

THE ART OF PAPER WEAVING

46 COLORFUL, DIMENSIONAL PROJECTS

INCLUDES
FULL-SIZE TEMPLATES
INSIDE AND ONLINE
PLUS PAPER FOR
ONE PROJECT



ANNA SCHEPPER AND
LENE SCHEPPER

THE ART OF

PAPER

WEAVING

46 COLORFUL, DIMENSIONAL PROJECTS

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Quarry Books

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CONTENTS

PREFACE

A BRIEF HISTORY OF PAPER WEAVING

THE BASICS

YOUR TOOLBOX

MATERIALS & SUPPLIES

BASIC TRIANGLE BUNTINGS

BASIC WOVEN HEART

BASIC HEART WITH CIRCLES

BASIC STAR

BASIC CONE

BASIC SPHERE

BASIC BASKET

LOVE & FRIENDSHIP

HEART IN HAND

HEART WITH CIRCLES OVERLAY

FLOWER HEART

CUTE HEARTS CONE

SCALLOPED BASKET

ROSE BASKET

CELEBRATIONS

SIMPLE HEART BUNTING

FLOWER BUNTING

HEART BUNTING WITH SPIRALS

BELL

CONE HAT

HOT AIR BALLOON

MAGIC CIRCUS

SPHERE WITH SPIRALS

STAR WITH CIRCLES

CANDY CANE CONE

HEART WITH CIRCLES

ROCKET SHIP

STAR DRUM

CIRCUS TENT

TIVOLI GARDENS

PEACOCK

HARLEQUIN CONE

SCALLOPED SPHERE

LAMP SHADE

ZEPPELIN

EXOTIC PALACE

DOMES & CONE TOPS

ONION DOMES

CYLINDER CONTAINERS

SHAPED CONTAINERS

ADDITIONAL PALACE COMPONENTS

ADVANCED DESIGNS

ON COLORS & PATTERNS

FRÖBEL CONE

TRIAXIAL BOX

TRIAXIAL CONE

TRIAXIAL SPHERE

TEMPLATES

REFERENCES

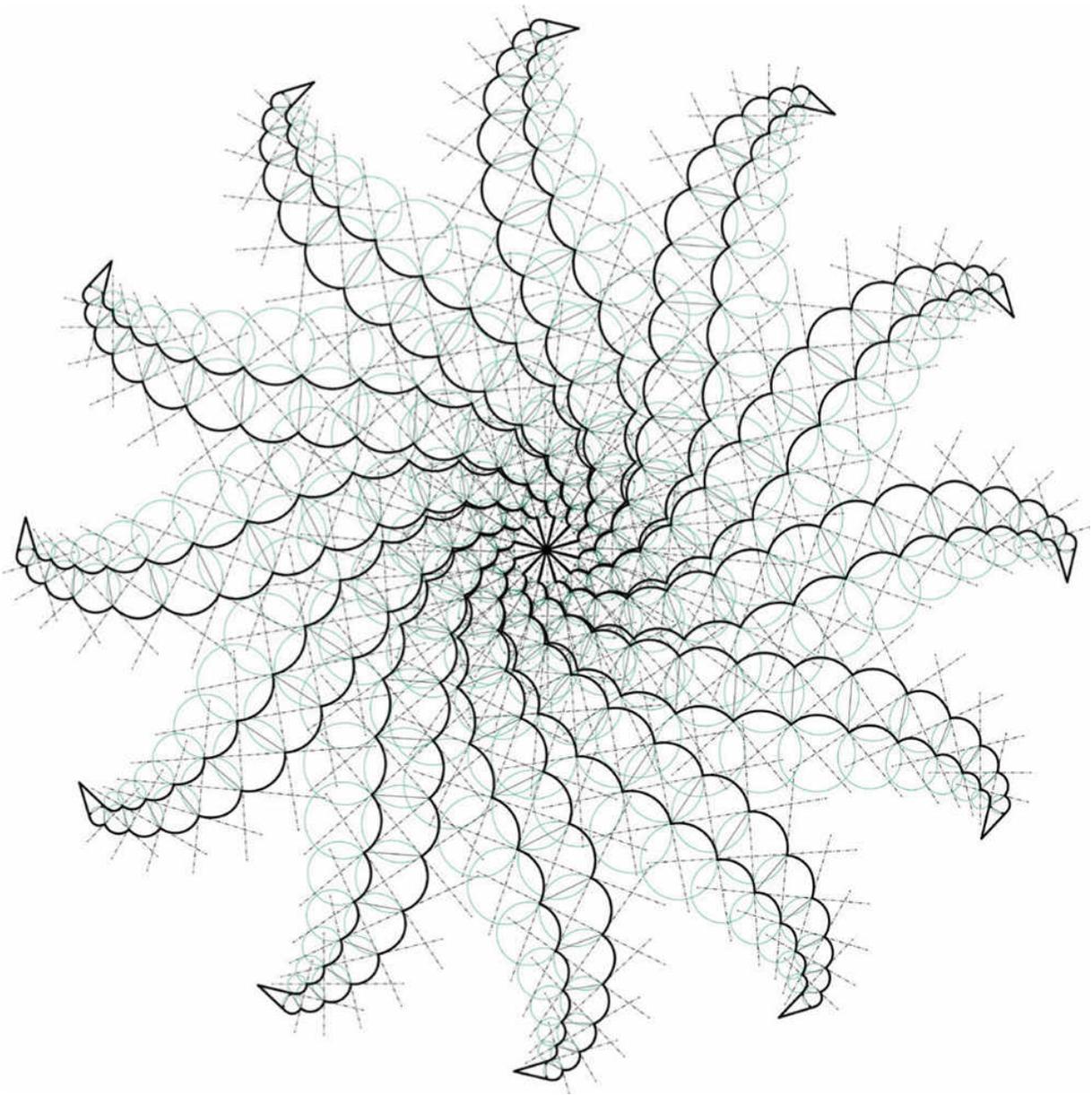
ABOUT THE AUTHORS

INDEX

PREFACE

Paper weaving is a thriving tradition in Denmark and Norway but is unknown in many other countries. In the United States, this magical craft, much loved by the Victorians, has passed into oblivion during the last 100 years. Anyone who has ever woven a paper heart understands its magic, when all of a sudden a beautiful geometrical object arises in front of you. Understanding this tradition and technique is a must for any paper lover. As essential as origami is for the Japanese, so too is paper weaving for the Danes.





We want to expose the tradition to a new generation of paper crafters and introduce its origin, but also reconstruct its geometries, further expand its possibilities, and harmonize with modern requests. The projects in this book represent our interpretations of several wondrous inspirations: exotic places, festive sceneries, and natural wonders. The objects can be used in daily life—as a mobile for a baby crib or container for your favorite keepsakes. They can be featured in festive scenarios as decorations or just to induce a smile on everyone’s face.

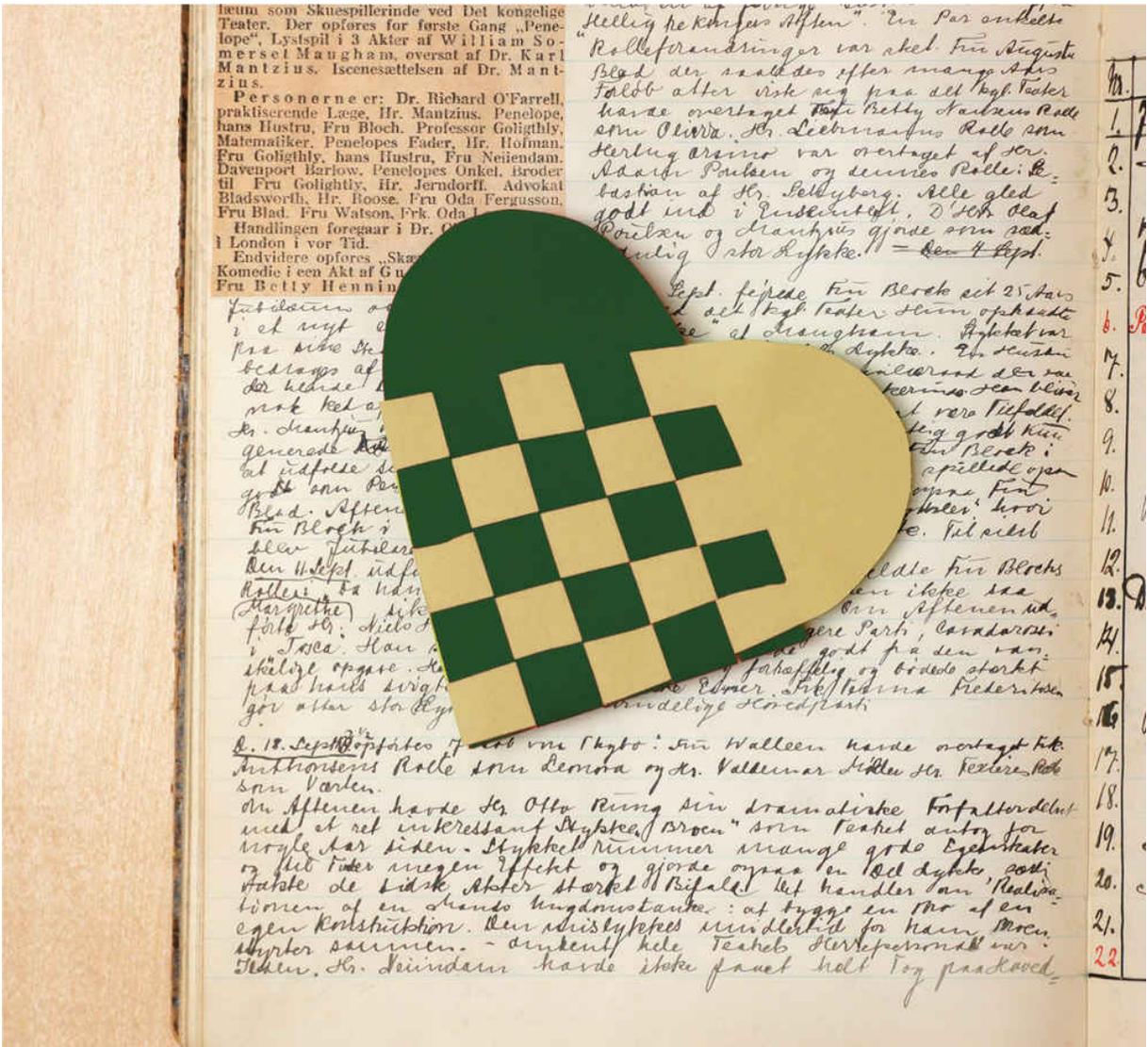
Paper weaving is a craft that the whole family can participate in and enjoy. The different projects in *The Art of Paper Weaving* are created to allow easy accessibility for the beginner, but more challenges also await the skilled crafter. The expression “practice makes perfect” has never been truer when it comes to paper weaving. Our book contains a substantial collection of woven-paper projects, so we can introduce many techniques and tricks that are important to a novice paper weaver. It is essential to thoroughly read and understand the instructions before starting your paper project. We have strived to provide instructions as precisely as possible, and they might seem overwhelming at first, but be prepared: some models are time consuming and have a high level of difficulty.

We wish you all the best with your future paper projects and hope that you will find our favorite craft as fun and riveting as we do. Don't panic, keep a cool head, be patient, and enjoy yourself. It is just for fun.

—Anna and Lene

A BRIEF HISTORY OF PAPER WEAVING

You may have seen a red-and-white woven-paper heart basket, a tradition so embedded in the Danish culture that schoolchildren are taught to make them. The woven hearts come in many shapes and sizes, but they all have two base colors neatly woven together to form the basket. In the mid-nineteenth century, Hans Christian Andersen, the famous author of the fairy tales “The Little Mermaid,” “The Ugly Duckling,” and many others, brought the concept of a woven paper heart home to Denmark from his travels in Europe.



A woven paper heart like one made by Hans Christian Andersen around 1860; the original is in the collection of the Hans Christian Andersen Museum in Odense, Denmark.

After such a magnificent introduction from their already internationally famous favorite son, the Danes came to love the woven heart, and it grew in popularity during the next fifty years. At the beginning of the twentieth century, the woven heart had reached the point of being an essential Danish tradition.

We have always been fascinated with this tradition. Devoted to create new patterns and matching colors and textures of all varieties, we set out to learn more about our favorite hobby.

We have traced the likely origin of woven-paper art to somewhere in the countries of Germany, Switzerland, and Austria. From there, the craft came to the United States with the immigrants in the early nineteenth century. In general, one could claim that the Germanic countries served as a melting pot of multiple ideas connecting and creating the woven-paper art form. Many varieties of this tradition are found today in folk-art museums and collections. Traditional woven paper objects fall into two categories: the woven heart basket and the “heart and hand” friendship and love token, the latter being a very popular art form in the Victorian age, particularly within the United States. Not just a pretty decoration, however, the paper objects had an intention: they were gifts or tokens of love for family, friends, and lovers. When one sees these woven-paper objects, it is not hard to imagine that the recipient would have been mesmerized by the intricacy, colors, and exquisiteness of these paper objects. Many were inscribed with verses, such as “Hand and heart / Will never part / When this you see / Remember me.” A German verse found on paper gloves mixes hand/finger and love/faithfulness as well: “Auf Dese Finger Thun Ich Schrieben, Das Ich dir vill Treü ver Bleiben” (Peesch 1983, 116), meaning, “On these fingers writes he, that I will to thee forever faithful be.”



Opposing triangular notches in two pieces of paper was used for joining documents in the nineteenth century.

Going back in time, the initial technique used to join two pieces of paper is based on the principle of cutting opposing triangular notches, then joining them by slipping one point over the other to secure the merge. This was a “method commonly used to join documents in the pre-stapler, pre-paper clip, white-flour-paste world of the nineteenth century. It is easy to imagine that someone who happened to join two documents of different colors in this way for expediency’s sake noticed the decorative possibilities and began experimenting” (May 2006, 62).

During the Biedermeier period in Germany (1815–1848), when Hans Christian Andersen was on his grand tour, many new influences were emerging onto society. When the German writer and statesman Johann Wolfgang von Goethe published *The Sorrows of Young Werther* in 1774, Romanticism—an intellectual and aesthetic movement that emphasized the imagination and

emotions—was becoming popular, and thus the symbol of the heart was being implemented into popular culture. At about the same time, Friedrich Fröbel (1782–1852), a famous German pedagogue and founder of the kindergarten, believed that learning the language of geometry in youth would provide a common ground for all people (Brostermann 1997; Täubner 2012) and emphasized the technique of paper weaving.



Heart-in-hand paper token resembling the tokens common in the United States during the period 1840–1860; the original (shown in Leslie S. May's article in *Folk Art* magazine) is in the collection of New York City's American Folk Art Museum.

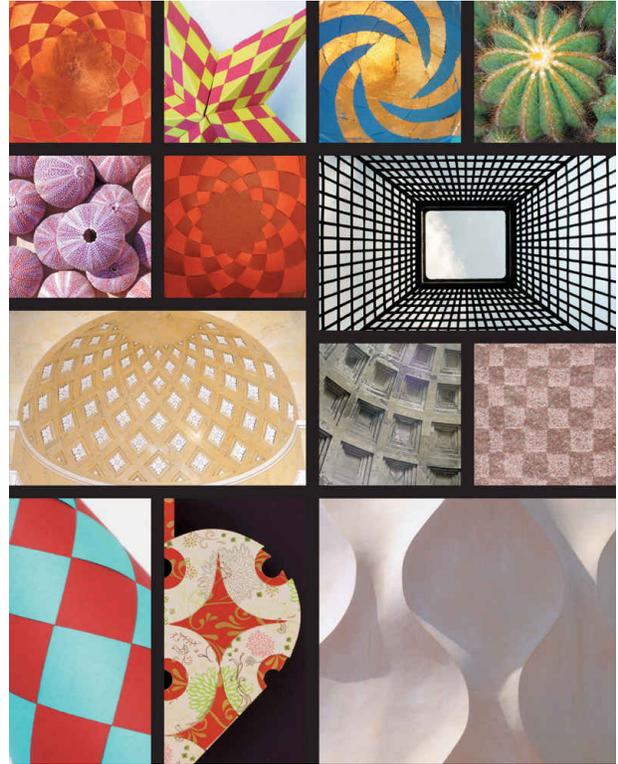
In Denmark and the rest of Scandinavia, the legend of Hans Christian Andersen's introduction of paper weaving has kept the tradition alive and thriving today, connected with simplicity and imagination, unlike other European countries and the United States, where the tradition slowly fell into oblivion. Leslie S. May (2006, 63) writes that the demise of the art of woven paper following the

U.S. Civil War “could almost certainly be attributed to the flood of colorful, commercially produced chromolithographed cards and scraps that appeared on the market around 1870.”

During the twentieth century, paper weaving continued to be developed and explored in Denmark. Many paper artists have presented their version of the woven heart and pushed the possibilities of the craft, and among them, we have been particularly inspired by two talented artists: first is the architect Hans Henrik Koch (1873–1922), godson of Hans Christian Andersen and a man so knowledgeable about geometrical shapes that he took the idea of woven paper beyond the strict and limiting geometries of the heart shape and applied the technique to a multitude of two-dimensional shapes. In the mid-1960s, a young man named Jesper Gundermann (1949–2006)—our second inspiration—created three-dimensional woven paper objects in the shape of a cone. Understanding his calculation methods has paved the way for the many of the three-dimensional objects presented in this book.

THE BASICS

For the beginner, we have provided the most basic weaving projects in this chapter. The techniques presented are embedded in all the other projects in this book. If, for example, you want to produce a scalloped sphere, it is a good idea to check out how a basic sphere is woven and understand its techniques. The basic templates are easy to cut; they require a minimum amount of work for each of their typologies. Thus, they are a great thing to practice.



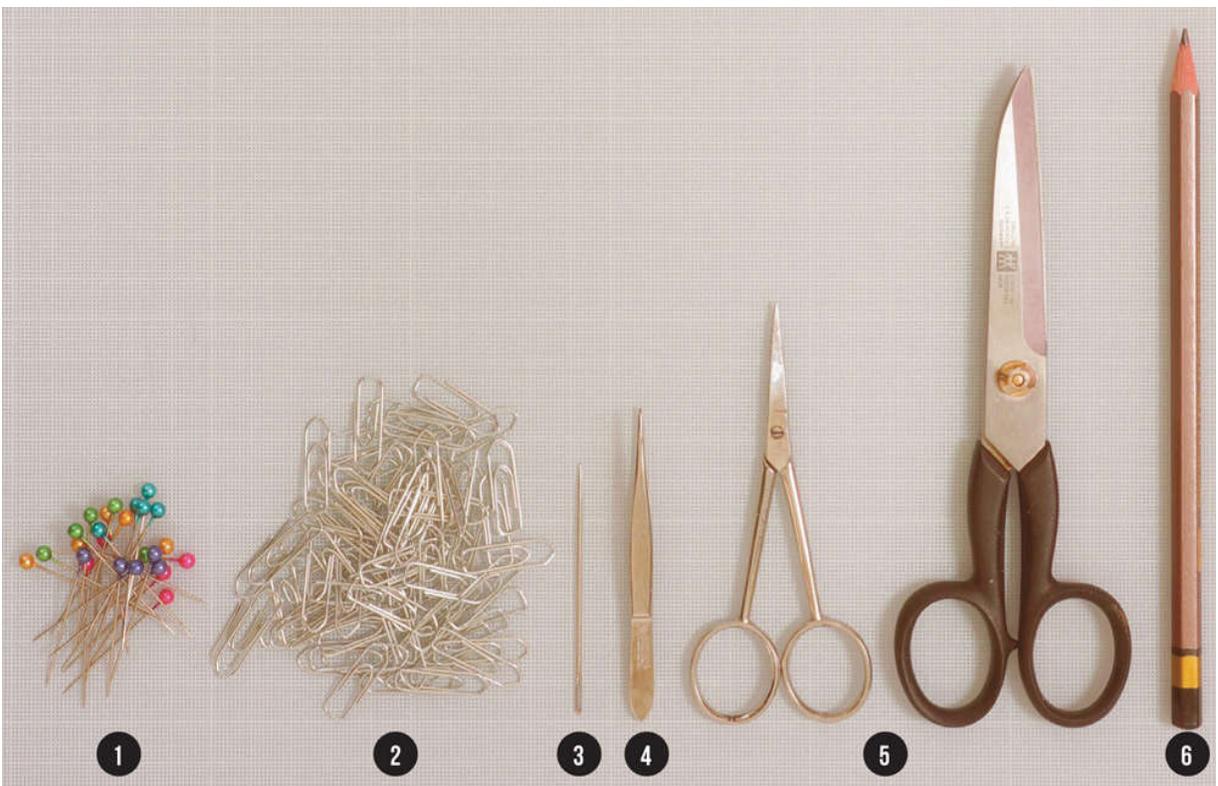
The two most-asked questions we hear are “How can I figure this out?” and “How long will it take me to make this?” To answer the first question, we normally use the analogy of knitting: you would not start to make a sweater before you know how to knit and purl. Work your way through the basic projects included in this chapter, and you will be more prepared to explore other projects or even to create your own designs. The answer to the second question concerning production time differs from person to person. If you are used to creating needlework, sewing, knitting, or other crafts, and your fine motor skills are good, you will probably be quite fast. On the other hand, if this is your first attempt to work on a small-scale craft, this can be an opportunity to exercise your finger muscles. In an attempt to quantify matters, for the beginner,

creating a woven heart could take up to 4 hours, and a sphere is a day's work. On the other hand, for the expert, a heart takes about 10 minutes to weave and a sphere 1 hour, so patience is definitely a must for the novice.

YOUR TOOLBOX

Choosing the right tools for paper weaving will yield better results and ultimately save you much frustration. This is a guide to the tools you need to prepare for the projects, including some helpful extras.

The projects will require many of the items listed here. Specific details are listed in From Your Toolbox for each project, if applicable. You'll need scissors for every project in this book, so they're not listed separately.



① STRAIGHT PINS

Straight pins with large heads are used to temporarily secure strips when weaving over a polystyrene form.

② PAPER CLIPS

Paper clips must be stainless steel; otherwise, they won't be strong enough to keep the elements in place as you weave them.

③ NEEDLE

You'll need a blunt, large darning needle for scoring paper before you crease it, (and a sharp needle for making holes in paper if you want to hang and display your woven creations.)

④ TWEEZERS

A pair of tweezers is an important tool, especially when weaving small squares or adjusting the tension of a weave. Use tweezers without heavily grooved tips, which will leave marks on the paper.

⑤ SCISSORS

When you're cutting out templates and the various parts and pieces of each project, it's crucial to have a good pair of small, sharp scissors—either silhouette scissors or surgical scissors. You should also have a standard pair of scissors on hand for cutting out larger, less intricate pieces.

⑥ PENCIL

A pencil will come in handy in case you need to mark up a project. You'll also need HB and 2H pencils (and some tracing paper) if you're planning to copy the templates by hand (see [Templates, page 135](#)).



7 RULER

A stainless steel ruler—the most durable type—is useful for measuring, for scoring paper prior to creasing, and for guiding a craft knife or scalpel while cutting strips of paper. The instructions include measurements in the U.S. customary system (inches) as well as in the metric system. When you are working on a project, always stick to just one of these systems.

8 9 10 11 12 TOOLS FOR CREASING, SHAPING & SMOOTHING

A table knife is useful for making sharp creases. Various cone-shaped and curved or rounded items that you might find around the house, such as a thick knitting needle or the rounded stopper on a perfume bottle, are good for shaping and smoothing a project's surface.

13 SCALPEL (OR CRAFT KNIFE)

An alternative to small scissors, a scalpel or craft knife is useful for making long, straight cuts. A craft knife is a more robust and safer-to-use version of a scalpel. You'll also need a cutting mat when using this tool. You may invest in a self-healing cutting mat, or just use a large piece of heavy cardboard.

14 CALIPER

A caliper is a measuring device that's great when you want to measure small items or check that your projects are perfectly symmetrical before gluing elements in place.

HELPFUL EXTRAS

A **mechanical paper trimmer or cutting machine** is great when you need to make lots of straight cuts.

When you're working with glue, **newspapers** are an inexpensive way to protect your work surface, and an old **towel** is useful for wiping away any excess glue from your project or hands.

A large **bin** for paper scraps keeps your work area tidy.

Digital tools: a photocopier, computer, printer, or a digital cutting machine—aren't necessary, but they can be used in the process to create and cut out the templates and the parts and pieces you need for the projects (see [page 136](#)).

MATERIALS & SUPPLIES

PAPER

Projects are prettiest when the edges are sharp and the faces are even and smooth without creases and frayed edges. Thus, it is prudent to use paper of good quality. One measure of paper's quality is its weight. In the United States, this is expressed as the weight of 500 sheets of paper in its basic uncut manufacturing size (or pounds of one ream). This quality measure is somewhat confusing, especially when working with a range of different handmade papers. Fortunately, there is a metric measurement that is nearly always displayed

alongside the U.S. basis weight of the more common types of paper. The metric measurement (sometimes called *grammage*) is the actual weight of one sheet of paper cut to 1 × 1 meter square, or grams per square meter (g/m²). Because the same size sheet is always being weighed, g/m² provides a more uniform scale to judge a paper's weight and thickness.



For the models shown in this book, we generally use 80 g/m² colored copy paper in letter size (8 1/2 × 11 inches [21.6 × 28 cm]) or in size A4 (21 × 29.7 cm). You may get these papers in a huge range of colors, and it is inexpensive. We buy packs of 500 sheets in the same color, but you may also find affordable packs with, for example, five hundred sheets in ten different colors in shops with stationery supplies. Supermarkets may have similar packs, but the quality of the paper varies greatly.

A weight of 80 g/m² works fine as long as the projects are no larger than about 4 inches (10 cm) or when the arms or strips you weave are narrow. When the item gets bigger, you will get a more robust and stable result when you use heavier papers. In general, you may use papers up to 130 g/m²; for some items, even higher weights may be used.

You may find paper of better quality and other weights in bookstores and craft shops; however, the price is usually somewhat higher. We use expensive papers for items we want to keep for a long time and for delicate items where the strips are very narrow, and unevenness is not acceptable. If you need gold, silver, or darker colors, you should also look in these specialty stores. The selection changes all the time; buy tempting papers whenever you find them. Look for papers that are the same color on both sides. These are usually colored all through, meaning that no white will show when they are cut.

Glazed paper is also fine, although this paper is usually softer and may be damaged and creased more easily than copy paper only. Unfortunately, this paper has color on one side, leaving the back side somewhat boring.

Japanese paper is strong and soft. This paper is well suited for the 3-D objects like spheres and balloons.

Metallic paper has a strong impact. It may, however, not always be easy to use. Some types will crease easily because the paper carrying the thin metal foil is soft. Other shiny papers are not metal at all, but plastic that is impossible to crease and must be abandoned. Genuine fine metal foil is the prettiest but is hard to cut. Again, try finding material colored on both sides.

Transparent paper used as an overlay on colored paper may give beautiful, misty effects.

We rarely use papers with patterns because we are making the pattern ourselves when weaving. However, patterns may yield quite different, surprising, and very pretty results. In particular, papers with a tiny pattern are well suited.

It is tempting to use or reuse pretty gift wrapping. Be careful: This paper may be fine, soft, and delicate. Very narrow arms and strips are easily damaged.



GLUE

We use a glue stick to join the pieces. You may find numerous types and qualities. Some will dry faster than others, which is useful because you will have different requirements, depending on what it is you have to fix. The fast-drying glue sticks are ideal for fixing individual arms where the surface is small. The slower-drying glue sticks (often less expensive) are perfect when you are fixing larger surfaces, like long strips, where it takes some time to align the strip all way around the item.

BASIC TRIANGLE BUNTINGS

These three triangular flags represent the main techniques used in this book: weaving in rows, weaving around a center, and sliding. If you are not familiar with these techniques already, you may start by making these simple flags.

All flags are provided with small holes along the upper edge. These are used when putting the flags on string. You may make the bunting from just one type of flag, or you may mix them. You may also scale the templates up or down so that the bunting is just the right size for your purpose.



MATERIALS

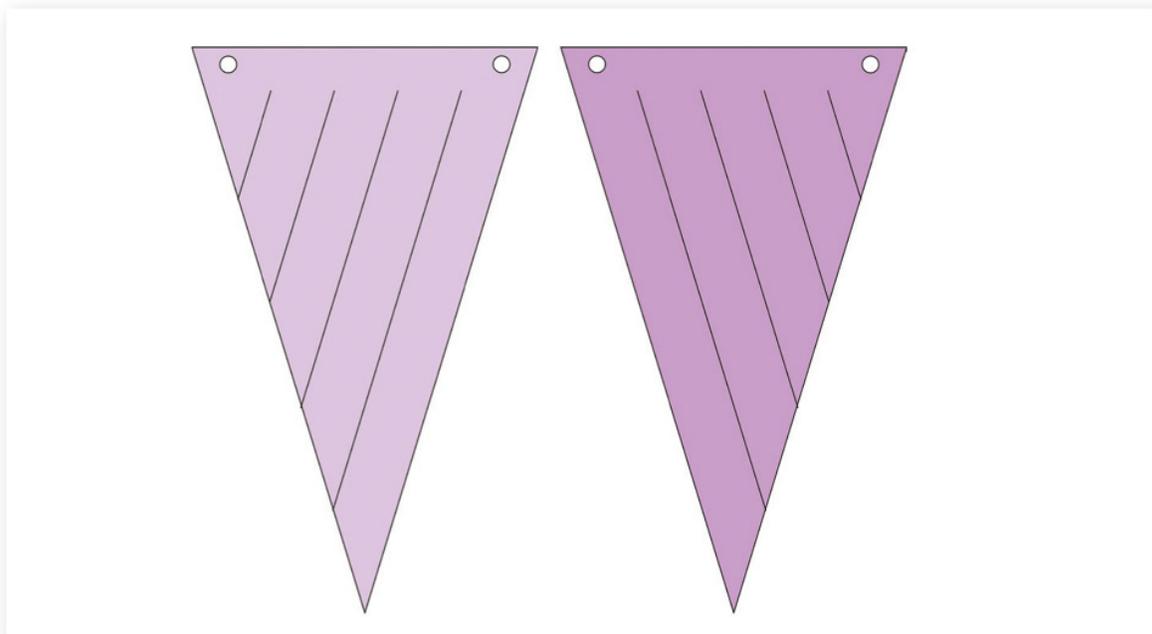
- Paper in two contrasting colors (colors X and Y), 80–130 g/m² in weight (*Note:* If you want the bunting to be viewed from both sides, use dyed paper that is the same color on both the front and back.)
- Glue stick
- String (for hanging the bunting)

TEMPLATES AND PIECES

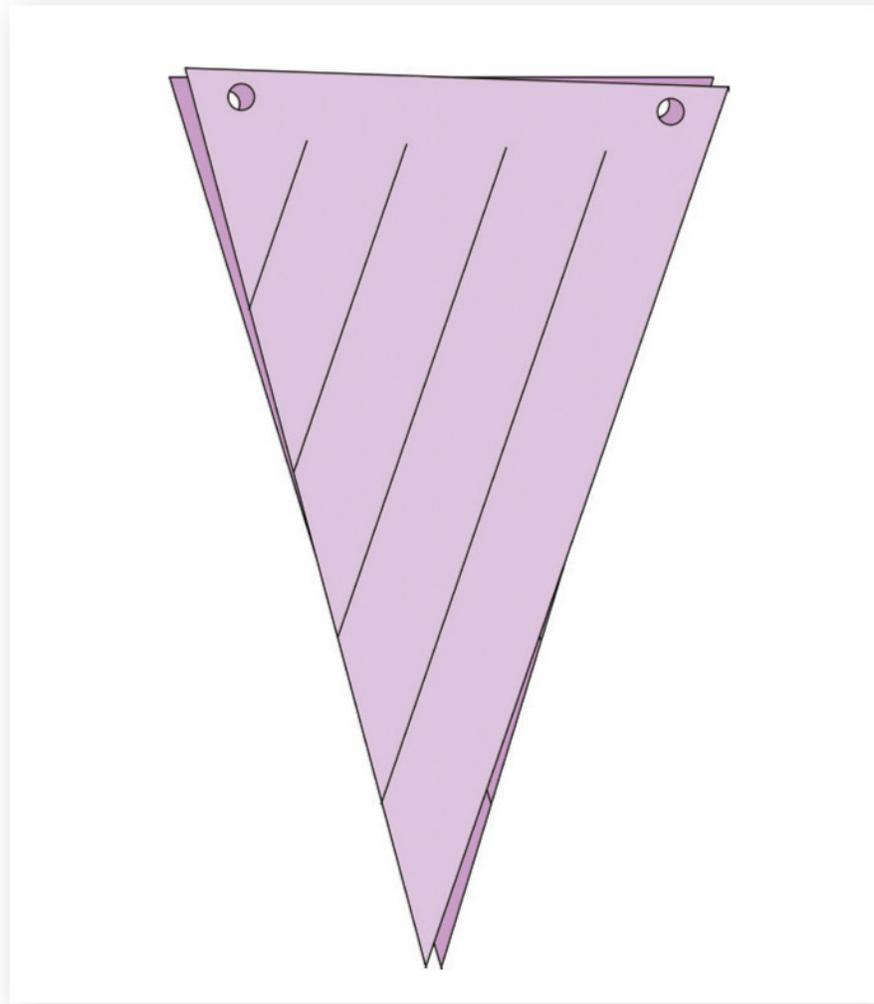
- For the project templates, see [page 135](#).
- Copy the template using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - A1 (for weaving in rows): 1 in color X (shown in light pink) and 1 in color Y (shown in dark pink)

INSTRUCTIONS FOR WEAVING IN ROWS

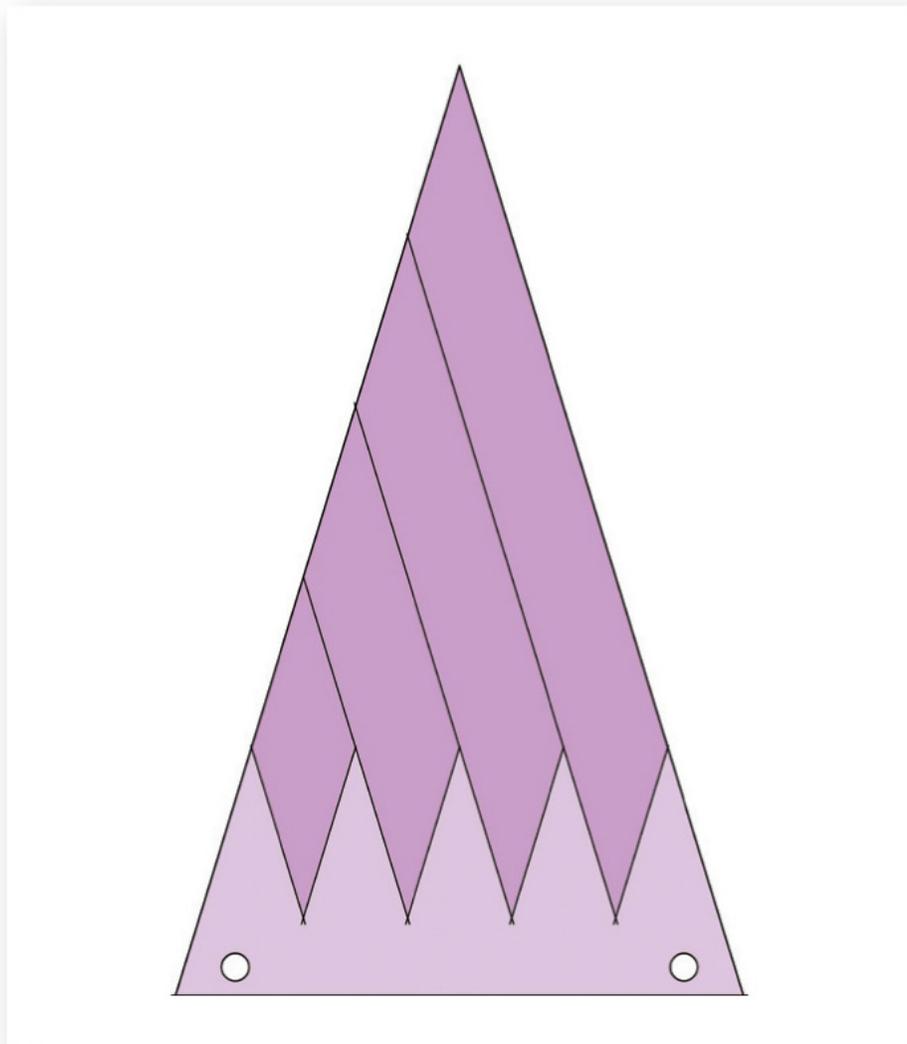
In the checkered flag, the strips are cut parallel and connected along the upper edge of the flag.



