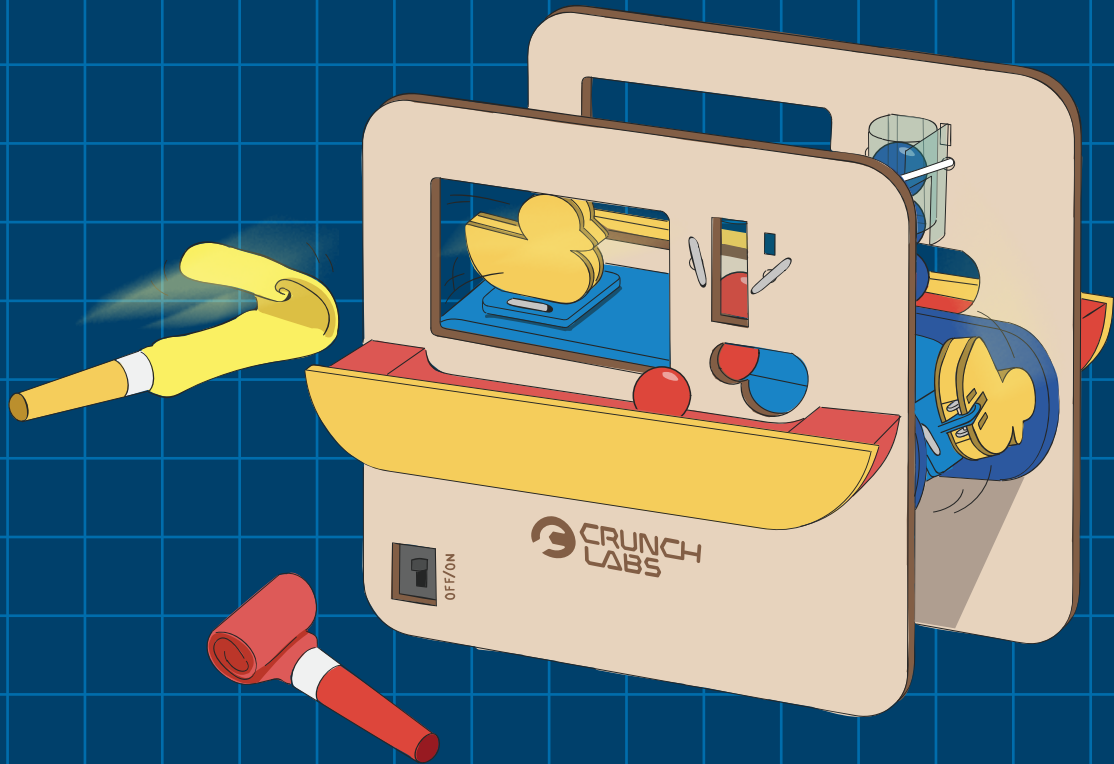




BUILD  
BOX



DUCK GAME



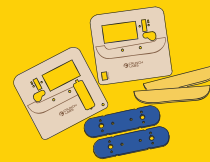
# NEW VIDEO UNLOCKED

BUILD ALONG & LEARN WITH MARK ROBER



[CRUNCHLABS.COM/DUCK](https://crunchlabs.com/duck)

