

Junior

Grade - 2



Start



Forest

Volcano Orla

Castle



INTRODUCTION

Laya: Welcome fellow adventurers! My name is Laya, this is Kit, and Rob there hanging on the tree, is our friendly robot! Don't tell him I said so, but he is a little brat, though he can find the answer to any question on the internet. Kit, though, loves to create trouble: he'll pick anything apart to see how it works!

Kit: And, I must interrupt to tell you, that Laya knows everything!

Laya: We love adventures and often travel to foreign lands with our bag of essentials, which includes our food, water and most importantly, our BLIX set.

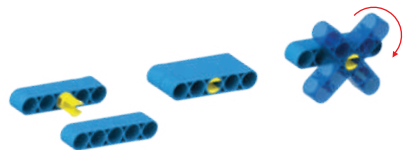
Rob: This set has everything that you can use to make whatever you need. Join us on our adventure and help us build our way out of every challenge that we face. But before we start, let's figure out how to use our BLIX set.



HOW TO CONSTRUCT



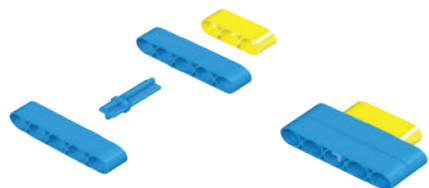
I - CL2 - Use this connector to loosely connect 2 pieces.



II - CT2 - Use this connector to attach 2 pieces.



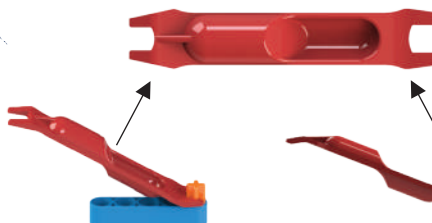
III - CT3 - Use this connector to attach 3 pieces.



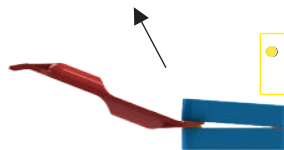
During assembly ensure position of collar is same as in the images.

How to Dismantle

- Narrow edge to remove connectors
- Fit the tool into narrow side of connector collar



- Broad edge to split two pieces



CHAPTER 1

Laya: It's a sunny morning! We are trained and ready to start our adventure.

Kit: Hey what do we see there?

Laya: Looks like an old man is trying to drag a huge tank of water on the ground.

Kit: Hello sir! That container looks a bit heavy. Where exactly are you taking it?

Old Man: There is a severe water shortage near my house and I have a big family who needs water. I've just filled this tank from the river behind and my home is rather far from here. I need to drag this till there.

Kit: It must be so difficult for you sir. Laya, can we figure out a way to help him?

Rob: Many cities around the world and in India are facing an acute water shortage crisis. Water is a precious resource and we must consume it carefully.

Laya: This is what we do! We solve problems. Let's open our BLIX set and see what we can do to make this easy for him.



Rob: One of our oldest and most trusted human inventions can come to the rescue here. Wheels!

Kit: Oh yes. Let's build a little cart for him on which he can keep his water tank. This way, he will utilise much lesser energy by rolling it to his house rather than dragging it.

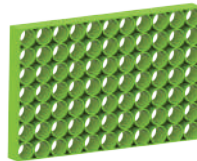
Step 1



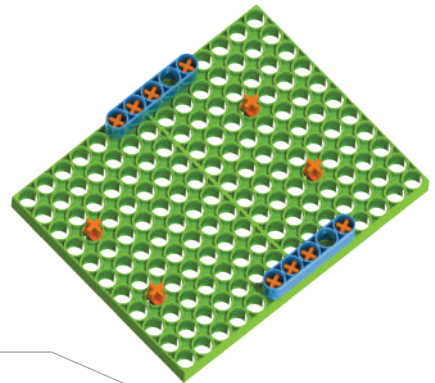
CT2 12 pcs.



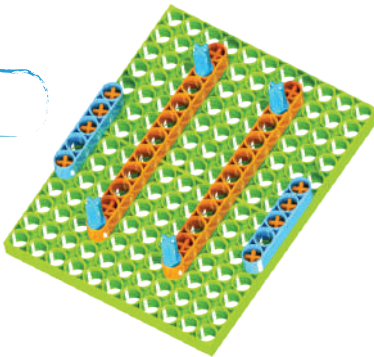
P5 2 pcs.



P7x11 2 pcs.



Step 2

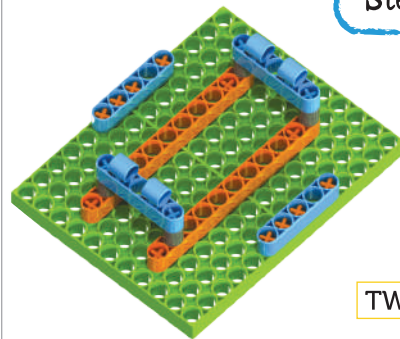


CT3 4 pcs.



P11 2 pcs.

Steps 3



TW1 4 pcs.

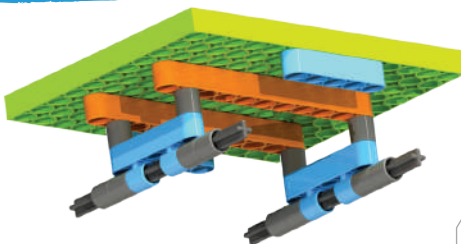


P5 2 pcs.



CH2 4 pcs.

Step 4

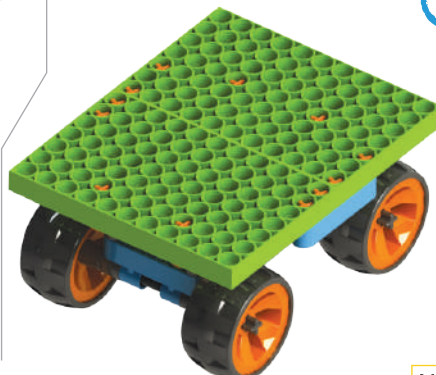


TW1 8 pcs.



