



AMUSEMENT PARK ENGINEER



Story and Instructions

Dear Parents,

Engineering is an extremely exciting and vast field. This kit, along with its illustrated storybook and instruction manual, provides an engaging way to teach simple physics and engineering concepts to preschool-age kids.

Read the story with your child and build the simple models of the amusement park rides and playground equipment described in the story. During their family trip to an amusement park, the main characters in the story build, fix, and enjoy various amusement park rides. As you follow along, your child can build 20 models of the rides and structures in the story with your help. Large, colorful plastic building pieces make it easy for small hands to put the models together.

The models are assembled step by step using a construction system. It will require a little practice and patience at first. Please assist your children when they need your help, but also let them try to build the models by themselves. Your children will be happy to have your help with the models or assembly steps that pose particular difficulties.

We wish you and your child lots of fun building, discovering, and learning!

Safety Information



WARNING:

CHOKING HAZARD — Small parts.
Not for children under 3 yrs.

- » » » **WARNING.** Not suitable for children under 3 years. Choking hazard — small parts may be swallowed or inhaled.
- » » » Keep the packaging and instructions as they contain important information.
- » » » Store the experiment material and assembled models out of the reach of small children.
- » » » If the components should get wet, please dry and clean them thoroughly before the next use.

AMUSEMENT PARK ENGINEER

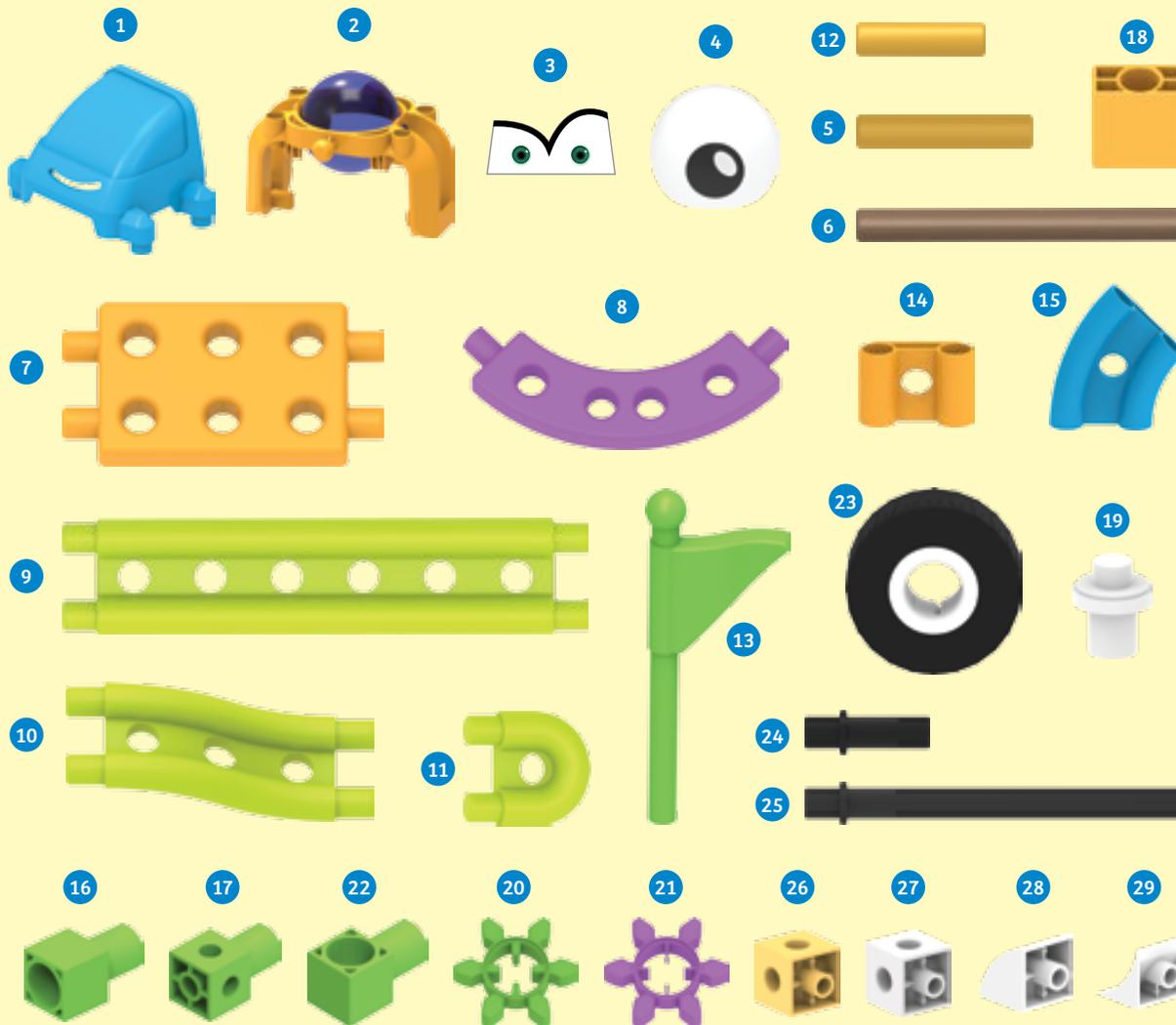


**Story by
Ted McGuire**

**Illustrations by
Dan Freitas and Ashley Greenleaf**

>>> KIT CONTENTS

What's inside your kit:



Checklist: Find – Inspect – Check off

| ✓ | No. | Description | Qty. | Item No. |
|--------------------------|-----|--------------------------------|------|----------------|
| <input type="checkbox"/> | 1 | Ball track car top* | 1 | 567008-1 |
| <input type="checkbox"/> | 2 | Ball track car bottom* | 1 | 567008-2 |
| <input type="checkbox"/> | 3 | Eye sticker for ball track car | 1 | 567008-3 |
| <input type="checkbox"/> | 4 | Eye | 2 | 7261-W85-A |
| <input type="checkbox"/> | 5 | Medium dowel | 2 | 7330-W11-A1T |
| <input type="checkbox"/> | 6 | Long dowel | 2 | 7330-W11-B1D |
| <input type="checkbox"/> | 7 | 6-hole panel | 1 | 7330-W11-C1O |
| <input type="checkbox"/> | 8 | 4-hole curved rod | 4 | 7330-W11-J1P1 |
| <input type="checkbox"/> | 9 | 6-hole straight track | 2 | 7330-W11-K1G1 |
| <input type="checkbox"/> | 10 | 3-hole slide track | 4 | 7330-W11-N1G1 |
| <input type="checkbox"/> | 11 | 1-hole end track | 2 | 7330-W11-P1G1 |
| <input type="checkbox"/> | 12 | Short dowel | 8 | 7330-W11-X1T |
| <input type="checkbox"/> | 13 | Flag | 1 | 7330-W11-ZA1G1 |
| <input type="checkbox"/> | 14 | Straight track connector | 8 | 7331-W10-A1O1 |
| <input type="checkbox"/> | 15 | Curved track connector | 4 | 7331-W10-B1B |
| <input type="checkbox"/> | 16 | Dowel block with top hole | 8 | 7331-W10-D1G1 |
| <input type="checkbox"/> | 17 | Cube block with peg | 2 | 7331-W10-D3G1 |
| <input type="checkbox"/> | 18 | Dowel connector | 4 | 7331-W10-E1O1 |
| <input type="checkbox"/> | 19 | Track holder | 4 | 7331-W10-F1W |
| <input type="checkbox"/> | 20 | Small gear, green | 2 | 7331-W10-L2G1 |
| <input type="checkbox"/> | 21 | Small gear, purple | 2 | 7331-W10-L2P1 |
| <input type="checkbox"/> | 22 | Dowel block with side hole | 9 | 7331-W10-M1G1 |
| <input type="checkbox"/> | 23 | Wheel | 3 | 8036-W85-C1D |
| <input type="checkbox"/> | 24 | Short axle | 2 | 8060-W11-G1D |
| <input type="checkbox"/> | 25 | Long axle | 1 | 8060-W11-H1D |
| <input type="checkbox"/> | 26 | Cube block, peach | 1 | 880-W10-A1PO |
| <input type="checkbox"/> | 27 | Cube block, white | 6 | 880-W10-A1W |
| <input type="checkbox"/> | 28 | Convex block, white | 4 | 880-W10-R1W |
| <input type="checkbox"/> | 29 | Concave block, white | 6 | 880-W10-D1W |

GOOD TO KNOW!

If you are missing any parts, please contact Thames & Kosmos customer service.

*Colors may vary.

Meet the Omega Family!

Ty and Karlie Omega are siblings. They live in a small city called Makersville. Ty and Karlie's dad is a writer. He writes science fiction stories. Their mom is a mechanical engineer. She designs big machines used in factories.

They live in an awesome warehouse filled with tools, equipment, and building materials. There are always a number of projects going on in the warehouse.

Ty loves figuring out how things work. Karlie loves building things.

When Ty and Karlie were little, Ms. O designed Huxley, a robot that can build just about anything. For one of his first projects Huxley converted Karlie's teddy bear, Remus, into a walking, talking science bear. Now Huxley and Remus are like members of the Omega family.



Ty and Karlie's Amusement Park Adventure begins ...

One hot summer day, while the Omega family was eating breakfast, Mr. O suddenly jumped up with an excited look in his eyes.

"I have an idea! Let's go to the amusement park today!"

"Yes!" shouted Ty and Karlie in unison.

The whole family piled into their bus and headed to the amusement park.

As they walked up to the gates of the amusement park, they saw Mikey the Park Manager standing in front of the ticket booth. He had a sad look on his face.

"Sorry folks," Mikey said, "The park is closed today because all of the rides are broken and the engineers who can fix them aren't here yet."

"We can help!" shouted Karlie immediately. "With Huxley our robot, and our knowledge of physics, we can fix practically anything!" The kids loved physics and they loved building!

"Well, alrighty then. How about you start with the roller coaster? The track is all broken up into pieces and we need help putting it back together," said Mikey.

"Okay! We're on it," Karlie responded.

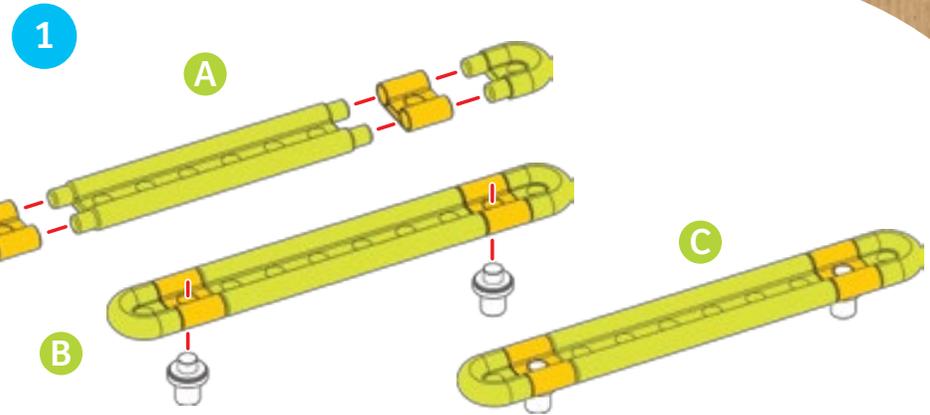


ROBBY THE ROLLER COASTER

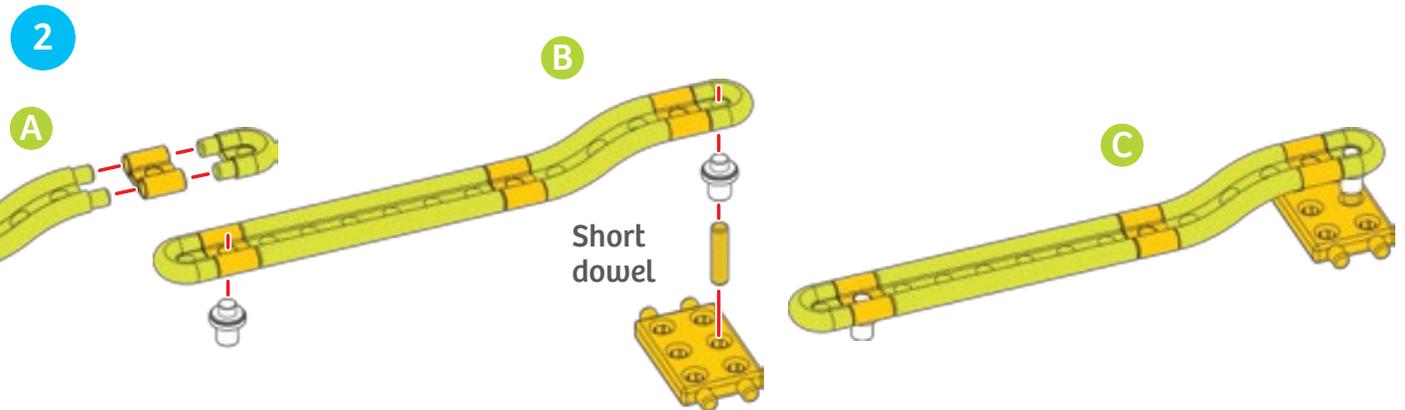
The kids started by assembling the roller coaster car.



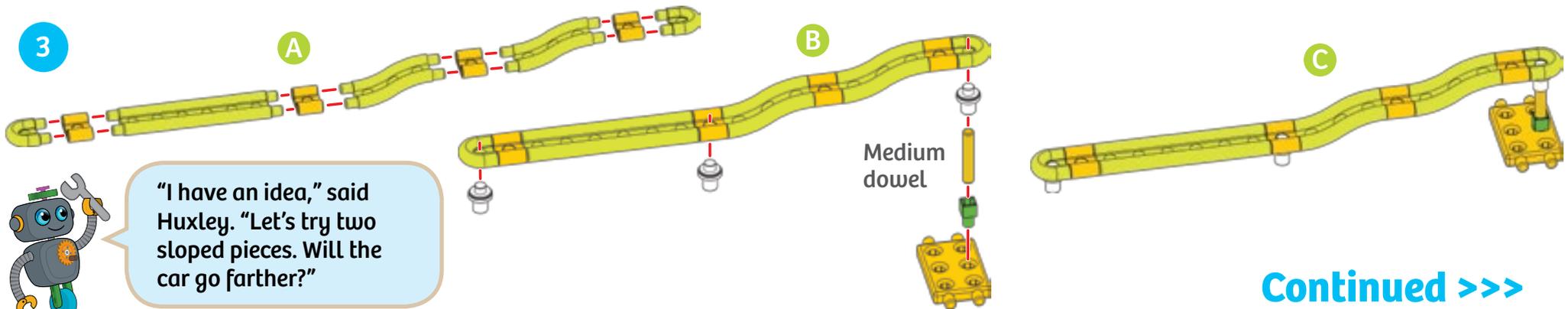
"Let's try one straight, flat length of track. Does the car roll along it on its own?" asked Karlie.



"What if we add one of these sloped pieces of track. Does the car slide down now?" Ty asked.

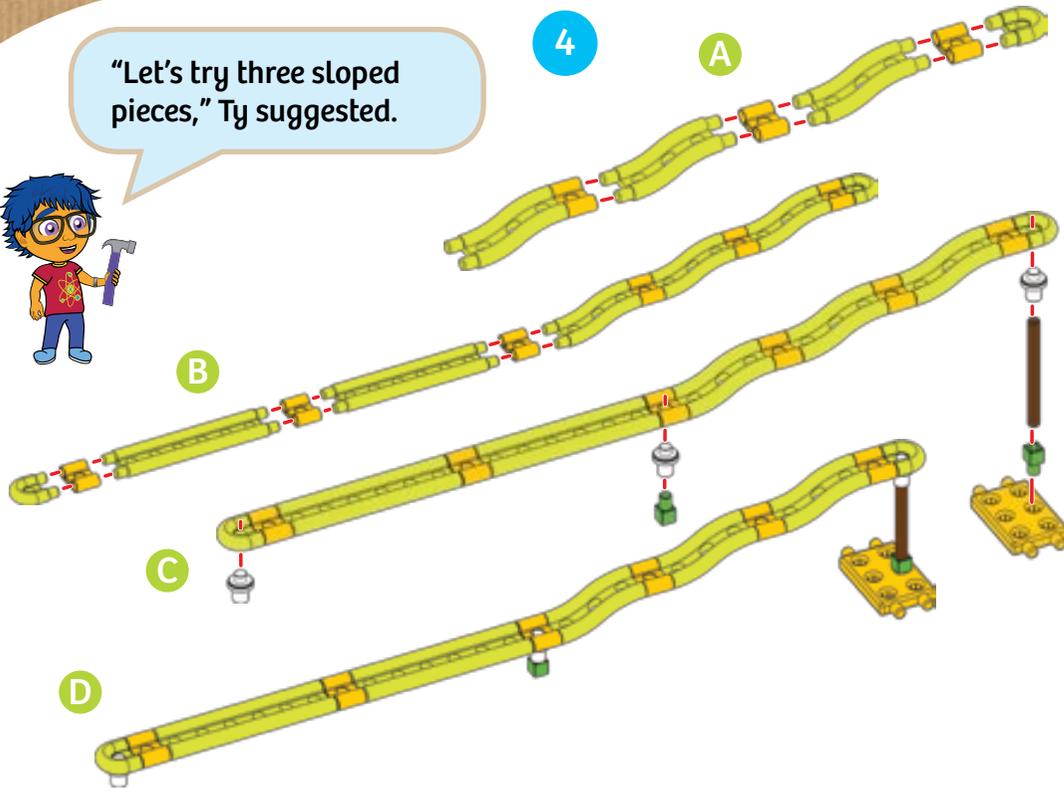


"I have an idea," said Huxley. "Let's try two sloped pieces. Will the car go farther?"