## PARTS



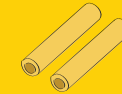
wood pieces



bolts



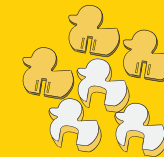
spacers



standoffs



rollers



ducks



duck stands



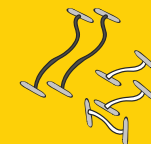
washers



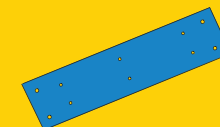
dowels



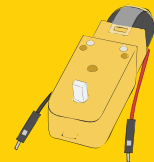
foam tray



elastics



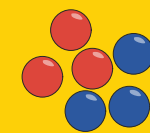
belt



motor



battery pack



marbles



tubes and tabs

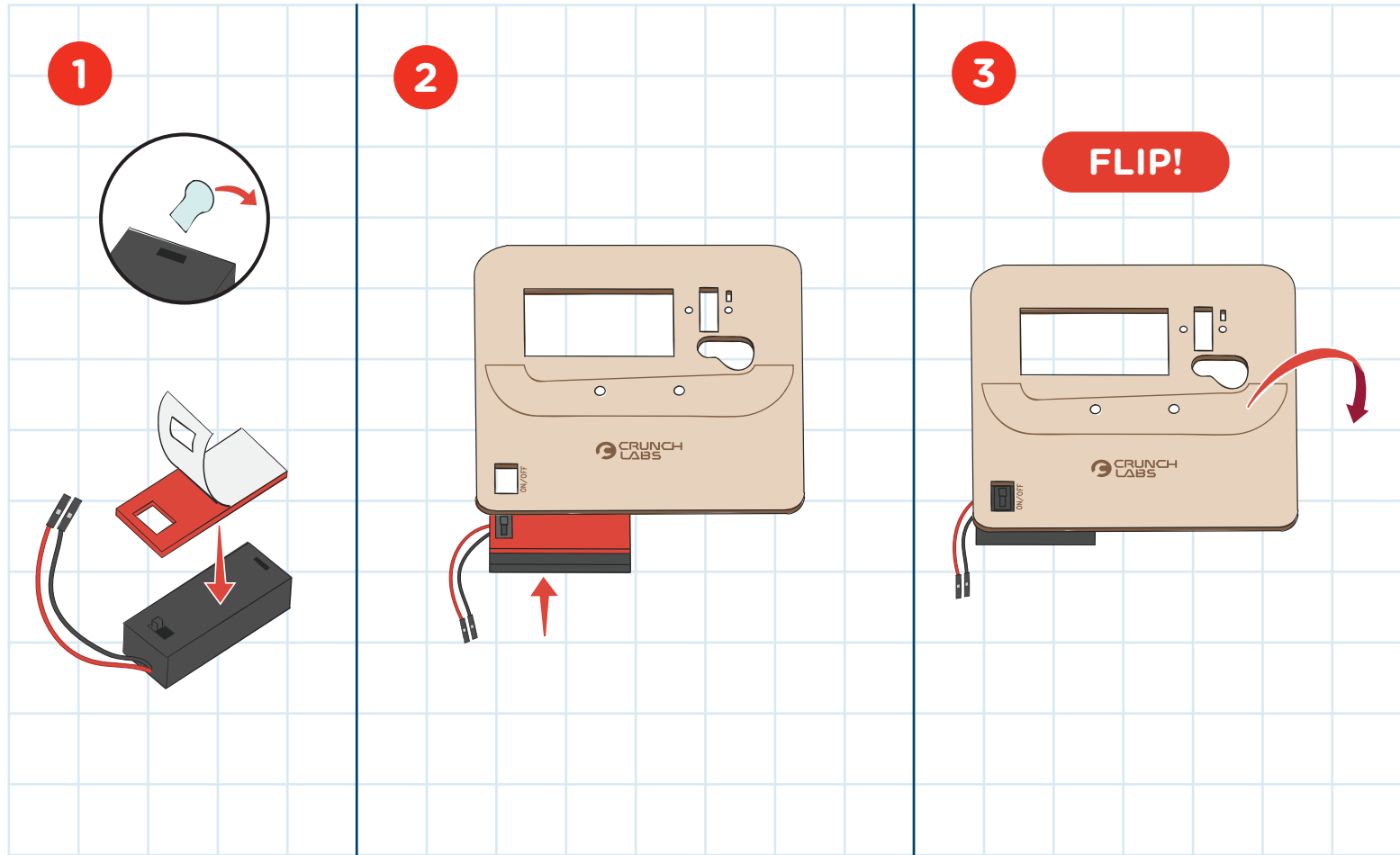


party blower

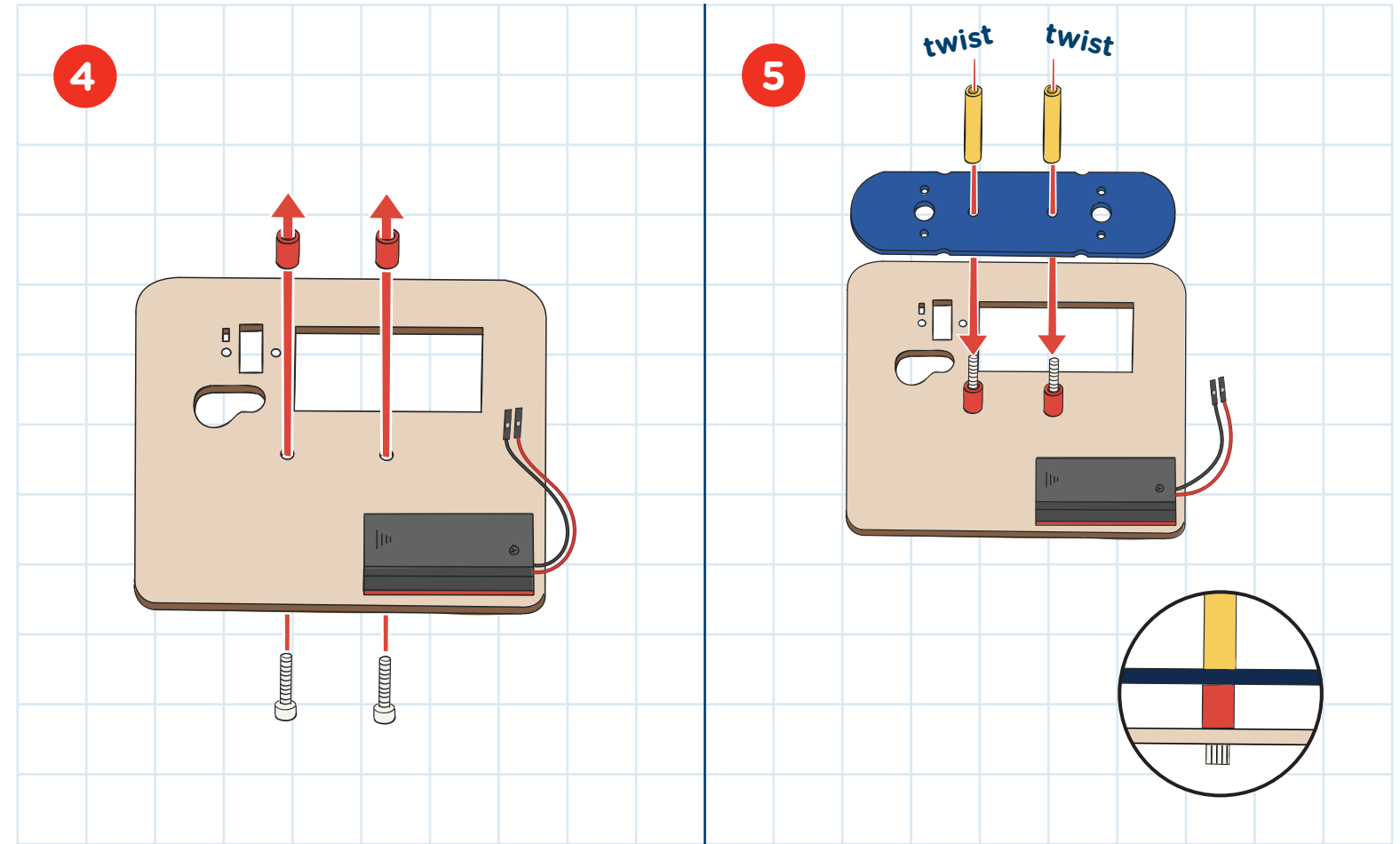


sticker foam

# BUILD

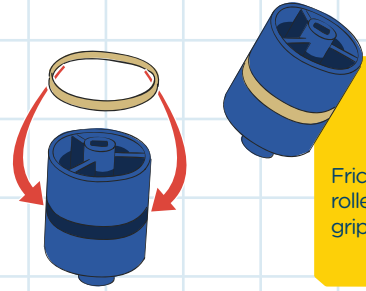


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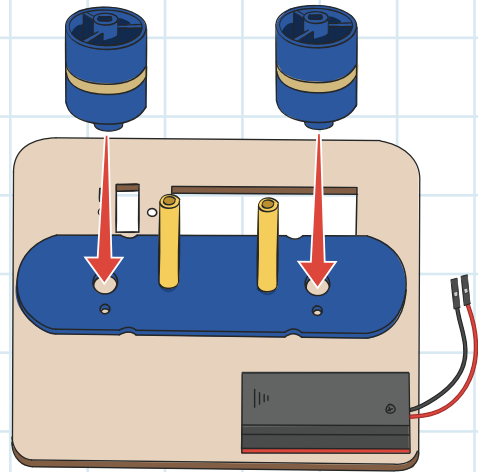
# BUILD

6

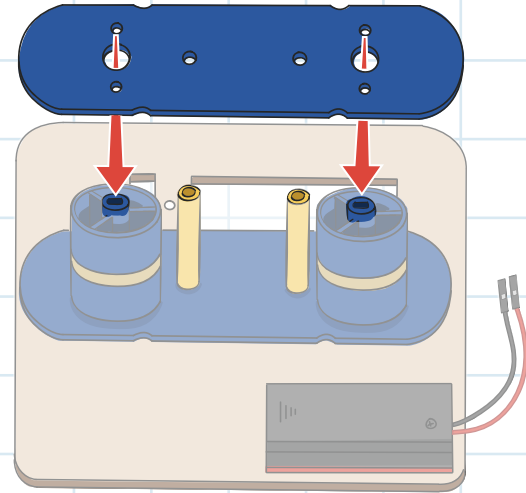


**PRO TIP!**  
Friction in the right place is awesome! These rollers use rubber bands to give them more grip, so they can turn the belt easily.

