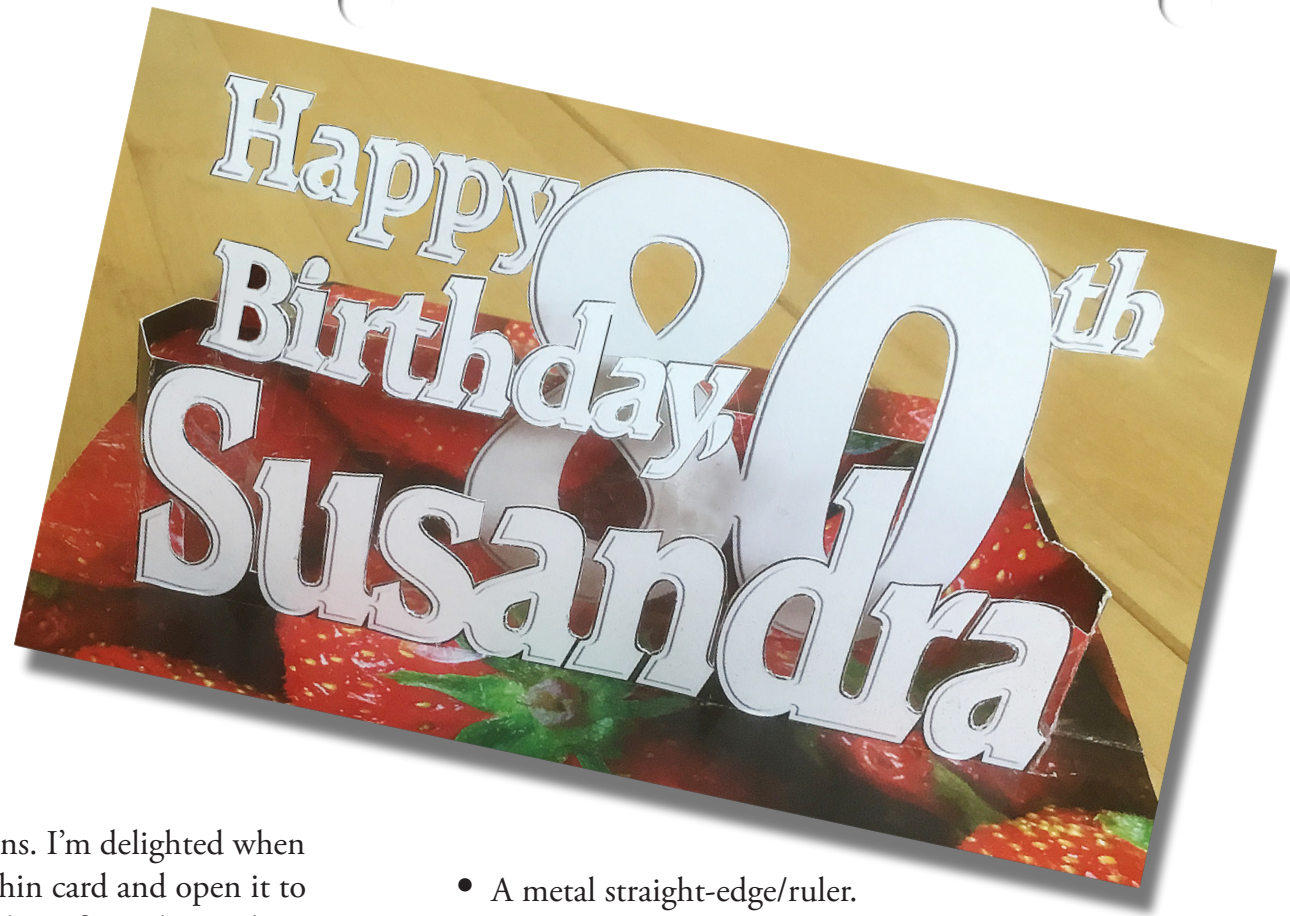# Making Custom Pop-up Cards

I've always been fascinated by magical illusions. I'm delighted when I open an ordinary flat envelope, pull out a thin card and open it to find physical objects which couldn't possibly have fit in there! Then as I close the card the magical object disappears again. Custom made pop-up occasion cards are the perfect way to show someone how special they are to you.

So far, I've only made a handful of pop-up cards, so I'm no expert, but I thought I'd pass along what I've learned and how I use Photoshop (you could download GIMP for free) to make the cards.

Some basics tools and materials you'll need:

- Find an envelope to fit the card you plan to make. I use 5x7".

- An Exacto knife or Olfa cutter to cut out the tiny centers of p's and q's and every other shape.

- A metal straight-edge/ruler.

- Cutting board.

- Glue. Water-based glues such as Elmer's and YES can saturate the card stock, causing it to warp. I use UHU petroleum-based glue in a tube. Glue sticks, tape, etc. are fine for playing with scratch paper to see what will work, but not for the final product.

- Spray mount adhesive takes some work to control but is great for making a thin, even coat to adhere paper to acetate, for instance.

