

# Making ~~Trouble~~ History

Saul Griffith

Squid Labs

Makani Power

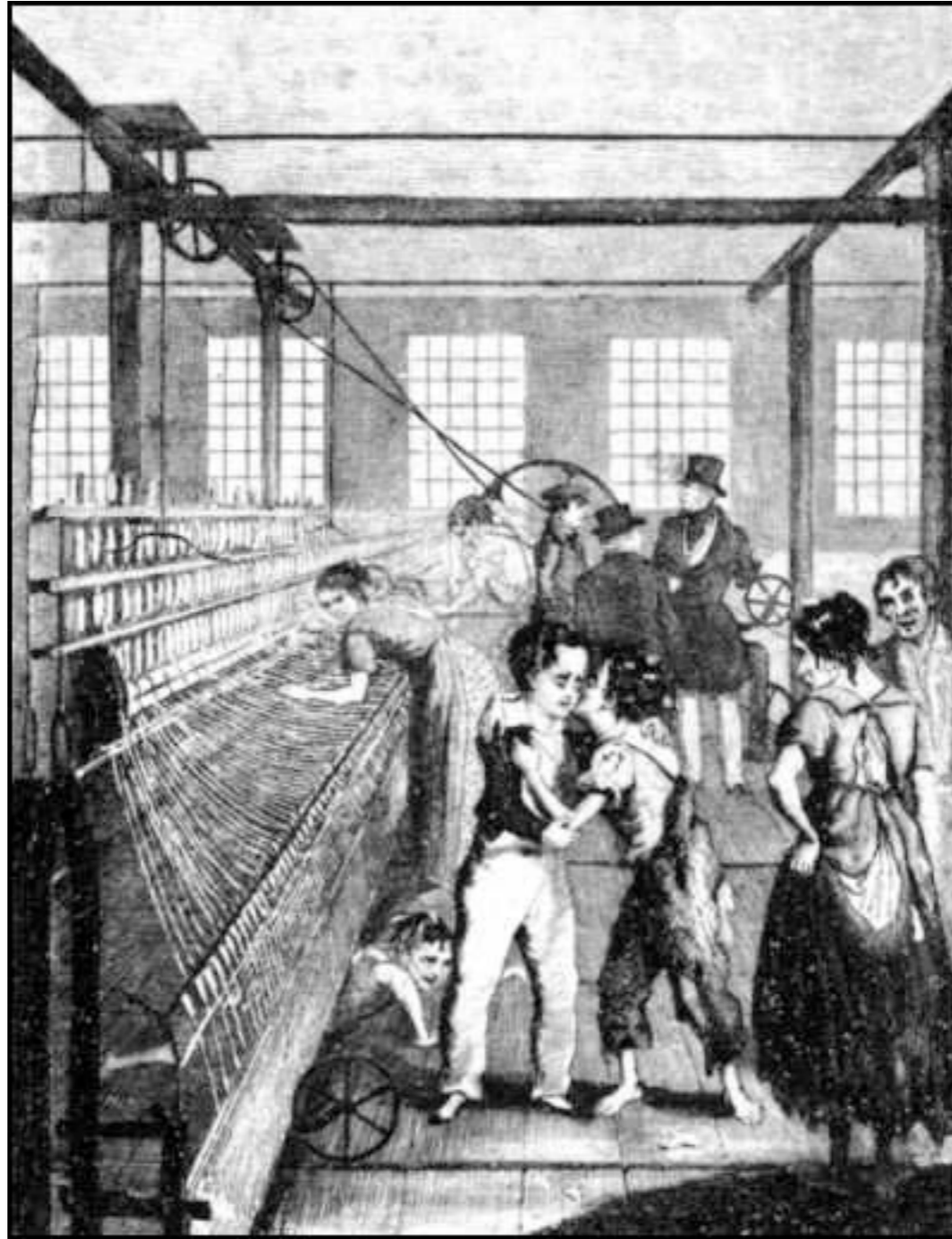
Advisor / contributor : MAKE Magazine

Contributor: CRAFT Magazine





# Industrial Revolution



John Ruskin  
c. 1888



Let me remind you that **craft** and its adjective **crafty** have been **degraded and misapplied in modern English**... they are used to express trickiness or dishonesty, where we ought to use guile or guileful.

The right **meaning of the word craft is simply power**: so that a handicraftsman signifies a man who exercises a power by means of his hands... to wit, a readiness of mind and deftness of hand, handed down from father to son and increased generation by generation: surely a class of men who possess such a power is to be honored and thanked rather than nicknamed by foolish, outlandish words.

