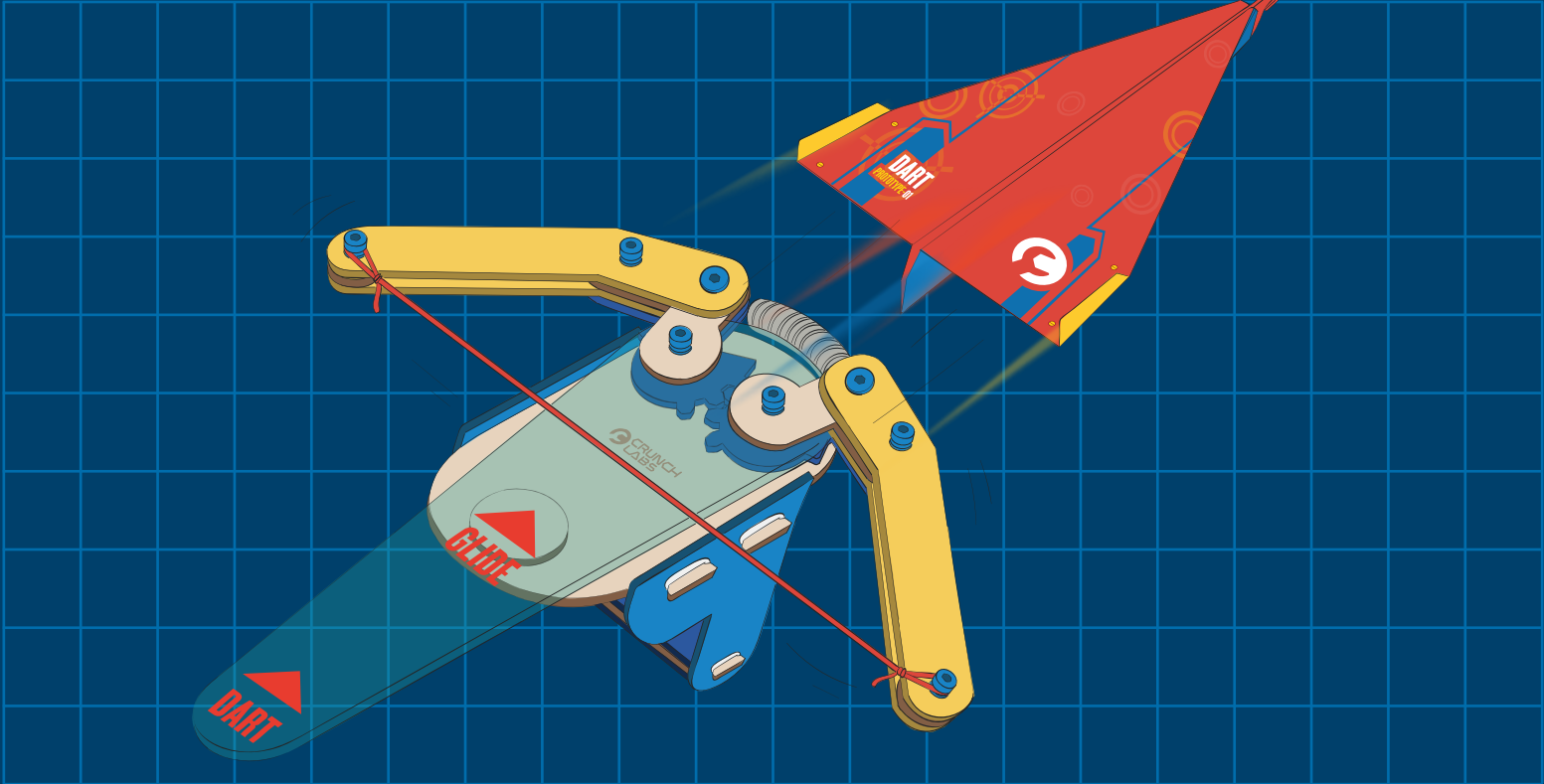




BUILD
BOX



AIR
PLANE LAUNCHER



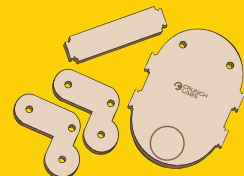
NEW VIDEO UNLOCKED

BUILD ALONG & LEARN WITH MARK ROBER



[CRUNCHLABS.COM/WING](https://crunchlabs.com/wing)