- A rubber brayer is handy to press down on newly glued areas (rubbing them might leave marks or smear ink).

- A fully depleted ballpoint pen is a great scoring tool for making precise folds.

- Photoshop or GIMP (a free download) or other image editing program.

- Fairly heavy card stock; paper is usually too flimsy to pop up well several times.

Start collecting letter-size scratch paper instead of immediately recycling it as soon as you read it. When I'm working on a new design for a pop-up card, I'll go through several attempts before I have files ready to print on clean card stock. No, your scratch paper isn't as thick and rigid as card stock, but you'll learn whether a folding/slotting scheme will work or not.

I'm going to assume many people who read this don't know much about Photoshop, just in case. If you're already proficient, you can skim the parts you already know.

First let's define some terms

Let me tell you what I mean by certain terms so we're speaking the same language. These aren't "card" terms, just conventions I'll use in this tutorial. In describing parts of the card, I'll assume the card opens right to left (so turn your bottom-to-top card sideways to understand what I'm speaking about); the fold is vertical. Now, when I say "top" you'll know what I mean, even though we'd both agree it's the right side of your vertically-opening card. OK?

A beginner's template

Page 3 of this tutorial is a basic card template. With this PDF stored on your hard drive, click on it in your browser or Adobe Bridge and **Open** it **WITH** *(my bold type indicates options you get to select)...* Photoshop (or your other image editor). You'll be asked
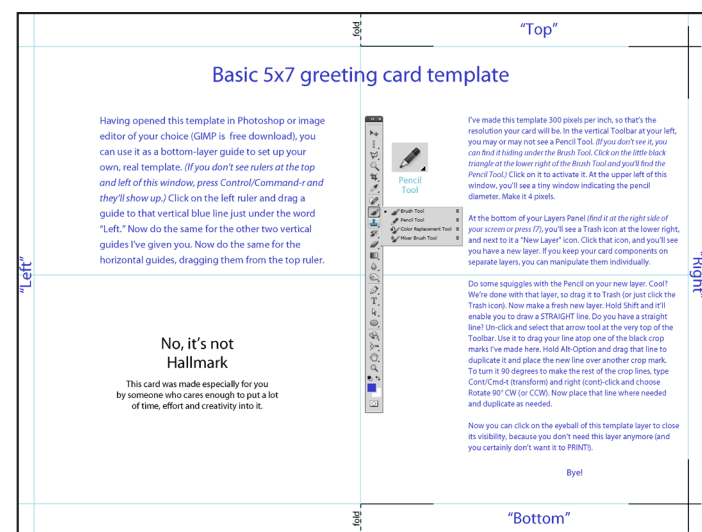
which page of this PDF you want to open. Select page 3. **Save** the Photoshop (or other format) template on your hard drive. Follow the instructions for making the template yours, including putting some appropriate mention of who made these cards. No, you can't edit my text, you'll have to remove it and type your own.

Your first card – a non-pop-up

Let's make a very basic, non-pop-up card to start with. **Save** your template image as *First-Card-Outside*. Find an appropriate image and put it on the right page, maybe type a greeting such as Happy Birthday. You can leave the left side alone, since it has your non-Hallmark information about your having made the card. Save again.

Now **Save** it **AS** *First-Card-Inside*. You can alter it now without affecting the outside pages. Remove the "who made the card" info and the cover image and greeting. The left side of the inside is usually blank on a greeting card (although sometimes there's a timeless quote, etc.). On the right panel, use whatever font you want for a greeting. You don't want to repeat what's on the front, so how about, "Thinking of you on your special day." Leave room beneath this for you and anyone else to sign it when it's printed. Remove the crop marks on the inside this time. **Save** again.
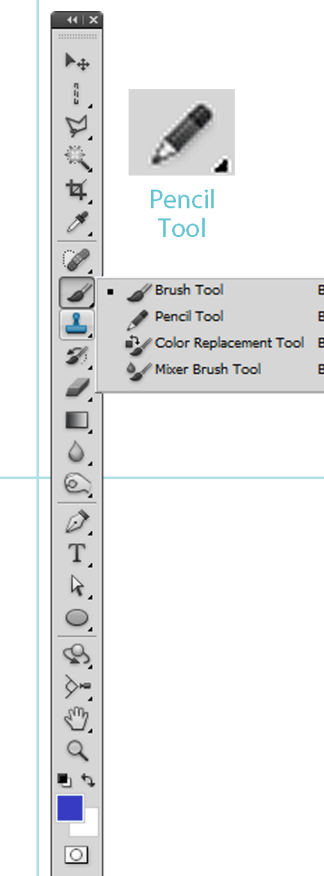
Basic 5x7 greeting card template

Having opened this template in Photoshop or image editor of your choice (GIMP is free download), you can use it as a bottom-layer guide to set up your own, real template. *(If you don't see rulers at the top and left of this window, press Control/Command-r and they'll show up.)* Click on the left ruler and drag a guide to that vertical blue line just under the word "Left." Now do the same for the other two vertical guides I've given you. Now do the same for the horizontal guides, dragging them from the top ruler.

