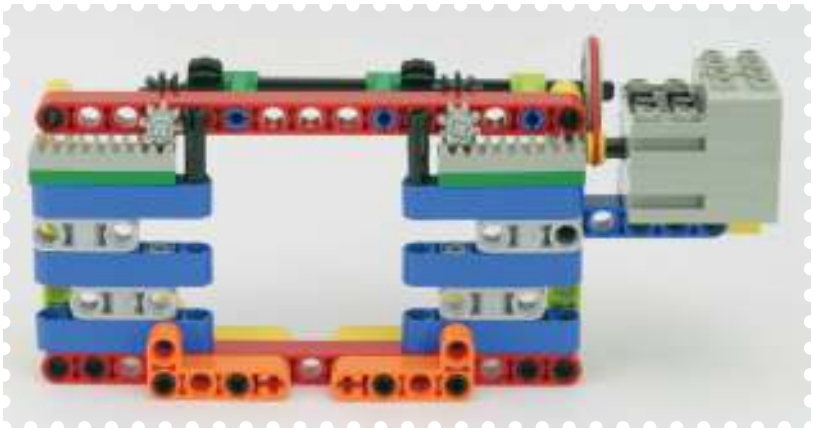


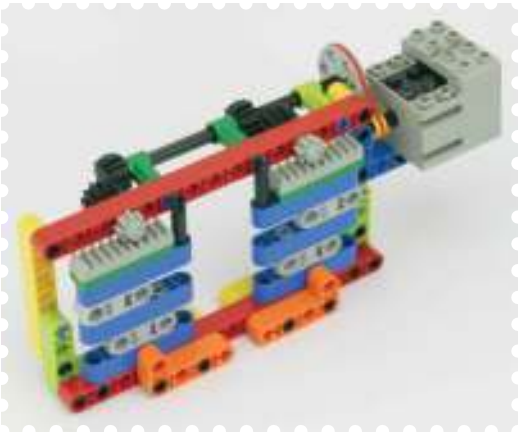


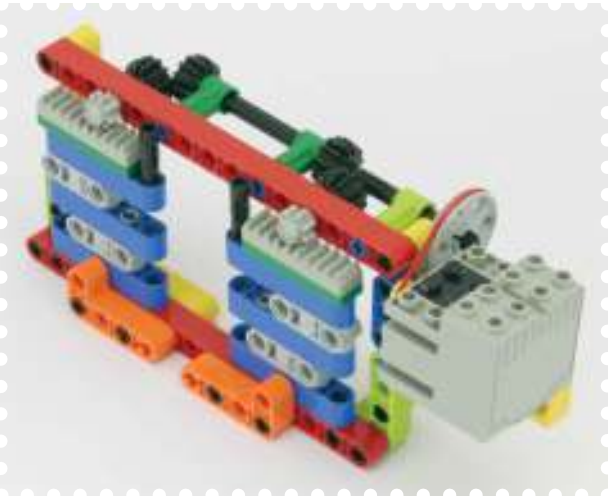


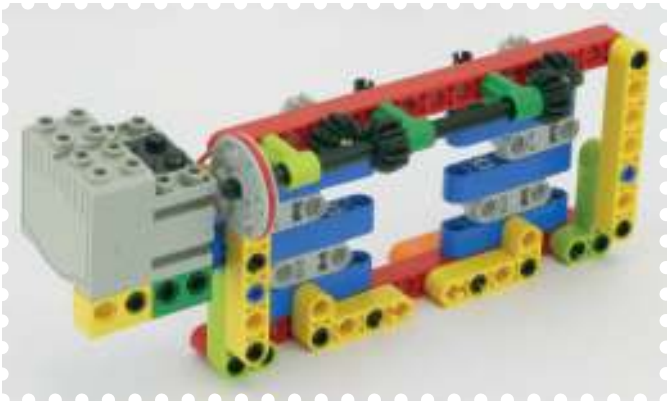


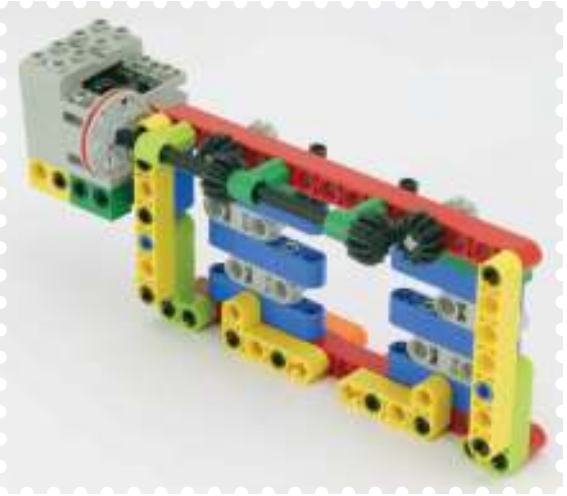



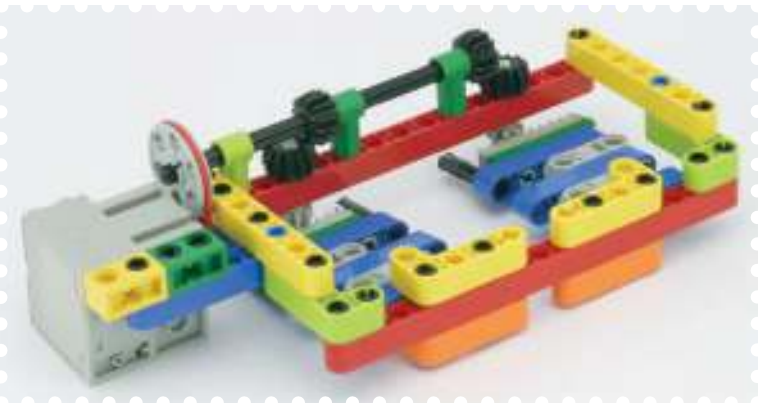


