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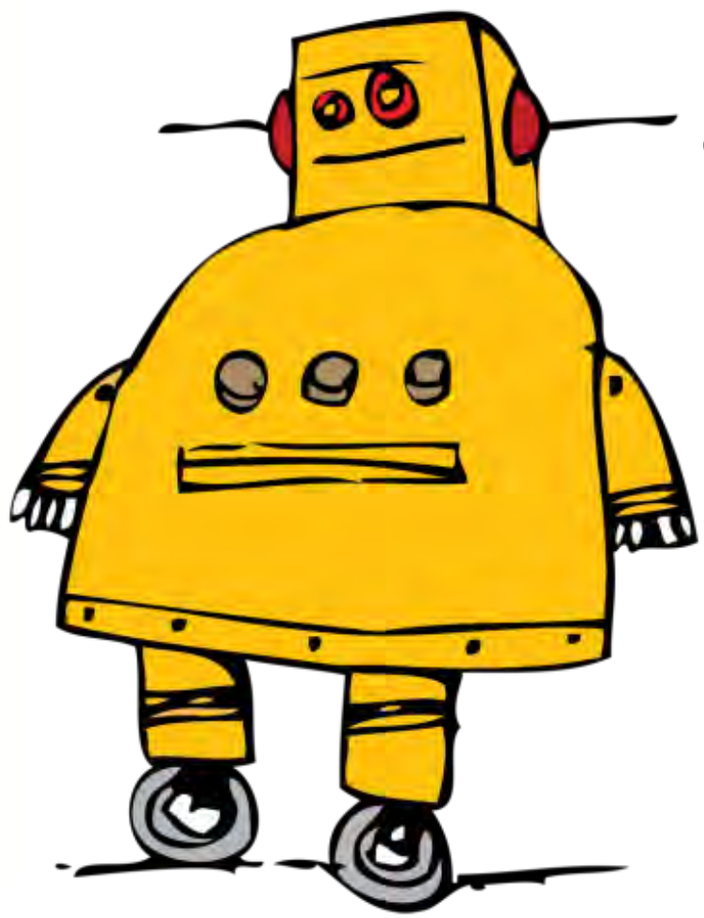


K’Nex Guns: How 13-year-olds and rubberbands power an open-source hardware community

Eric J. Wilhelm
Instructables.com Founder

Storyline

The Story of Instructables and Big Ideas about Open-Source Hardware

What Actually Happened

K'Nex Guns as a Model Open-Source Hardware Community

Autodesk

Instructables was acquired by Autodesk in August 2011

“K’Nex Gun Site Acquired by Billion-Dollar CAD Maker – What Gives?”

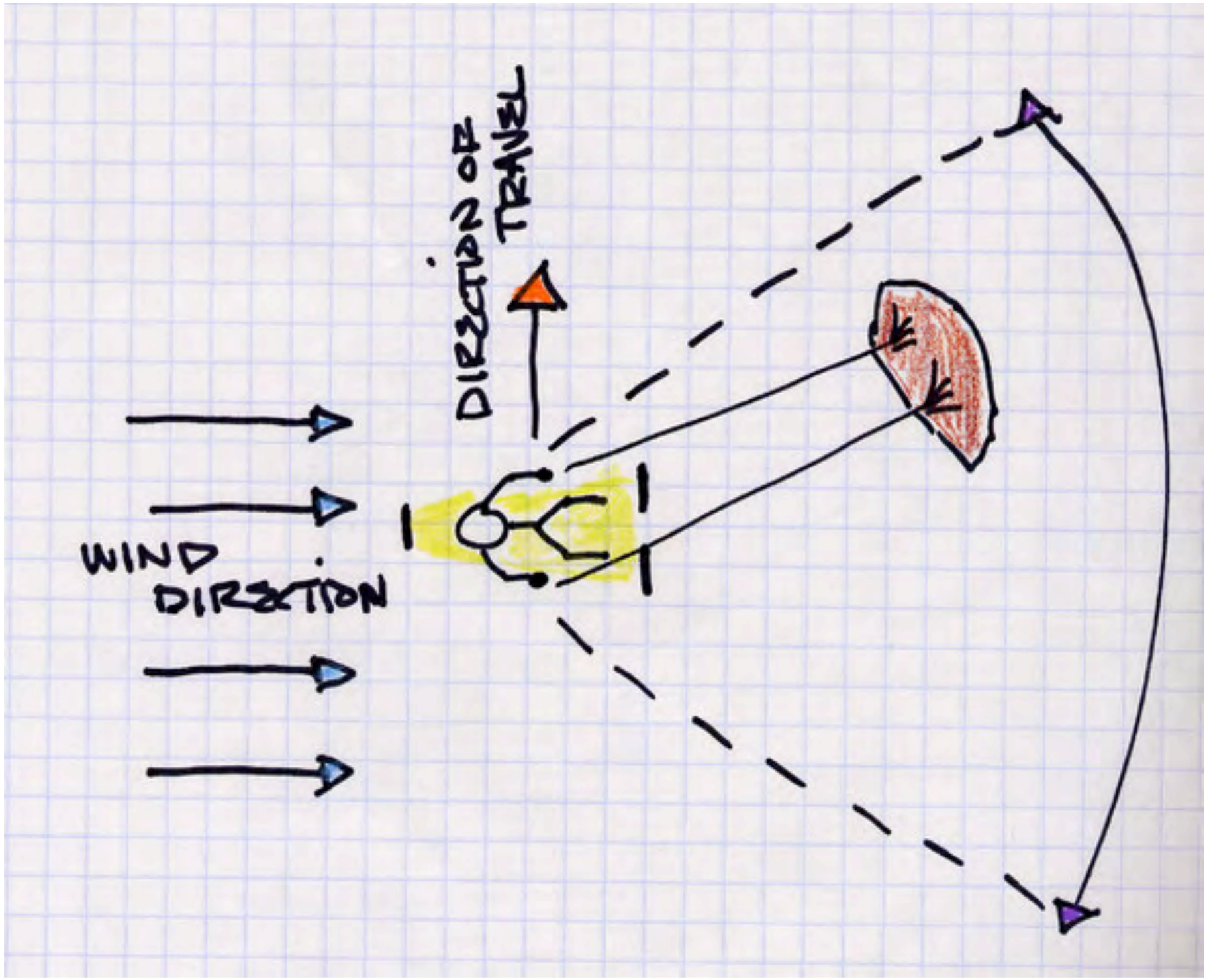
Sunday 2011-09-18 2 PM on the Main Stage at Maker Faire

The Story of Instructables

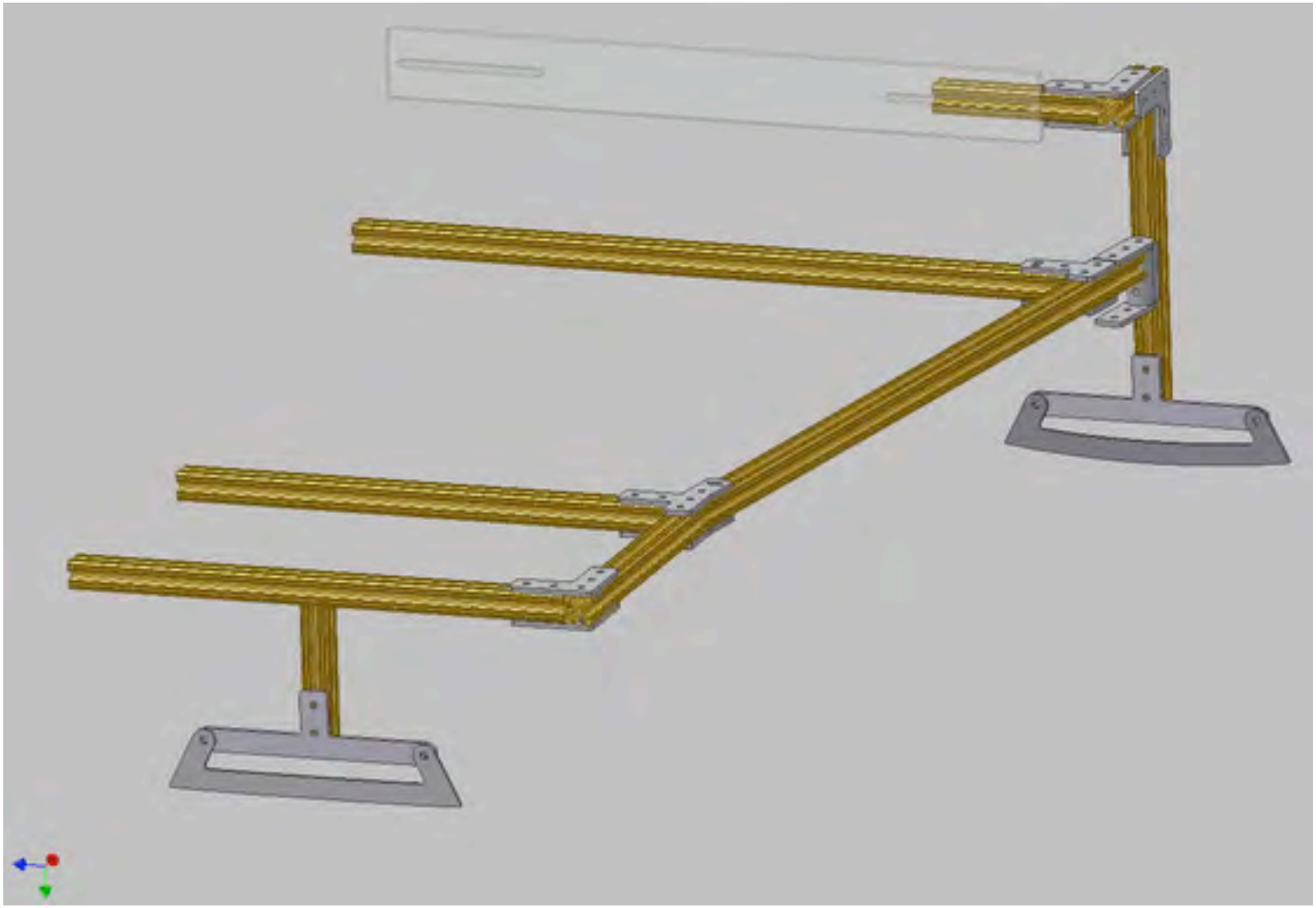
http://www.instructables.com/id/How-to-Start-a-Business-1/

The Story of Instructables

The Story of Instructables



The Story of Instructables



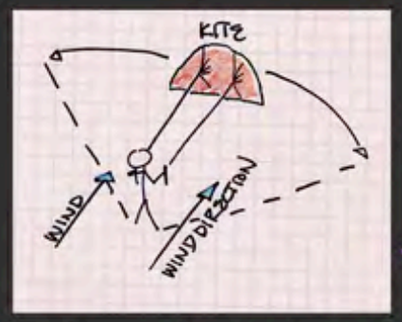
The Story of Instructables

Traditional Polynesia Ice Canoe (Ice Proa)

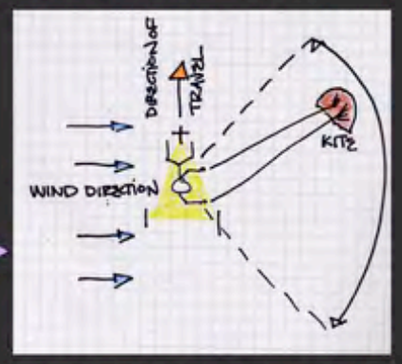
To invent, you need a good imagination and a pile of junk.
-Thomas Edison

Once it's too cold to kitesurf in the water, it's time to find a frozen lake and kite on top of the water.

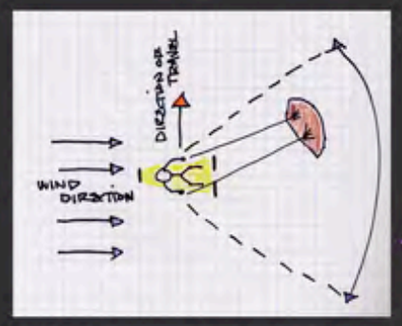
initially, I cut some ice skates out of steel, sharpened them on a belt sander, and bolted them onto Saul's old sand buggy. This ice buggy moved fast, but I felt like I was always being pulled out of the seat by the kite.



