

# Kinetic Cards

 **DIY pop-up engineering.**  
**BY BONNIE BURTON**



While every great book should have characters so vividly described that they jump off the page, it's infinitely cooler to have people, creatures, and scenes that literally pop up with every page that's turned.

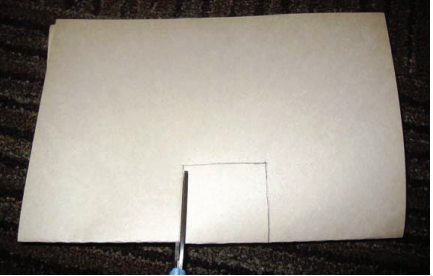
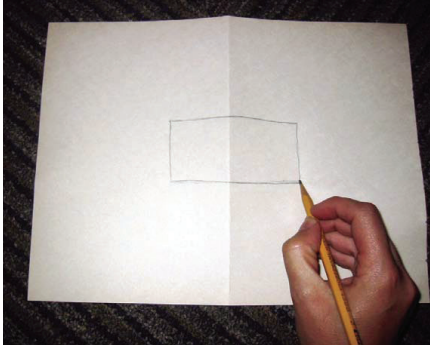
Pop-ups are not only exciting to read, they're even more fun to make. Whether you plan to create a greeting card complete with a birthday cake and candles, or a mini mystery book featuring a killer carrot that hides out in the crisper, you need to know the pop-up engineering basics. Here's how to get started.

- MATERIALS**
- » **SCISSORS**
  - » **PENCIL**
  - » **CONSTRUCTION PAPER**
  - » **GLUE** OR GLUE STICK
  - » **TAPE**
  - » **MAGAZINE CUTOUTS** IMAGES AND LETTERS
  - » **EXTRA DECORATIONS (OPTIONAL)** SUCH AS PIPE CLEANERS, STRING, FABRIC, GOOGLY EYES

## BOX SUPPORTS

One of the most basic kinds of pop-up is the box support, which holds the object in place when the card is open. In order for the pop-up to work, you'll be making the box support on the fold of the card, so that when it opens at a 90° angle you can see the scene come to life.

- 1.** Fold a piece of construction paper in half either vertically or horizontally.
- 2.** Lightly draw a rectangle across the fold.
- 3.** Cut along the lines that cross the fold, but not the end lines of the rectangle. You don't want to fully cut out the rectangle shape.



Photography by Sam Murphy (top) and Bonnie Burton (bottom)

4. Push the rectangle out so that it forms a 3D box, as shown here. Tape or glue to the box the image you want to pop up when the card opens. Add to the scene inside the card with fabric scraps, magazine letters, etc.

5. Fold the card back up and make a harder crease along the fold. Glue another piece of construction paper to the front and back of the card to hide any hints of the paper engineering that's happening inside. Decorate the outside of the card with magazine letter cutouts, drawings, or whatever you want.

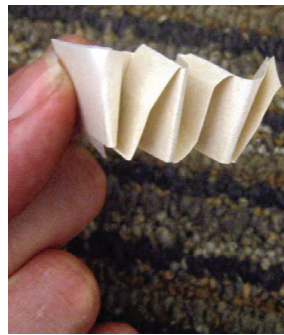


## ACCORDION SUPPORTS

1. Fold a sturdy strip of construction paper, ideally the same color as the background of the card, back and forth like the pleats of an accordion. The shorter the strip, the better (usually).

2. Tape or glue one end of the accordion to the picture you want to support, and the other to the inside of the card.

3. This support is great for smaller pop-up items, like individual letters, googly eyes, little bird cutouts for sky scenes, cotton ball clouds, tiny kites, etc.



➦ Check out a range of pop-up styles in our online gallery at [craftzine.com/05/popup](http://craftzine.com/05/popup).



Bonnie Burton creates geektastic crafts for Lucasfilm in the Kids section of [starwars.com](http://starwars.com). She's the author of *You Can Draw: Star Wars*. When she's not making pop-up cards, she can be found on her site [grll.com](http://grll.com).

Photography by Bonnie Burton and Sam Murphy (bottom left)

# Popping Up

## with Matthew Reinhart

**W**hen you crack open a book by author and artist Matthew Reinhart, you never know what crazy critter or fantastical character will jump off the page and into your imagination.

Working with Robert Sabuda (the Prince of Pop-ups), Reinhart constructed paper special effects in the *Encyclopedia Prehistorica* series and the *Young Naturalist Pop-Up Handbooks* of beetles and butterflies. He engineered *The Pop-Up Book of Phobias* and *The Pop-Up Book of Nightmares*. He then branched out on his own with his first solo book, *Animal Poposites*.

"It's a series of little pop-up flaps with opposite animals, one being drawn on the flap's cover and the other a pop-up inside," Reinhart explains. "I tried to make unconventional creatures rather than the obvious ones — for instance, a mouse was brave while the elephant was afraid."

More recently Reinhart has ventured to a galaxy far, far away with his new book, *Star Wars: A Pop-Up Guide to the Galaxy*. "I worked for a year, and during the last 4 months, 7 days a week and all day long," Reinhart says. "I was obsessed with getting everything right while still interpreting the galaxy in my unique way. *Star Wars* is one of the sole reasons I am an artist today. The collaboration of artists over the last 30 years always inspired me, and it made me see that I could make a living in the arts doing what I loved.

"My favorite pop-ups in the book are the Hoth battle on the first spread, with the stomping AT-AT; the rancor with thrashing claws (and a doomed Gamorrean in his clutches); the completely three-dimensional Millennium Falcon; and the exploded Cantina with practically all of the scum and villainy inside! The light-up lightsabers are über-cool, as well as the helmet of Vader, which ominously closes over the scarred face of Anakin Skywalker."

Among the more unusual aspects of Reinhart's *Star Wars* book are pop-ups within pop-ups, and mini plastic lightsabers that light up. "I began with just engineering the pop-up, and getting Vader's and Luke's postures just right," he says. "Once we got the saber working, I worked on creating



a mechanism to turn the lightsaber on when the pop-up opens. I knew it'd be cool to see Luke and Vader dueling from across the pages."

Reinhart is now working on the follow-up series to *Encyclopedia Prehistorica*, called *Encyclopedia Mythologica*. "The first of the three volumes is all about fairies, mermaids, pixies, and magical beasts!" he says. "It's kind of weird to go from *Star Wars* vehicles, droids, and creatures, to fairies, but I like the challenge. After *Fairies and Magical Creatures*, I'll continue with *Dragons and Monsters*, and then *Gods and Heroes*. Maybe if I'm lucky, I'll get to do a *Star Wars Prequel Trilogy Pop-up Guide to the Galaxy*."

For novice paper engineers, Reinhart offers a few tips to start making pop-up books and cards.

"Try and try again — we make many, many mistakes to get to the finished pop-ups," he advises. "Look at pop-ups that you like, and try to remake them yourself. We use scissors, tape, glue, and 110-pound cardstock that you can easily find at an office supply store. Start simple, and you'll gradually get better. Pop-ups don't happen perfectly the first time, so be patient. Don't let failure get in your way; learn from a 'failed' pop.

"Sometimes we listen to the pops to hear where paper is catching or snagging. At my partner Robert Sabuda's website, [robertsabuda.com](http://robertsabuda.com), there are all kinds of make-your-own pops to print and build, complete with step-by-step instructions."

—Bonnie Burton