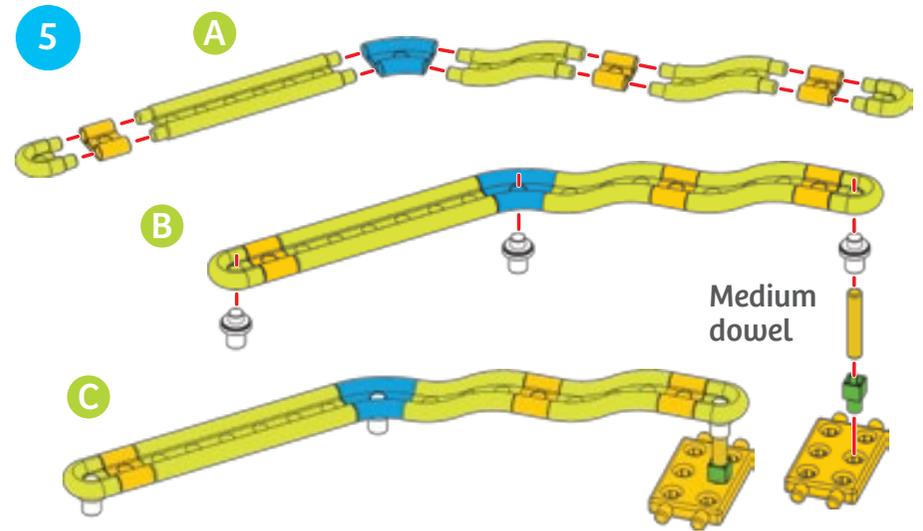


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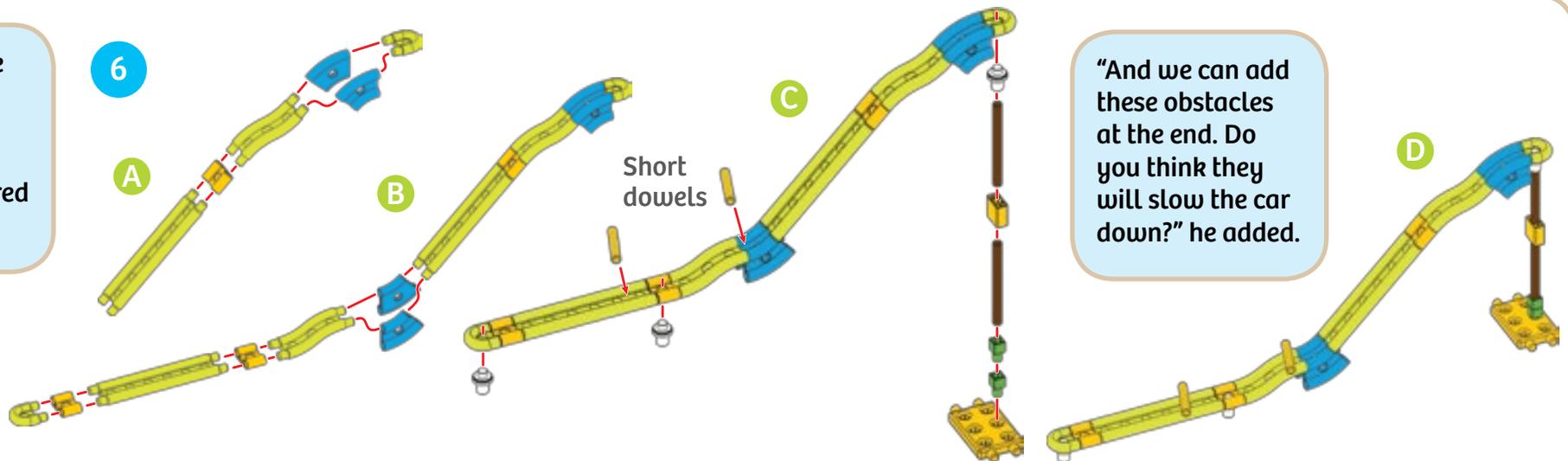
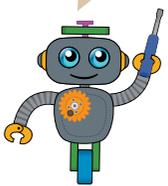
"Let's try three sloped pieces," Ty suggested.



"I know what's happening! An invisible force called gravity is pulling the car down the sloped track," explained Karlie. "The higher the track, the faster the car travels by the end. Now what if we add a curved track?"

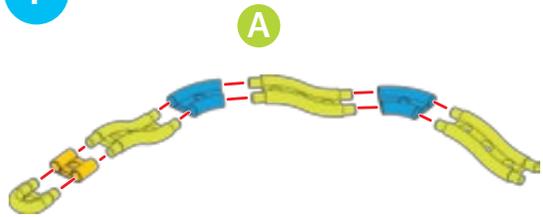


"We can use the curved track pieces to make the track much steeper," declared Huxley.

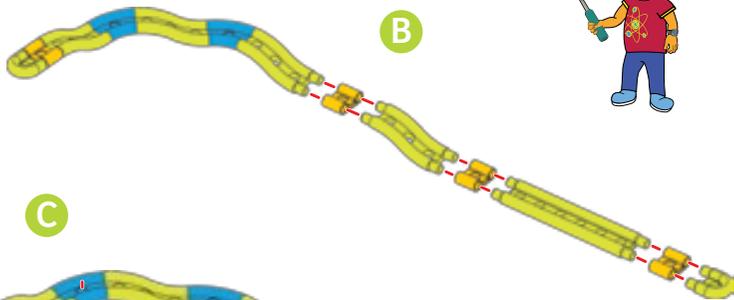


"And we can add these obstacles at the end. Do you think they will slow the car down?" he added.

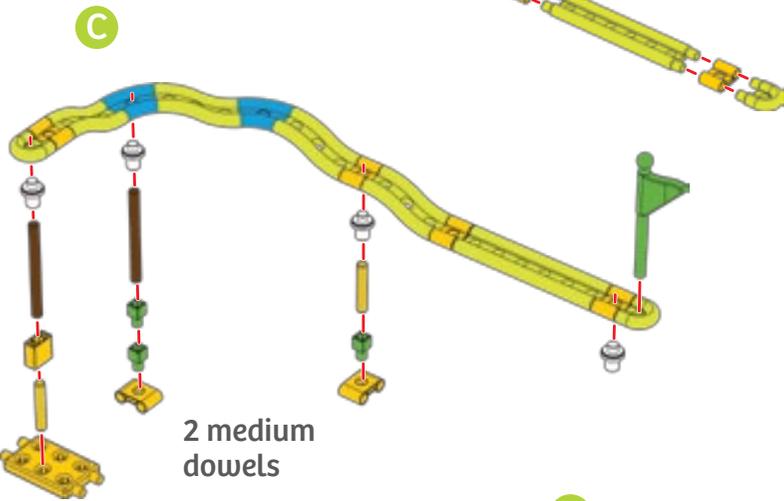
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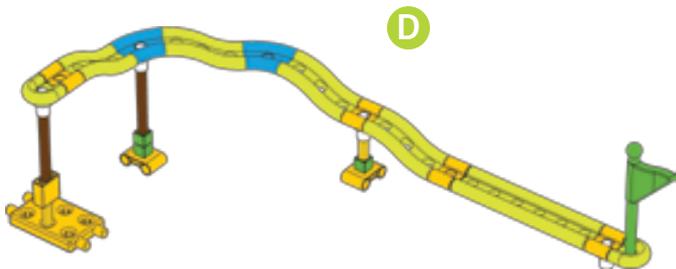
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C

2 medium dowels

Medium dowel

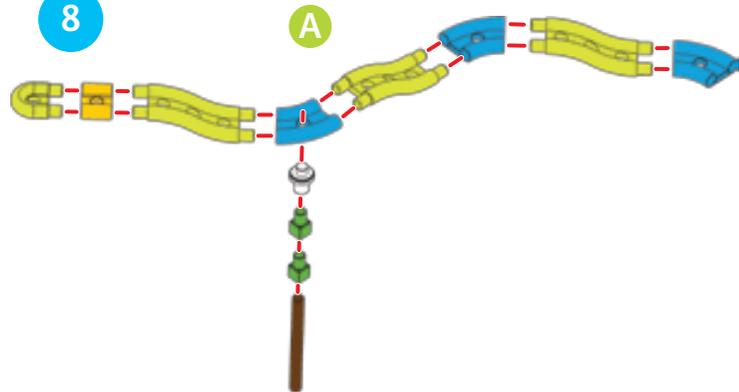


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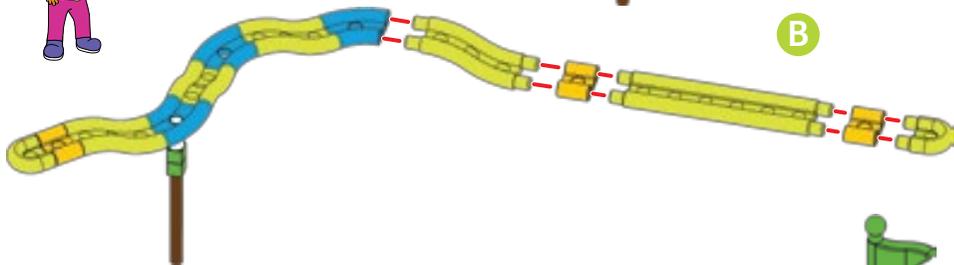
"Oh, that gives me an idea," said Ty. "To keep the car from going off the end of the track, we can add a flag."



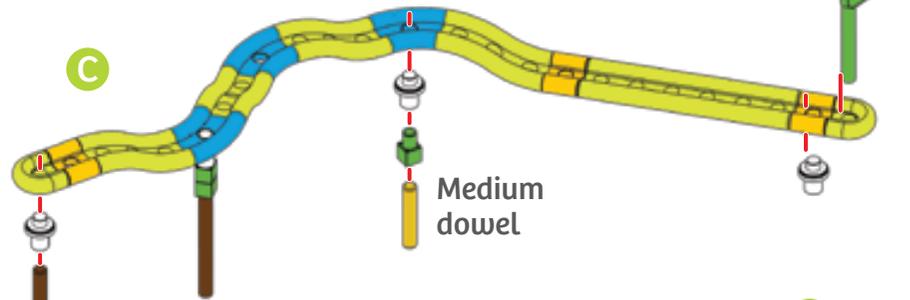
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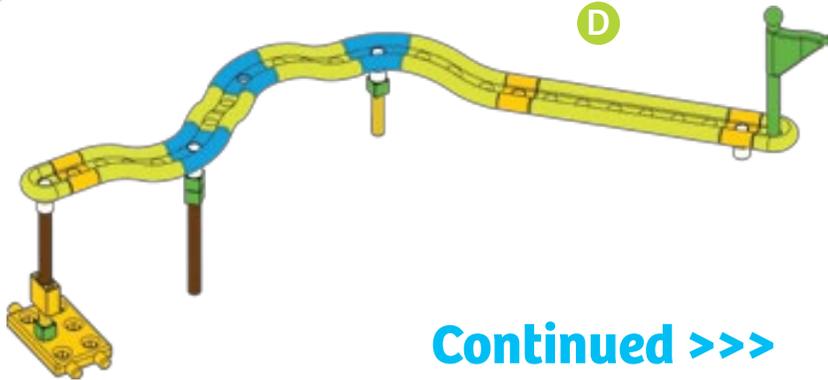
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C

Medium dowel

Short dowel



D

"Let's see if we can make the track turn one way and then the other way!" Karlie proposed.

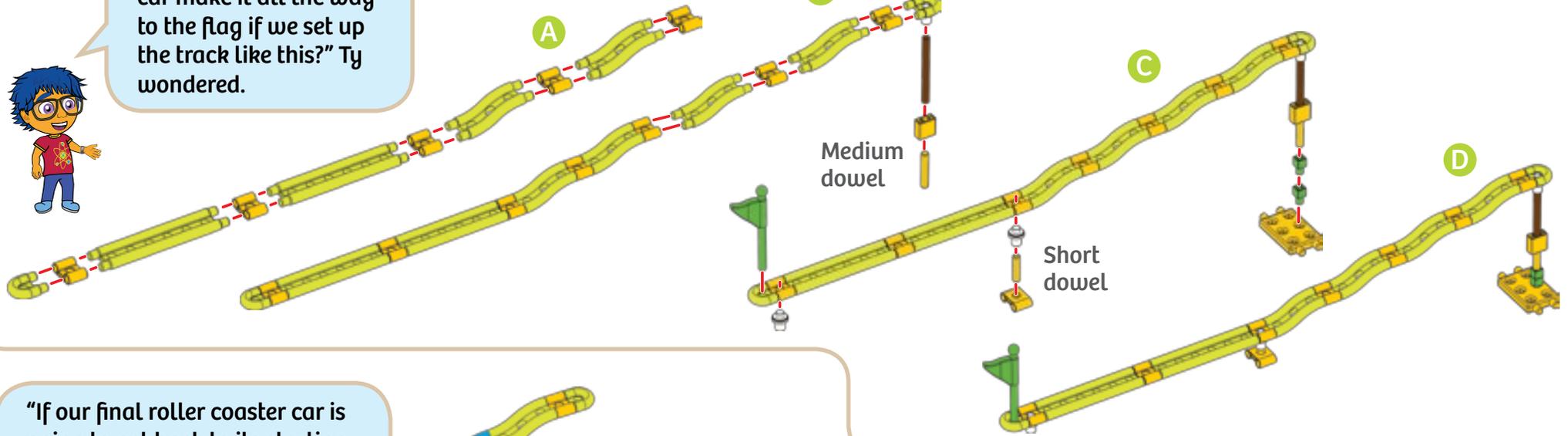


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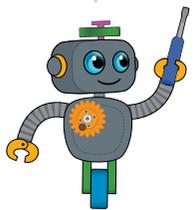


“Will the roller coaster car make it all the way to the flag if we set up the track like this?” Ty wondered.

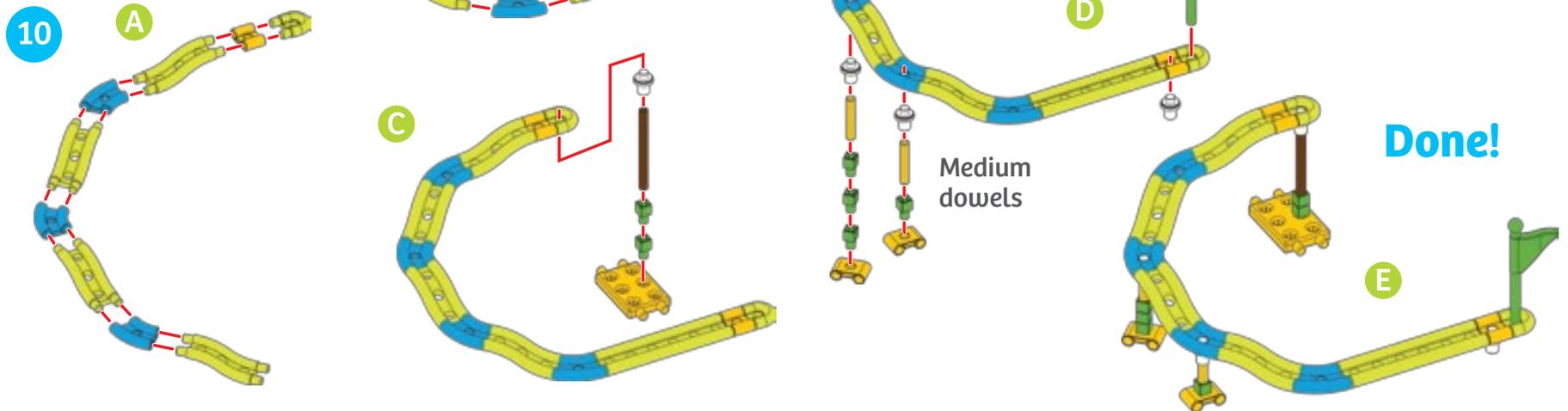
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“If our final roller coaster car is going to get back to its starting point, we will need to make a curved track that lets the car turn around to go in the opposite direction,” said Huxley.