Pencil
Tool

▪ 🖌 Brush Tool	B
🖊 Pencil Tool	B
🖌 Color Replacement Tool	B
🖌 Mixer Brush Tool	B

I've made this template 300 pixels per inch, so that's the resolution your card will be. In the vertical Toolbar at your left, you may or may not see a Pencil Tool. *(If you don't see it, you can find it hiding under the Brush Tool. Click on the little black triangle at the lower right of the Brush Tool and you'll find the Pencil Tool.)* Click on it to activate it. At the upper left of this window, you'll see a tiny window indicating the pencil diameter. Make it 4 pixels.

At the bottom of your Layers Panel *(find it at the right side of your screen or press f7)*, you'll see a Trash icon at the lower right, and next to it a "New Layer" icon. Click that icon, and you'll see you have a new layer. If you keep your card components on separate layers, you can manipulate them individually.

Do some squiggles with the Pencil on your new layer. Cool? We're done with that layer, so drag it to Trash (or just click the Trash icon). Now make a fresh new layer. Hold Shift and it'll enable you to draw a STRAIGHT line. Do you have a straight line? Un-click and select that arrow tool at the very top of the Toolbar. Use it to drag your line atop one of the black crop marks I've made here. Hold Alt-Option and drag that line to duplicate it and place the new line over another crop mark. To turn it 90 degrees to make the rest of the crop lines, type Cont/Cmd-t (transform) and right (cont)-click and choose Rotate 90° CW (or CCW). Now place that line where needed and duplicate as needed.

Now you can click on the eyeball of this template layer to close its visibility, because you don't need this layer anymore (and you certainly don't want it to PRINT!).

Bye!

No, it's not Hallmark

This card was made especially for you by someone who cares enough to put a lot of time, effort and creativity into it.

Now **Print** the outside, then put the paper back into the printer face-down and **Print** the inside. (This may take a bit of practice to get them both right side up.)
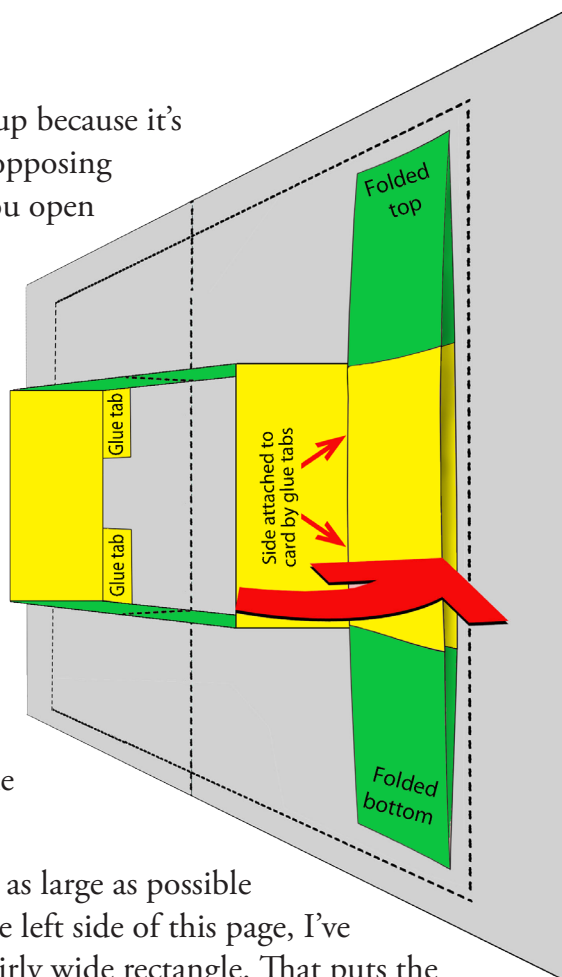
Fold the paper in half carefully. Using the crop marks on the front cover of your folded card, cut it to 5"x7" with a knife and straight edge. You're done! You've printed your first card.

Now, to make things pop up

A folded feature will pop up because it's anchored to glue tabs on opposing pages which separate as you open the card. The closer to the crease, the taller a feature can be; further from the crease, it would stick out of the opening edge when closed.

The height (top to bottom as we look at it on our horizontal page), and width have to be balanced to prevent the feature from sticking out of the top or bottom of the card.