--William Morris

# William Morris

## THE NATURE OF GOTHIC.



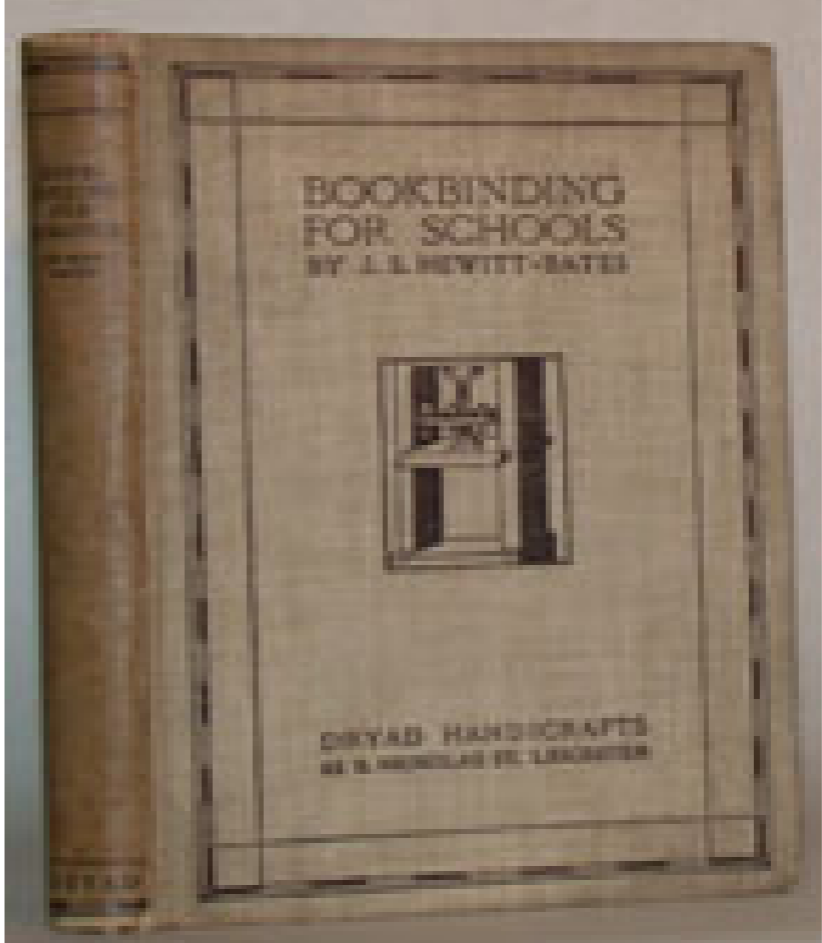
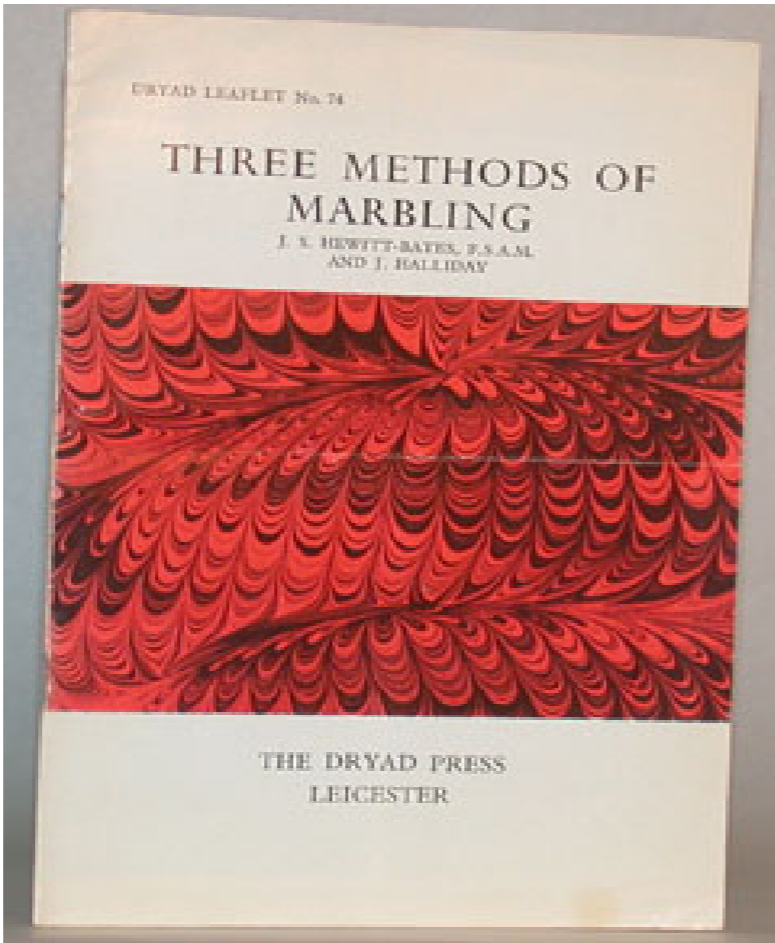
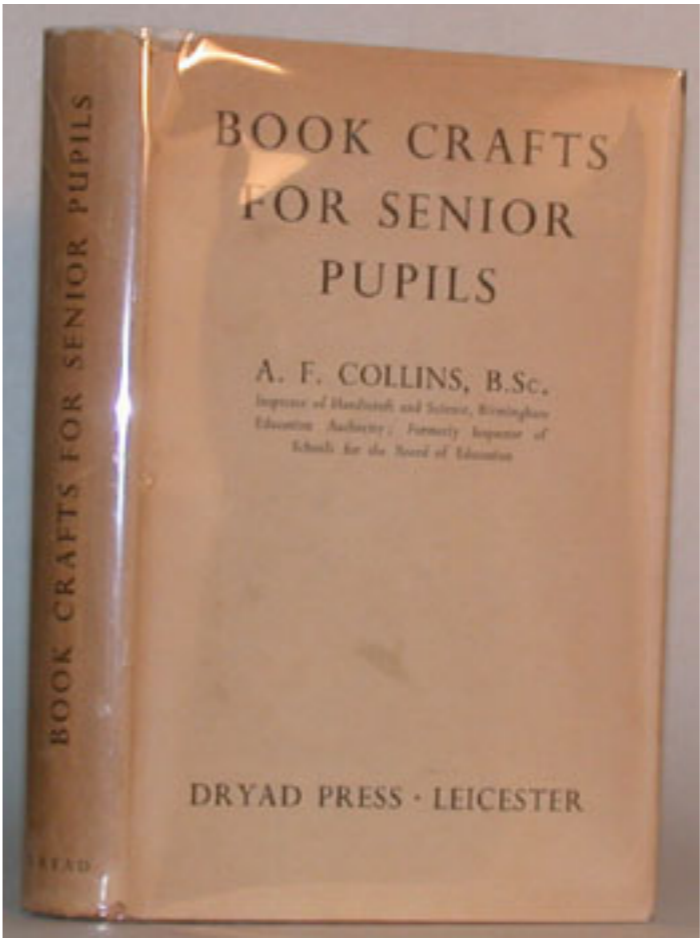
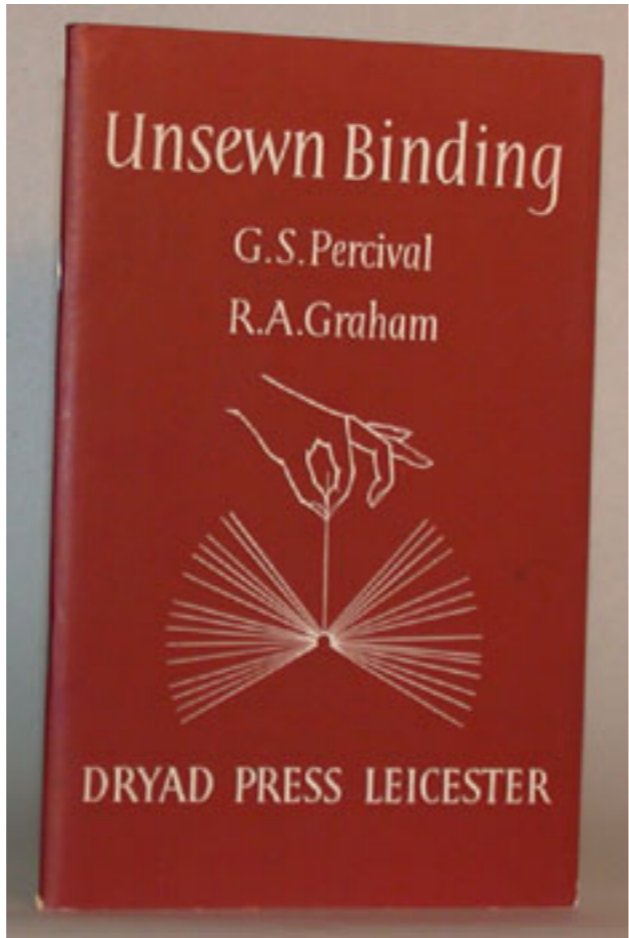
WE are now about to enter upon the examination of that school of Venetian architecture which forms an intermediate step between the Byzantine and Gothic forms; but which I find may be conveniently considered in its connexion with the latter style. ¶ In order that we may discern the tendency of each step of this change, it will be wise in the outset to endeavour to form some general idea of its final result. We know already what the Byzantine architecture is from which the transition was made, but we ought to know something of the Gothic architecture into which it led. ¶ I shall endeavour therefore to give the reader in this chapter an idea, at once broad and definite, of the true nature of Gothic architecture, properly so called; not of that of Venice only, but of universal Gothic: for it will be one of the most interesting parts of our subsequent inquiry, to find out how far Venetian architecture reached the universal







Harry Peach  
the  
“Dryad  
Leaflets”



NOVEMBER

25 CENTS

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JAN.  
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# Internet Revolution

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vol. 03

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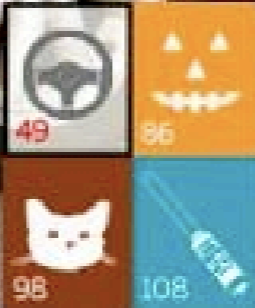
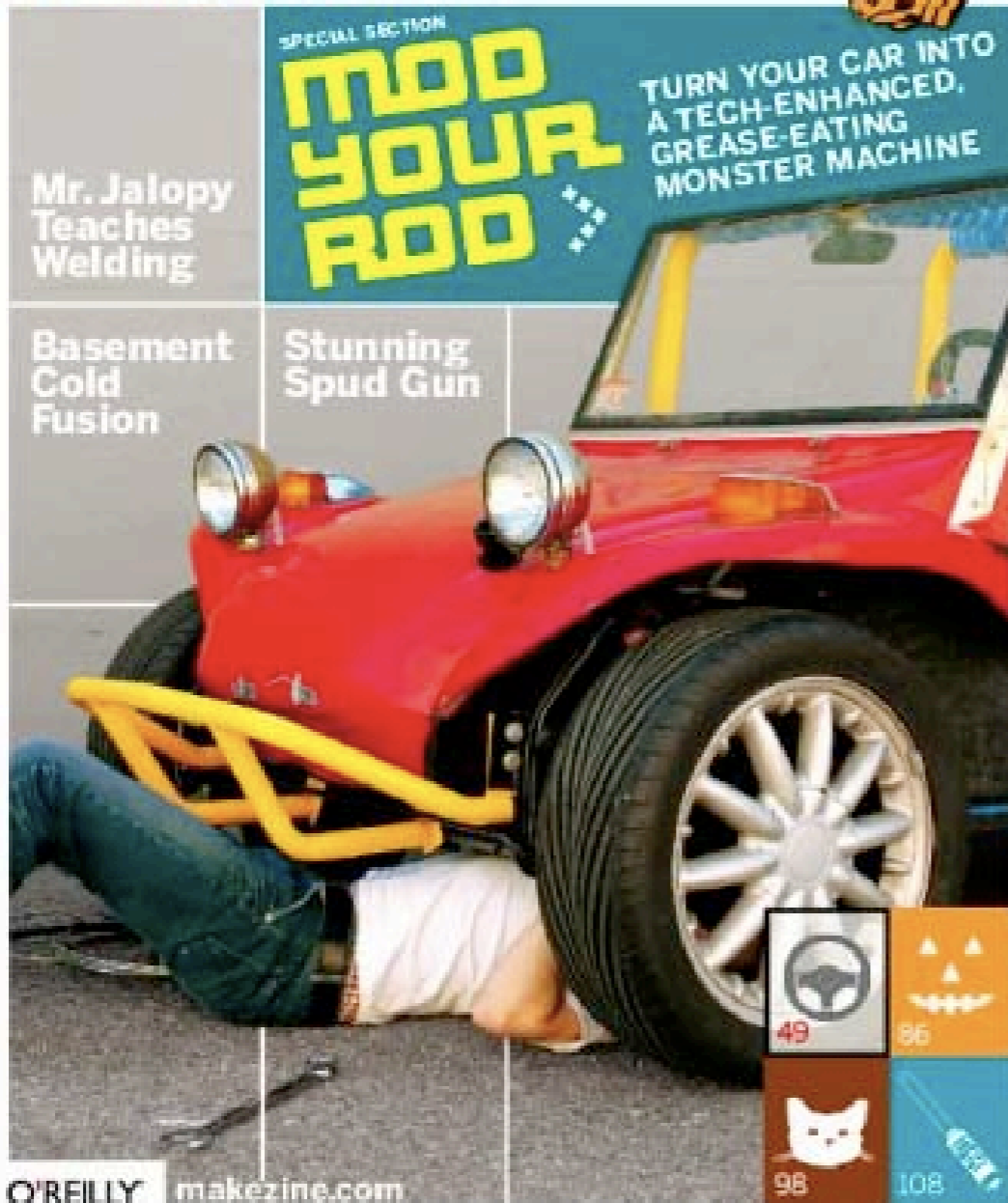
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O'REILLY makezine.com

vol. 04

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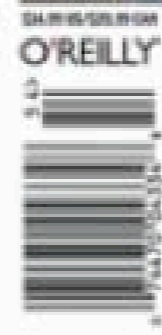
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Hacks