SH100 2 pcs.

Step 5



Wheel 4 pcs.

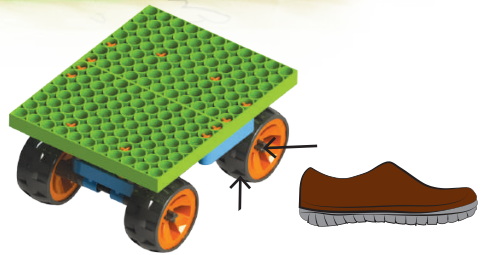


Kit: Wow! What a lovely feeling it is to be able to help those in need.

Laya: I agree. Now let's hurry, we have places to go, people to see.

Theory

When you try and drag an object on any surface, there is a force that resists this. This force is called friction. Friction can be very good as well! For example, rubber soles on shoes stop us from slipping. But when you are trying to move something, friction makes it very difficult. Wheels help reduce friction since there is no sliding that takes place.



Wheels along with an axle are one of the simplest of machines and we use them everywhere. They make our work easy and since their invention thousands of years ago, they have been irreplaceable.

Rob: Now there's one more place where Laya and Kit have a problem with friction. Slides! They love swings and seesaws, but slides are their favourite. Except the times when there is too much friction and you don't slide! So, can you think of ideas to make a slide that's always slippery?

What are the new words that you have learned today?

Laya: In this part of our journey, we must travel on the highway till the very beginning of the forest. The road ahead looks smooth, but the forest does seem far away. Walking is going to take way too long, Kit.

Kit: Let's build a car that will help us get there faster, Laya. The drive will be so beautiful! Look at the mountains and the trees, I'm already excited. But what kind of a car should we build?

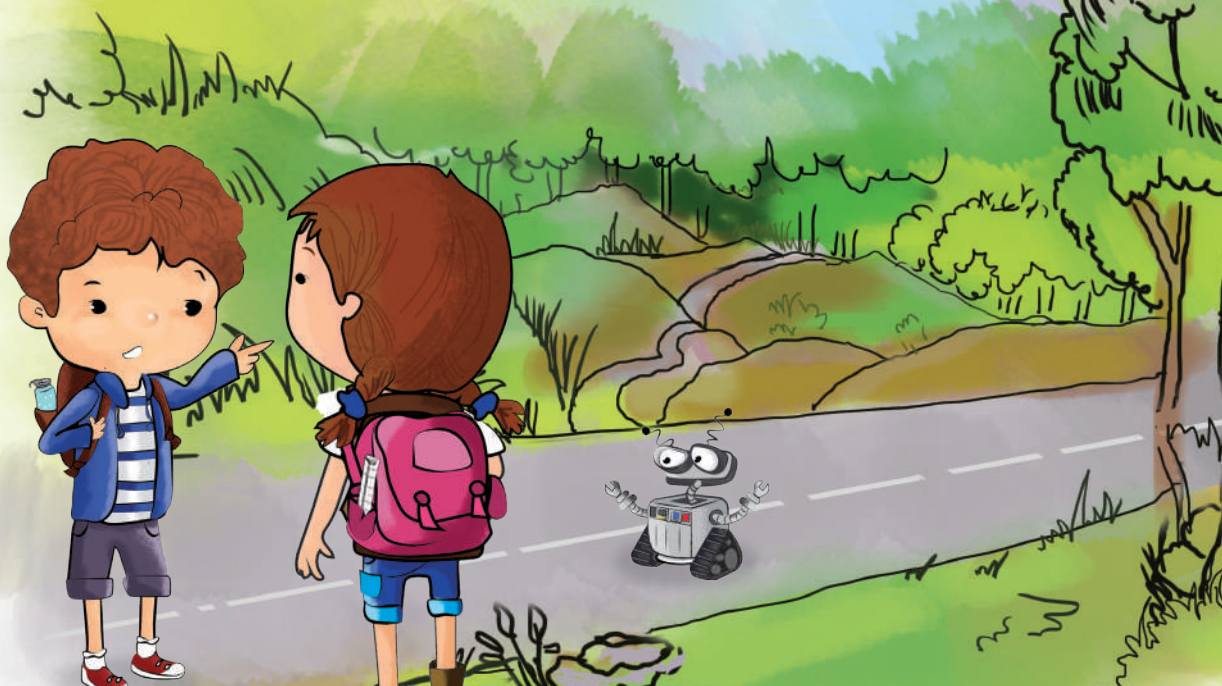
Laya: That's a stellar idea. Hey Rob, what kind of car do you think we should build?

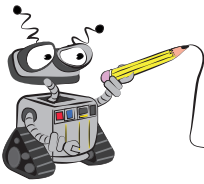
Rob: Hmm, my calculations say that the destination is far but the roads are very good!

Laya: I already know that Mr. Smarty Pants.

Rob: Pants? I'm not wearing pants. I don't even have any legs.

Kit: Rob, you are funny. But for this car we will also need intelligent ideas.





Draw a car you would like to make for Laya and Kit. Remember the conditions: the road is good and the distance is long.

Laya: Oh I know! Let's make a light efficient and aerodynamic car.

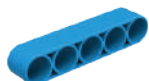
Kit: Great idea, Laya. Rob, get our Blix set.
Here's how Kit and Laya built their car:



Step 1



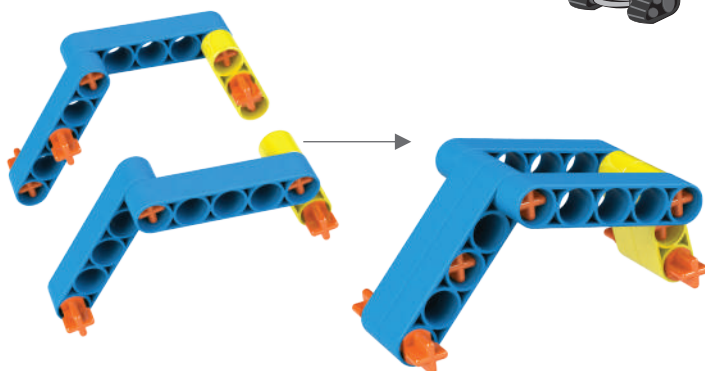
P3 2 pcs.