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Done!

After dozens of experiments with the roller coaster tracks and car, the kids figured out how to build the best possible roller coaster.

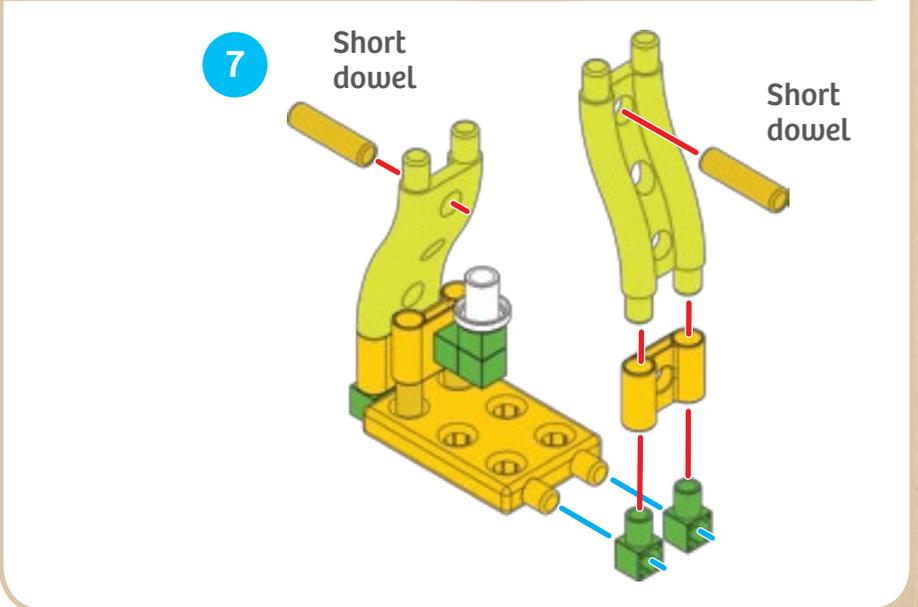
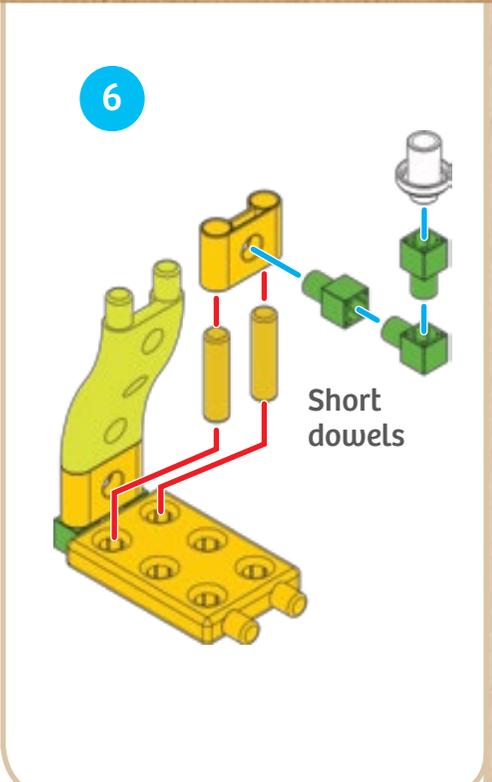
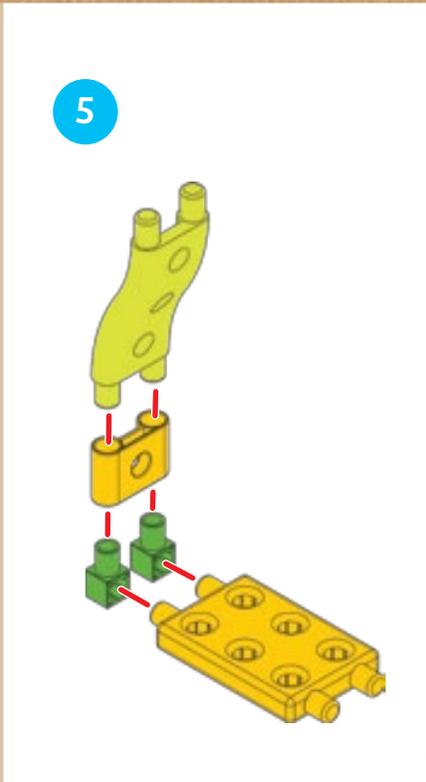
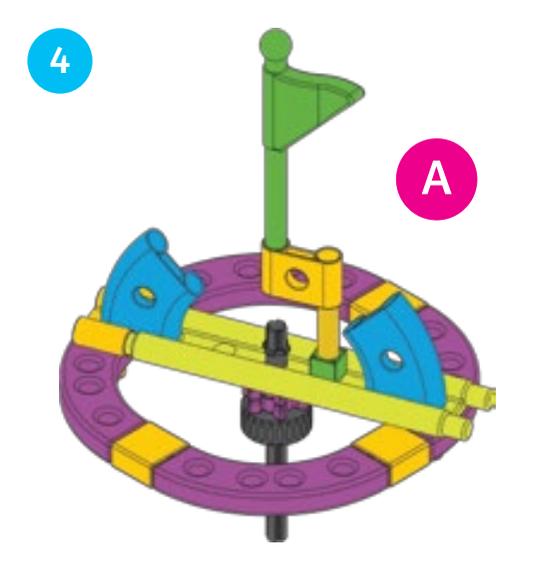
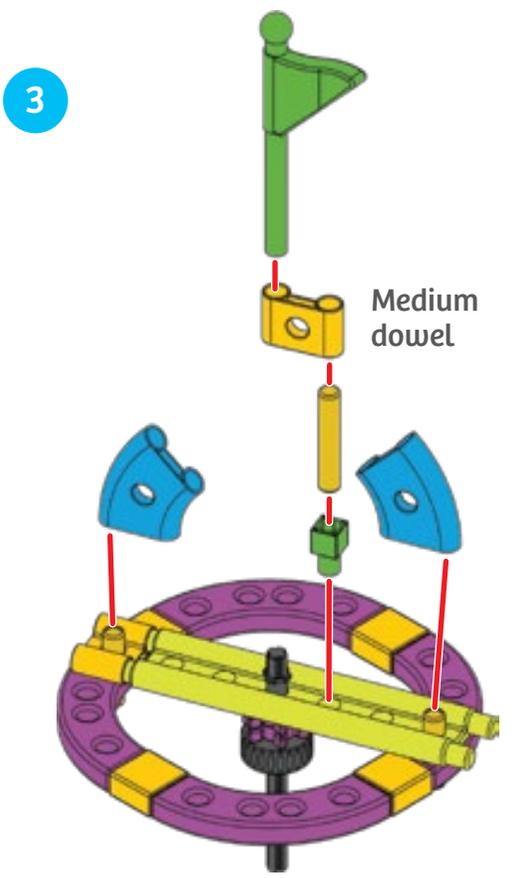
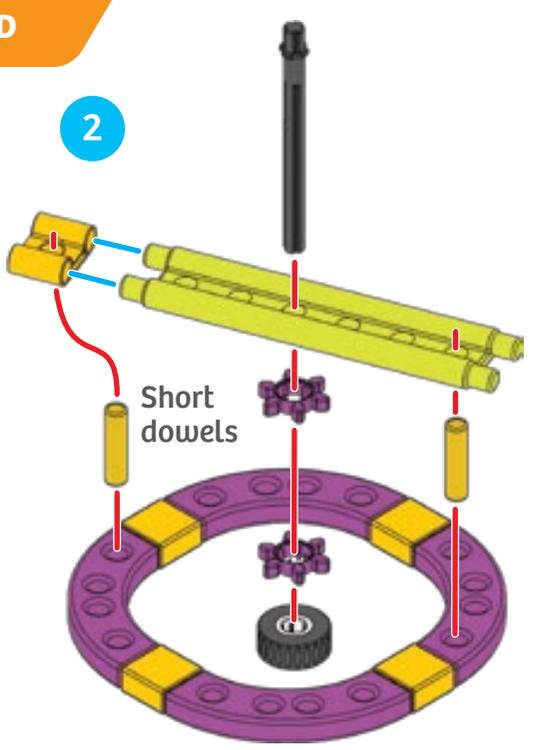
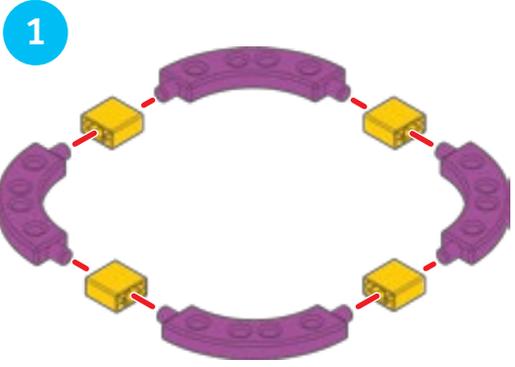
“Yay! We fixed the roller coaster,” Karlie said proudly. “We learned that gravity pulls the car down the track, and we learned how to make the car go in the directions we want it to. Now let’s all go for a ride.”

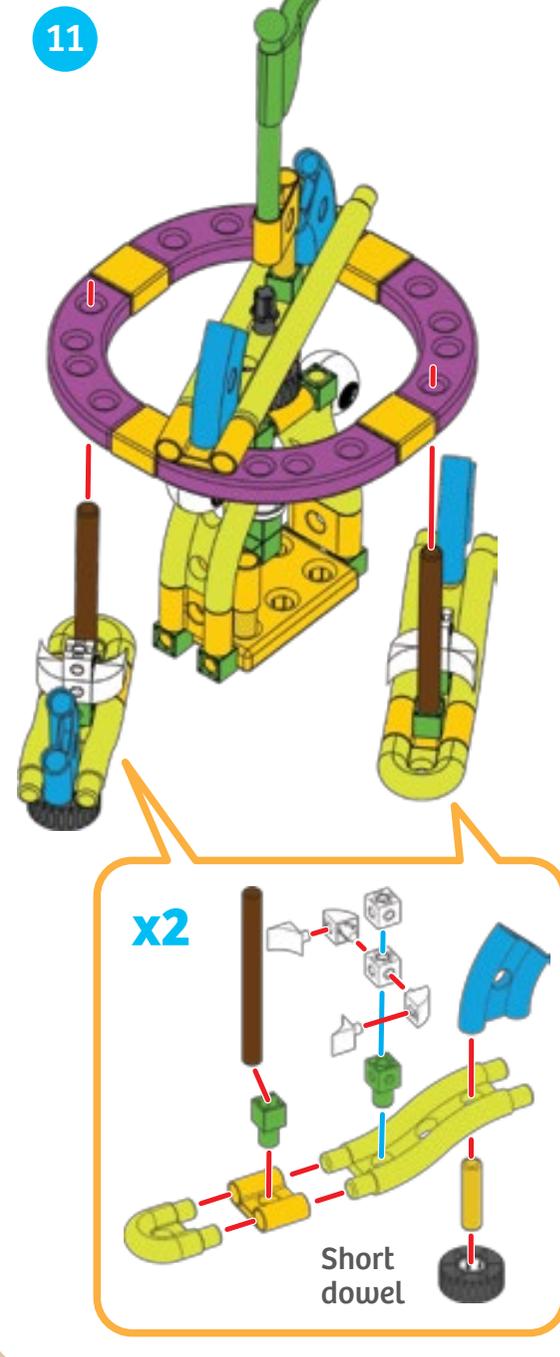
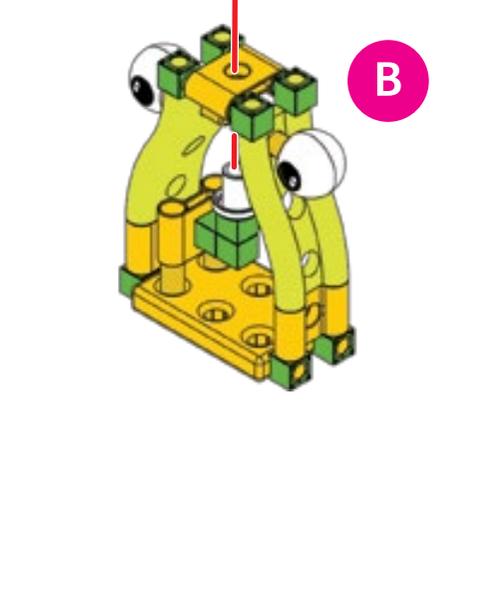
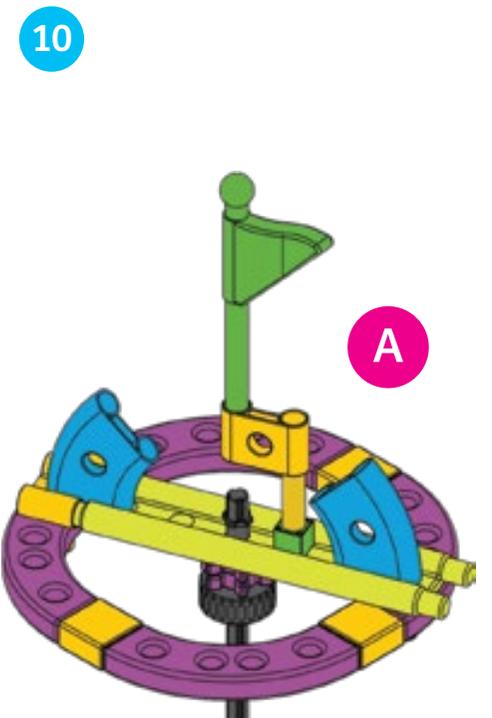
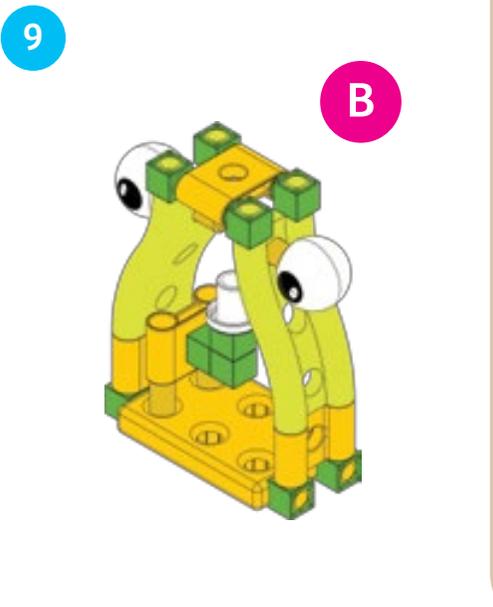
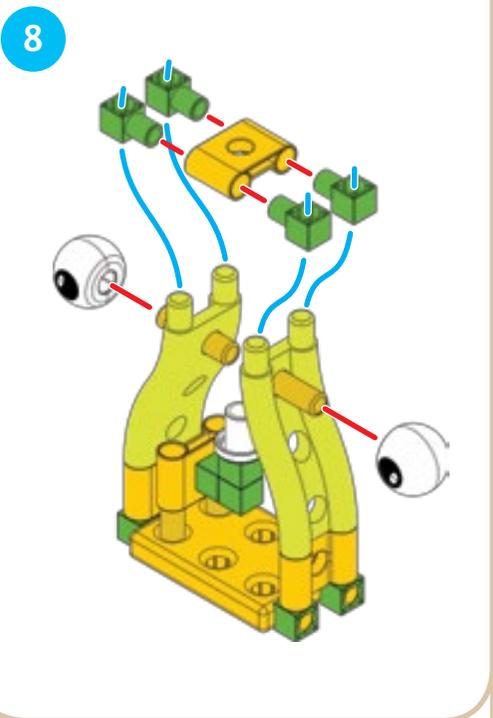
The whole family, including Huxley and Remus, rode the roller coaster with Manager Mikey.

When they were done, Mikey said to the kids, “You did such a great job fixing the coaster — do you think you could take a look at the merry-go-round? It’s not turning.”