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a Balloon  
Popping



## Electric Cigar Box Guitar

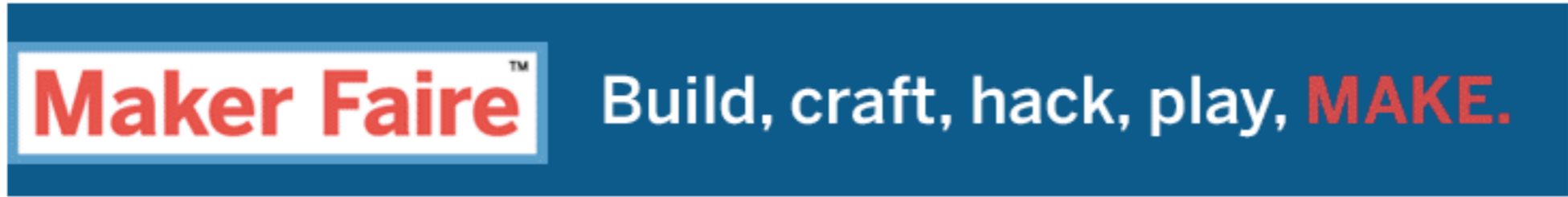
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## Volume 03: Japanese Influence



Coming soon! On newsstands April 24!

## Current Issue



Volume 03: the Japanese Style issue. With DIY tutorials ranging from blushing finger puppets to Sumi paper marbling to hypertufa planters to gorgeous dorodango mud balls, knitted kimonos, a Harajuku-style T-shirt, and way more than we can list here, get ready to have no shortage of exciting crafting projects.

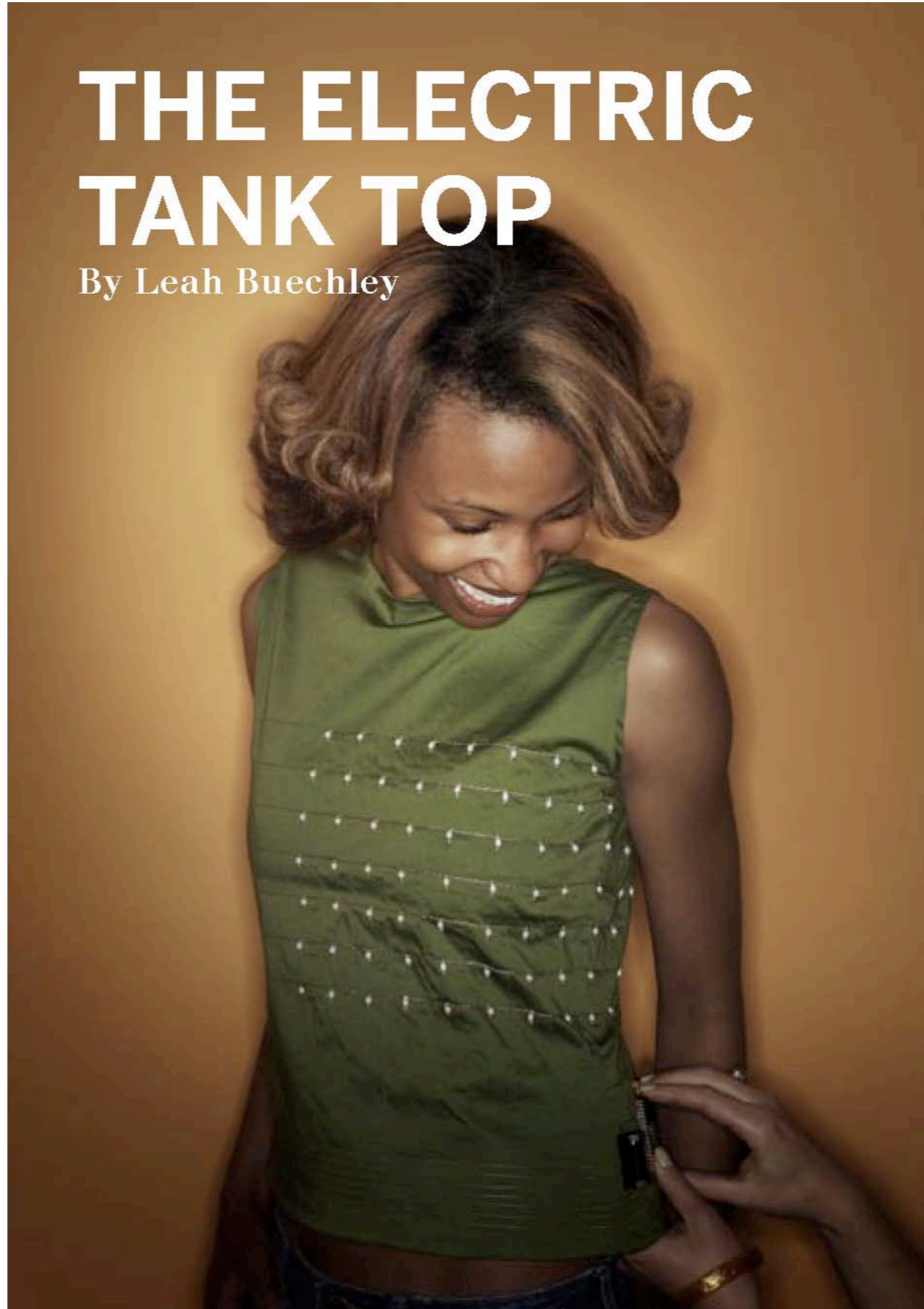


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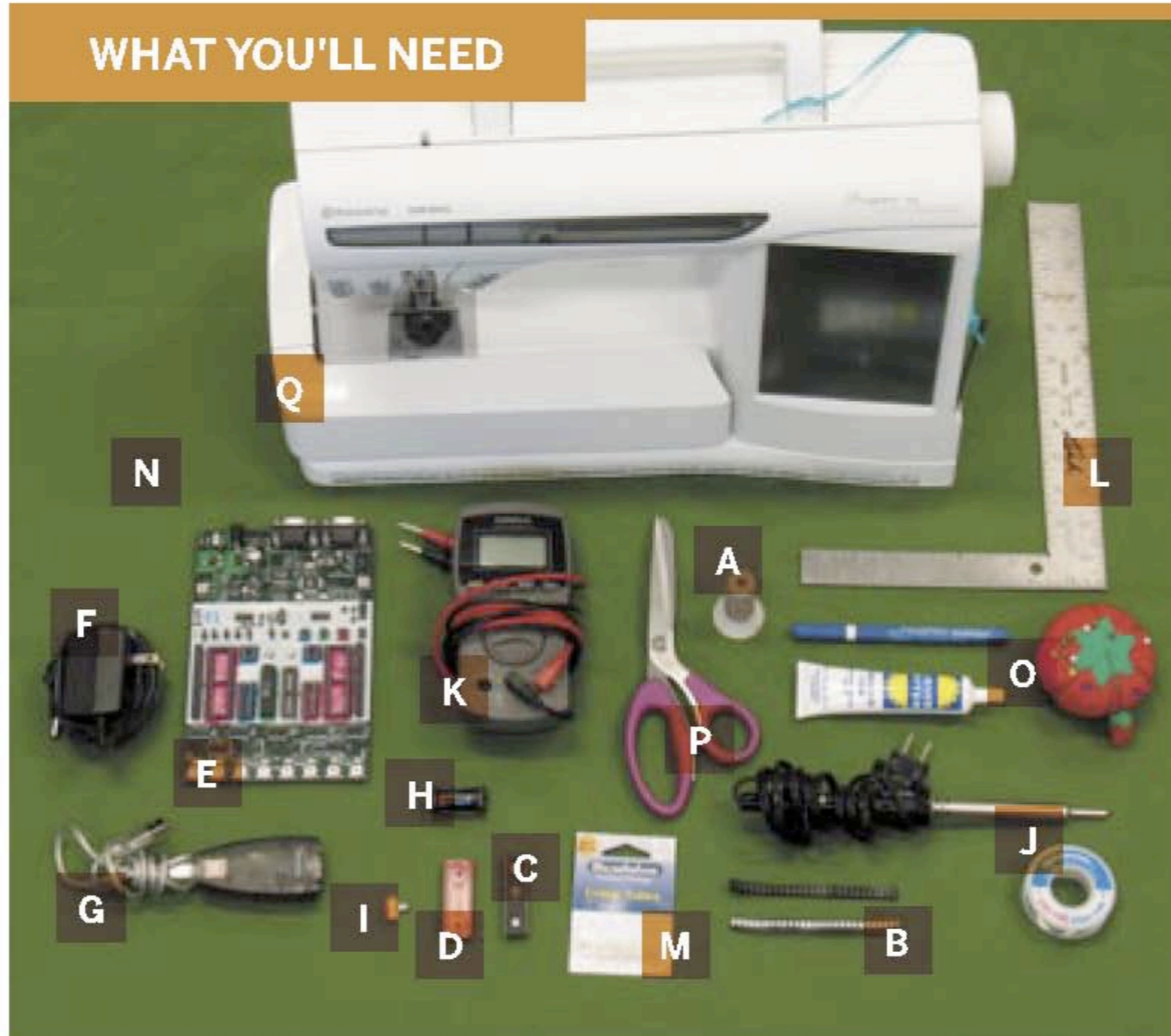
**Desire to engage with physicality of  
objects**

# THE ELECTRIC TANK TOP

By Leah Buechley



## WHAT YOU'LL NEED



[A] Silver thread  
[members.maw.ca/ubik/thread/order.html](http://members.maw.ca/ubik/thread/order.html)

[B] Surface mount LEDs  
100, or as many as you'd like. I used a super-intensity red LED (Digi-Key part # 67-1695-1-ND).