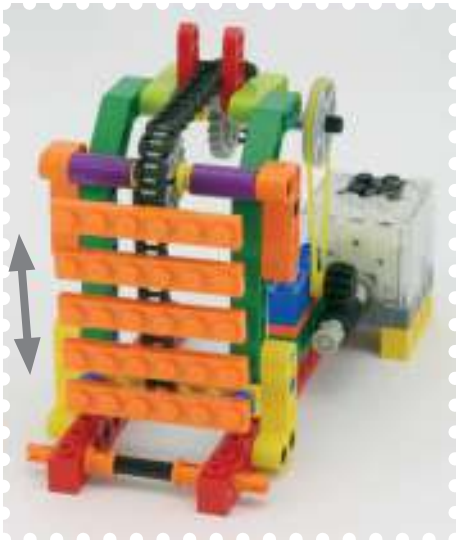


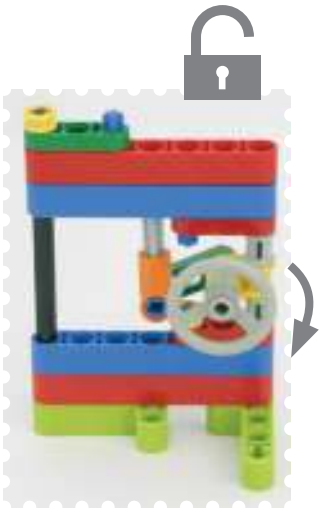


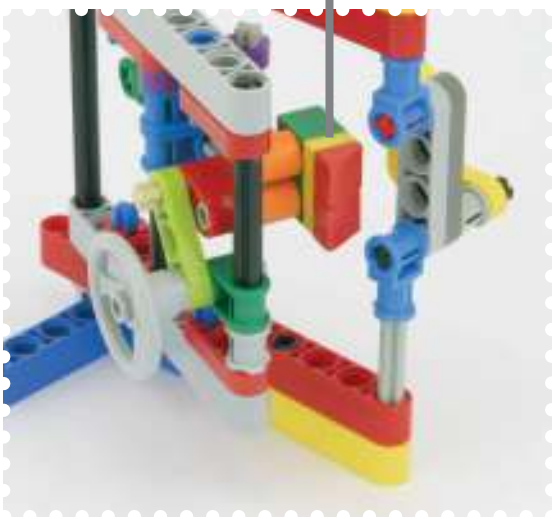


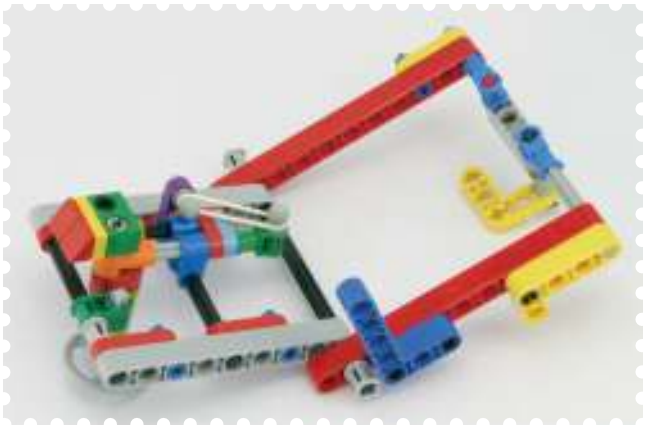


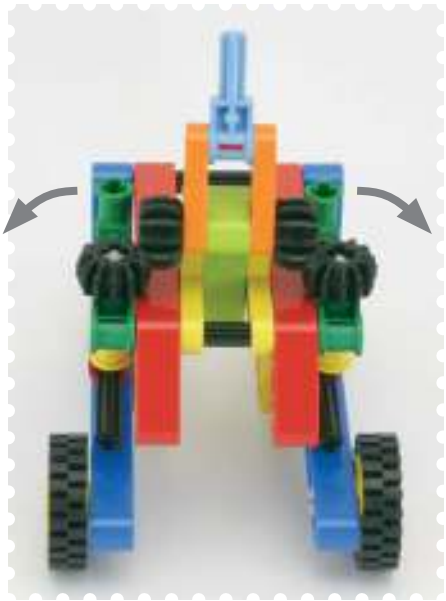


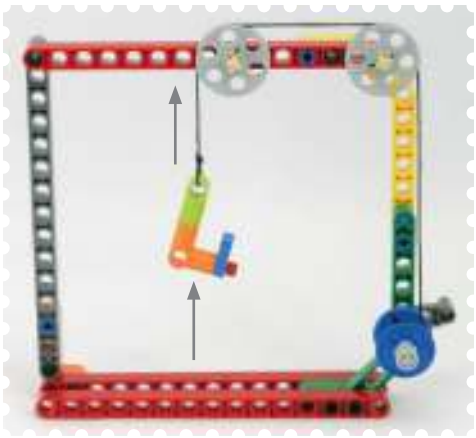


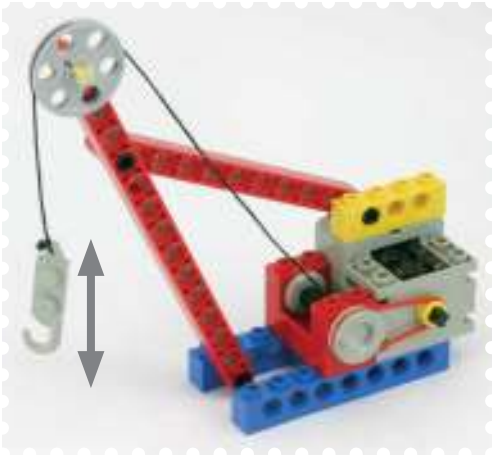