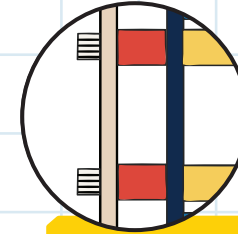
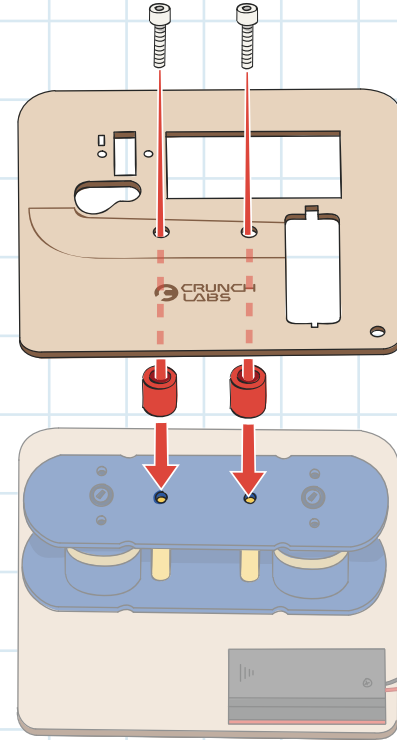
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8

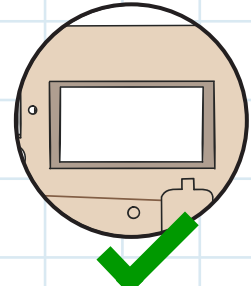
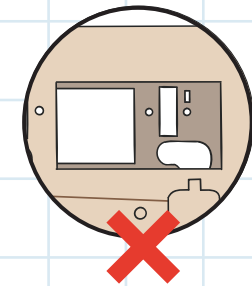
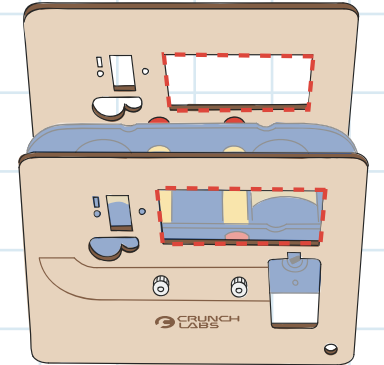


9



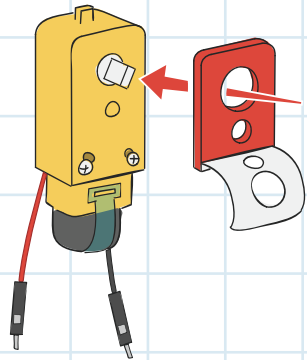
**PRO TIP!**  
Spacers are used to keep certain parts from touching. In this case, the red spacers leave room in between the wood pieces.