MARY THE MERRY-GO-ROUND





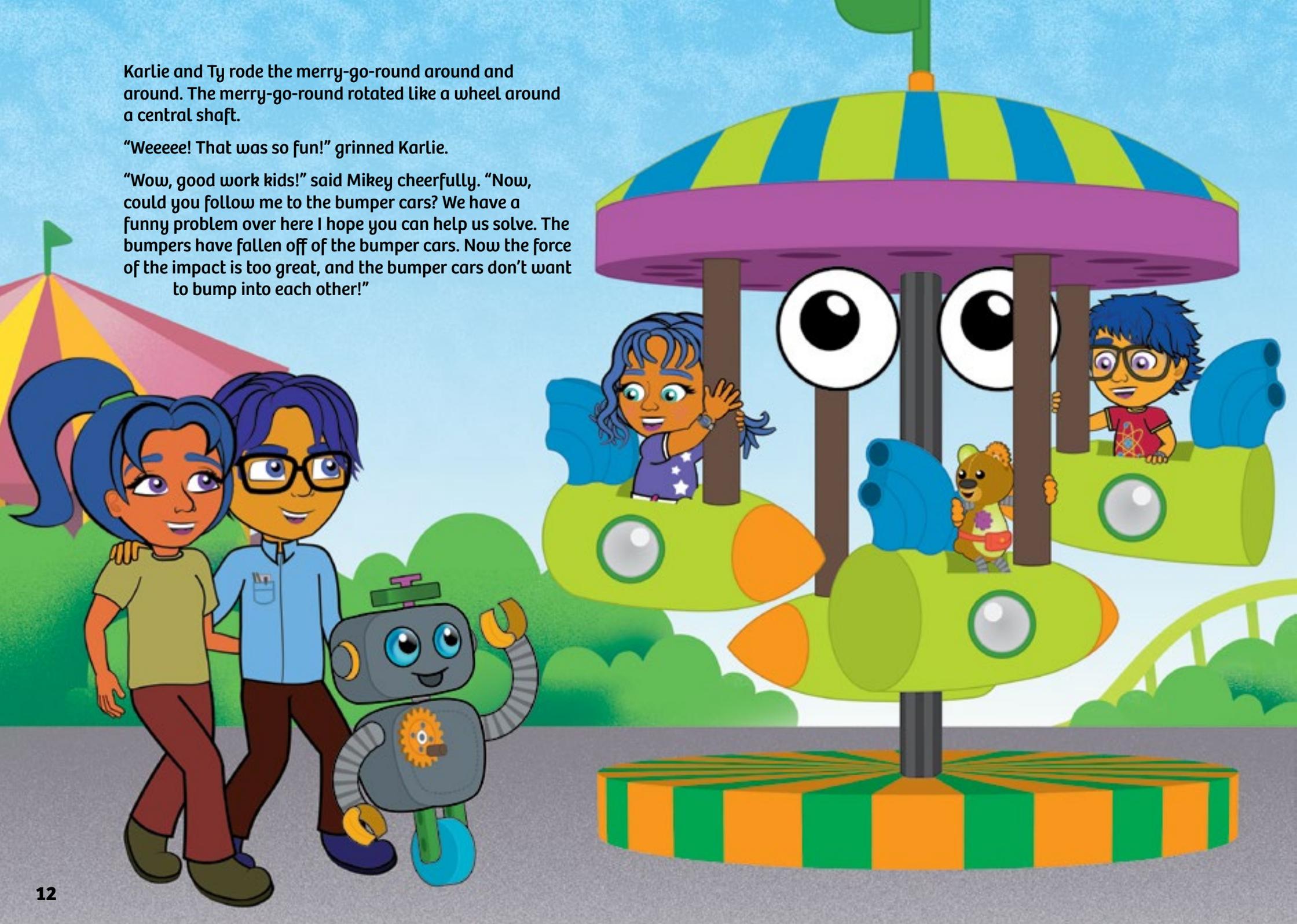
Huxley and the kids fixed the merry-go-round.

"Now I can spin on my central axis!" Mary the Merry-Go-Round said.

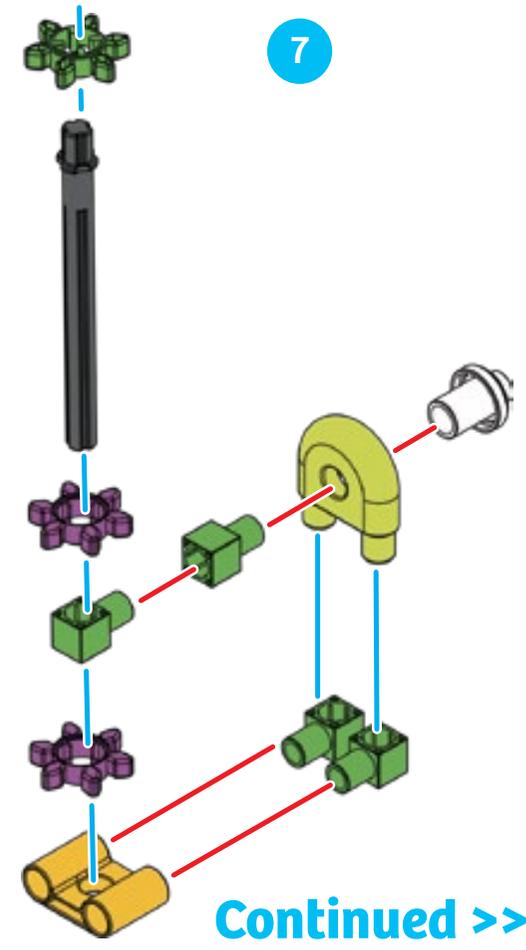
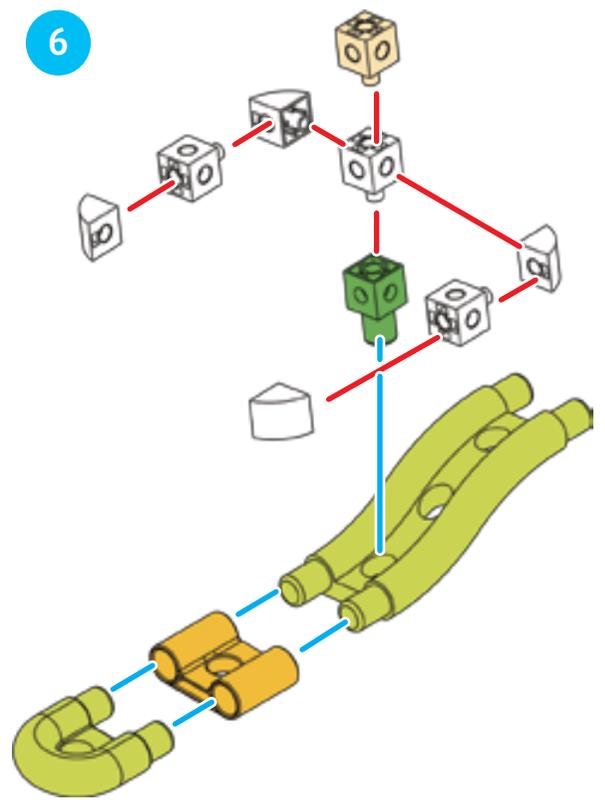
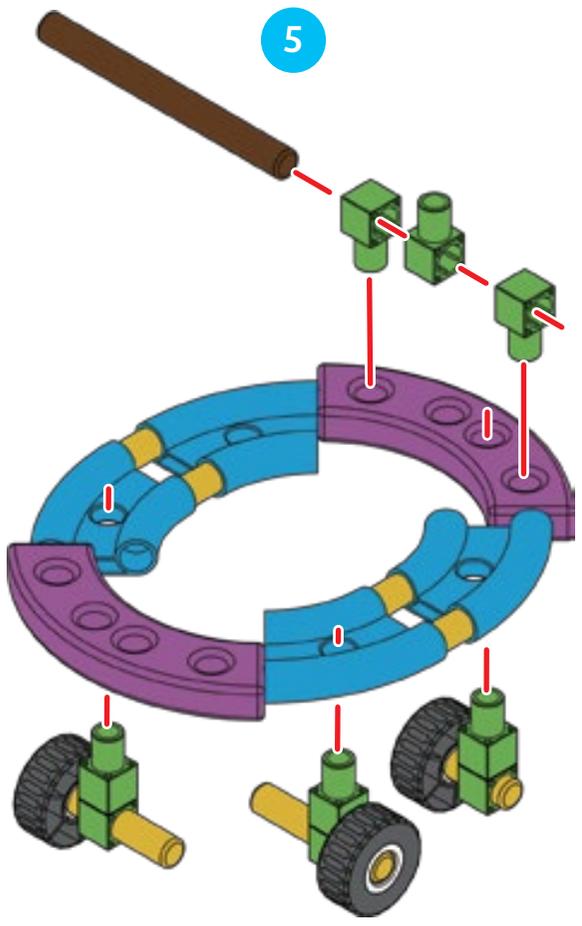
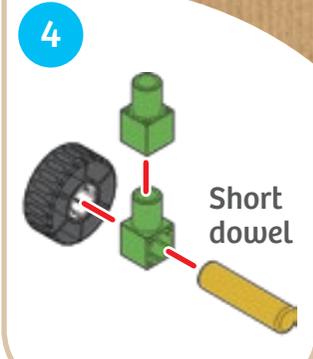
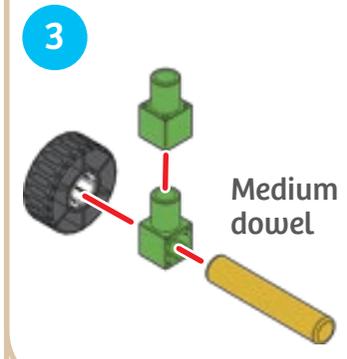
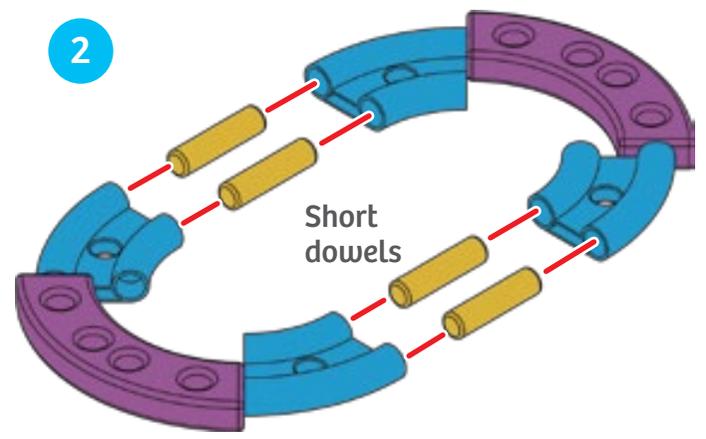
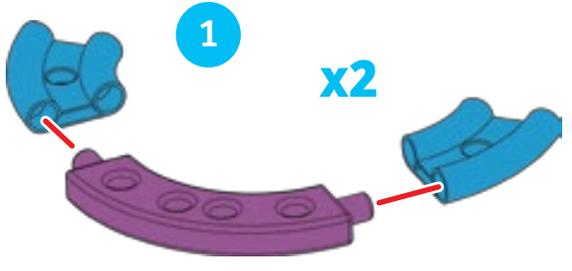
Karlie and Ty rode the merry-go-round around and around. The merry-go-round rotated like a wheel around a central shaft.

“Weeeee! That was so fun!” grinned Karlie.

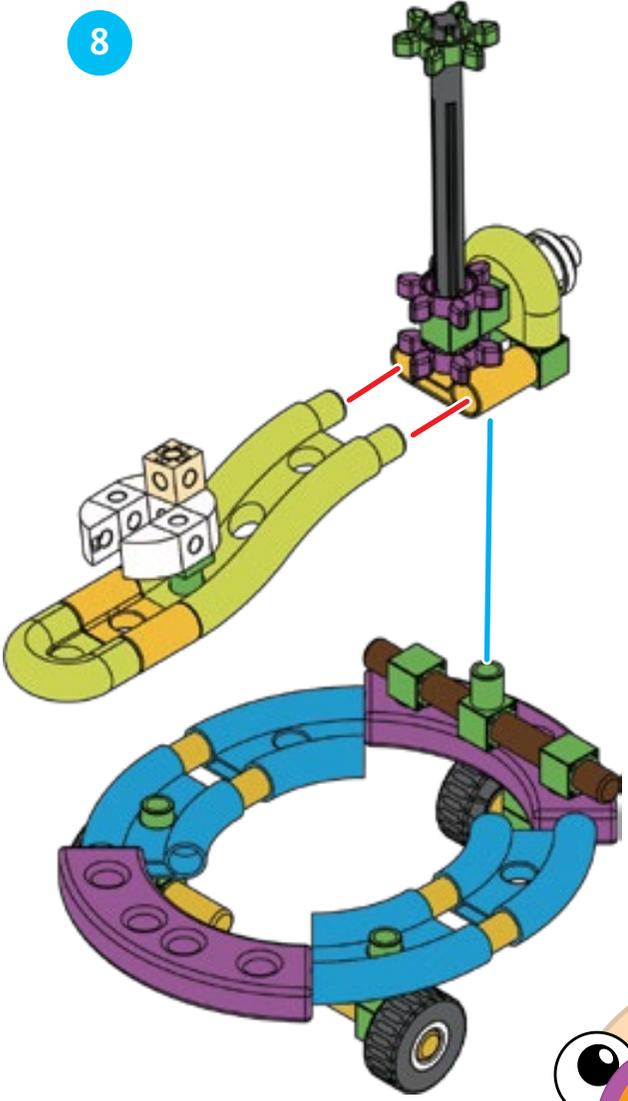
“Wow, good work kids!” said Mikey cheerfully. “Now, could you follow me to the bumper cars? We have a funny problem over here I hope you can help us solve. The bumpers have fallen off of the bumper cars. Now the force of the impact is too great, and the bumper cars don’t want to bump into each other!”



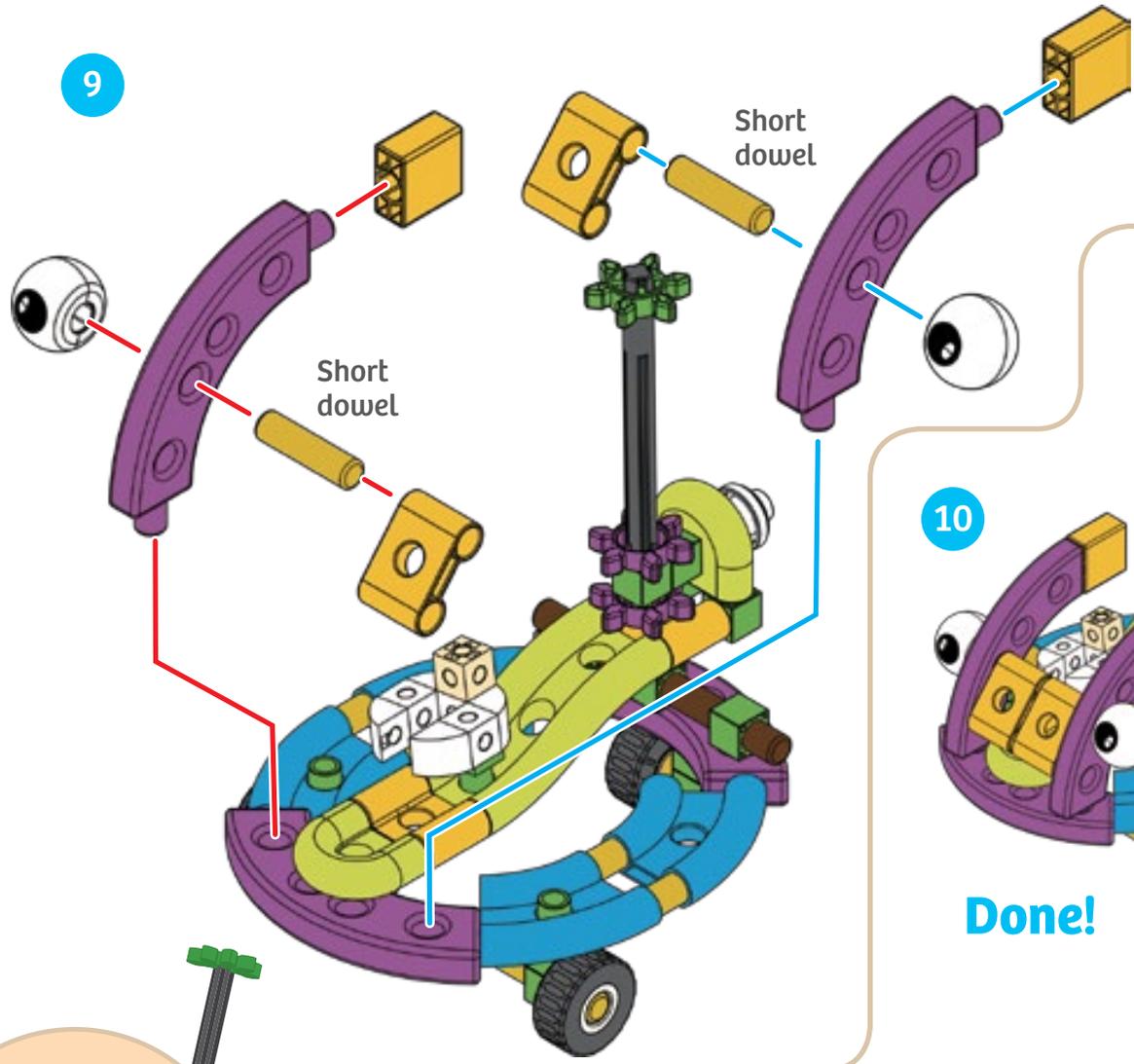
BOB THE BUMPER CAR



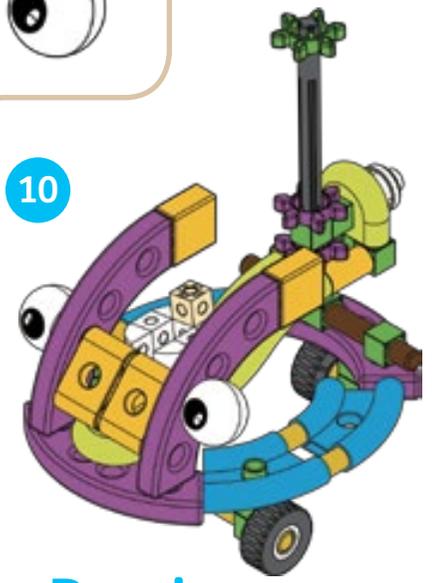
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Done!