P5 4 pcs.



CT2 10 pcs.



Step 2



P3 2 pcs.



CT3 2 pcs.



Step 3

Assembly of step 1 and step 2



TW1 4 pcs.



P11 2 pcs.



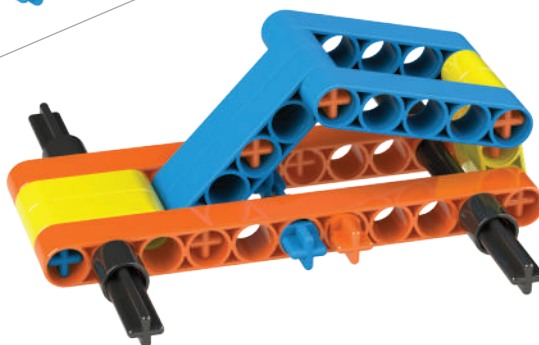
CT2 2 pcs.



CT3 2 pcs.



SH100 2 pcs.



Step 4



Mudguard Left 1 pc.



Mudguard Right 1 pc.



Wheel 4 pcs.

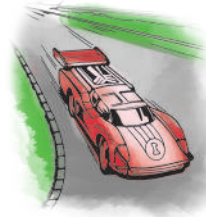




Laya: This journey will take us time. Good thing our car is light and aerodynamic. It gives us speed and uses very little fuel.

Kit: Laya, what does aerodynamics mean?

Laya: When we run, we can feel the air gushing past us. It doesn't matter so much at that speed, but the faster we go, the air around us will resist the motion further. So, sports cars, fast trains and aeroplanes are designed in a way to cut through the air, so as to create least resistance. Aerodynamics is how objects move through air. Remember this the next time you see a race car.



What are the new words that you have learned today?

Kit: Laya, Laya, Laya. I think it is a good time to take a break. I'm getting hungry. Maybe we should stop for a food-break.

Laya: Of course, Kit. But our supplies are almost over and I can't spot a restaurant here.

Kit: What do we do then?



Laya: Oh look, there's a little farmhouse there! Why don't we stop and ask the farmer if he has some fresh fruits we can eat?

Rob: My batteries are drained too. I could use a recharge as well!

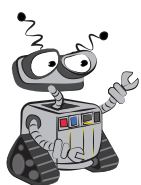
Laya: Hello sir, the two of us are quite hungry, and our stock is over. Could you spare us some food?

Farmer: Come on in kids, I'll feed you! I don't have too much but I am happy to share what I have with you. Those frustrating crows have been ruining my crops: they are not fooled by my scarecrow anymore. They know it's a dummy.



Kit: We can help you with that! Why don't you let us build you another scarecrow?

Laya: Yes! Only we will use our BLIX parts and build one with moving hands. This will confuse the crows and they'll stay away from your crops.



Rob: C'mon kids let's do this! Follow the instructions and build a humanoid robot with moving hands

Step 1



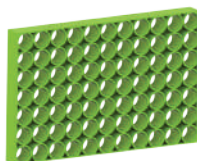
TW 1 2 pcs.



CL2 2 pcs.



CT2 2 pcs.



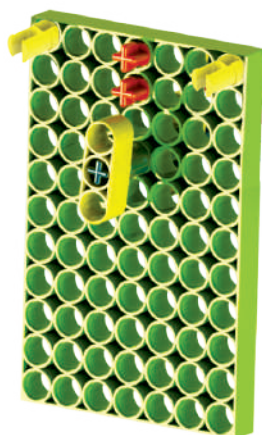
P7x11 1 pc.



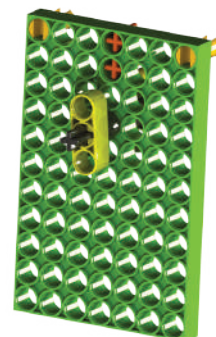
P3 Plus 2 pcs.



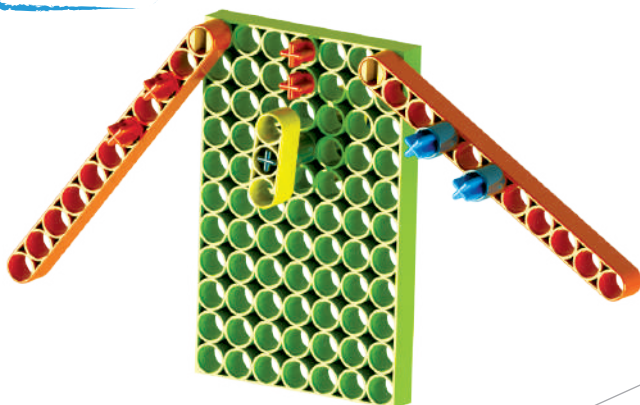
SH60 1 pc.



Backside view



Step 2



CT2 2 pcs.



TW 1 2 pcs.

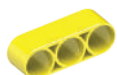


P11 2 pcs.



CT3 2 pcs.

Step 3



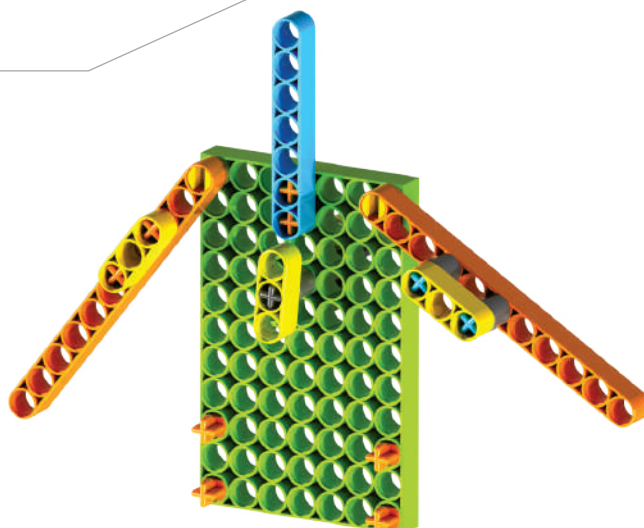
P3 2 pcs.