10

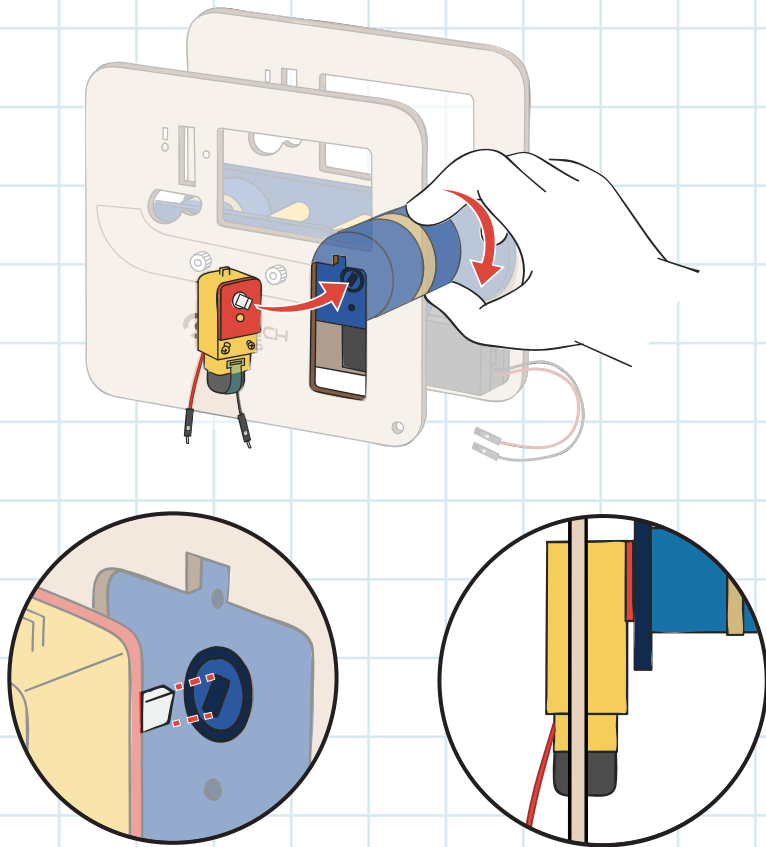


# BUILD

11

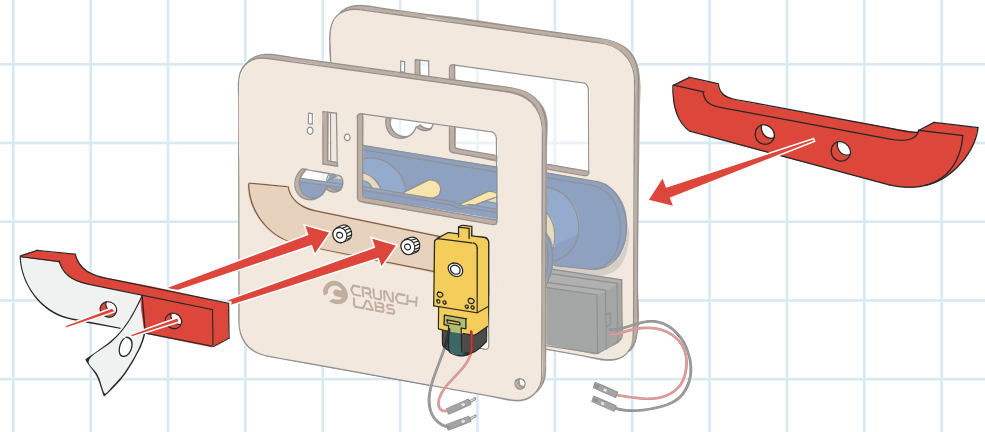


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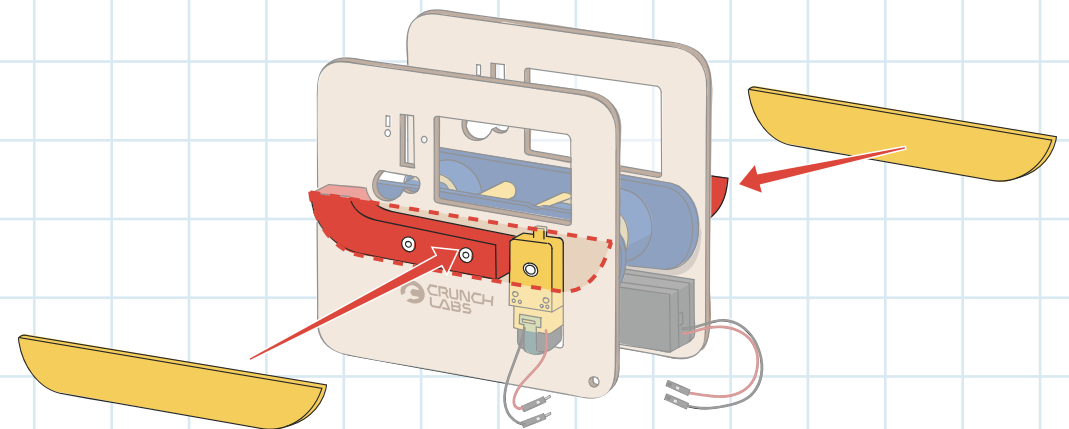


# BUILD

13

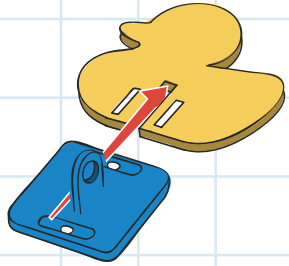


14

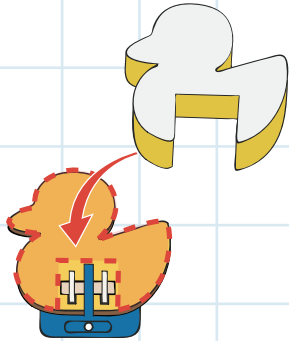


# BUILD

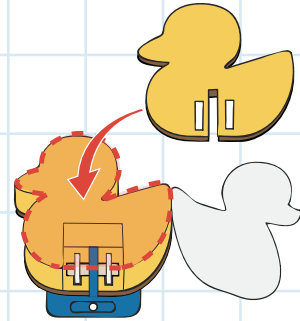
15



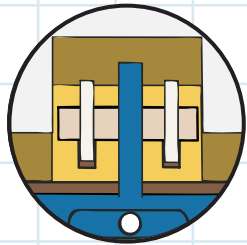
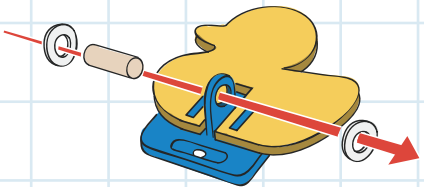
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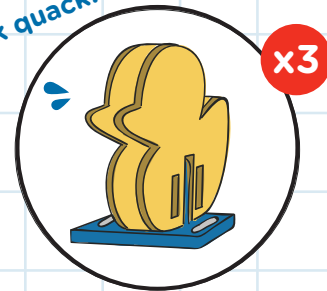
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16

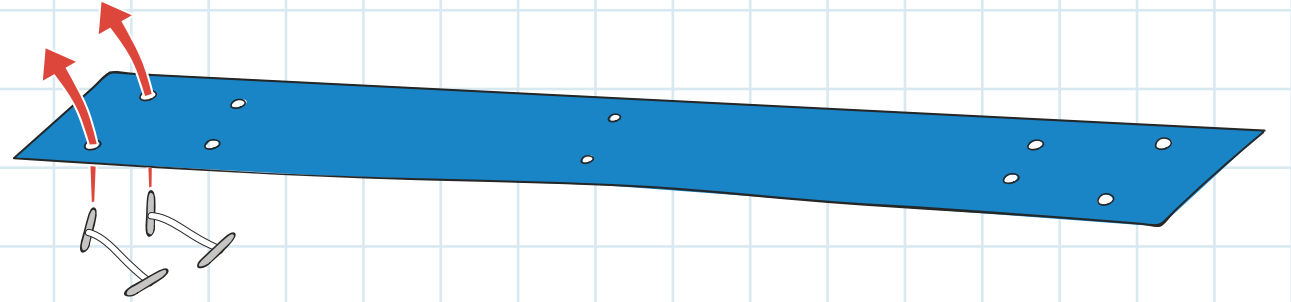


quack quack!