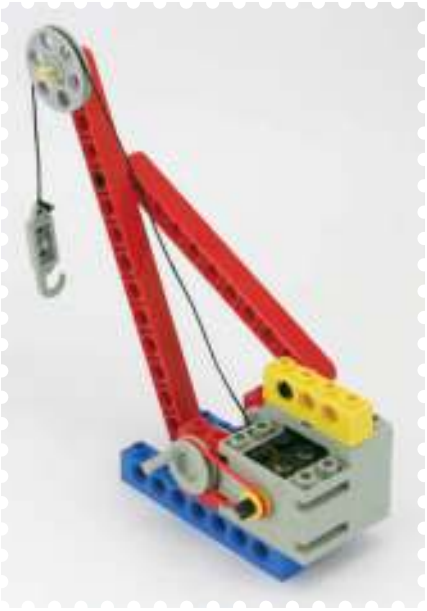


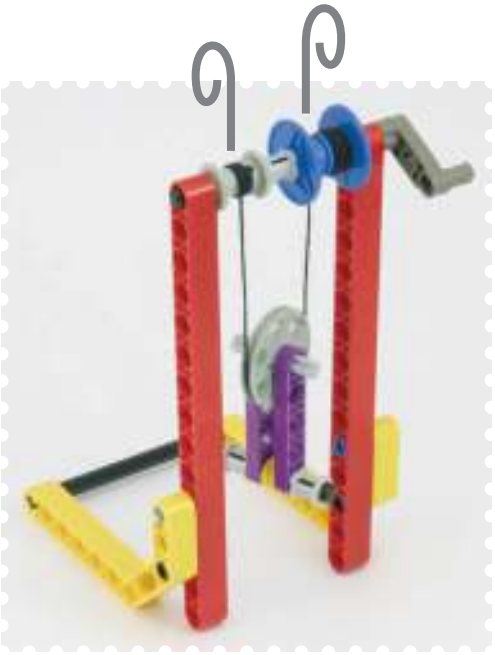


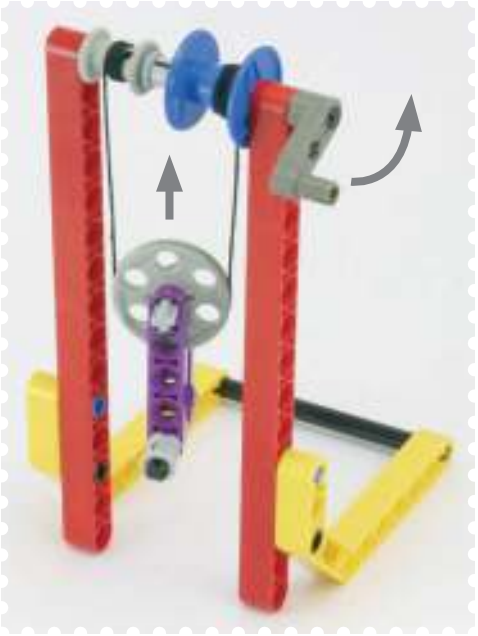


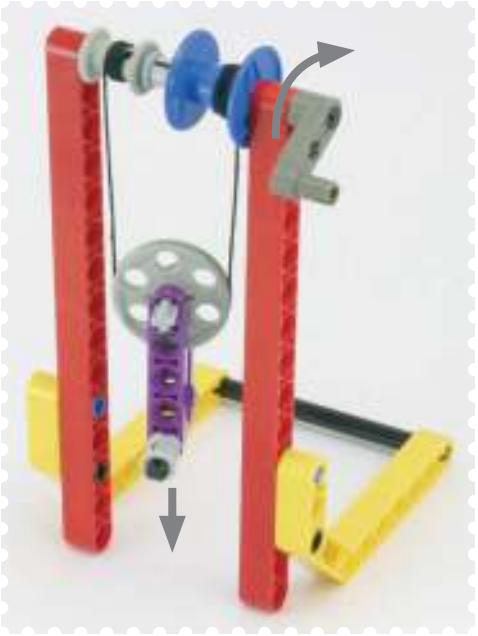


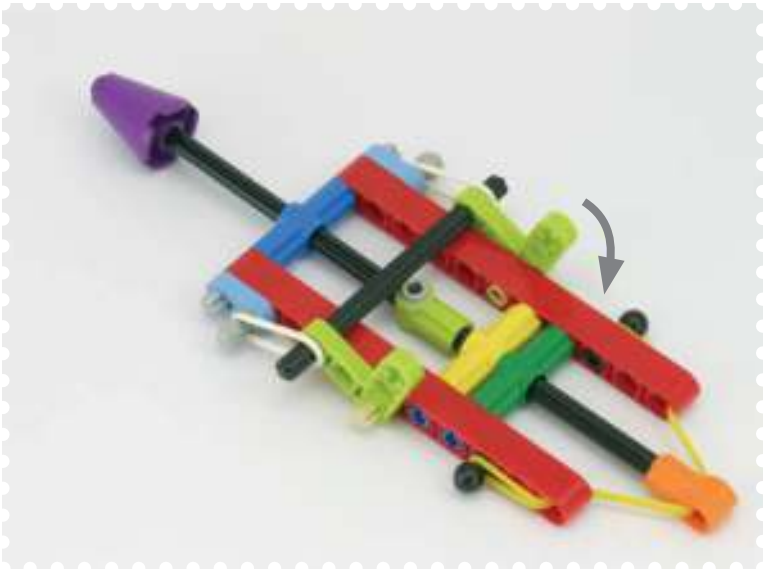


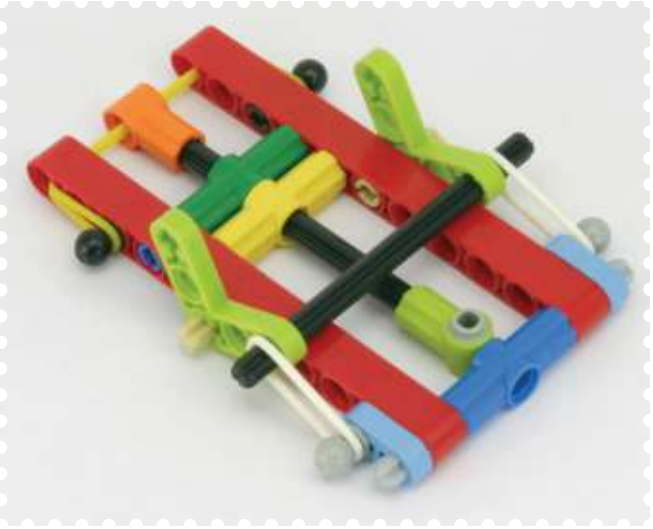