[C] AVR ATmega16 microcontroller  
Digi-Key part # ATMEGA16L-8PC-ND

[D] IC socket for your microcontroller  
Digi-Key part # A9440-ND

[E] AVR programmer  
Digi-Key part # ATSTK500-ND

[F] 9-15VDC power supply  
For your STK500 programmer. Available at RadioShack.

[G] USB serial adapter and included software  
This will attach your programmer to your computer.

[H] Battery and holder  
I used a standard 6V camera battery (part # A544). For the holder, use Digi-Key part # 108KK-ND.

[I] On/off switch  
Digi-Key part # SW100-ND

[J] 30-watt, or higher, sol-

dering iron and lead-free solder. **remember: Keep it lead-free!** TIP: If your soldering iron tip is dirty, it will stick to the bead and make the job very difficult. If this is happening, you should clean or replace your tip. Once you get the hang of it, you should be able to solder 100 LEDs per hour.

[K] Multimeter

[L] T square or ruler

[M] Assortment of silver and brass crimping beads  
At least twice as many as you have LEDs.

[N] Garment or a piece of fabric and a pattern

[O] Sewing needle, fabric marker, bottle of fabric glue

[P] Scissors

[Q] Sewing machine

[R] Insulating backing  
TK from the author.

For additional information about materials and equipment, visit [www.cs.colorado.edu/~buechley/links/material\\_links.html](http://www.cs.colorado.edu/~buechley/links/material_links.html)

### 3. SEW YOUR LED PATTERN

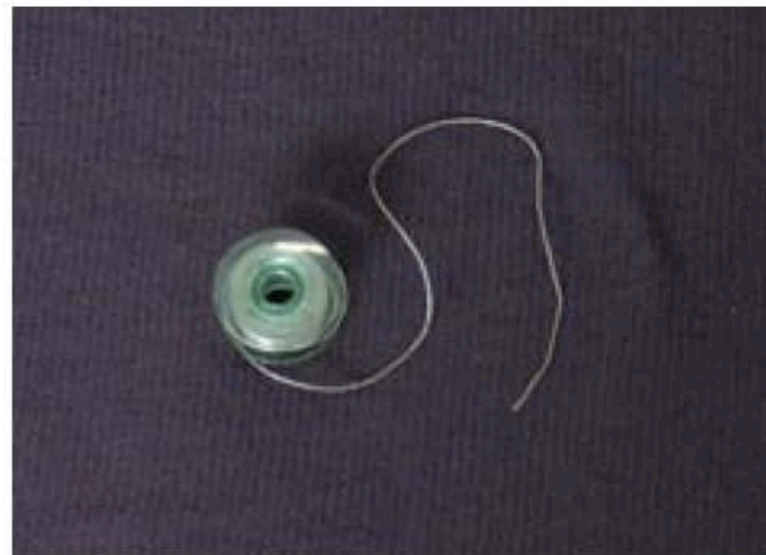
**3a.** With a marking pen, mark the lines for your LED pattern on the garment. Also, mark where you want your microcontroller (IC socket) and power supply to be. You want a grid of conductive traces where the vertical traces do not touch the horizontal ones. A simple way to do this is to put one trace on one side of the fabric and the other trace on the flip side of the fabric, utilizing the fabric as a natural insulator. The lines for the vertical traces should be on one side of your garment, and the lines for the horizontal traces should be on the other.



**I marked both sets of lines on both sides of my tank top to make sure my lines were well placed.** Use a T square to get good right angles and straight lines.

**3b.** Make a bobbin of silver-coated thread for your sewing machine, and put it in the machine. Use a spool of ordinary thread for the top thread.

**Using silver-coated thread in the bobbin of a sewing machine will allow you to sew conductive horizontal traces on one side of your garment and conductive vertical traces on the other side, taking advantage of the fabric as a natural insulator.** As you sew, the bobbin thread will remain on the underside of the fabric you are sewing.



**Q:** So, if I want conducting vertical traces on side A, where should I draw my lines?

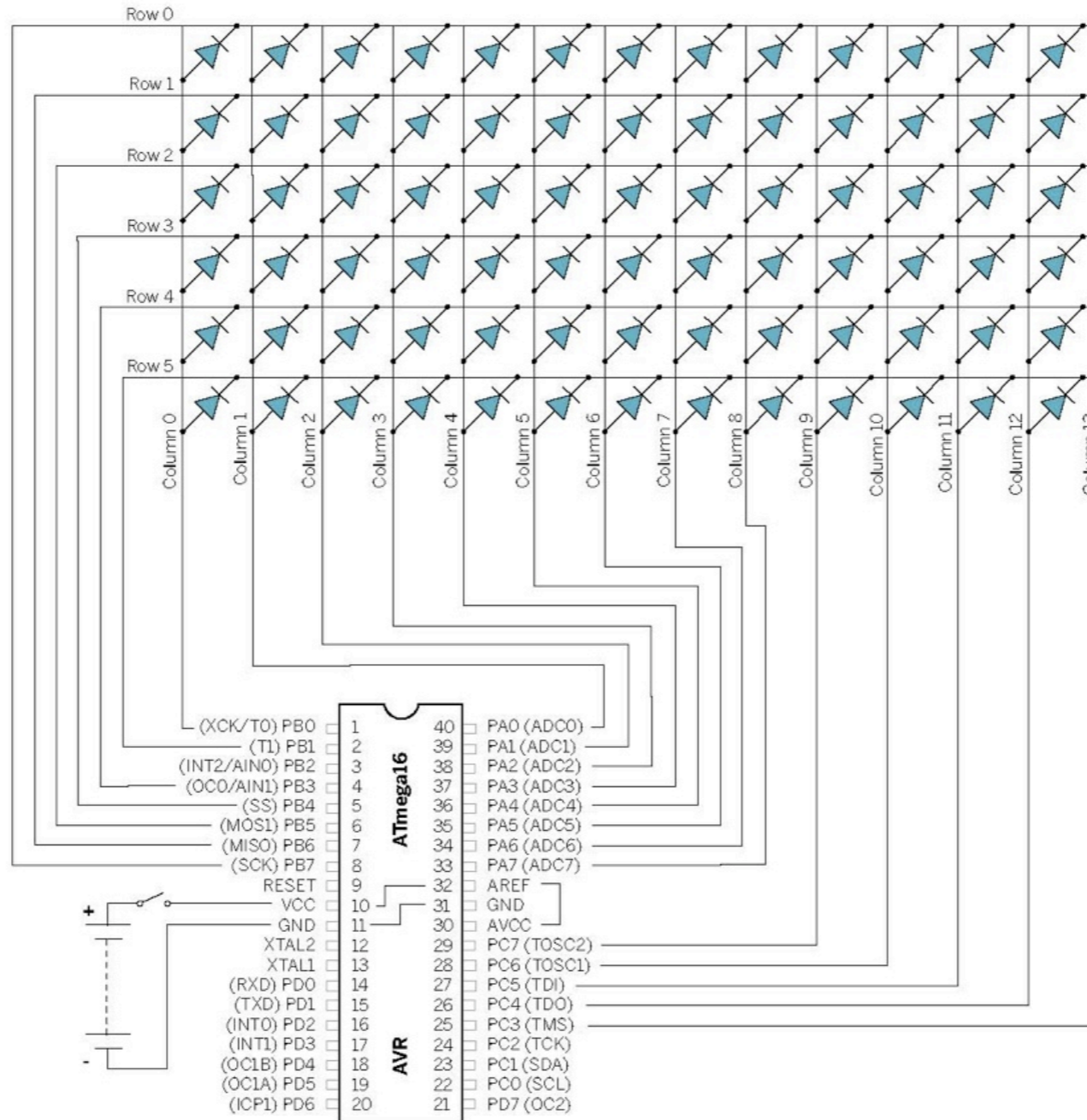
**A:** You should draw them on the opposite side (side B). The lines you draw will be facing up as you sew so that you can follow them. The conductive trace, from the bobbin thread, will be on the opposite side of the fabric (underneath your line).

## 4. PREPARE AND SEW ON THE IC SOCKET

Before you start sewing threads onto the IC socket, you should familiarize yourself with the pins of the microcontroller. Here's the pin layout diagram for the ATmega16 chip.

All the pins labeled PA0-PA7, PB0-PB7, PC0-PC7, and PD0-PD7 are general-purpose input/output pins that can be used to power LEDs and the like. See my sample code and header files at [url.tk](http://url.tk) to see how to reference and control individual pins with your code. You can download AVR microcontroller data-sheets from [makezine.com/go/arr8](http://makezine.com/go/arr8).