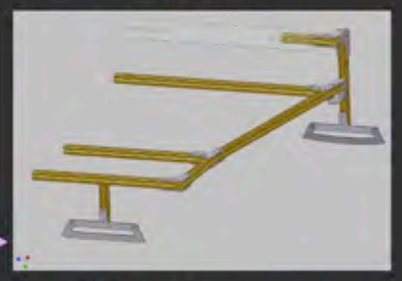
All kites fly and generate force within some quarter sphere defined by the kite itself, the pilot, and the conditions. The homemade 9 m^2 nasawing shown above Quaboag pond flies in an angle a bit greater than 135 degrees, while some very efficient foils can push that angle much further.



To get going on the ice buggy you edge against the pull of the kite and use only the component of force that points in the direction you want to go. Rarely do you want to be pointed directly at the kite, so the pull of the kite is almost always to the side. Since your feet are used to steer, there isn't much to hold you in the buggy.



After a full day of ice kiting left me with a sore back and bruised hips (especially after a couple of crashes where I was actually pulled completely out of the ice buggy) it seemed clear I needed a proa type vehicle - something which has a constant windward and leeward side. I wanted to sit with the wind to my back and use my feet to steer and to hold my position in the vehicle.



With a bit of CAD, some leftover 8020 structural aluminum, a few jet machined connectors and blades ...

The front is symmetric so I only put the right side into CAD.

... I made a "traditional" Polynesian ice canoe. Or at least I'm sure if the water ever froze in polynesia this is what their ice kite/sail craft would look like.

The plastic beam on the leeward side is a flexture that turns the two skates. Push out in the center at the footstrap to go upwind, pull in to go downwind.

Here I explain the difference between the ice buggy and ice proa as part of a quick tour through MITERS (where I build most of my kites and toys).

Don't miss this!

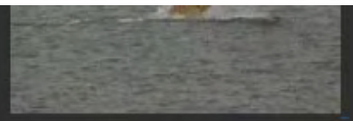
More ice kiting pictures:

(plays in quicktime)

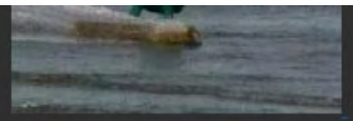
Here's video of me explaining how the ice proa works as well as zooming over Quaboag pond - part of the "3 Mustkiteers go ice kiting" video.

More pictures.

The Story of Instructables



3 Mb .mov movie of me kitesurfing (and crashing) at Pleasure Bay, South Boston. (plays in quicktime)



1.6 Mb .mov movie of me kitesurfing at Nahant.

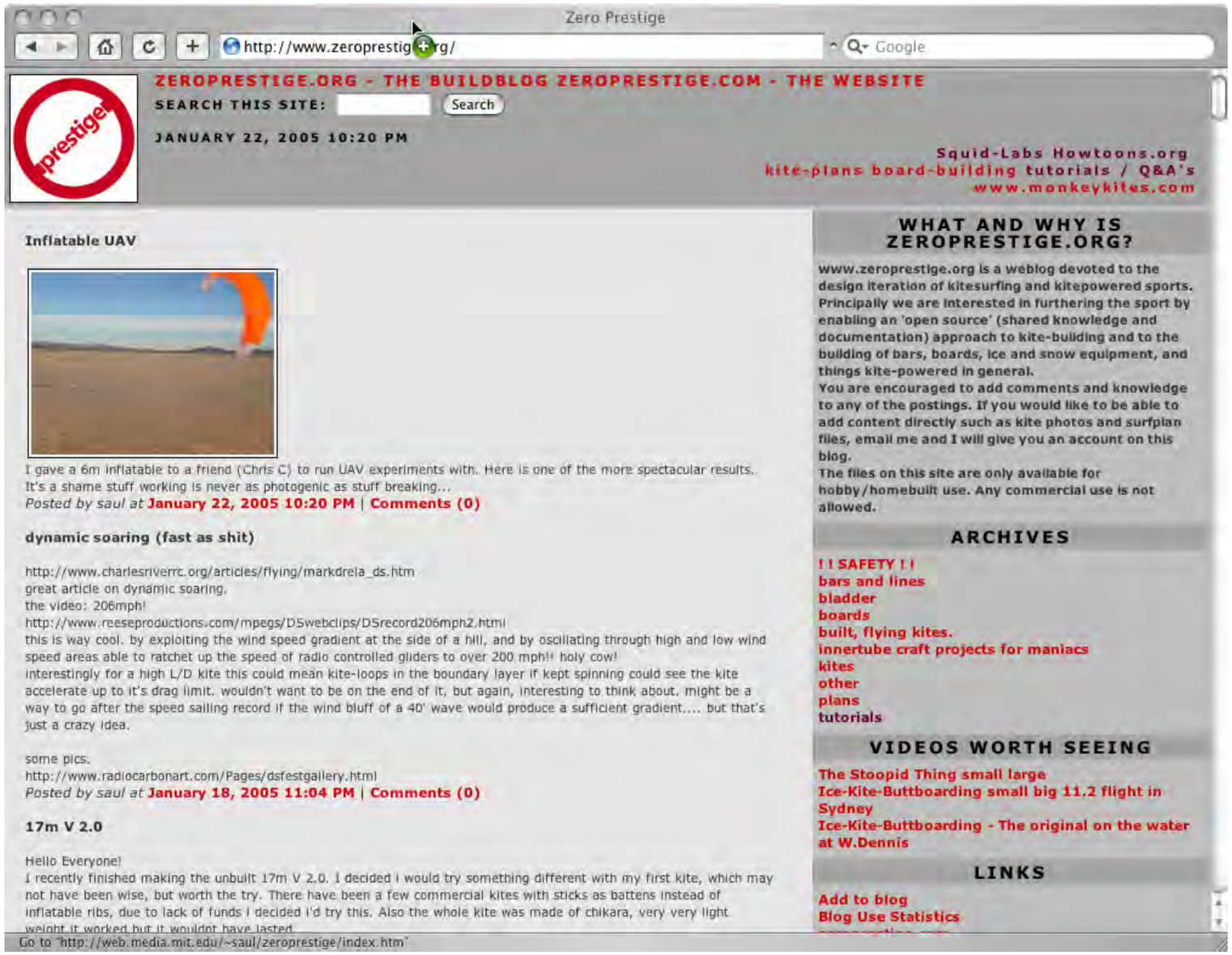
Unsatified with commercial kitesurfing boards, I decided to make my own.

Red planet CAD file (corel draw file)

After drawing the shape and graphic for my board, I cut the rough shape out of half inch plywood. I chose an ellipse because I found that the corners on some of the more rectangular boards caught the waves when I rode in surf and tended to trip me. With my aqua colored wet suit and full surfing helmet, people on the beach always ask me where I left my space ship, so I figured I'd put a picture of Mars on my board so they'd know what kind of creature was asking to be taken to their leader.

I sanded the board, applied a coat of stain, and drilled holes for the foot straps and leash. I then printed out the graphic on non-glossy paper with a plotter, gave the board a coat of epoxy, applied the graphic and gave it another coat of epoxy.

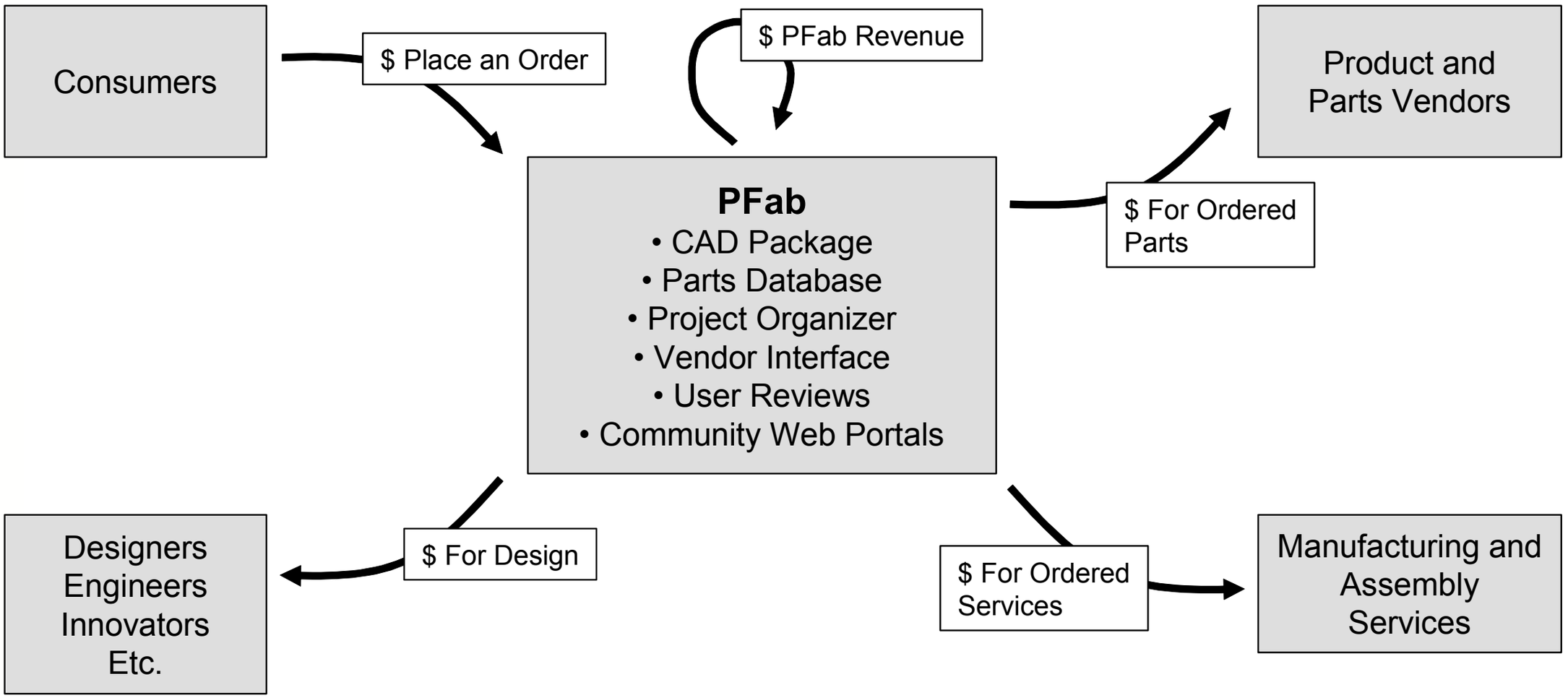
The Story of Instructables



Zeroprestige.org – Open-source approach to kite and kite-powered vehicle design; more than 400 kites built from plans.