CT2 4 pcs.

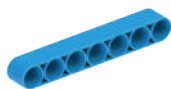


P7 1 pc.

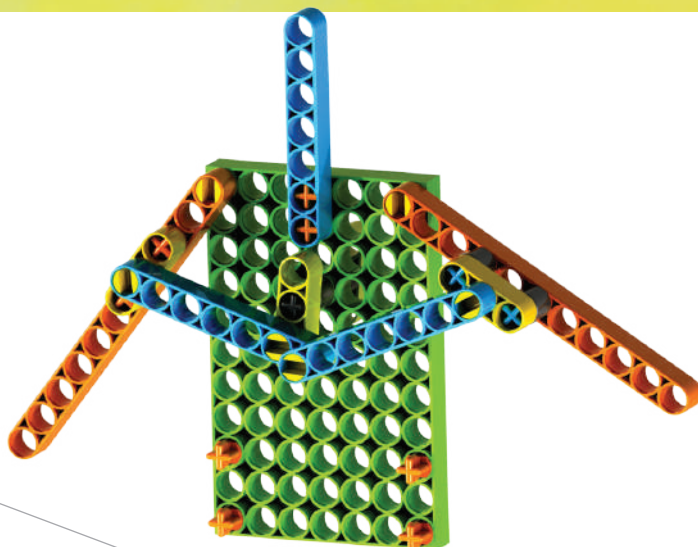


Step 4

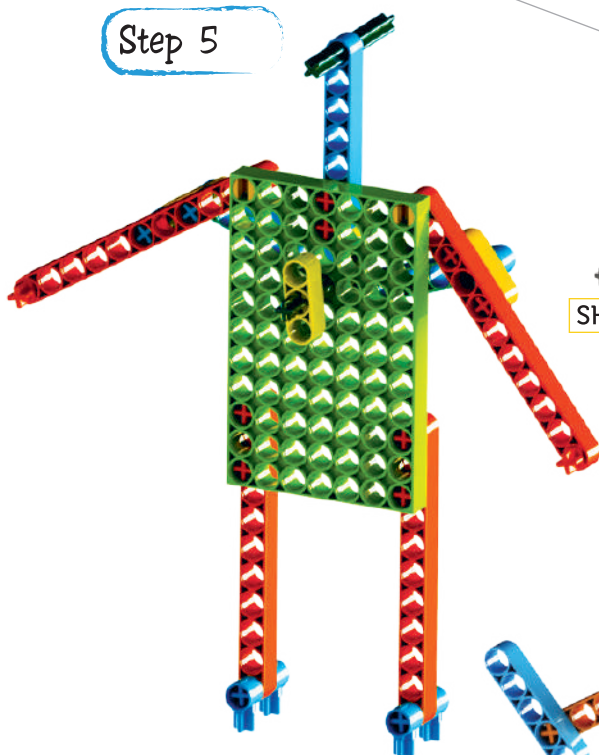
CL2 4 pcs.



P7 2 pcs.



Step 5



CT2 2 pcs.

CT3 2 pcs.

SH60 1 pc.

P11 2 pcs.

CH2 4 pcs.



Step 6

P5 4 pcs.



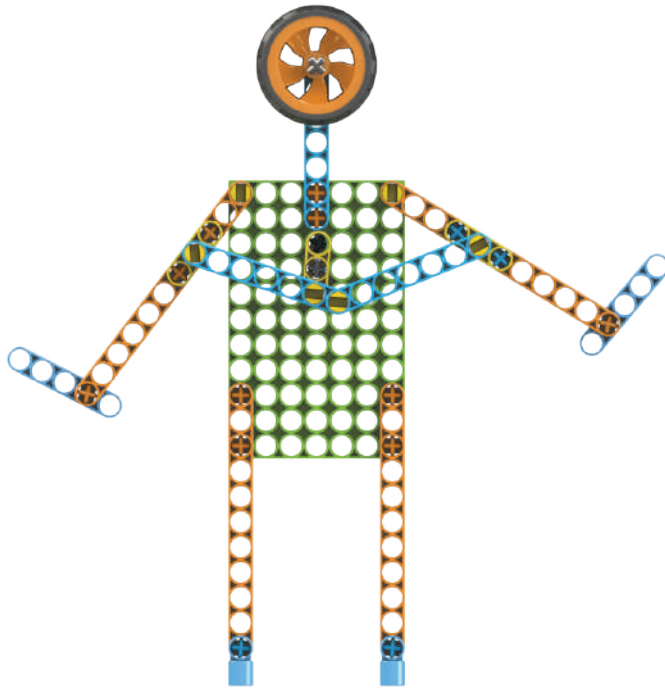
Wheel 2 pcs.



CT3 1 pc.

Kit: Yay, now this kind farmer will not have any more problems created by pesky birds.

Laya: Kit, did you notice how by attaching different parts to the scarecrow, we could create a continuous motion like that of a wiper in a car? These are called linkages.



Rob: Linkages help create many different types of motions. But to make it possible you need links, fixed pivots and moving pivots. Don't forget this when making models in the future.

Note:

Laya: Finally, here we are, the beginning of the forest!

Kit: Wheeeee. But, I can see no roads here. How are we going to go ahead since our car won't make it?

Laya: We just need to find a way to get to our next stop, Volcano Orla. Hey Rob, can you tell us how far Volcano Orla is from here?



Rob: My GPS tells me that Volcano Orla is about 100 kilometres from here.

Kit: I'm not walking a hundred kilometres!

Laya: Of course not. We will find another way.

Kit: How about we build another car, one that can go through bumpy forest paths? Our Blix sets do have suspensions in them, don't they?

Laya: Kit, you're a genius! Let's build a car with suspensions.