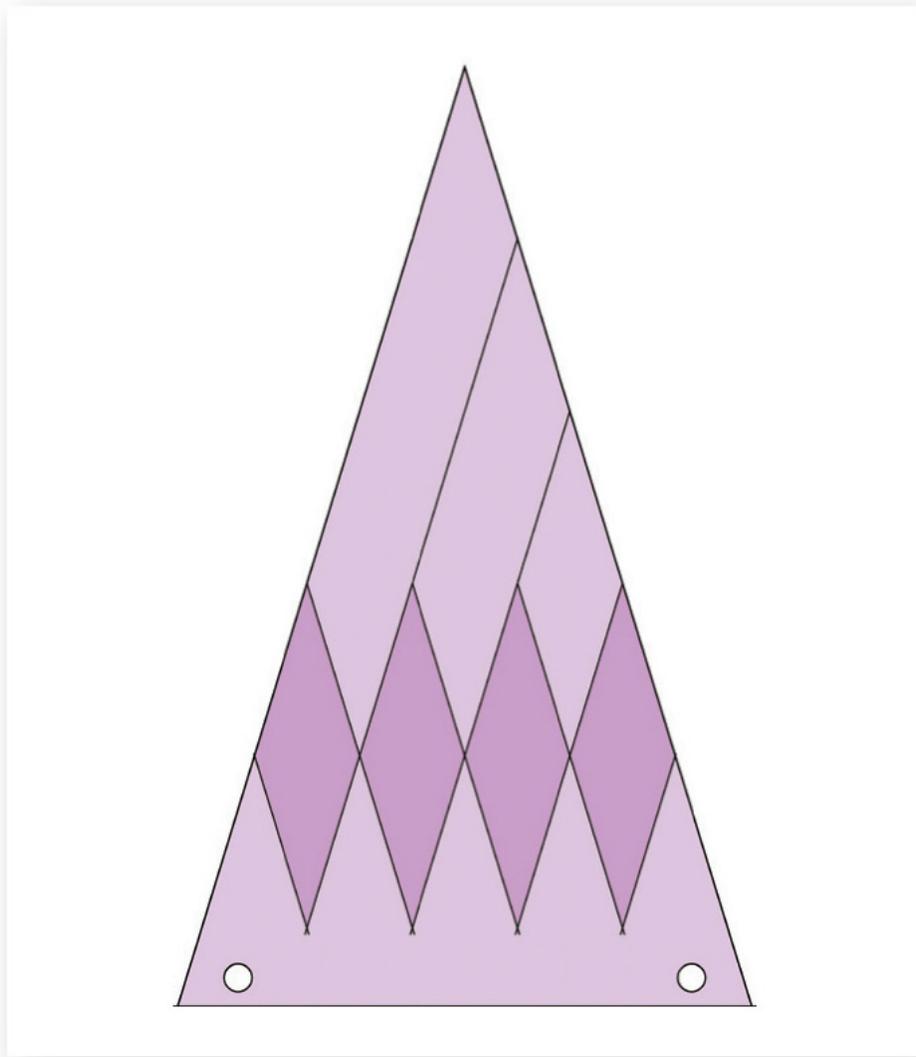
- 1 Turn the pieces so that the strips run in opposite directions.



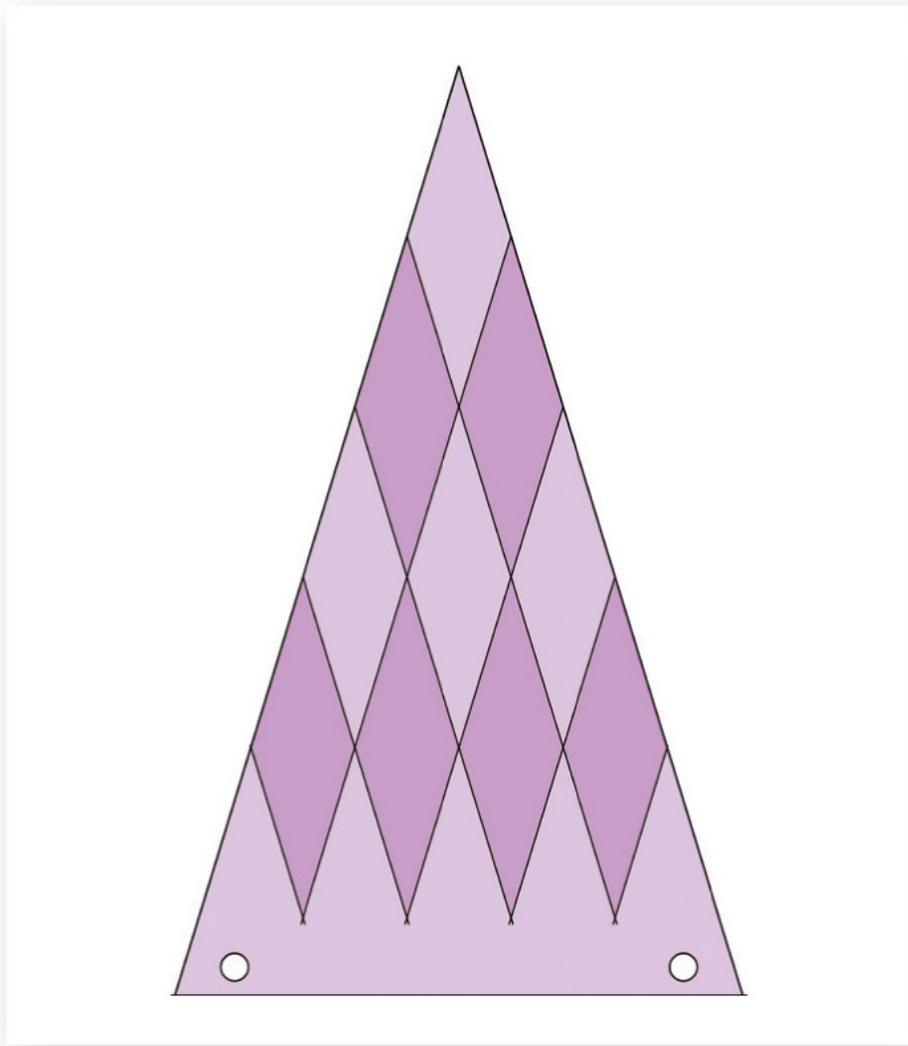
② Place the two pieces on top of each other. Align the edges and holes. Secure with a little glue near the uncut upper edge.



③ Turn the flag so that the tip points upward. Start at one side and draw the first strip from the layer below to the front through the nearby slit in the top layer. Continue, strip by strip, across the entire row.



④ Align the pieces and continue weaving all rows in the same way. With a little practice, this will go quickly



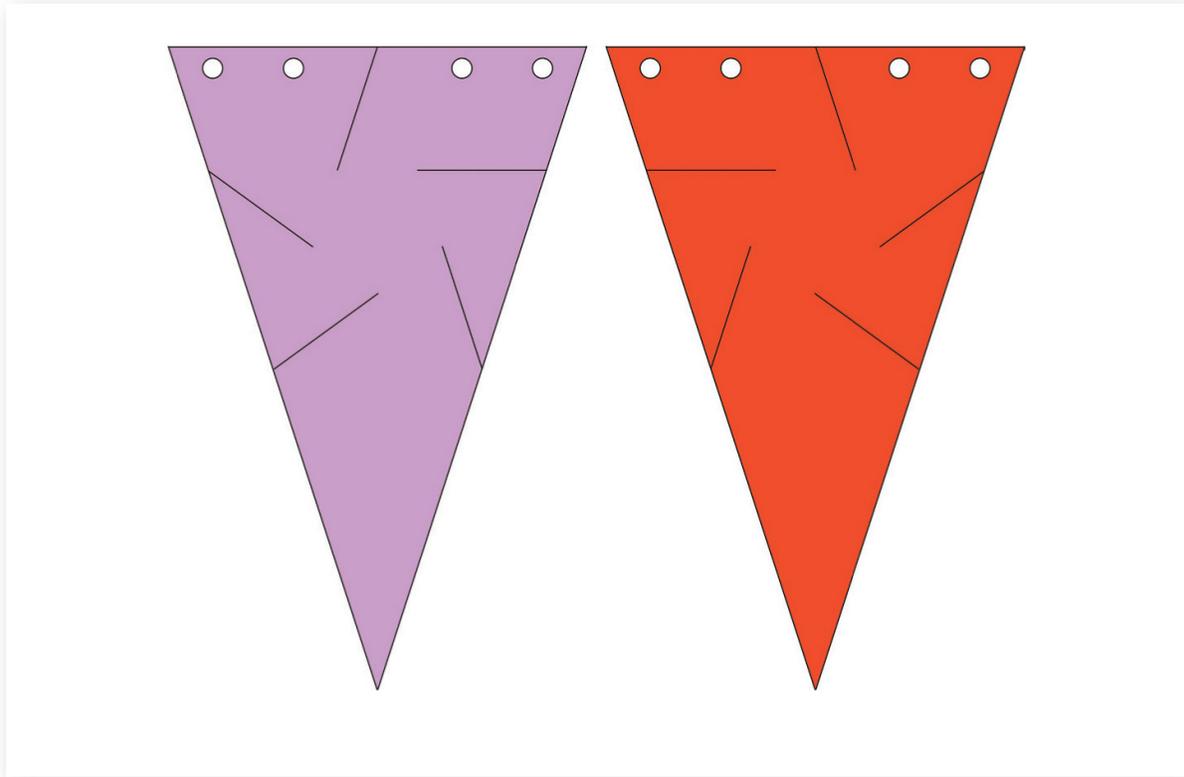
⑤ Secure the two layers with glue at the tip, or at the end of every strip, if needed, for a perfect flag.

INSTRUCTIONS FOR WEAVING AROUND A CENTER

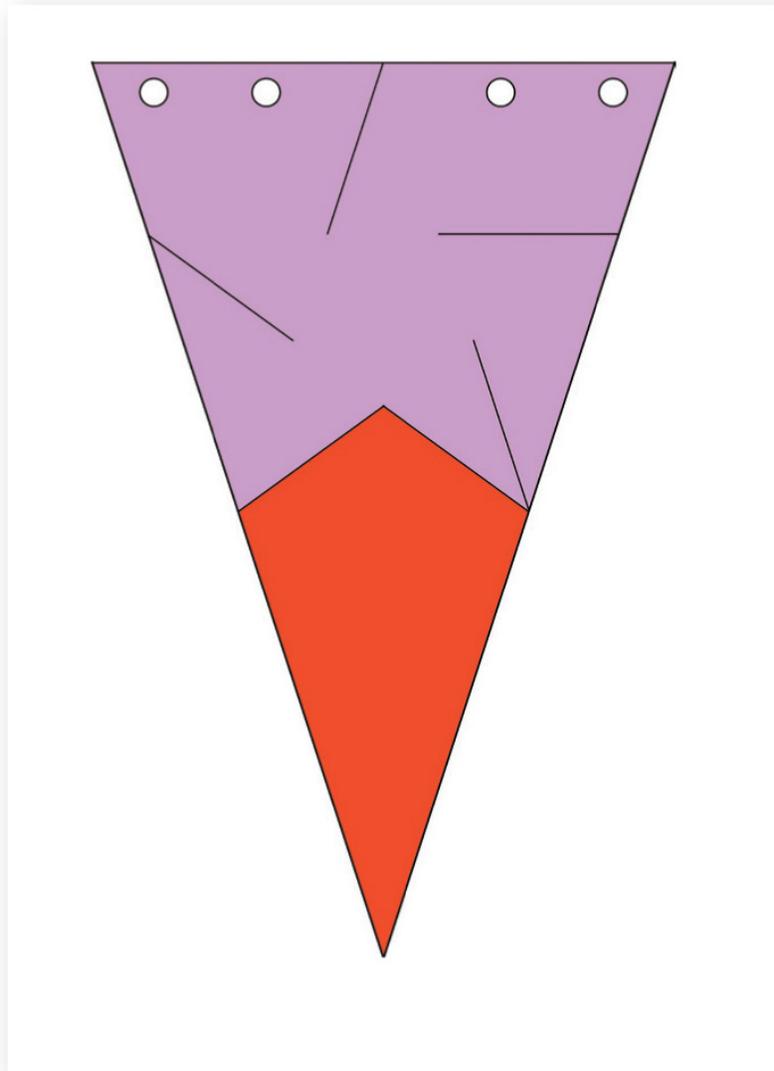
In the star flag, the strips are connected around a center shape. In this case, it is a pentagram. When you weave this flag, you do not work in rows along a straight line, as you did in the preceding checkered flag, but in rows around a center.

TEMPLATES AND PIECES

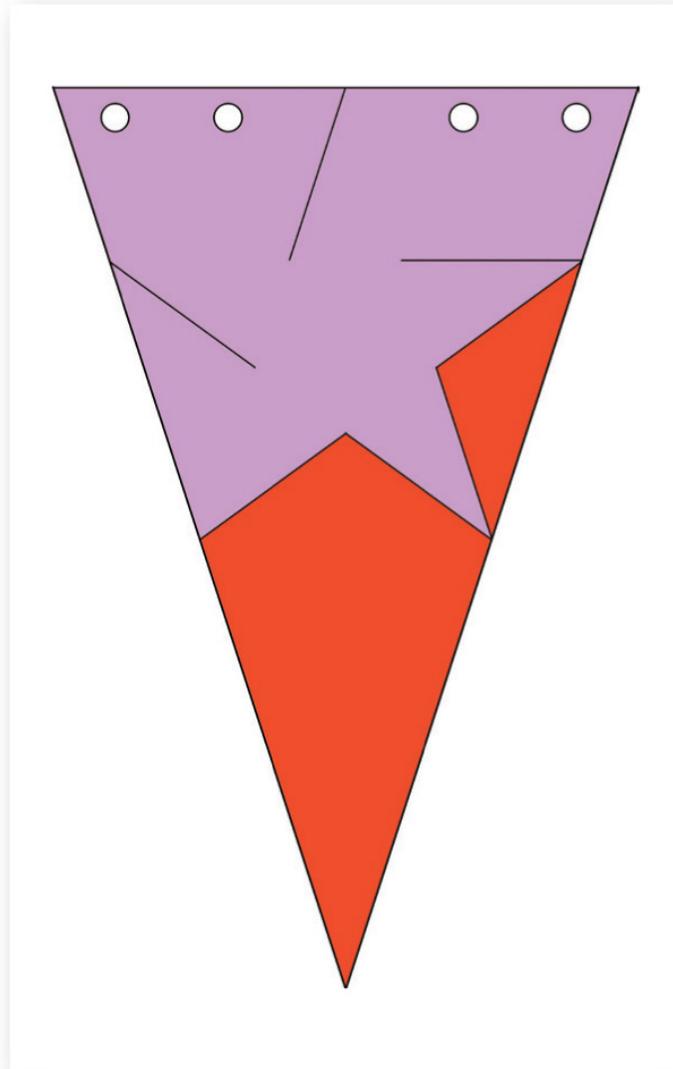
- For the project templates, see [page 135](#).
- Copy the template using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - A2 (for weaving around a center): 1 in color × (shown in dark pink) and 1 in color Y (shown in red)
 - A3 (for sliding): 1 in color × (shown in light pink) and 1 in color Y (shown in red)



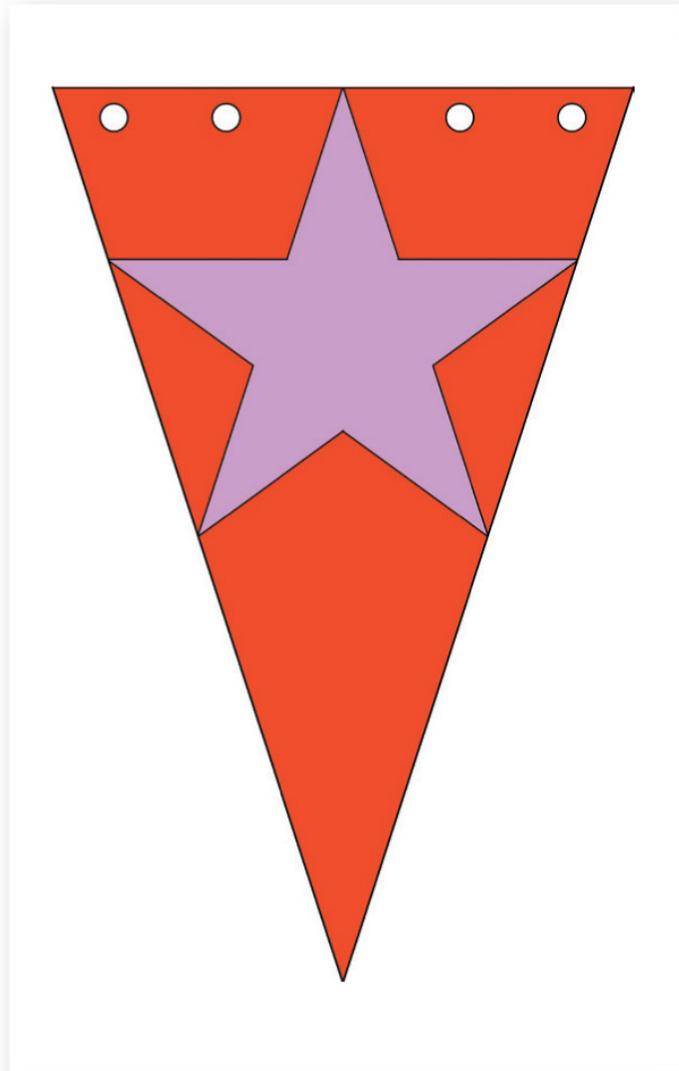
① Arrange the pieces so that the slits are mirrored (or reversed). Place the two pieces on top of each other so that the upper edges and the holes are aligned.



② Start wherever you like and twist the layers of paper around the base of a slit so that part of the underlying piece goes through the slit.



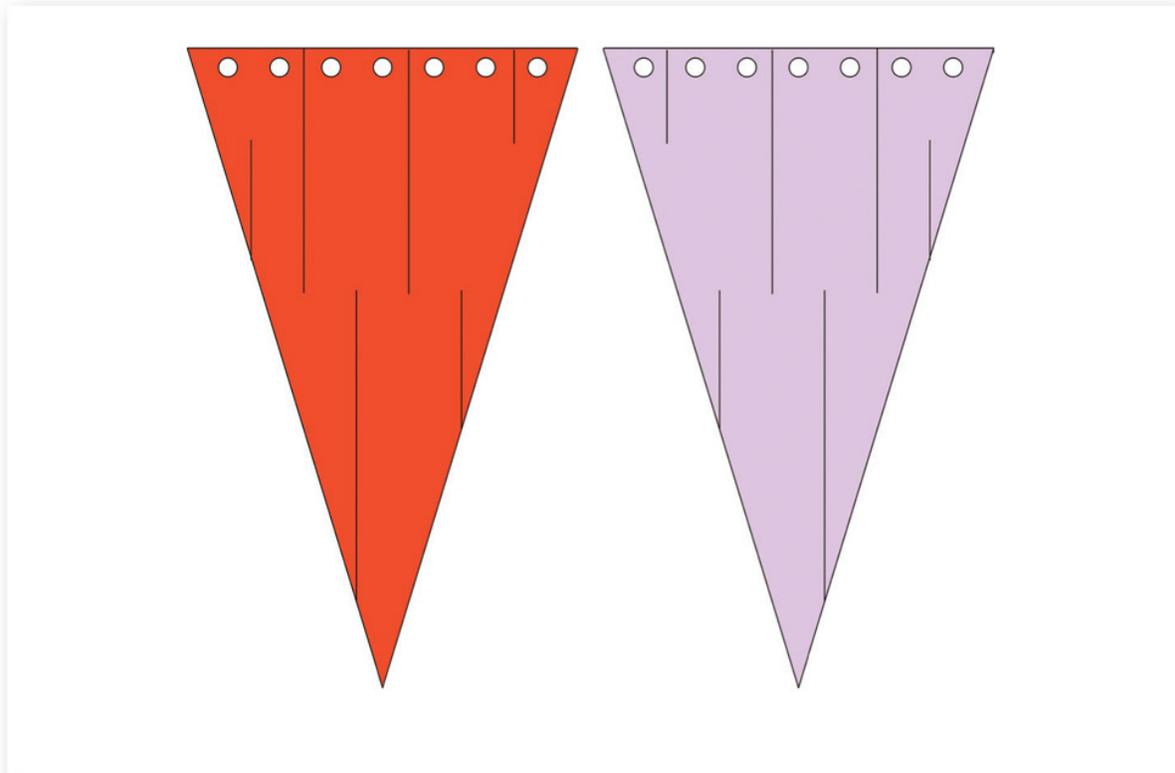
③ Align the edges and continue to twist through each slit in the same way, working around the center of the star.



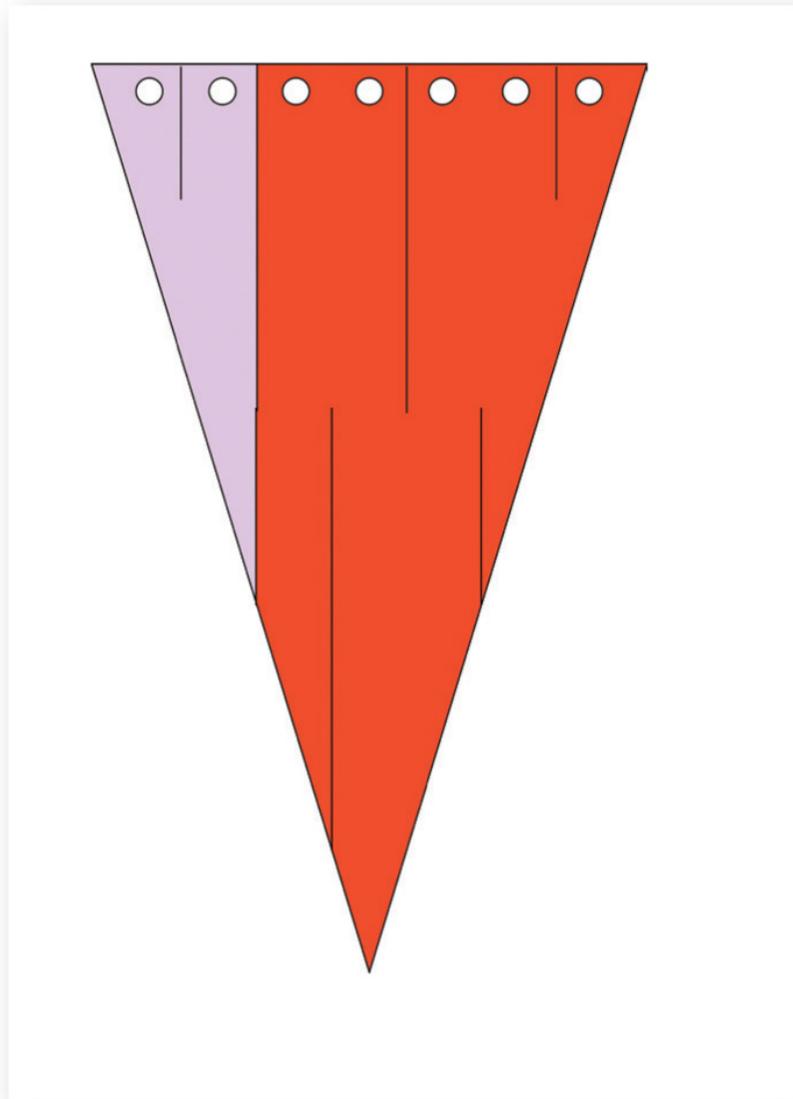
④ Align the triangles and fix the two layers with glue where they meet along the edges.

INSTRUCTIONS FOR SLIDING

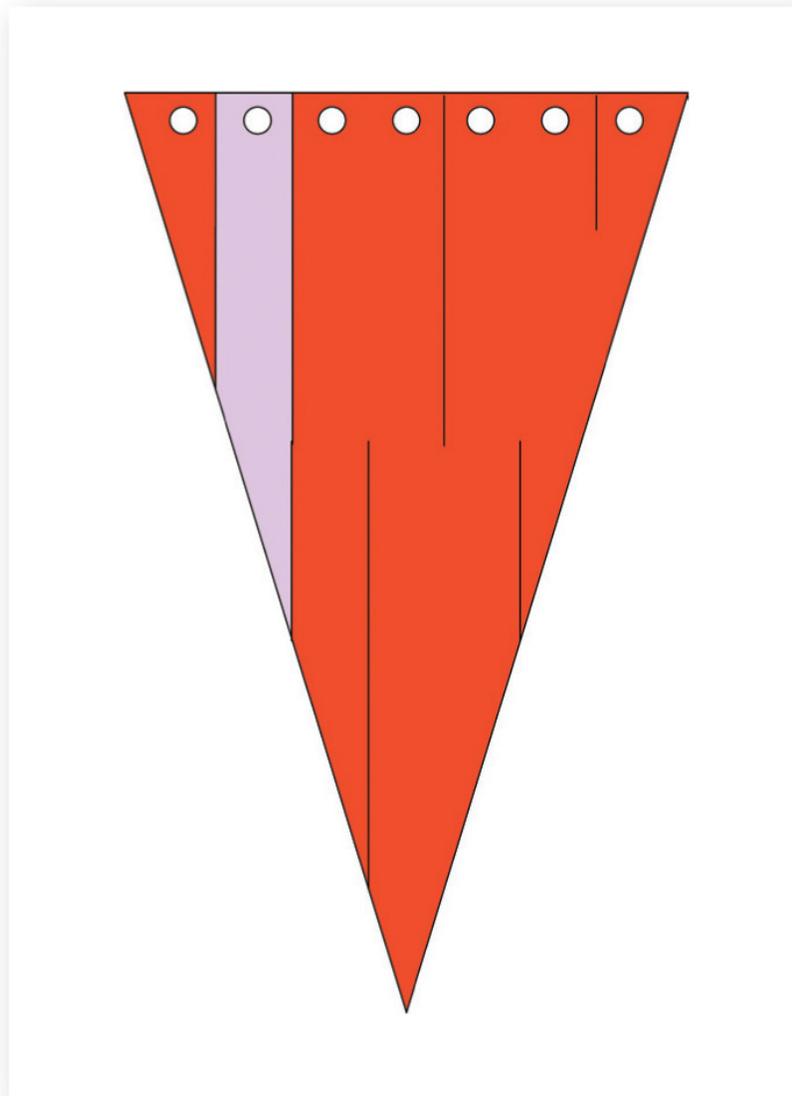
The striped flag may not be what you consider “woven.” The two pieces are joined using a sliding technique, which is most useful when you want to alternate two colors.



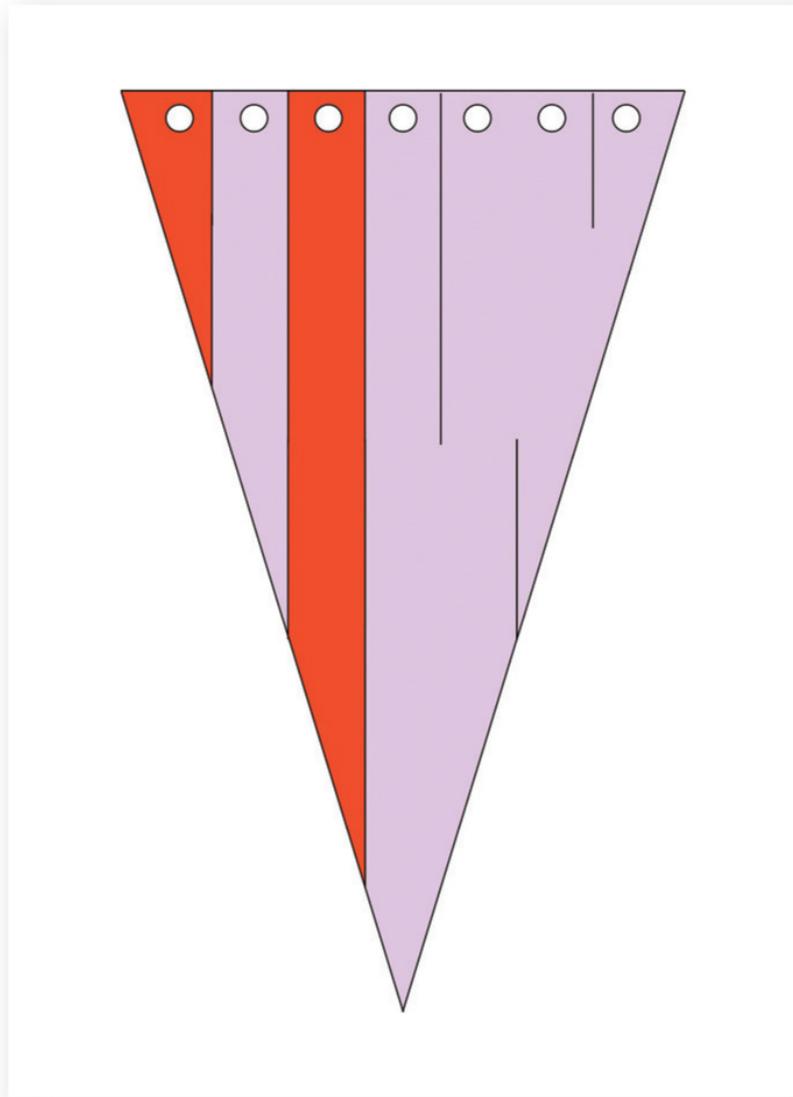
① Arrange the pieces so that the slits are mirrored. Place them on top of each other so that the upper edges and the holes are aligned. Hold the flag so that the tip points downward.



② Start by sliding the two pieces together using the second slits from the left edge. Align the two pieces, matching the edges.



③ Slide the flag next using the first slits at the left. You do this by turning the flag so that the tip is to the left. Twist the piece that is behind to the front and put the small point into the slit in the front piece.



- ④ Turn the flag so that the tip points to the right. Now join the third set of slits by twisting the piece that is behind up and forward.
- ⑤ Continue in the same way, working upward and sliding the remaining slits together.
- ⑥ Align and fix the flag's points with glue.

BASIC WOVEN HEART

When prepared as a token of love or friendship, the Basic Woven Heart needs no handle. If you want to hang the heart, glue a handle to the inside of the basket where the rounded sections meet. Some prefer that the color of the handle match the color of the squares going down the middle of the heart, but the choice is yours.



MATERIALS

- Paper in two contrasting colors or patterns (colors X and Y), 80–130 g/m² in weight. (*Note:* The woven heart traditionally is made from glazed 80 g/m² paper.)
- Optional: Glue stick (for attaching the handle)

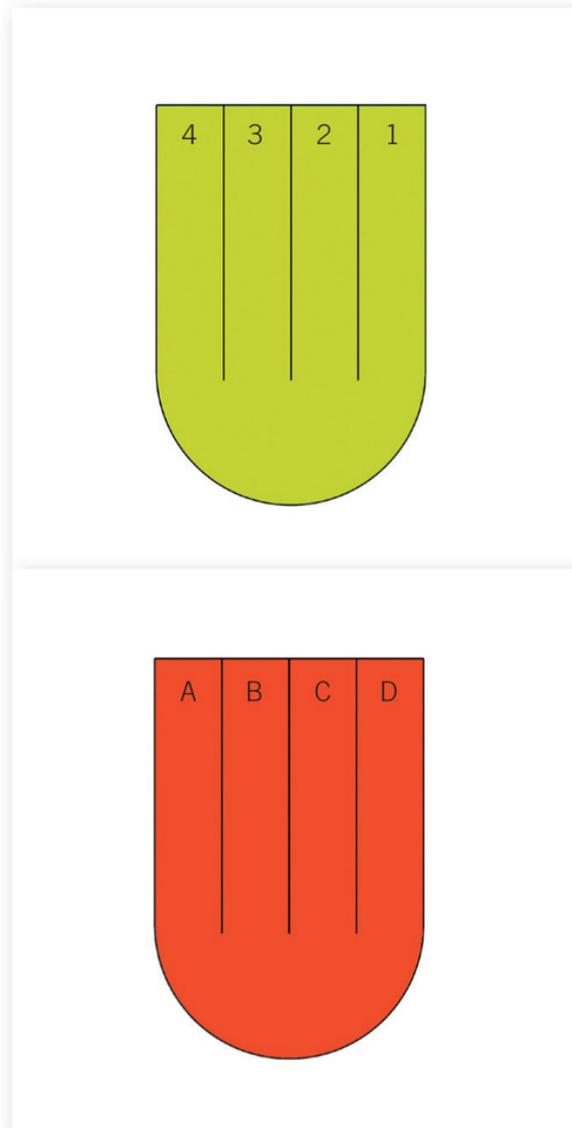
FROM YOUR TOOLBOX

- Tweezers (for weaving).