4a. Use the following diagram as a guide to tell you which thread goes to which socket. (If you've chosen a different number of rows or columns, you'll assign them to the PA-PD pins somewhat differently.)



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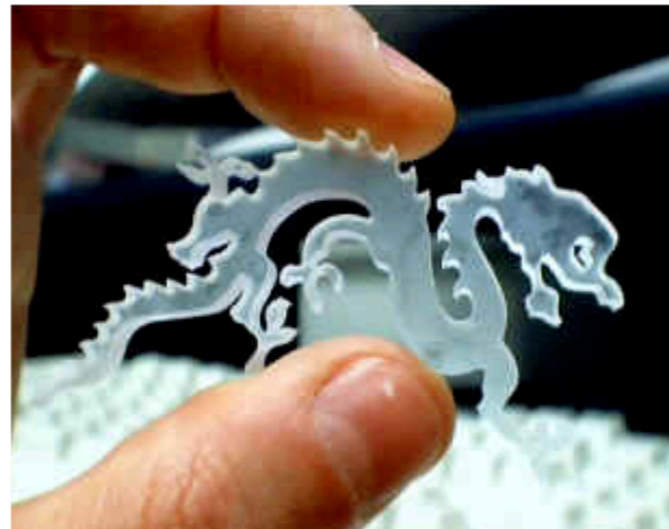
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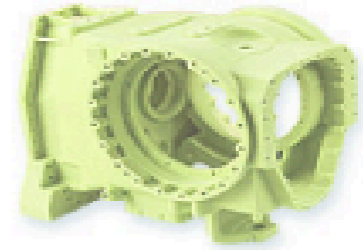
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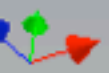