I like to make my features as large as possible within these limits. On the left side of this page, I've drawn a pop-up that's a fairly wide rectangle. That puts the
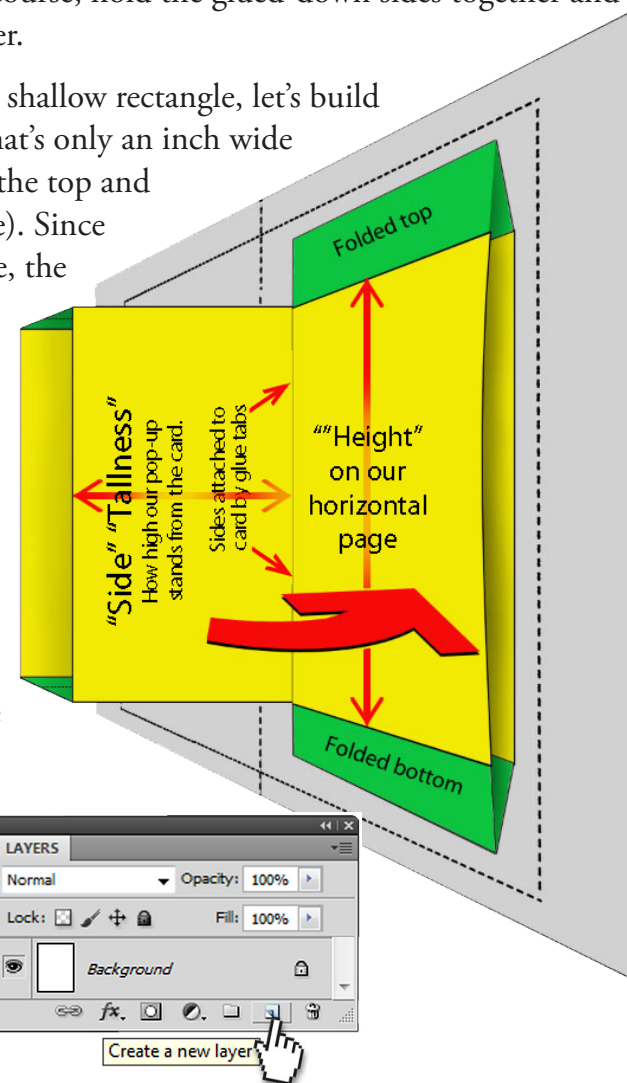
anchor points (the glue tabs under the left and right sides) pretty far from the center crease of the card, which limits how tall the feature can be. When the top and bottom of this feature (shown here in green) are folded in half (as shown beneath the large red arrow), that doesn't leave us much space for the sides (shown in yellow), since we want to keep the top and sides inside the folded card. The top and bottom, of course, hold the glued-down sides together and pull them up together.
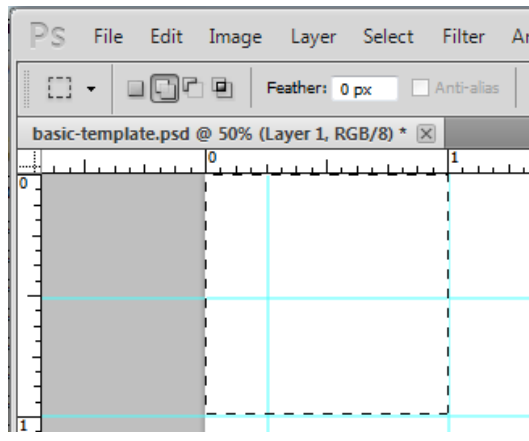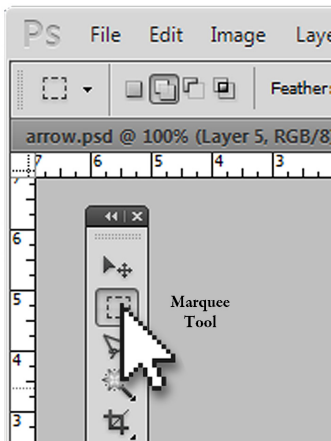
Instead of that wide, shallow rectangle, let's build a birthday pop-up that's only an inch wide (again, I'm showing the top and bottom in green here). Since it's only an inch wide, the side glue tabs are half an inch from the center fold, so there's a lot of room left for tallness!

Create a new layer (*click on the New Layer icon at the bottom of the Layers Panel*) and select the Marquee Tool. Drag a square from the upper left of your window to create a one-inch square selection.

Ps File Edit Image Laye

Feather:

arrow.psd @ 100% (Layer 5, RGB/8

Marquee Tool

Ps File Edit Image Layer Select Filter An

Feather: 0 px □ Anti-alias

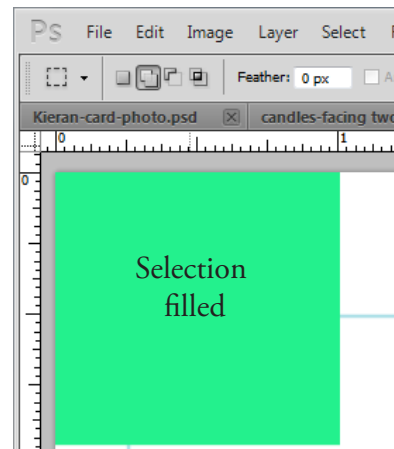basic-template.psd @ 50% (Layer 1, RGB/8) * ⊠

(Holding Shift will keep the dimensions equal).