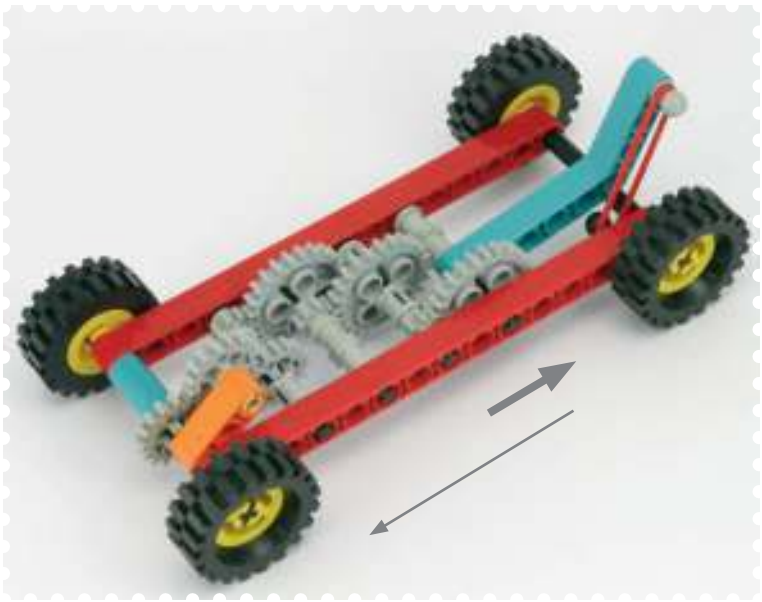


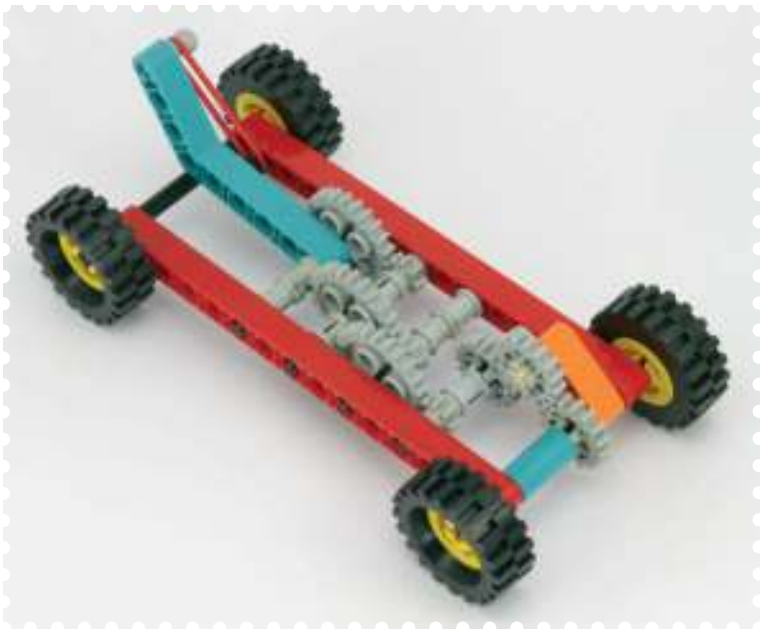


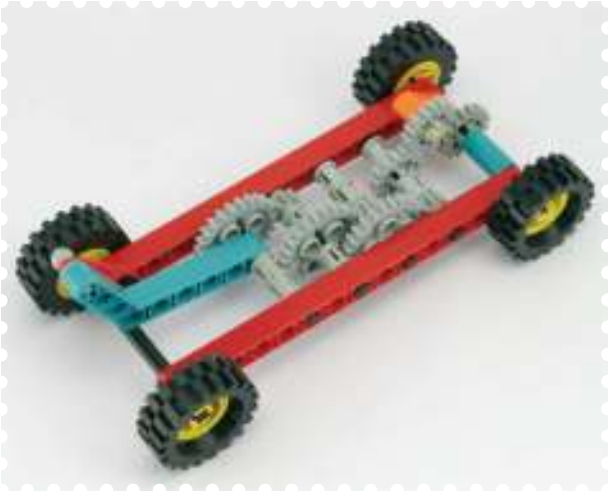


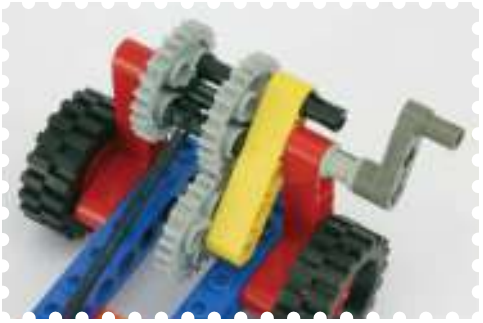


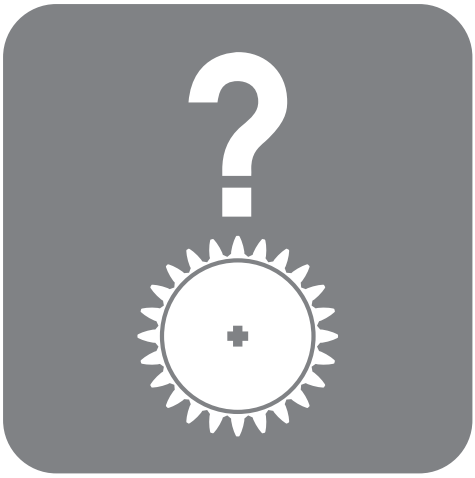


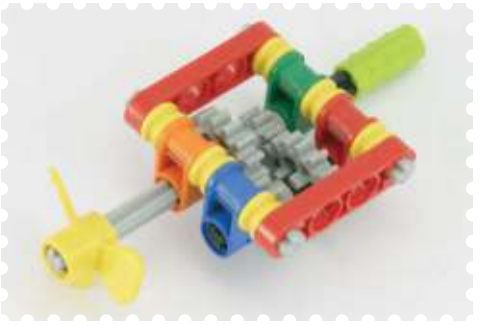


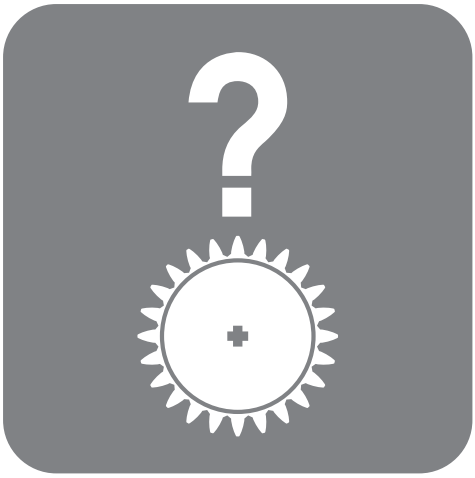