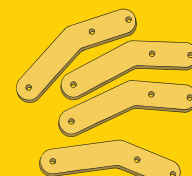
PARTS



wood pieces



gears



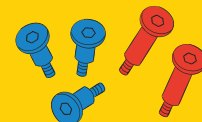
bow arms



runway



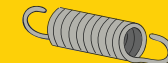
handle sides



shoulder bolts



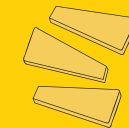
round nuts



extension spring



spacers



hook adhesive



string



o-rings



handle padding



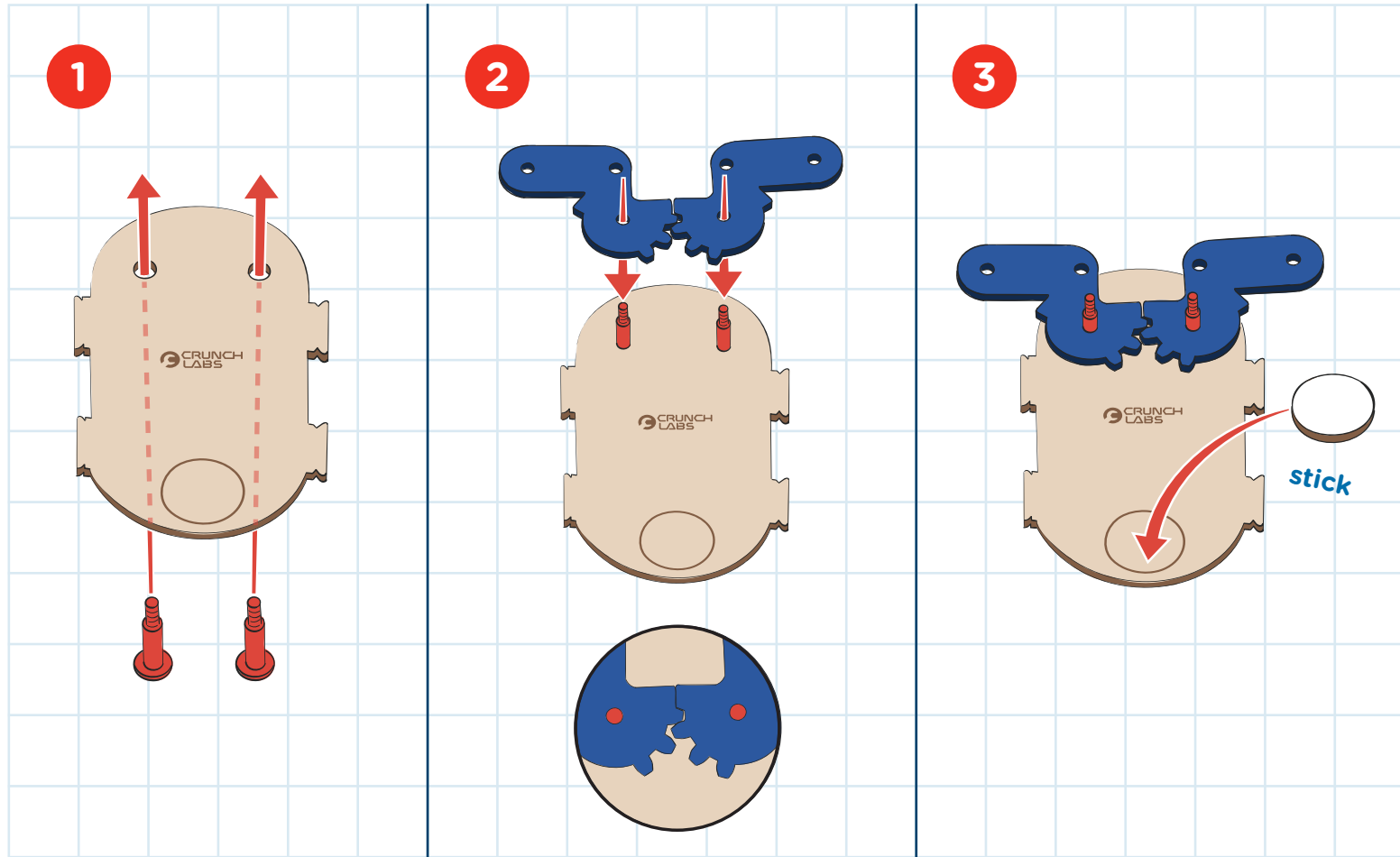
hooks



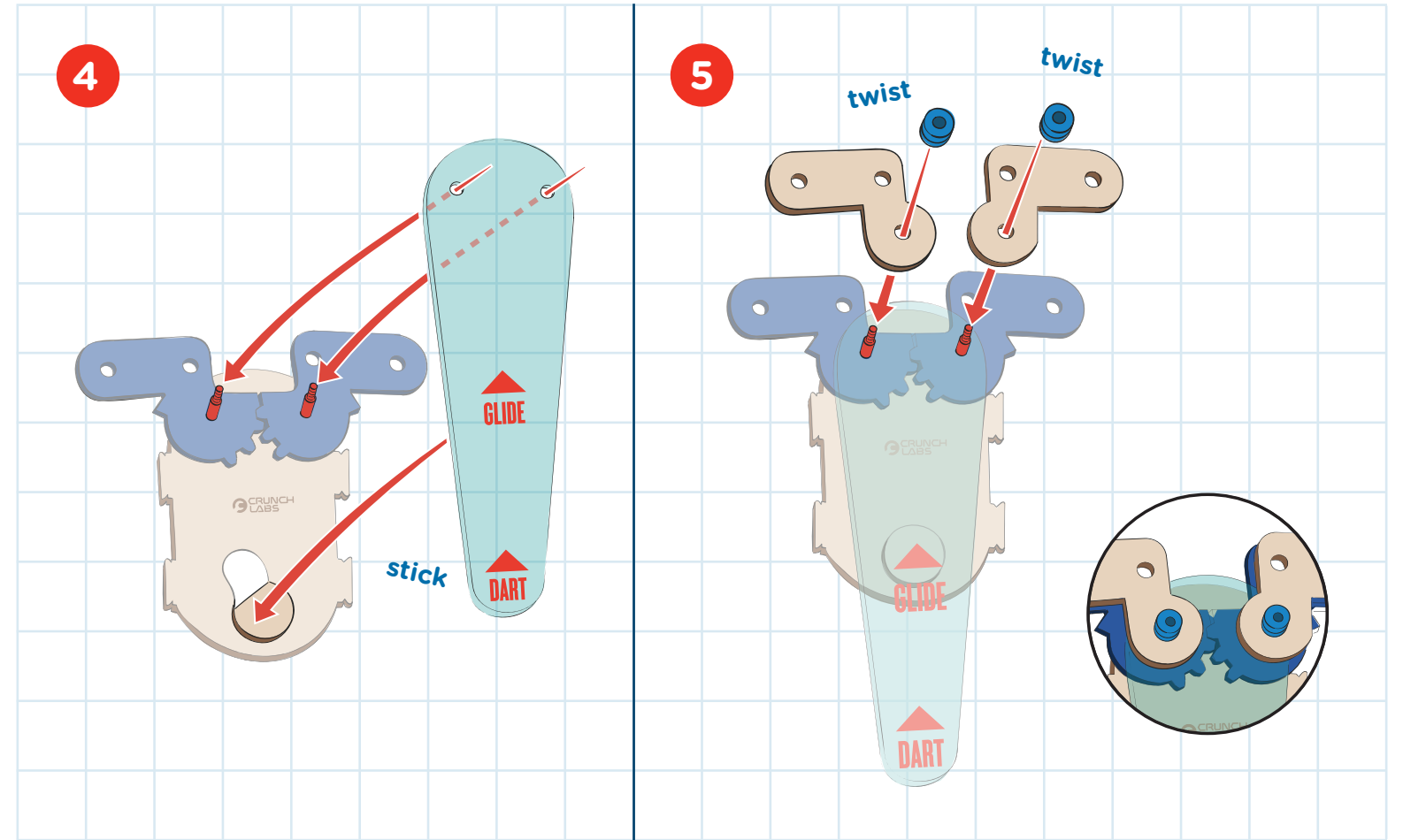
paper planes