To follow my example and fill that selection with green, click on the icons showing the current foreground/background colors and then choose a green from the panel which pops up. To fill your square with your new foreground color, press Alt-Backspace on Windows (Option-Delete on Mac).
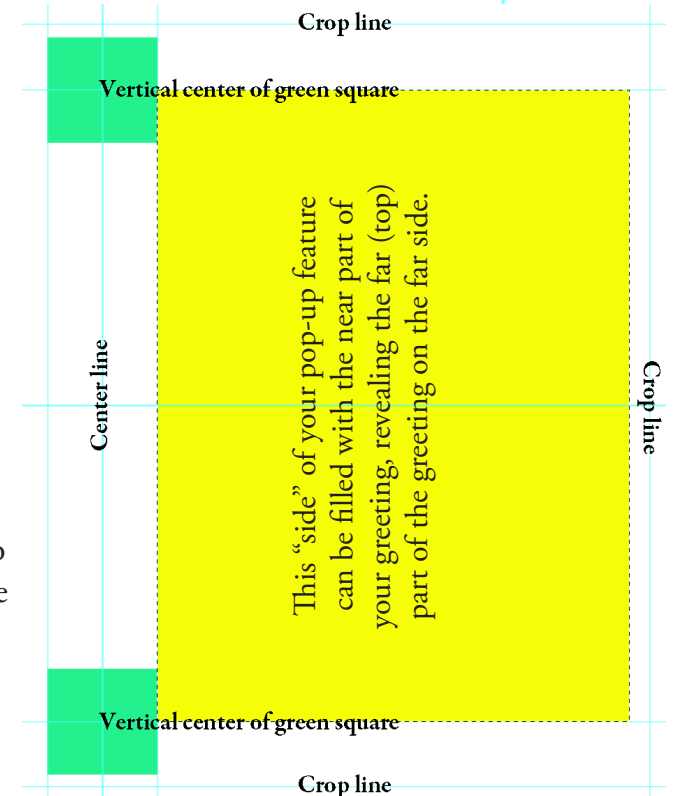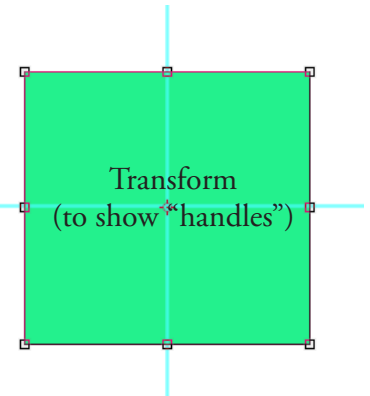
OK, drag your new green square to the center line of your template, about an eighth of an inch below your top crop line. *(Hint: if you press Cont/Cmd-T, you'll enter a Transform mode which shows the center point of whatever you're addressed to.)* Drag guides from the top ruler *(press Cont/Cmd-R if you don't see rulers)* to the vertical center of your green square. **Hold Alt/Option** (to duplicate) and **drag** a copy of it

Foreground/ Background color selector

Ps File Edit Image Layer Select Fi

Feather: 0 px □ An

Kieran-card-photo.psd ⊠ candles-facing two

Selection filled

to about an eighth of an inch from your bottom crop mark. Drag a guide to the vertical center of *that* green square. The "side" of your pop-up feature can be the size and shape I've shown here in yellow.

Create another new layer and marquee-select that space (allowing about an eighth of an inch from the right edge) and fill it with yellow if you're following along. Of course, there's another "side" on the left side. (See the diagram on the following page.)
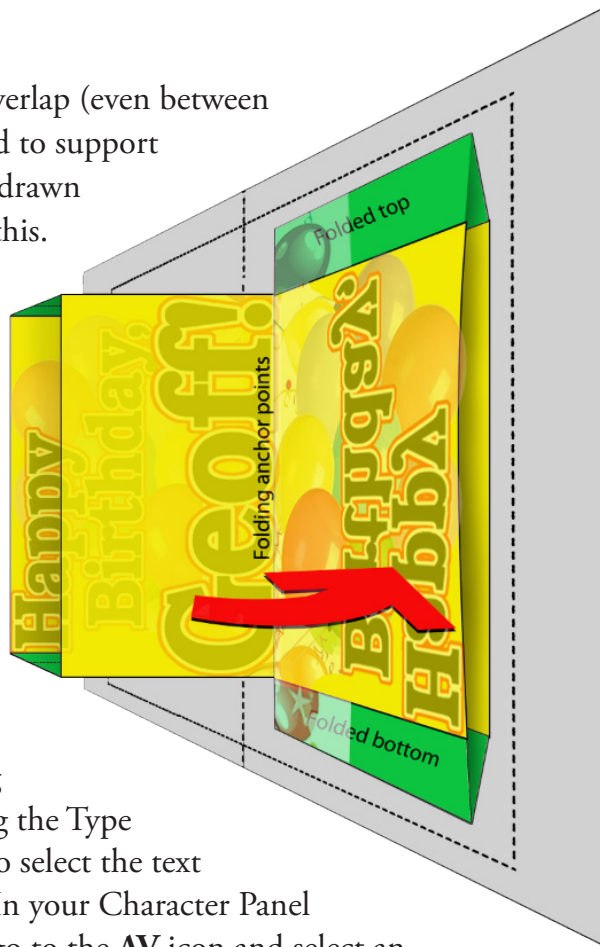
Alt/Option-drag this yellow side to the left side of the page as the other "side" of your pop-up box. You can delete those green squares now. You'll add "top and "bottom" panels later.