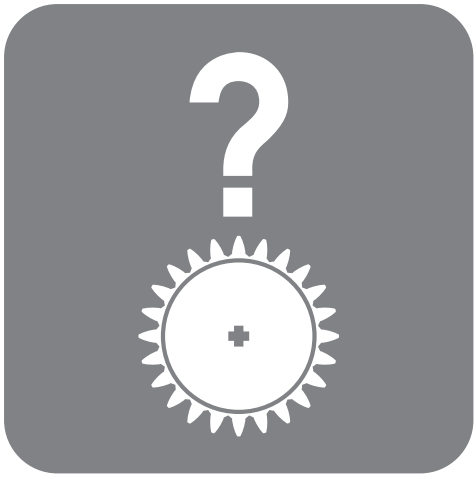


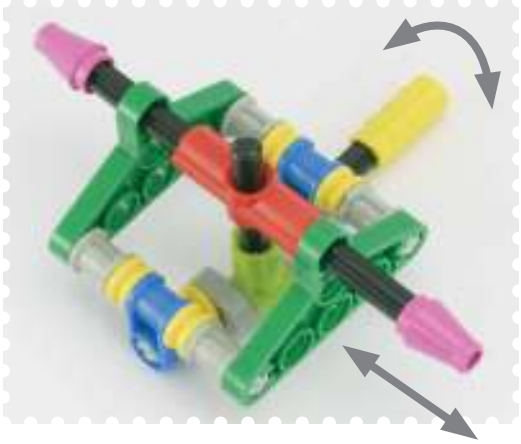


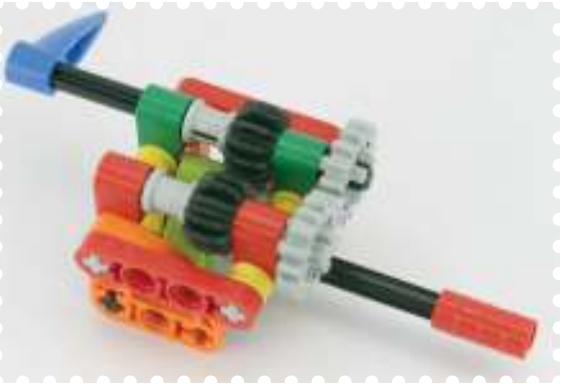


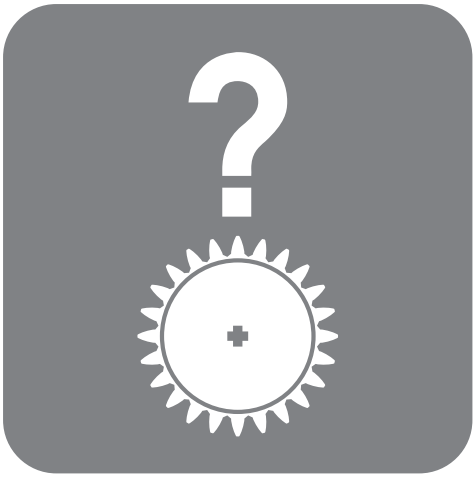


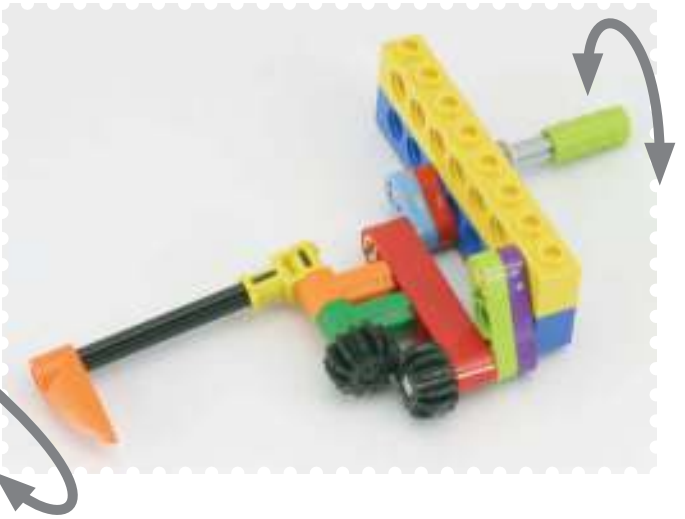


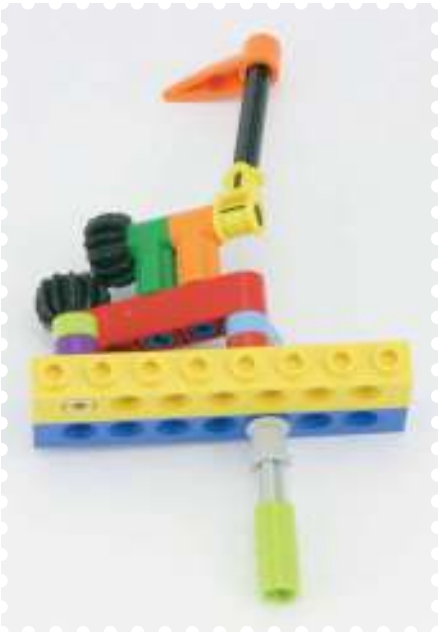