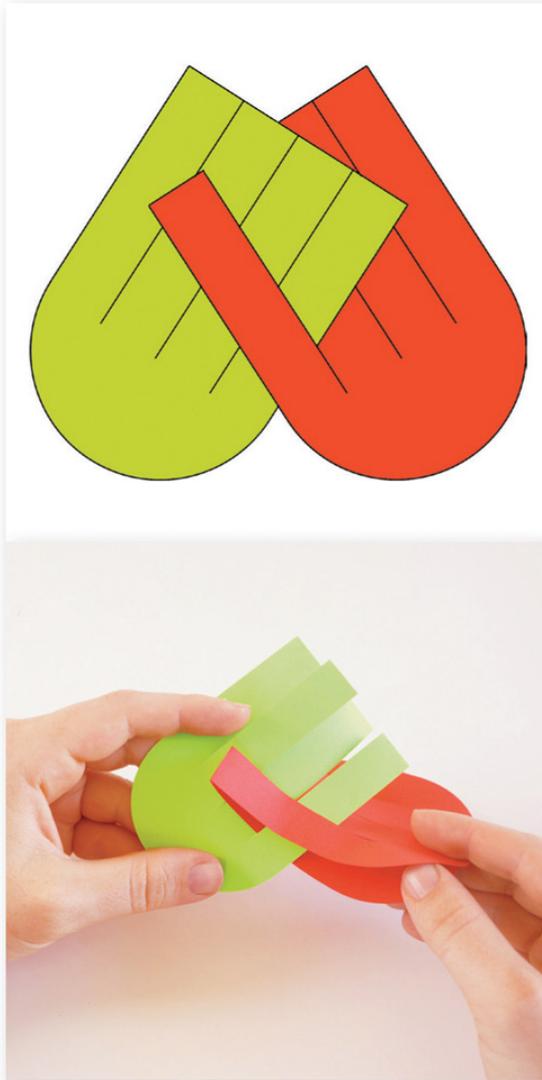
TEMPLATES, PARTS AND PIECES

- For the project templates, see [page 135](#); for a variety of alternative handle templates, see [page 132](#). Copy the template using your preferred method as described on [page 135](#).
- Using the template, cut the following pieces:
B1: 1 in color X (shown in red) and 1 in color Y (shown in green) (*Note:* If cutting by hand, you may cut this piece from folded paper, placing the template's dashed line on the fold.)
- Optional handle in any color, 3/8-inch wide × 8-inches long (1 × 20 cm)

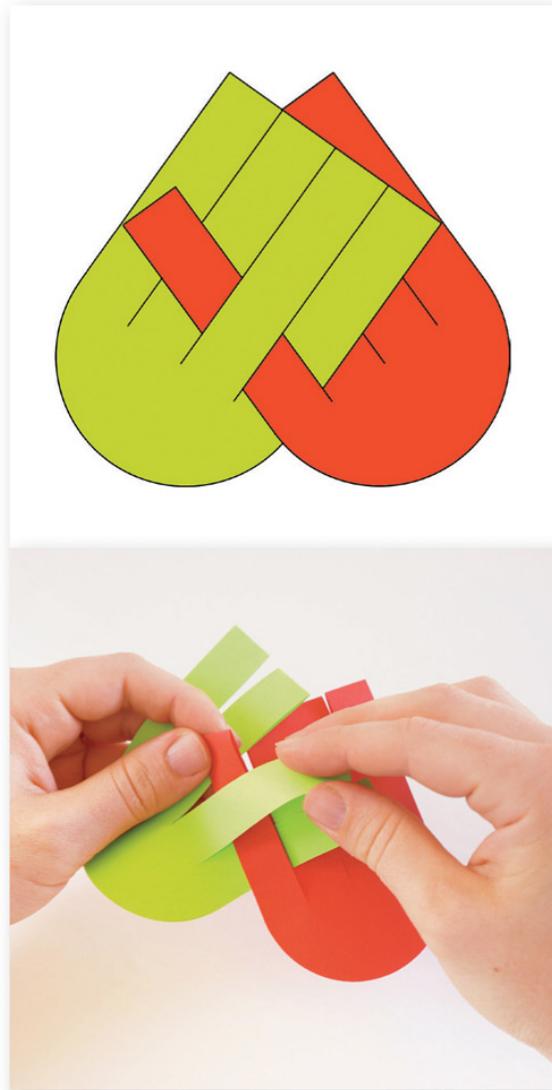
(*Note:* The instructions refer to the strips as labeled in the diagram.)



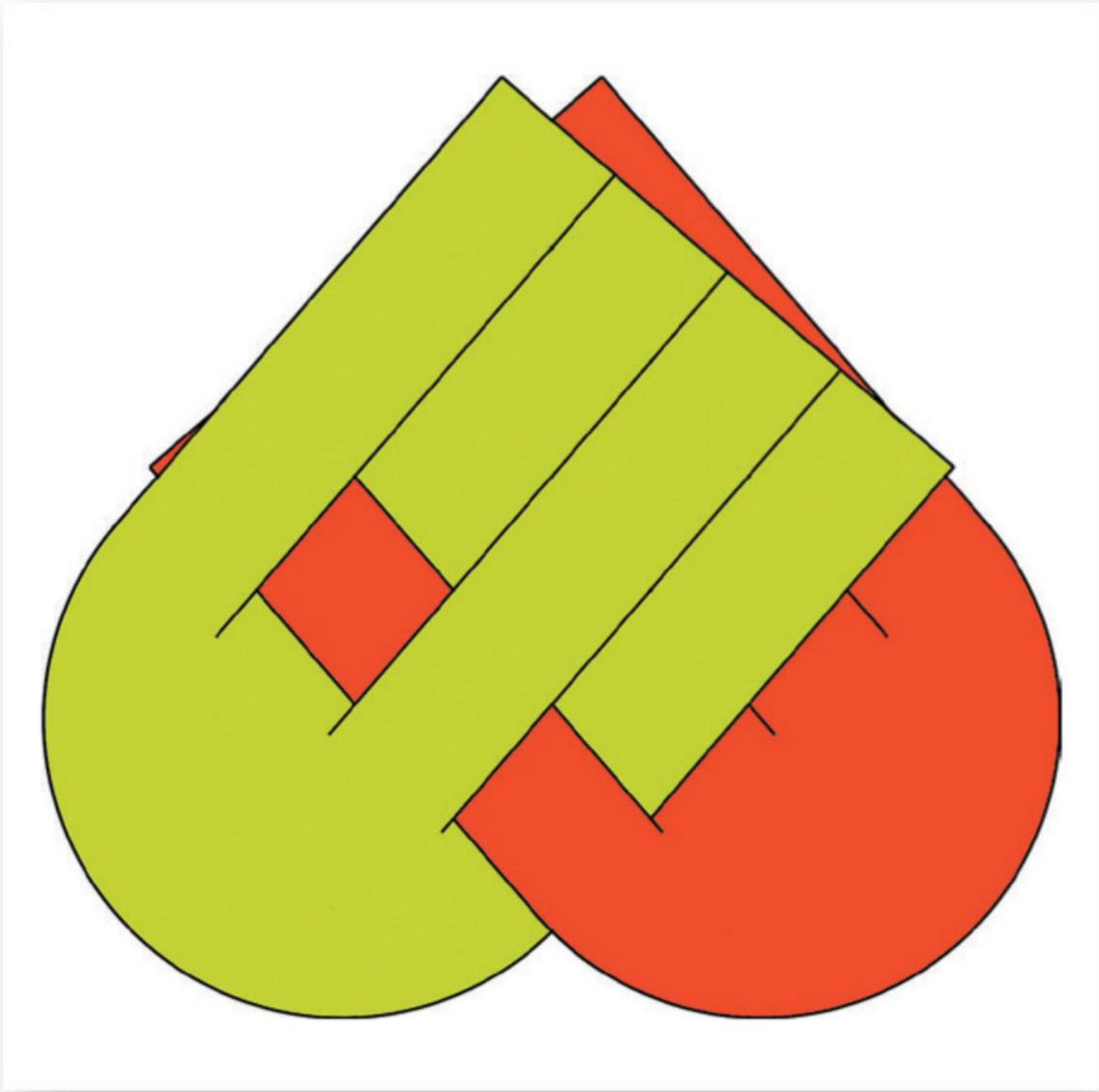
① If not done already, crease the two heart pieces along the cut lines.



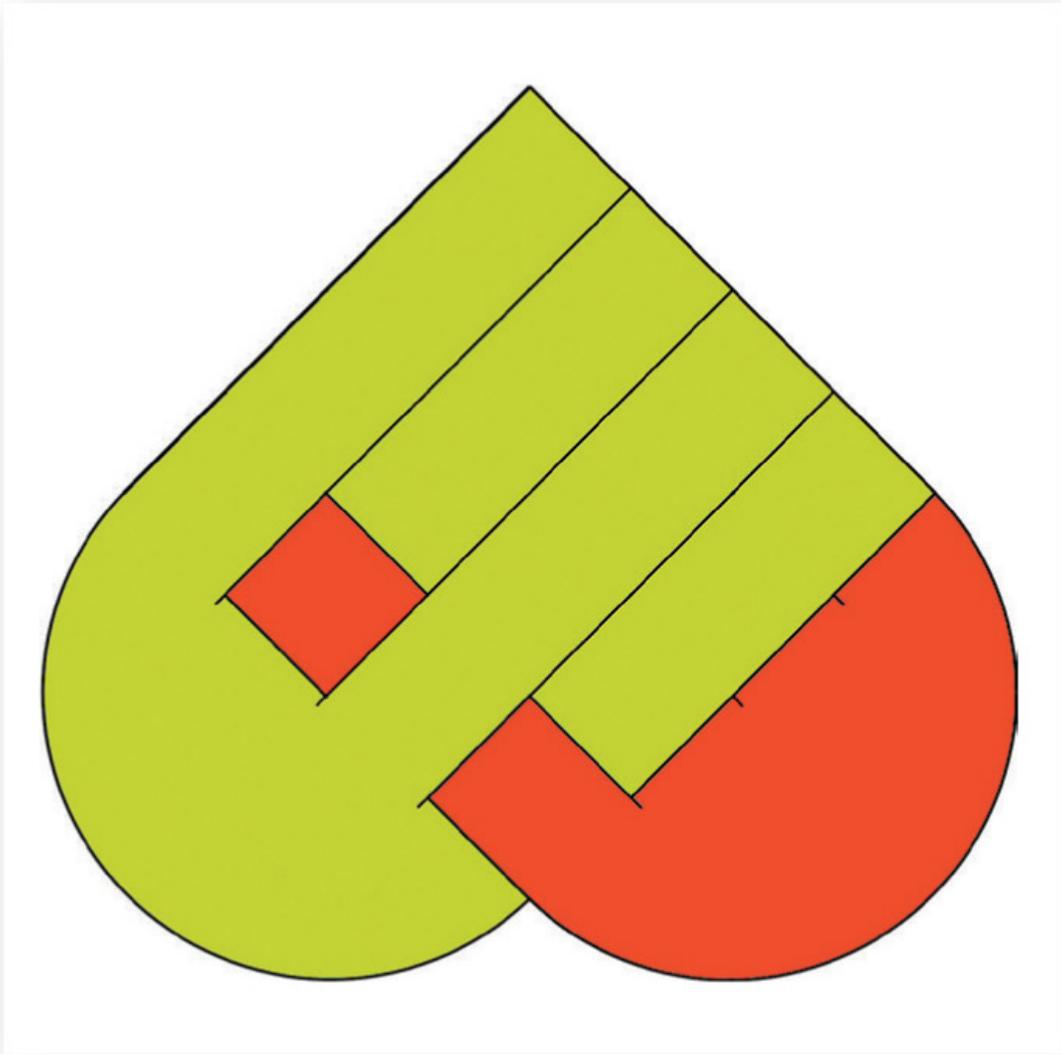
② Start the weaving process by placing strip A around strip 1 (in other words, strip 1 goes into the loop formed by the two layers of strip A.)



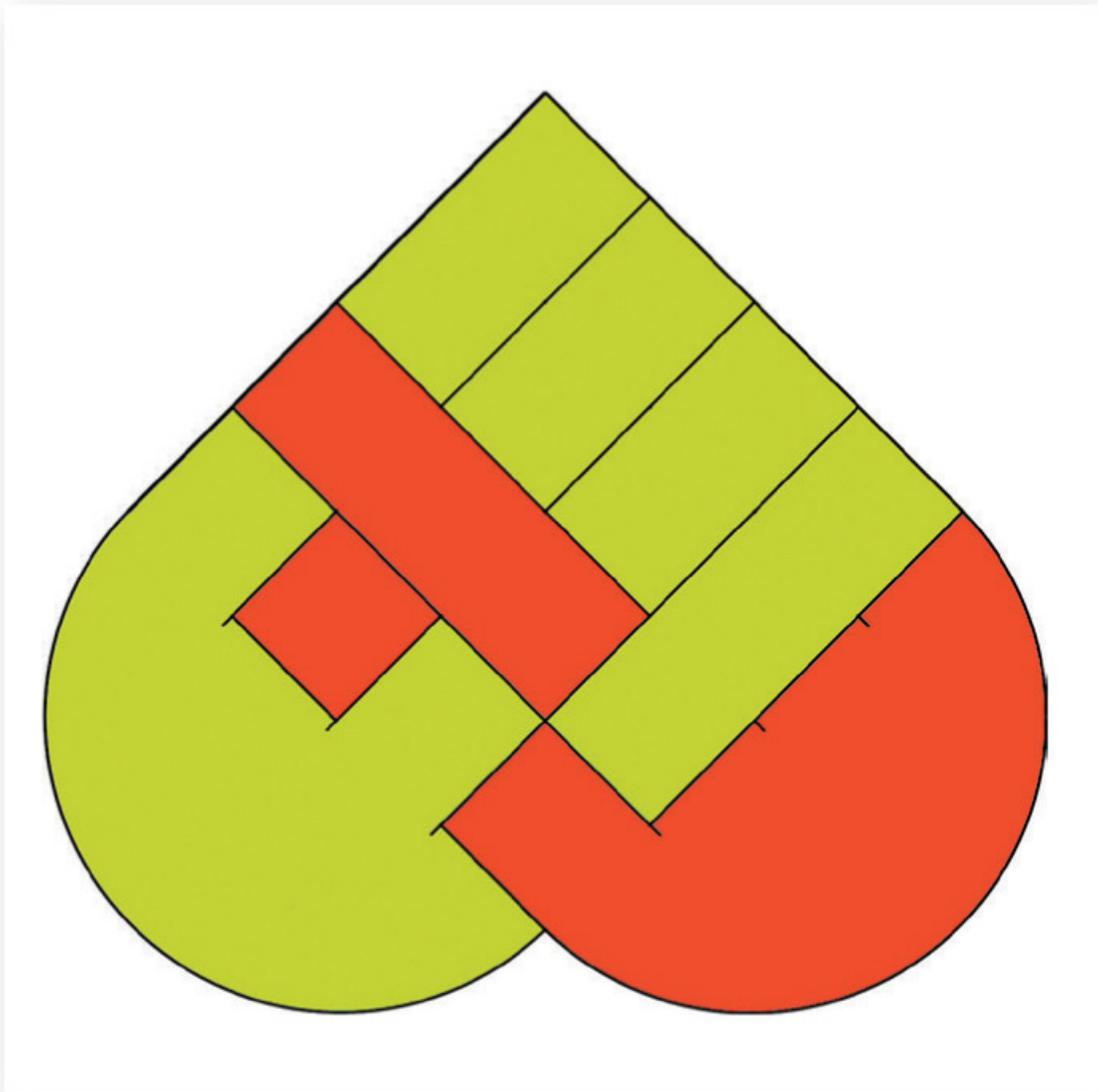
③ Put strip A through the loop of strip 2.



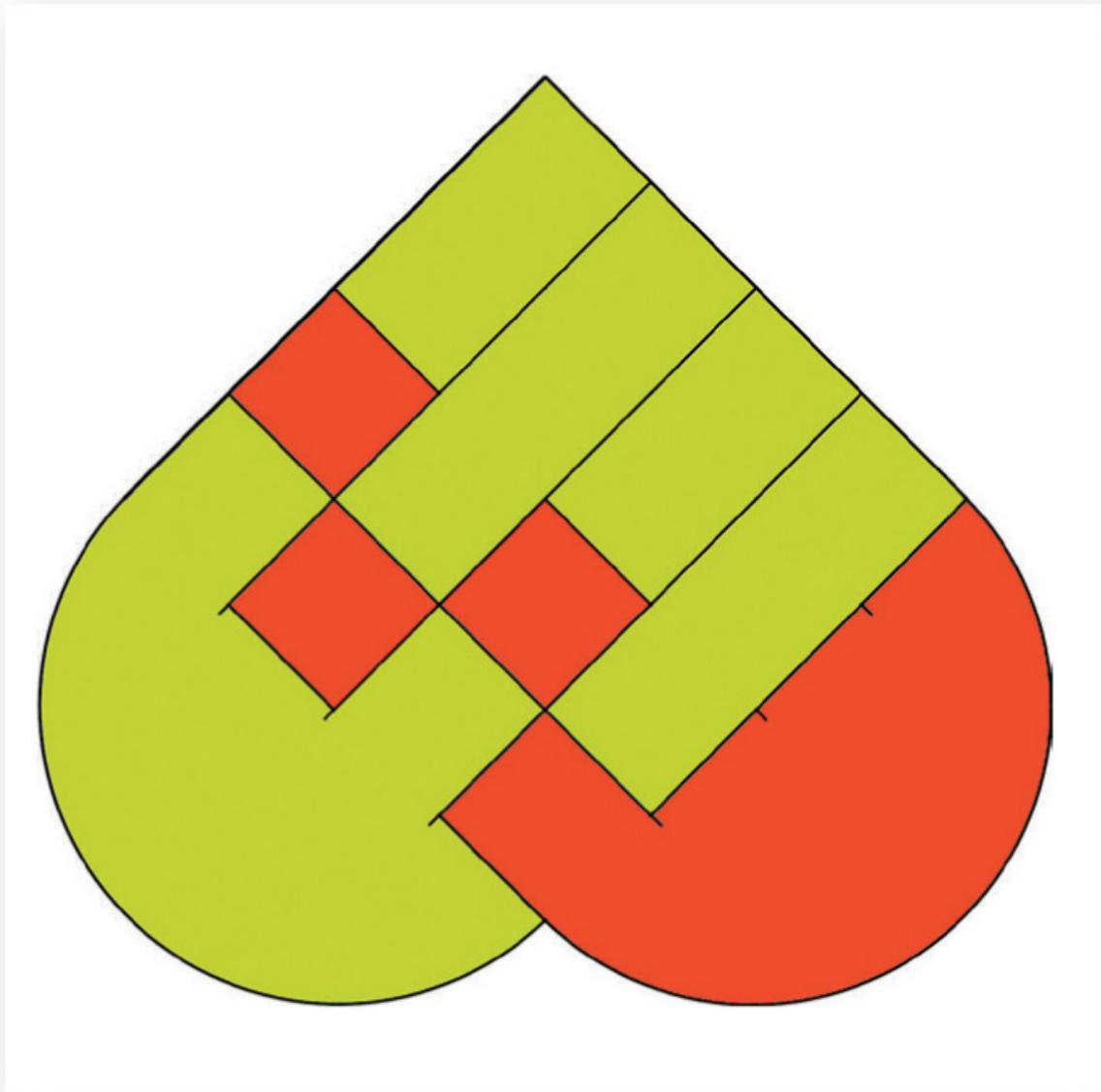
④ Repeat steps 2 and 3, weaving strip A around strip 3 and then through the loop of strip 4.



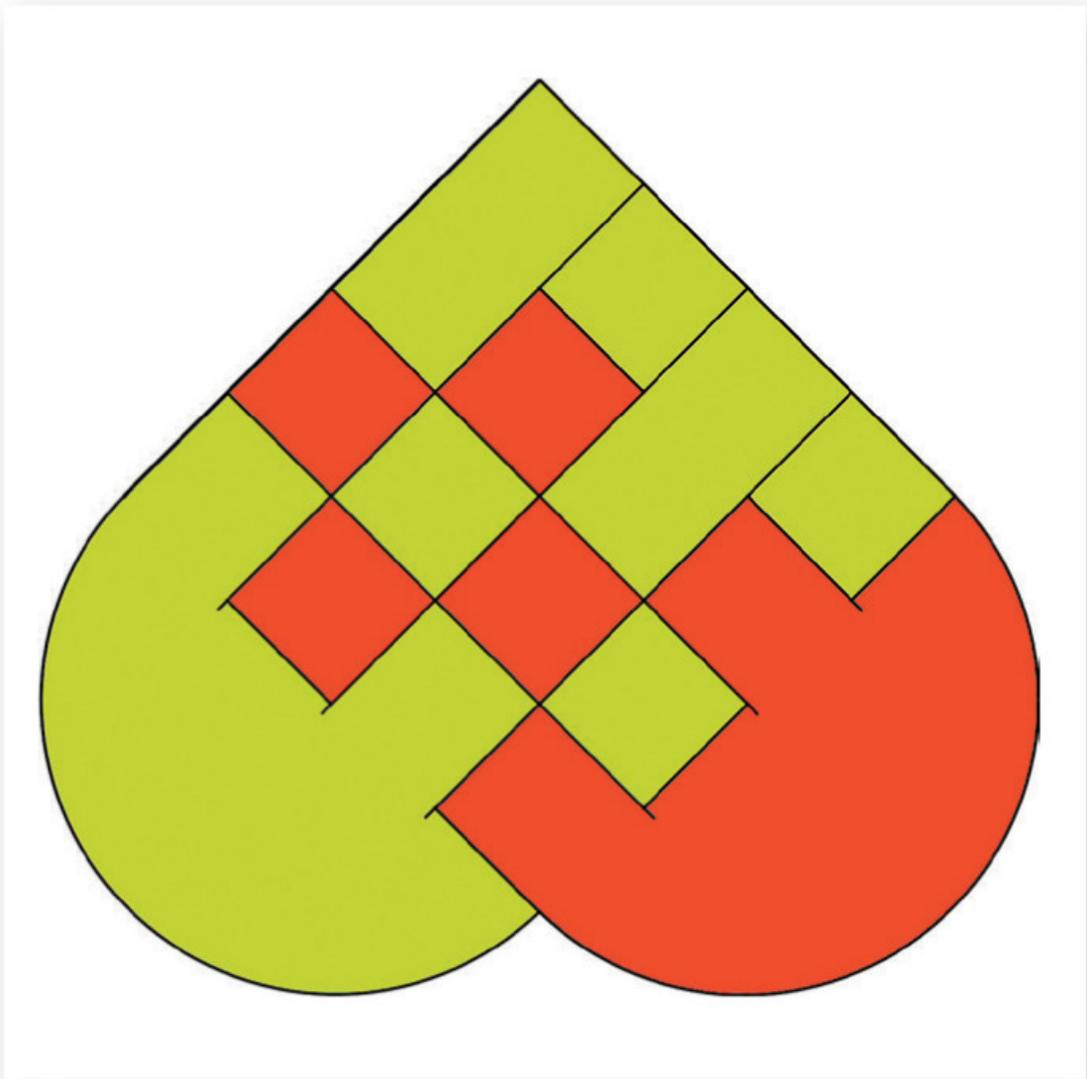
5 Push strip A down toward the rounded section where the cut strips end.



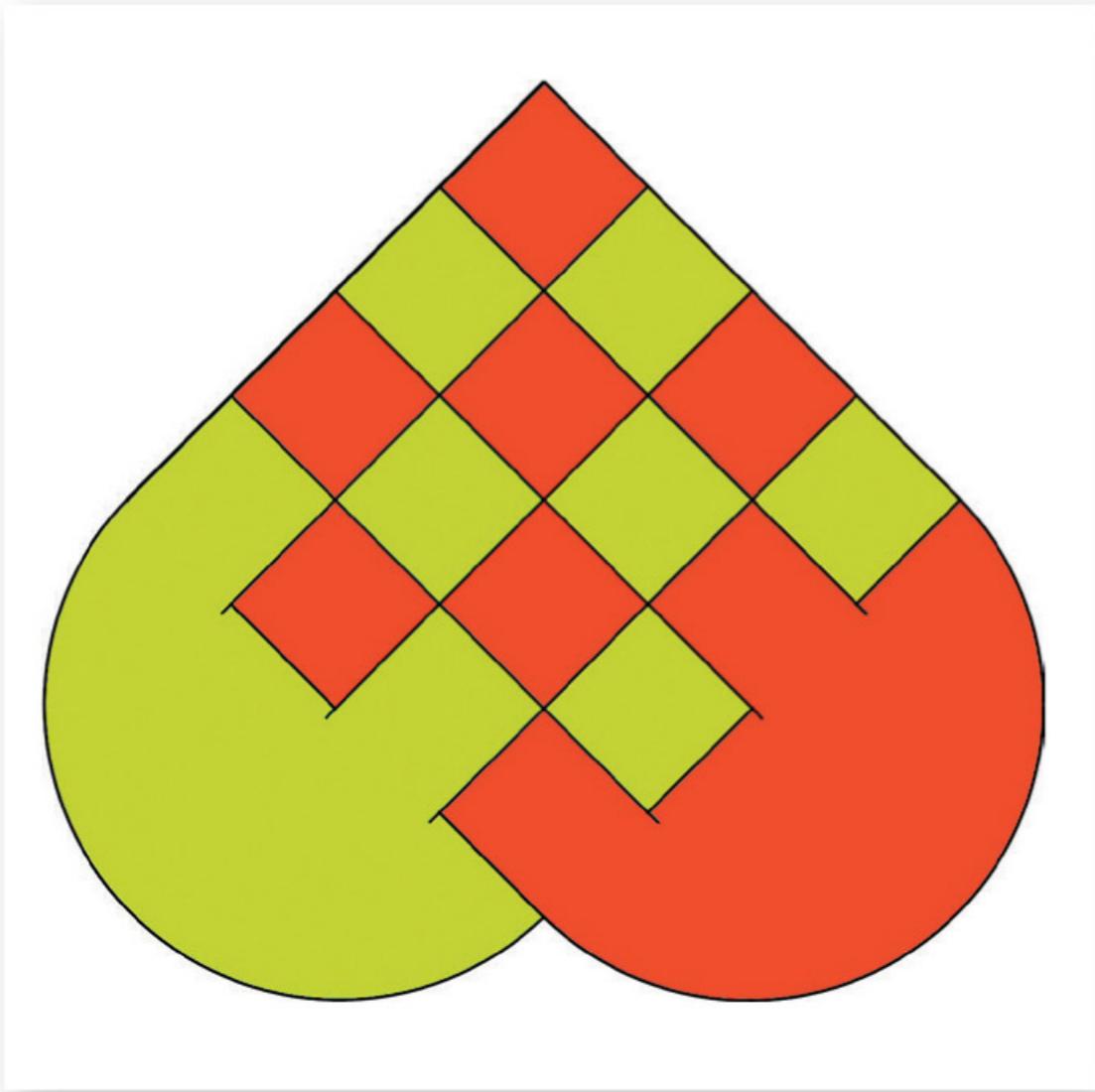
⑥ Continue the weaving process with strip B. First, weave strip B through the loop of strip 1 and then around strip 2.



- 7 Finish the row by weaving strip B through the loop of strip 3 and around strip 4. Move strips A and B down toward the heart's rounded sections, if necessary.



⑧ Weave strip C in the same way as strip A.



⑨ Finally, weave strip D in the same way as strip B. Tweezers may help with weaving the last square.

⑩ Add a handle, if desired.

BASIC HEART WITH CIRCLES

The Basic Heart with Circles illustrates how the entire surface of a project can become part of the woven pattern. We've used labels to identify the various strips on each part so they're easier to weave. Until you're familiar with the weaving process, you may find it helpful to transfer the labels to the strips of your own project.



MATERIALS

- Paper in two contrasting colors or patterns (colors X and Y), 80–130 g/m² in weight
- Glue stick

TEMPLATES, PARTS, AND PIECES

- For the project templates, see [page 139](#); for a variety of alternative handle templates, see [page 132](#). Copy the templates using your preferred method as described on [page 135](#).

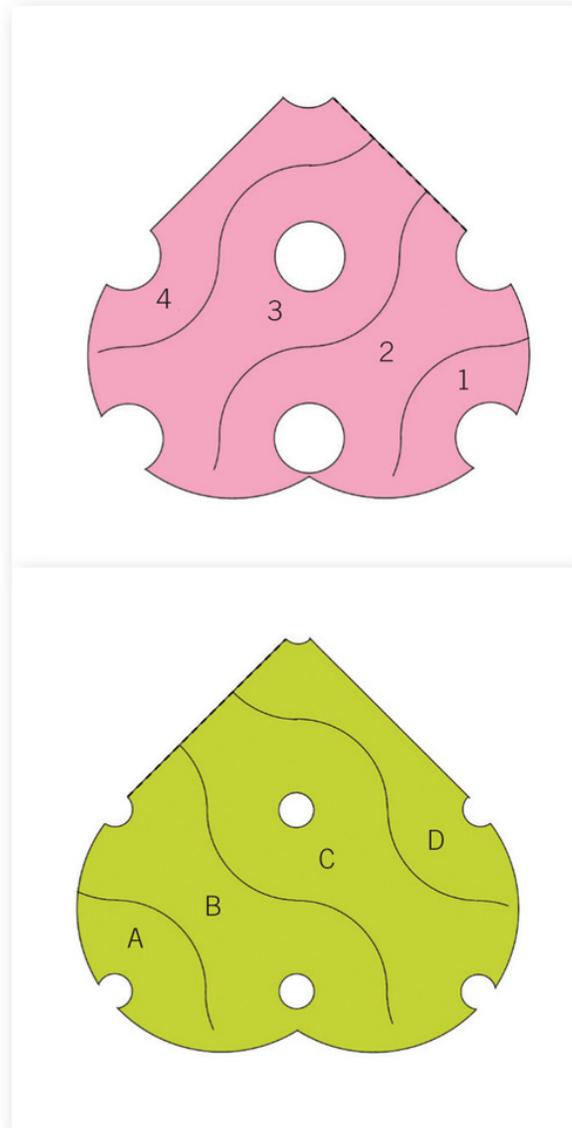
- Using the templates, cut the following pieces:

- B6 (smaller holes): 1 piece in color X (shown in light green)
- B7 (larger holes): 1 piece in color Y (shown in pink)

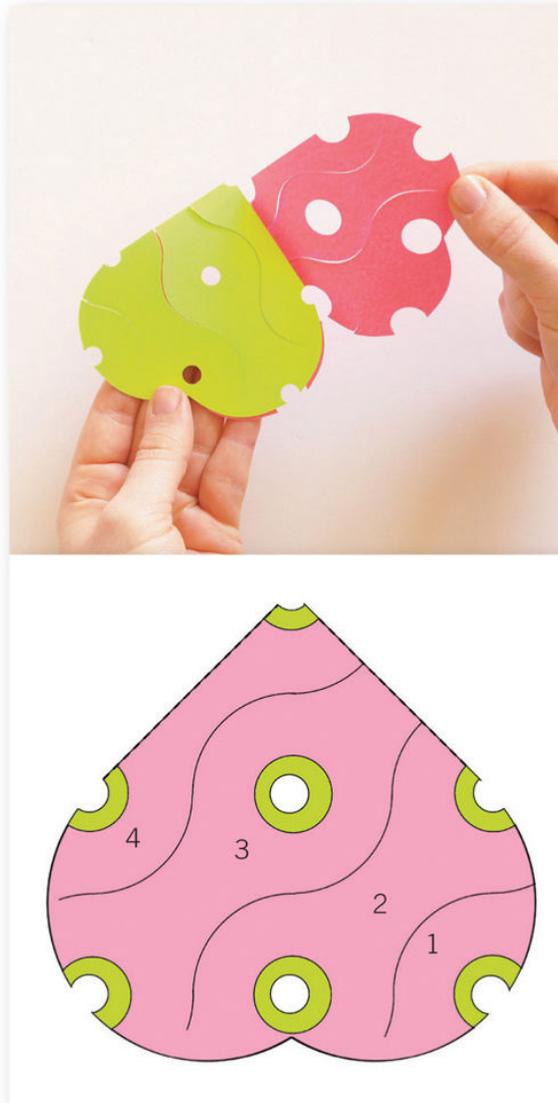
(*Note:* If cutting by hand, you may cut both templates from folded paper, placing the template's dashed line on the fold.)

- 1 handle in color X, 3/8-inch wide × 9 1/2-inches long (1 × 24 cm)

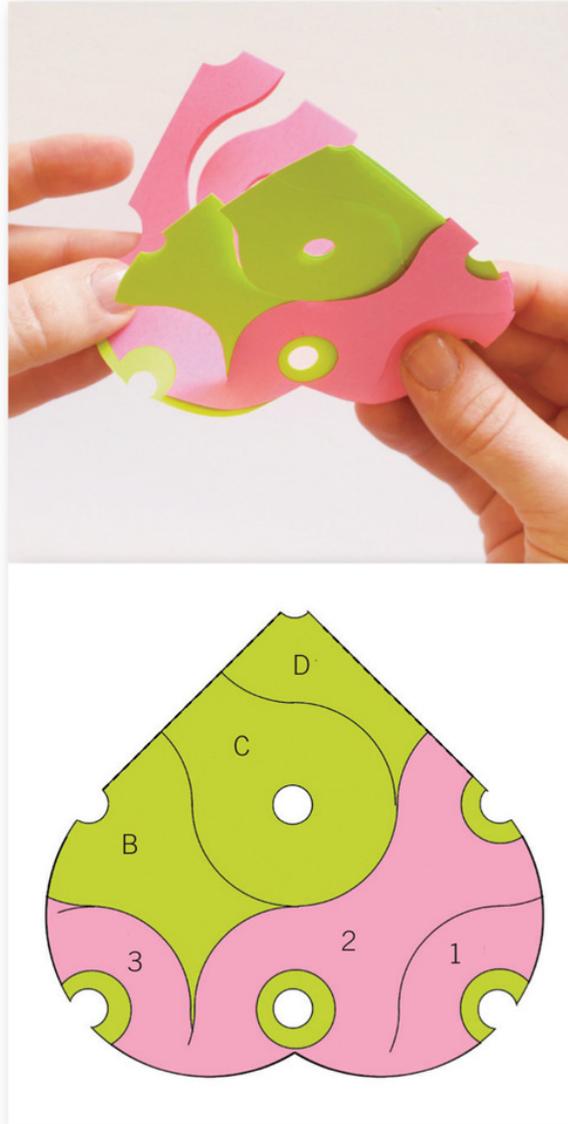
(*Note:* The instructions refer to the strips as labeled in the diagram.)



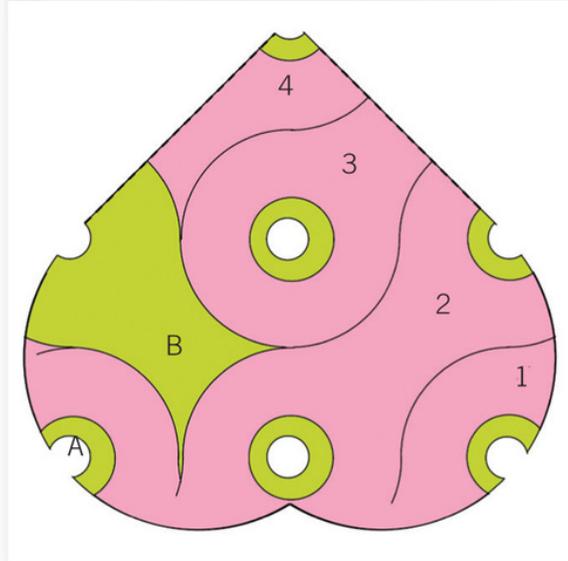
① If not done already, crease B6 and B7 along the center dashed line and place them side by side as shown.