Transform (to show "handles")

Crop line

Vertical center of green square

Center line

Crop line

This "side" of your pop-up feature can be filled with the near part of your greeting, revealing the far (top) part of the greeting on the far side.

Vertical center of green square

Crop line

Looking at those "side" rectangles, we can compose the feature of our first pop-up. It'll be more convenient if you rotate the sides 90 degrees (***Cont/cmd-T, right (Cont)-click*** and choose ***Rotate 90 degrees***).

Cut-out letters must overlap (even between words) if they're needed to support each other. Your hand-drawn lettering can easily do this. In Photoshop you can reduce the letterspacing. You can also surround text with a contrasting color until that area overlaps, and even put an outside line around that area as shown.

Let's begin by reducing the letterspacing. Using the Type Tool, use your cursor to select the text you want to work on. In your Character Panel (Window>Character) go to the **AV** icon and select an amount less than the default zero.
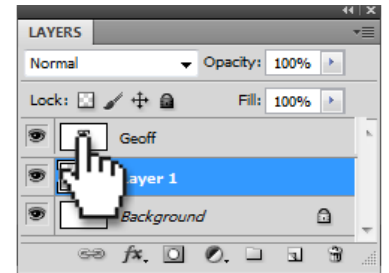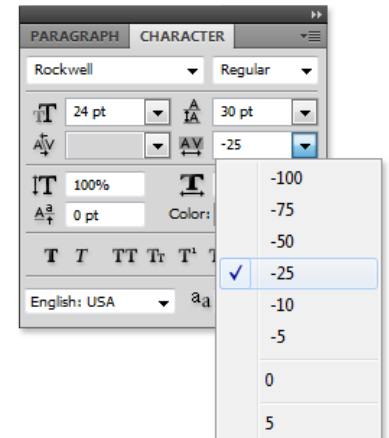
To outline around your letters, create a New Layer by clicking on the New Layer icon at the bottom of your layers panel. Drag that new layer beneath your text layer.

Control/Command-click on the preview window of your text layer to make a selection of the pixels which make up those letters. Now expand

that selection by going up to **Select**, dragging down to **Modify** and clicking on **Expand**.
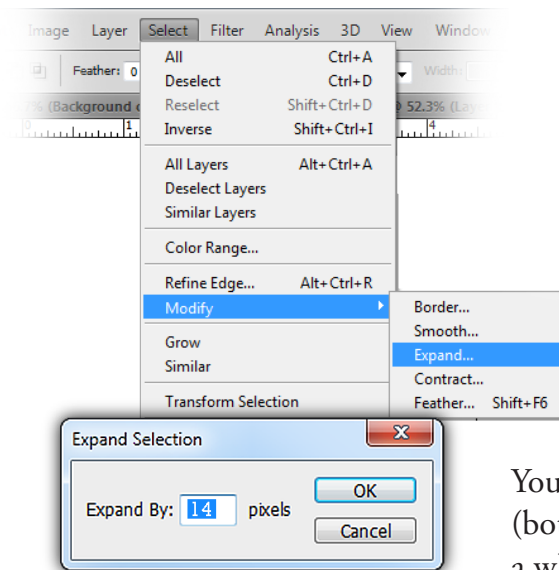
A dialog box will appear, allowing you to enter how many pixels you want this selection to expand in each direction. You're addressed to the layer beneath the black type, and (in my example, anyway) you have black selected as a foreground color. Since our text is already black, let's choose a different color by clicking on the Foreground/Background color selector. This will take you to the Color Picker where you can choose the color you want (I chose white). You can repeat this process *(new layer beneath, select,*

enlarge, fill) with a red outline as I did. I also used a red felt pen on those white cut-out edges on the printed card.

On the web, you can find images to enhance your card. (See my sidebar about copyrights.)

You'll find covers of your card (bottom of next page) occupy a whole Photoshop document.

Type tool

6

You'll need to create another one from the template to use as the interior (the base for your pop-up feature). I look at where my feature will be on that interior and make the feature elements on that document and then drag them onto yet another Photoshop document of their own, adding the one-inch "top" and "bottom" with glue tabs to attach one "side" to the other.

At the bottom edges of your pop-up feature "sides," you'll need to add 3/8"glue tabs (red arrows, below right). You have the choice

Slits for glue tabs

Glue tabs

of just folding those tabs (forward or backward) and gluing them onto the interior of the card, or slitting the card and sliding the tabs through where they'll be hidden when you glue them to the back.

In this case, you'll print the cover document separately and glue it onto the glued-together assembly, fully hiding those glue tabs.