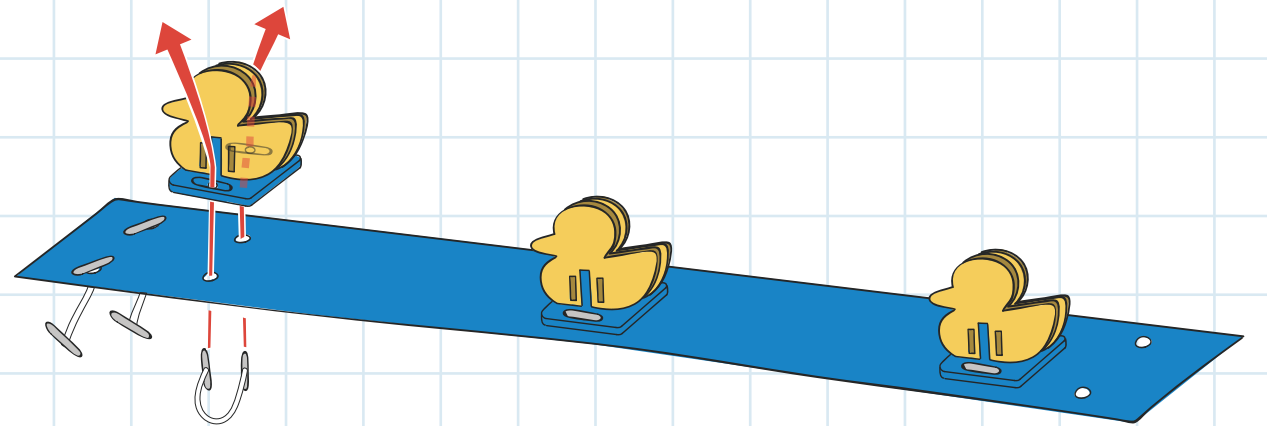


# BUILD

19

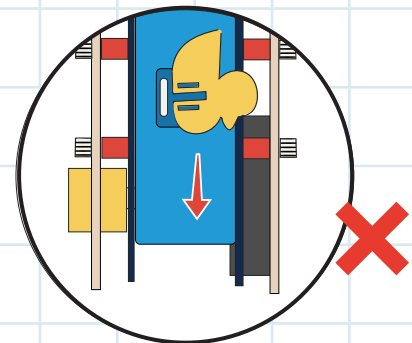
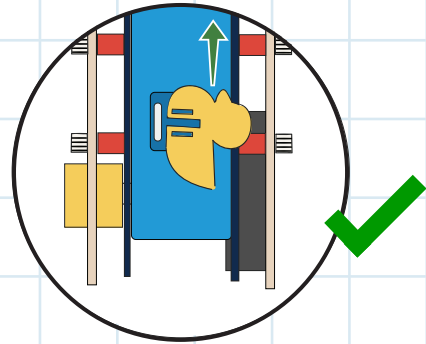
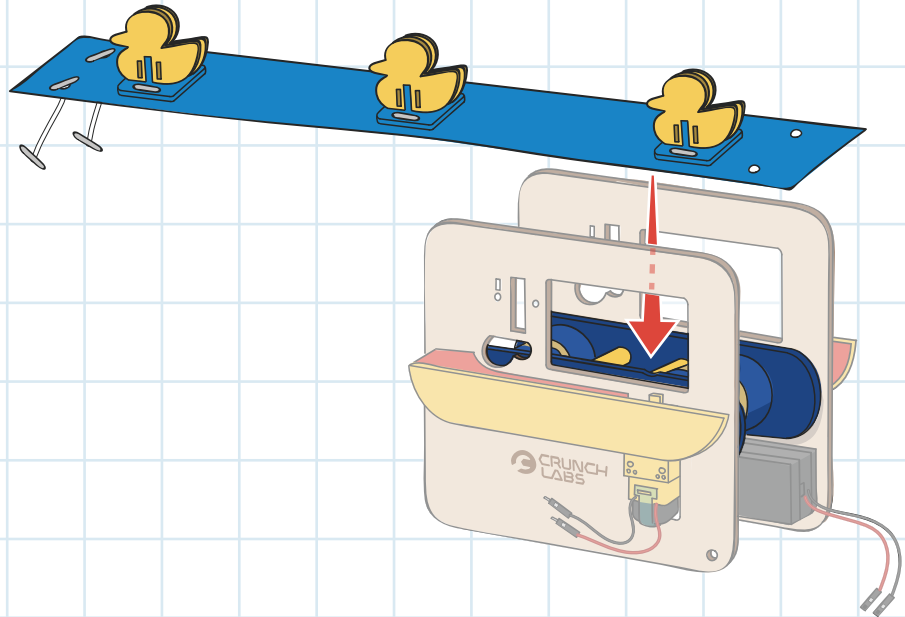


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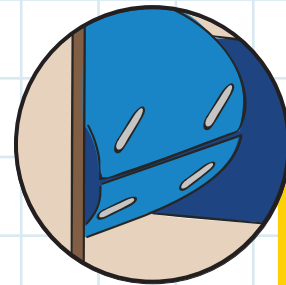
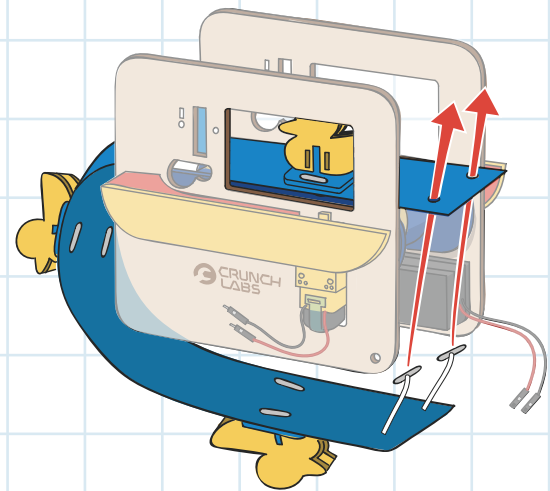
# BUILD

21



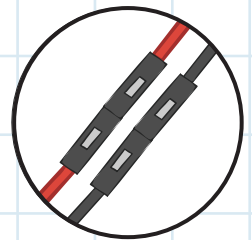
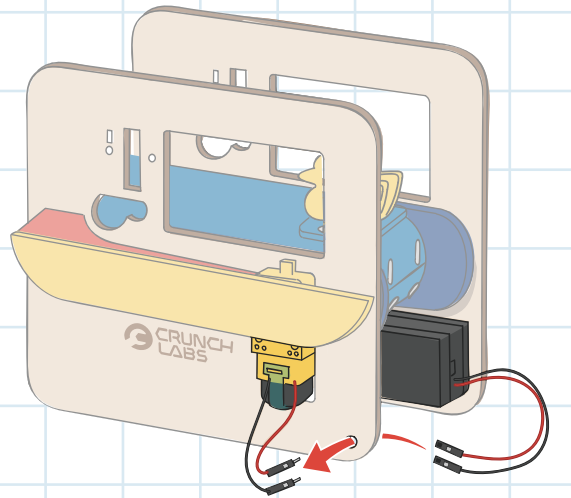
# BUILD

22

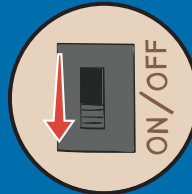
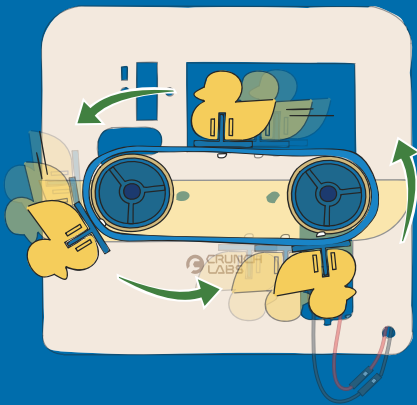