They arrived at the bumper car area. The bumper cars' bumpers were lying on the ground under each car. Ty and Karlie tried to lift the cars up to reattach the bumpers, but the cars were too heavy to lift. Huxley suggested they use a lever to lift the cars up.

"A lever is a rod that pivots on a point like a seesaw, and it makes work easier ... it makes loads lighter to lift up!" explained Huxley.

"I've got something even better: a jack." said Ty. "It uses many levers all working together to lift up cars and other heavy objects."

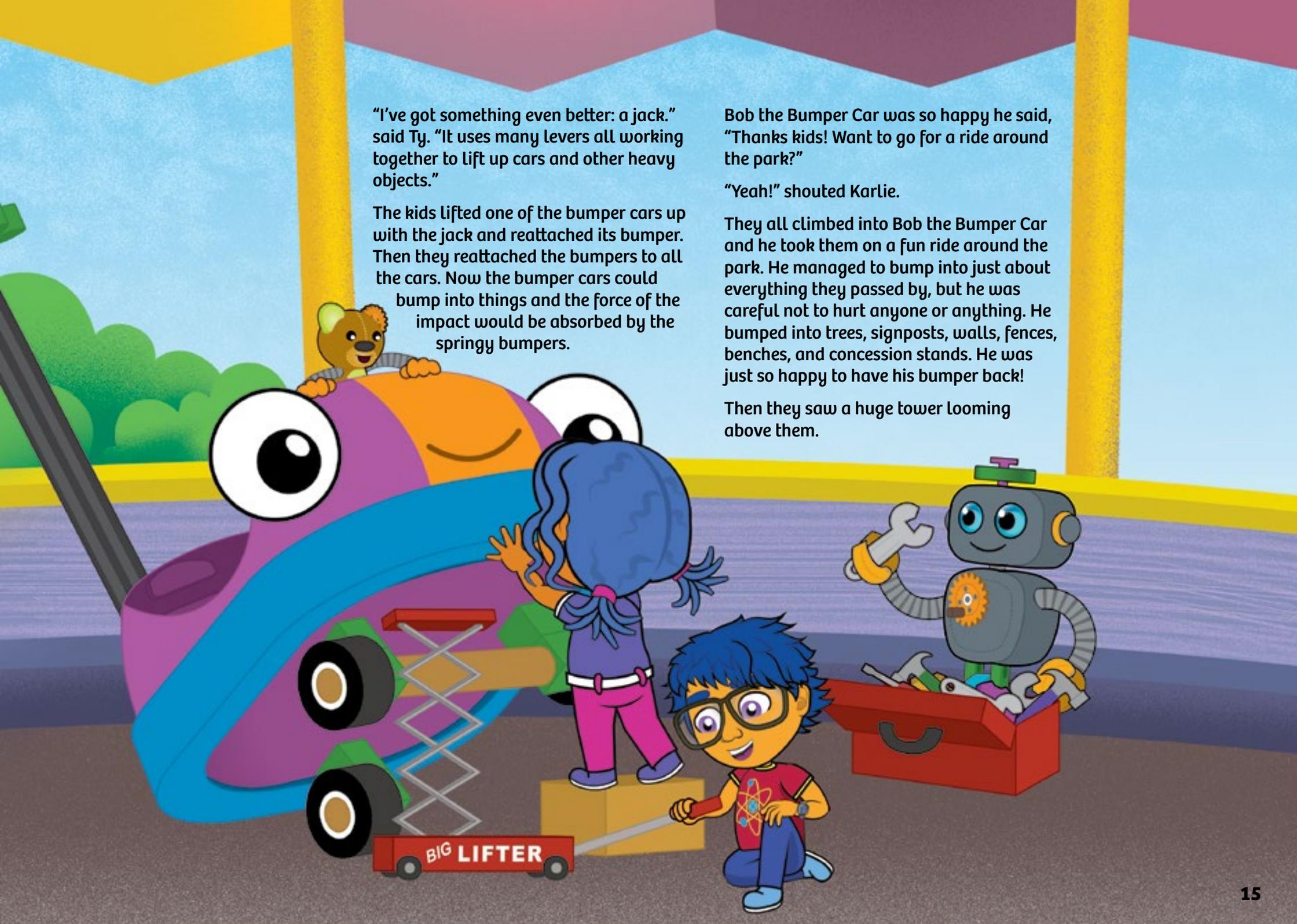
The kids lifted one of the bumper cars up with the jack and reattached its bumper. Then they reattached the bumpers to all the cars. Now the bumper cars could bump into things and the force of the impact would be absorbed by the springy bumpers.

Bob the Bumper Car was so happy he said, "Thanks kids! Want to go for a ride around the park?"

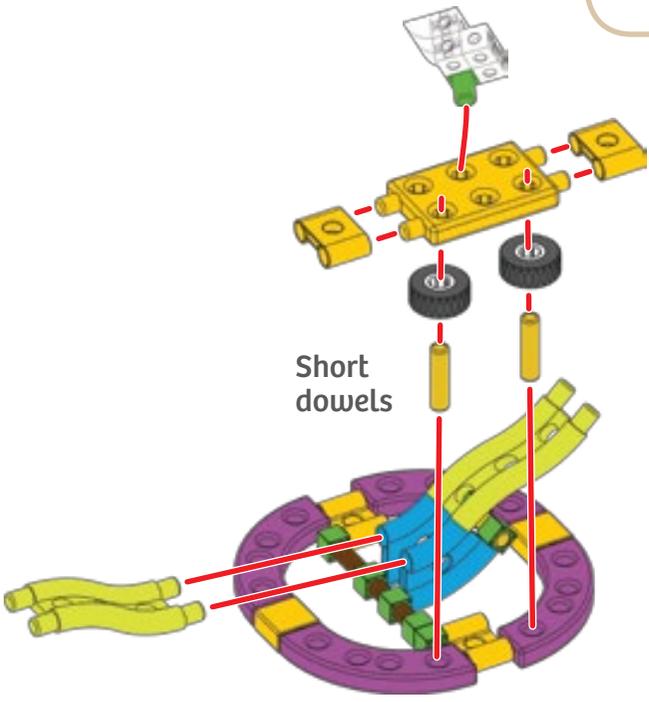
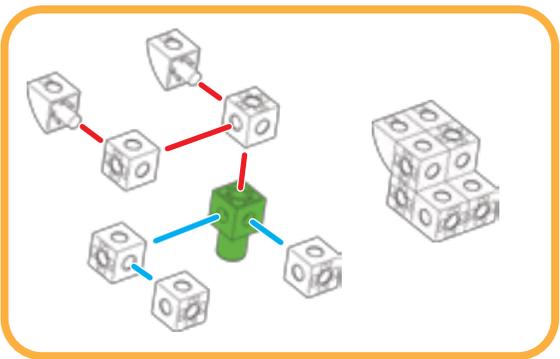
"Yeah!" shouted Karlie.

They all climbed into Bob the Bumper Car and he took them on a fun ride around the park. He managed to bump into just about everything they passed by, but he was careful not to hurt anyone or anything. He bumped into trees, signposts, walls, fences, benches, and concession stands. He was just so happy to have his bumper back!

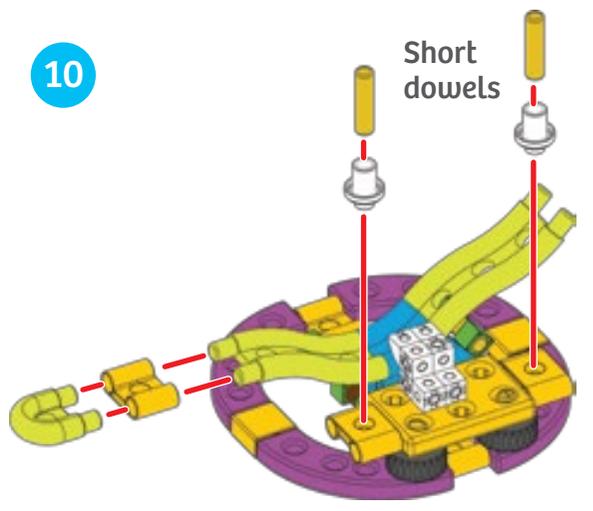
Then they saw a huge tower looming above them.



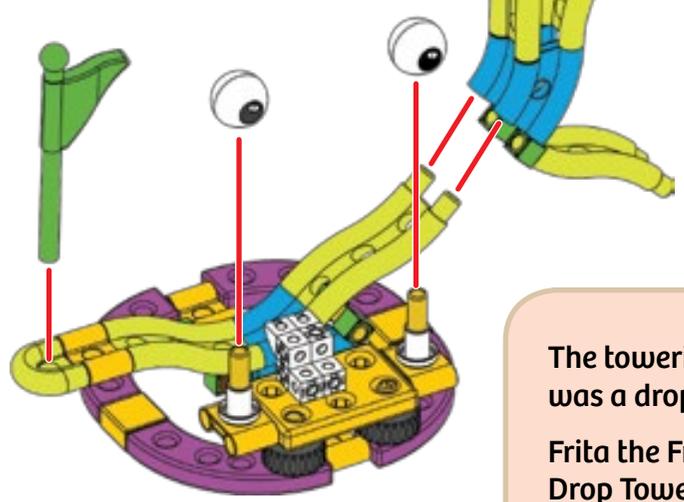
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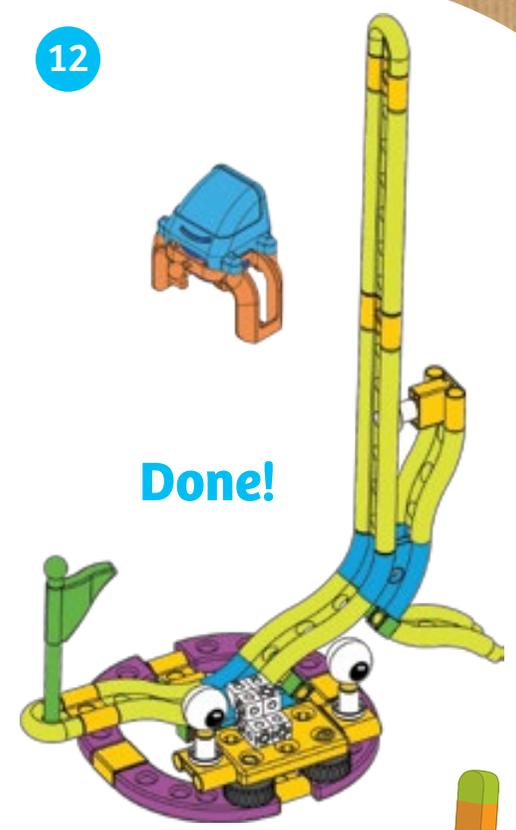
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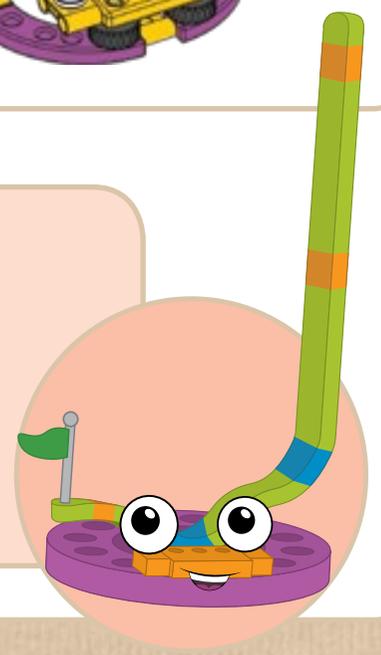


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The towering structure was a drop tower ride!

Frita the Free-Fall Drop Tower said, "Are you kids tall enough to ride the tallest drop tower ever built?"



Ty and Karlie measured themselves and found they were just tall enough to ride the drop tower ride. Remus and Huxley were not tall enough.

Ty and Karlie got into the drop tower car. The car climbed up to the top of the tower. At the top, they could see for miles around. Then the car was released and it fell down the track very fast. It was thrilling.

“Do you know what makes the ride work?” asked Frita as they exited the car.

“Gravity!” shouted both Karlie and Ty in unison.

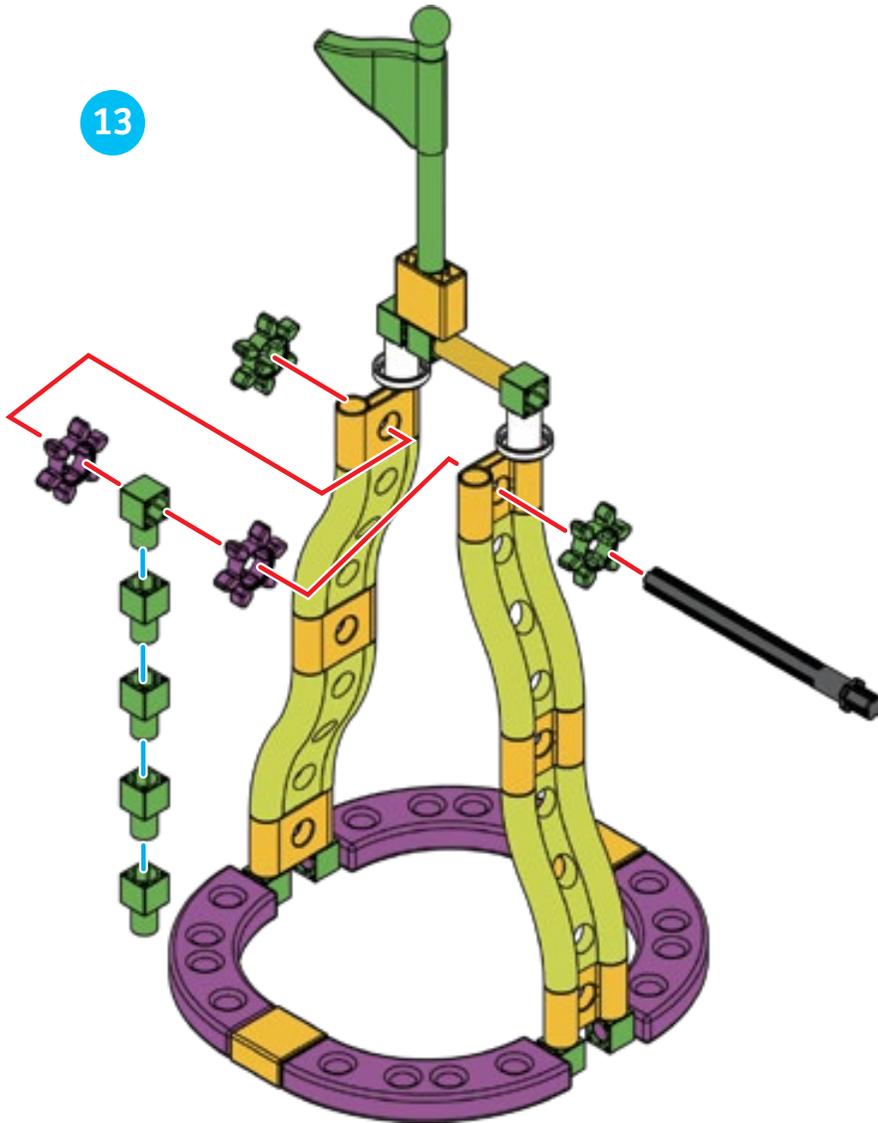
“That’s right,” said Frita. “Gravity is an invisible force between all objects. It makes objects attracted to one another. The bigger an object is, the greater its force of attraction is. Earth is so big that it has a very strong gravity that pulls us all toward it. That’s why you don’t float off into space. It’s also why the car falls downward.”