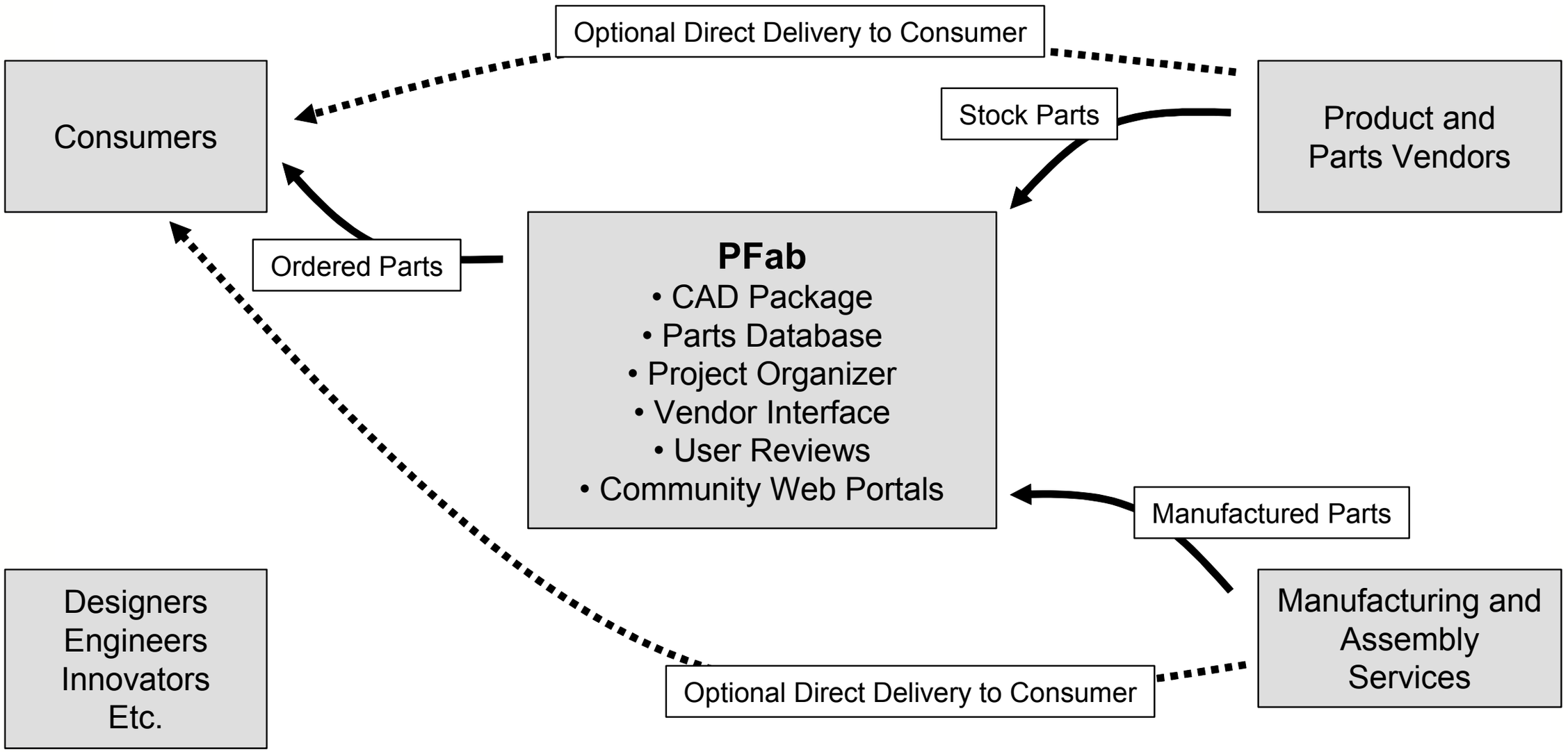
Big Ideas about Open-Source Hardware

Movement of Money

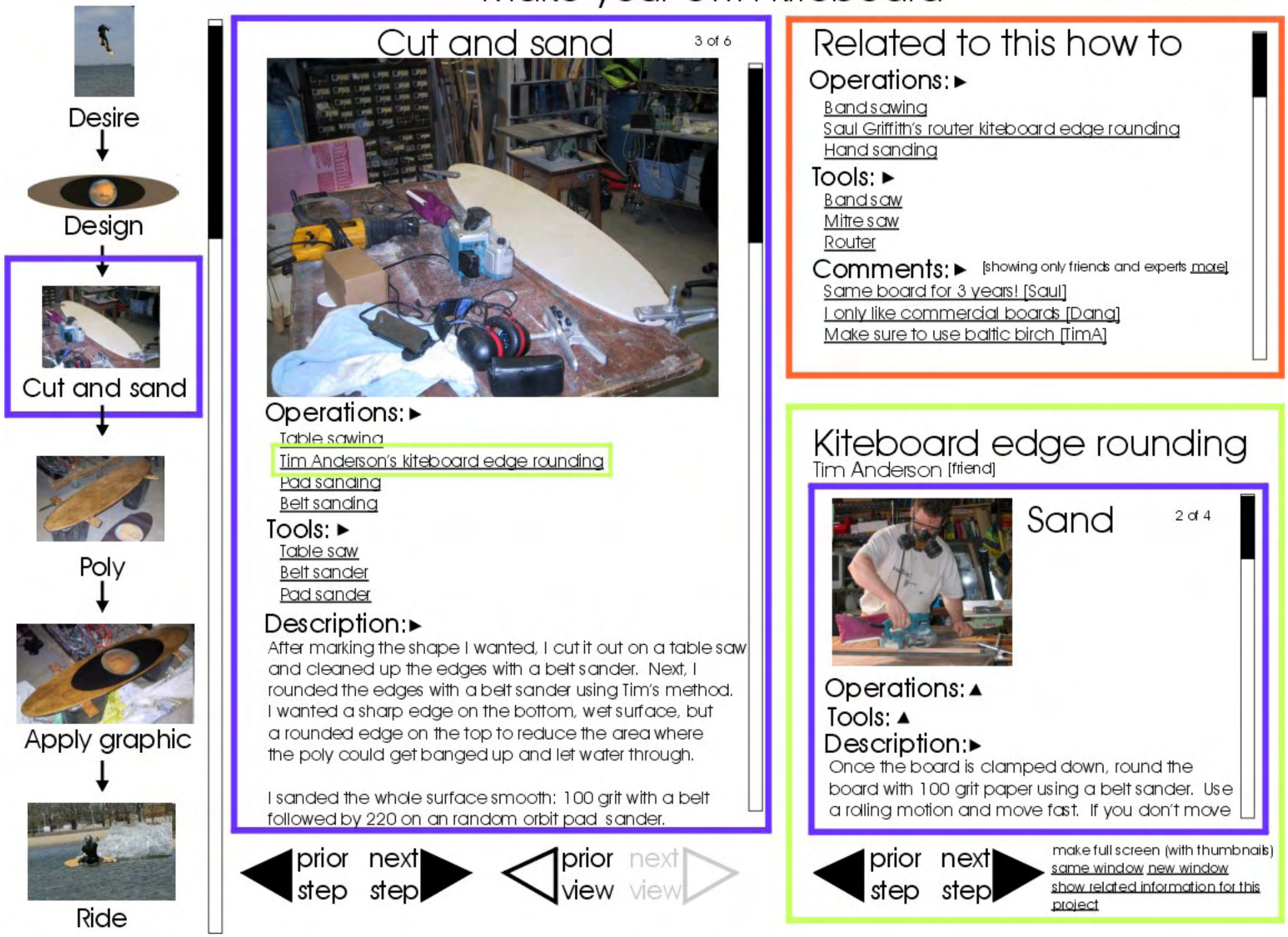


Big Ideas about Open-Source Hardware

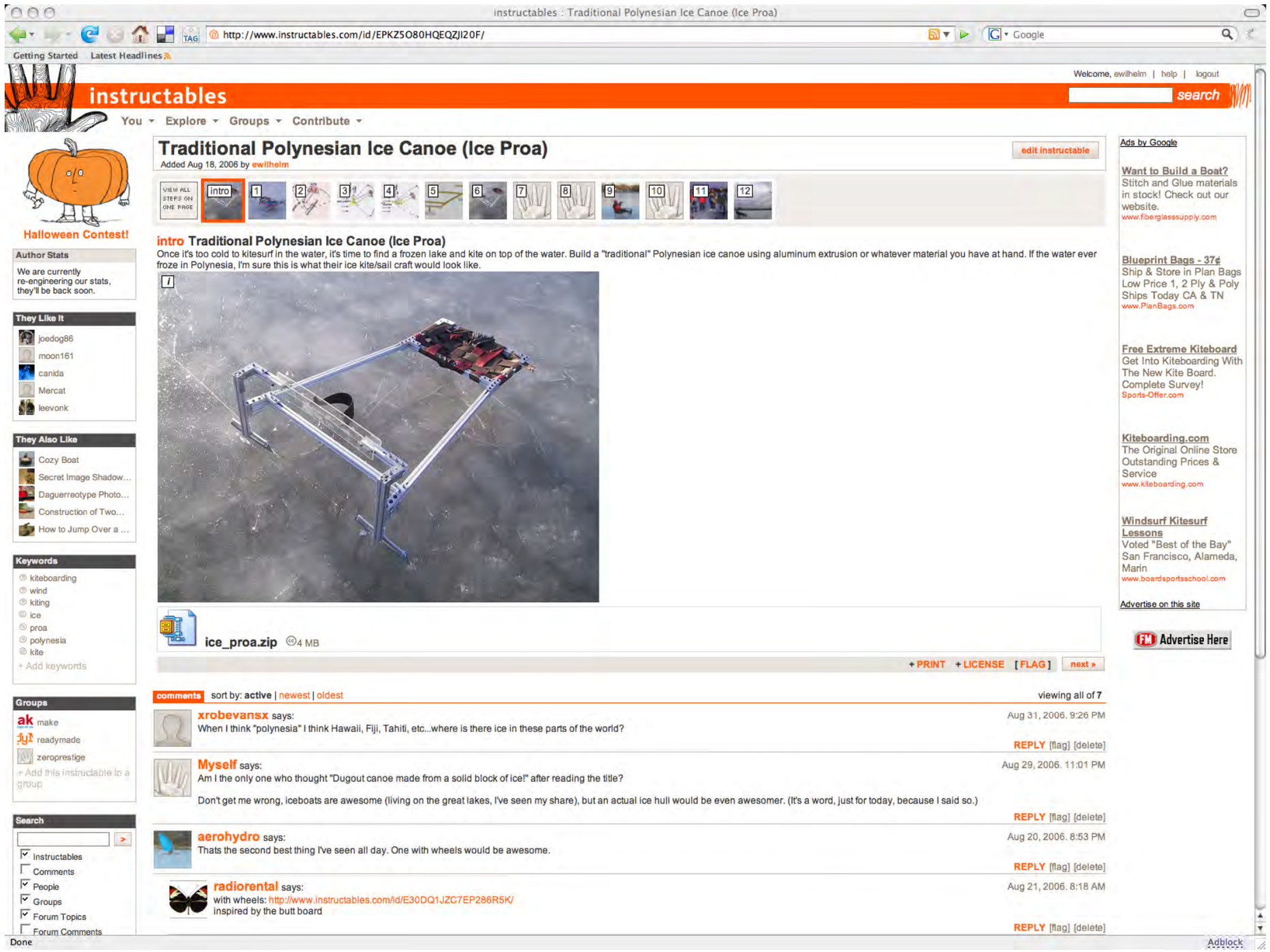
Movement of Physical Goods



Big Ideas about Open-Source Hardware

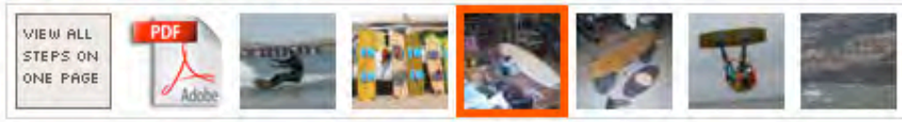


Open-Source Hardware Documentation



Open-Source Hardware Documentation

Plywood kiteboard



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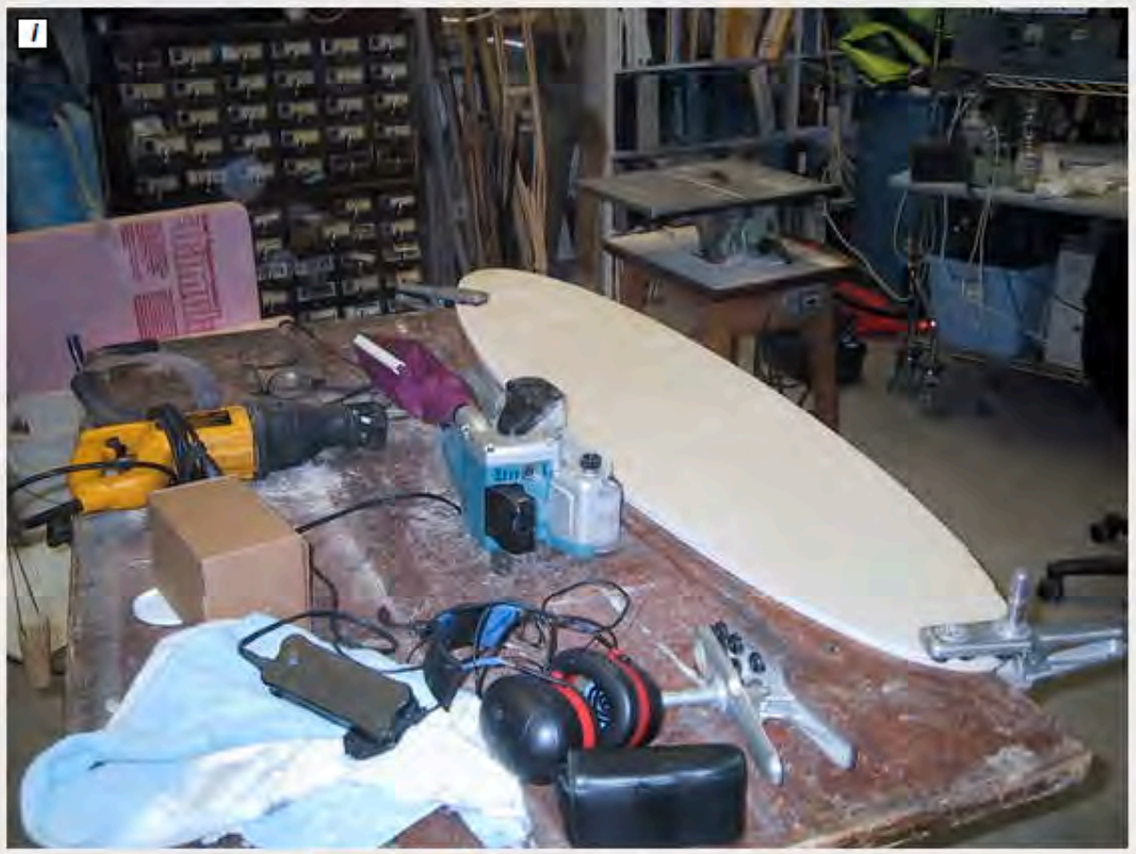
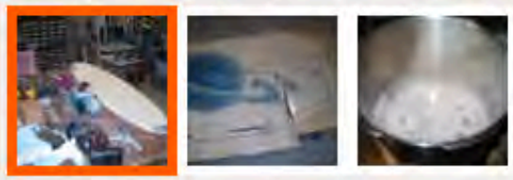
Author: ewilhelm