**◀ PRO TIP!**  
Belts only work when they're pulled tight, or tensioned. The two elastic cords tension the belt.

23



TEST

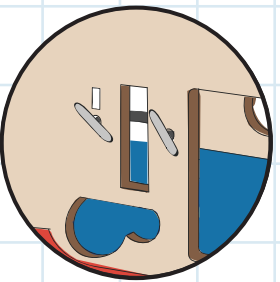
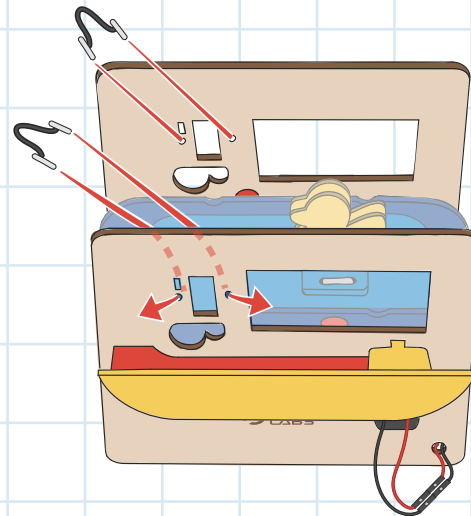


PRO TIP!

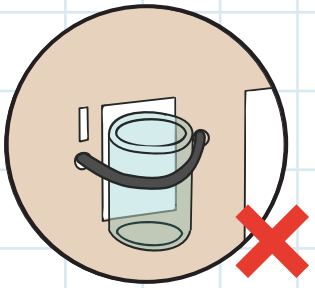
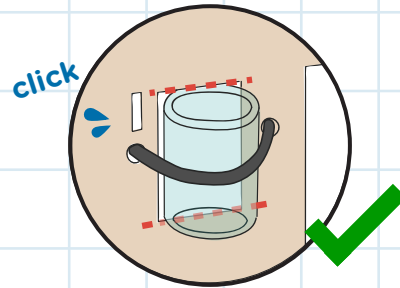
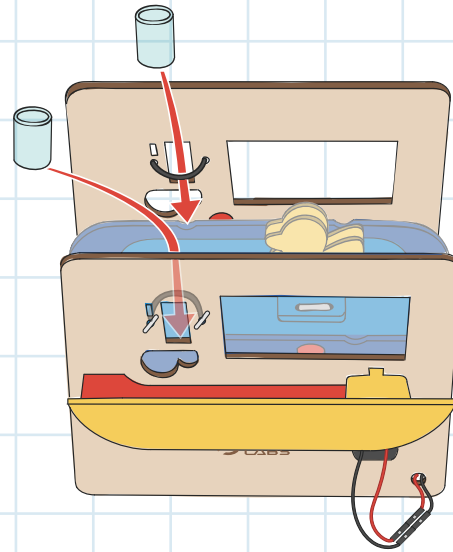
You can reverse the direction that a DC motor spins by swapping the wire connections.

Having trouble? Watch the video at [crunchlabs.com/duck](http://crunchlabs.com/duck)

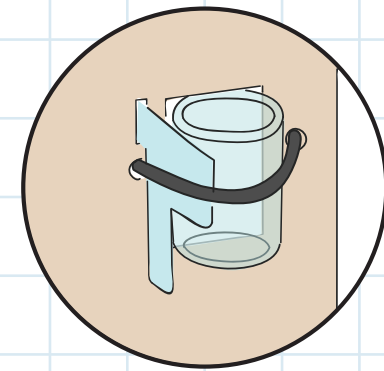
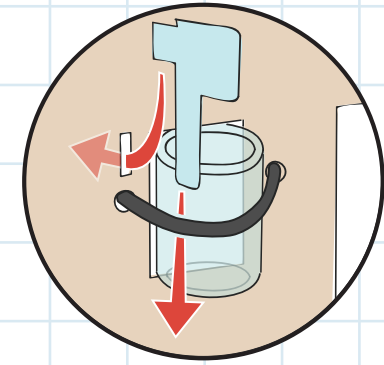
24



25



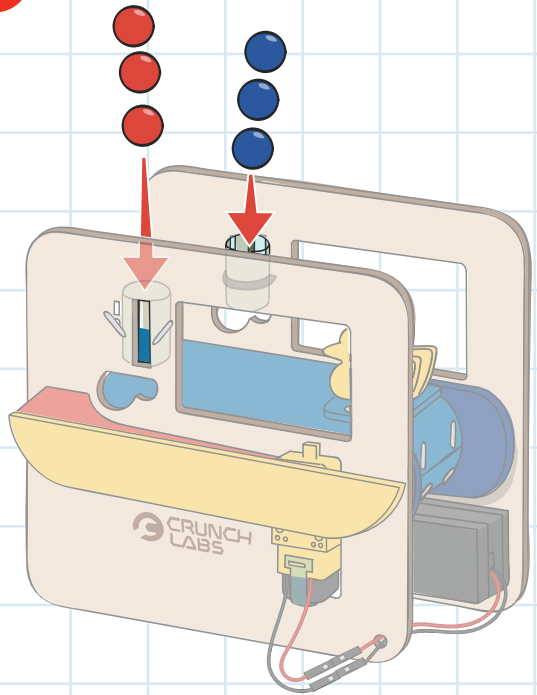
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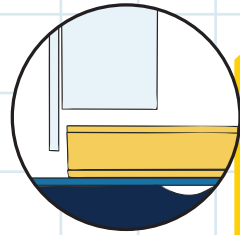
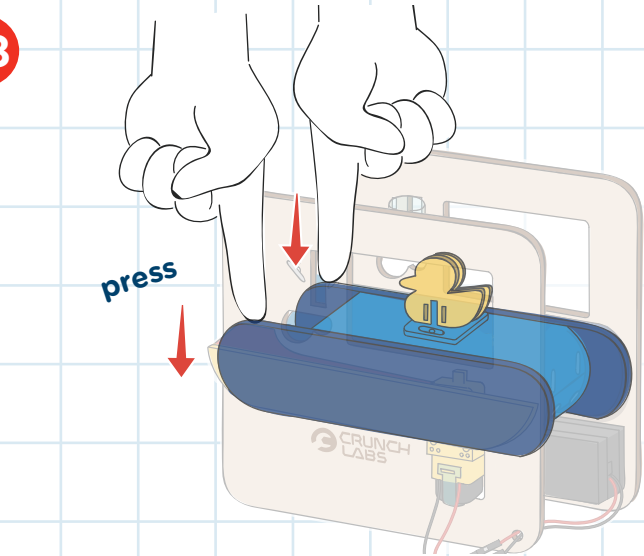