Step 1



CH2 2 pcs.



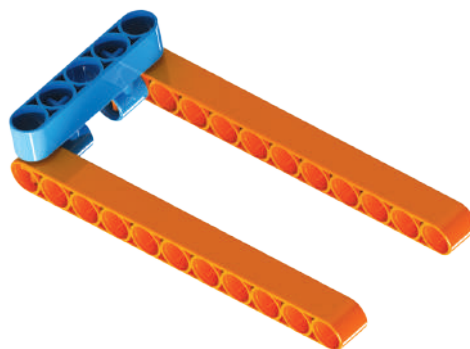
P5 1 pc.



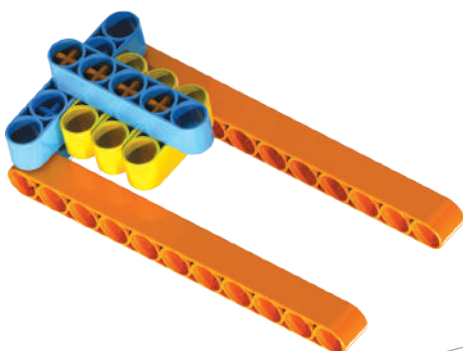
CT2 2 pcs.



P11 2 pcs.



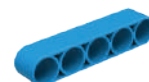
Step 2



CT2 4 pcs.



P3 3 pcs.



P5 1 pc.

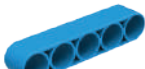
Step 3



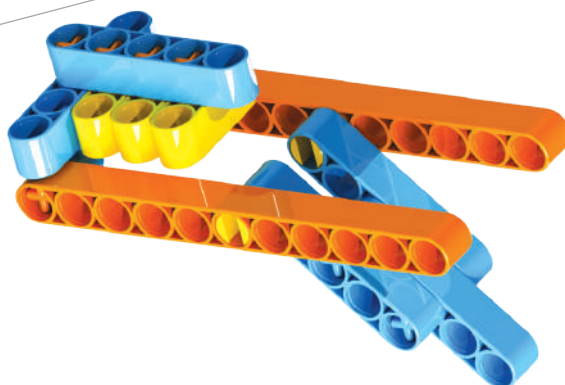
CL2 2 pcs.



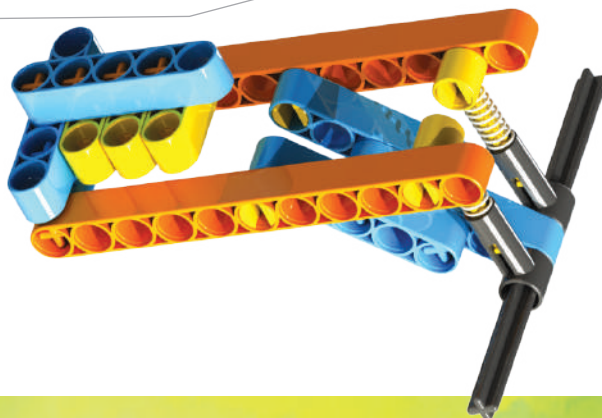
CT3 2 pcs.



P5 3 pcs.



Step 4



CL2 2 pcs.



Suspension
2 pcs.



SH100 1 pc.

Step 5

CT2 2 pcs.

Mudguard Left
1 pc.

CH2 1 pc.

CL2 1 pc.

Mudguard Right
1 pc.

Add CH2 here with CL2

Step 6

Put CT2 in the last hole with CH2

Steering Wheel
1 pc.

CT2 2 pcs.

Spoiler 1 pc.

CH2 2 pcs.

Step 7

TW 1 4 pcs.

Wheel 4 pcs.

SH100 1 pc.

Kit: This looks like such a fun ride. Did you have fun while doing the test drive, Laya?

Laya: I really did, Kit. It is such an amazing experience. The trees just whizz by, and with this suspension system, there's no stopping us from reaching the castle.

Rob: Suspensions are an integral part of every car. If you can sit comfortably, sleep, drink juice, eat snacks, or do anything basically in a moving car, you have to thank the suspension system for it. It is what makes us comfortable even when the road is bad. The next time you're on the road, especially a bad one, make notes and remember to tell mom and dad what a suspension is!

Laya: Our next stop is Volcano Orla, where as per our map we shall find the key to the most beautiful castle in the world.