For missing and replacement parts, visit "My Account" at crunchlabs.com and we'll ship them to you for free.

BUILD

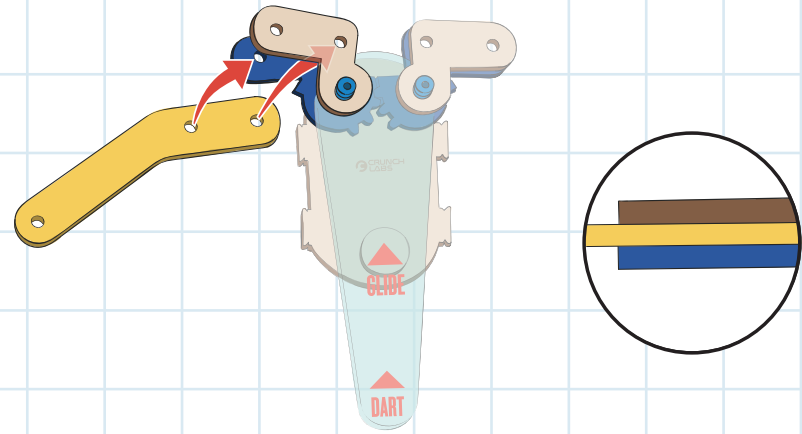


BUILD

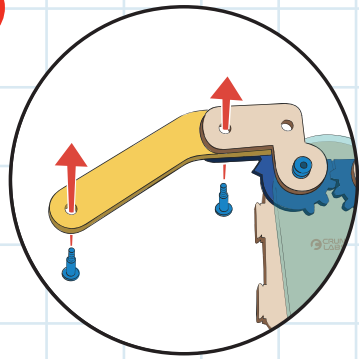


BUILD

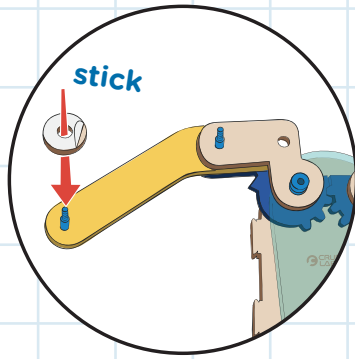
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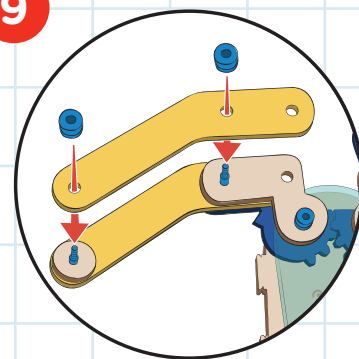
7



8

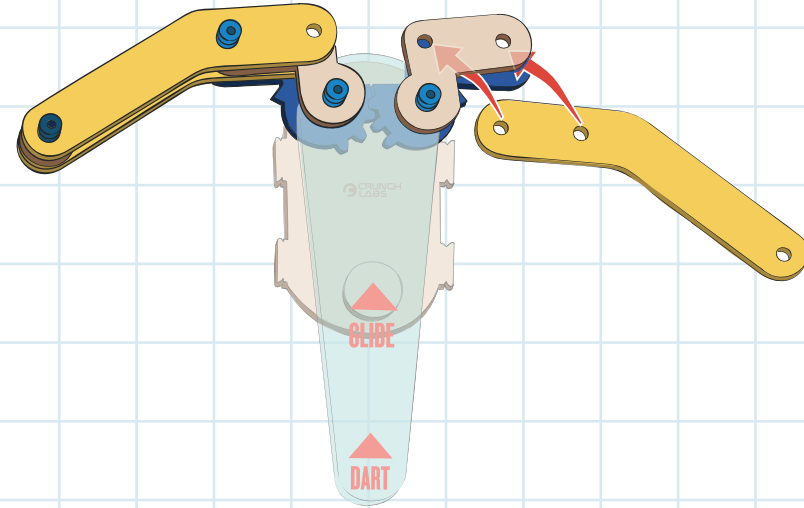


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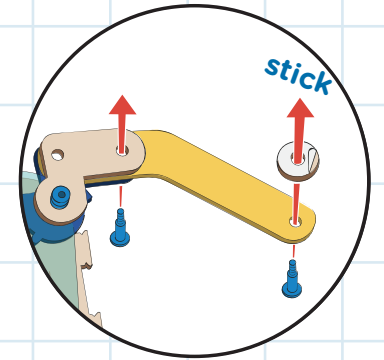