# BUILD

27



28

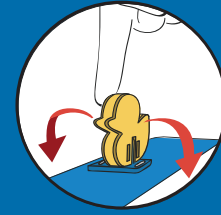
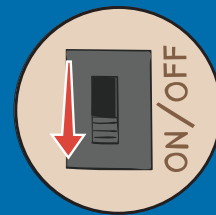
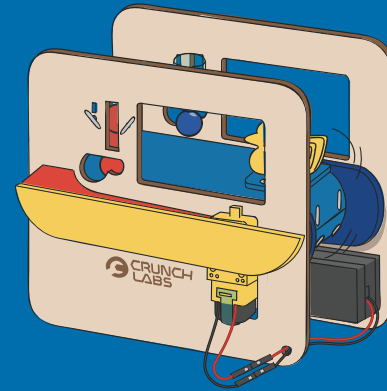


## PRO TIP!

Pressing down on the belt track near the marbles will help ensure your ducks have **clearance**, or enough room to pass by.

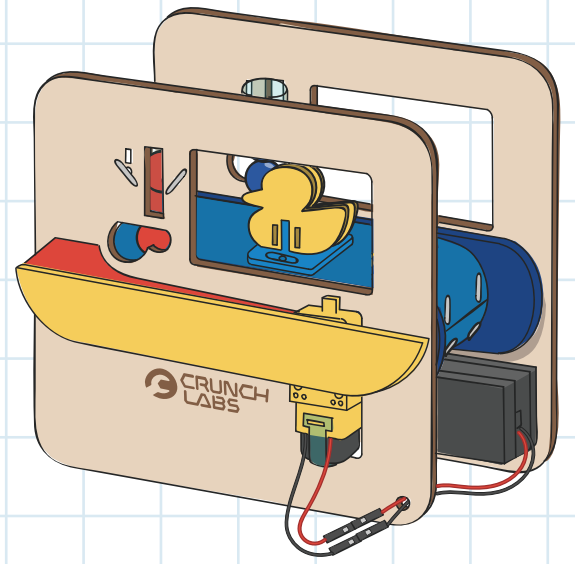
# BUILD

## TEST



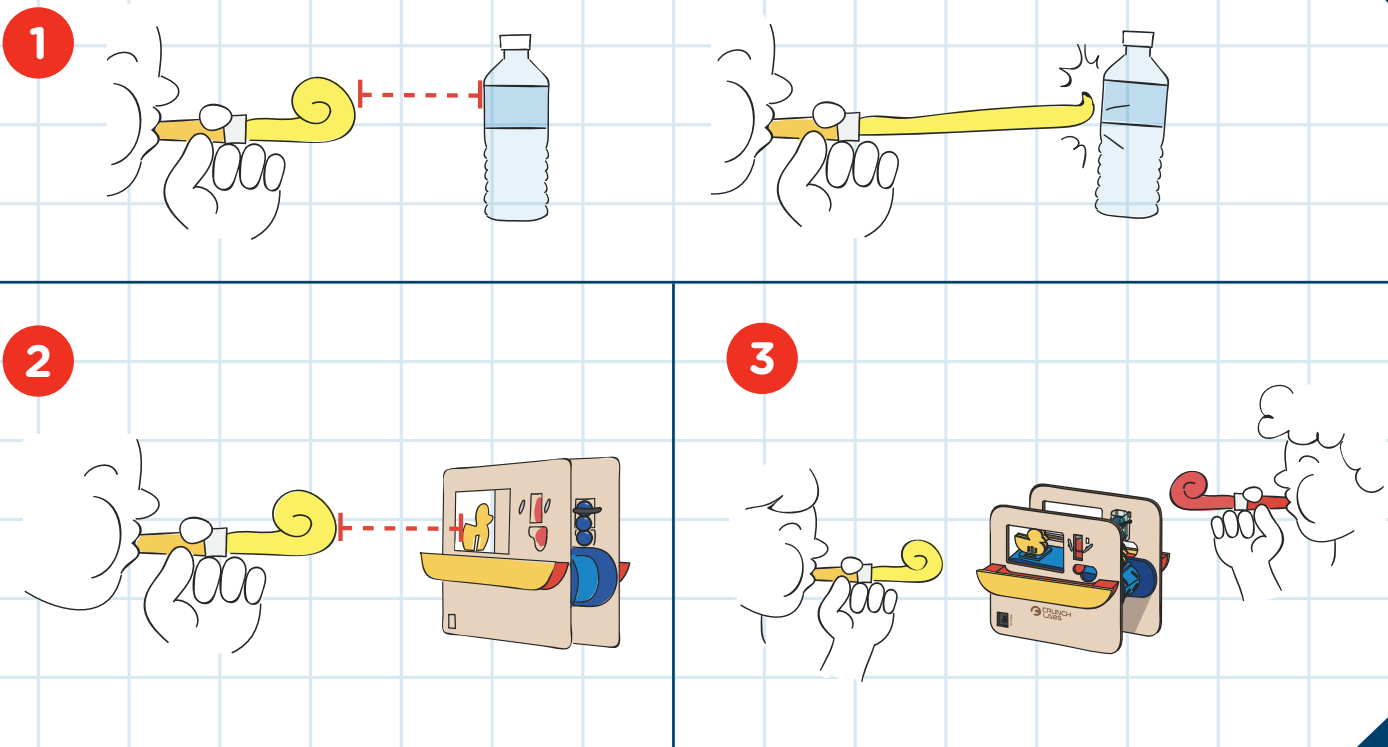
Having trouble? Watch the video at [crunchlabs.com/duck](http://crunchlabs.com/duck)

BUILT!