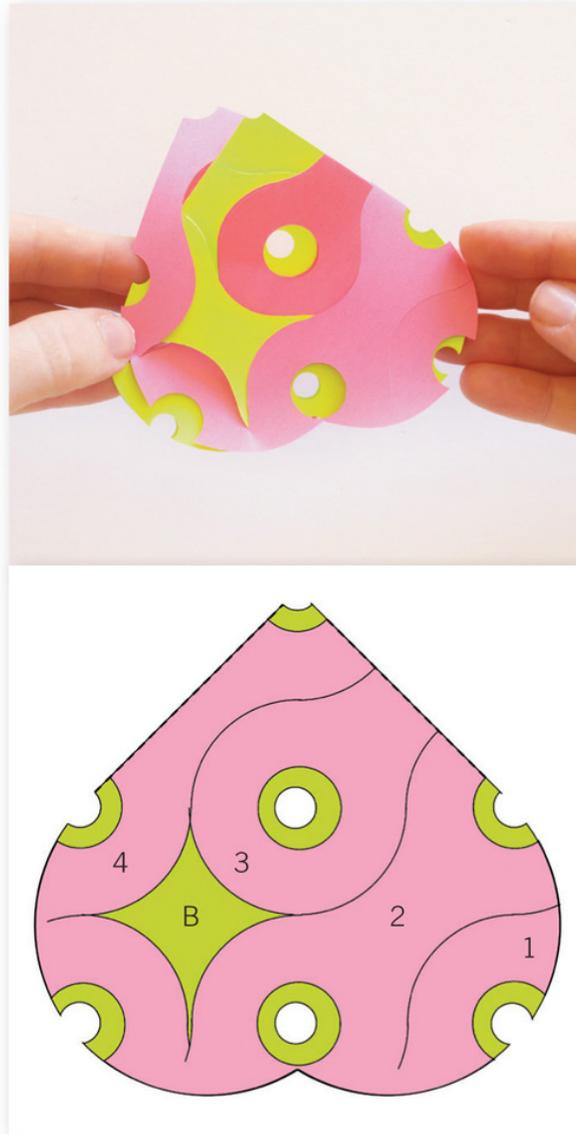
- ② Place B6 (with the smaller holes) inside B7 (with the larger holes); you'll see the smaller holes through the larger ones. The creased edges of the pieces should be perpendicular (at 90-degree angles), with B6's folded edge facing left and B7's facing right. As you work, make sure the heart is positioned with the point upward. The pieces have been placed correctly if the strips on the outer piece (B7) run from the lower left to the upper right corner.



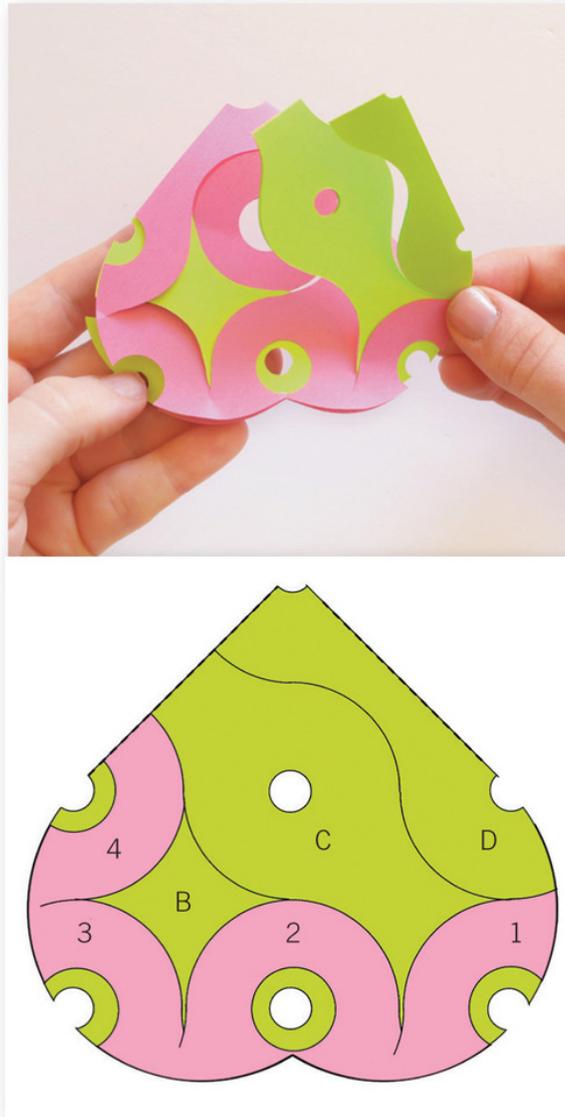
③ The first strips to be woven are B and 2, which are located in the center where the two sets of the hearts' rounded sections meet; they're already in place. The next strips to be woven are B and 3; pull strips B, C, and D out through the slit between strips 2 and 3.



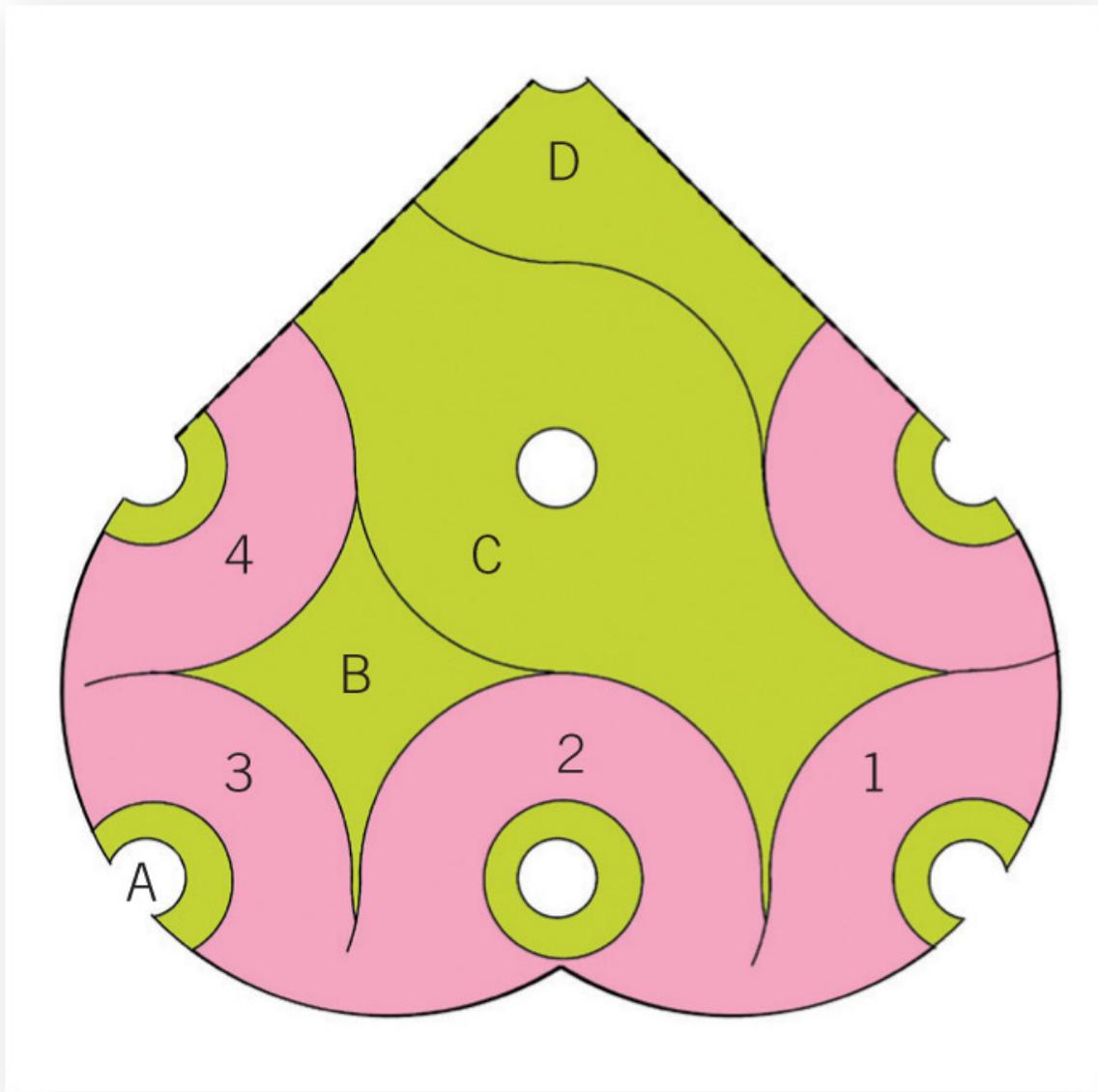
- 4 Place the loop of strip B in front of strips 3 and 4. Place the loops of strips C and D behind strips 3 and 4.



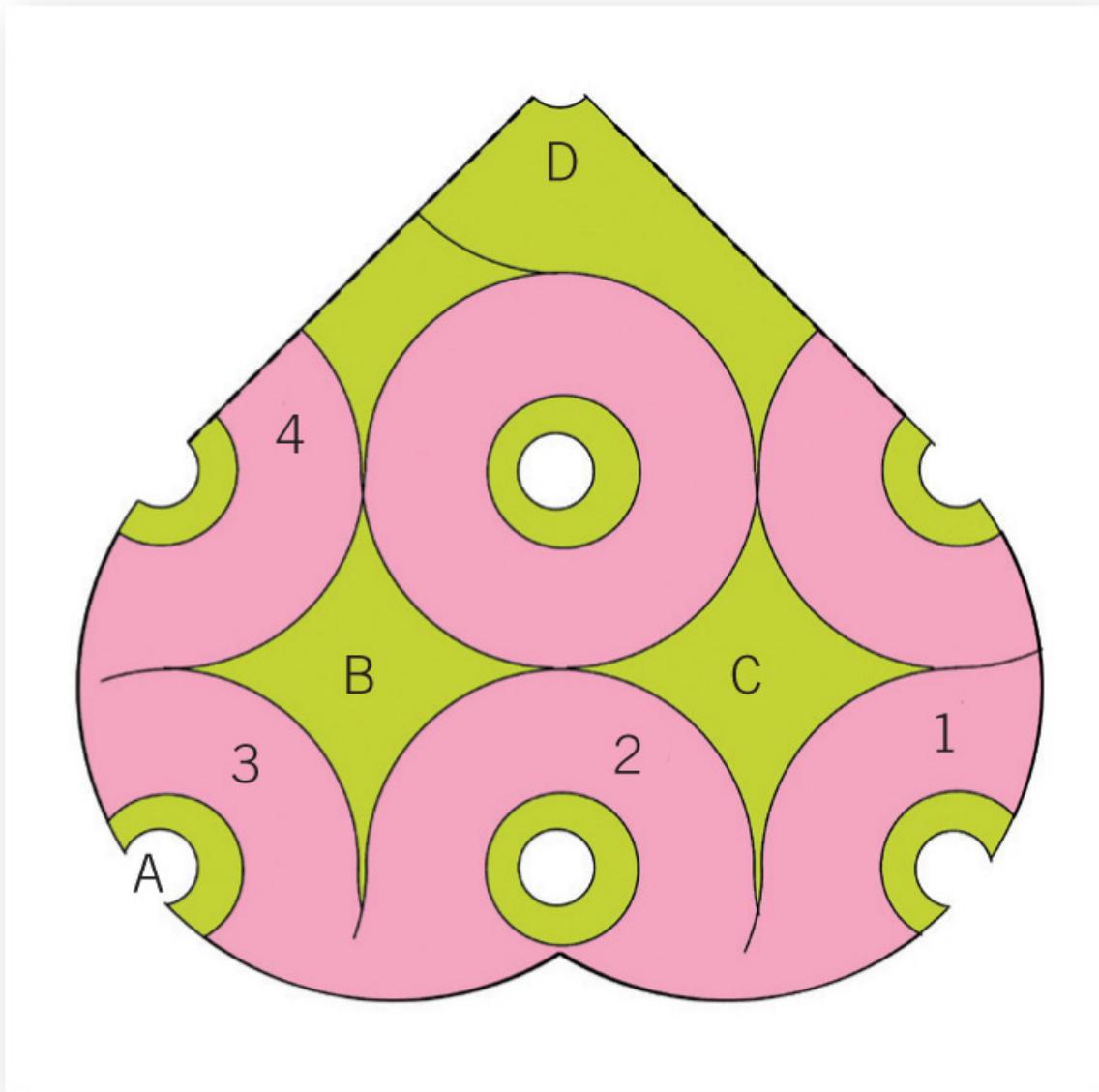
⑤ Pass strip 3 through the loop of strip B, then insert strip B into the loop of strip 4. (*Note: As you weave, don't worry about strip A, which is actually two separate half strips forming the heart's left rounded section as you weave. After weaving strip B in this step, place these half strips inside the heart when you align the two pieces.*)



⑥ Weave the corresponding strips C and 2, which are in the heart's right half. Pull strips C and D (which you placed on the back side of the heart) through the short slit between strips 1 and 2, then place the loops in front of strips 2, 3, and 4.



⑦ Pass strip 2 through the loop of strip C. Align the two pieces of the heart so the two short half strips (strip 1) lie flat on its surface. Pass strip D through the loop of strip 2.



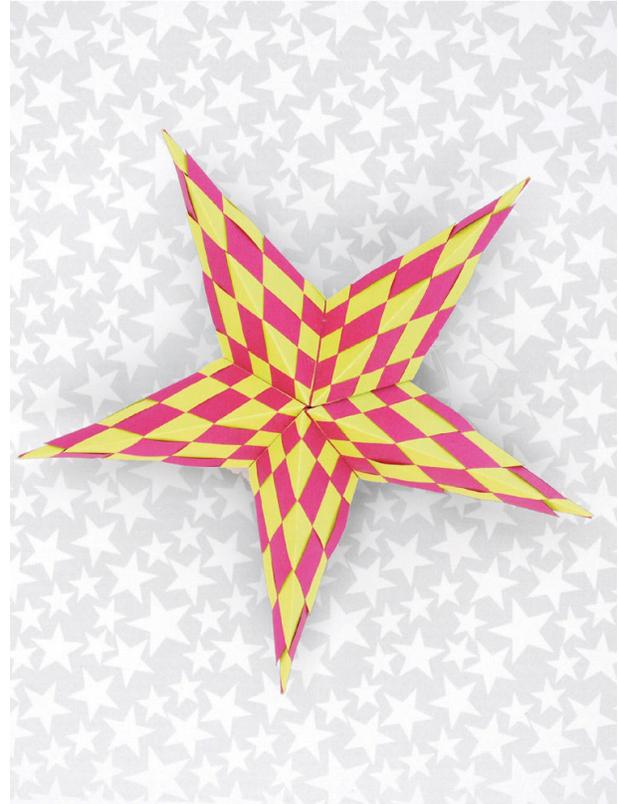
⑧ Pass strip C through the loop of strip 3. Pass strip 4 through the loop of strip C.



⑨ Weave in the rest of strip D; make sure it encloses strip 3 after weaving it into the loop of strip 4. Adjust and flatten the heart as needed. Attach the handle with a little glue, making sure not to cover any of the small holes. If desired, you can also glue the small flaps of strip 1 inside the heart.

BASIC STAR

The pointed star is a well-known classic. You may buy them ready made with printed patterns or complicated punched lace patterns. The Basic Star has woven points made just like a Basic Woven Heart (see [page 18](#)). The heart's rounded sections have been cut down to narrow strips that are used when you assemble the points to form the star.



MATERIALS

- Paper in two contrasting colors or patterns (colors × and Y), 80–130 g/m² in weight
- 16 inches (40 cm) of string or fishing line (for hanging the star)
- Glue stick

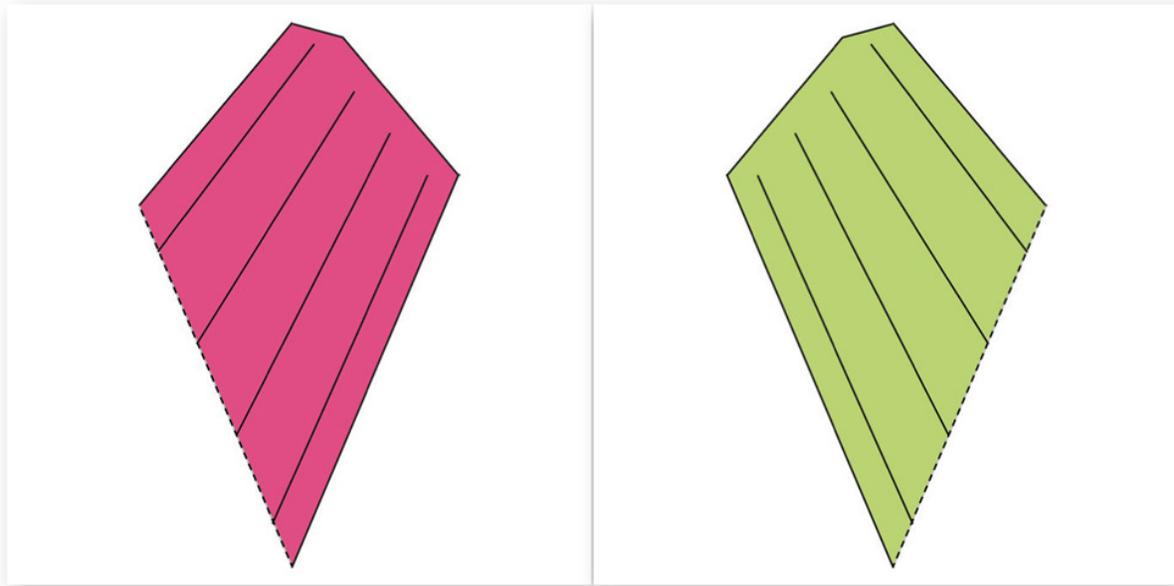
FROM YOUR TOOLBOX

- Tweezers (for weaving and assembling the star)
- Needle (for threading the string or fishing line)

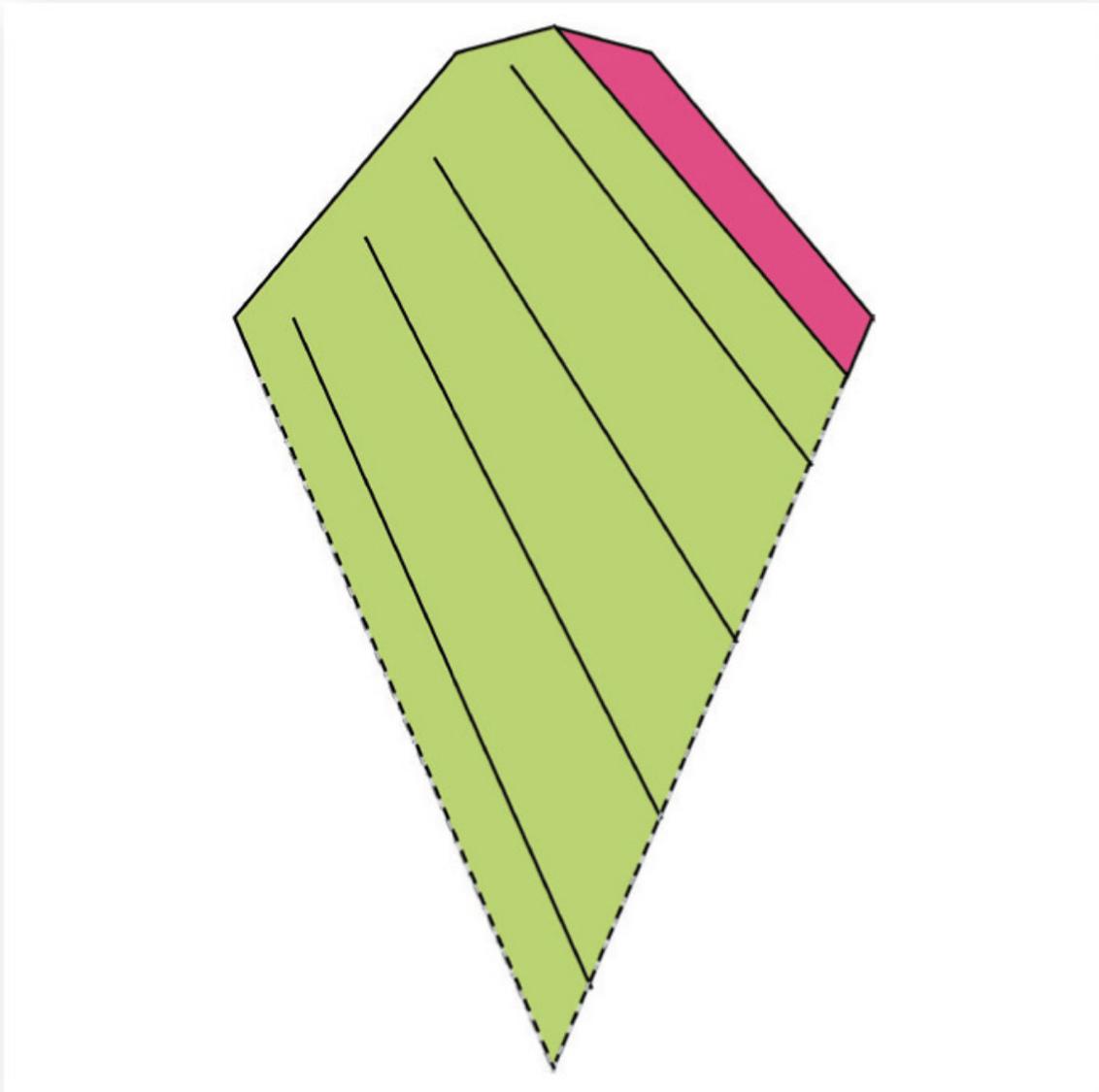
TEMPLATES, PARTS, AND PIECES

- For the project template, see [page 147](#). Copy the template using your preferred method as described on [page 135](#).
- Using the template, cut the following pieces:
 - E1: 5 pieces in color × (shown in light green) and 5 pieces in color Y (shown in purple)

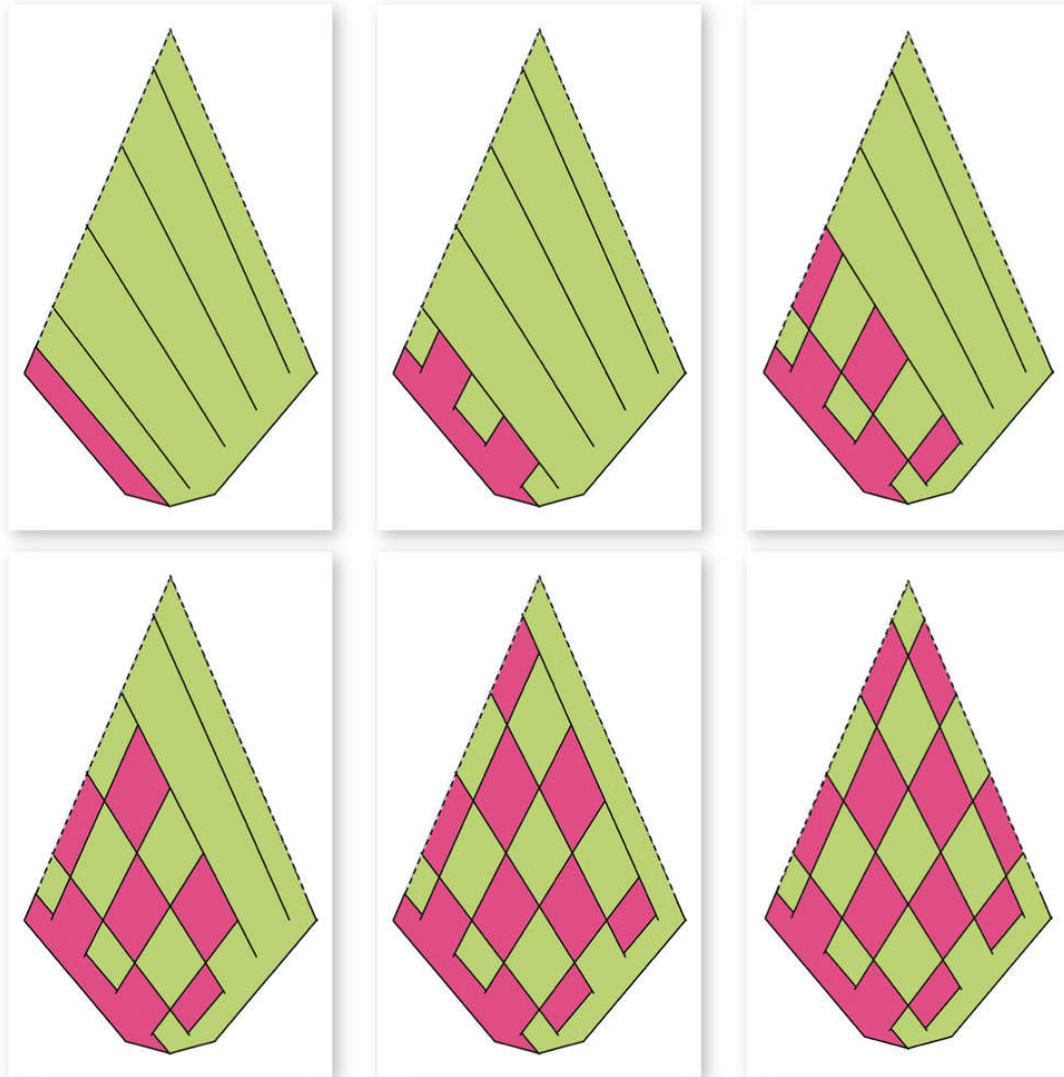
(Notes: If cutting by hand, you may cut this piece from folded paper, placing the template's long dashed line on the fold. You may also choose to make a star with 6 or even 7 points; just add as many pieces as needed.)



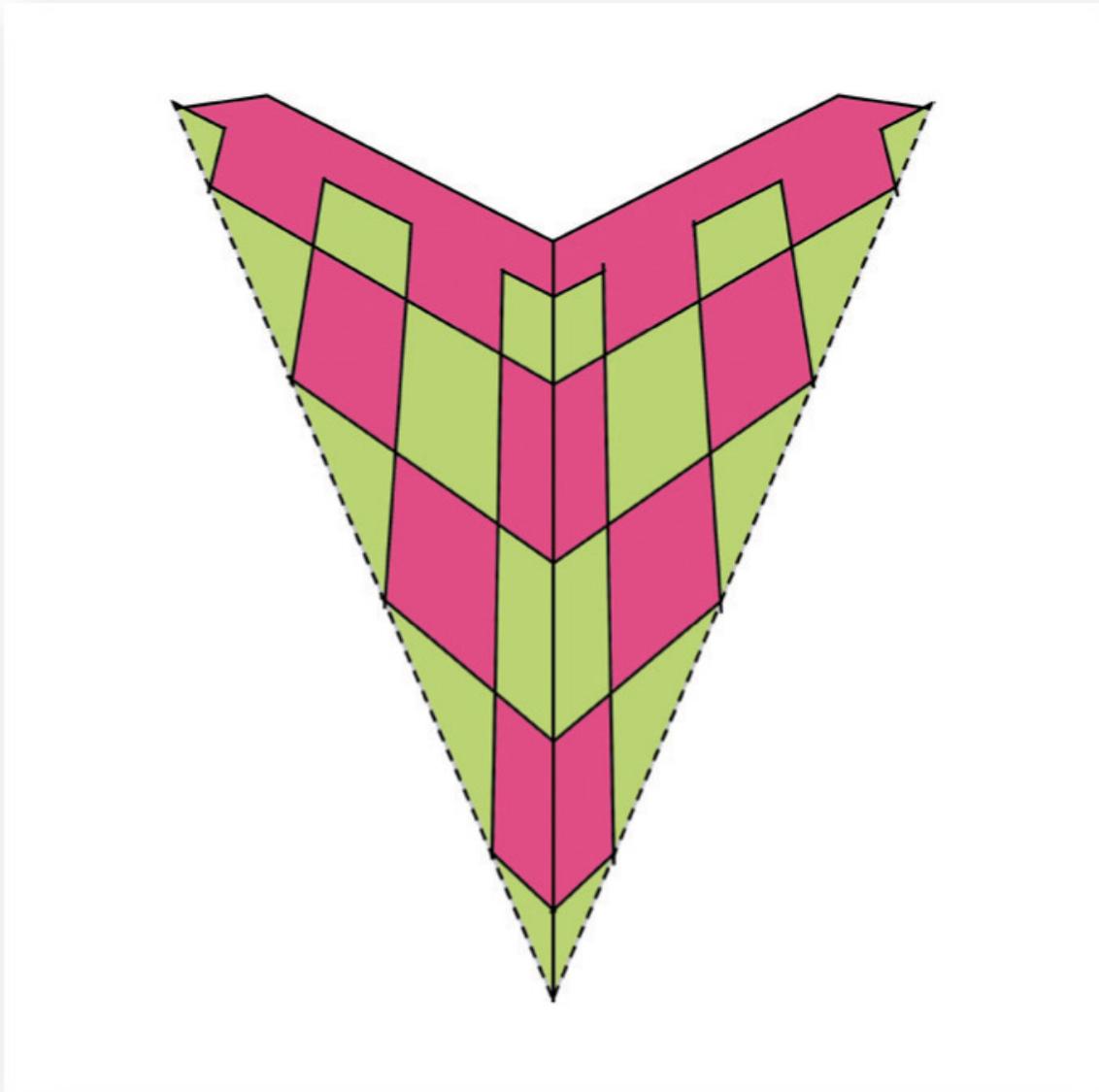
1 If not done already, crease two pieces, each a different color, along the long dashed line and place them on the table. The shorter open edges should be next to each other.



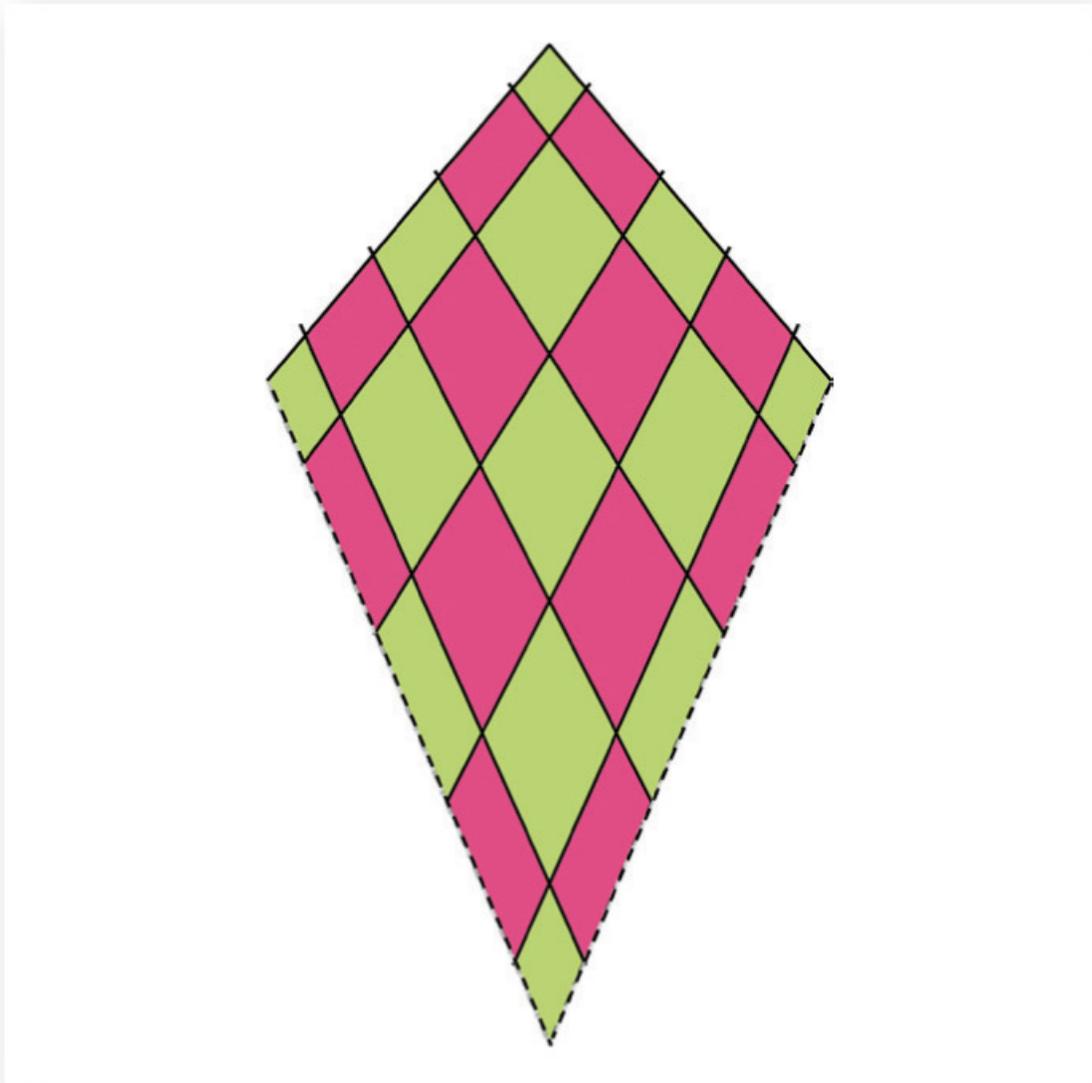
② Place one part within the other so that the folded edges of each meet at the bottom point.