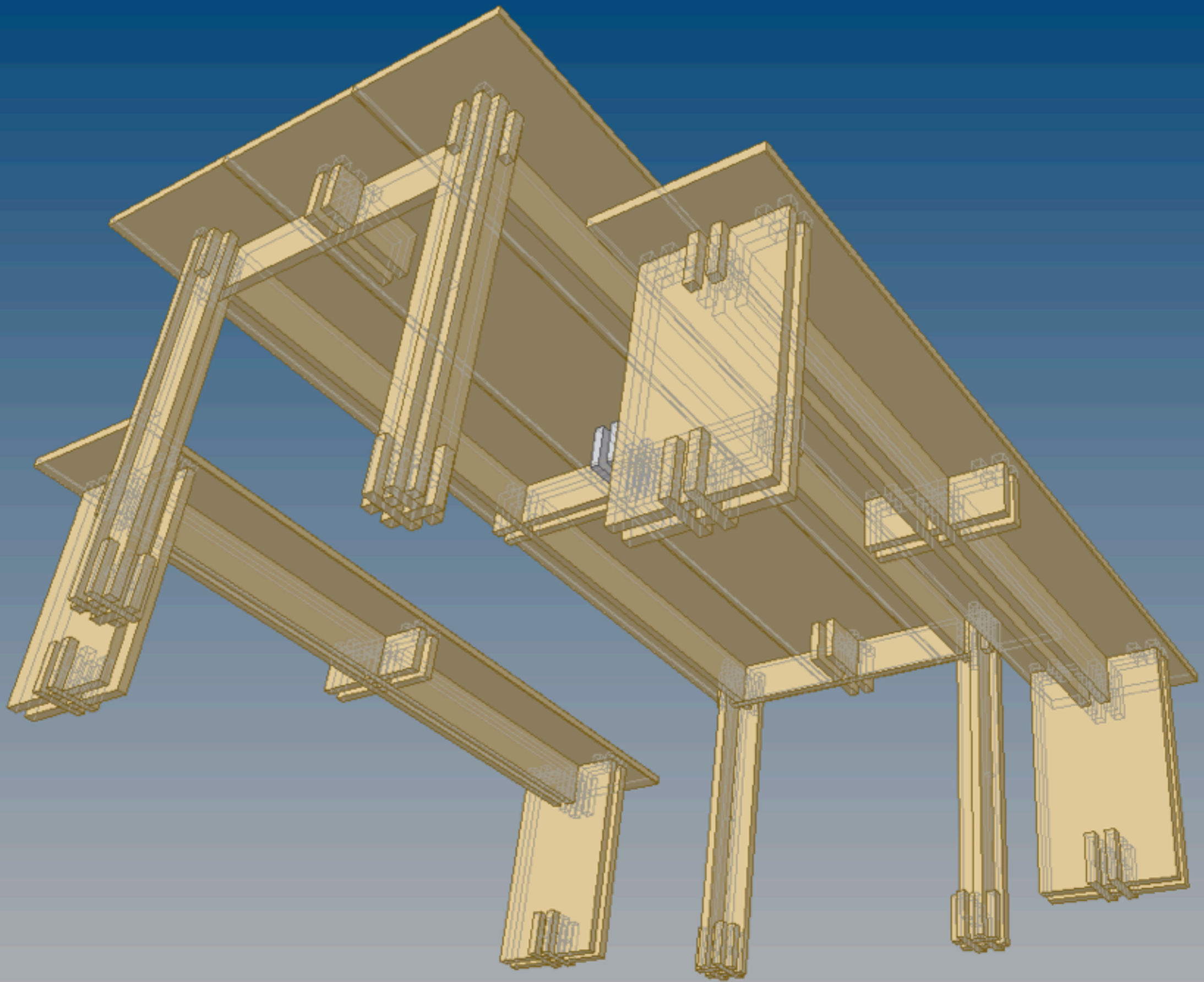
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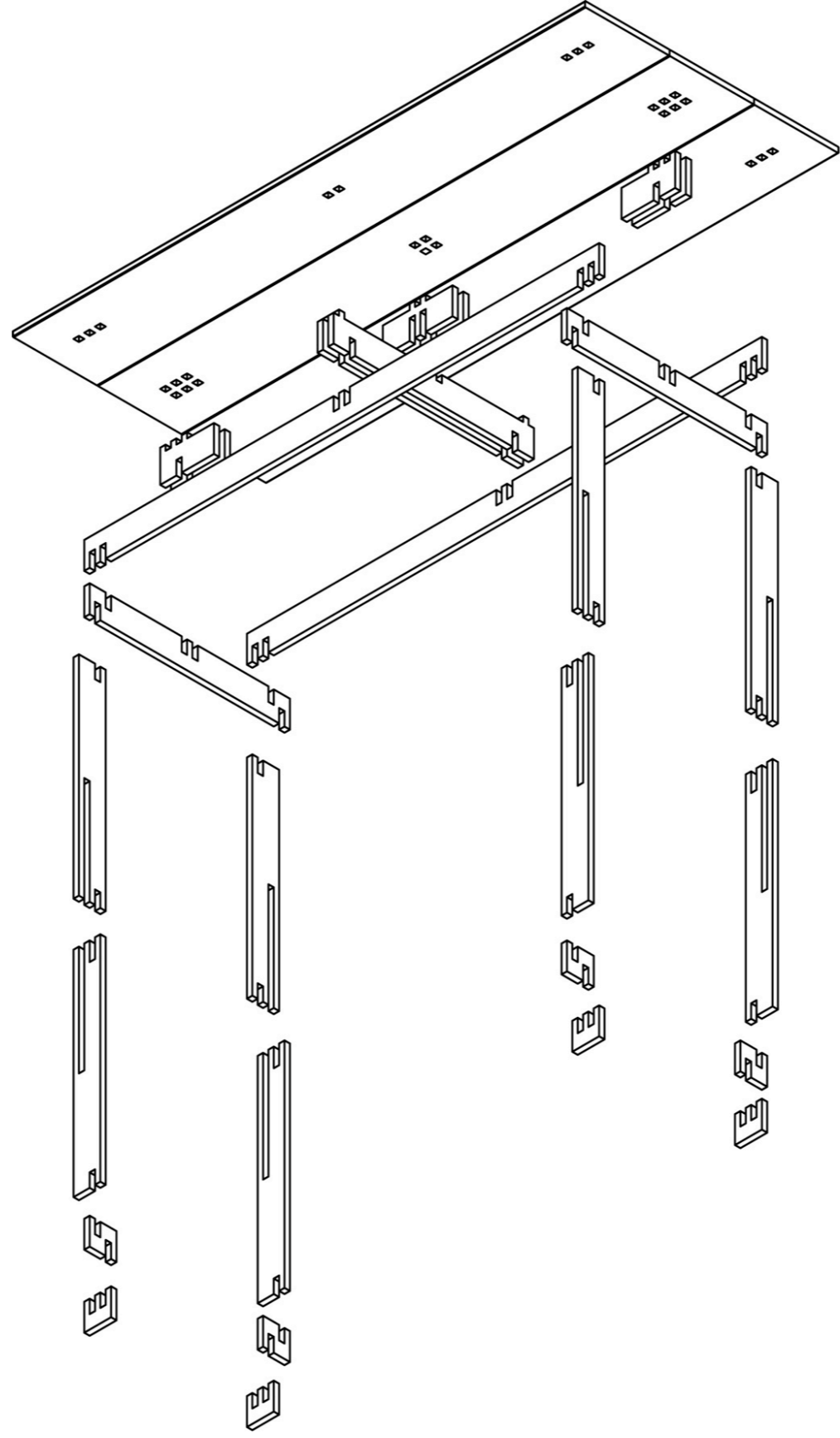
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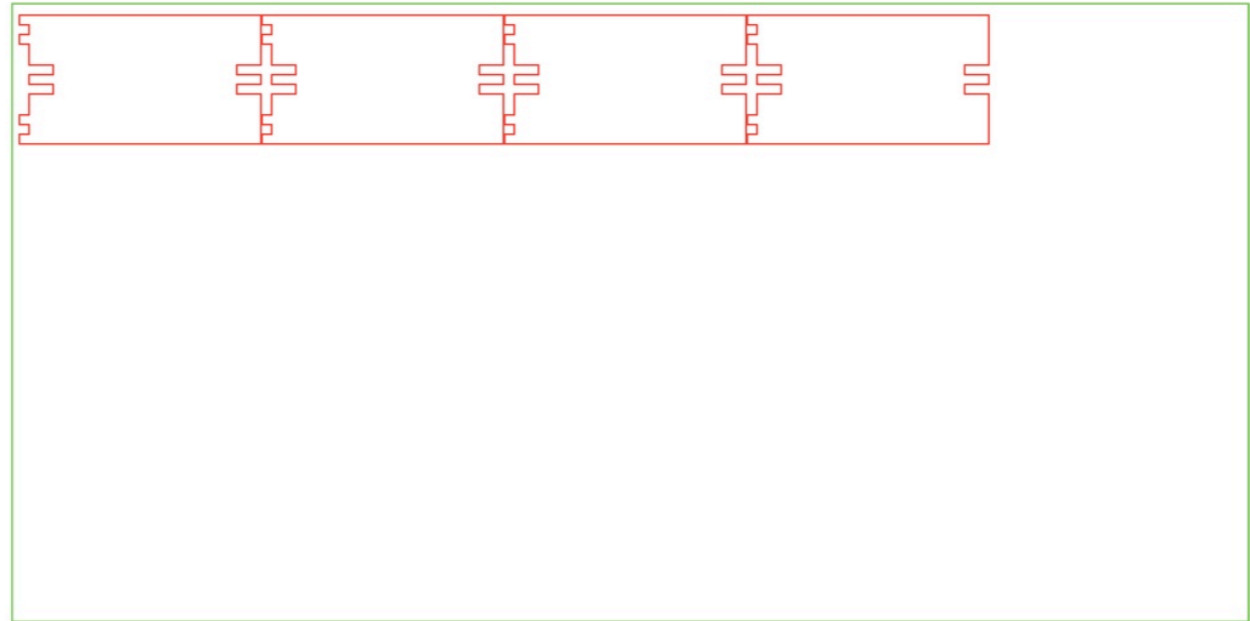
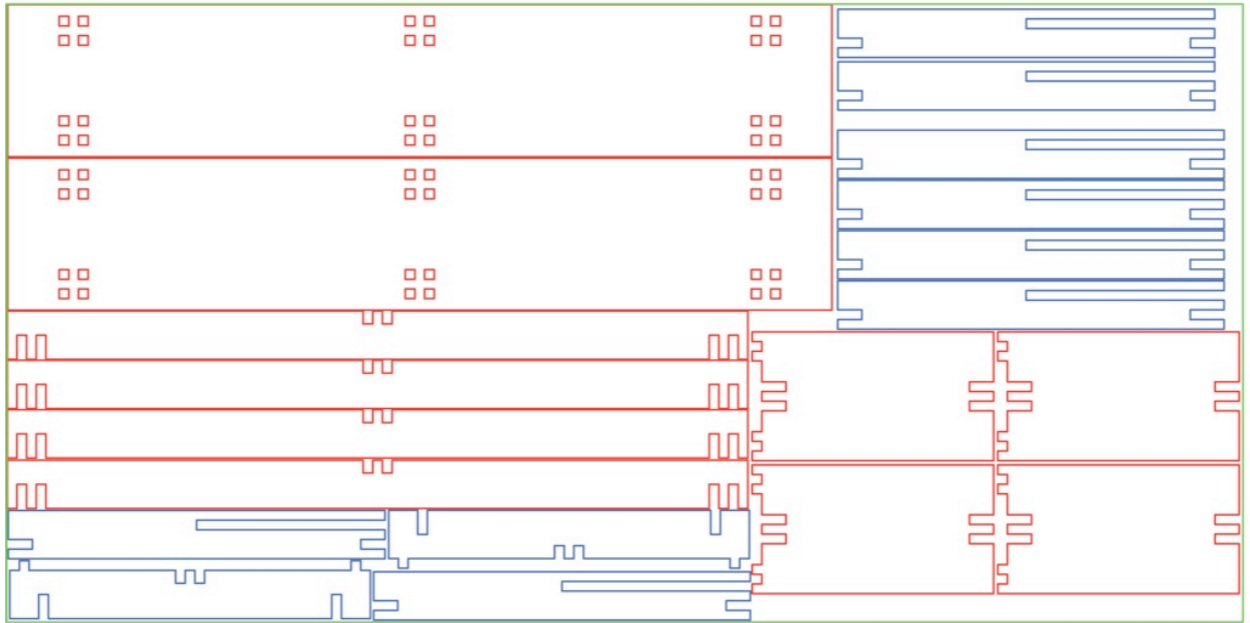
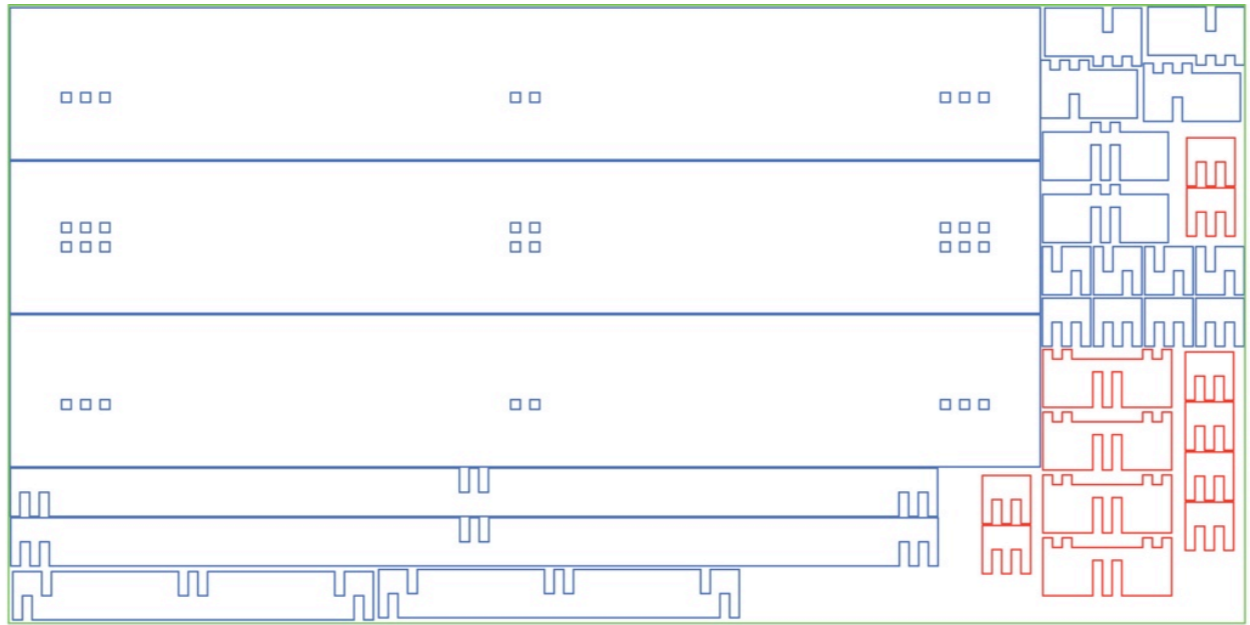
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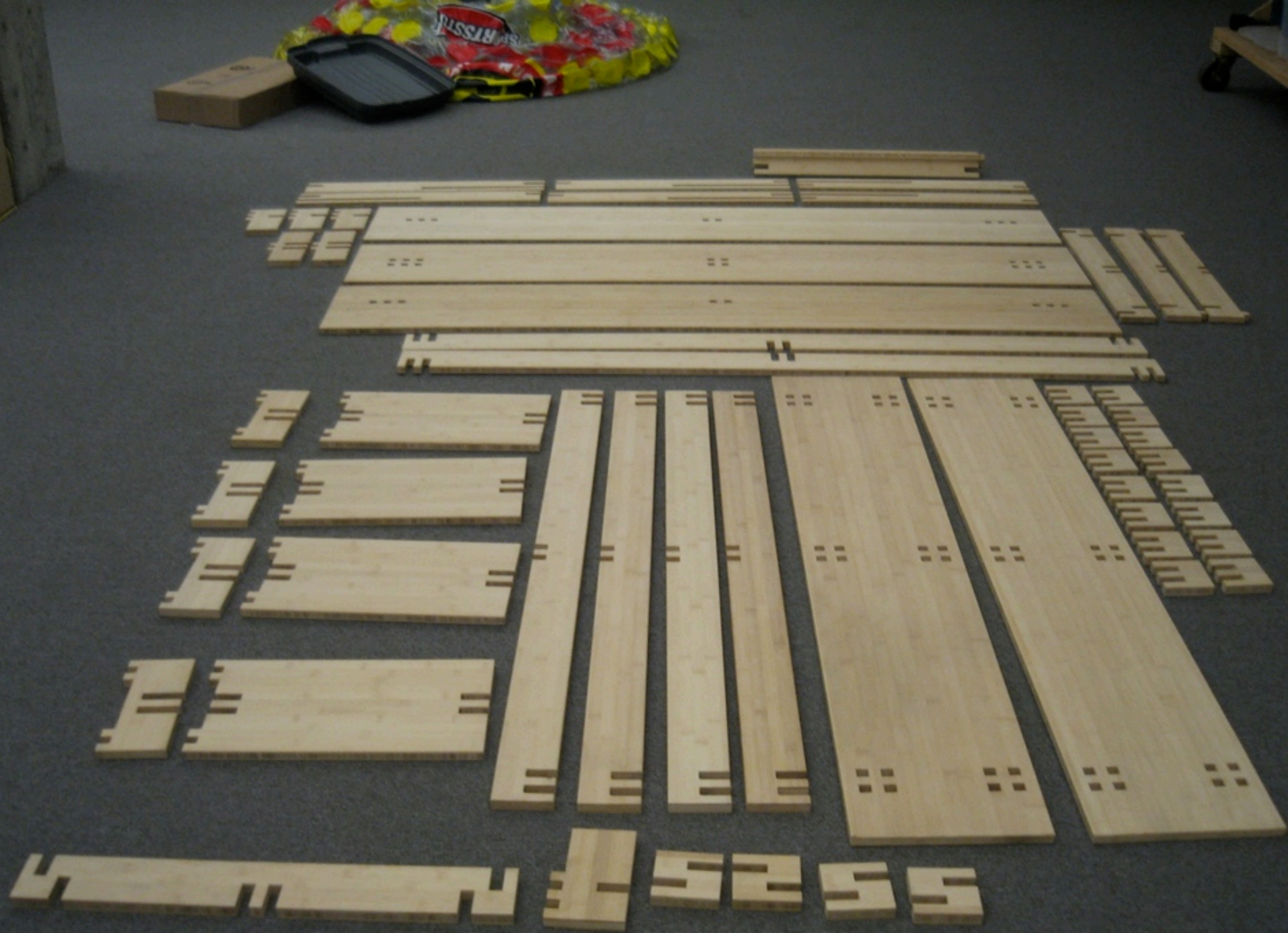
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precision pattern-maker**