Eric J. Wilhelm is the founder of Instructables. He has a Ph.D. from MIT in Mechanical Engineering. Eric believes in making technology

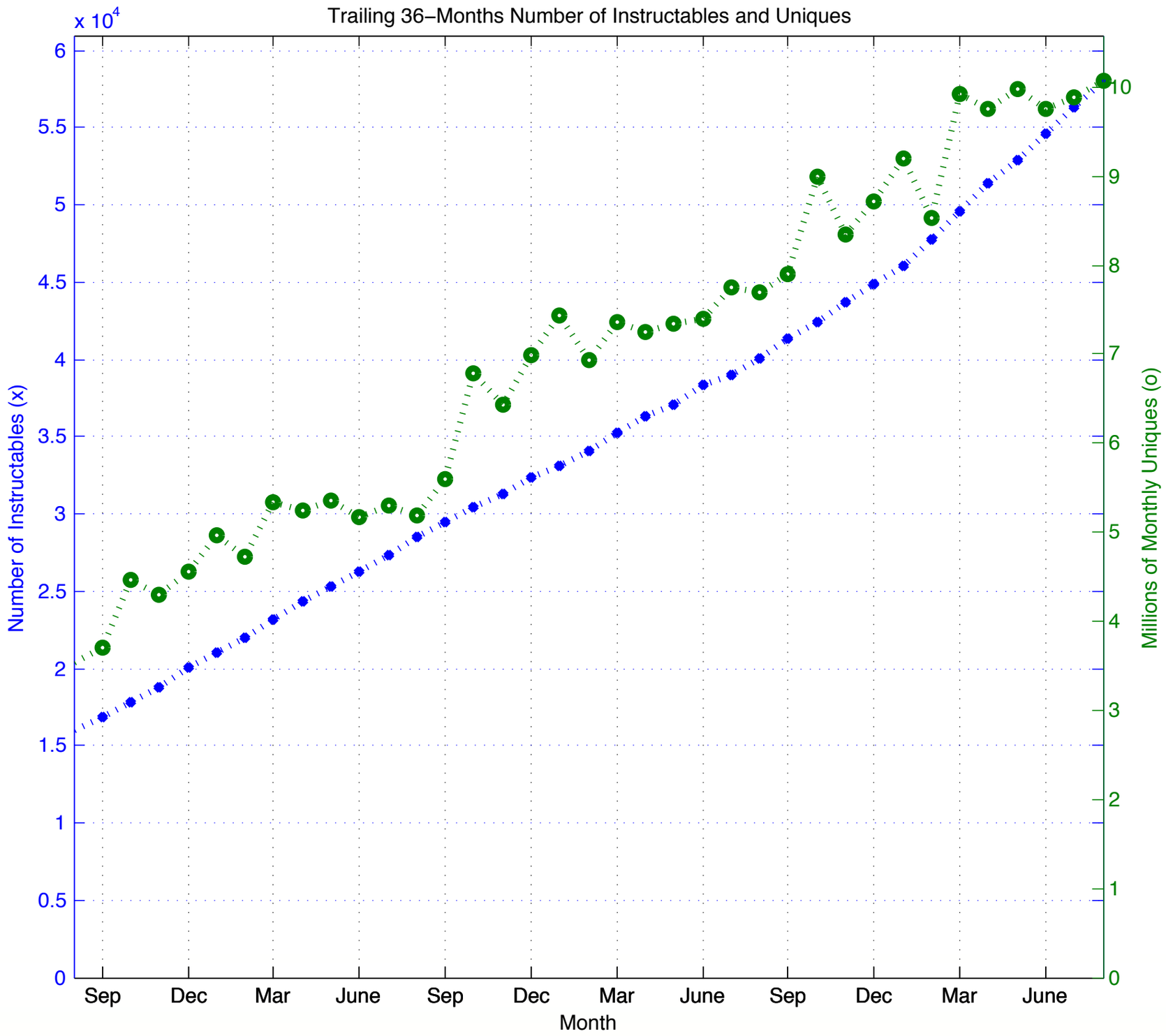
more »