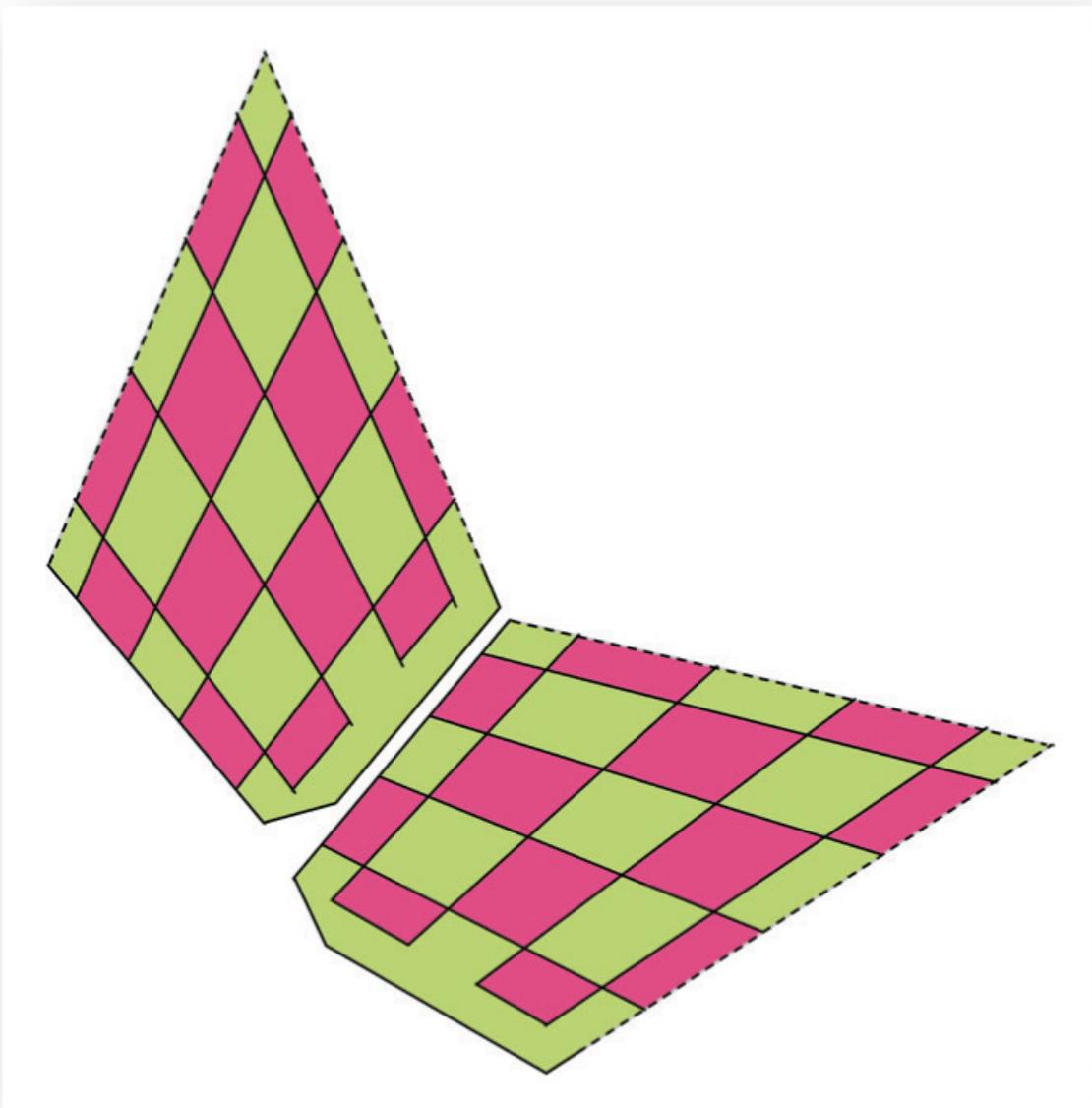
- 3 Turn the project so that the tip is up and weave the strips one by one, following the Basic Woven Heart instructions on [page 18](#). The only differences are that this is cut to give a more pointed form and the width of the strips is uneven. When you weave, you must take great care not to damage the strips near the flaps or they may break off; it is important that they stay intact. If a strip is damaged, it must be mended by reinforcing it with extra paper and glue on the back or replaced with a new piece



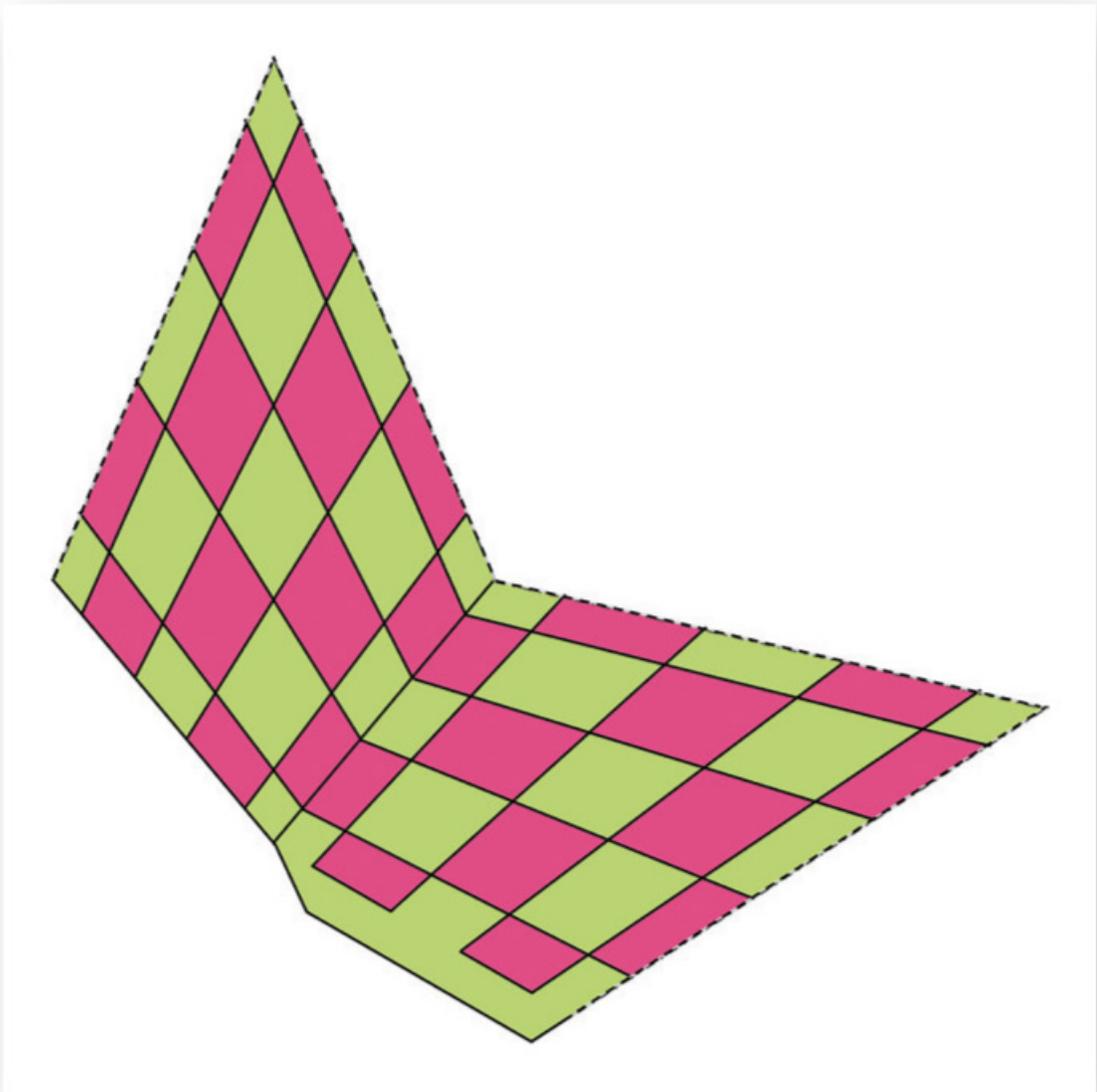
- ④ To make the point into the correct three-dimensional shape, open it up and flatten the point the other way so that the narrower strips run along the center line. Press down the tip to make a sharp edge.

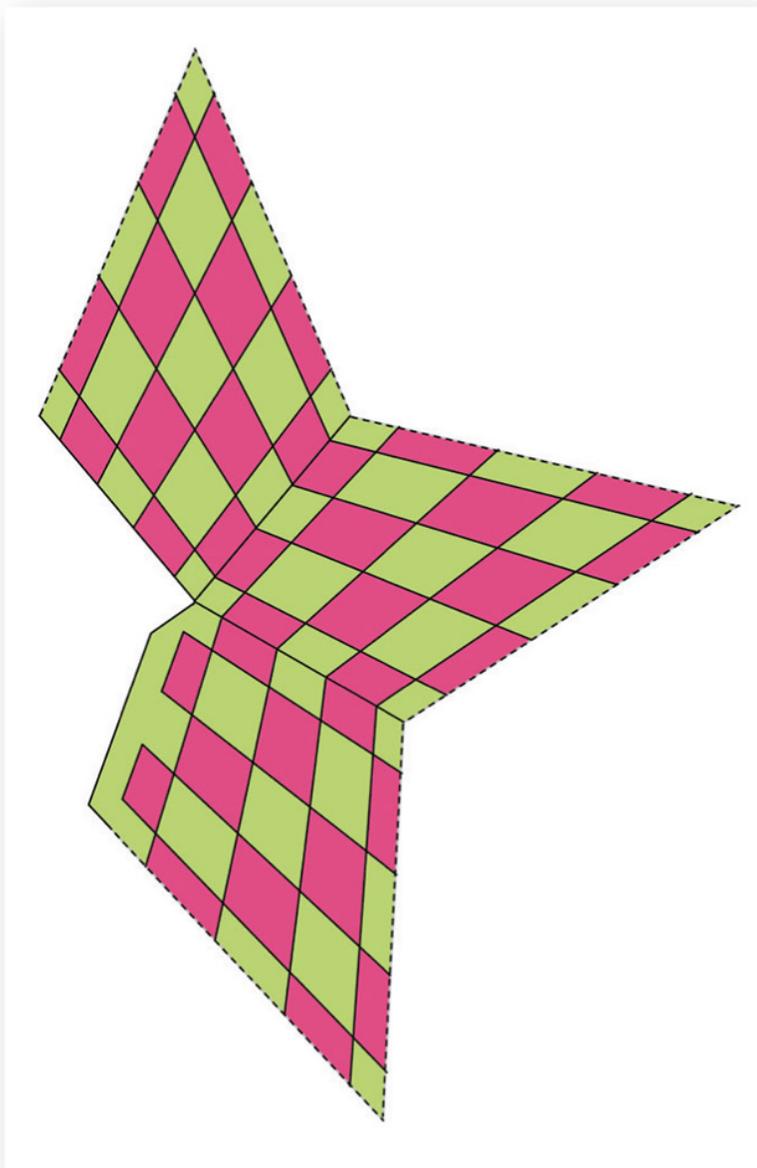


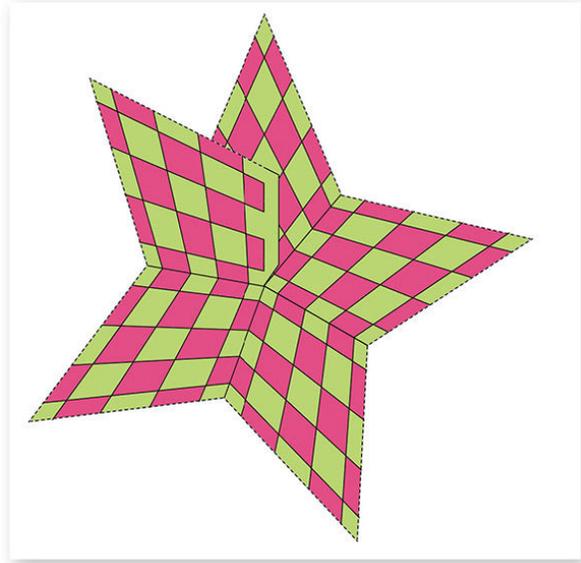
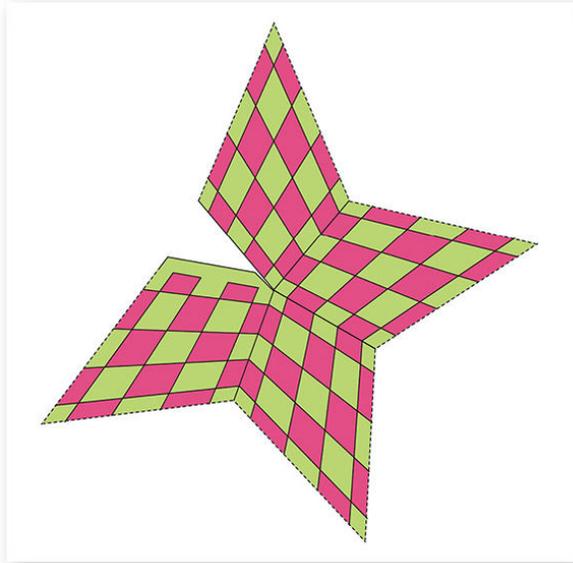
- ⑤ Fold the star point back to its previous diamond shape. Crease all four flaps to the inside of the point along the shorter dash-dotted line.
- ⑥ Glue one set of flaps (of the same color) to the inside of the point. The other set of flaps is used to assemble the star.
- ⑦ Repeat steps 1–6 to complete all five points



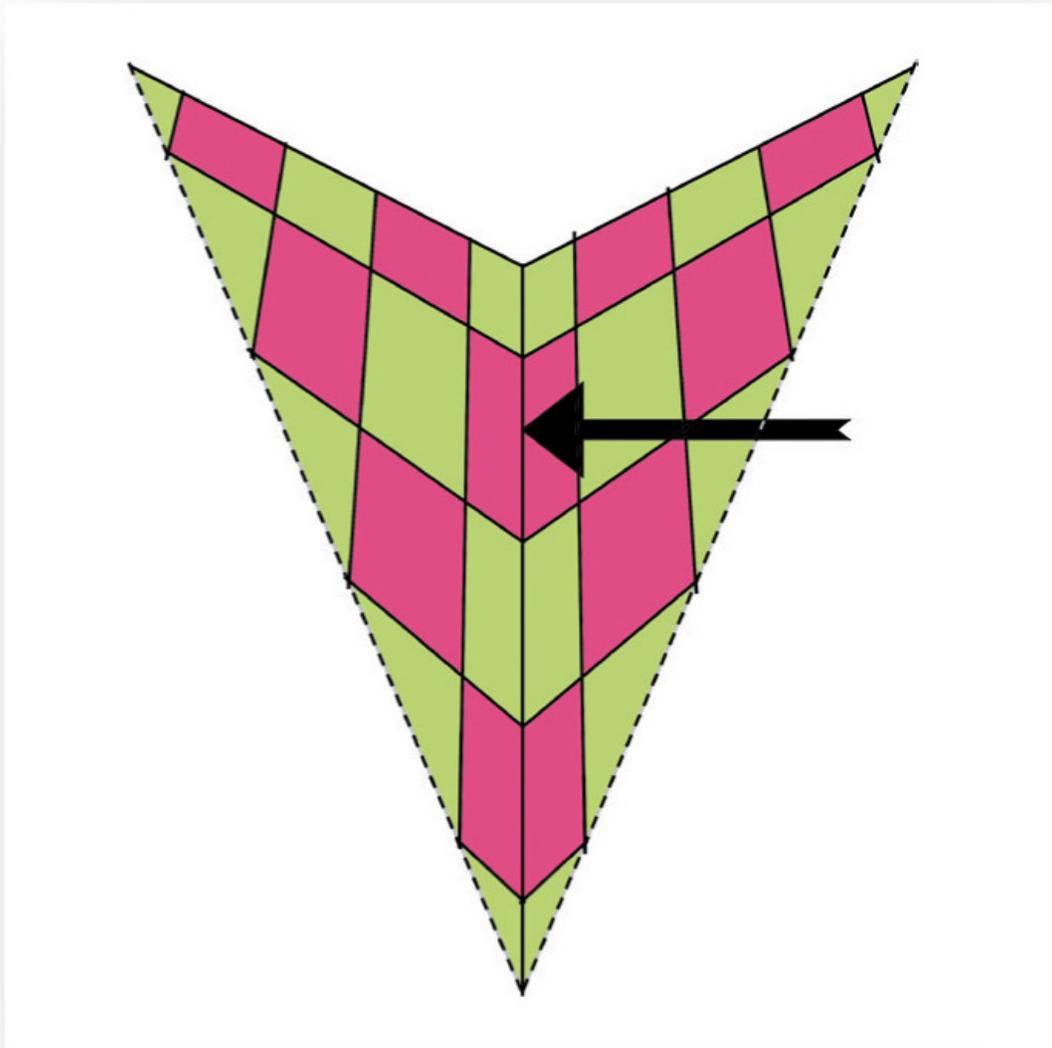
⑧ Straighten the remaining set of flaps on each point and glue the points together, one after the other.







- ⑨ When all five points are fixed, you can crease back the last unused set of flaps and fix them to the inside of the star. Line up the five points to form a regular star with no overlap, using the creases that make the star three-dimensional.



⑩ Thread a needle with a piece of string or fishing line and pull it through holes made about 1 inch (2.5 cm) away from where the sides of the first and fifth point would meet if they were glued together. Tie a knot and fix the points into the right position. Tie another knot on the string or fishing line to hang the star.

ALTERNATE FINISH

When you complete the star, you may also use the last set of flaps to join the first and last point. This is possibly prettier, but is not quite as easy. In this case, you may choose to hang the star from one of the points instead.

BASIC CONE

Simple paper cones have been used for ages when wrapping of all kinds of grains, nuts, and candy. The woven cones are rather elaborate to prepare and, thus, they are mainly used as ornaments. The shape of the cone varies in accordance with the size of the section of the circle it is made from. A small section makes a very pointed cone with little space for any sweets; a large section makes a broader cone where you may also view the surface inside.



MATERIALS

- Paper in two contrasting colors or patterns (colors X and Y), 80–130 g/m² in weight
- Glue stick

FROM YOUR TOOLBOX

- Knitting needle or conical item (for shaping the cone)
- Darning needle and ruler (for scoring the paper)
- 6 paper clips (for weaving)
- Tweezers (for pulling the strips when weaving)

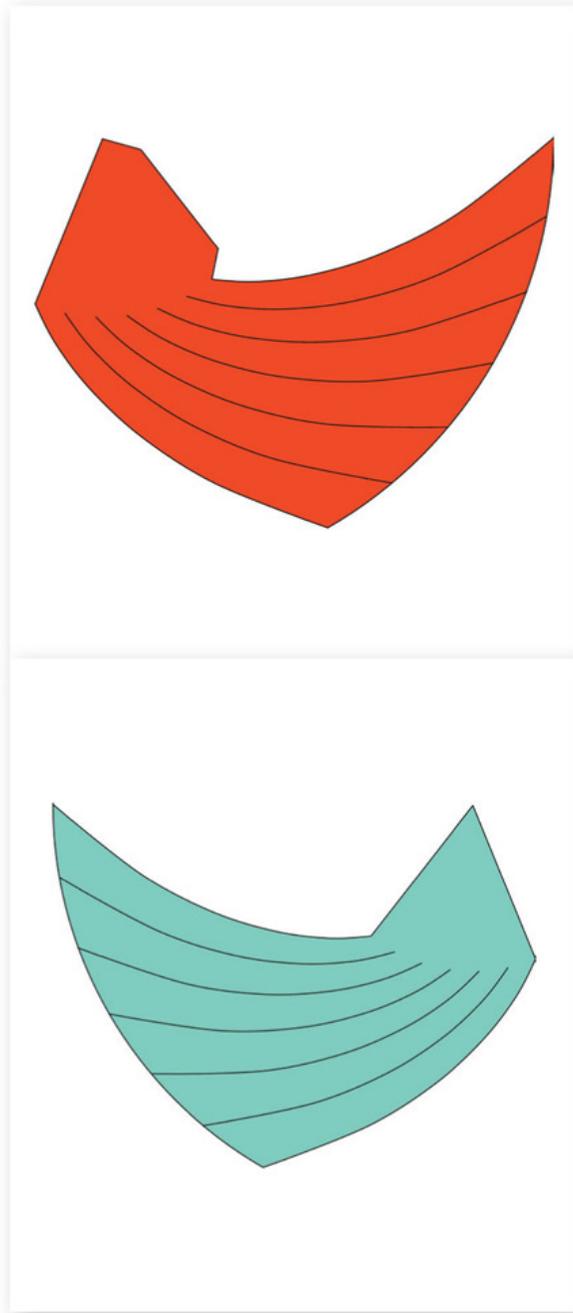
TEMPLATES AND PIECES

- For the project templates, see pages [141](#) and [152](#); for a variety of alternative handle templates, see [page 132](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - E8 (large swirling piece with arms): 1 in color X (shown in red; use the color you intend for the bottom cone)
 - E8 (mirror or reverse image of template and without the flap): 1 in color Y (shown in turquoise)
 - E9 (arched strip): 1 in color X and 1 in color Y
 - E10 (form): 1 any color
- 1 handle in color X, 3/8-inch wide × 10-inches long (1 × 25 cm)

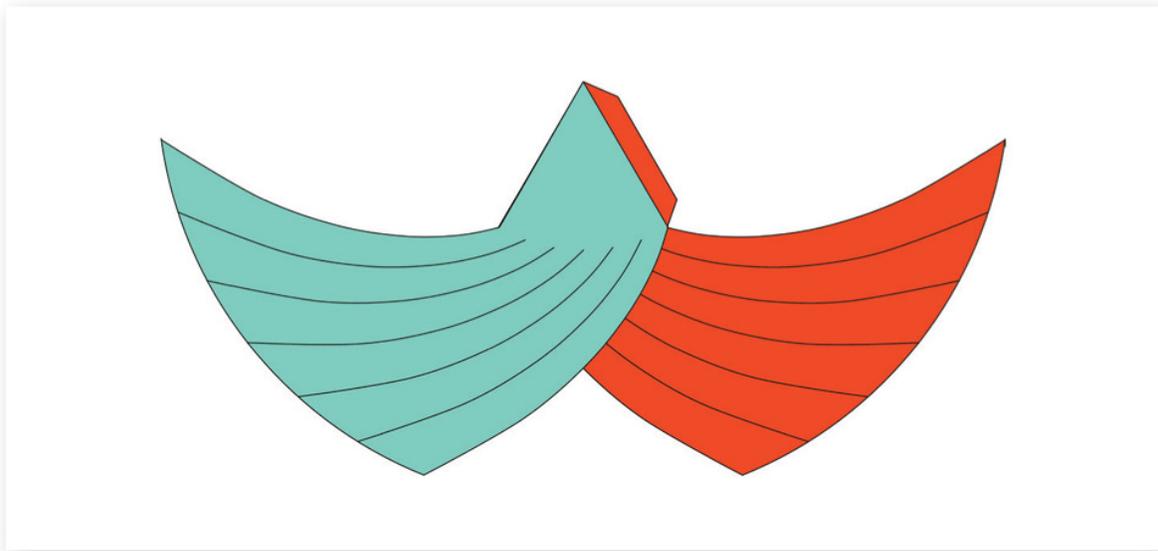
To make a simple cone, you need two identical but mirrored pieces. The lower part of each piece is a circular section that will form the bottom of the cone. Along one of its straight edges is a small flap that is used to fix the bottom. From the arch of the small cone's circular edge, run other arches (spirals, actually). When cut, these

spiral “arms” are woven to create the cone. In addition to the two large pieces, you need a handle; you also may use arched strips to cover the upper edge of the cone after weaving.

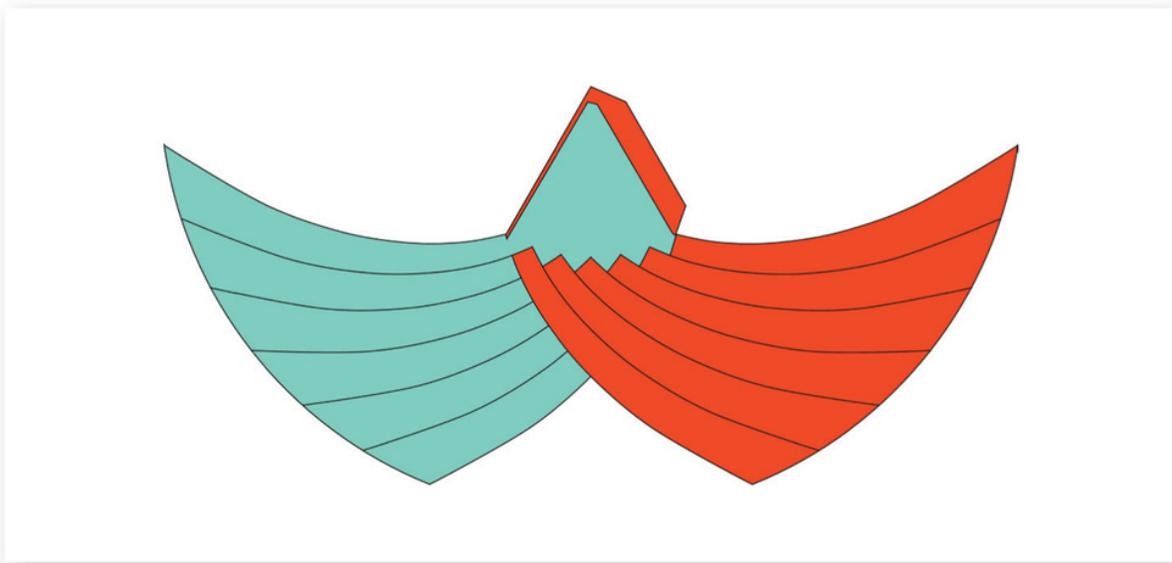
Read the instructions carefully before you start. There are many pitfalls causing the outcome to be less crisp and pretty than you envisaged. Possibly make one or two simple and easily cut-out cones before you move on to the more elaborate ones.



① Place the two E8 pieces on the table, back side up, with arms swirling in opposite directions.



② Place the piece without the flap on top of the one with the flap and line them up as shown.



③ Weave the first row. Align the pieces so that the points and straight edges still are in line. Secure the two layers with a little glue.

④ Form the paper into a cone; a knitting needle is a useful tool for this. You will find that the point and the inner edge of the cone show or bulk

when you shape the cone. Unfold and cut away the surplus material from the part without the flap—but only that part. Secure the two layers with glue along the edges.

⑤ Crease the flap on the E10 cone form, smear glue on the flap and edge, bend so that the edges meet, and press down and hold until the glue has dried. Then finish the cone form as explained in step 9.

⑥ Round the cone's bottom around the knitting needle so that the two edges meet with ease.

⑦ Smear glue on the flap and on the inside edge.

⑧ Bend the cone so that the two edges align precisely; the first arms from either set should also align perfectly. Press them down and hold until the glue has dried. It is important that the fit is perfect so that the arms flow evenly around and over the previous edges. There must be no empty interval. Take care not to make any creases in the opposite side of the cone because they will show permanently on the front. (This is difficult to avoid in the pointed end of the cone, however.)

⑨ Open the cone and flatten the area near the previous edges using the knitting needle as a counterweight.

⑩ Crease the flap along the inner edge of the inner cone to the inside of the cone. It is very important to be precise: the crease must start at the point and end in the corner where the arms start. To get it right, you may score the creasing line using a darning needle and a ruler. Sharpen the edge after creasing.

⑪ Insert the cone form into the cone bottom. Press down firmly. You may even use a little glue—but not too much—to hold it in place; you need to be able to remove the cone form without damaging the woven cone after weaving

12 Now begin weaving the cone. Place the form and cone on the table with the point upward and the arms hanging down.



13 Make sure that all arms from the inner cone part are pulled to the front through the closest slit in the outer cone. The arms should be uniformly run smooth along the surface of the cone.

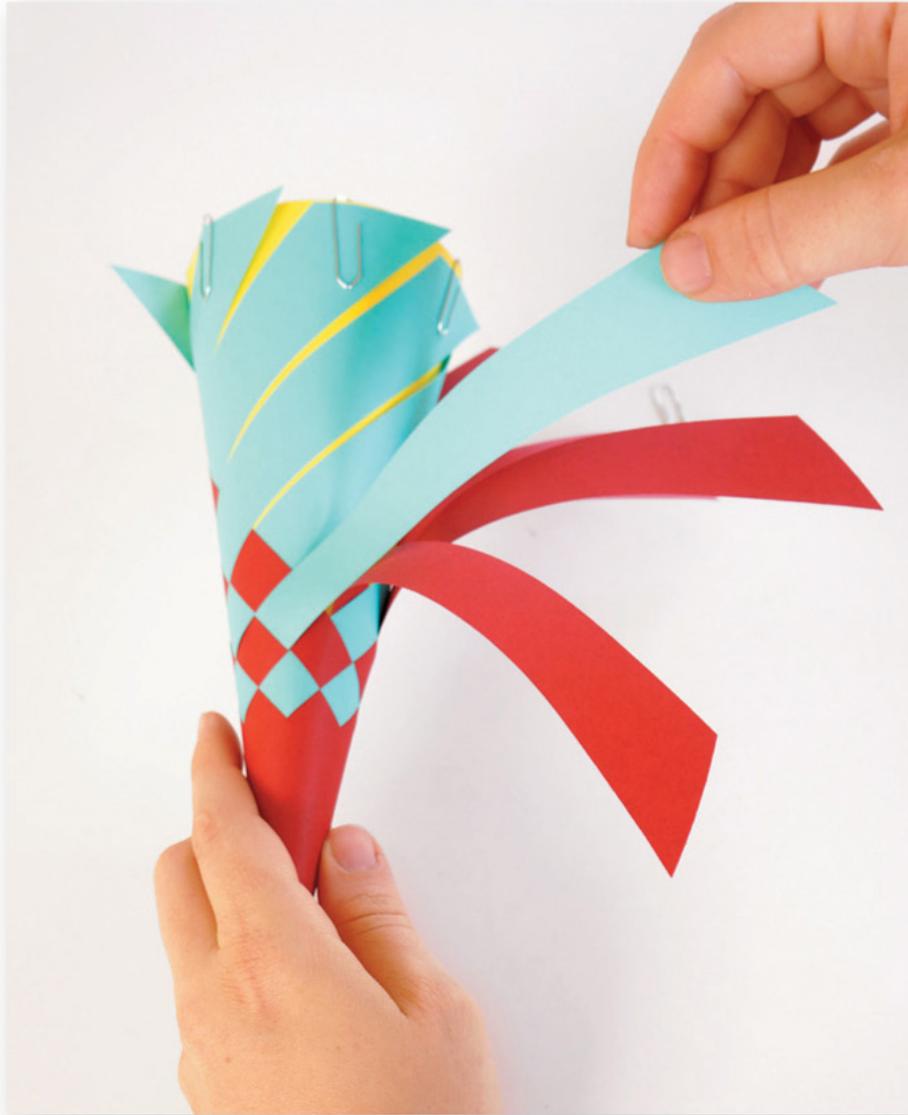
14 Turn the cone so that the tip points downward and the arms fall out and down.



15 Twist one arm from the inner piece around the outside of the cone form as it naturally falls and fix it to the upper edge of the cone form with a paper clip. The upper edge of the cone form and the edge of the arm must align.



16 To weave the next arm, choose the same-color arm that runs at the outside arc of the arm you just fixed. Weave the new arm through the arms of the other color it meets on its way to the edge of the cone form; the second arm will meet just one arm from the outer cone, but for the third arm, it will be two, then three for the fourth arm, and so on. Continue until you have woven and temporarily fixed all the arms with paper clips and you are back at the first arm again.



⑰ To continue weaving, you must loosen the paper clip of the next arm and pull the arm free of the cone until it is at the arm of the other color where last woven. Weave in as many arms of the other color as possible before you fix the arm again with a paper clip at the upper edge of the cone form. Continue in this way until all arms have been woven up to the edge.

⑱ Now you must tighten the cone. It will fit tightly around the form. Remove one paper clip at a time and pull the two loose arms gently; a pair of tweezers helps when pulling. Replace the paper clip. Continue around the cone edge a couple of times until you are satisfied with the result. Aim for an even edge of equally long arms.

- ⑲ Fix the arms with glue, one by one, all around the cone edge.
- ⑳ Remove the cone form.
- ㉑ Now you will add the handle and edge strips. Smear glue on the arched E9 edge strip and on the outer side of the cone's top edge. The result looks prettiest if you let the shorter, lower edge of the arched strip run from point to point of the squares. In this way, you will see only full squares on the finished cone.
- ㉒ Fix the handle to the inside of the cone. The handle should not extend more than $\frac{1}{3}$ inch (8 mm) below the upper edge
- ㉓ Fix the other arched strip E9 (preferably in color Y) to the inside of the cone.

BASIC SPHERE



MATERIALS

- Paper in two or more contrasting colors (we used three, colors X, Y, and Z), 80–200 g/m² in weight (Note: See “Sphere Size and Paper Weight.”) Glue stick

FROM YOUR TOOLBOX

- 12 paper clips (for weaving)
- Tweezers (for pulling the strips when lining them up)

TEMPLATES & PIECES

- For the project templates, see [page 141](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - K1 (arm): 6 in color × (shown in purple) and 6 in color Y (shown in green) (Note: If you prefer to use two colors only, all 12 K1 arms should be the same color.)
 - K1 (mirror or reverse image of template): 12 in color Z (shown in gold)
 - K2 (circular piece): 1 in color X
 - K2, K3, K4, or K5 (circular piece): 1 in color × (Note: This is optional. Do not cut this piece until after you have woven the sphere to determine the actual size needed: K3 is a little larger than K2, and if you want to hang the sphere, use the pierced K4 or K5 circular piece.)

SPHERE SIZE AND PAPER WEIGHT

If you enlarge the templates for this project, you may use paper that’s heavier than recommended in the materials list. The rule of thumb is, the larger the sphere, the heavier the paper you’ll need. If you make a large sphere with paper that’s too light, it won’t keep its shape. Although heavier papers are easier to weave and yield sturdier spheres, if you use them to make a

small sphere—one that’s less than about 4 inches (10 cm) in diameter—the arms may break or crease permanently as you weave them

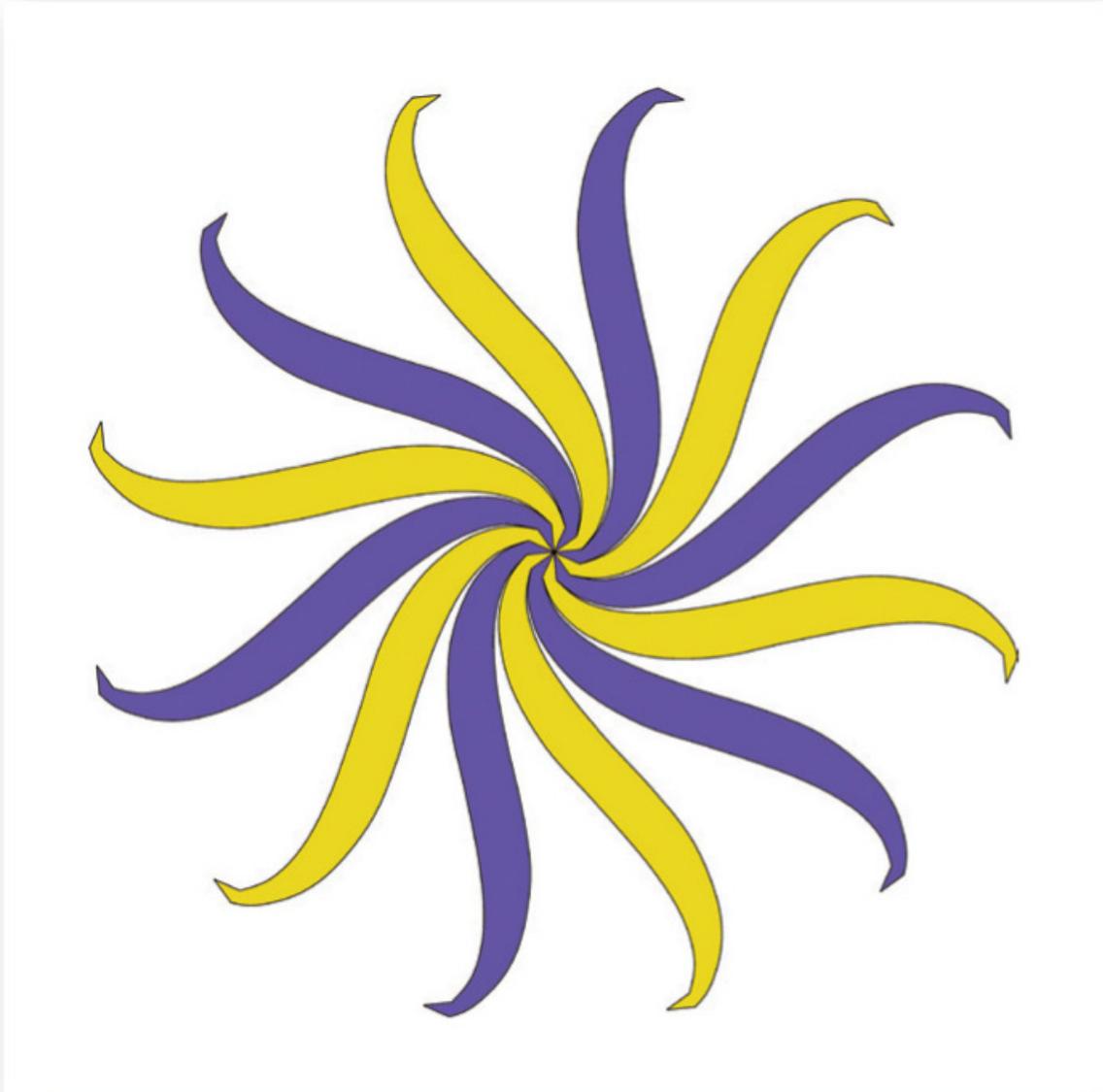
A sphere is woven from two identical swirling parts. The center of each part is a small circle, from which curved arms extend in a spiral from its circumference. The length of the arms is about one half the circumference of the finished sphere. If a finished sphere’s diameter is approximately 6 inches (15 cm), then the length of the arms will need to be about $9\frac{1}{2}$ inches (24 cm), which means that the diameter of the two swirling parts from which the sphere is made would need to be approximately 19 inches (48 cm).