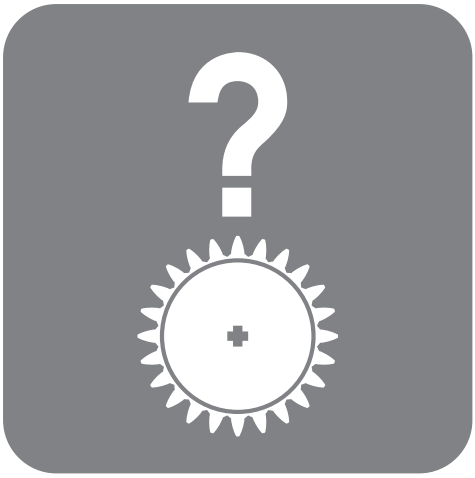


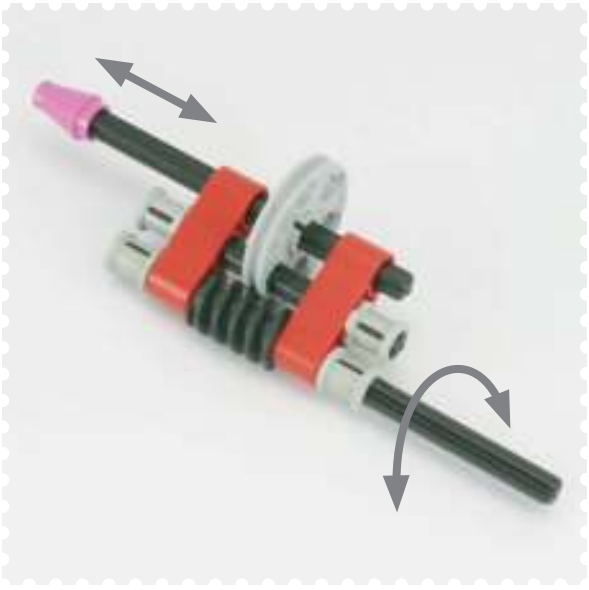


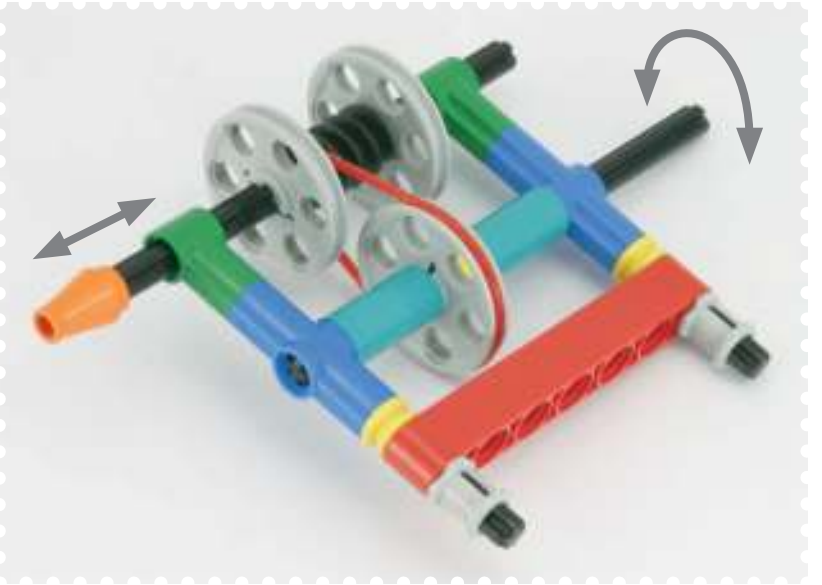


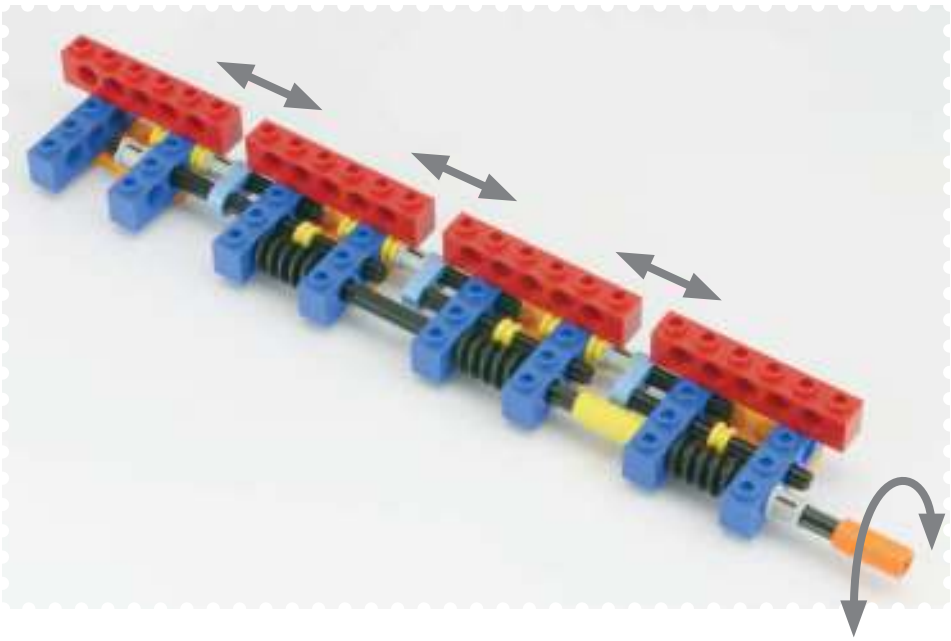


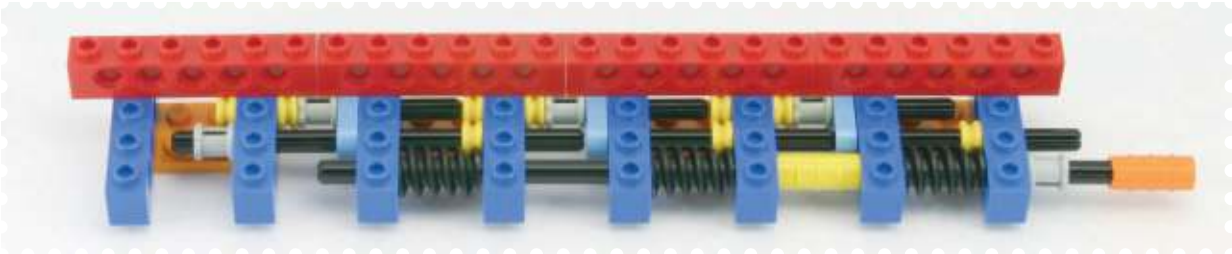


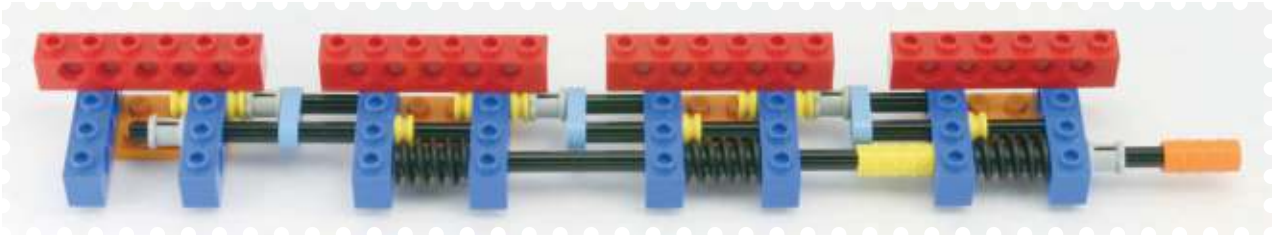


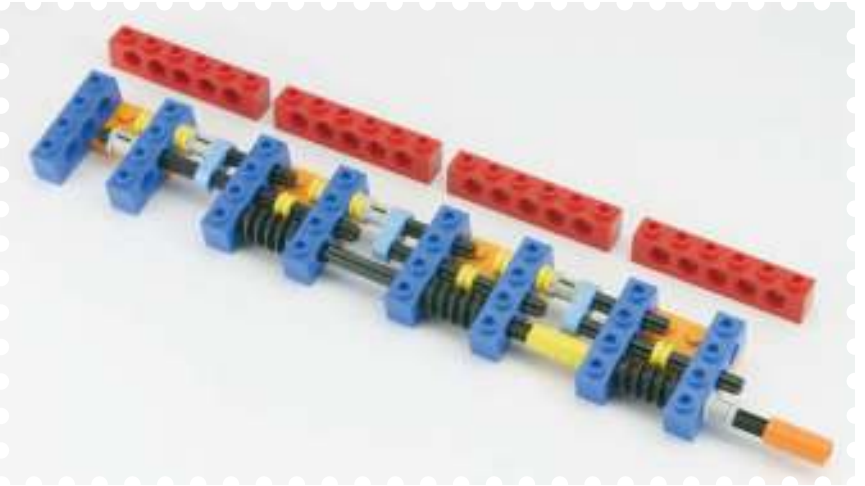