Step 2 Cut board



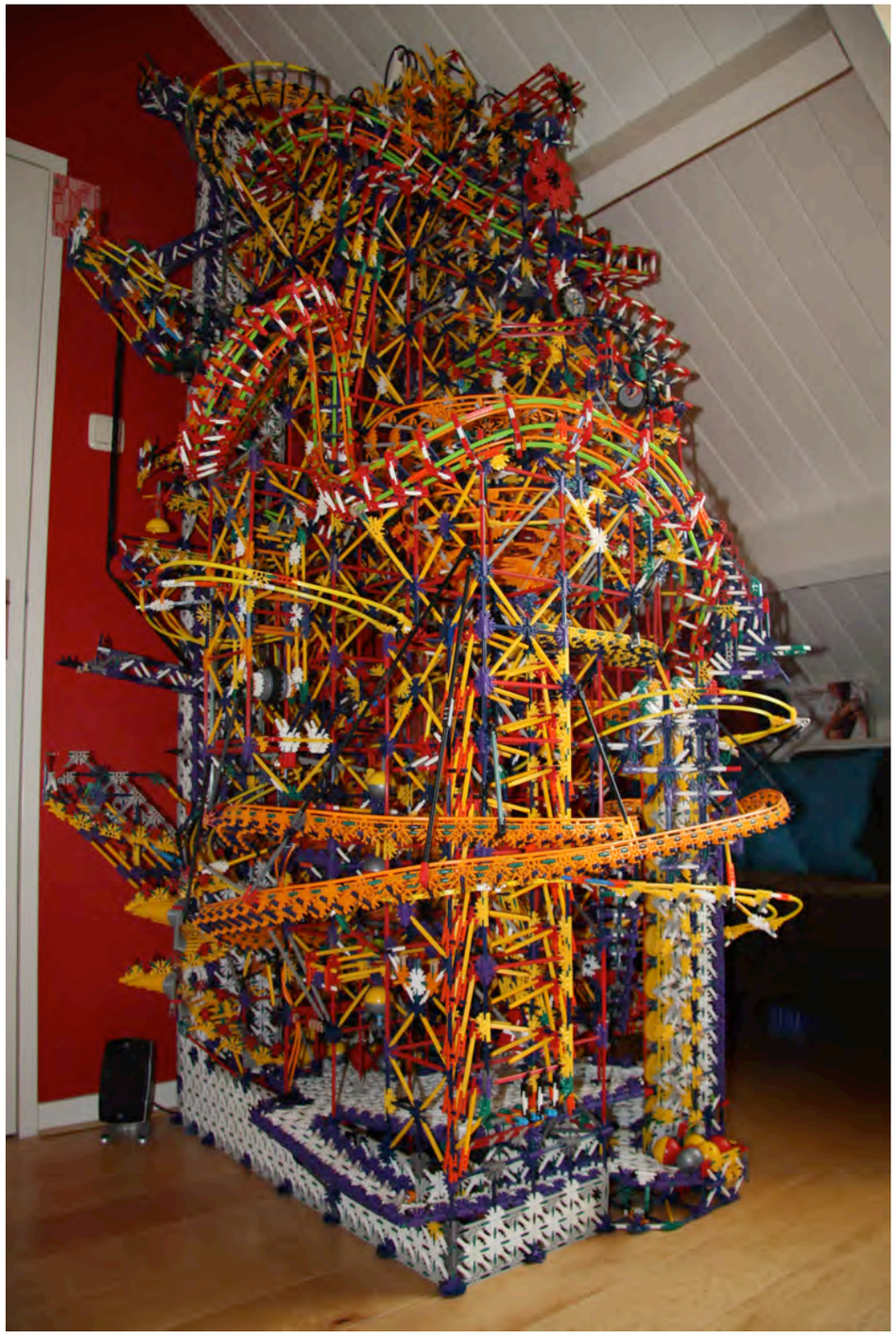


Open-Source Hardware Documentation



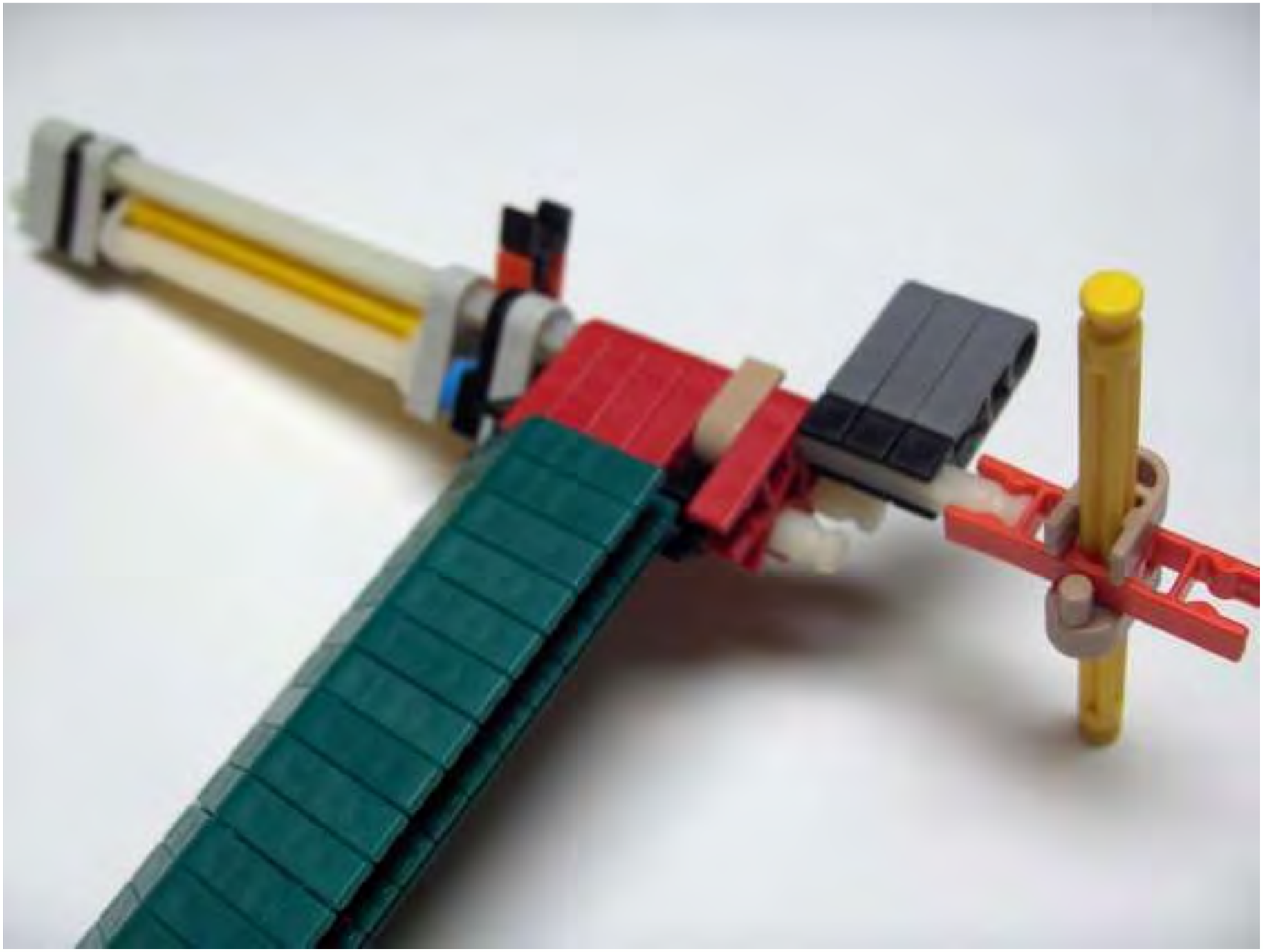
Bring on the K'Nex

Bring on the K’Nex

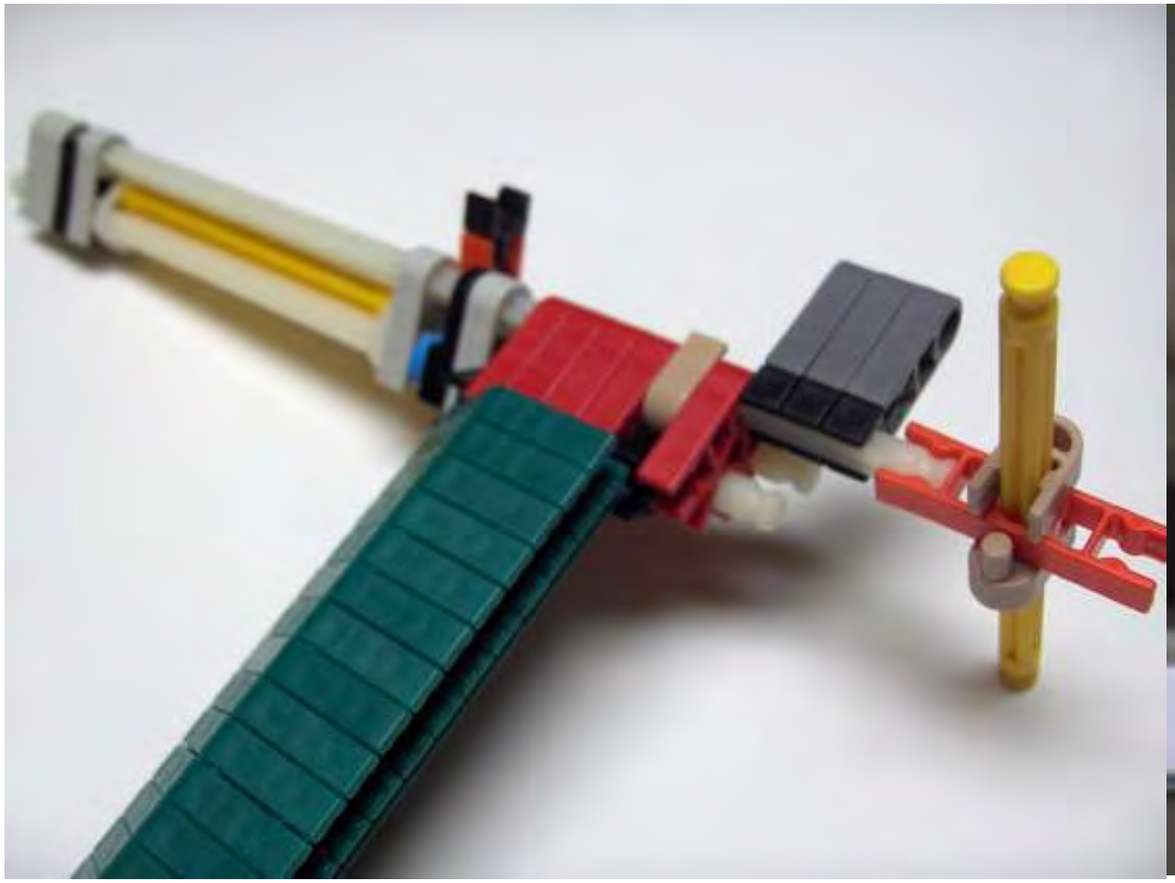


Metropolis - a K'nex Ball Machine

Bring on the K’Nex Guns



Why Guns?

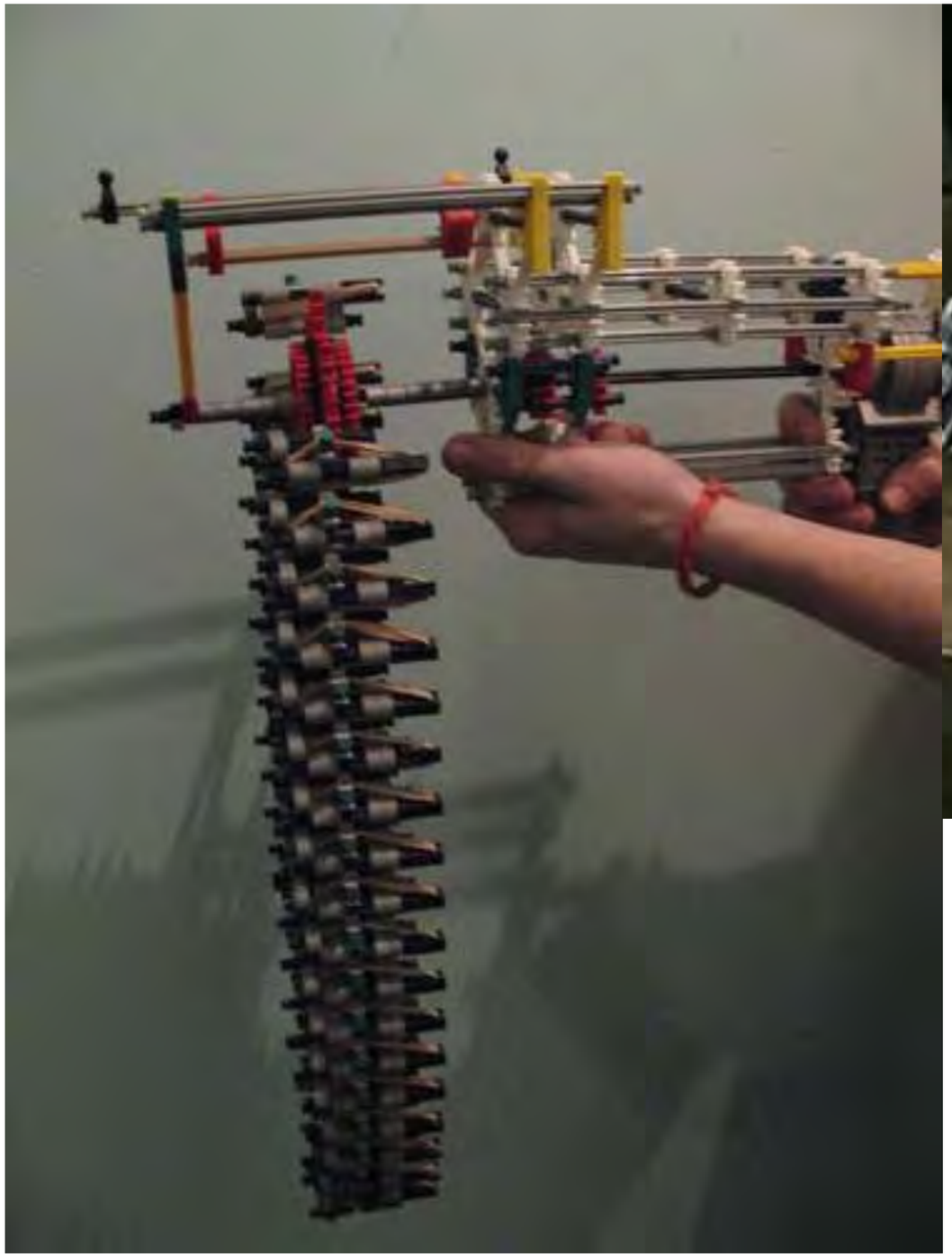


http://www.instructables.com/id/K-NEX-GUN/

The motivation of an air rifle

Changing the RSS feed

Bring on the K’Nex Guns



http://www.instructables.com/id/Knex-Machine-Gun_1/

Bring on the K'Nex Guns – K'Nex Heavy Cannon

It shoots large missiles, and shoots them hard. It is powered by 48 rubber bands, tied together into 8 strings of 6. It is 2 feet wide (on the bow) and 5 feet long. A true monster.

X985 Vivisector

http://www.instructables.com/id/X985-VIVISECTOR/

K’Nex CAD

Making 3d knex models using mlcad

edit

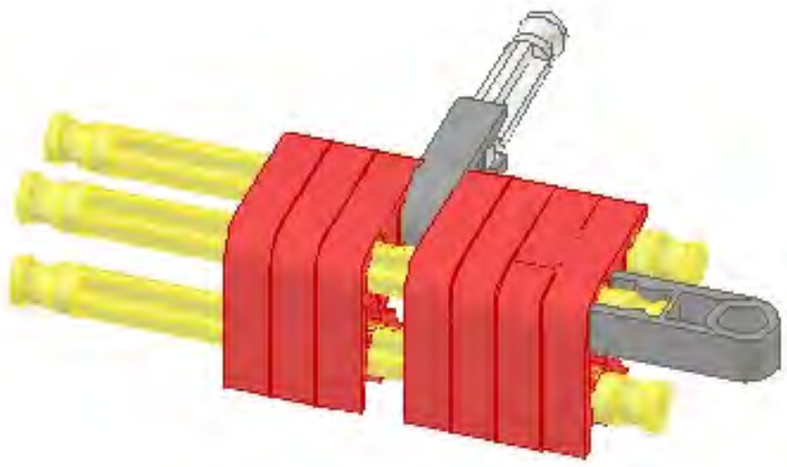
by toulvus on Jan 30, 2007

rate it + -

intro Making 3d knex models using mlcad

Here I will teach you how to make 3d knex models using mlcad.