Templates of that size can’t be photocopied or printed on a standard $8\frac{1}{2} \times 11$ inches (21.6×27.9 cm) or an A4 sheet, so they have to be assembled from smaller pieces.

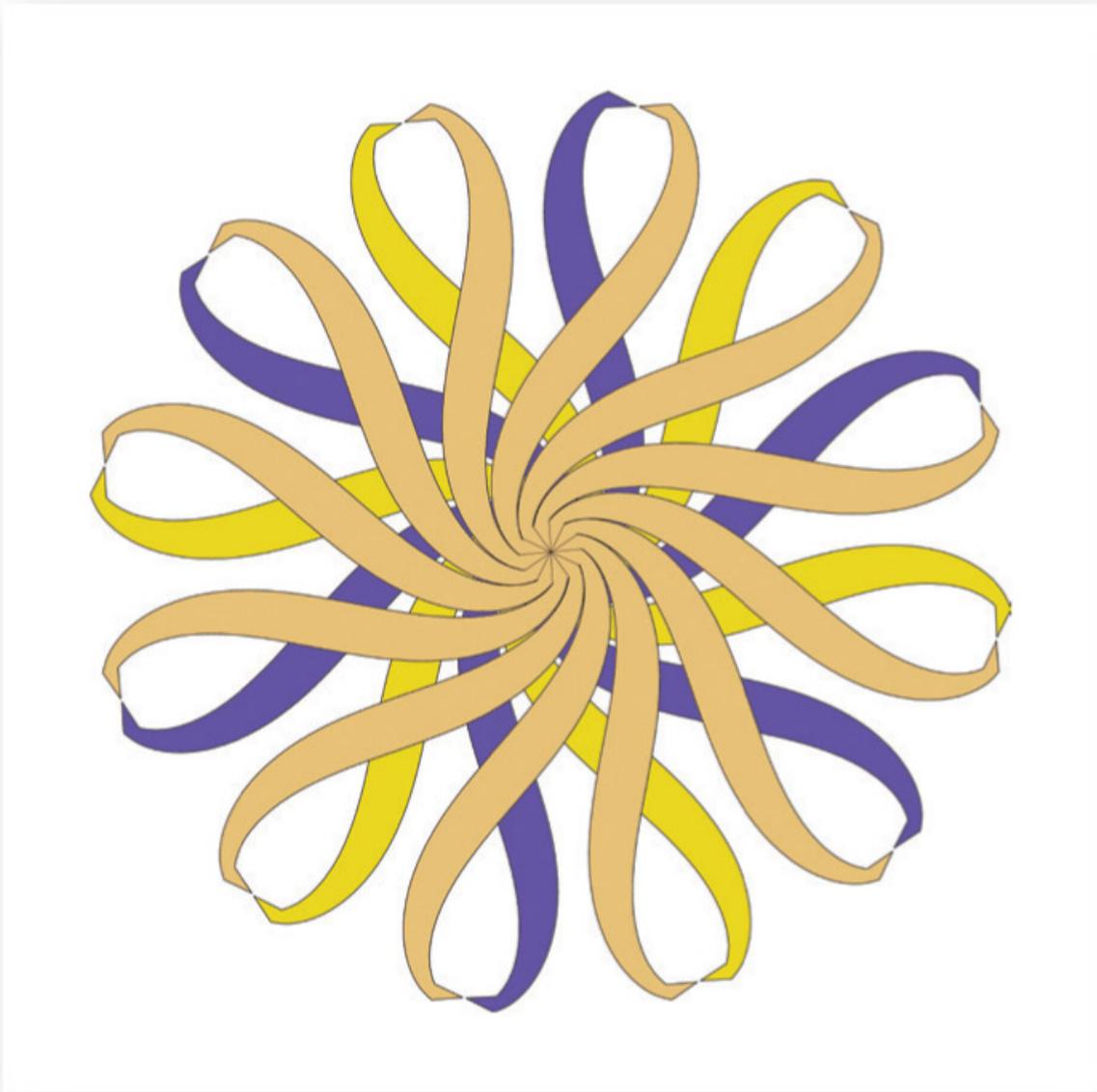
When weaving the Basic Sphere using the templates at the size shown on [page 141](#), its diameter will be about $4\frac{3}{8}$ inches (11 cm). If you want to resize the templates to make a larger or smaller sphere, read “Sphere Size and Paper Weight” on [page 32](#), for details on how a change in scale will affect the weight of the paper you use.

You can use multiple colors for the spiral arms to yield a more intriguing pattern than the basic checkerboard, which is what you’ll get if you use only two. To make the sphere shown in the instructions, we used three colors.

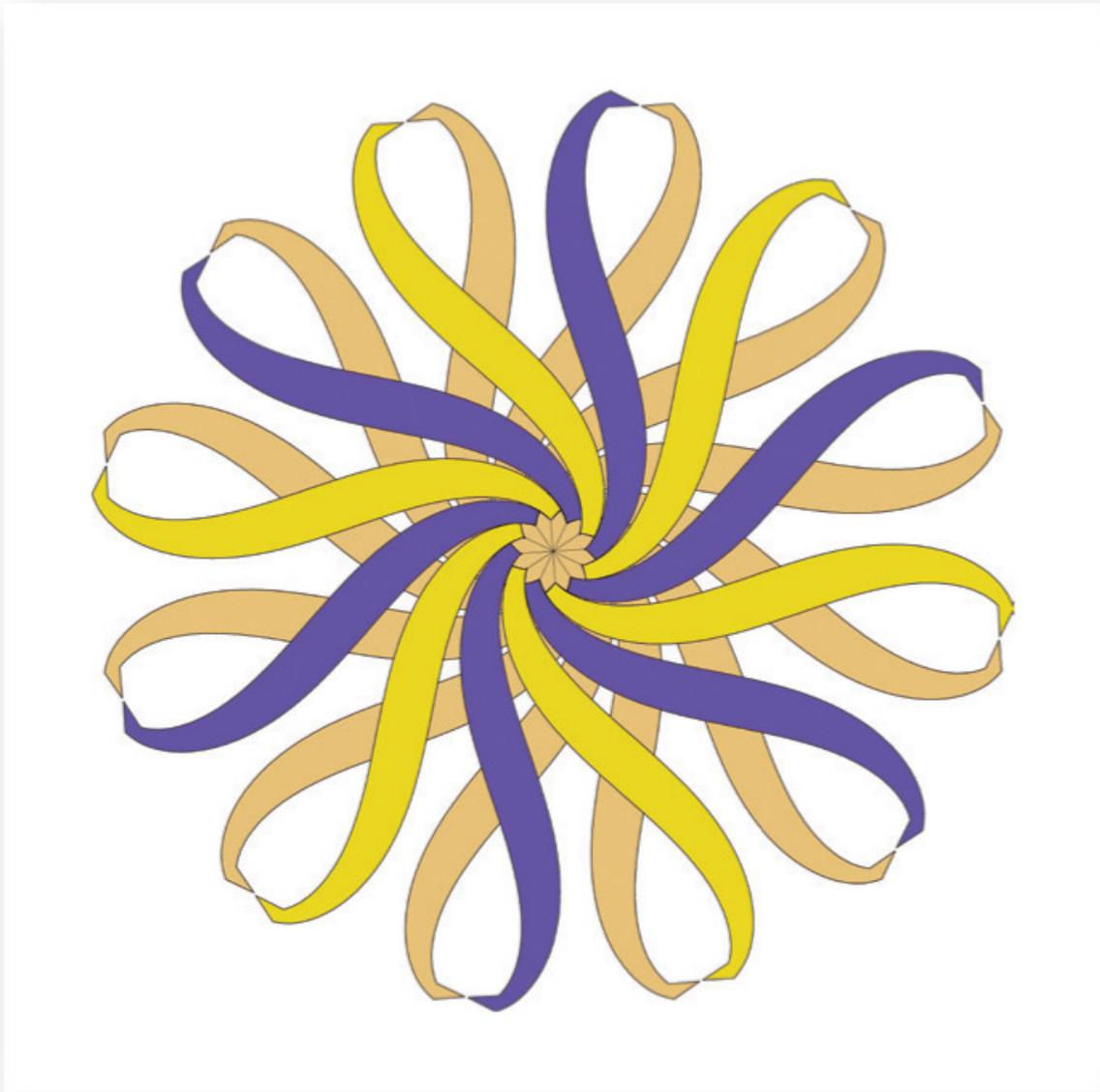




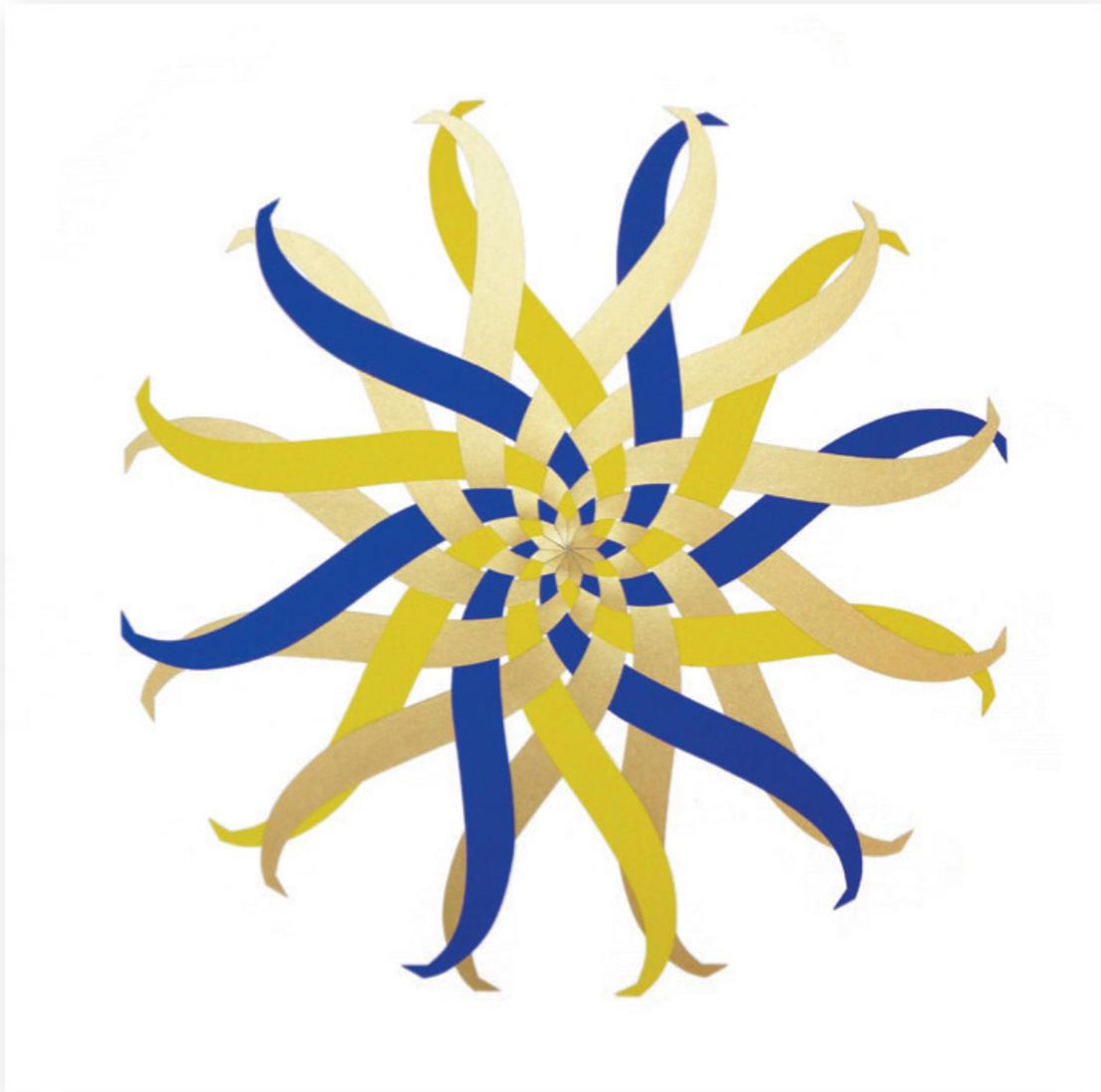
① To create the swirling shape, glue the first set of twelve K1 arms (six each in two different colors) to a circular K2 piece, making sure that all the arms are swirling in the same direction. The points of the small triangles at the ends of the arms must all meet at the center of K2, and they must be arranged and glued tightly and precisely so there's enough room for all of them. Place the item flat on your work surface, circular piece downward, and make sure all the arms are glued securely.



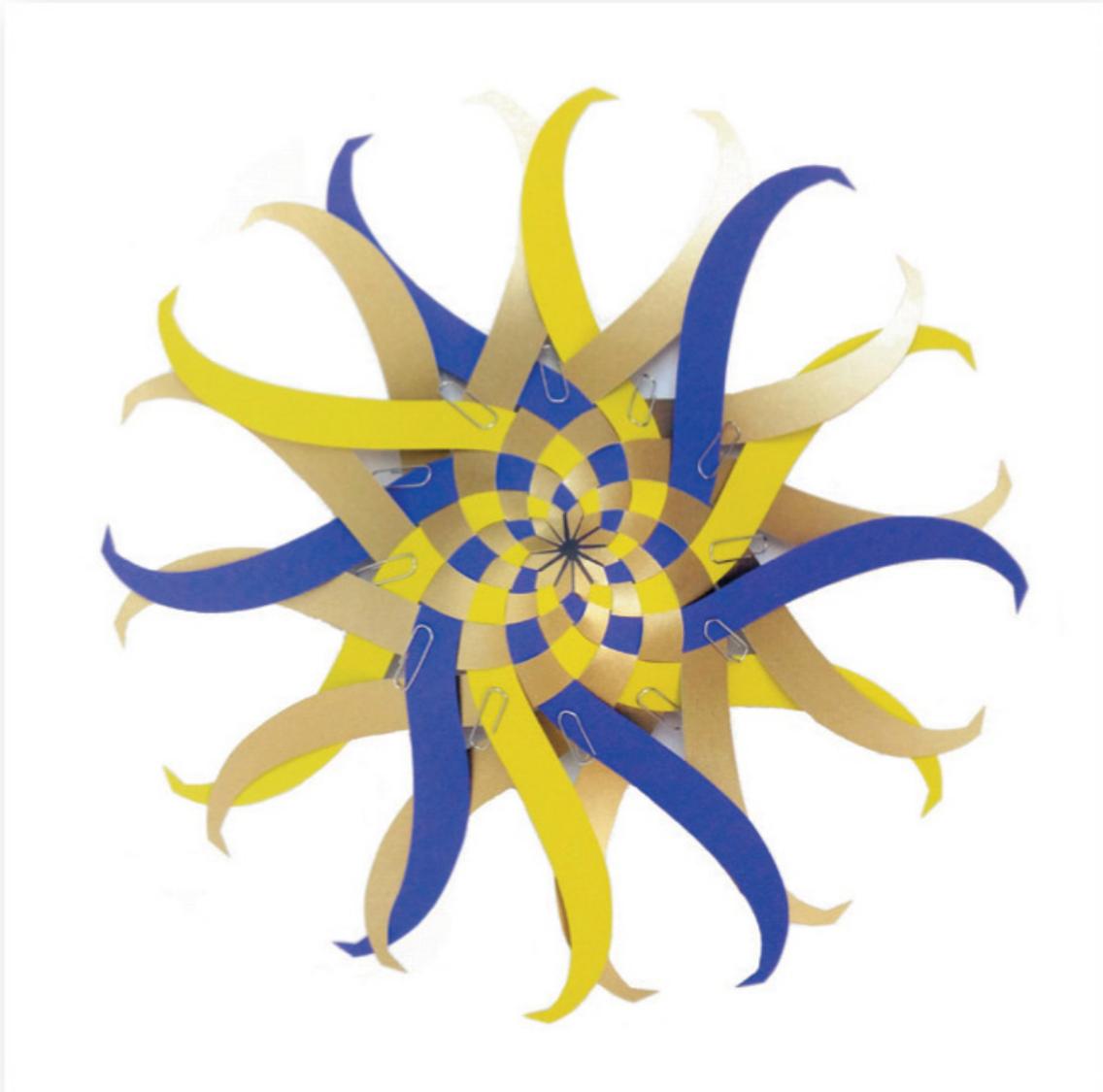
- 2 Glue the second set of twelve mirrored K1 arms (all in the same color) to the same circular piece on top of the first set of arms. Again, all these arms should swirl in one direction but in the opposite direction of the arms from step 1. The small triangles must be placed exactly above each other. Place the item flat on your work surface, circular piece downward, and make sure all the arms are glued securely



③ Begin weaving by pulling each arm of the two-color set through the nearest slit between the arms of the one-color set.



④ Continue weaving as long as possible while the project is still flat on the work surface.



⑤ Now you must begin to tighten the weaving, which will cause the sphere to become three dimensional. Tighten all sets of arms along the sphere's circumference, keeping each pair together with a paper clip. Tighten the weaving consistently and as tightly as possible; if it's too loose, you'll be unable to make the arms meet at the sphere's other end (see "Troubleshooting," below.)



⑥ Continue weaving and tightening, row by row, until only one or two rows remain. As you get to the ends of the arms, it helps to weave them with the tweezers



- 7 When the sphere is woven tightly and precisely, there should be the same number of squares on either side of its equator, and you should also be able to make the small triangles at the ends of the arms meet in overlapping pairs. Glue each pair of triangles in place.

TROUBLESHOOTING

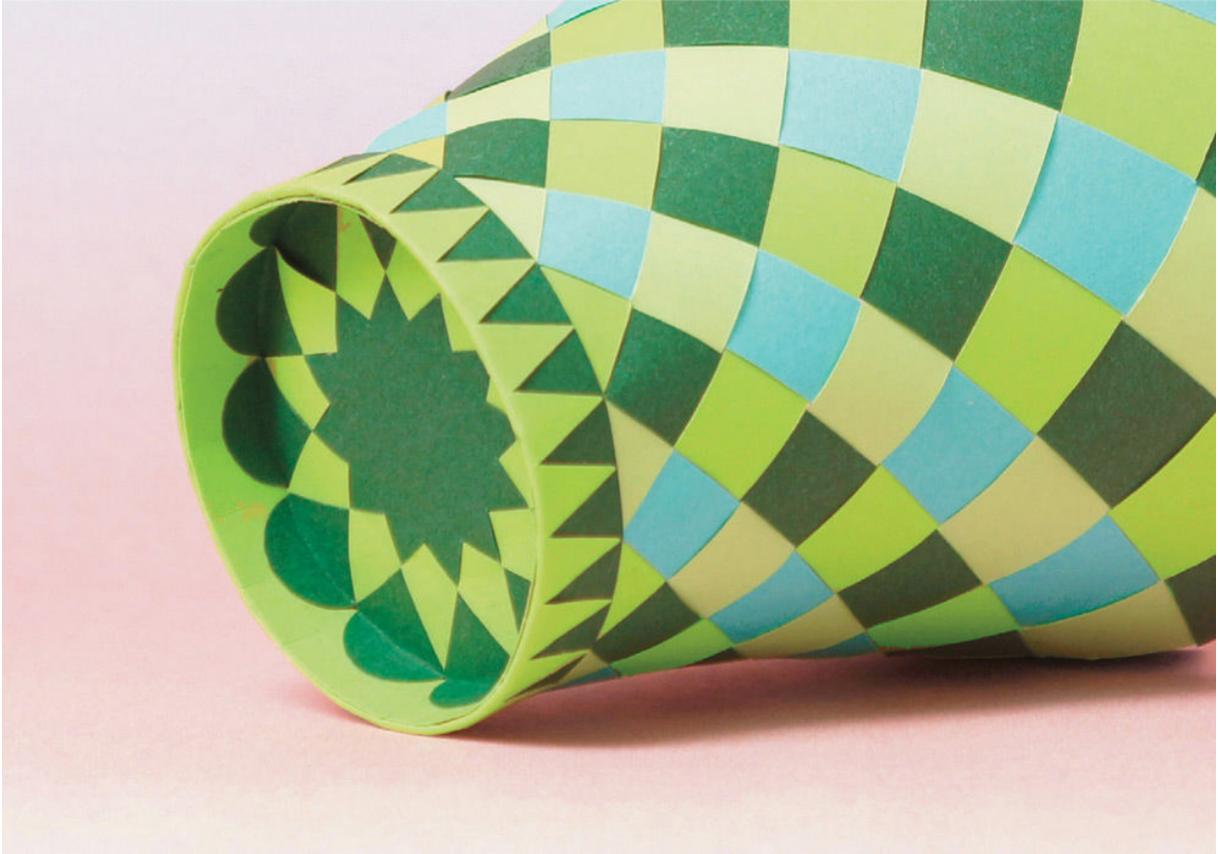
If your finished sphere isn't perfectly round, try gently rolling it between your palms.

If, when you're finished weaving, the triangles at the ends of the arms don't quite meet, cut out a circular piece—K2, K3, K4, or K5, depending on the gap—in color × to cover the open area. If these pieces are too small, cut out a larger circle with the circumference you need.

BASIC BASKET

The basket may hang or stand on the table. Fill the basket with candy, nuts, or flowers.





MATERIALS

- Paper in four colors (colors W, X, Y, and Z), 80–130 g/m² in weight (*Notes: If you want to fill the basket with anything hefty or you want to hang it, you must use heavier papers, otherwise the basket and, in particular, the handle will become misshapen. You may weave the basket from two colors, but it will look more interesting if you use four. You may use contrasting colors or choose complementary colors.*)
- Glue stick

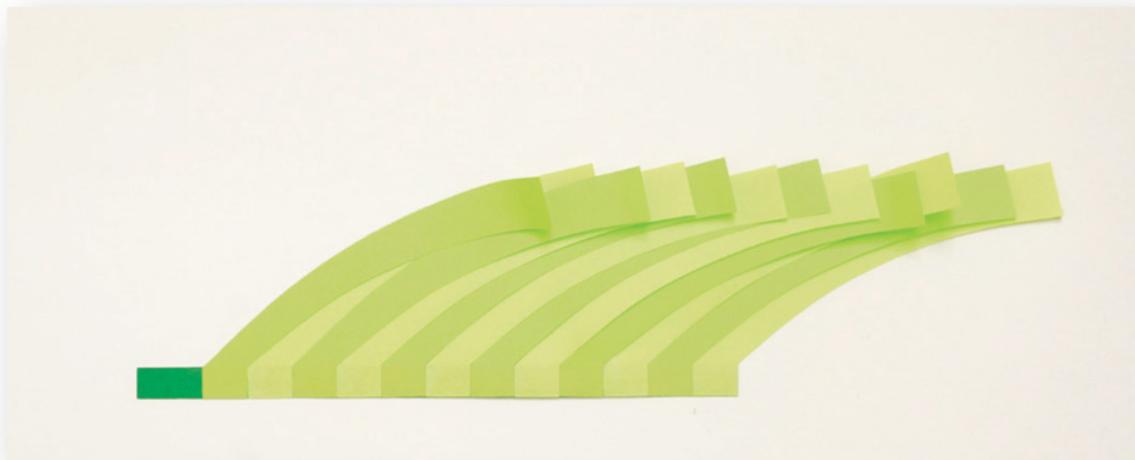
FROM YOUR TOOLBOX

- 12 paper clips (for weaving)
- Knitting needle or other rounded object (for shaping)
- Darning needle (for scoring)
 - Tweezers (for pulling the strips)

TEMPLATES AND PIECES

- For the project templates, see pages [148](#) and [156](#); for a variety of alternative handle templates, see [page 132](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - I1: 6 in color W (shown in dark green) and 6 in color X (shown in blue)
 - I1 (mirror or reverse image of template): 6 in color Y (shown in green) and 6 in color Z (shown in lighter green)
 - I2 (narrow strip): 1 in color W
 - I3 (large round bottom piece): 1 in color W and 1 in color Y
 - I4 (round bottom piece): 1 in color Y and 1 in color W
 - I6 (narrow strip with notches): 1 in color Y
 - I7 (zigzag strip): 1 in color Y
 - T13 (handle strip): 1 each in colors W and X

SIDES OF THE BASKET



- 1 Fix the twelve I1 arms in colors Y and Z to the narrow I2 strip in color W. They must make a tight fit, with colors alternating.



- 2 Add another layer of twelve mirrored I1 strips, alternating colors W and X, precisely aligning them with those below but swirling in the opposite direction.



③ Join the strip into a ring, with no interval between the arms; the arms must abut, using the free end of the strip for gluing. When you form the ring, consider the colors: The colors of the arms showing on the inside will be those showing at the upper rim of the basket. Secure the ring with glue.



④ Now you may start weaving around and around, row by row, keeping the arms in place as you go with paper clips.



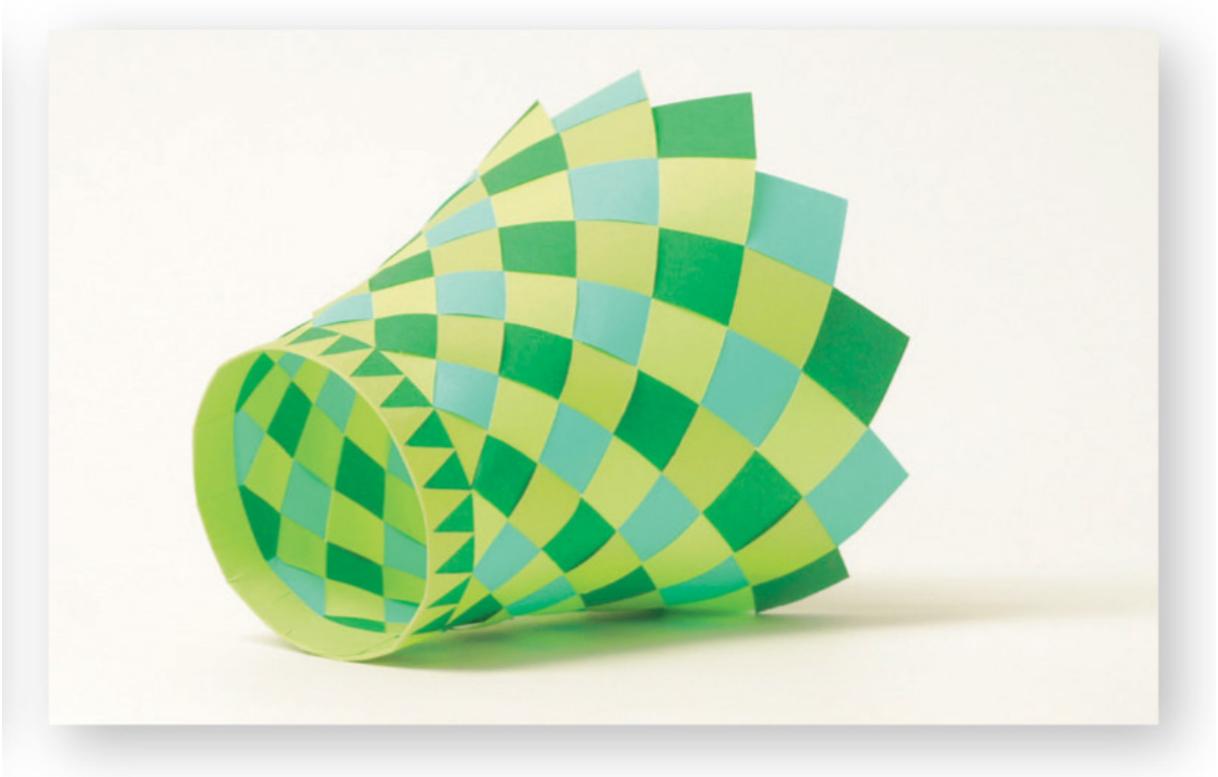
- ⑤ After weaving, tighten the arms so that the points at the end of the arms are aligned and all arms appear to be equal in length. When satisfied with the result, secure the woven strips with glue.

LOWER EDGE OF THE BASKET

- 6 The lower edge of the basket may appear somewhat angular and stiffened by the glue. Try to smooth the edge, creasing it gently around a rounded object, such as a knitting needle.



- 7 Add the I7 zigzag strip, smearing glue only on the small triangles. Fix the strip so that every second point meets a point on the basket. This means that the other half of the strip will stand out at the bottom of the basket.

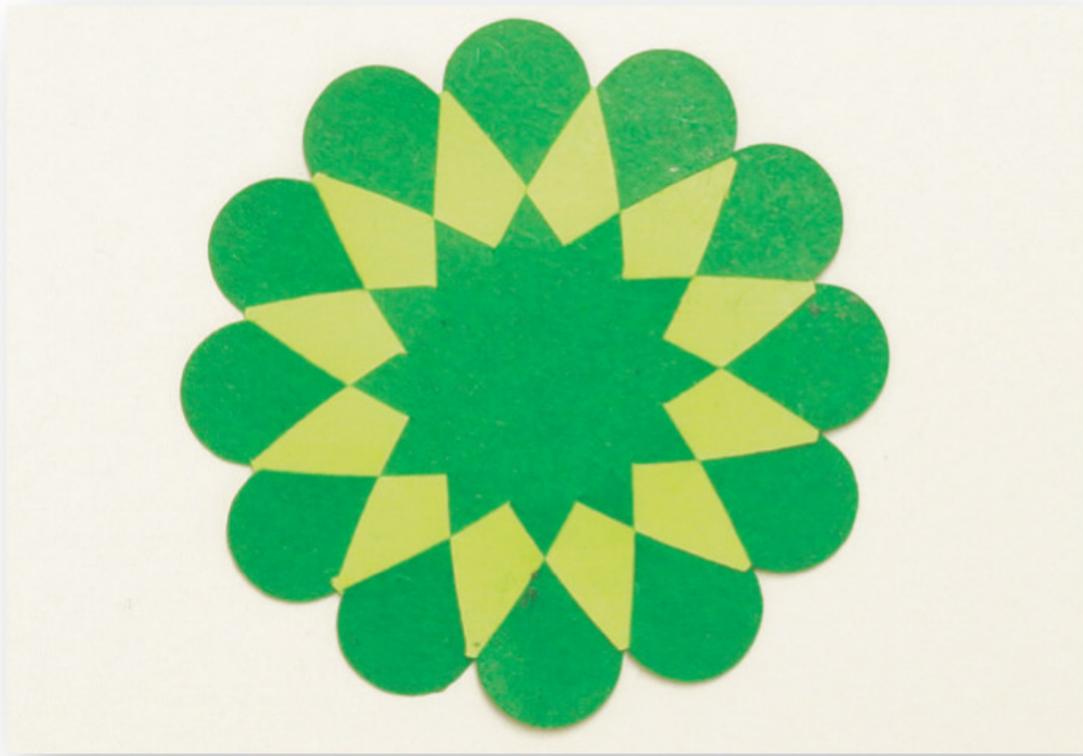


⑧ Smear glue on the back of the remaining part of the I7 strip and crease it onto the inside of the basket; two sets of small triangles will show on the lower edge of the basket

THE BOTTOM FACE



- 9 Weave together the round I3 piece in color W and the round I4 piece in color Y in the same way as explained for weaving a bunting around a center (see [page 16](#)). However, here you must work your way around the center twice. To tighten the weaving and make the center star stand out, gently pull sets of adjacent arms swirling in opposite directions. Pull them set by set and work your way around the center. No slit should remain unused.



10 Fix the pieces with glue.



11 Score the back side (the side showing the I4 circle) using a darning needle and the I4 circle as a form.



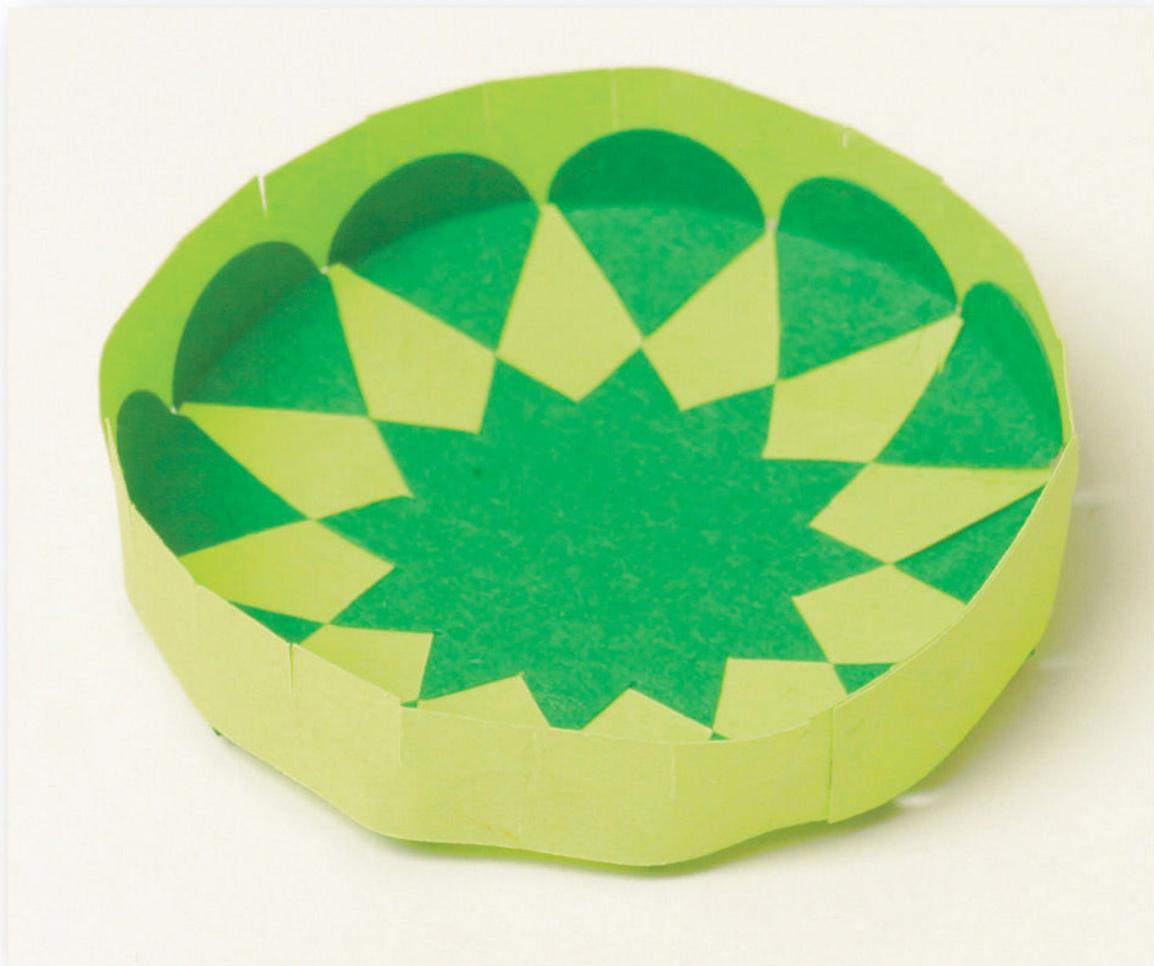
⑫ Turn the object and crease so that the small semicircles in color W stand up.