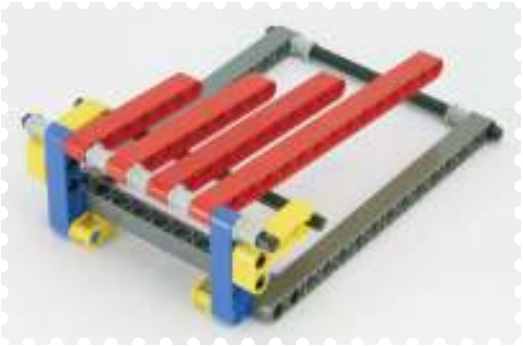


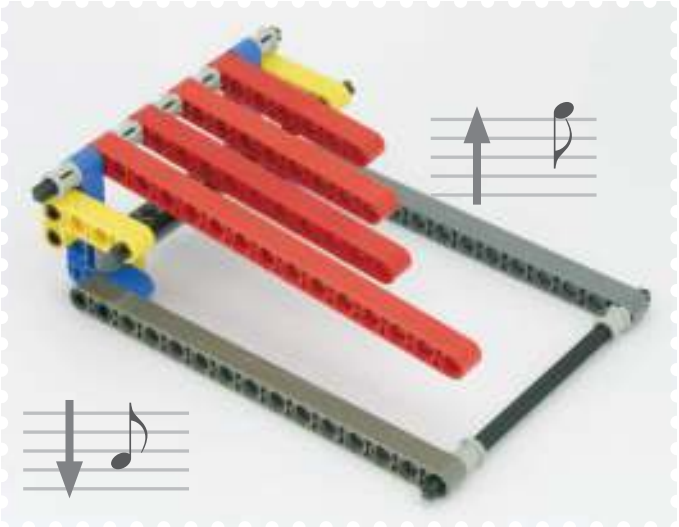


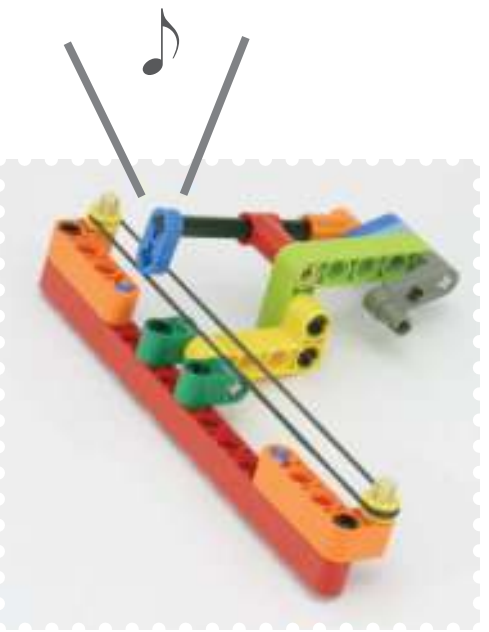


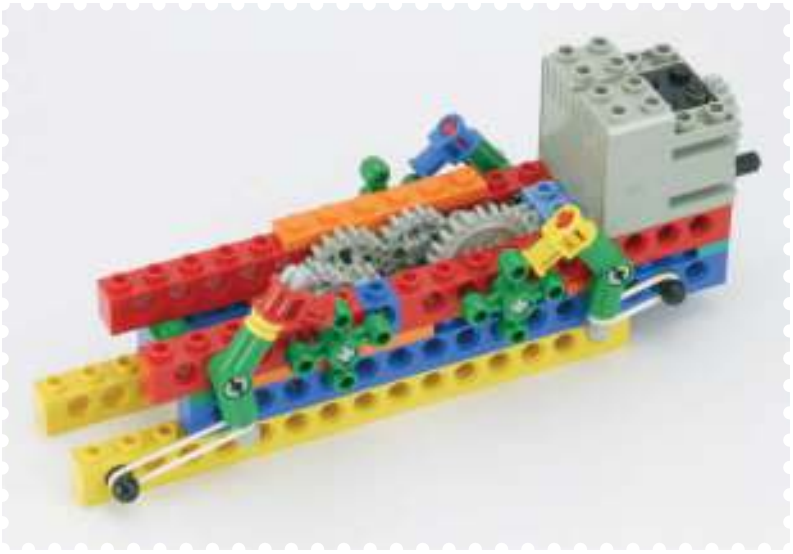


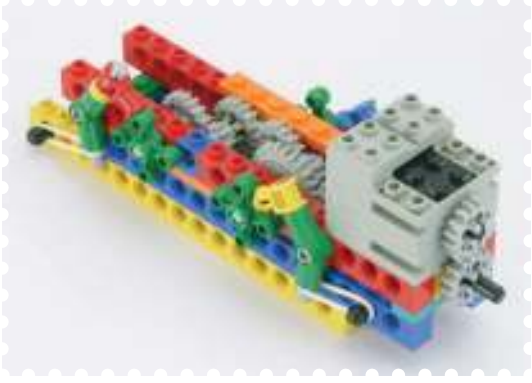


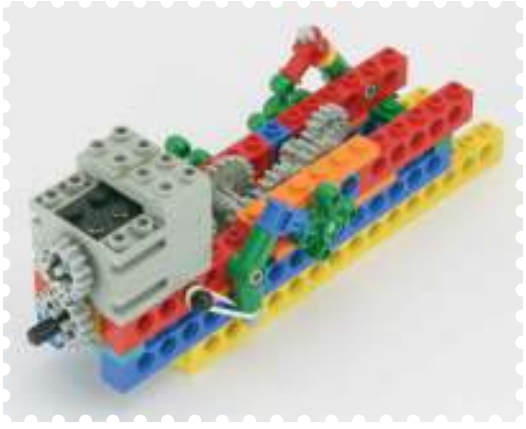