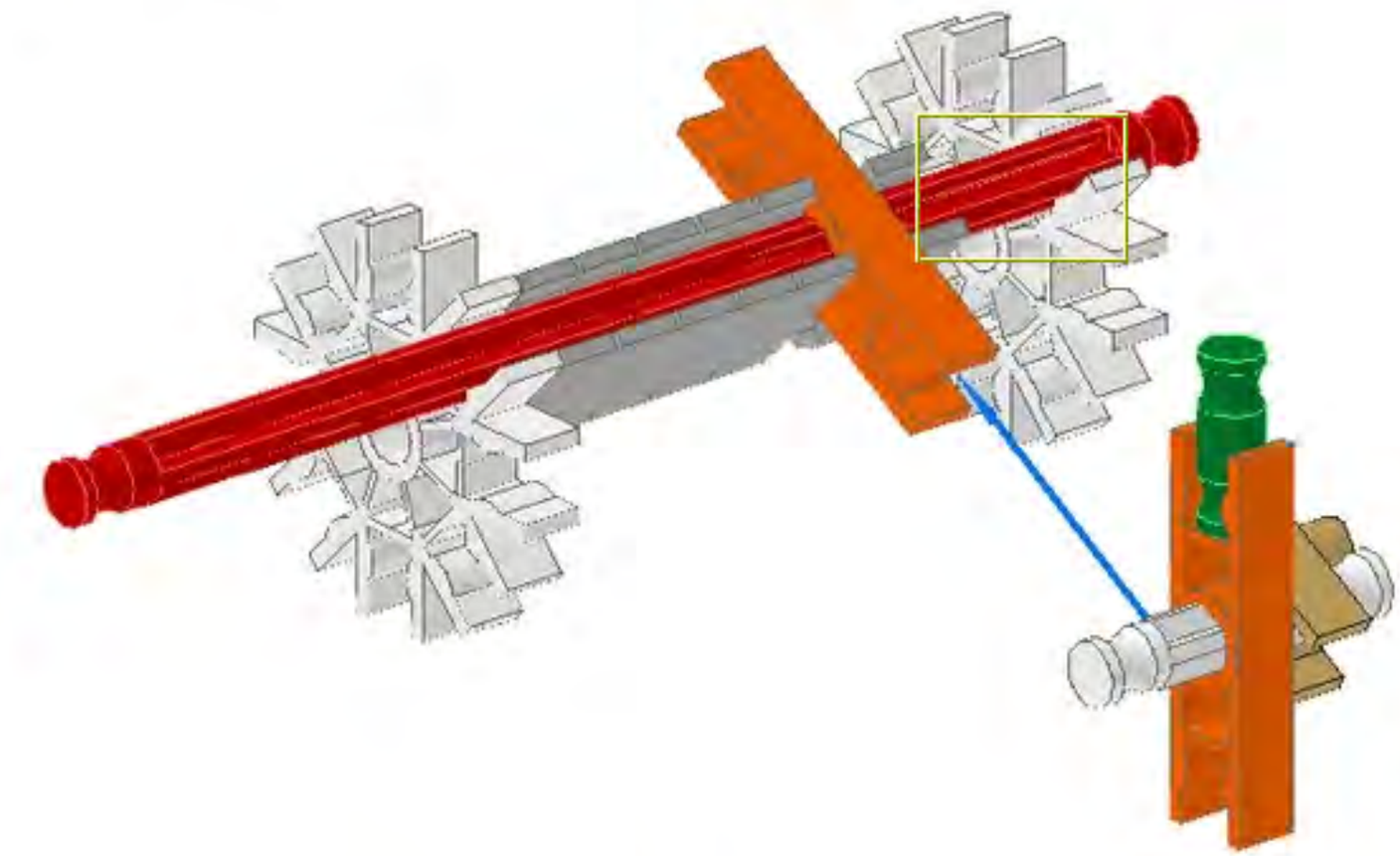
i



K’Nex CAD

step 1 construction

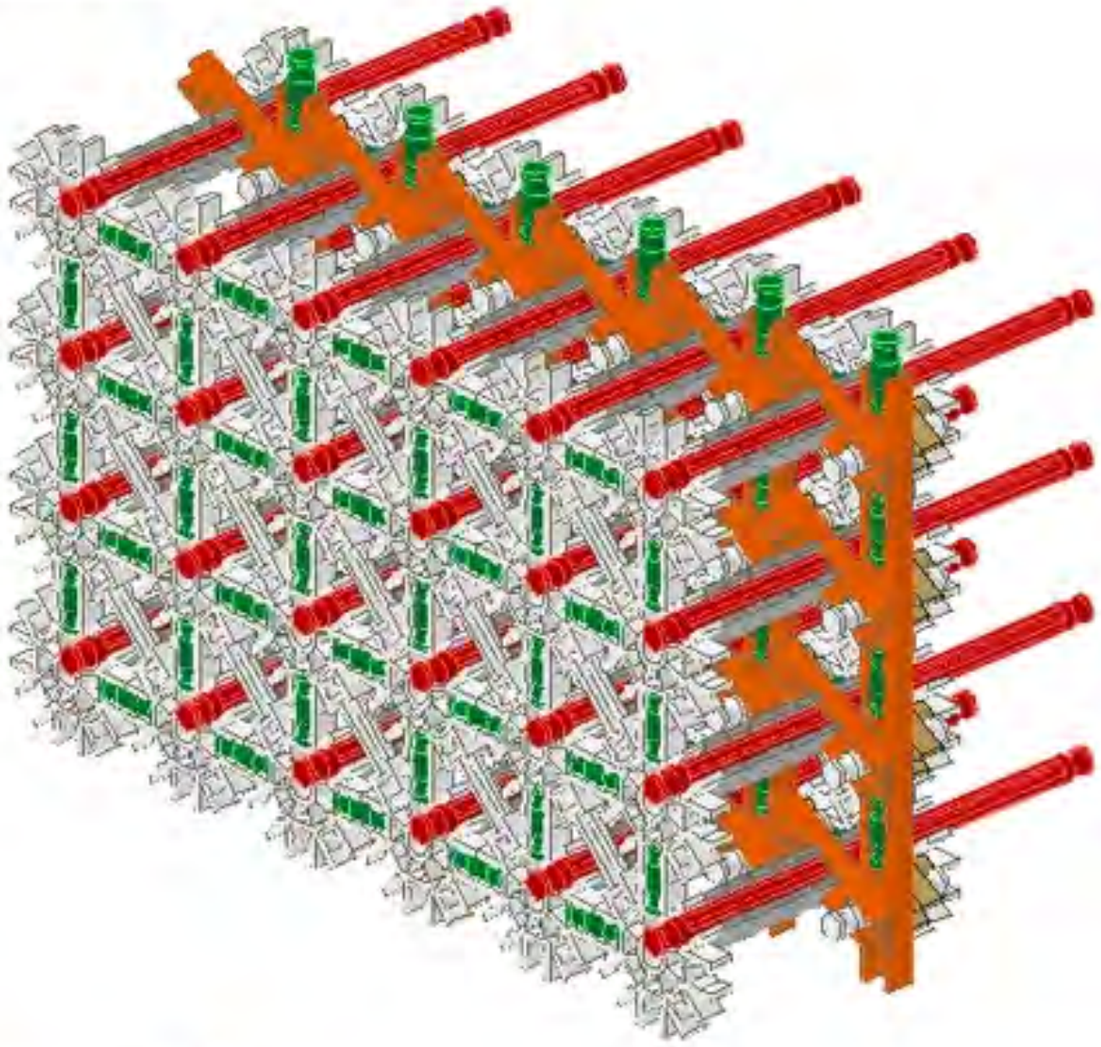
make 24 of these!!!! wow!!!

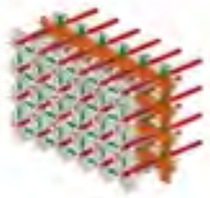


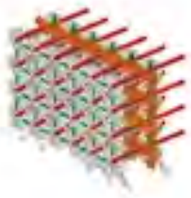
comments (0)

K’Nex CAD

step 2 construction
the 24 barrels go like this







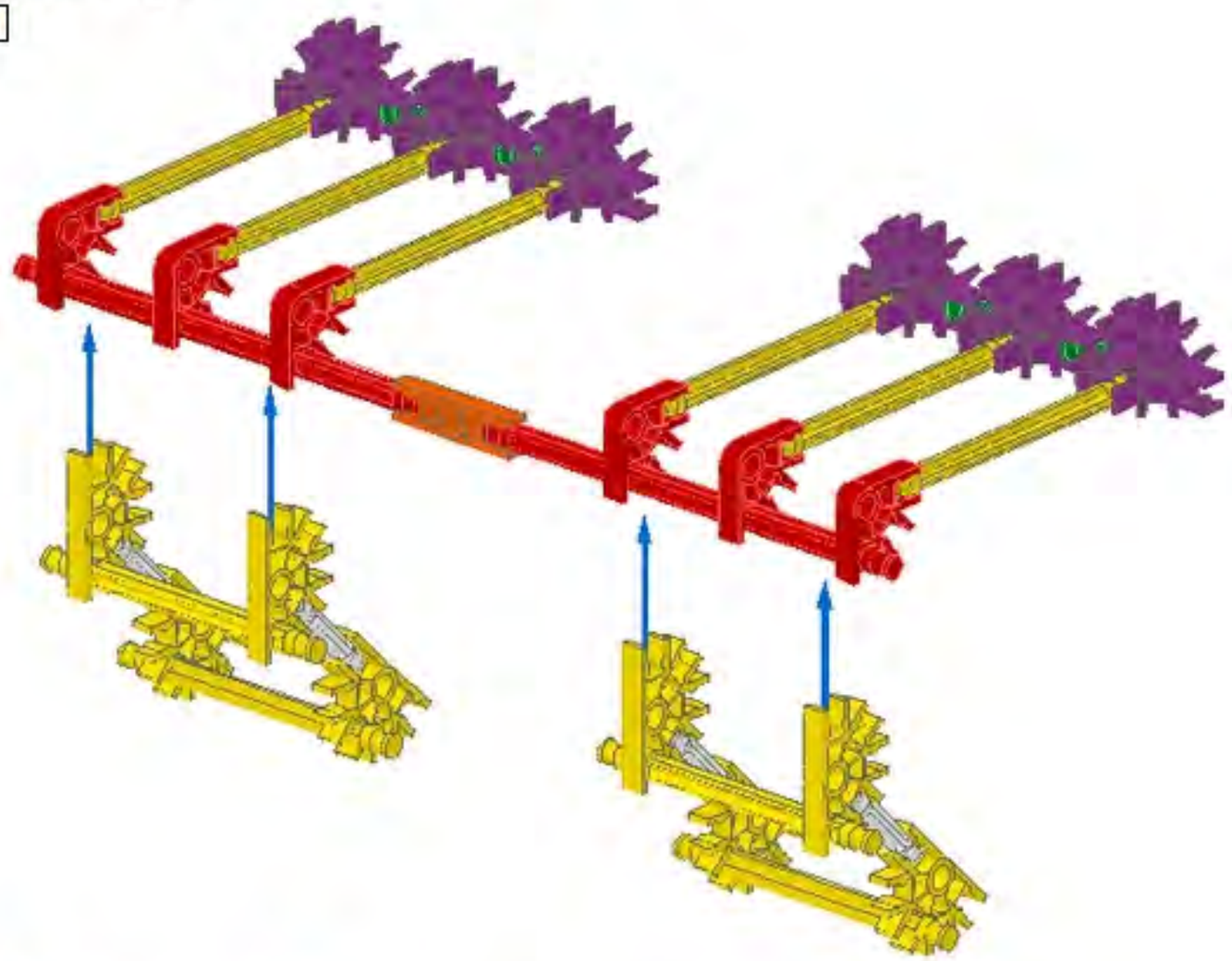
comments (0)

K'Nex CAD

step 3 construction

construct the legs

1



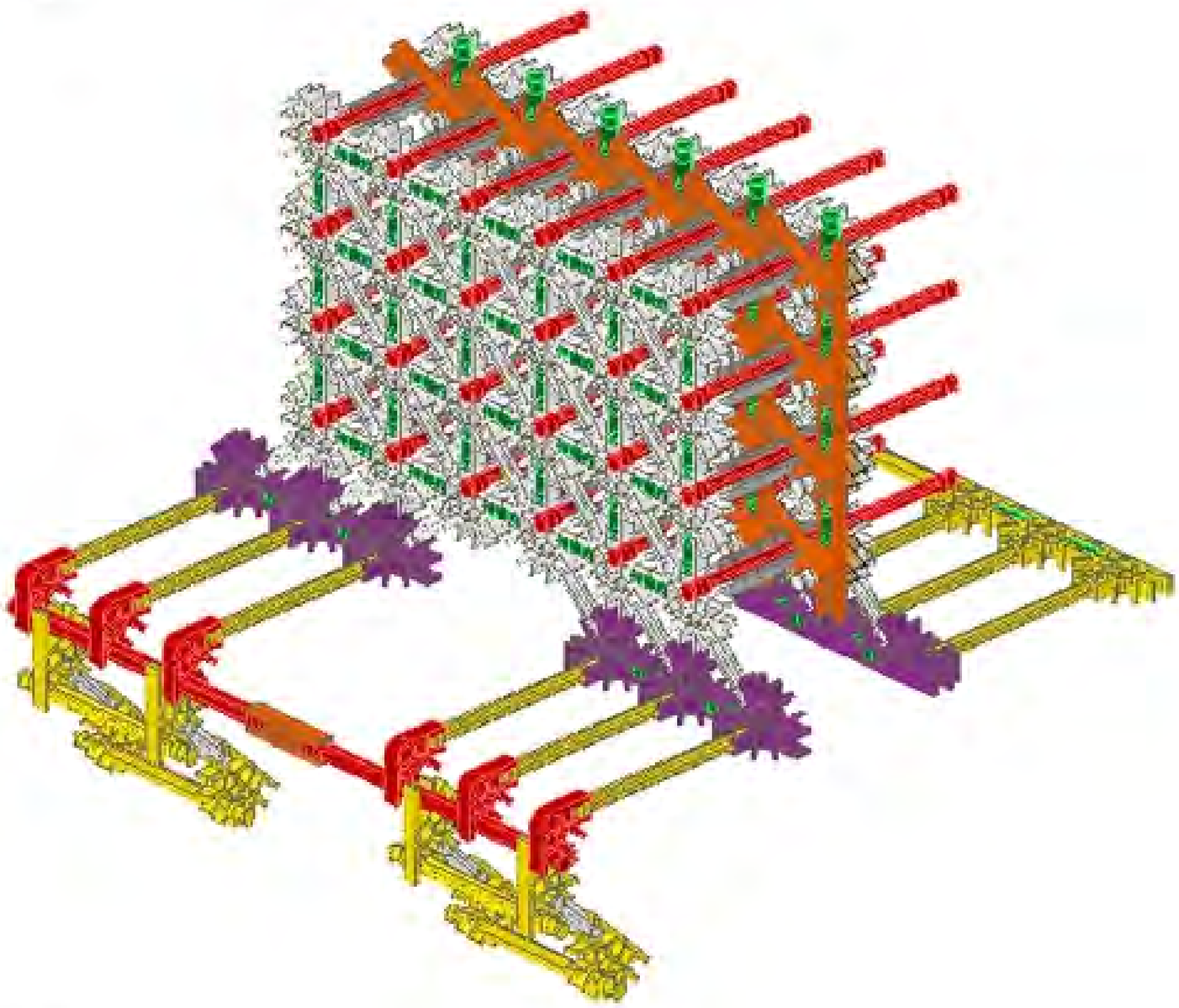
comments (0)