BUILD

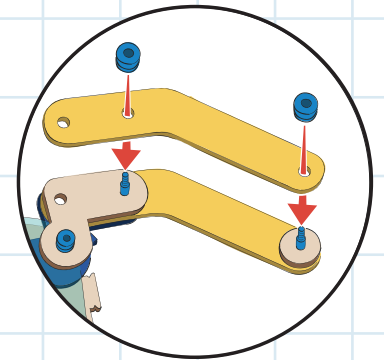
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11



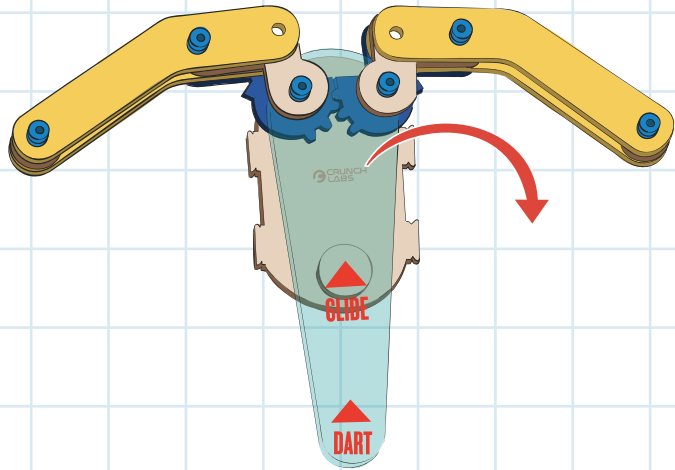
12



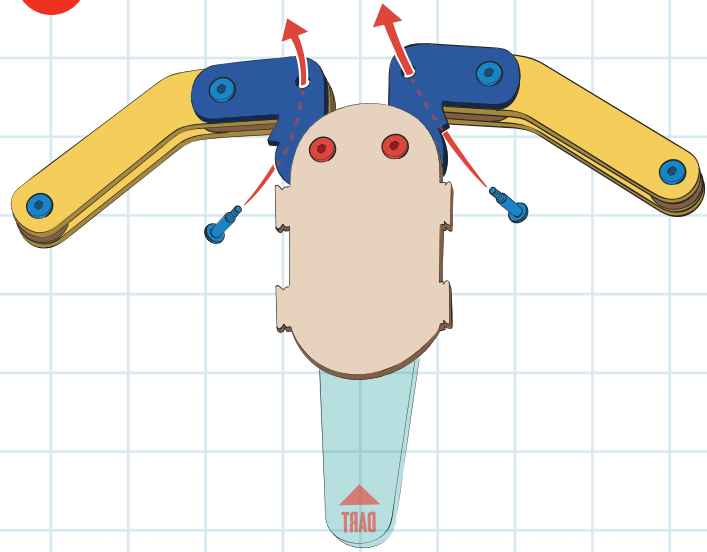
BUILD

13

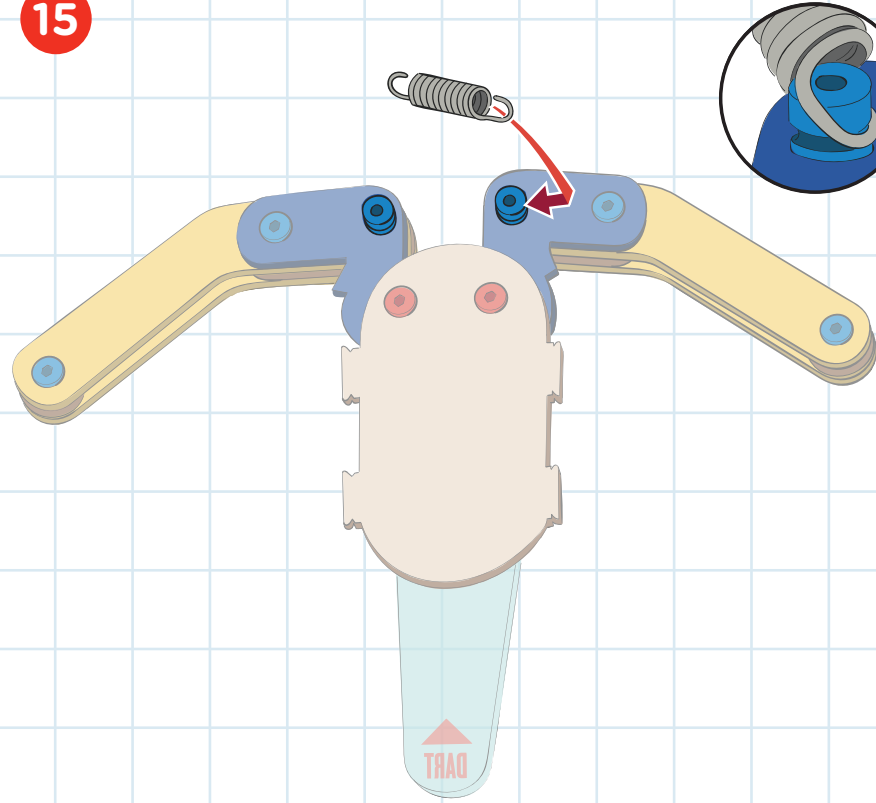
FLIP!