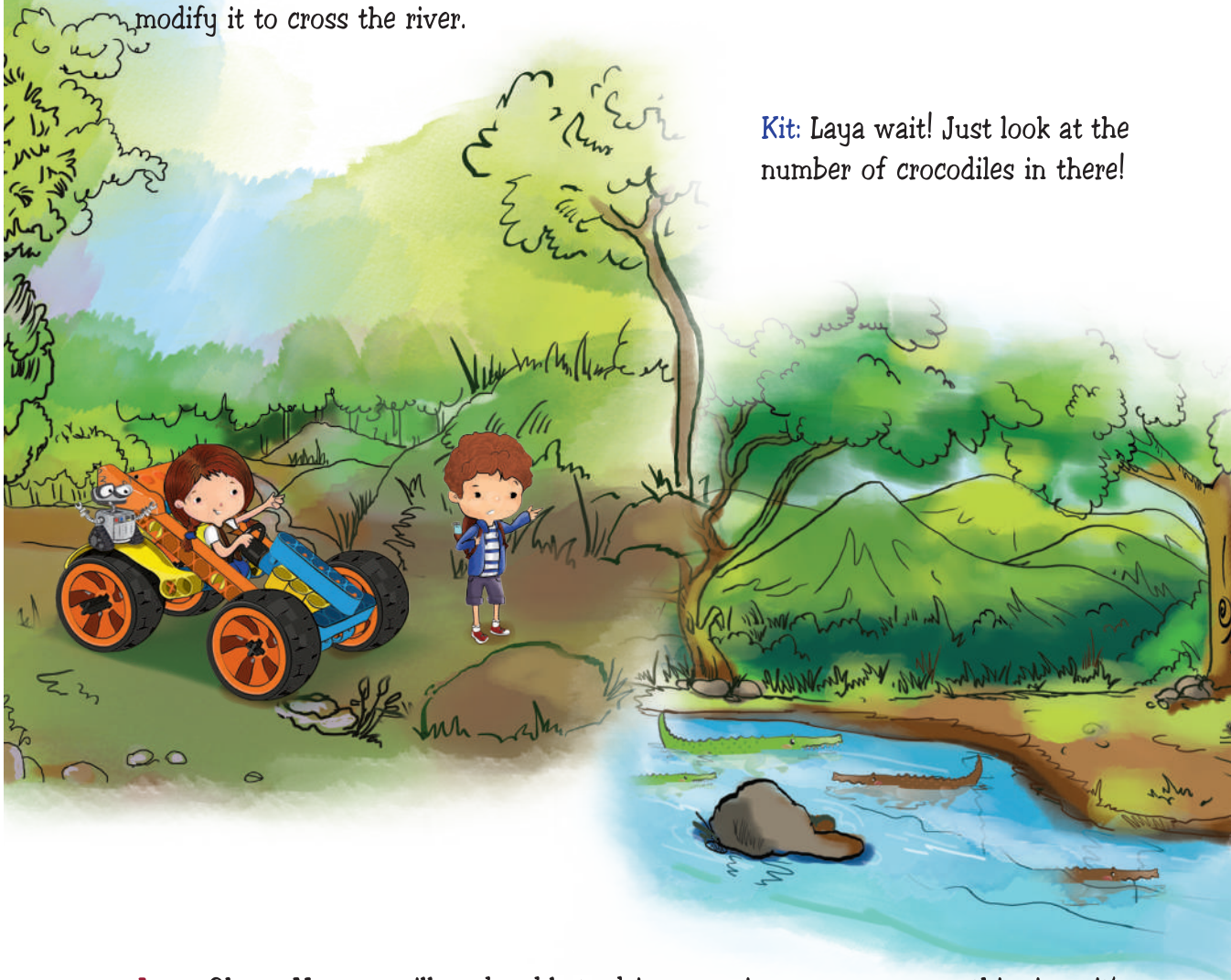
CHAPTER 5

Laya: Hold on hold on, what is this river doing here? I don't see it on the map! Are we on the wrong route?

Kit: Everything else seems correct. Maybe the map maker might have missed out drawing this river?

Laya: It sounds a bit odd to me, but could be another test. Let me see how deep the water is. Then we can decide whether our car will work or will we have to modify it to cross the river.

Kit: Laya wait! Just look at the number of crocodiles in there!



Laya: Oh no. No way will we be able to drive or swim our way across this river, it's too dangerous. We'll have to build a bridge to cross it.

Rob: As per my calculations, according to the width of the river I believe a bridge which is 25 holes in length should be ideal to cross the river.

Laya: Thanks, Rob. The bridge must be sturdy and not bend, as we don't want to fall into a river filled with crocodiles. Let's start building, Kit.



Kit: Our bridge is ready. Hi-5, Laya!

CHAPTER 6

Kit: Finally, we have reached Volcano Orla. And it feels so eerie. Everything is coloured in hues of red and brown.

Laya: It looks like the volcano has just erupted, and the house in which the key is hidden is now in the middle of a lava field!

Rob: Volcanoes are blistering hot, and when they erupt, they spew lava from deep under the earth's core. Lava is basically rocks which are so hot that they melt and flow, destroying everything in their path.



Kit: Clearly, we cannot reach the house just by driving or walking. We need to build a bridge to get there.

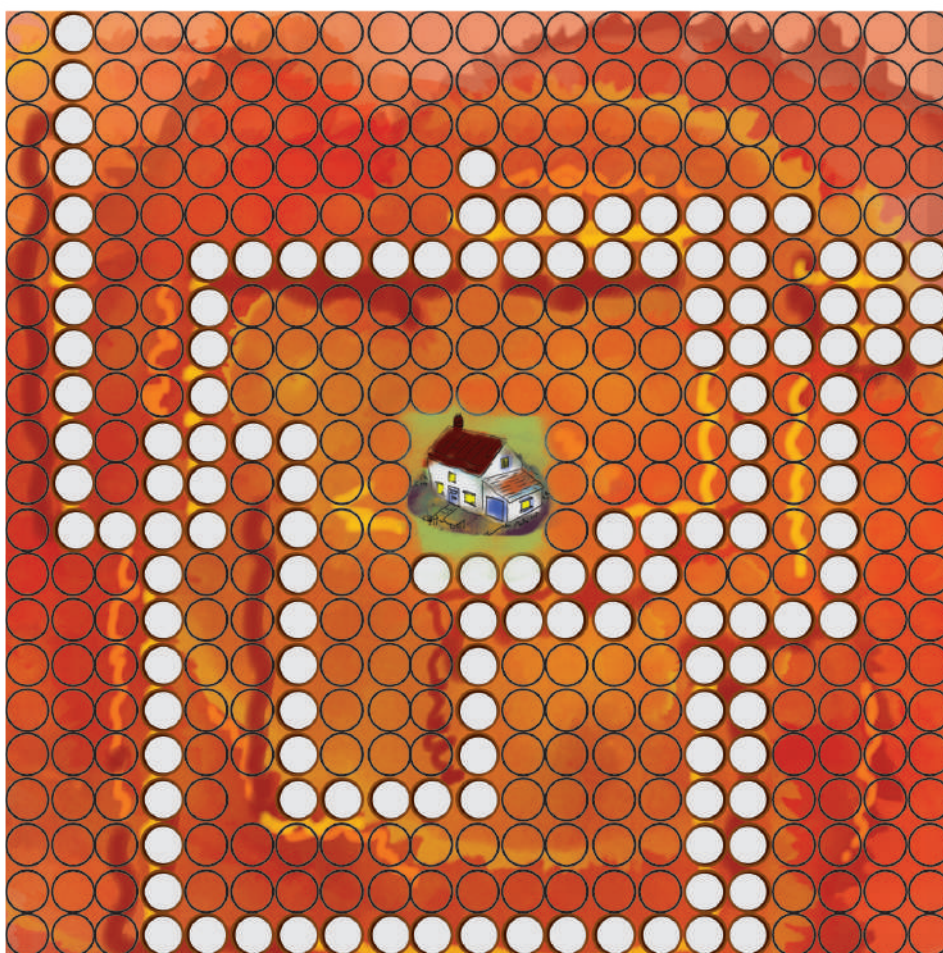
Laya: But it needs to be a special bridge as there are super-hot zones out here which will burn even our bridges.