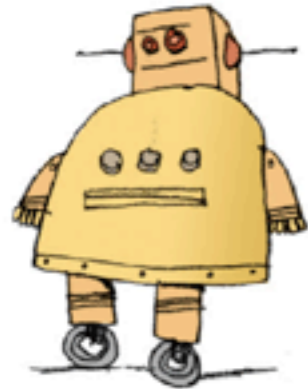


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- [not liable](#) : 524
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- [home](#) : 359
- [ride](#) : 313
- [life](#) : 310
- [art](#) : 304

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- [easy](#) : 208
- [cheap](#) : 207
- [gun](#) : 181
- [food](#) : 149
- [cool](#) : 134
- [fun](#) : 133
- [recipe](#) : 125
- [knex](#) : 110
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- [paper](#) : 95
- [diy](#) : 90
- [LED](#) : 88


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Invisible Book Shelf Cast levitation level 7 on your books! What You'll Need Book Good sized "L" Bracket Carpet Knife Pen Small wood screws (of...

 posted by [dorxincandeland](#) on Jan 29, 2007  
 comments (145)

**LED Throwies**

 LED Throwies Developed by the [<http://graffitiresearchlab.com> Graffiti Research Lab] a division of the [<http://research.eyebam.org/> Eyebeam R&D &hellip;

 posted by [Q-Branch](#) on Feb 14, 2006  
 comments (357)

**Shake it like a Tic-Tac!**

Shake it like a Tic-Tac! Rechargeable led flashlight powered by magnets housed in the obligatory mints container. Parts PARTS: 150 ft. 30 gaug...

 posted by [MrMunki](#) on Oct 1, 2006  
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**Screen Printing: Cheap, Dirty, and At Home**

Screen Printing: Cheap, Dirty, and At Home You don't have to spend a ton of money on equipment or have a screen printing studio to make some prett...

 posted by [tracy\\_the\\_astonishing](#) on Jul 29, 2006  
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**Mad Scientists Light**

Mad Scientists Light A Maker friendly version of the Tube Lamp by Nik Willmore. a captivating Light source suitable for normal usage and able to b...

 posted by [tim-1138](#) on Apr 7, 2006  
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## Teddy Bear Remote Control

by [leahculver](#) on May 12, 2006

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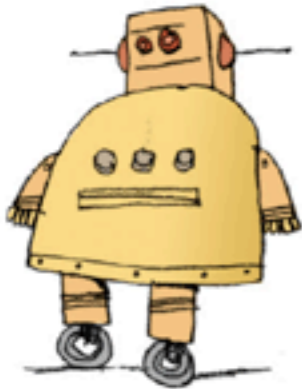
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### intro Teddy Bear Remote Control

The teddy bear remote sits nicely on your sofa or bed and can be used to control your iPod or computer. It's a cute modification to an RF remote control and is surprisingly soft! The project is difficult to make and requires quite a few odd materials, some soldering skill, and a lot of hand and machine sewing.



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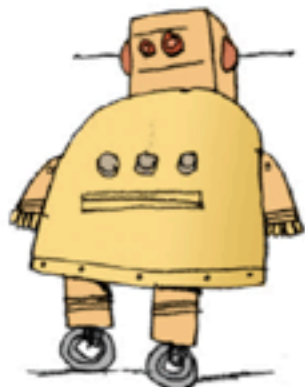
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## Lego USB Stick

by **lanhampton** on Jun 16, 2006

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### intro Lego USB Stick

Creating a case out of Lego to house a USB memory stick. This has been done before but I haven't seen it done like this :)

i



#### Category

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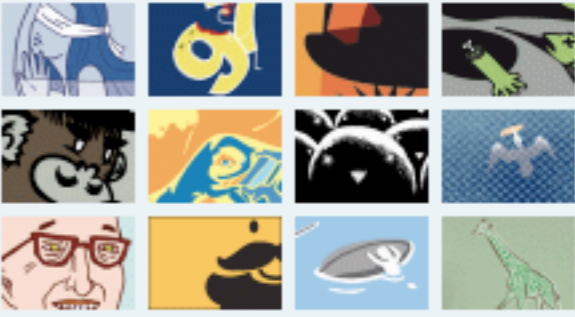
Eclipse! by Ian Leino