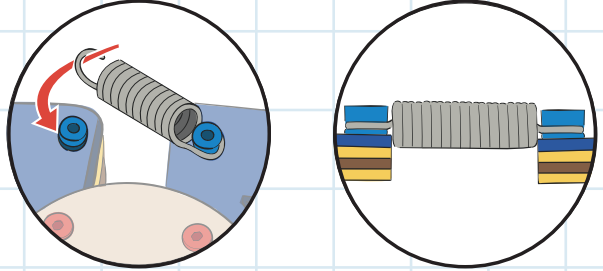
14



15

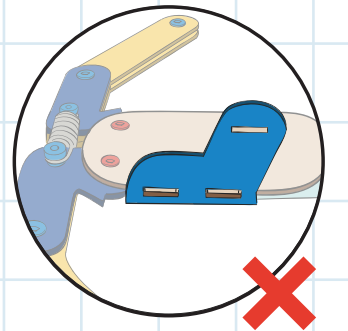
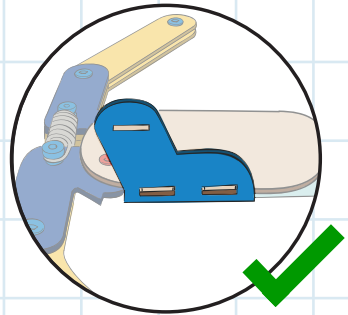
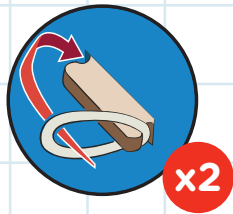
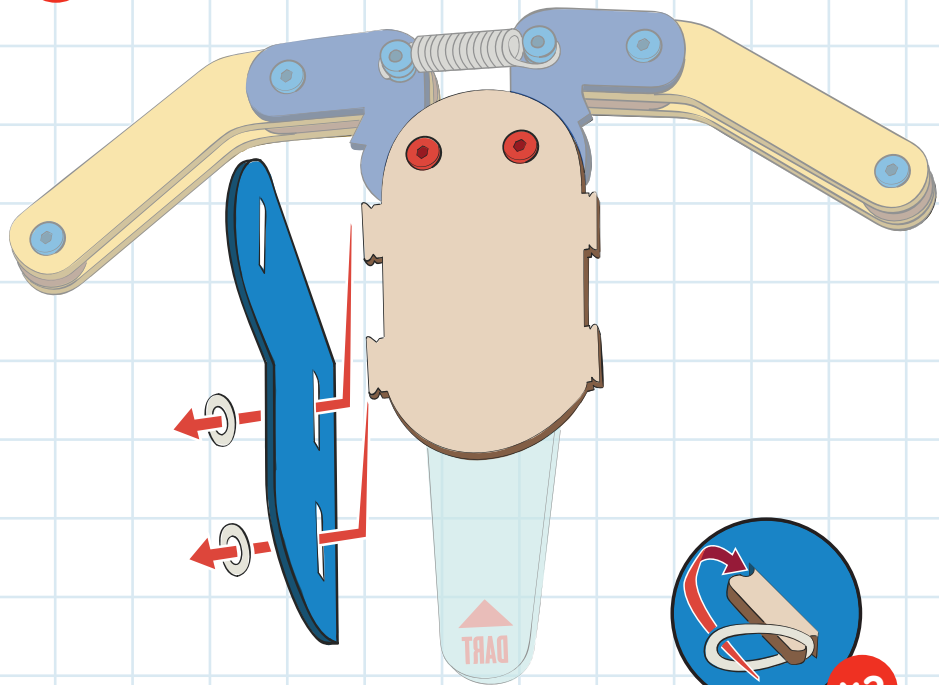


PRO TIP!
Extension springs give machines the ability to store mechanical energy. In this build, an extension spring is what supplies the energy to launch a paper airplane.



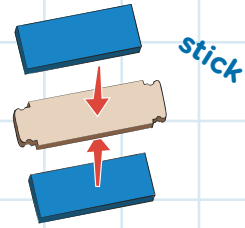
BUILD

16

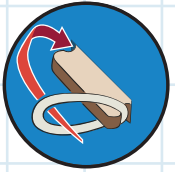
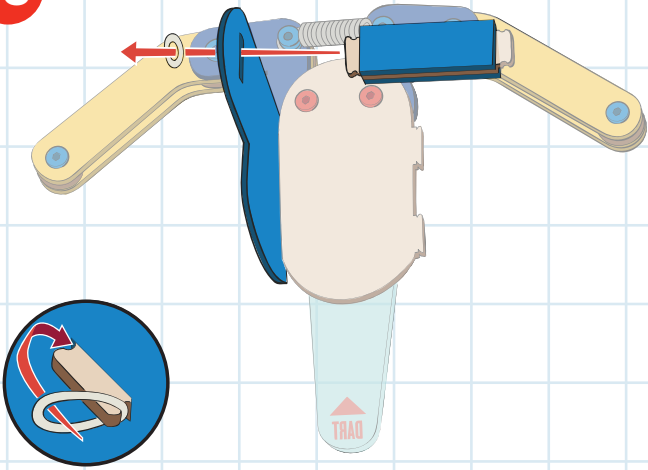