K'Nex CAD

step 4 construction

add the legs

I



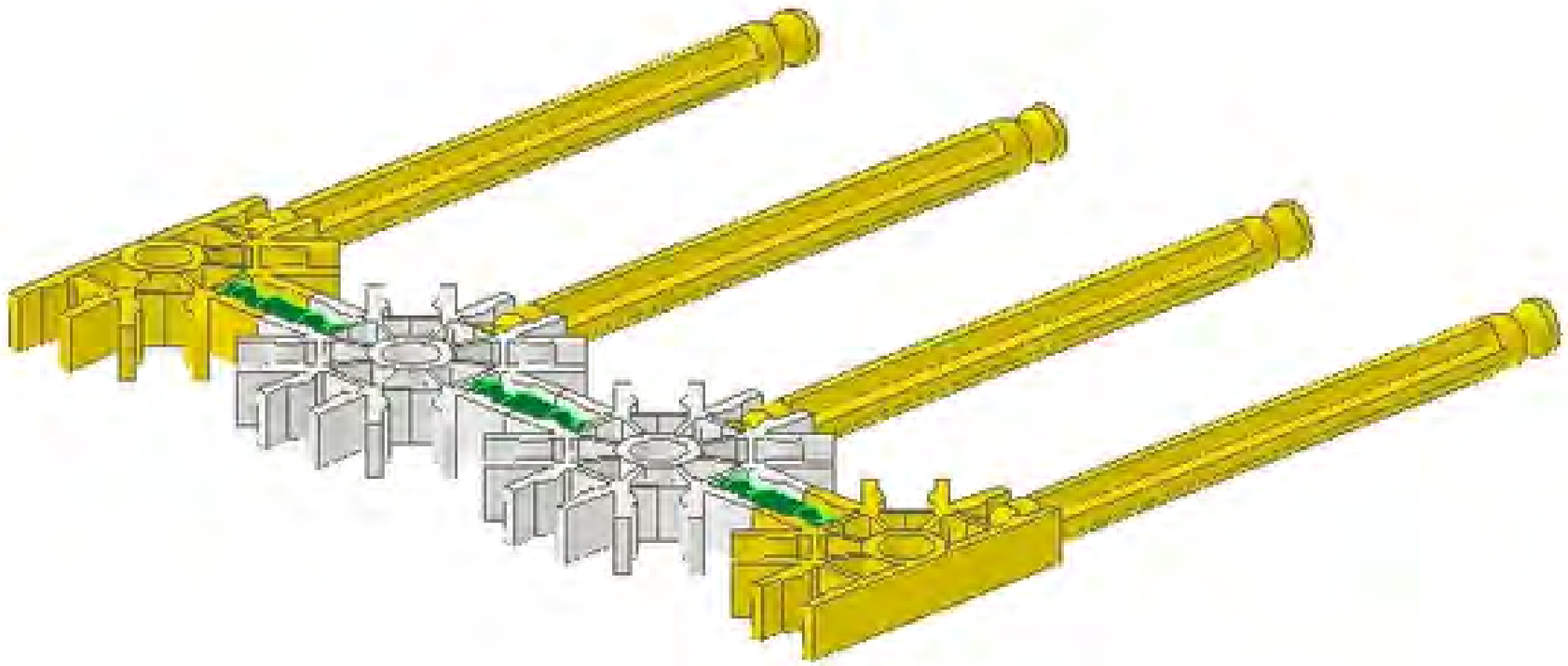
comments (0)

K'Nex CAD

step 5 firing pins

make 6 of these

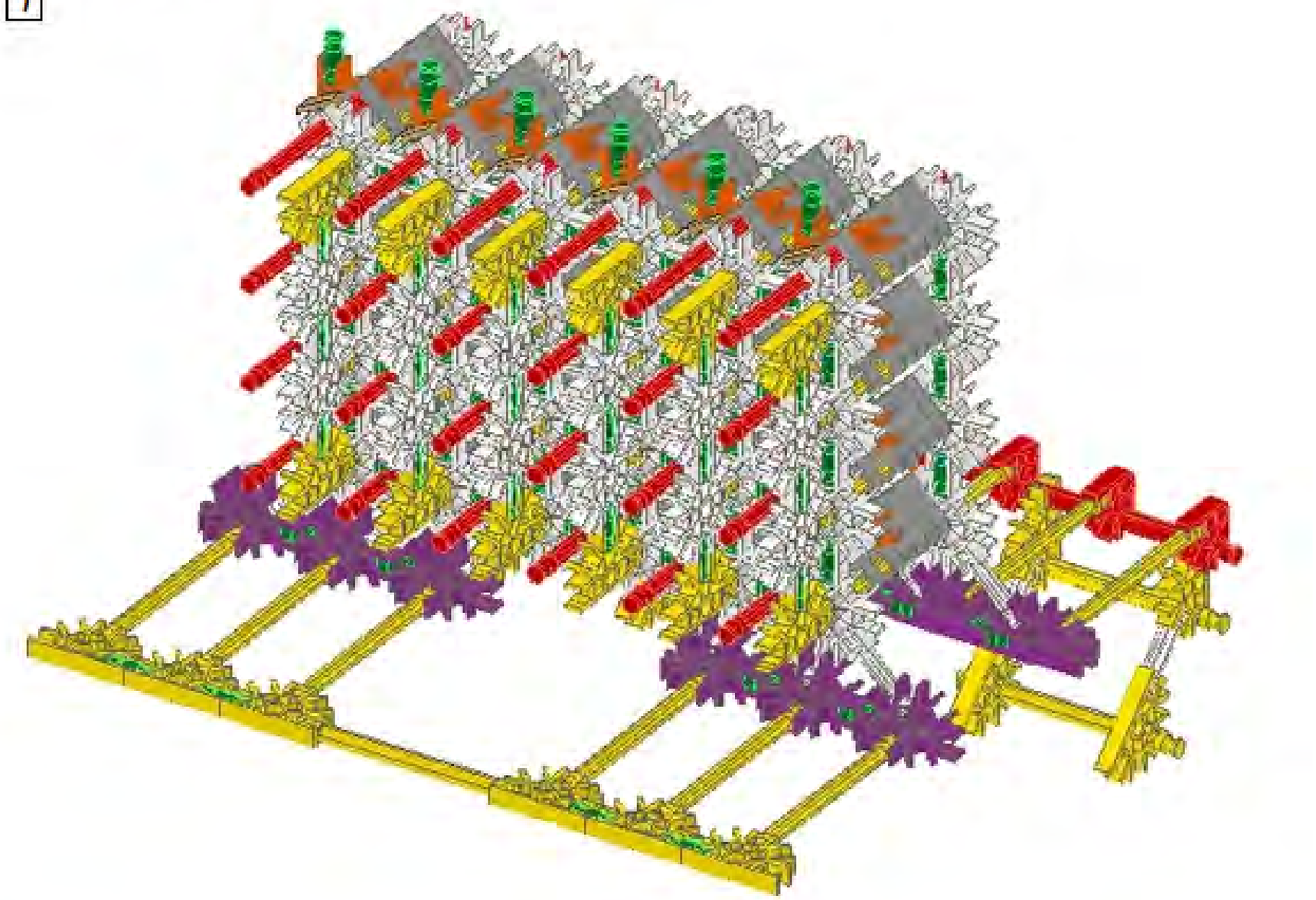
I



K'Nex CAD

step 6 construction

add the firing pins

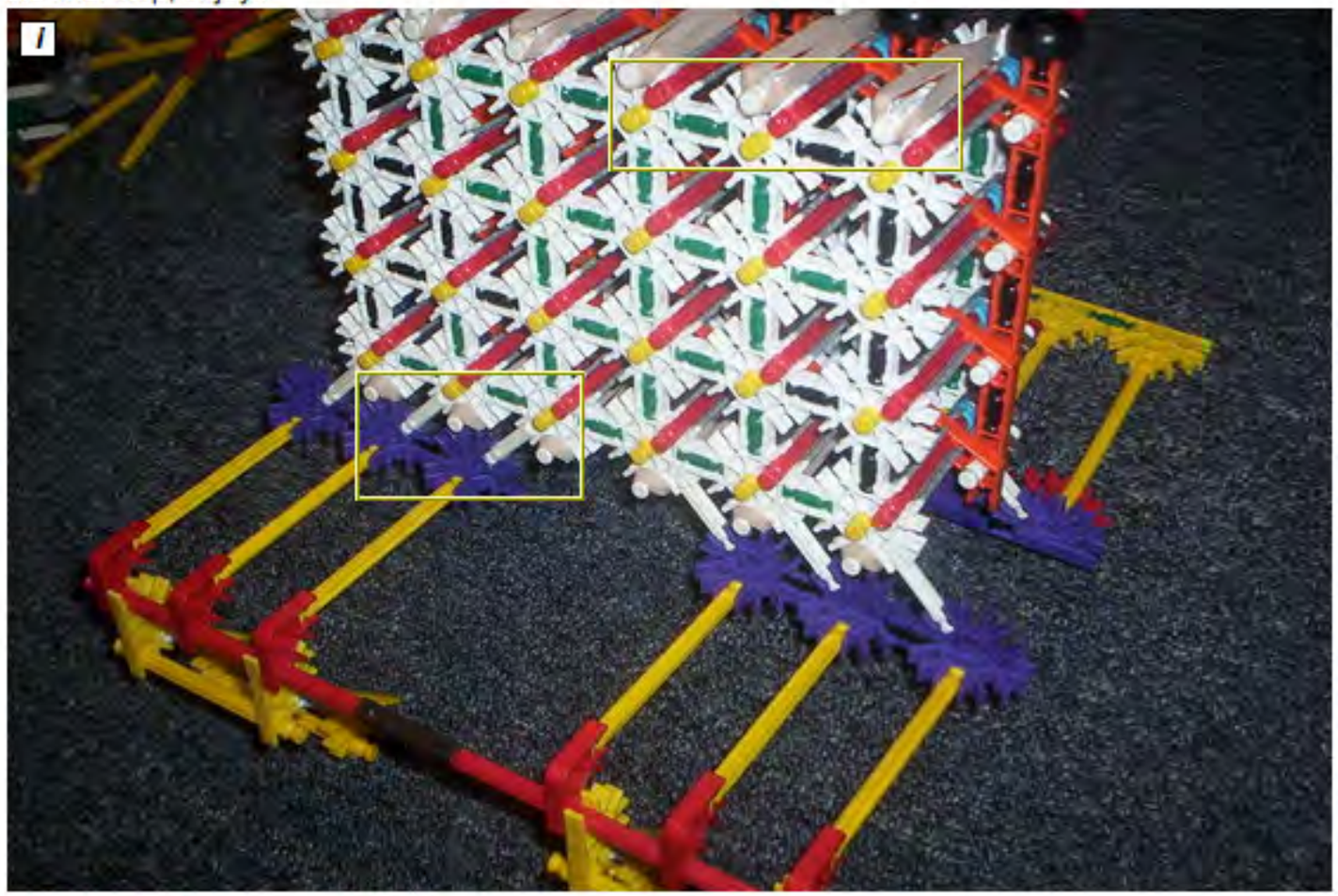


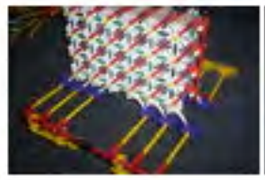
comments (0)

K’Nex CAD

step 7 rubber bands and extras

the final step, enjoy!!





comments (0)

K’Nex CAD

knex tripwire (cannon?)