THE BOTTOM SIDES

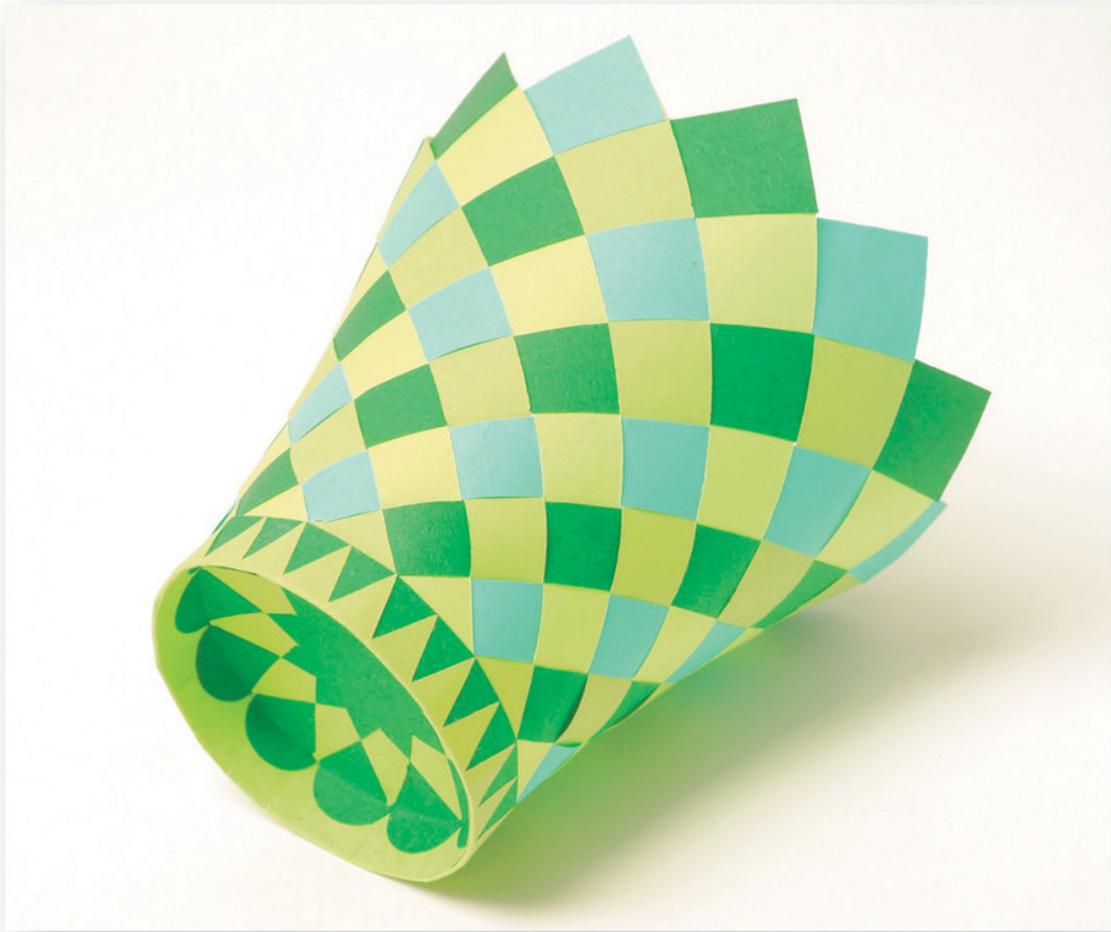


- ⑬ Form a ring from the I6 strip with the notches and place it inside the basket. Adjust the ring until it makes a perfect fit.
- ⑭ Mark the overlap with a pencil, remove the strip from the basket, and fix it with glue to the size determined in step 13.
- ⑮ Crease the ring to divide it into two sections of equal length. Crease once more so that the ring is subdivided into four equal sections.

ASSEMBLE THE BOTTOM



⑩ Secure the bottom face inside the I6 ring with glue. The small notches must point away from the woven face. Use the creases and the top points of the semicircles to judge how to distribute the paper in an even way. When aligning, the semicircles will nearly cover the creases, so no harm done.

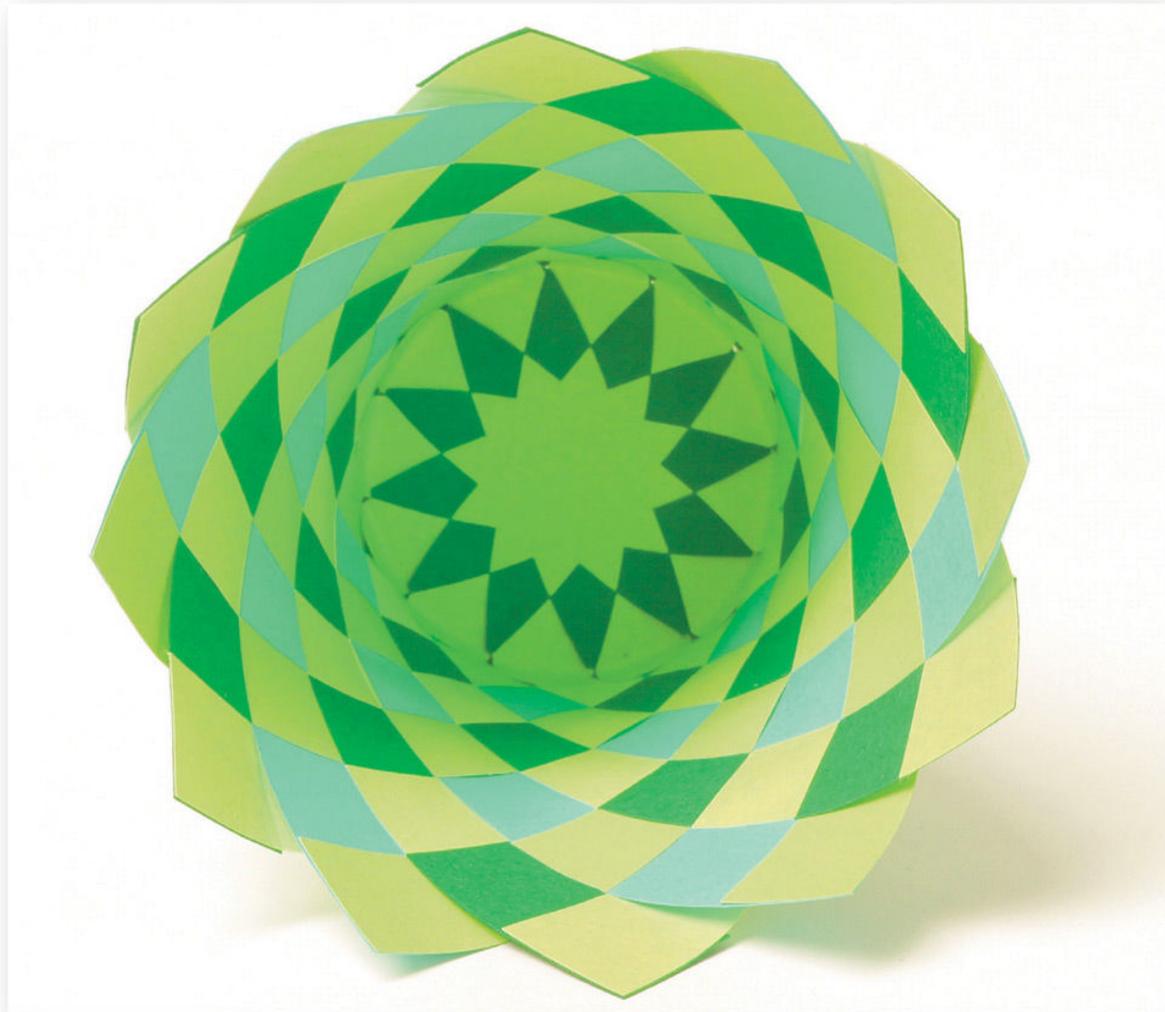


17 Smear glue on the outside of the I6 ring and place it inside the basket's bottom opening so that the edge of the ring with the semicircles is aligned with the lower edge of the basket; that is, you can see a firm rim standing up from the basket's bottom face. Press the rim until the glue has dried.

18 Align the basket and the bottom so that the edge becomes even and smooth.

The inside of the basket will look more finished if you add another bottom piece inside.

THE BASKET INTERIOR

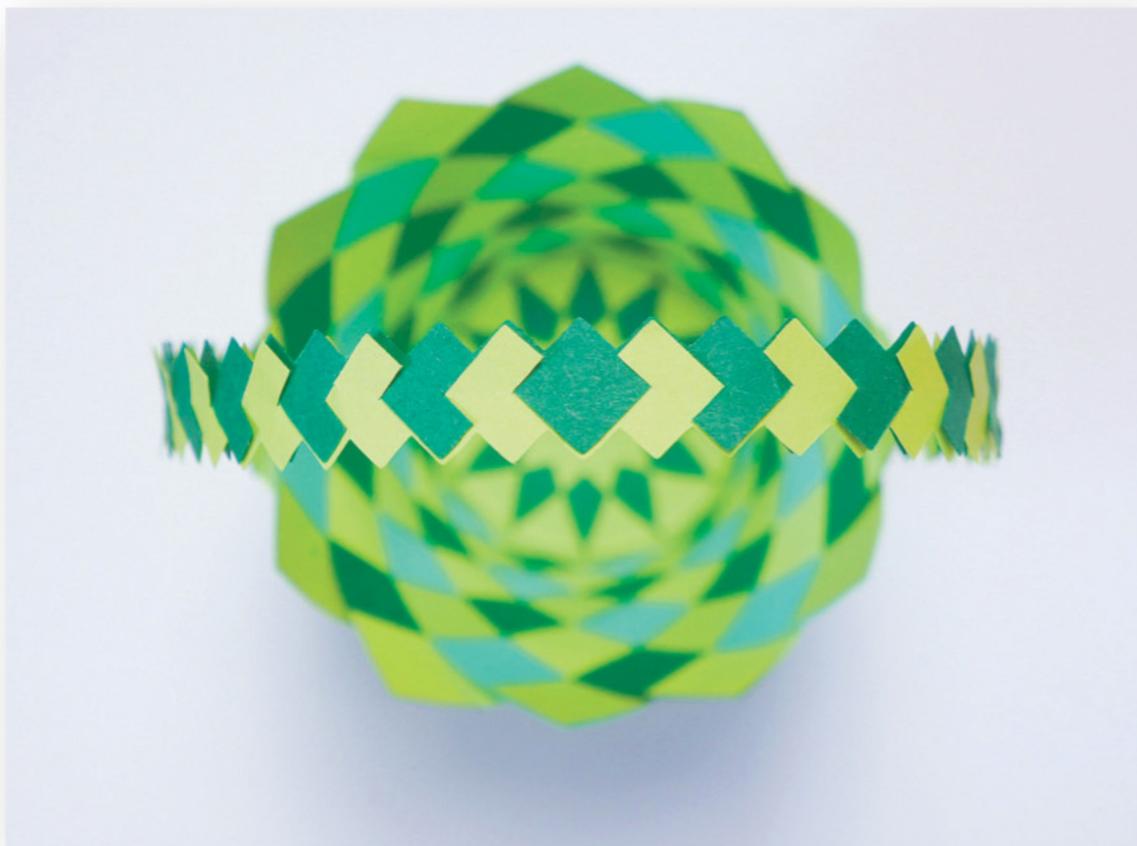


- 19 Weave together the remaining round I3 and I4 pieces as explained in step 9 and fix them with glue.
- 20 Score the woven piece using a darning needle and the edge of I4 as a form.
- 21 Crease the semicircles so that they stand up from the bottom.
- 22 Smear glue on the outside of the semicircles.

23 Place this inner bottom inside the basket with the semicircles pointing upward.

24 Align the patterns on the bottom and sides and press down onto the basket's side.

HANDLE



Add the handle. A handle joined from two strips with squares—T13—is suggested, but, of course, you can make a plain handle, such as a simple strip, or any other handle you prefer. The handle is glued inside the basket. You may want to trim the ends of the handle so that they follow one of the lines inside the basket.

LOVE & FRIENDSHIP

Making something special for your loved ones is a fantastic benefit of paper weaving. The art form is founded on love and devotion. Woven tokens of love and friendship are the traditional subjects of paper weaving. From the Scandinavian heart basket to the joined hand and heart, we offer an insight into their creation. Luckily, we are today able to study them and reveal their secrets. In an article for *Folk Art* magazine, Leslie S. May writes that these small art pieces were “treasured by their makers and recipients” and “have survived by being tucked into Bibles, glued into albums, and folded into preserved correspondence” (May 2006, 58). It is important to note that not all were associated with courtship and valentines; some were also made as bookmarks, others were given to schoolchildren as rewards of merit, and some passed between family members.



HEART IN HAND

The Heart in Hand design is based on the 1840s love and friendship tokens (see [page 6](#)). We have combined tricks and features handed down to us through the preserved old tokens with inspiration from other period craft work. The new Victorian-style love token requires both skills and patience to prepare. Weaving may appear complicated, but it is straightforward once you have grasped the principle.



MATERIALS

- Paper in two or more contrasting colors (colors × and Y), 80–100 g/m² in weight

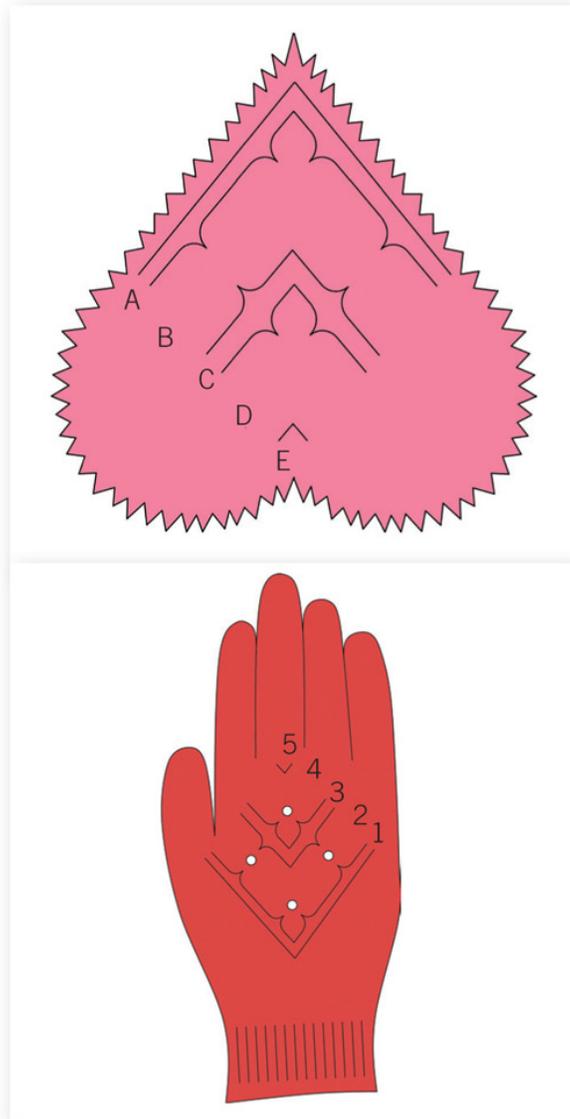
FROM YOUR TOOLBOX

- Tweezers (for weaving)

TEMPLATES, PARTS, AND PIECES

- For the project templates, see pages [137](#)–[138](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - A6 (heart): 1 piece in color × (shown in pink)
 - A7 (bar): 1 piece in color × or another color
 - A8 (hand): 1 piece in color Y (shown in red)

(Note: When cutting the pieces by hand, it is easier to create the intricate patterns of A6 and A8 if you crease the paper along the dotted lines; then you can cut on the fold and need not piece the paper. Any inaccuracy also will be symmetrical and appear as if it were planned.)



The instructions refer to the strips, as labeled in the diagrams.



① Place the A6 heart piece on top of the A8 hand piece as shown. The point of the heart is at the base of A8's fingers.



② Inside A6 is a large flap with the strips labeled A–E. Insert this whole flap into the largest and lowest slit in A8; this is the slit below strip 1. Align the pieces.



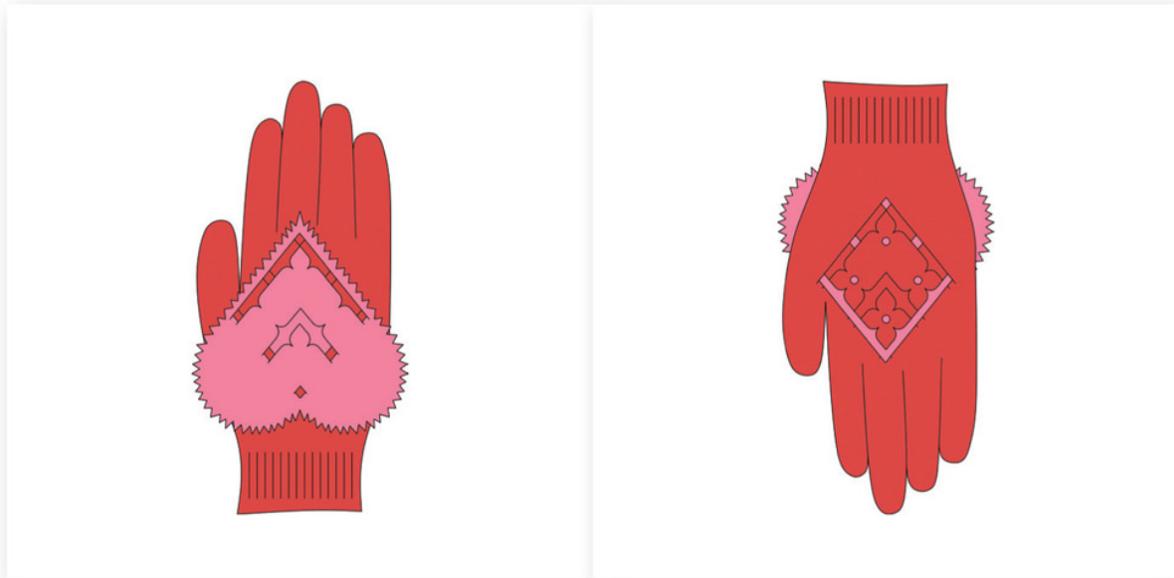
③ Begin weaving strip 1 by pulling out strips B, C, and D from behind strips 1 through 5. Align the pieces.



- 4 Pull out the point of strip 1 through the slit between strips B and C.



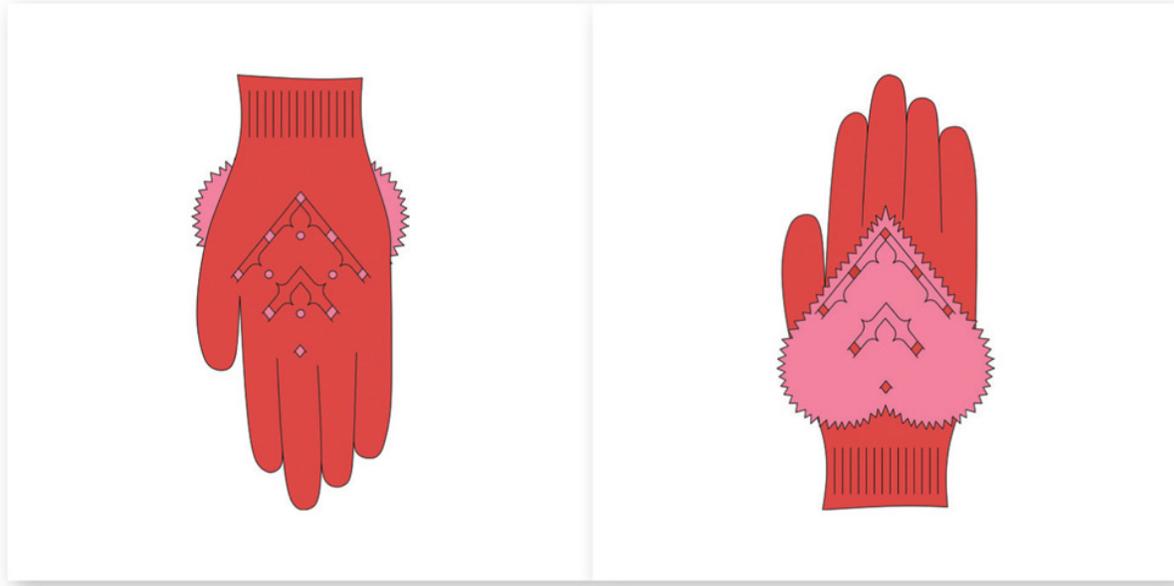
5 Inset the point of strip 1 into the slit between strips C and D.



- 6 Pull out the point of strip 1 through the slit between strips D and E. Align. Turn the project so the back side is facing up and the fingertips point downward.



7 Weave strip A using the same steps as for strip 1 (steps 3–6). Begin by pulling strips 2–5 out from behind strip A, then pull the point of strip A out through the slit between strips 2 and 3.



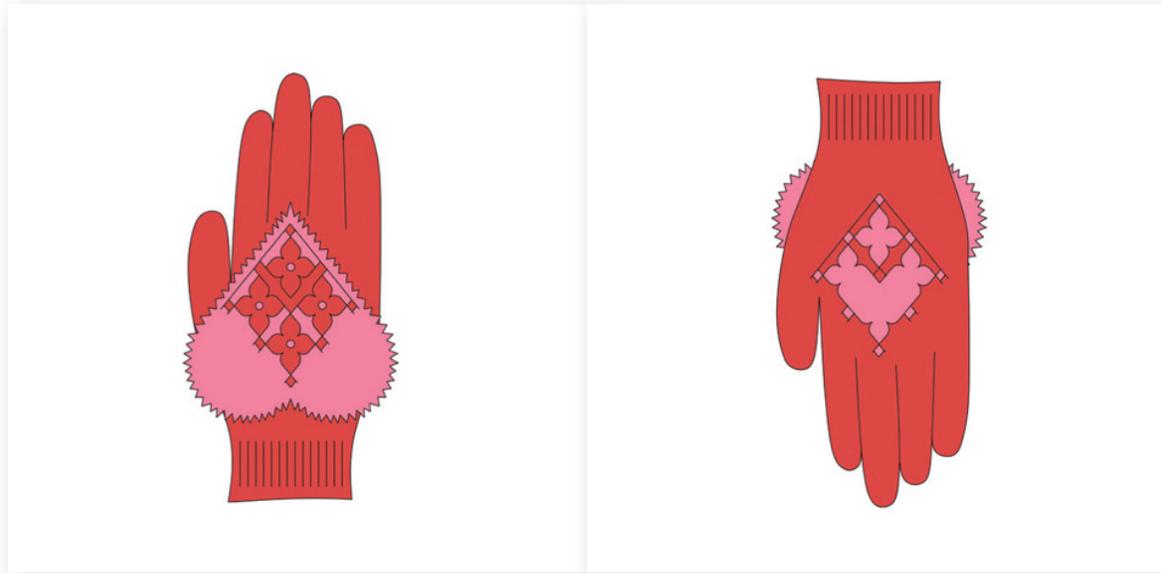
⑧ Insert the point of strip A in the slit between strips 3 and 4. Pull out the point of strip A from the slit between strips 4 and 5. Turn the project so the front side is facing up and the fingertips point upward.



⑨ Weave strip 2 by pulling the points of strips 2–4 through the slit between strips A and B.



10 Insert the point of strip 2 into the slit between strips B and C.



11 Pull out the point of strip 2 through the slit between strips C and D. Align. Turn the project so the back side is facing up and fingertips point downward.



12 Weave strip B by inserting the point of strip B in the slit between strips 2 and 3.



13 Pull out the point of strip B through the slit between strips 3 and 4. Align. Turn the project so the front side is facing up and finger tips point upward.



14 Insert the point of strip C in the center slit between strips 2 and 3. Align the pieces. Weave the A7 strip into the slits near the wrist of A8.

HEART WITH CIRCLES OVERLAY

You may prepare hearts that look impressively complicated just by adding an overlay in a contrasting color. For this heart, we have designed an overlay with circles.



MATERIALS

- Paper in four colors (colors W, X, Y, and Z), 70–110 g/m² in weight
- Glue stick

FROM YOUR TOOLBOX

- Tweezers (for weaving)

TEMPLATES & PIECES

- For the project templates, see [page 150](#); for a selection of alternative handle templates, see [page 132](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - B3: 1 in color W (shown in red) and 1 in color × (shown in yellow)
 - B4: 1 in color Y (shown in pink)
 - B5: 1 in color Z (shown in orange)
 - 1 handle each in colors W and X, each $\frac{3}{16}$ -inch wide × 9 $\frac{1}{2}$ -inches long (5 mm × 24 cm)

Make the Heart with Circles Overlay in almost the same way as described for the Basic Woven Heart (see [page 18](#)). The only difference is that you crease the overlay pieces (B4 and B5) along the short dashed line (the line of symmetry) and put them around the large heart pieces in the contrasting color before you start weaving. Once you start weaving, make sure the circles are visible.

FLOWER HEART

The Flower Heart is made using four different colors of paper. Both the colors you choose and how you mix them will affect the result. See the six other alternate looks that can be made with the same colors as those used in the sample.



MATERIALS

- Paper in four colors (W, X, Y, and Z), from 70g/m² up to 100g/m² in weight

TEMPLATES, PARTS AND PIECES

- For the project templates, see [page 139](#); for the handle templates, see [page 132](#). Prepare the templates as directed on [page 135](#).
- From the templates, cut the following parts and pieces:
 - C1 (with the smallest holes): 1 piece in color X
 - C2: 1 piece in color Y
 - C3: 1 piece in color Z
 - C4 (with the largest holes): 1 piece in color W
 - 1 handle (approximately $\frac{3}{8}$ -inch (1 cm) wide and 9 $\frac{1}{2}$ -inches (24 cm) long in color X



The two parts for this heart each consist of two pieces, which are layered before weaving is begun. Pieces C1 and C2 are layered and then pieces C3 and C4 are layered. This heart is woven and finished using the same technique used for the Basic Heart with Circles (see [page 21](#)), with part C1/C2 corresponding to part B6 (the one with the smaller holes).

CUTE HEARTS CONE

The Cute Hearts Cone is time consuming to cut out but fast and easy to weave. Use two different colors of paper—one metallic paper creates a special effect.



FROM YOUR TOOLBOX

- Knitting needle or conical item (to shape the cone)
- Darning needle and ruler (for scoring)
- 5 paper clips (for weaving)

TEMPLATES & PIECES

- For the project templates, see [page 145](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - G1 (with solid hearts): 1 piece in color X (shown in yellow and pink)
 - G2 (with open hearts): 1 piece in color Y (shown in metallic gold)
 - 1 handle in color X, $\frac{3}{8}$ -inch wide \times 9 $\frac{1}{2}$ -inches long (1 \times 24 cm)
 - 1 handle in color Y, $\frac{3}{16}$ -inch wide \times 9 $\frac{1}{2}$ -inches long (5 mm \times 24 cm)

The principles for weaving the Cute Hearts Cone are similar to those for the Basic Cone (see [page 28](#)).

- ① Place the G1 piece with the flap on the table, back side up. Place the G2 piece next to it, also back side up. Check that the arms swirl in opposite directions; this is crucial to weaving.
- ② Place the G2 piece on top of the G1 piece and line them up so that the material for the small bottom cone overlaps exactly and only the flap of G1 is visible.
- ③ Weave the first row. Align the pieces so that they still make a perfect overlap. Secure the position of the two layers with glue.

- ④ Form the small bottom cone (a knitting needle or similar tool is useful for this) and fix it with glue.
- ⑤ Weave the cone. Because of the heart pattern, no cone form is required for weaving. Pull and tighten the arms until the right heart pattern shows as you weave. Keep the woven arms together with paper clips when necessary.
- ⑥ Tighten and line up until all hearts are even. Secure the cone with glue along the top edge.
- ⑦ Fix the narrow handle strip onto the wider strip with glue. Fix the handle to the cone with glue.

SCALLOPED BASKET

For the most part, the Scalloped Basket is woven in exactly the same way as the Basic Basket (see [page 35](#)). The only difference is that the template for this project has wavy arms. You may change the appearance of the basket by adding a beautiful edge (see [page 134](#)).



MATERIALS

- Paper in four colors (colors W, X, Y, and Z), 80–130 g/m² in weight
- Glue stick

FROM YOUR TOOLBOX

- 12 paper clips (for weaving)
- Knitting needle or other rounded object (to shape and smooth the basket)
- Darning needle (for scoring)
- Tweezers (for pulling the strips)

TEMPLATES & PIECES

- For the project templates, see pages [153](#) and [156](#); for a selection of alternative handle templates, see [page 132](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - I9: 6 in color W (red in standing basket) and 6 in color × (shown in yellow)
 - I9 (mirror image of template): 6 in color Y (shown in pink) and 6 in color Z (shown in orange)
 - 2 (narrow strip): 1 in color W
 - I3 (large round bottom piece): 1 in color W and 1 in color Y
 - I4 (round bottom piece): 1 in color W and 1 in color Y
 - I6 (narrow strip with notches): 1 in color Y
 - I7 (zigzag strip): 1 in color Y
 - T4 (handle strip): 1 each in colors W and Y

This project is made following the instructions for the Basic Basket (see [page 35](#)). For the handle, braid the two T4 strips, trim the ends to the same length, and then glue them to the inside of the basket.

ROSE BASKET

The Rose Basket is woven from arms in nine slightly different shapes. This is our first attempt to move beyond a rotationally symmetrical object like the Basic Basket. Take great care to fix the arms in the correct order.





MATERIALS

- Paper in two contrasting colors or patterns (colors X and Y), 80–110 g/m² in weight
- Glue stick

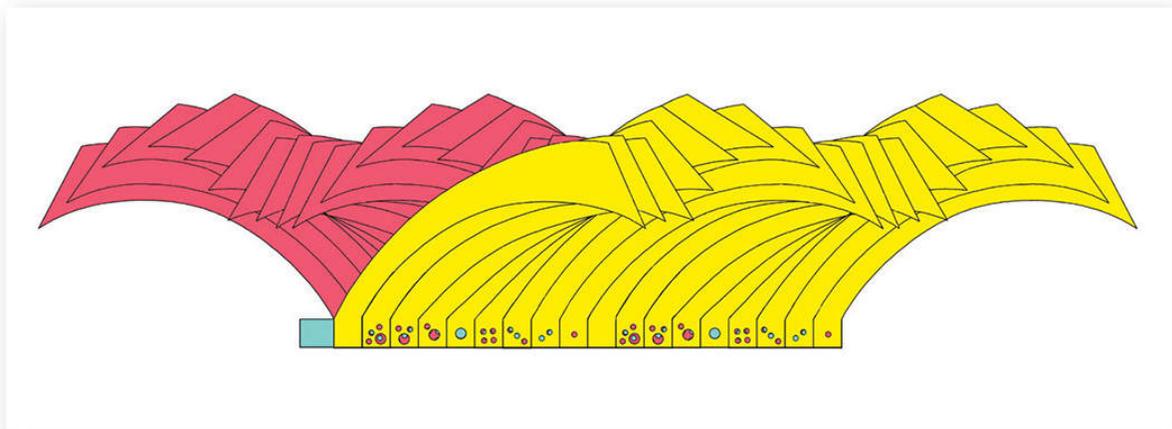
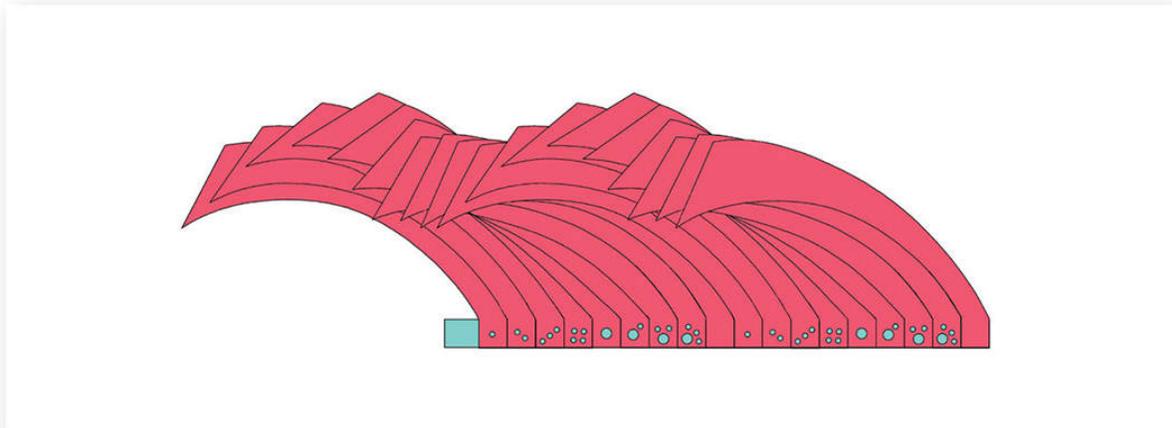
FROM YOUR TOOLBOX

- 18 paper clips (for weaving)
- Knitting needle or other rounded object (for shaping)
- Darning needle (for scoring)
- Tweezers (for pulling the strips)

TEMPLATES & PIECES

- For the project templates, see pages [144](#), [153](#), and [155](#); for the handle template and alternatives, see [page 132](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - D13–D21 (arms): 2 each of 9 different arms in color X (shown in pink)
 - D13–D21 (mirror or reverse image of template): 2 each of 9 mirrored arms in color Y (shown in yellow)
 - J10 (narrow strip): 2 in color X
 - J11 (zigzag strip): 1 in color Y
 - J12 (indicated by the two red circles and the red lines): 1 in color Y
 - J13 (large black circle on template): 1 in color X, solid piece
 - J14 (large and smallest black circles): 1 with small hole in color Y
 - J15 (large and medium black circles): 1 in color X
 - J16 (edge strip): 2 in color X and 2 in color Y
 - T4 (handle strip): 2 in color X and 1 in color Y

In principle, the project is made following the instructions for the Basic Basket (see [page 35](#)). However, there are some important differences described in the steps below.



- ① The arms (D13–D21) are coded for identification. The symbols indicate numbers from 0 to 8. A small circle counts as 1; a large circle counts as 5. Fix the first set of eighteen arms (two each of nine arms), D13–D21, in color \times to the narrow J10 strip also in color \times (blue on template to show codes). The sequence should be as indicated on the page with templates; that is, the higher-numbered arms should be placed at the outside of the rounded strip. The arms must make a tight fit.
- ② Add the next layer of the eighteen mirrored D13–D21 strips; the bases must be precisely aligned with the first layer but swirling in the opposite direction. Important: You must start the sequence aligning the strips with

number 5 in both layers, then number 6 will go on number 4 (and so on) in the layer below.

③ Shape the strip into a ring with no interval between the arms. Fix with glue.