Rob: Don't worry kids, I've mapped out the area for you. If you observe this map closely, you'll see that the house is in the centre of the lava field.

Rules:

- The bridge cannot go through the super-hot Orange zones.
- Your bridge must be designed to be as short as possible.

All the best! And remember, we will need the key for the next part of our journey.



Rob: That was fantastic, kids. Thank you. It wasn't easy, but the bridge is going to help us get the key.

Laya: Oh no! I just checked the thermometer and the reading shows that the temperature over the bridge is still really high for humans to cross.

Kit: But is it also too hot for our robot friend Rob to cross, Laya?

Laya: There is a tiny problem, his senses gets blurred when there is too much heat. As long as we give him accurate instructions, he'll be able to cross the bridge without any harm. So we will have to be his eyes.

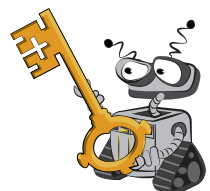
Rob: Hey, hey, before you start on me, practice with your friends!

Kit: Now let's build step-by-step instructions for Rob to reach the house.
We can't lose him.

1. Move _ holes ahead.
 2. Turn Left.
 3. Turn Right.
-
-
-
-
-
-
-
-
-
-

Laya: Yay! Rob has retrieved the key.

Kit: Castle, here we come.



CHAPTER 7

Laya: This Kit has started his antics again. Now he won't let me drive the car anymore, and is insisting he drive. Hmph.

Kit: I can't understand why only you get to drive all the time. I'm a good driver too, after all.



Rob: Kids, kids, don't fight. I have a solution. Why don't we build two cars?

Laya: We can... but for two cars, we'll need to build one which uses only three wheels and one suspension since we don't have enough parts.

Kit: That's okay, I don't mind driving the three-wheeled car. Let's just hurry and build it.

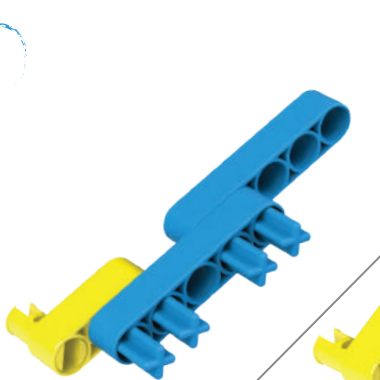
Step 1

CL2 1 pc.

P3 1 pc.

CT3 4 pcs.

P5 2 pcs.



Step 2

Fit Suspension on this P5 before attaching it to model

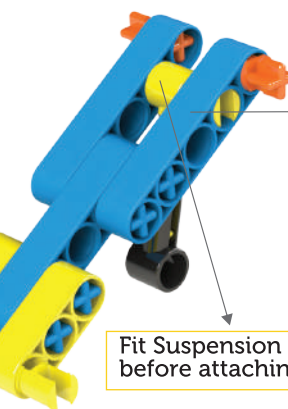
CT2 2 pcs.

Suspension
1 pc.

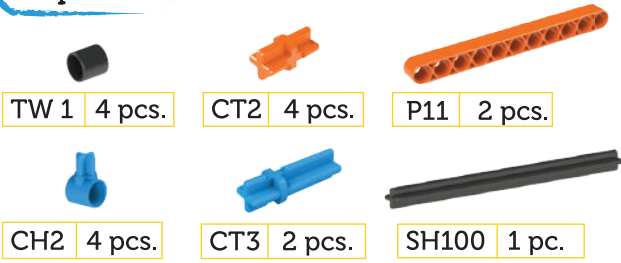
P5 1 pc.

P3 1 pc.

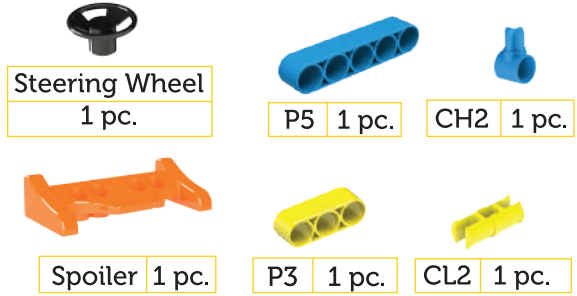
CL2 2 pcs.



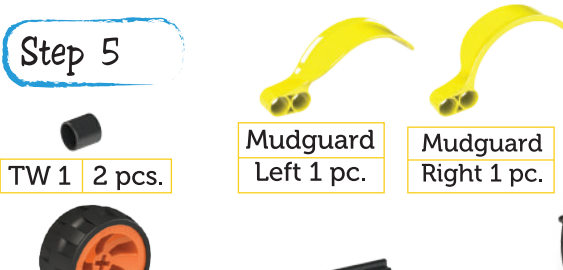
Step 3



Step 4



Step 5



Kit: And it's ready.
Off I go, bye Laya, bye Rob.

CHAPTER 8

Laya: I can't see Kit anywhere. What about you, Rob?

Rob: Me neither.

Laya: This boy drives too fast, I just knew he'd get lost. The map is also with me.

Rob: Don't worry Laya, you have your mobile phone. Just give him a call.

Laya: Oh yeah, let me do that... Oh no Rob, there's no network in this forest. No mountain I can see to climb either for better reception. Do you think I should just build a tower?

Rob: Brilliant suggestion, Laya! My calculations tell me you need a tower exactly 30 holes high to make the call. That's really high.