# GAME TIME

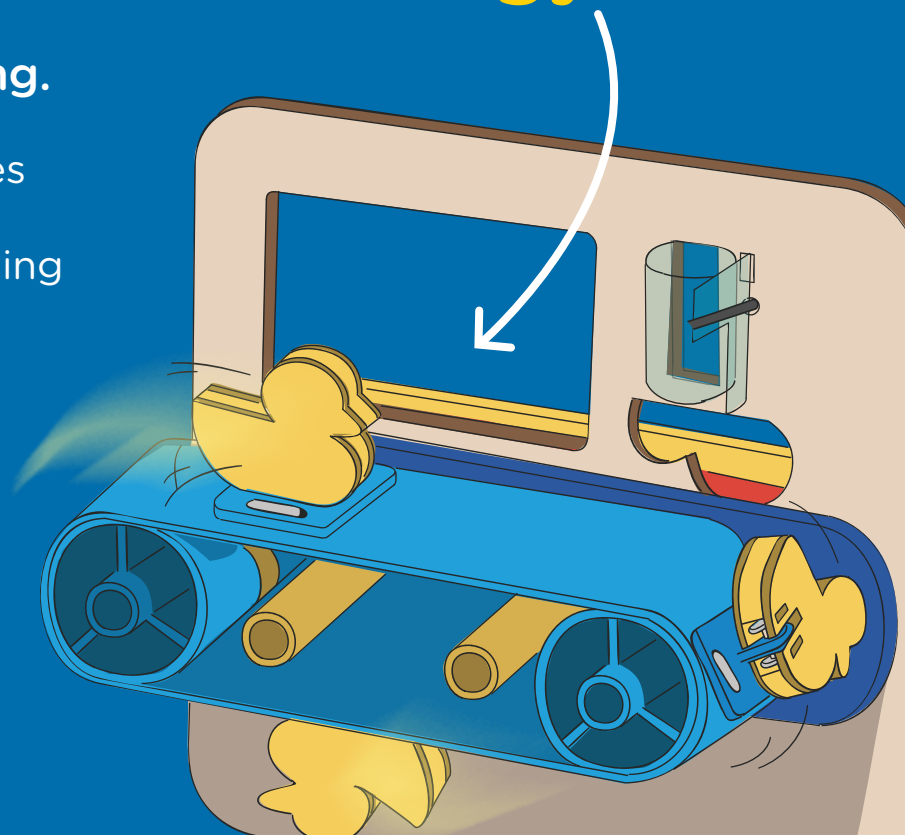
Test the range of your party horn!  
Find a friend and see who can score 3 marbles first.



A **belt** is a loop of material used to carry objects or transfer energy.

Basically, belts move stuff along.

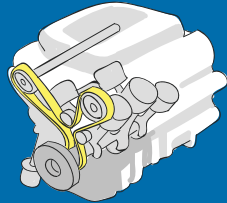
The **belt** on your Duck Game carries the ducks in an endless loop. The rollers drive the belt forward, bringing the ducks along along for the ride. Because there are two rollers, the ducks have a **long flat area** to float. As the belt continues, the ducks are flipped upside down. Whether or not they were knocked over, gravity **resets** them back to standing!



THINK

## Find belts in other machines!

Belts are useful for all sorts of machines. Belts can be used to **transfer rotational energy**, from one thing to another, or as a surface to **transport objects**.



### TIMING BELTS

Timing belt are used in most gas-powered vehicles. They are attached to multiple pulleys on the motor and they make sure that everything is **rotating in sync**.



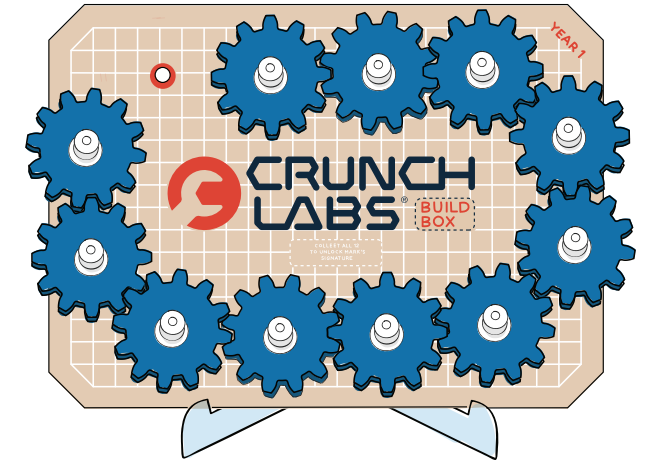
### DOMINO ROBOT

Mark used a few belts to help load a TON of dominoes into his domino robot. Belts are often a very efficient way to **move a lot of stuff** in a predictable way.

THINK

# CONGRATULATIONS!

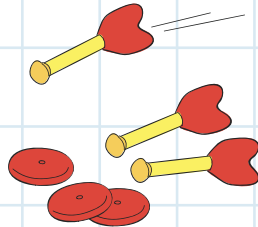
You earned a gear badge for belts



Don't forget to add your gear badge to your gear train!

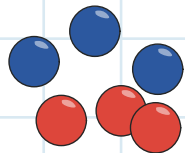
# CRUNCH

It's crunch time! Use your engineering superpowers to keep building.



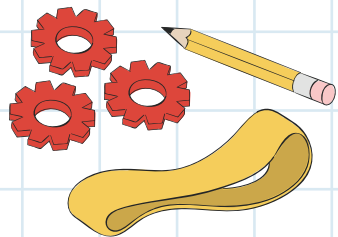
## LONG RANGE

Try using other toys like foam darts to help the ducks collect marbles. How far back can you score?



## HIGH SCORE

Modify a way to load 6 marbles on to one side. Set a timer and see how fast you can get 6 points!



## BELT IT OUT

What does it move? How does it work? Pro tip, paper towel rolls make great rollers for prototyping.

# SHOW OFF YOUR BUILD



Share your funniest moments & coolest mods!

#crunchlabs @crunchlabs    



**WARNING:** Improper assembly can short circuit batteries.

#### **BATTERY SAFETY**

Remove exhausted batteries. Do not mix old & new batteries. Do not mix alkaline, standard (carbon-zinc), or rechargeable batteries. Do not recharge non-rechargeable batteries. If using rechargeable batteries, remove them from the toy before charging. Rechargeable batteries should be charged under adult supervision. Do not short-circuit supply terminals. Do not connect this toy to a power supply greater than two AA batteries. **How to remove batteries:** 1. Remove screw and lid from battery pack. 2. Remove batteries. **How to insert batteries:** 1. Remove screw and lid from battery pack. 2. Insert two new batteries into the battery pack with correct polarity (+ and -). 3. Replace lid and secure the screw on the battery pack.

#### **SWEEPSTAKES**

**Each CrunchLabs build box contains the chance to WIN a trip to visit CrunchLabs with Mark Rober! Sadly, you are not a prize winner this time. Check inside your next build box for another chance to win.**

*Trip includes roundtrip transportation and two (2) night's hotel accommodations for a family of four (4). Approximate value: \$4,500. NO PURCHASE NECESSARY. Open to legal U.S. residents, 18 years of age or older. Void where prohibited. For complete Official Rules, including promotion end date and information on how to obtain a free game ticket, visit [www.crunchlabs.com/win](http://www.crunchlabs.com/win).*

This toy is intended for use by children over the age of eight years. These instructions contain important information, do not throw away.