“Like the roller coaster,” added Karlie.

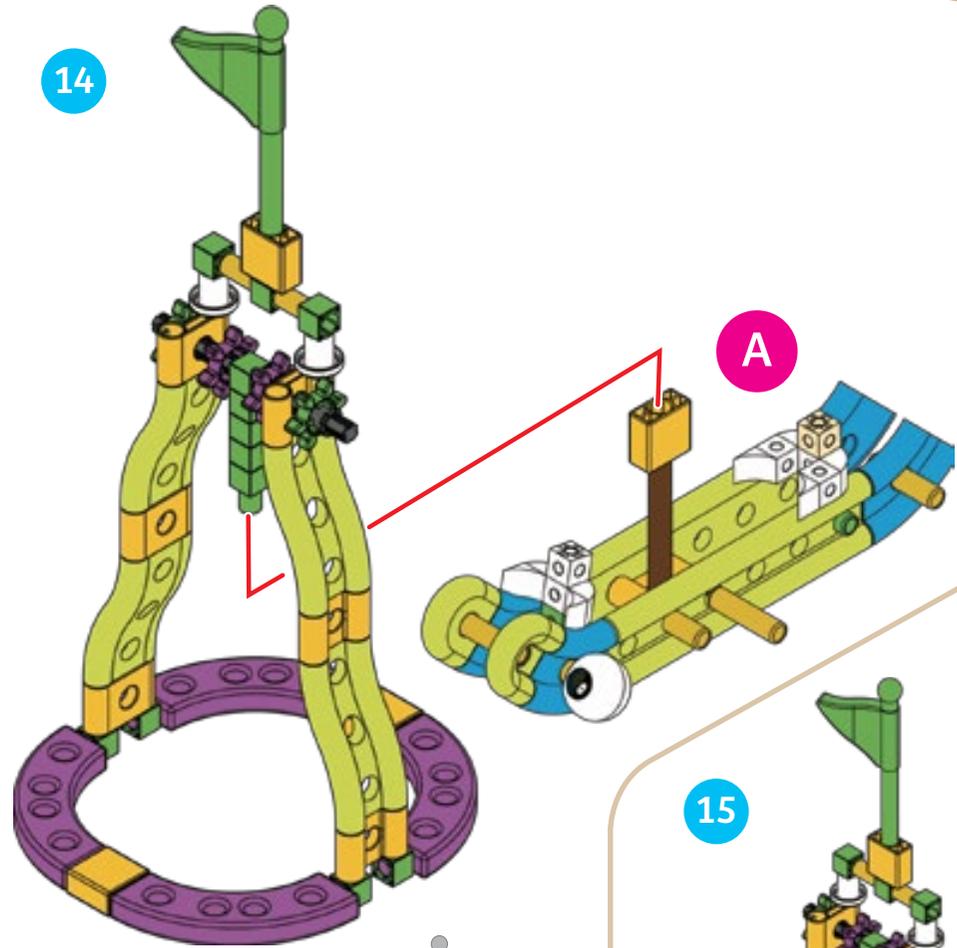
“Thanks, Frita!” said Ty. “Everyone, let’s check out that ride that looked like a pirate ship on a swing.” He pointed toward a big ride that looked like a pirate ship on a swing.



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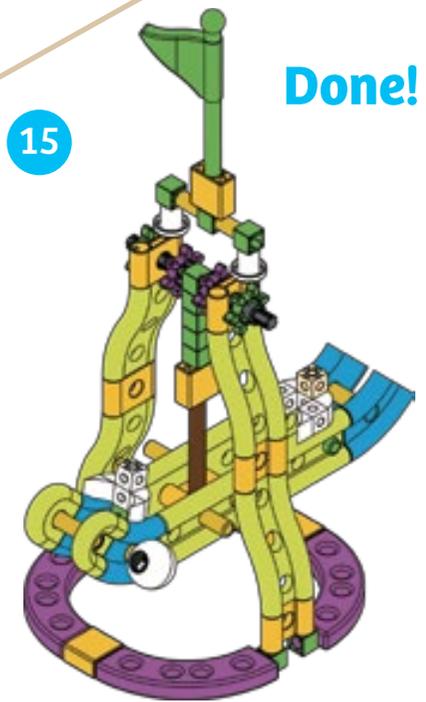


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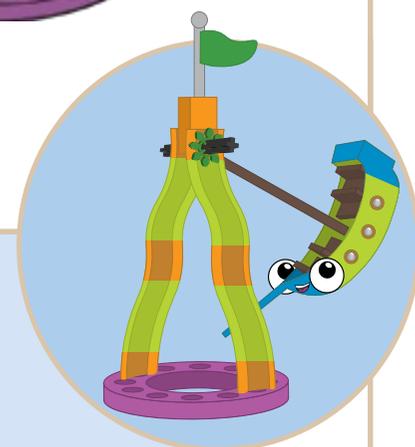


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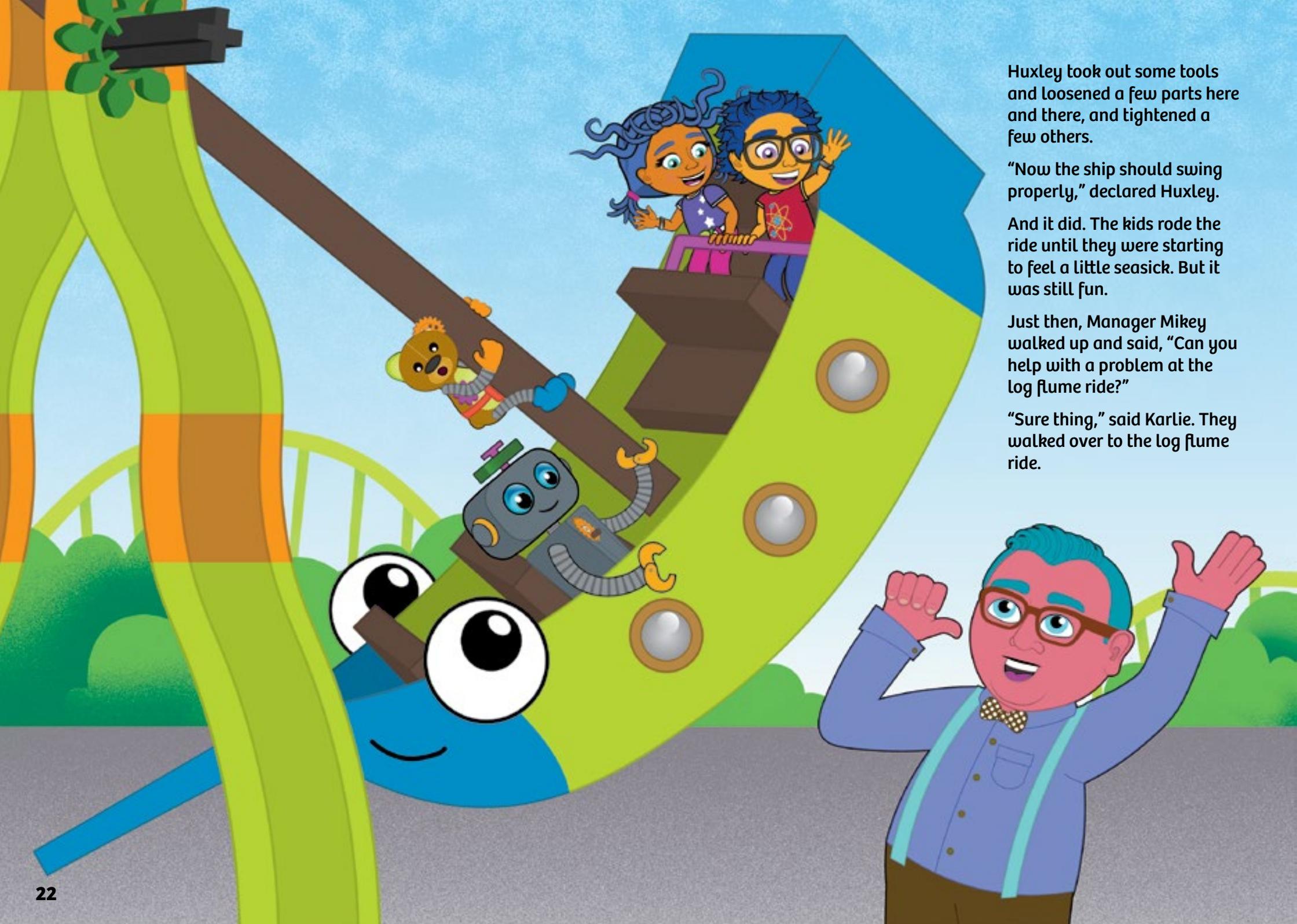


Done!



"Can you help me?" Penny the Pendulum Pirate Ship Ride asked. "My ship is not swinging."

"I certainly can," responded Huxley. "A pendulum is a term used in physics to describe a weight that swings from a pivot point. We just have to make sure the ship can swing freely here."



Huxley took out some tools and loosened a few parts here and there, and tightened a few others.

“Now the ship should swing properly,” declared Huxley.

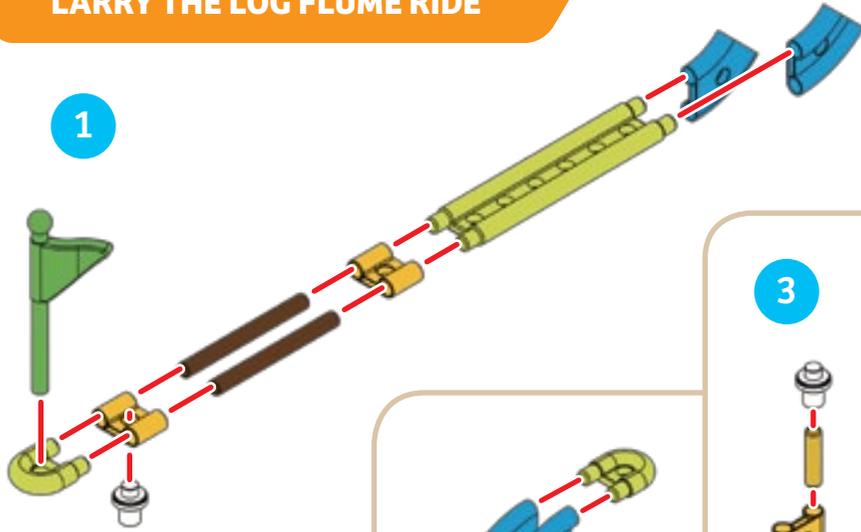
And it did. The kids rode the ride until they were starting to feel a little seasick. But it was still fun.

Just then, Manager Mikey walked up and said, “Can you help with a problem at the log flume ride?”

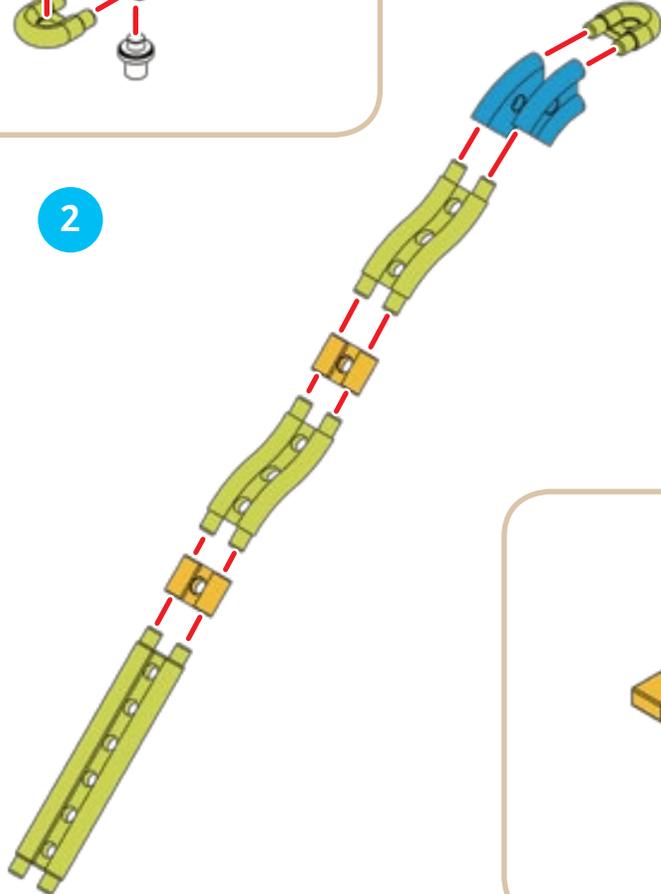
“Sure thing,” said Karlie. They walked over to the log flume ride.

LARRY THE LOG FLUME RIDE

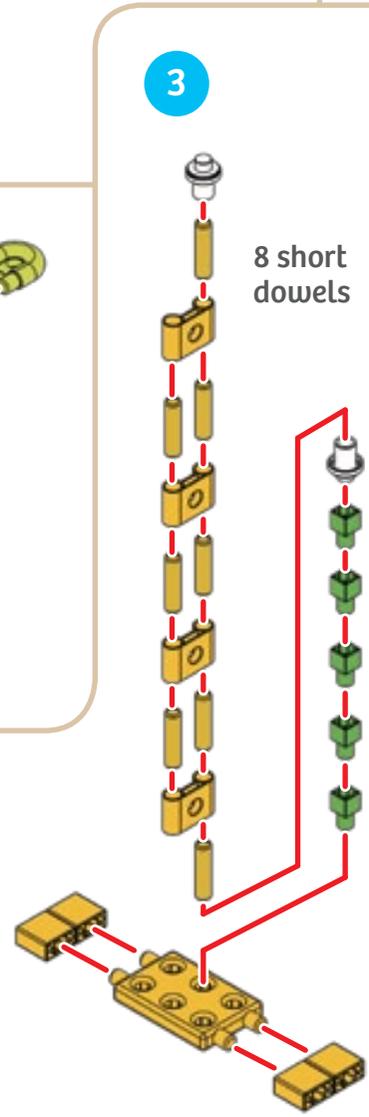
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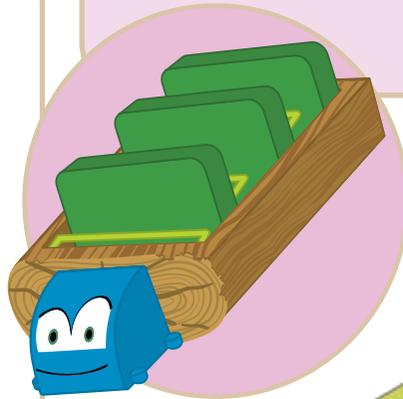


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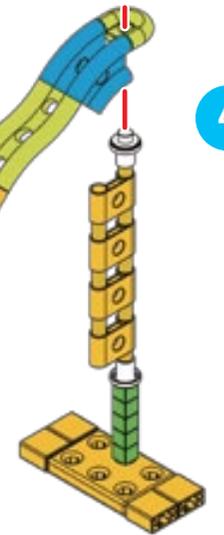


8 short dowels

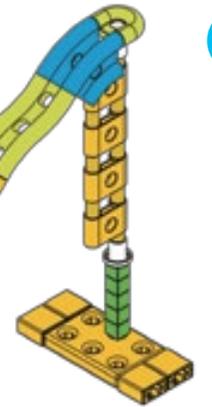
"Hi kids! I'm Larry the Log Flume," said Larry. "But my log boats won't go down the track. I'm not sure what's wrong. Can you help?"



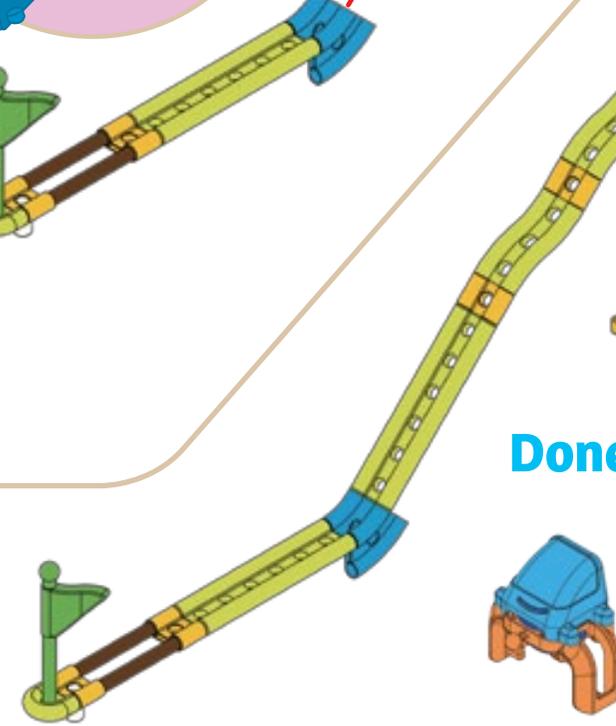
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Done!