Laya: Don't worry, Rob. I'll ensure it's really steady so that I don't fall.



CONDITIONS:

- The tower must be 30 holes tall.
- It must stand straight, and be steady.

Rob: Design your tower here before building it.

Laya: Hello? Hey Kit, where have you vanished? Un huh, uh huh, okay I'm going to get there soon. Don't disappear like this again-we have to get to the castle before dark. Okay, see you soon. Bye!

Laya: We've reached the castle! It's almost sunset, but we made it before time. However, I don't see anyone around.

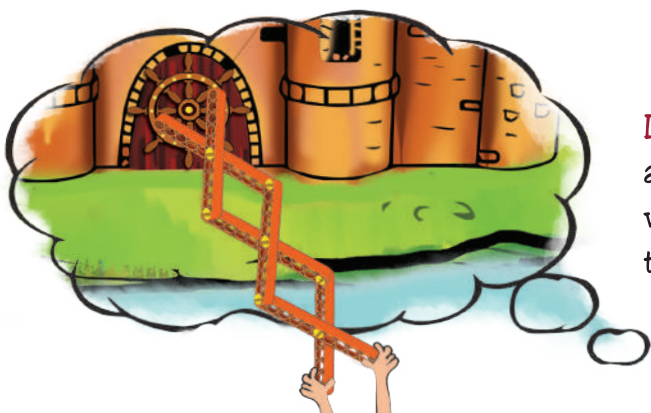
Kit: HELLO! IS ANYONE THERE?



Rob: I don't hear a response kids. And look, the door is across this moat. It seems to be locked.

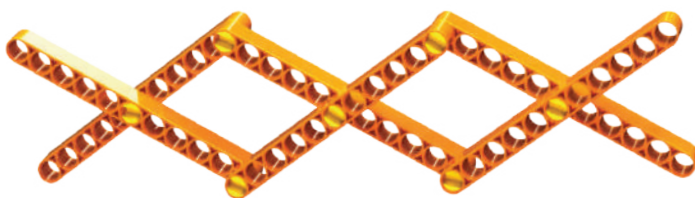
Laya: There's a wheel there. If we could just turn it, the drawbridge will open and we can enter this beautiful castle.

Kit: But Laya we don't have a boat, and the moat seems really deep for us to swim across. Do you think we can build something with our BLIX set?



Laya: I have an idea! Let's build a scissor mechanism, similar to what is used in airports when they lift luggage and place it in an aeroplane.

Rob: Excellent suggestion. Here is a picture of it:



Kit: This is awesome! I love how it grows big and small with one motion. I think I'm going to play with this for some time.



Laya: Kit! Come inside the castle now.

Kit: Or maybe I'll play some other time... It's time for the final adventure.

CHAPTER 10

Kit: Ooh this castle is so majestic. I wonder how old it is.

Laya: Or how many rooms it has. Kit, see there seems to be a secret passage here. We need to go explore.

Kit: It's cool how creepy this is. How much lower do these stairs go?



Laya: We've reached the bottom now.

Let me just switch on my torch, it's very dark out here.

Rob: Kids, this is a computer room! It's my ultimate robot dream come true. This is an ancient computer.

Laya: Indeed, it is from the 1940s, when World War II was happening.

Kit: How do you know?

Laya: There are dates everywhere on these papers, Kit. And look, this seems to be some sort of code.

Rob: This is the key to decode computer language children. Back when these computers were built, there were no CDs or USB drives to store information. They had to use punched cards.



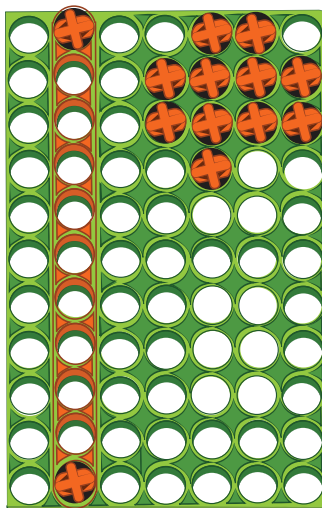
Kit: But why didn't they just write it down?

Rob: They did, Kit. But computers can't understand our language, and hence, they created a special one for it. This chart explains how to convert our language to computer language.

Laya: This is super interesting Rob. I love a good puzzle! Kit, let's decode these papers with the help of the chart.

Rob: Now it's your turn. See if you can decode the message that Laya has made with her BLIX set.

Decode here:





Rob: Done? Great. Build your own coded BLIX card and give it to your friends. Let's see if they can solve the puzzle.

Kit: This was such an epic adventure. But now, I'm off to find a soft bed to rest my weary bones.

Laya: Me too. Goodnight, Kit. Tomorrow will bring us new surprises I hope... Wait a minute. KIT!! Come here fast.

Kit: What happened, Laya? Are you okay?

Laya: I'm okay but you need to look at this.



Kit: WOW! This is a treasure chest overflowing with more BLIX parts—the ones that we don't have.

Laya: And it's guarded very well. We need to find a way to get these parts, they look really special. Kit, it looks like our new adventure has fallen into our laps.

Kit: I'm so excited!

Rob: Don't forget me, kids. I'm going to go recharge my batteries for our next adventure. See you on the other side!



CT2 14 pcs.



CT3 10 pcs.



TW1 12 pcs.



CH2 10 pcs.



CL2 10 pcs.



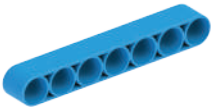
P3 Plus 2 pcs.



P3 4 pcs.



P5 5 pcs.



P7 3 pcs.



P11 6 pcs.



Mudguard
Left 1 pc.



Mudguard
Right 1 pc.



Suspension 2 pcs.



Sterring Wheel
Left 1 pc.



Spoiler 1 pc.



Wheel 4 pcs.



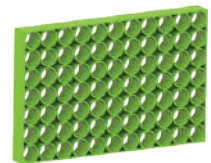
SH60 2 pcs.



SH100 2 pcs.



Remover
Tool 1 pc.



P7 X 11 2 pcs.



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