edit

by mepaln on Feb 1, 2007

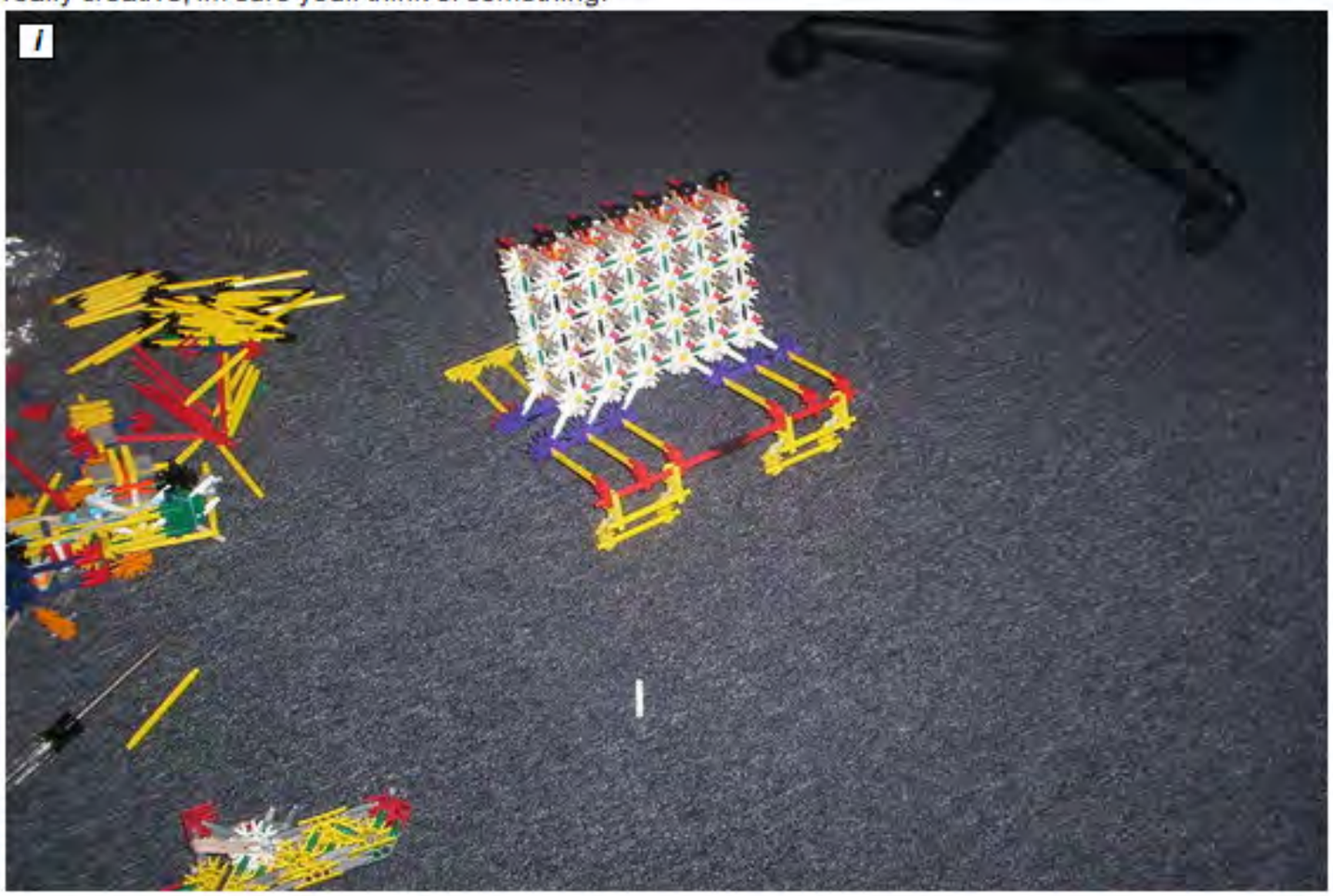
rate it + -

VIEW ALL STEPS ON ONE PAGE

intro 1 2 3 4 5 6 7

intro knex tripwire (cannon?)

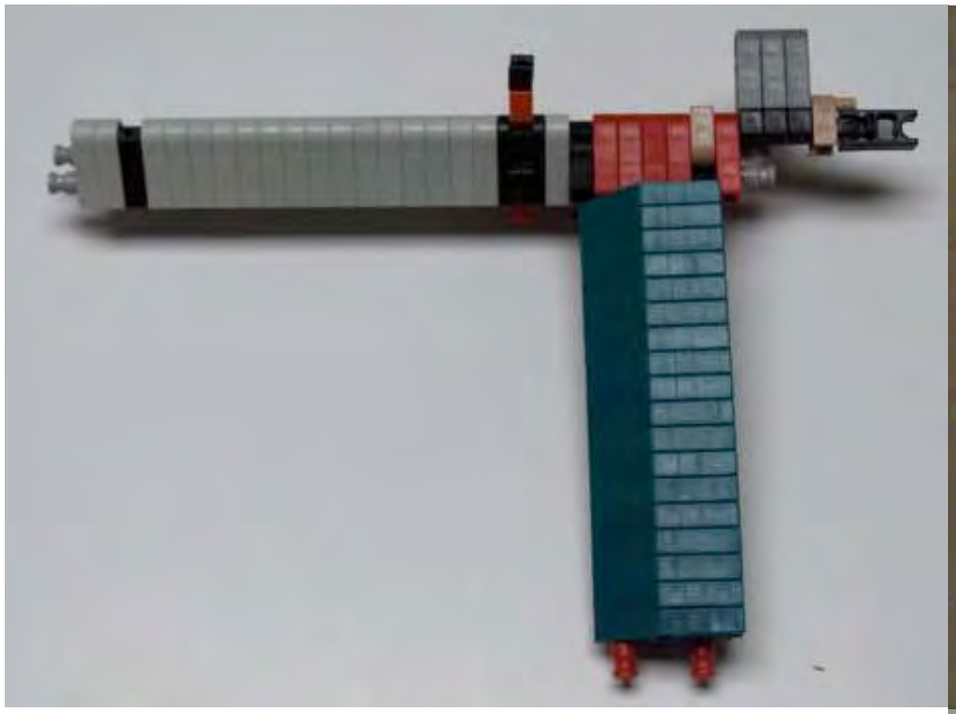
i sereously dont know what to call this, maybee a tripwire claymore? anyway, i dont have any kind of string attached now, but you all are really creative, im sure youll think of something!



+ EMAIL + PRINT + LICENSE [FLAG] next »

Community-Sponsored Challenges

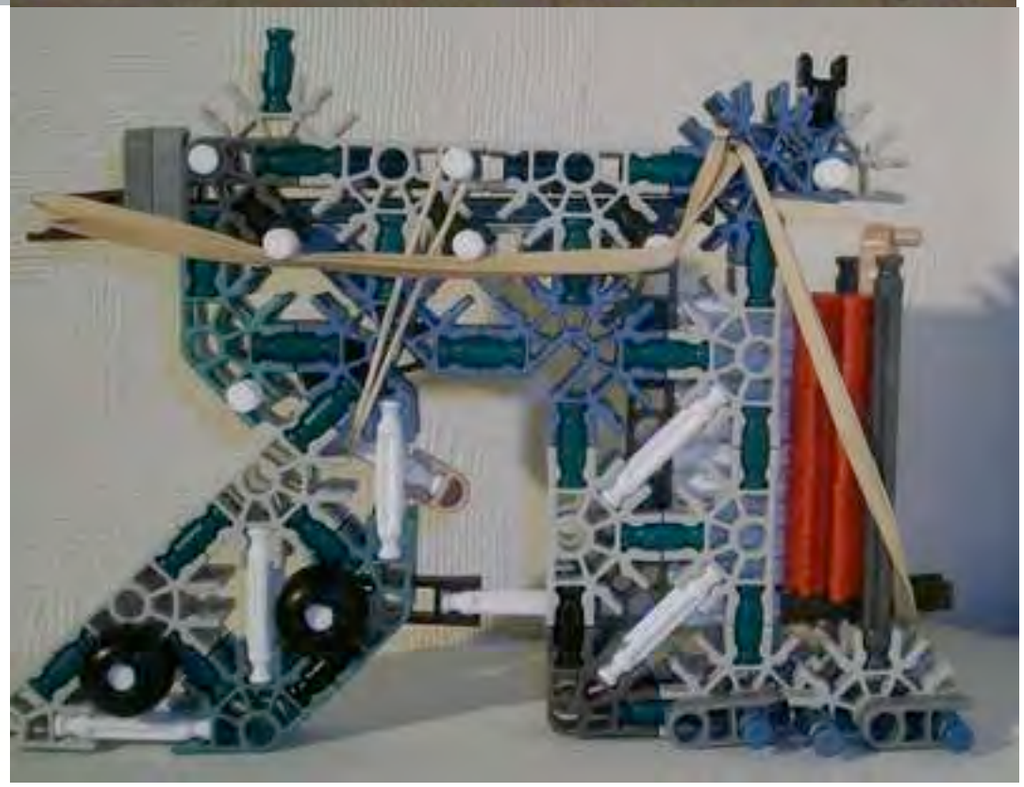
Real Innovation in K'Nex Weaponry



Block trigger

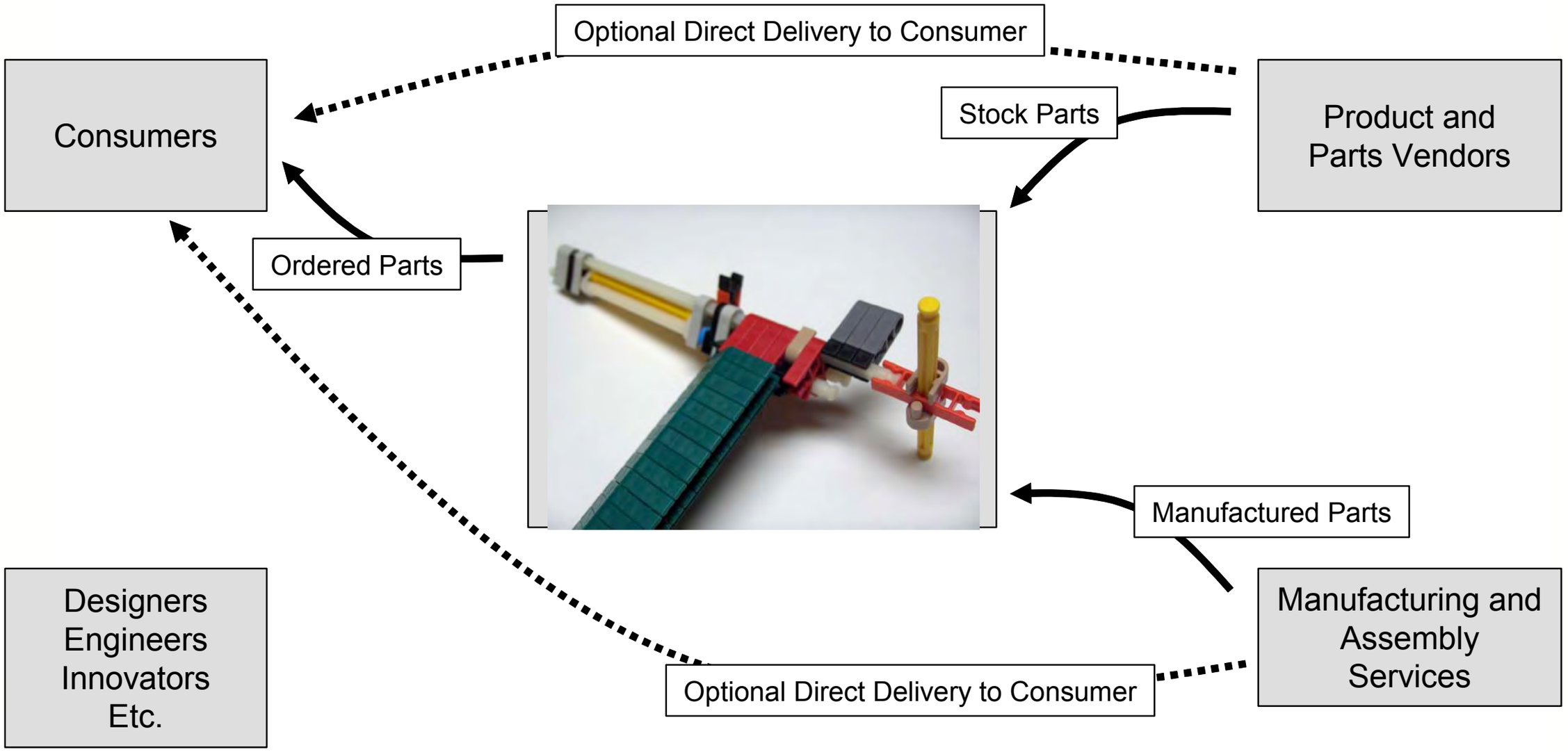
Sear trigger

True trigger with magazine



This is Open Hardware!

Movement of Physical Goods



Self-Sustaining Open Hardware Community

Suitable tools

Motivation

Recognition

This is Open Hardware!

http://www.instructables.com/id/Knex-Heavy-Cannon/

X985 Vivisector

The Story of Instructables


B2 City & Region

GLOBE STAFF PHOTO/JOANNE RATHE

SURF'S UP — Gusty winds at Pleasure Bay in South Boston made for good kite surfing yesterday. Eric Wilhelm, 26, took advantage of the conditions.

Boston Globe appearance in the same week as dissertation