"This log flume ride is dry as a bone!" remarked Huxley.

"I know what the problem is here," Karlie said. "There's no water! Without water, there is too much friction and the logboats won't slide."

"Friction happens when two surfaces slide against each other. Friction is the result of many tiny forces resisting the motion," explained Huxley. "When you rub your palms together, you feel friction. Very small parts of your hands' surfaces are getting caught on each other, keeping them from moving effortlessly."

"So the rougher a surface is, the more friction it has!" added Ty. "That's why the rough wood of the logboats doesn't glide along the track."

"Yes. So if you add water, the water allows the surfaces to glide past each other," said Karlie.

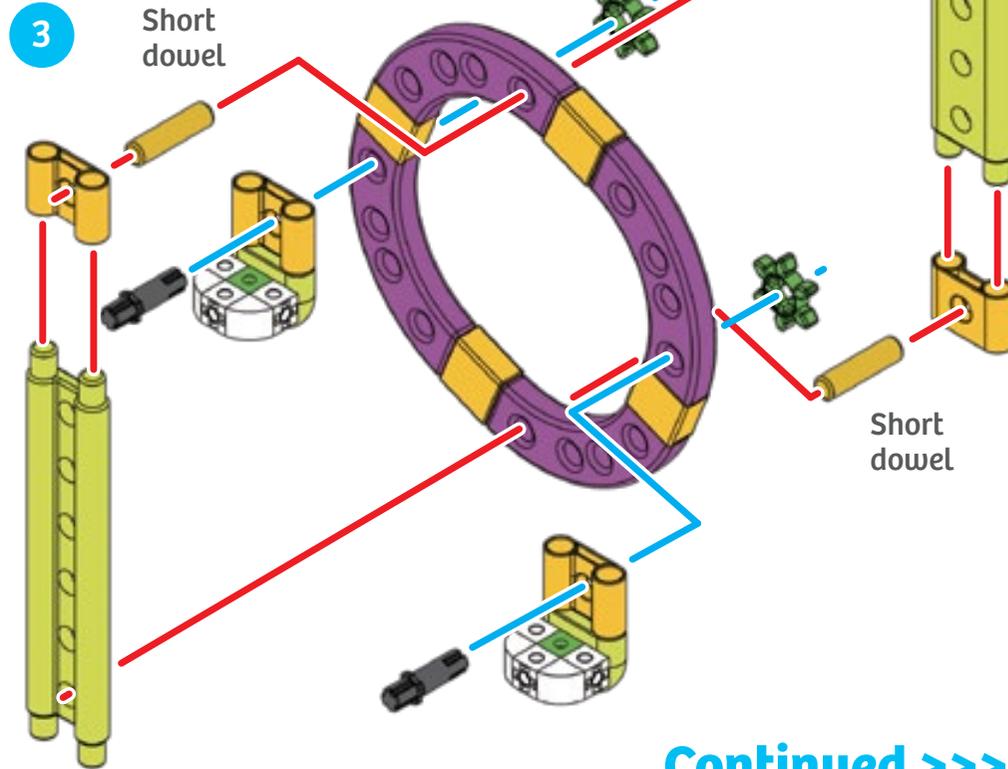
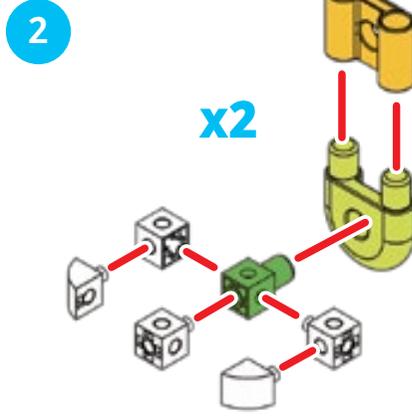
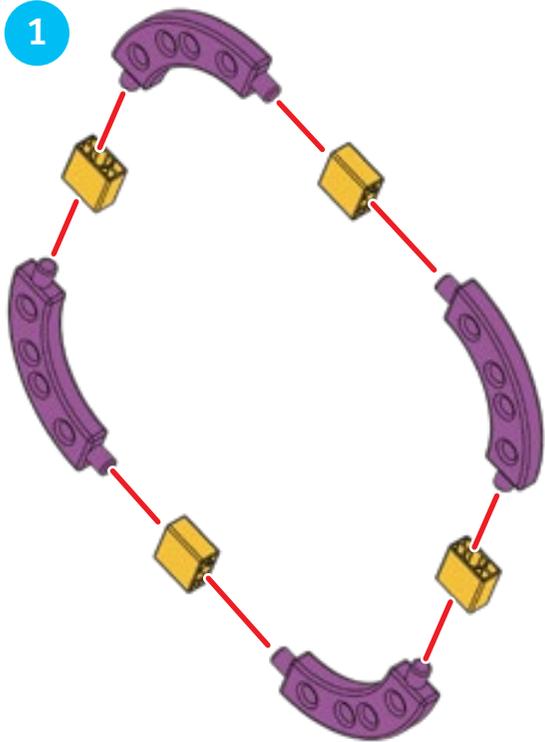
"Hooray! You've figured it out," said Larry the Log Flume.

And they all took a few rides on the log flume. They got soaked from the splashing water.

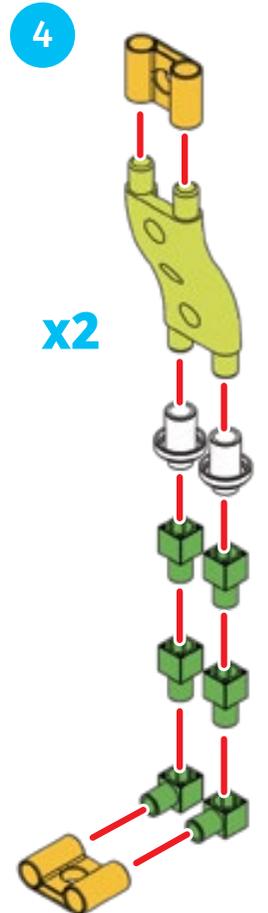
"Now let's go to the Ferris wheel!" Karlie suggested enthusiastically.



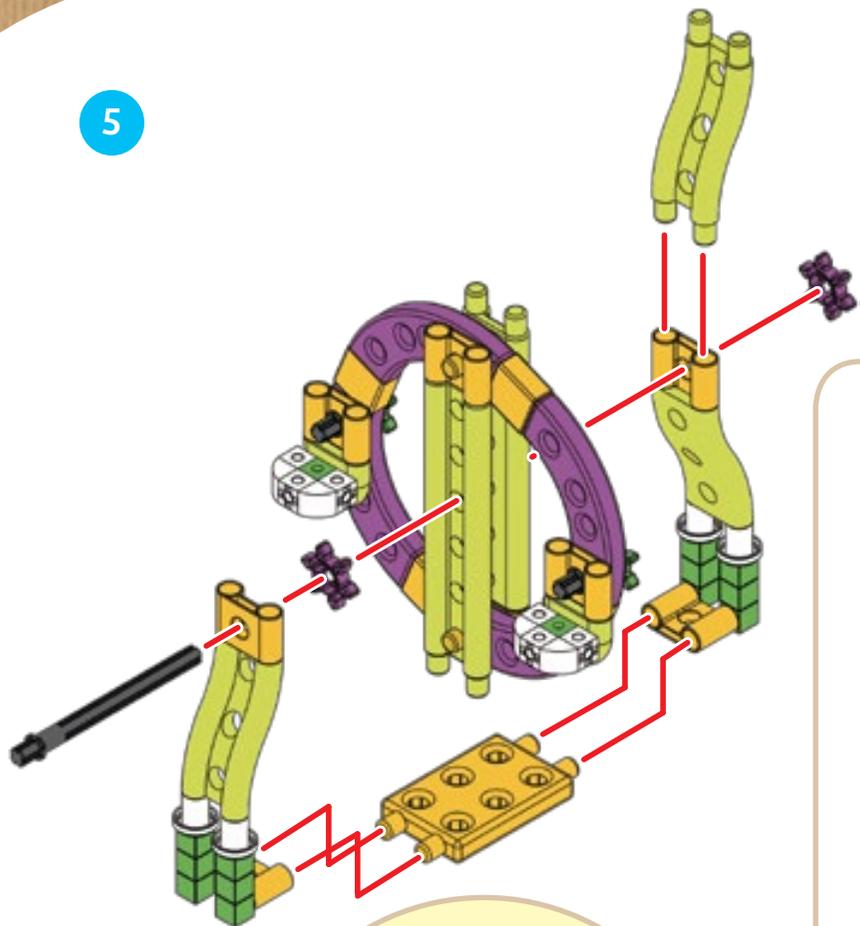
FELIX THE FERRIS WHEEL



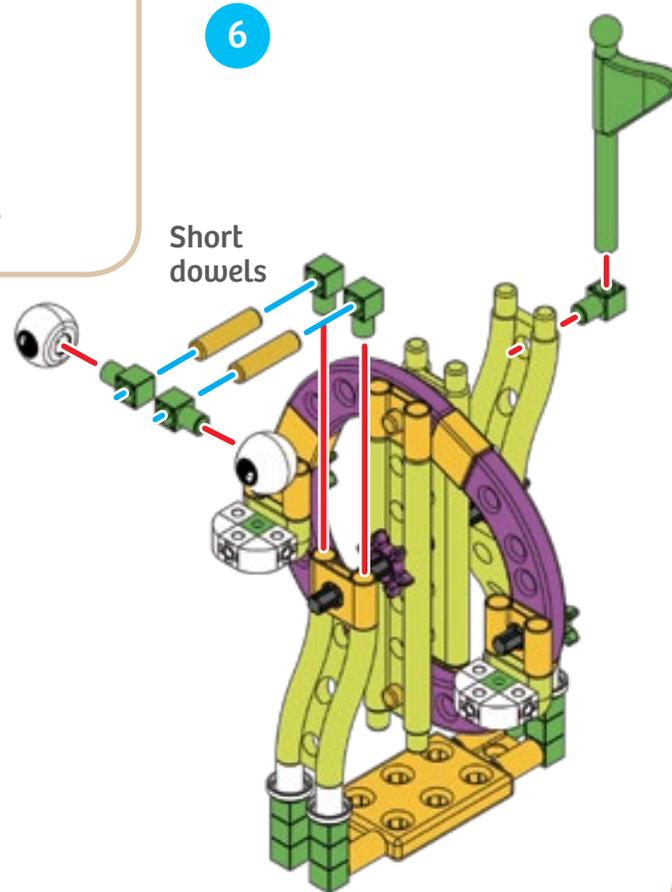
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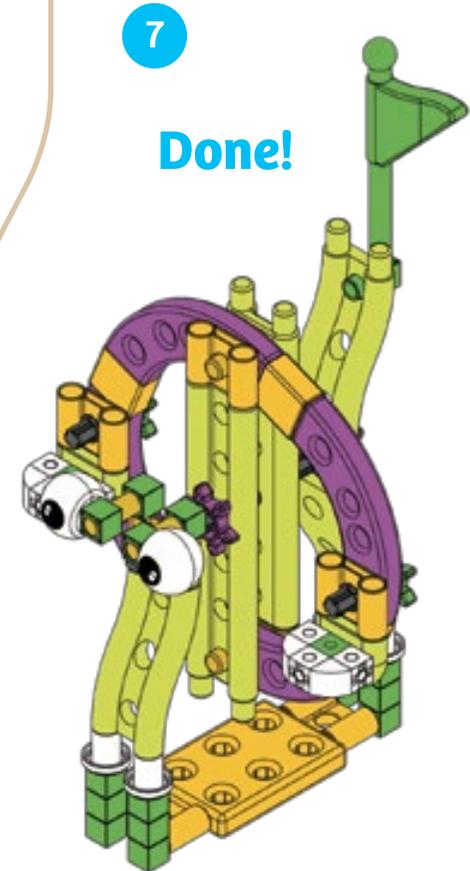
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Felix the Ferris wheel wasn't turning.
"What's wrong Felix?" Ty asked.
"I need a central axle to turn, but my axle has fallen out."
"Huxley, can you help us put the axle back into place?" Karlie asked Huxley.

"Yes! The axle is the center shaft around which all wheels and gears turn. Without the axle, a wheel will not turn ... it's just a disk," explained Huxley. He picked up the axle in his gripper, jumped high up into the air, and quickly put the axle into place.



"Weeeeeeee! Now I can turn!" said Felix with glee.

Just then, Mr. and Mrs. O walked up. "Hey kids, here you are! Looks like you have had a lot of fun and learned a lot today!" said Ms. O. "But it's time to go home. Maybe you can put some of what you learned here at the amusement park to good use at home."

"Yeah! Let's build a playground in the backyard. We can make a swing set like the pendulum

ride and a slide like the roller coaster!" said Karlie.

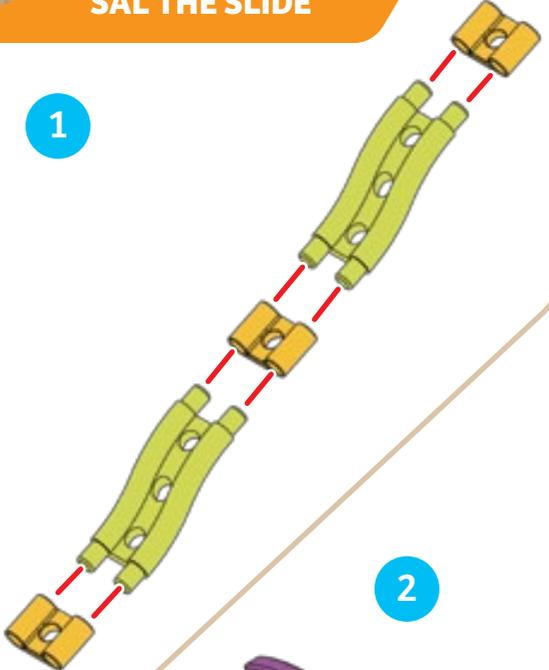
"And we can make a seesaw, which works like the lever we used to lift up the bumper cars."

"And a jungle gym!" shouted Huxley from atop the Ferris wheel. "I love to climb on things!"