If you simply glue the outside covers onto the interior, you'll have difficulty opening and closing the card (and displaying it open). Instead, I like to cut the covers apart at their fold mark, and glue the front onto the folded interior, and then glue the back onto this folded assembly, keeping a single interior layer with a thin "hinge." Here's a PDF of that Geoff Birthday card, in case you want to see it more closely: http://brucephilpott.com/photos/geoff-card.pdf

Now that you've made an actual pop-up card, I can speak in "shorthand" about making them. This next one is a hexagon-shaped birthday cake. I'll share with you a few of the things I learned from making it.

In the previous card, you saw that the "top" and "bottom" (I showed those in green in my diagrams, remember?) of a box need to fold in

half as the card closes. I figured if I made the two halves of the top and bottom the same size as the sides, I'd have a hexagon.

You can see that the outer edges of the pop-up feature on a card seven inches tall have to be less than 6-3/4" (to hide within the card) when folded in half, so we have 13.5" maximum for a perimeter. Divided by six sides, that gives us sides that are 2-1/4" wide. The left and right sides (which will be glued to the card itself) will be 3.897" apart - about four inches. Since our cake will center on the center crease of the card, the cake will occupy about two inches on either side of the crease, leaving less than three inches when it folds into the 5" width of the card. So the feature has to be under 3" in "tallness," including the candles I designed around the perimeter of the cake.

In printing a scratch paper proof of this design, it became obvious that I'd have to print both sides of the pieces that were to show as candles. It's next to impossible even for a print shop to get the printing on both sides of a sheet of paper to align consistently, so I saw that I'd have to allow for this mis-register on the image that would be printed on the back side.

I used the Cloning Tool (see my tutorial on Cloning) to enlarge those candles so the backs of those candles would look decent even if the print job wasn't aligned. You can see the results on the next page.

Something I didn't understand until too late with this card was the top of a box won't pop up correctly unless it has a sturdy "leg" between the folding-in-half top of the box and the crease of the card. Now neither of us has to make this mistake again. The cake top is attached to the left and right sides with glue tabs.

After giving this card to my granddaughter, I thought *Who has ever*

Copyrights and images for your cards

I'm not an attorney and I don't suggest you commit criminal acts. I own copyrights and I believe in the rights of copyright holders. When t-shirt companies are prosecuted for using Snoopy or Batman without being licensed to do so, it pleases me.
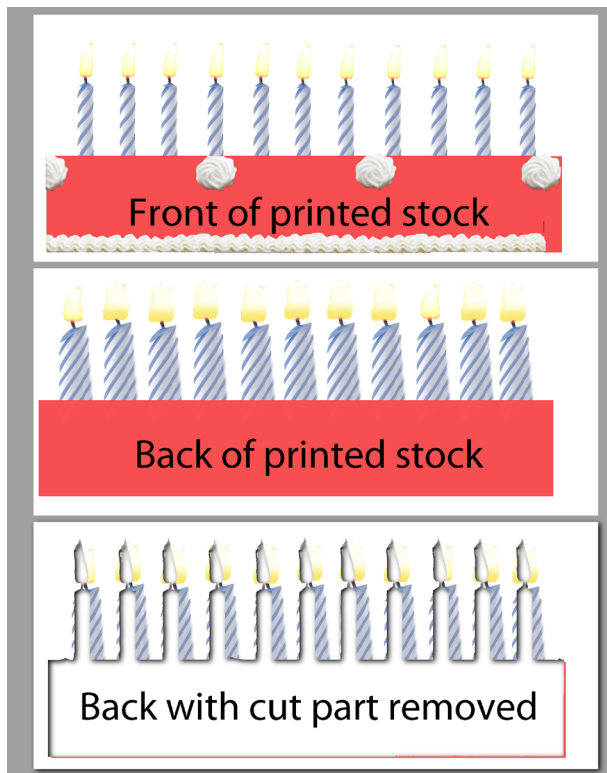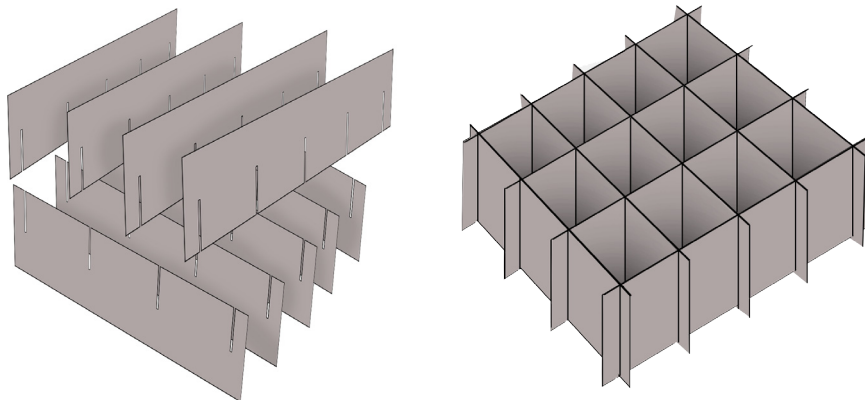
However if your nephew is nuts about Batman, I don't believe it's morally wrong to copy an image of that character for his birthday card.