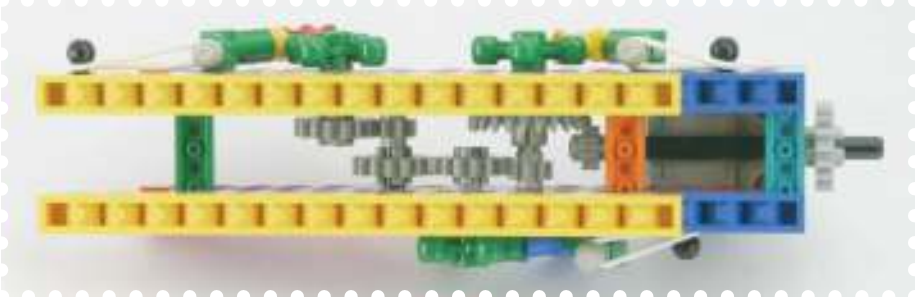


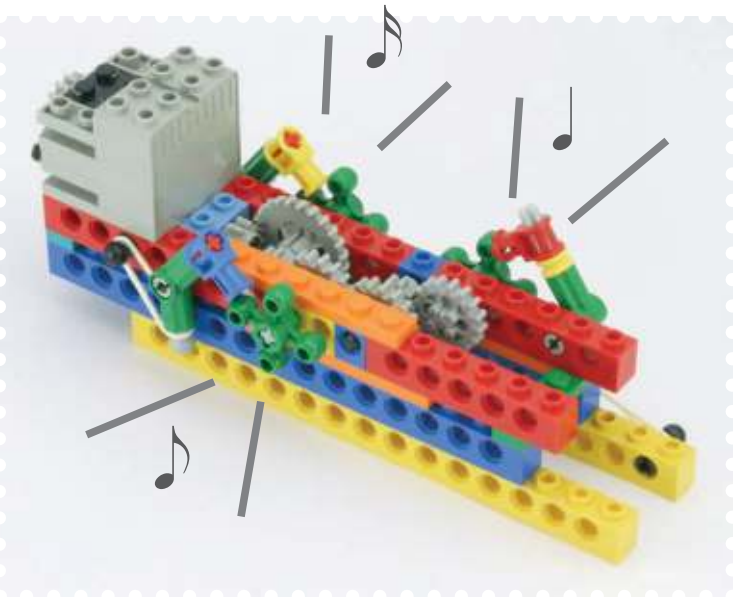


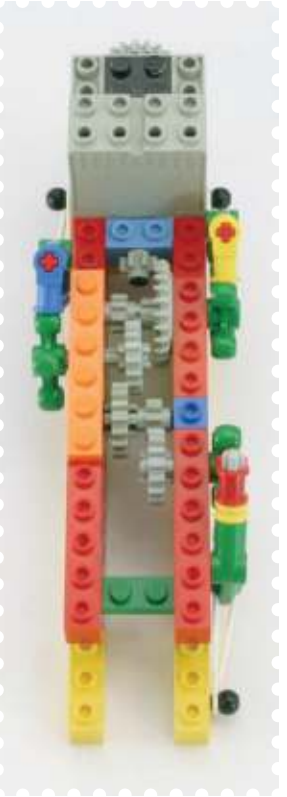












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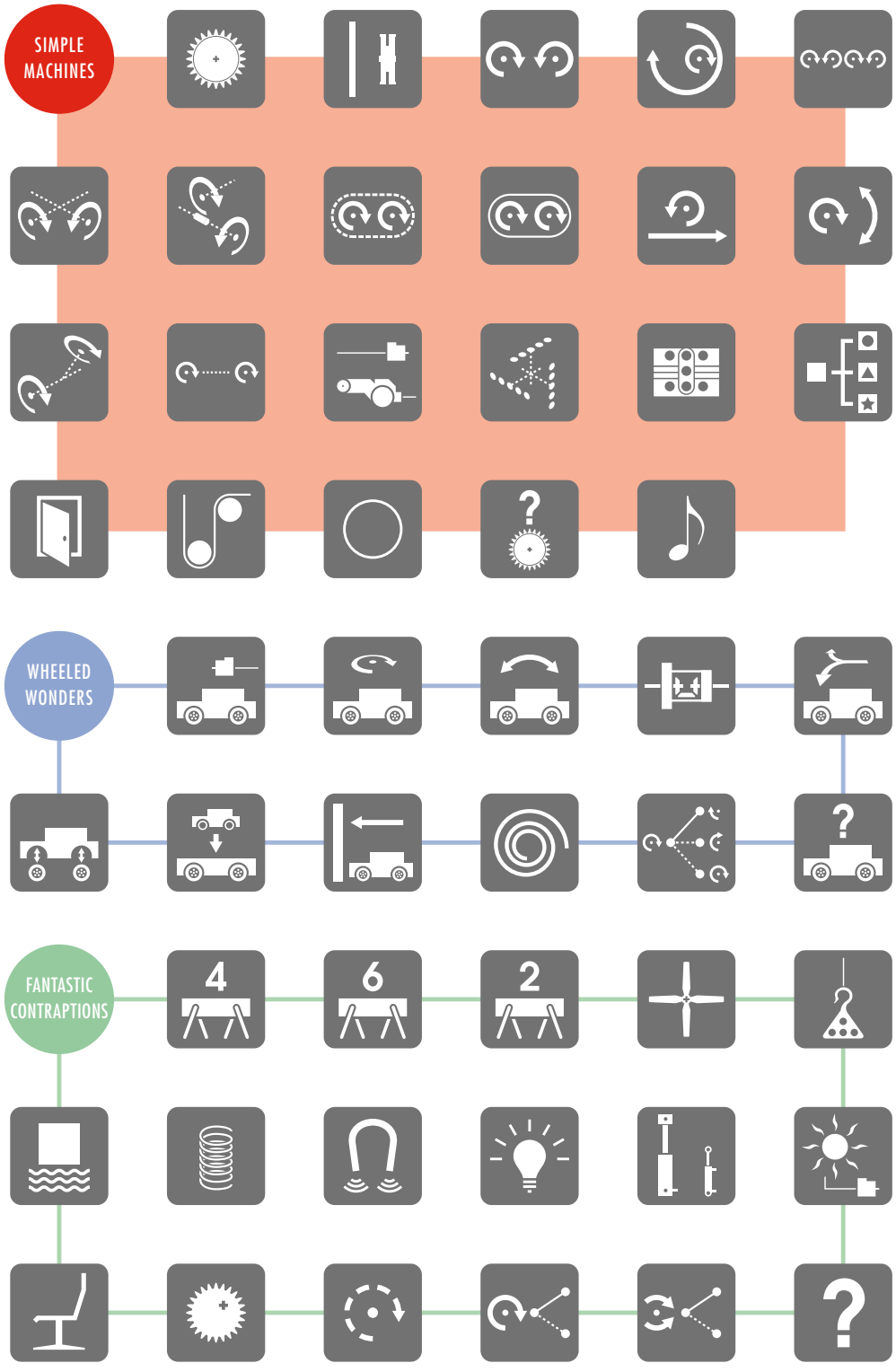

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