BUILD

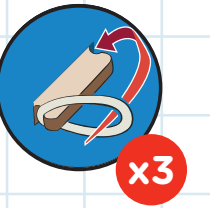
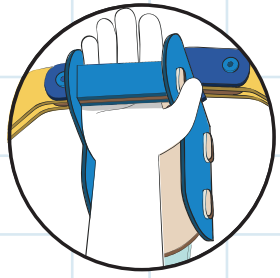
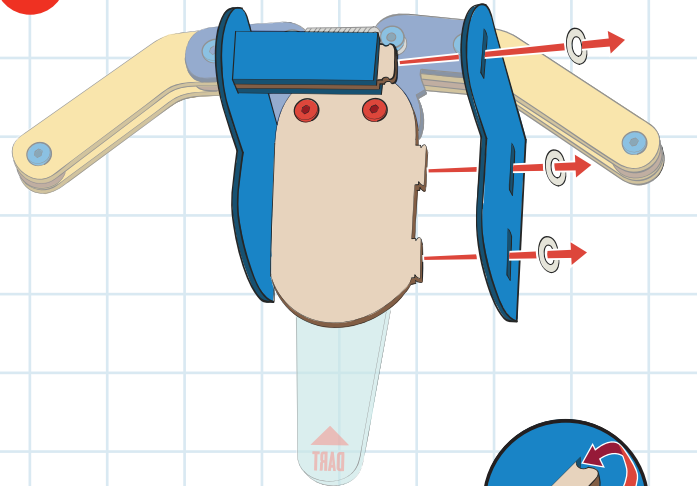
17



18

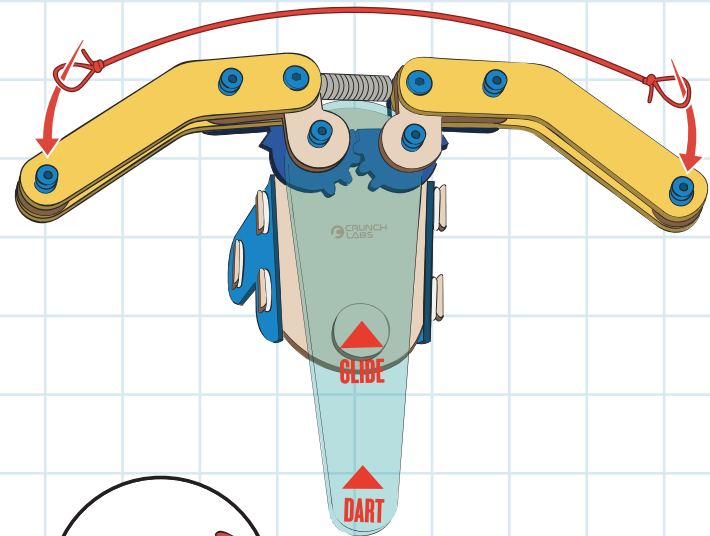


19



BUILD

20

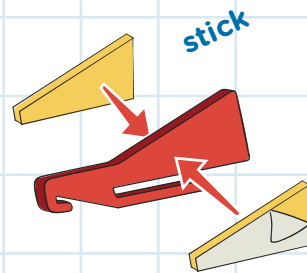


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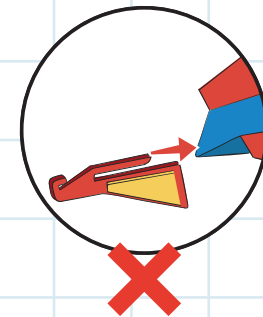
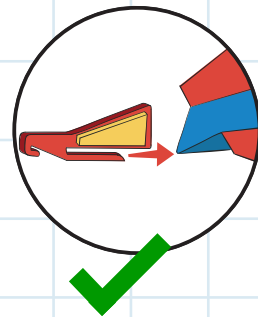
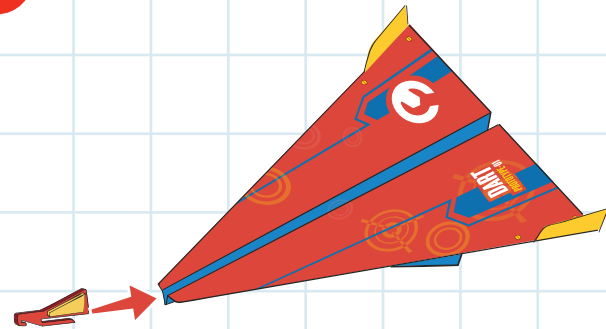
SCAN & MAKE



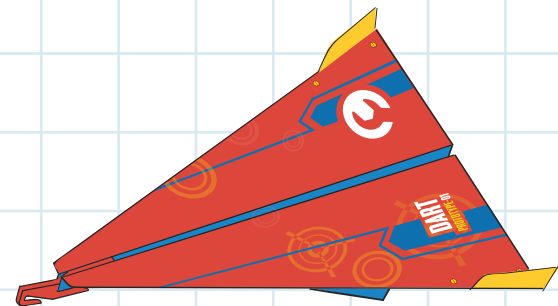
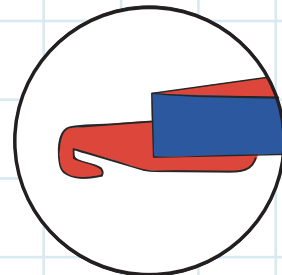
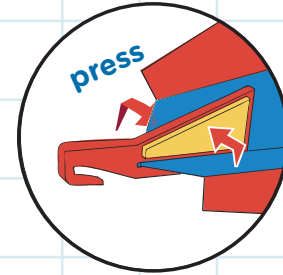
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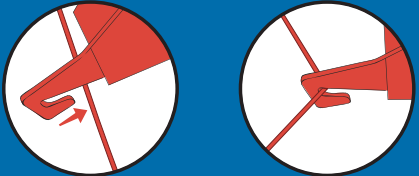
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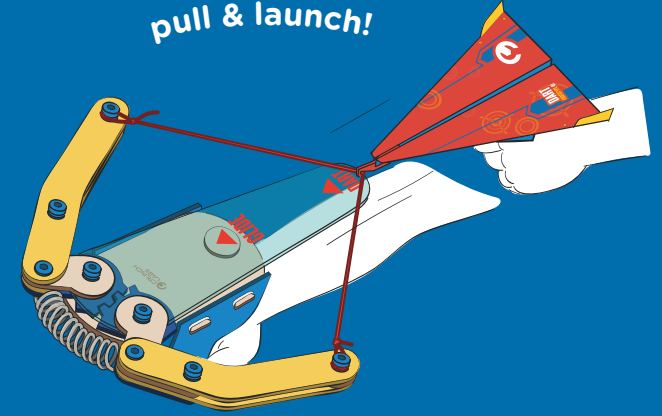
24