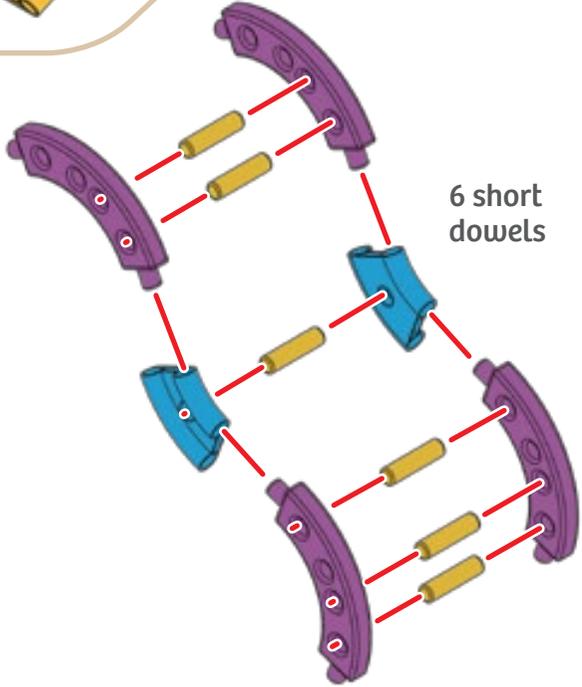


SAL THE SLIDE

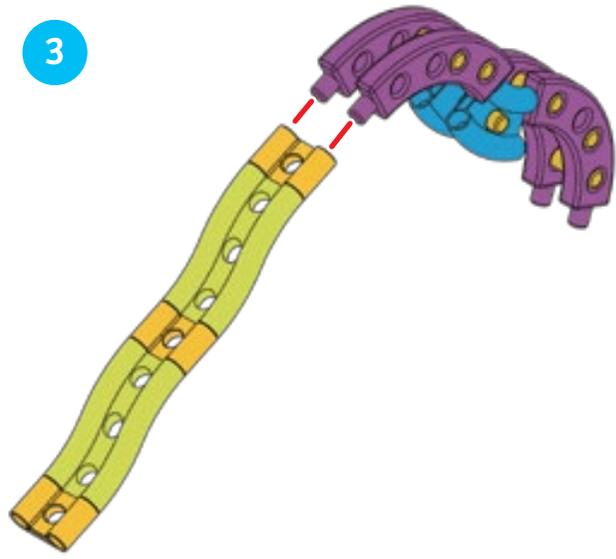
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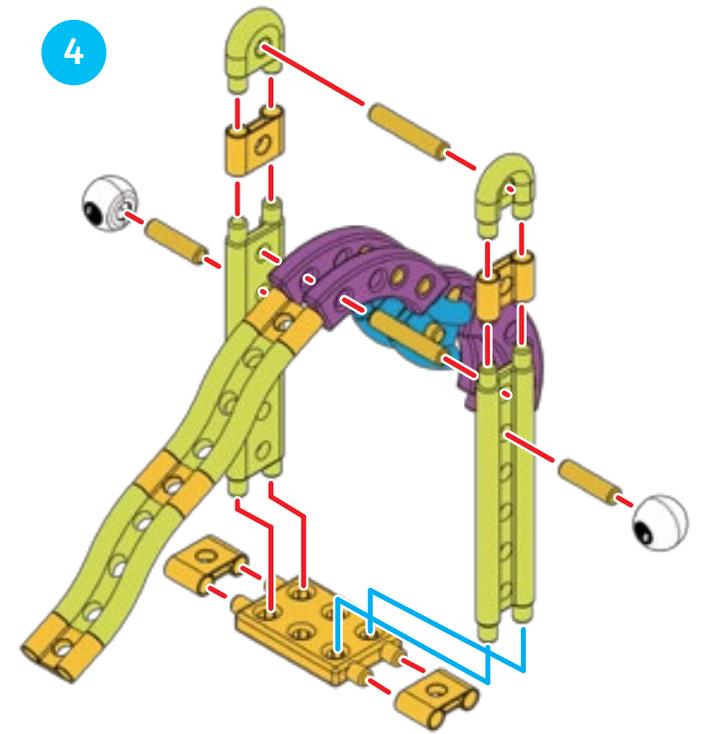
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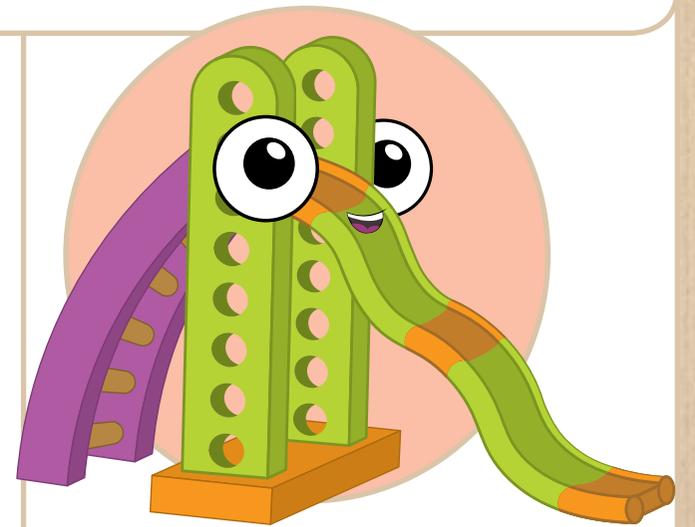


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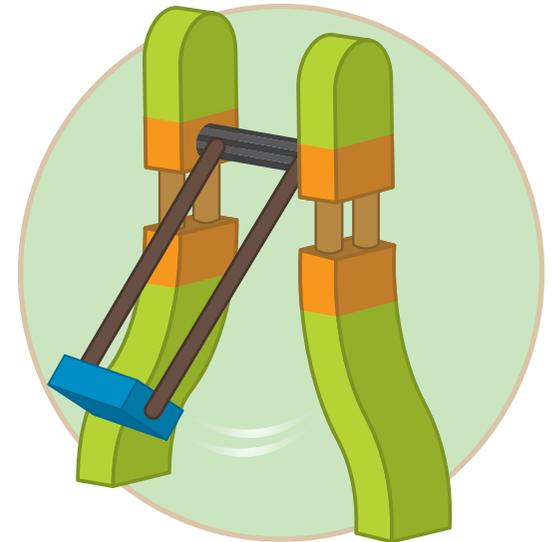
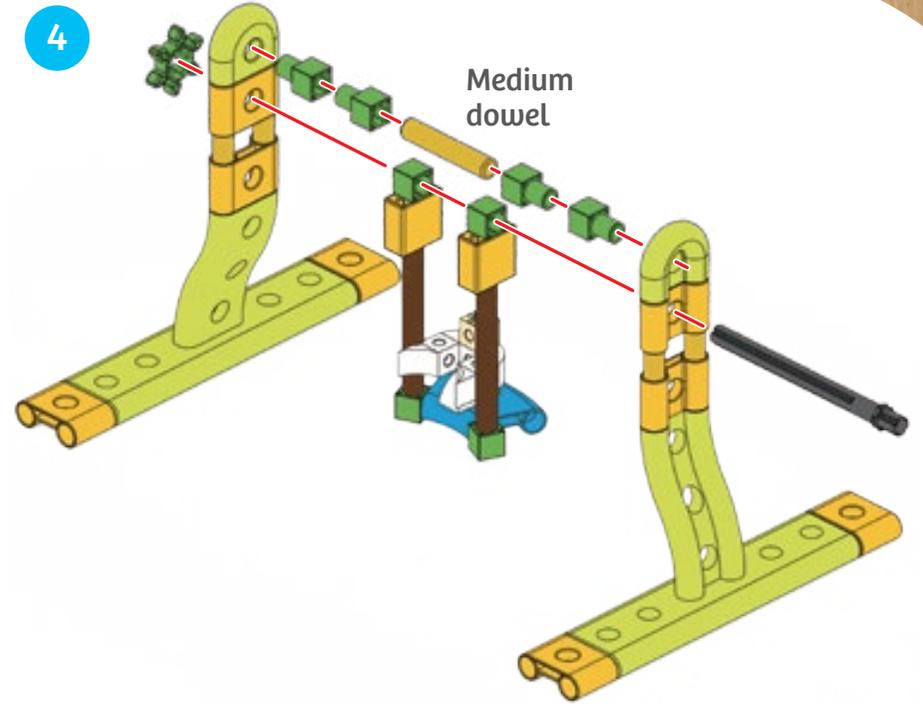
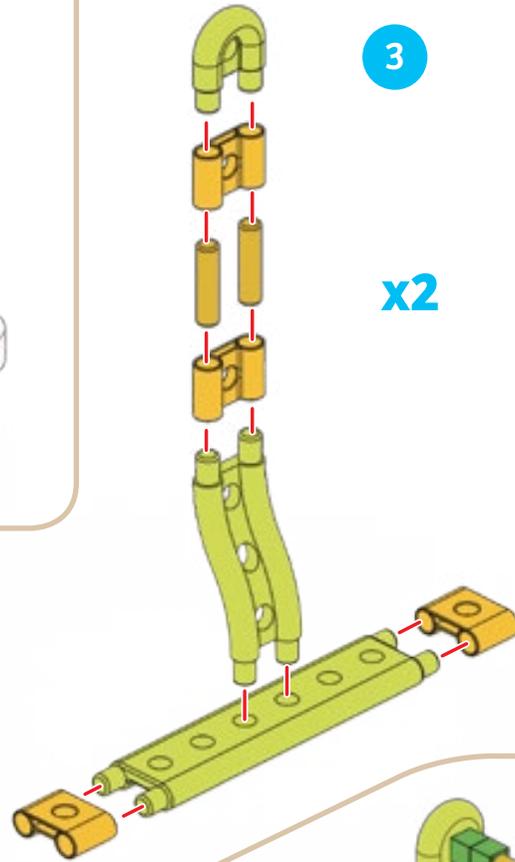
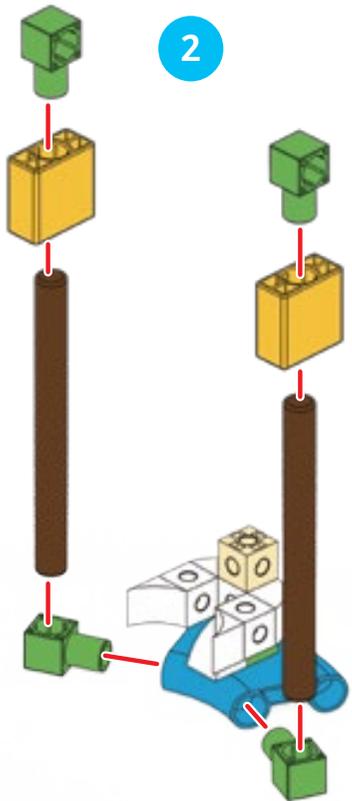
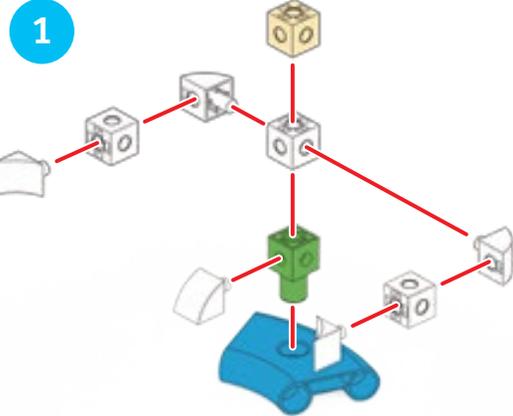


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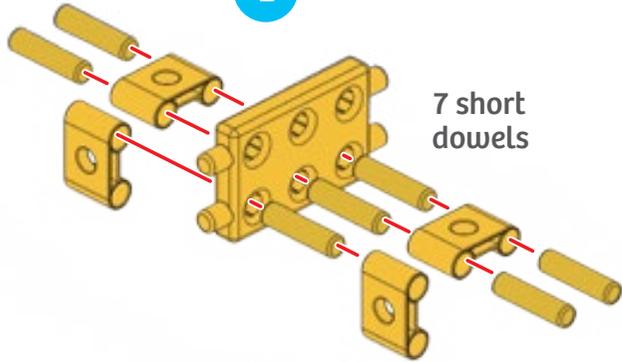


SUSIE THE SWING

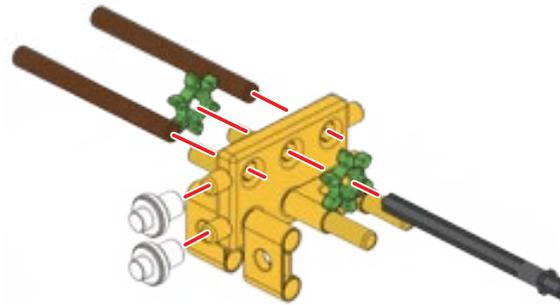


GINNY THE JUNGLE GYM

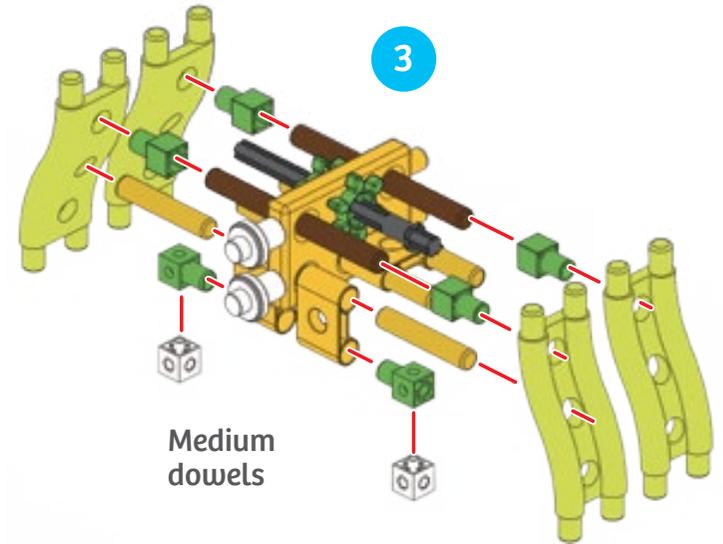
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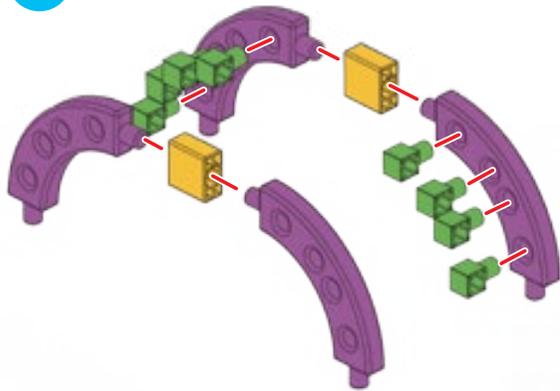
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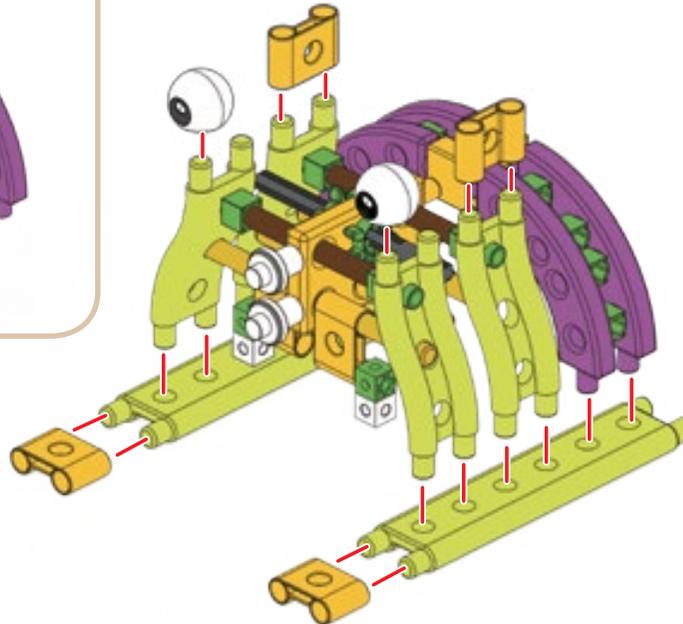
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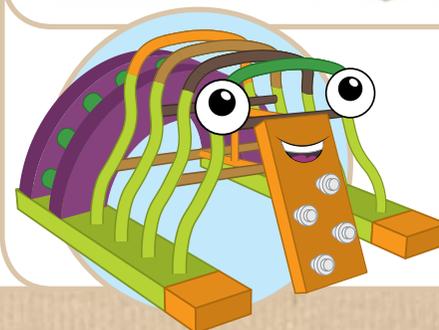
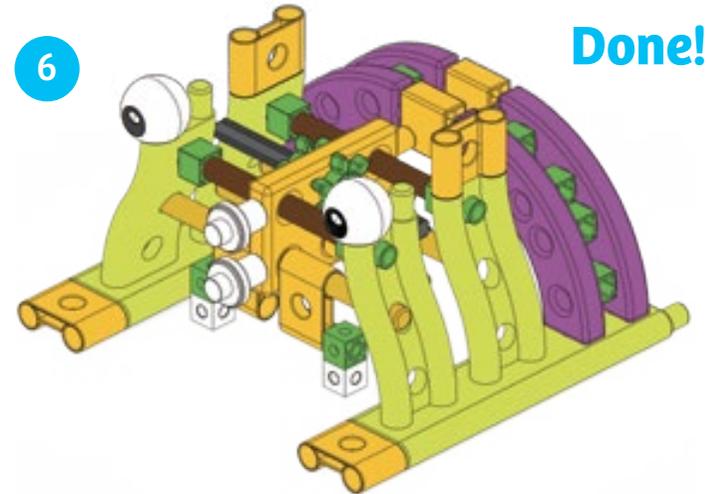
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At home, Ty and Karlie proceeded to build a slide, a swing set, a jungle gym, and a seesaw. Huxley helped them gather all the tools and parts they needed.

Their playground contained simple versions of many of the rides they saw at the amusement park. They had learned how simple machines, like levers, wheels, and pendulums, work. They had seen forces, like gravity and friction, in action.

Physics is at work everywhere! Even in the playground.



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Technical product development: Genius Toy Taiwan Co., Ltd., Taichung, Taiwan, R.O.C.
Text: Ted McGuire
Graphics and Packaging: Dan Freitas
Illustrations: Dan Freitas and Ashley Greenleaf

Manual assembly instruction diagrams: Genius Toy Taiwan Co., Ltd., Taichung, Taiwan, R.O.C., and Thames & Kosmos
Photos: Genius Toy Taiwan Co., Ltd., Taichung, Taiwan, R.O.C., and Thames & Kosmos

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Distributed in United Kingdom by Thames & Kosmos UK, LP, Goudhurst, Kent TN17 2QZ
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Printed in Taiwan / Imprimé en Taiwan