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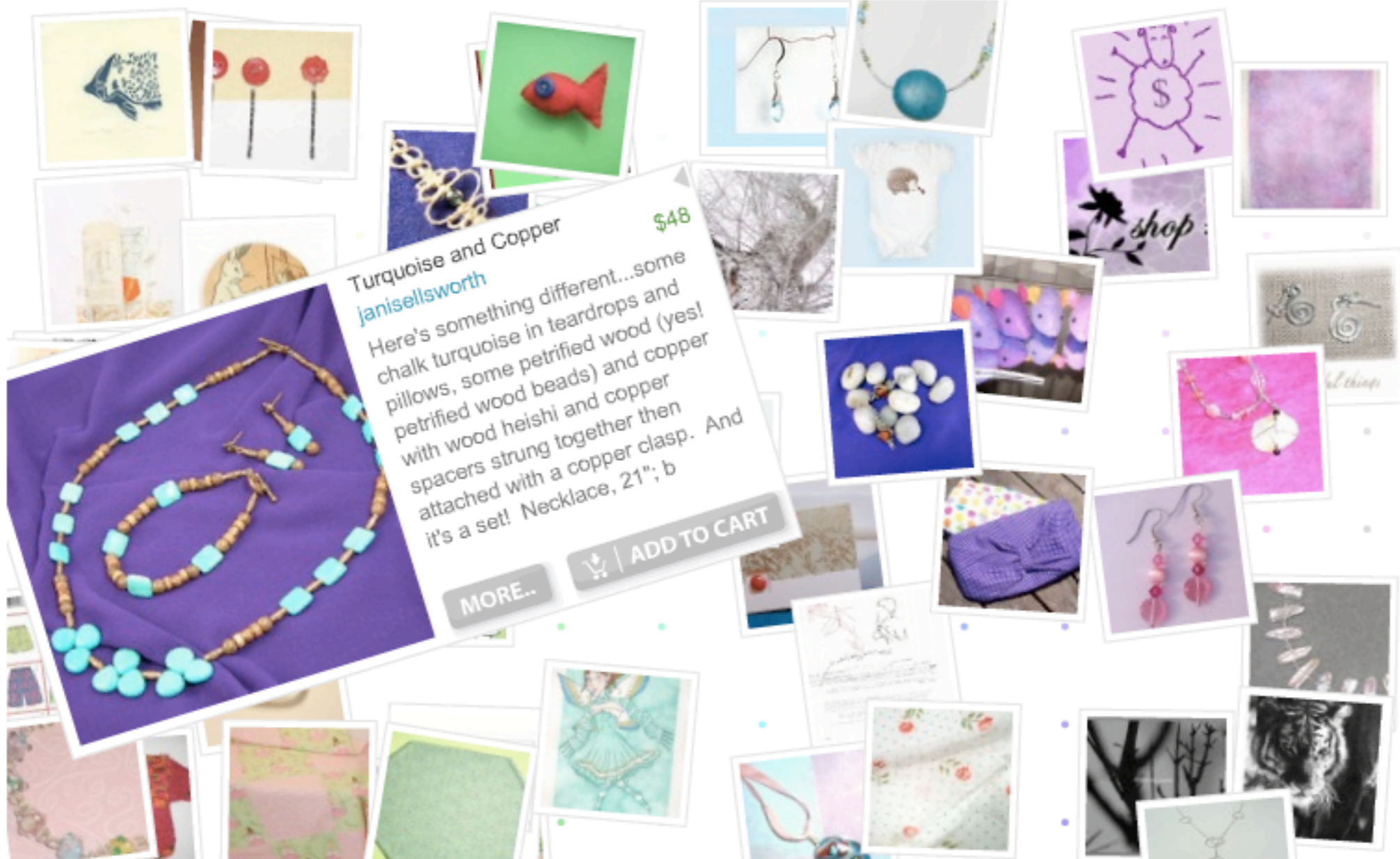
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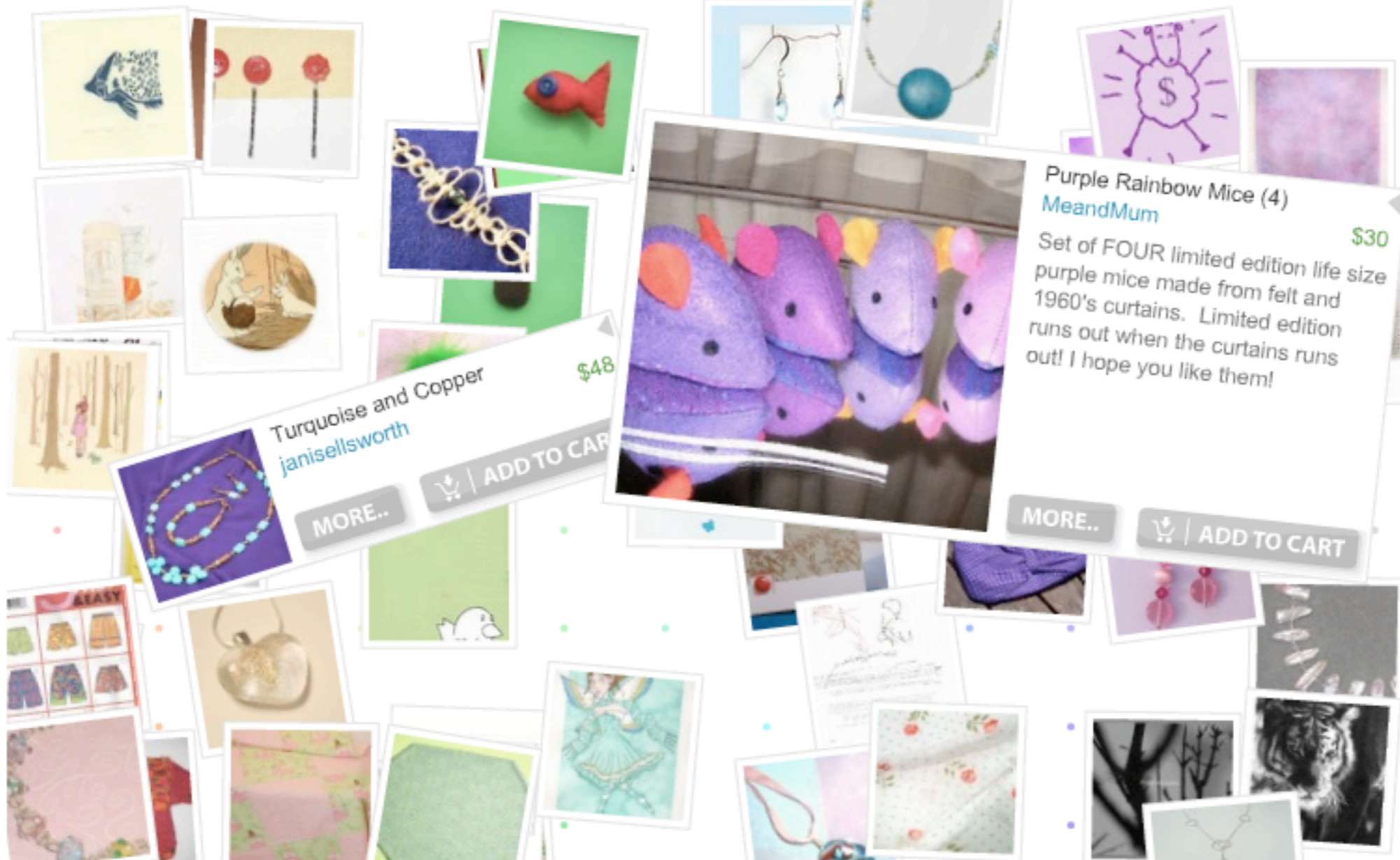
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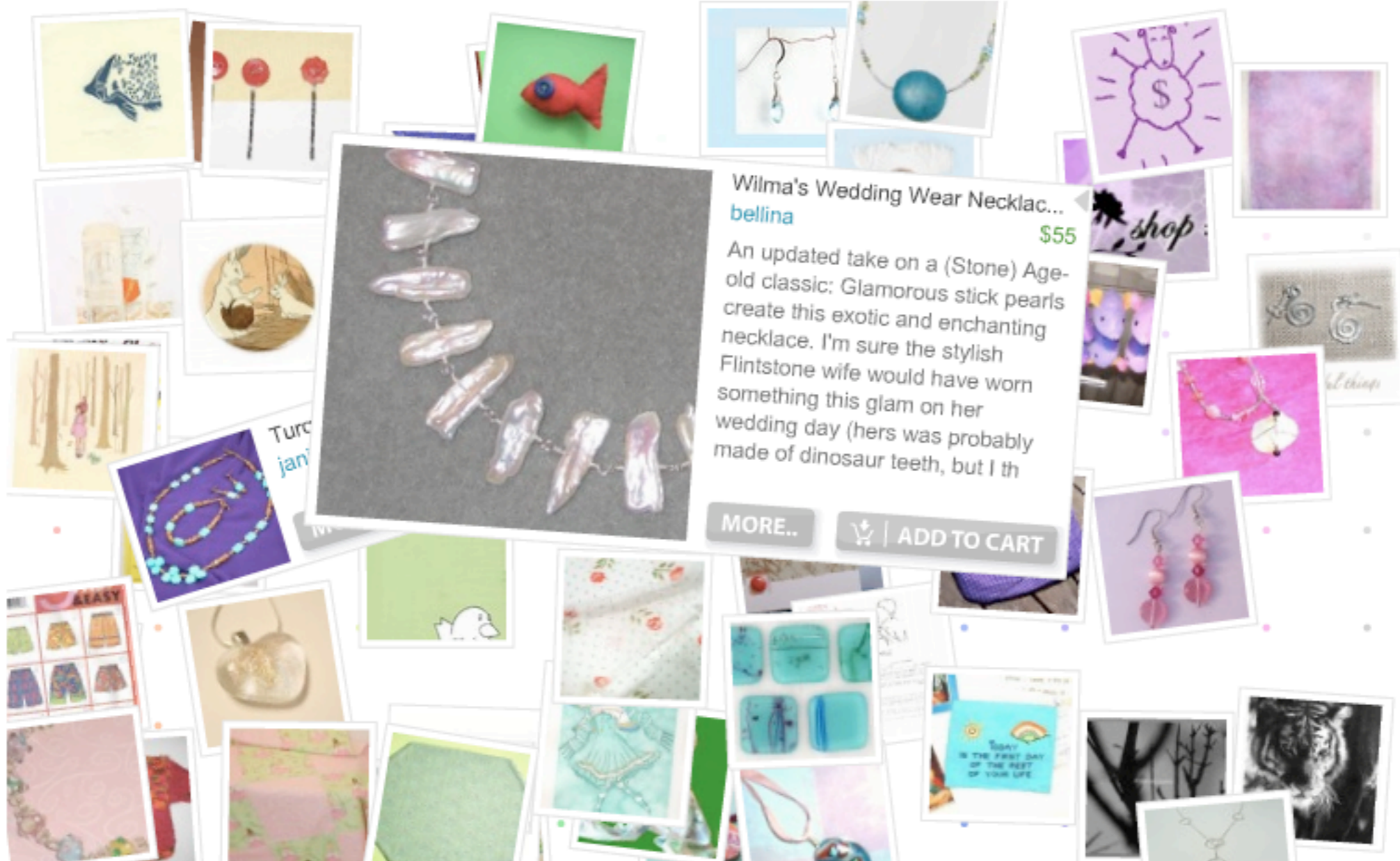
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**Wilma's Wedding Wear Necklac...**  
 bellina \$55

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