TEST

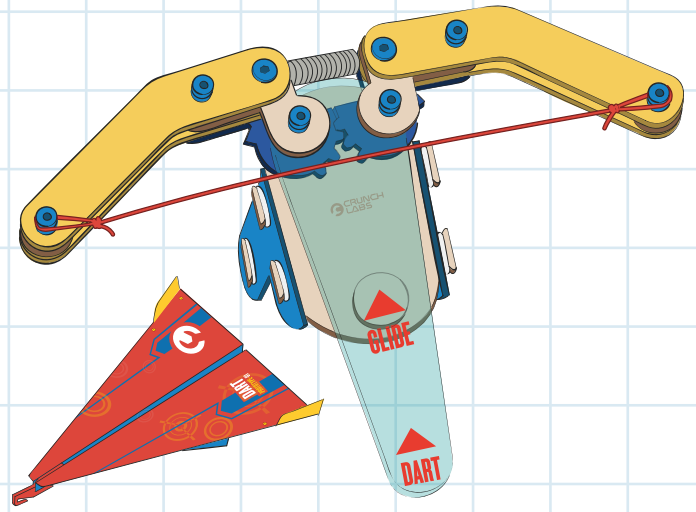


pull & launch!



Having trouble? Watch the video at crunchlabs.com/wing

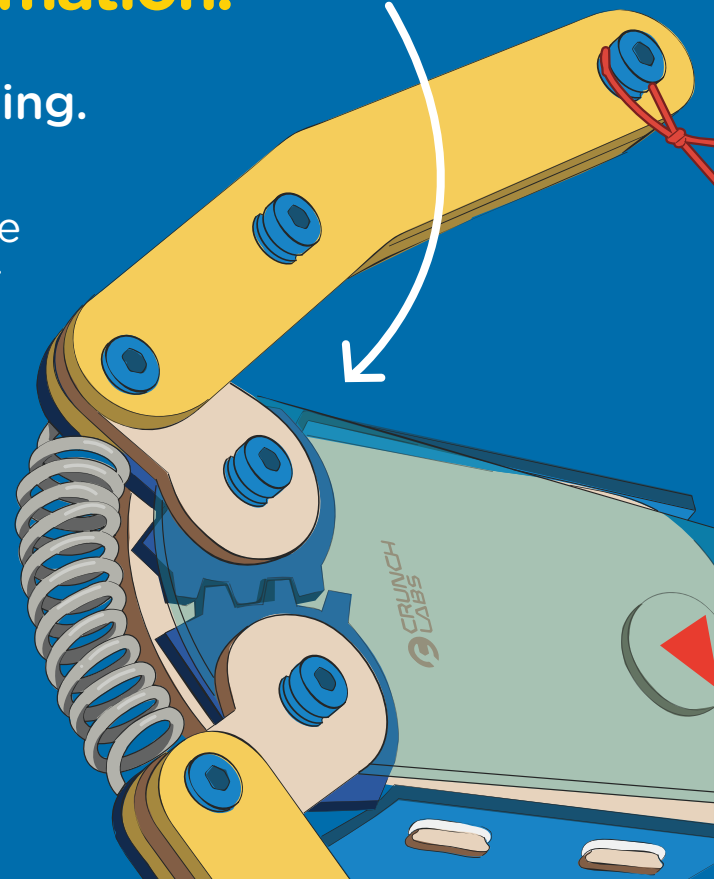
BUILT!



A spring is a mechanism that stores mechanical energy through elastic deformation.

Basically, they store energy by stretching.

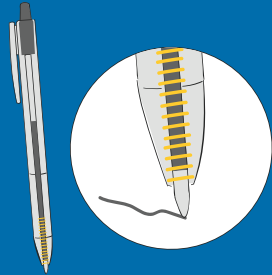
The extension spring in your paper airplane launcher stores energy when you pull your string back and releases energy when you let it go. Your spring is able to return to its original shape after being stretched due to **elastic deformation**. If you stretch a spring too far, it won't return to its original shape, which is known as **plastic deformation**.



THINK

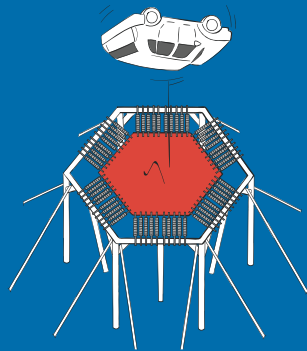
Find springs in other objects!