I get many of my pop-up card images on Google and I don't receive money for my cards. OK, now I'll leave it to your conscience whether or not you have to create your own, entirely original images for these cards.

seen a hexagonal cake? and *Candles are never around the very edge of a cake*, and wanted to make a more realistic cake – a *round* one with candles all over the center!

I'd seen beautiful commercial pop-up cards such as those by lovepopcards.com, and noticed many of them are based on a diagonal grid of panels which are slid together at 45 degrees to the center fold. They collapse very well diagonally. I thought I'd just put five candles on five rows of panels and have a birthday card for a grandson's 25th birthday.

Front of printed stock

Back of printed stock

Back with cut part removed

I made a prototype using scratch paper and really disliked the result! I had ranks of candle "soldiers" all marching in rows, and I wanted a round cake, anyway!

Of course, the flat paper candles could each only face one of two directions, so I played with my grid (which I now limited to a circle with a 13.5" circumference) until most of the left half of the candles were facing left and most of the right half of the candles were facing right. By the way, circles do not want to fold flat and then pop back into a circle. This photo shows the finished cake pop-up early-on. I did learn another method of

connecting pieces when this circular cake surround failed in two places. It came apart at both sides where I had the two side lengths attaching to the grid where the grid, in turn, was glued-tabbed to the card itself. I'd made the mistake of using water-soluble glue. In reassembling these joins

with Uhu tube glue (petroleum-based), I made two holes through each assembly and used a needle and thread and securely sewed through them as if they were buttons which had come off.

This round cake card also showed me that the less time a card spends in its envelope, the better shape it will be in when the recipient opens it.

In designing your card, if you plan to enclose cash, a gift card or tickets, for instance, you might hide a pocket in the essential parts of your design, so those tickets could peek out from the edge of the plate the cake is on.

After getting a great pop-up feature to work, you might put some thought into the rest of the inside of the card... what your 3-D feature would be plausibly sitting on. I've put my pop-up cakes on a plate (beveled & embossed and casting a subtle shadow). The plate is on colored fabric. The cake and candles cast a shadow as well.

Some shapes are better than others for building as pop-ups. I'd love to have a hot air balloon pop up over a satellite photo of a friend's neighborhood, but that shape is very small at the base and very large on top, so I haven't succeeded. The hot air balloon pop-ups I've seen have disproportionately large gondolas beneath them for this reason.

A Christmas tree is the opposite shape, so it lends itself well to this kind of project. I'll probably come up with a different type of pop-up Christmas tree each year. This year, I played a bit with a rounded pyramid grid design that might look a bit like a tree, but scrapped that design and imagined the pages of a booklet splayed out when the front and back covers were brought together. I stapled five sheets of letter-size scratch paper into what otherwise might be seen as a 20-page booklet (counting the cover sheets as pages). I could see

from this attempt that those pages would need gussets – angled, folding panels – to both pull the pages open and to keep them apart. On this final prototype, I put narrow strips of Velcro® at the top and bottom of the outside covers so they could be stuck together. Below, you can see the inside of the back cover near the star on the tree. The pages are sewn together at the spine. Sewing is very secure and

the stitch holes can be further apart than staple holes, reducing the chance of tearing.

Having done a couple of cakes, I wanted to do a different pop-up feature for a birthday card for a long-time friend who is a math teacher. I decided to try to make some kind of classroom chalkboard appear with a chalk-drawn greeting for her. I looked at the types of things which I had been able to have pop up, and thought I might be able to attach a schoolroom wall to a pop-up box which I'd turn

into a teacher's desk. This time I knew enough to put a support wall between the middle of the desk top and the center crease of the card.

The walls didn't want to close, folding around the glue-tabbed sides of the desk as the card closed; the outer bottom edges of the wall snagged on the "floor" as the card closed. Rounding the bottom edges of the wall in those areas allowed it to work. The wall and desk left a lot of floor space, so I filled it with an A-frame (also attached with glue tabs) with a couple of math jokes on it.

Here's a link to a PDF of that classroom pop-up card in case you're interested in the details:
http://brucephilpott.com/photos/classroom.pdf

I can't emphasize enough how important it is to try out your various ideas using scratch paper first, for each variation.

Here's a silent minute and a half video of these pop-ups in motion:
https://youtu.be/97C5_8j3iT8

Further references:

Duncan Birmingham has written a marvelous book, *Pop-Up Design and Paper Mechanics: How to Make Folding Paper Sculpture,* and has more than fifty excellent video tutorials on YouTube. He doesn't use printed card stock as I show here, but he explains the basic engineering principles involved in getting various shapes to come into being at different places on a folding card.

Peter Dahmen has a wonderful, different style you may also enjoy, and he has video tutorials as well.

Here are links to those two sets of tutorials for future use:
Duncan Birmingham: https://youtu.be/aGJZbNh9Phs
Peter Dahmen: https://peterdahmen.de/en/category/tutorials/

My other tutorials:
http://brucephilpott.com/photos/index.htm#tutorials

brucephilpott.com