Springs come in all shapes and sizes. Some springs are meant to be stretched, others are compressed, and some are designed to be twisted. No matter their shape, all springs are capable of **storing** and **releasing energy**.



DIFFERENT SIZES

Springs can be found everywhere you look. Most pens use small **compression springs** to help click open and shut. They make a great material for DIY projects.



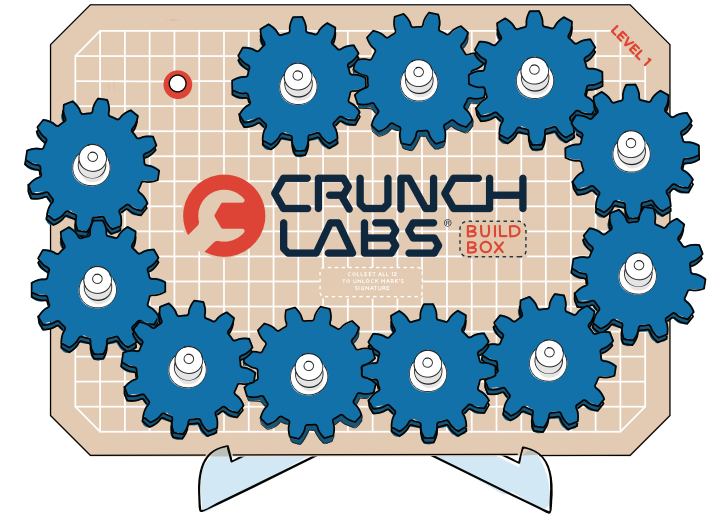
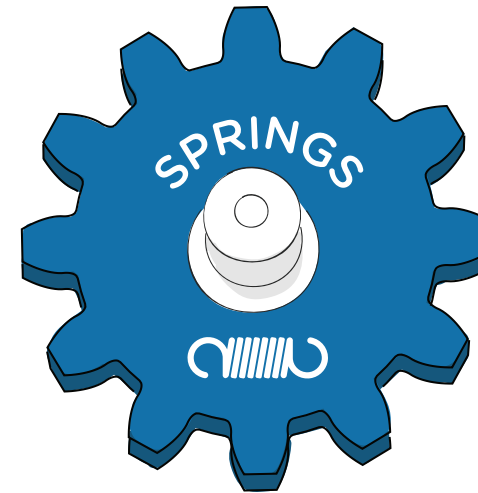
THE GIANT TRAMPOLINE

Mark and his buddy Josh created a giant trampoline that used one hundred forty-four garage door **extension springs**.

THINK

CONGRATULATIONS!

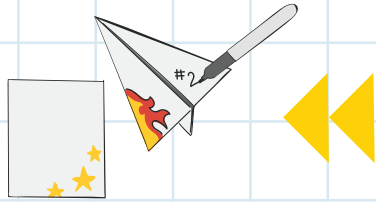
You earned a gear badge for springs



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

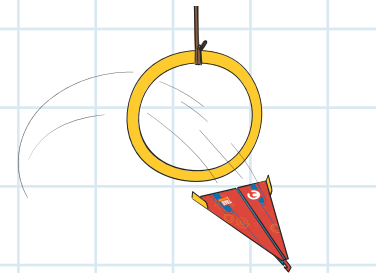
CRUNCH

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



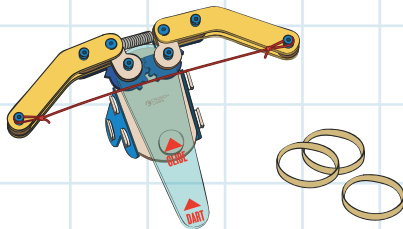
DESIGN YOUR PLANE

Now it's your turn to prototype a paper airplane. Choose a new design and decorate it.



OBSTACLE PRACTICE

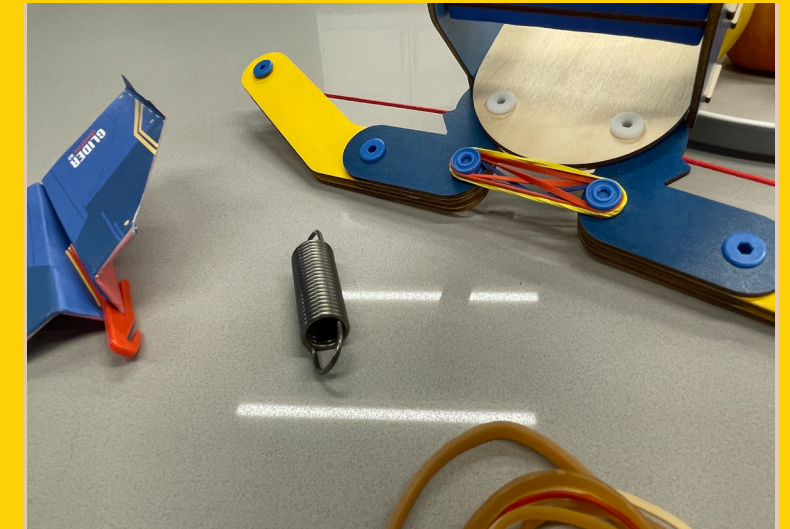
Set up obstacles around your testing area and see how many targets you can navigate around.



TENSION TEST

LET'S SPRING INTO ACTION! Test out other objects and see what else can create tension instead of the coil spring.

SHOW OFF YOUR BUILD



Share your funniest moments & coolest mods!
#crunchlabs @crunchlabs    



WARNING: Do not aim at eyes or face.

Do not discharge an object other than the projectile provided with this toy.

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.

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