④ It is important that the bottom of the basket remains a circle while you weave. Stack pieces J12, J13, J14, and J15 to form a pattern of concentric circles. Fix the layers with glue. Crease and fold all flaps on piece J12 upward from the pattern. Smear glue on all the flaps and place the bottom inside the ring of arms so that the edge of the flaps aligns with the lower edge of the strip and press them together.

⑤ Smear glue on the half of the J11 zigzag strip with the triangles. Place the strip on the outside of the ring made in step 4 so that the zigzag points meet the points of the squares; press together. Smear glue on the other half of the zigzag strip, crease around the edge, and press down.

⑥ Weave the arms, keeping them in place with paper clips.

⑦ After weaving, align and tighten the arms so that all arms appear to be equal length. When satisfied with the result, fix with glue.

⑧ An edge strip J16 covers half the circumference of the top edge of the basket, starting at midfront and ending at midback. Smear glue on a J16 edge strip in color Y and fix it to the inside of the basket; the lower edge should be aligned with the points in the last set of woven squares, just $\frac{1}{16}$ – $\frac{1}{8}$ inch (2–3 mm) from the edge. Continue gluing the other J16 strip in color Y to the remaining section of the edge, and allow it to dry. Next, fix the two J16 strips in color X to the outside of the basket, aligning the top edges of the strips.

HANDLE

Finally, add the handle. A handle woven from three wavy T4 strips is suggested. You are of course free to make a simpler handle, such as a simple strip. The handle is fixed inside the basket. You may trim the ends of the handle so that they follow one of the lines inside the basket.

CELEBRATIONS

For special occasions, woven paper objects make colorful contributions to a cheerful atmosphere. Easily put on the table or hung from the wall, bunting, bells, and hot air balloons will lend the room a touch of homemade magic. As additional decoration, cone hats are certainly a fun accessory for a colorful party.

Once the routine of everyday life returns, pretty balloons and bells may decorate your living room in dynamic combinations of color, shapes, and sizes. Make a mobile from the hot air balloons, and they will twist, turn, and fly around endlessly. Such a mobile will undoubtedly brighten up a nursery and put you and any toddler in a cheerful mood.



SIMPLE HEART BUNTING

The small woven hearts are fast and easy to make. Use several different colors to get a vivid bunting. You can fit about twelve hearts on 40 inches (1 m) of bunting.

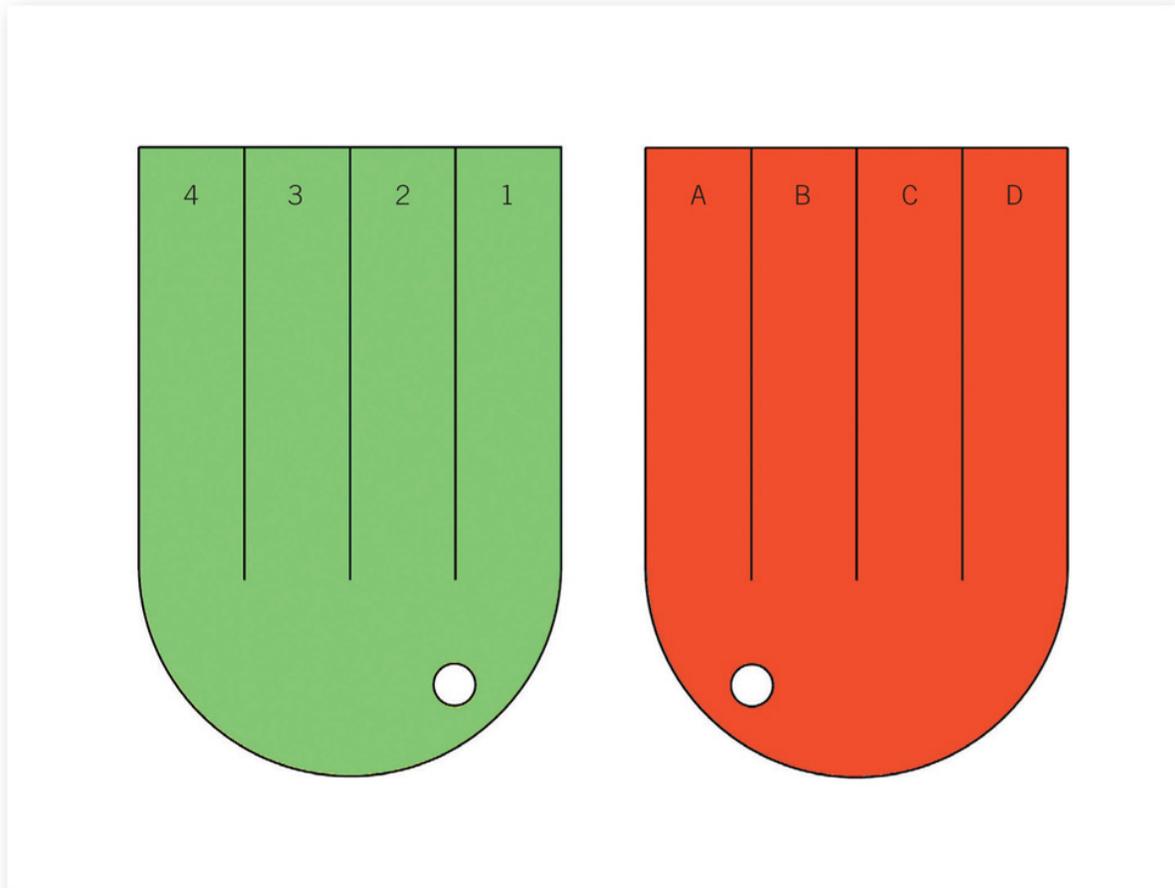


MATERIALS

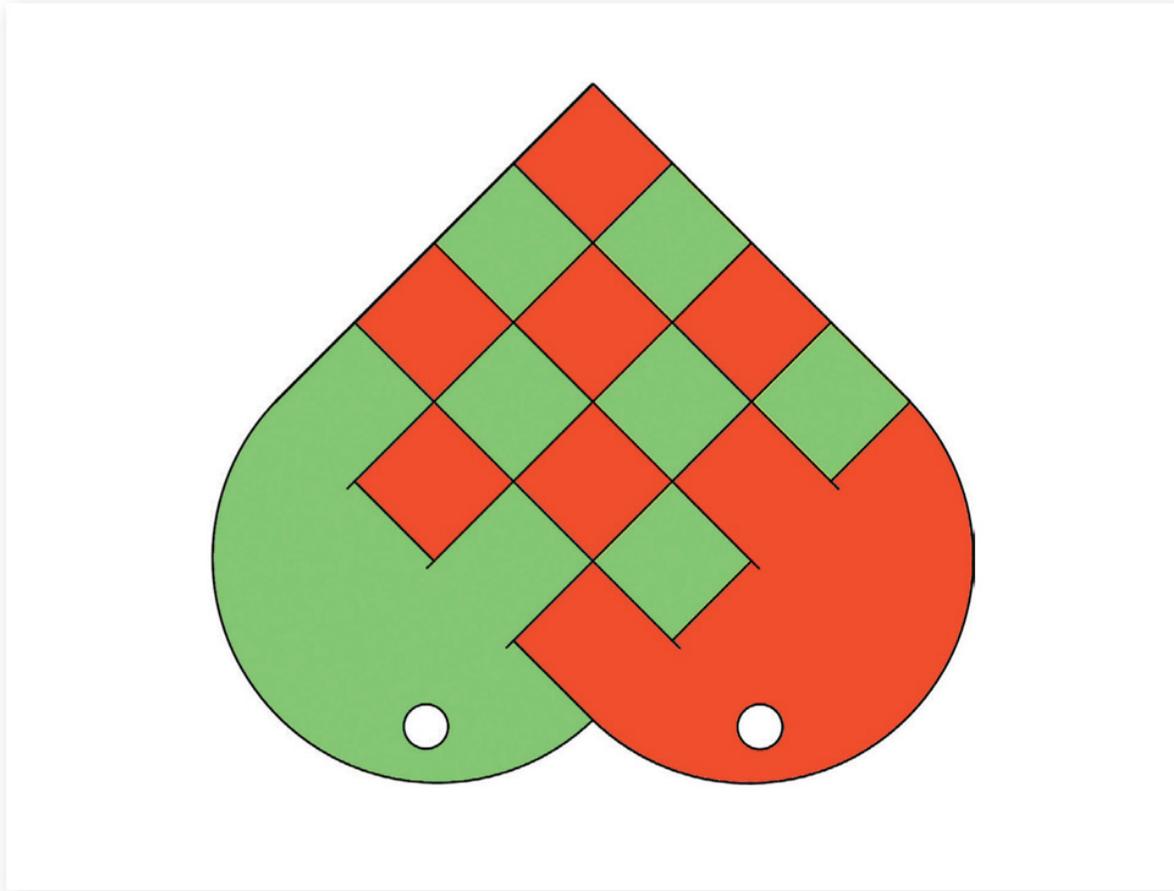
- Paper in two contrasting colors (colors \times and Y), 80–130 g/m² in weight
- Glue stick
- A piece of string not more than $\frac{1}{16}$ inch (2 mm) in diameter and as long as you need

TEMPLATES & PIECES

- For the project template, see [page 135](#). Copy the template using your preferred method as described on [page 135](#).
- From the template, cut the following pieces for each heart:
 - A14: 1 in color \times (shown in green)
 - A14 (mirror or reverse image of template): 1 in color Y (shown in red)



① Place the two pieces next to each other so that the small holes are directly across from each other (one piece is mirrored) and weave them together almost in the same way as the Basic Woven Heart (see [page 18](#)). The difference is that the strips are only one layer; thus they are woven simply under and over—not around—each other.



- ② Continue weaving until all four rows are done. Fix the D4 point with glue; securing the strips along the edges is optional.
- ③ Weave the string in and out through the small holes of the hearts to display them.

FLOWER BUNTING

The Flower Bunting is a variation of the second Basic Triangle Bunting (Weaving around a Center), introduced on [page 16](#). Chose and mix many different colors to obtain the look and sentiment you prefer. You may fit about seven flags on 40 inches (1 m) of bunting.



MATERIALS

- Paper in two contrasting colors (colors \times and Y), 80–130 g/m² in weight
- Glue stick (optional)
- A piece of string not more than 1/16 inch (2 mm) in diameter and as long as you like

TEMPLATES & PIECES

- For the project template, see [page 138](#). Copy the template using your preferred method as described on [page 135](#).
- Using the template, cut the following pieces for each flag:
 - A9: 1 in color \times and 1 in color Y

The Flower Bunting is woven in the same way as the Basic Triangle Bunting, Weaving around a Center (see [page 16](#)): Slide the A9 pieces together at the slits near the points and line them up. You

may fix the flag with a little glue at the point to keep the pieces in place, if you find they tend to move. Make as many flags as desired and feature them by weaving the string in and out through the small holes.

HEART BUNTING WITH SPIRALS

You may fit about twelve of these on 40 inches (1 m) of bunting. At first the hearts seem complicated to make, but once you have learned the trick, they are simple and fast to put together.



MATERIALS

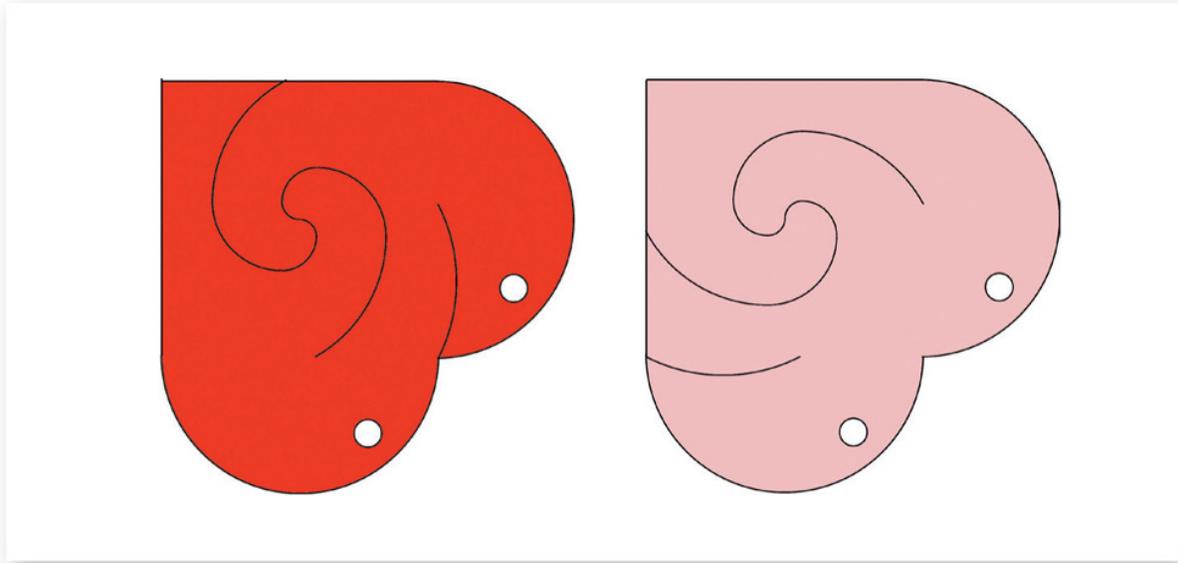
- Paper in two contrasting colors (colors X and Y), 80–130 g/m² in weight
- Glue
- A piece of string not more than 1/16 inch (2 mm) in diameter and the length you like

TEMPLATES, PARTS & PIECES

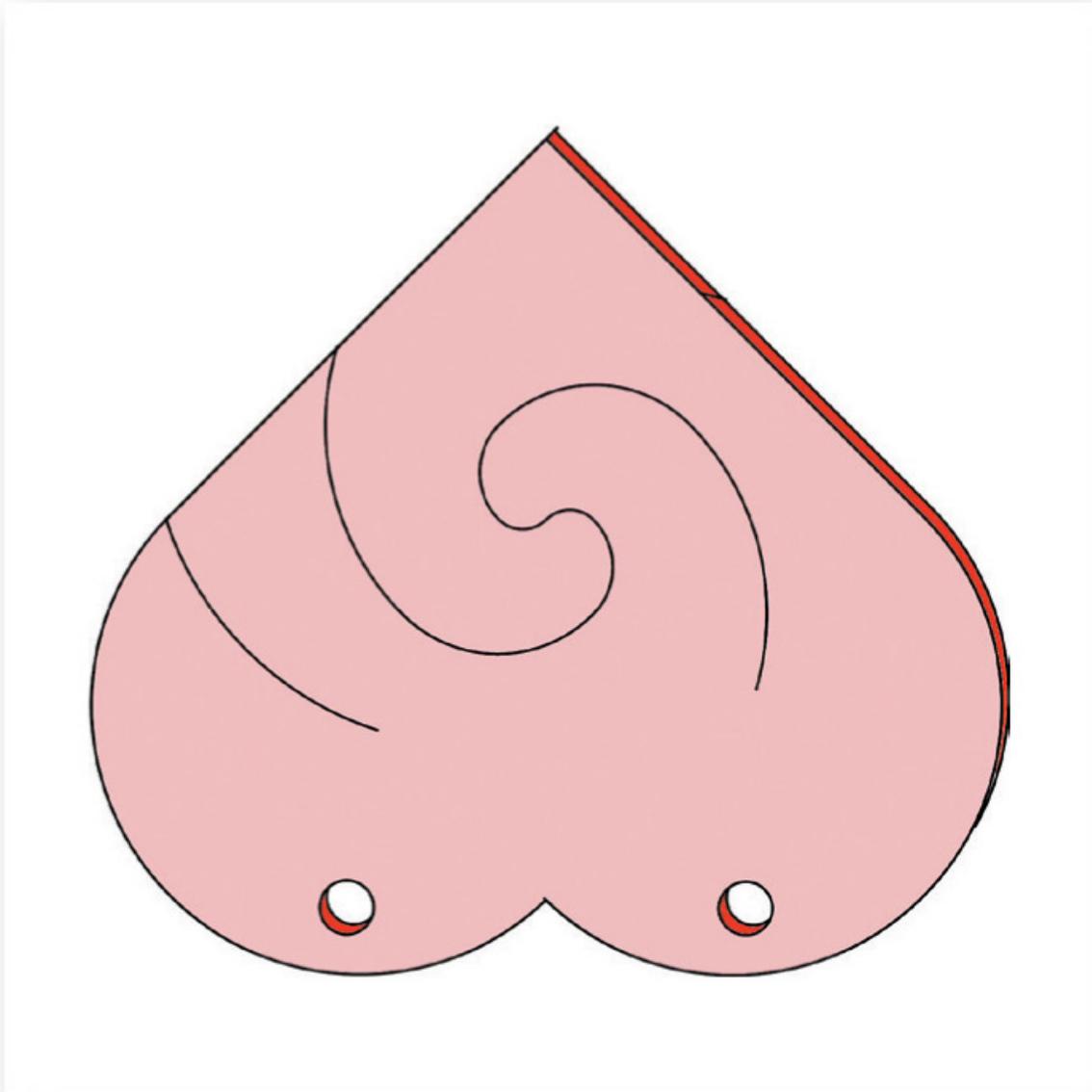
- For the project templates, see [page 135](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces for each heart:
 - A4: 1 in color X (shown in red)
 - A5: 1 in color Y (shown in pink)
 - Glue stick

TIP

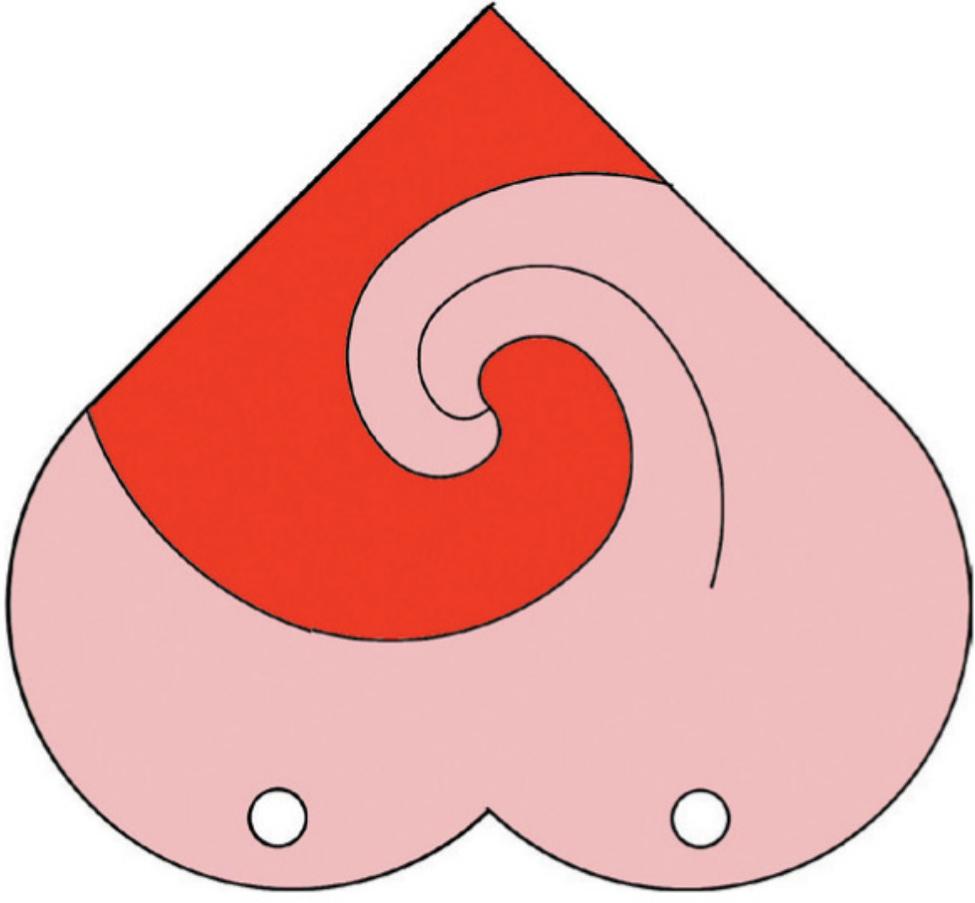
When you turn the heart, the spiral swirls in the opposite direction. Vary the swirls' directions to get a lively bunting.

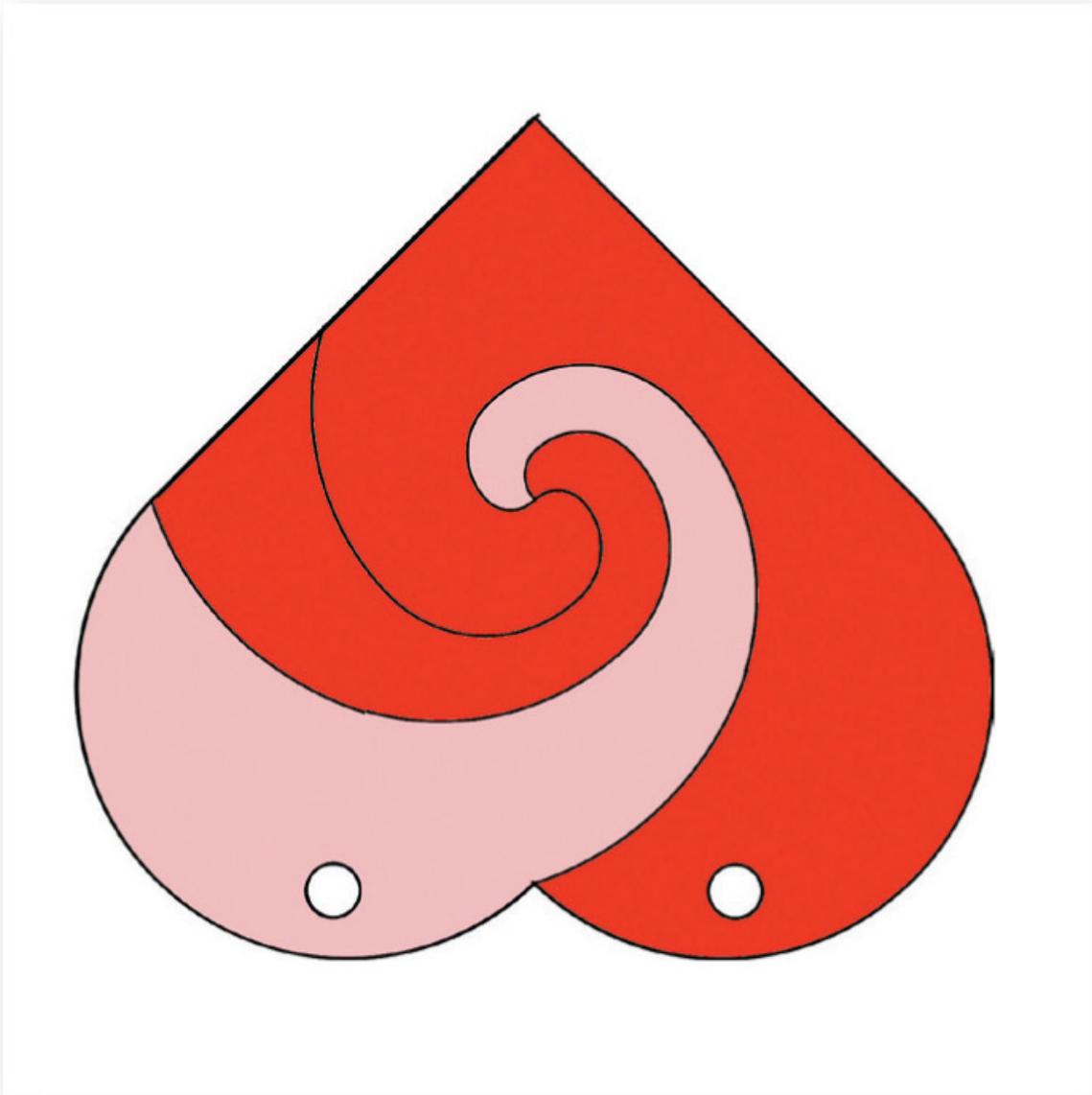


① Place the two pieces A4 and A5 next to each other as shown.

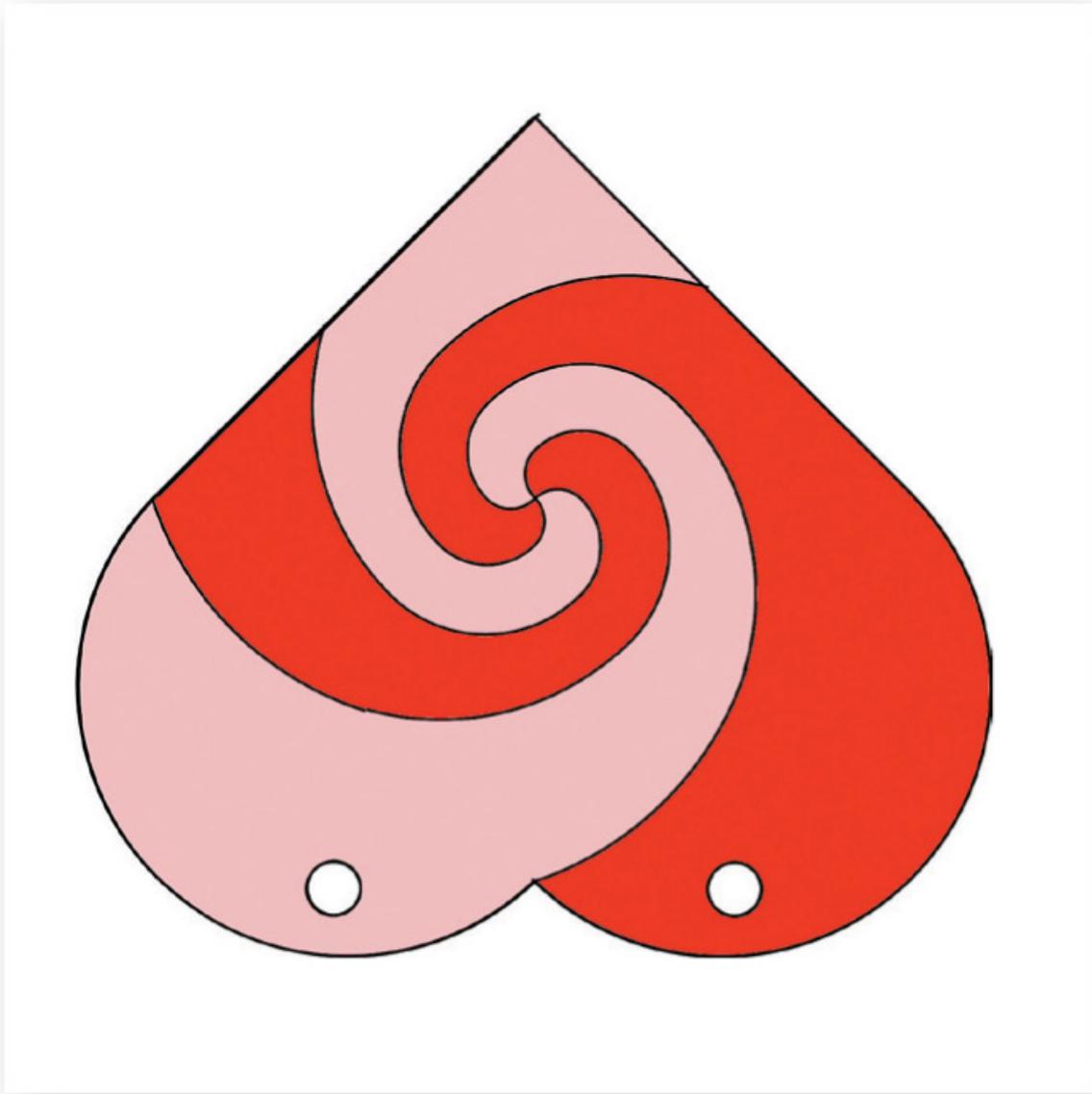


② Place A5 on top of A4 and align. Turn the heart so that the point is upward. Note that the endpoint of the short slit from the left edge of A5 is meeting the endpoint of the long slit from the right edge of A4. Twist the two layers around this meeting point so that the left part of A4 now shows on the front.





- ③ Note that the endpoint of the long slit from the left edge of A5 is meeting the endpoint of the short slit starting between the rounded sections of A4. Twist the two layers around this meeting point so that the right rounded section of A4 shows on the front.
- ④ Twist the two layers around the center of the spiral to make the point of A5 show on the front.



- ⑤ Align the arms at the center of the heart so that a regular spiral is formed.
- ⑥ Fix the heart's point with glue. Feature the hearts by weaving the string in and out through the small holes.

BELL

Starting the weaving process for this project is somewhat challenging, as the arms near the top are very narrow and may be damaged easily. Also keep an eye on the small diamonds as you weave; their diagonals must form straight lines toward the rim to achieve a regular top and bell shape.



- ① Start and weave the bell as indicated for the Basic Sphere (see [page 32](#)). The large M4 pieces, however, are made in one piece, and you need not prepare the parts from individual arms (as for the Basic Sphere). The visible central star will be in color X.
- ② When all is woven, tightened, and lined up, fix the two layers of arms along the edge of the bell with glue.
- ③ Smear glue on a narrow rounded M5 strip in color Y and fix it to the outside of the bell along the edge. The edge of the strip must follow the points of the last row of full squares; that is, after fixing, you will see either full squares or half squares (that cut through the diagonal).
- ④ Fix a narrow rounded M5 strip in color X to the inside edge of the bell in the same way.
- ⑤ Use a needle to make a small hole in the top of the bell.

6 Tie the bell to the string or ribbon.

7 Make a large knot in the string or ribbon about 2 inches (5 cm) above the jingle bell; the woven bell will rest on the knot when it hangs. Pull the string through the hole on top of the bell from the inside; the distance from the knot should be just enough to show the lower part of the jingle bell.

MATERIALS

- Paper in two contrasting colors or patterns (colors × and Y), 70–100 g/m² in weight
- Glue stick
- Jingle bell, $\frac{3}{8}$ – $\frac{3}{4}$ inch (1–2 cm) in diameter
- 20 inches (50 cm) of yarn or narrow ribbon

FROM YOUR TOOLBOX

- 12 paper clips (for weaving)
- A pair of tweezers (for pulling the strips when lining them up)
- Needle (for making a hole for the yarn or ribbon)

TEMPLATES & PIECES

- For the project templates, see [page 146](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces for the left bell:
 - M4 (swirling piece): 1 in color × (shown in turquoise)
 - M4 (mirror or reverse image of template): 1 in color Y (shown in brown)
 - M5 (arched strip): 1 in color × and 1 in color Y

CONE HAT

You may make a festive woven Cone Hat using a template for a simple cone. We have included one with an inner circumference of 12 inches (30.5 cm) just scale the template to fit the intended head. Go to the tutorial “On Colors & Patterns” (see [page 122](#)) to learn more about how to plan colors and patterns to get a vivid selection of very different hats from the same template. You may also use the advanced weaving techniques introduced with the Fröbel Cone (see [page 124](#)).



The Cone Hat from two colors is woven just like the Basic Cone (see [page 28](#)). Make two holes near the rim and attach the elastic cord or ribbon.

If you want a hat with a spiral pattern or one that shows four colors, each part will be made from two pieces cut as indicated by F6. Stack the two pieces so that they form one full part with ten arms and a two-layer base, and cut away the extra paper so that only one flap remains; repeat for the two mirrored F6 pieces, cutting away the extra paper and both flaps.

MATERIALS

- Paper in two colors or patterns (colors × and Y), 70–130 g/m² in weight (*Note:* For a large hat, heavier paper weights may be necessary.)
- 20 inches (50 cm) of round elastic cord or ribbon
- Glue stick

FROM YOUR TOOLBOX

- Large knitting needle or other conical item (for shaping the cone)
- 10 paper clips (for weaving)
- Darning needle and ruler (for scoring)
- Tweezers (for pulling the strips when lining them up)
- Needle (for making holes for the cord or ribbon)

TEMPLATES & PIECES

- For the project templates, see [page 147](#). Copy the templates using your preferred method as described on [page 135](#). Scale the templates as required.
- Using the templates, cut the following pieces for a checkered Cone Hat:
 - F5 (swirling piece): 1 in color × (shown in red)
 - F5 (mirror or reverse image of template, without flap): 1 in color Y (shown in yellow)
 - F7 (arched strip): 2 in color X
 - F8 (cone form): 1 in any color

(*Note:* In addition to the templates listed above, F6 indicates where to cut when making a piece with every second arm only, which is used to make a spiral pattern. Template F9 is a decorative cone top; you may add it if you want the cone's top to show a different color.)

HOT AIR BALLOON

The Hot Air Balloon is cute by itself, but try making a mobile of five and watch them fly and turn perpetually. The balloons are made much like the Basic Sphere (see [page 32](#)), but, they are simpler and easier to make. The template for the main pieces may be printed on a of 8 1/2 × 11-inch single sheet (21.6 × 27.9 cm) or A4 paper. Also, the bottom of the balloon is open, and there is no need for the arms to meet when you finish the shape.

MATERIALS

- Paper in two contrasting colors or patterns (colors X and Y), 70–120 g/m² in weight
- Glue stick
- 20 inches (50 cm) of fishing line for hanging the balloon
- A small bead, button, or the like, 1/8 inch (3 mm) in diameter, to secure the string inside the balloon

FROM YOUR TOOLBOX

- 12 paper clips (for weaving)
- Tweezers (for pulling the strips when lining them up)
- A needle (for making a hole to hang the hot air balloon)

TEMPLATES & PIECES

- For the project templates, see [page 145](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces for a checkered balloon:
 - M1 (main swirling piece): 1 in color X (shown in white)
 - M1 (mirror or reverse image of template): 1 in color Y (shown in red)
 - M2 (arched strip): 1 in color X (*Note:* Three templates of different sizes are provided; the tightness of your weaving determines the best one to use.)
 - M3 (basket): 1 in color X

① Place the two M1 pieces flat on the table, one on top of the other and arms swirling in opposite directions. Begin weaving by pulling the arms of the part underneath through the slits between the arms of the part above, one arm through each slit. Tighten the project by pulling arms in opposite

directions. Work around the center until the central star emerges and no unused slit remains. Weave the remainder of the balloon as indicated for the Basic Sphere (see [page 32](#)). The visible central star will be in color X.

- ② When all is woven, tightened, and lined up, fix the two layers of arms along the edge of the balloon.
- ③ Fix an arched M2 strip in color × to the low edge of the balloon. Three templates of slightly different sizes are included to accommodate the tightness of your weaving; choose the one that best fits your balloon.
- ④ Smear glue on the appropriate M2 strip and on the low edge of the balloon. Fix the M2 strip to the outside of the balloon along the edge.
- ⑤ Form and fix the sides and bottom of the M3 basket.
- ⑥ Using tweezers and glue, fix the basket's small rectangles to the inner edge of the balloon.
- ⑦ Use a needle to make a small hole in the top of the balloon. Pull a piece of string through the hole and tie the gem to the end of the string inside the balloon.

SWIRLING STRIPES

If you prefer a balloon with swirling stripes, substitute one M6 piece in color × and one piece in color Y. M6 is identical to M1, except every other arm is cut away along the red line indicated. Together, the two M6 pieces replace the M1 piece in color X. Cut another pair of M6 pieces in colors × and Y, but reverse or mirror them if the front and back of the paper are not the same. This pair replaces the mirrored M1 piece in color Y.

MOBILE

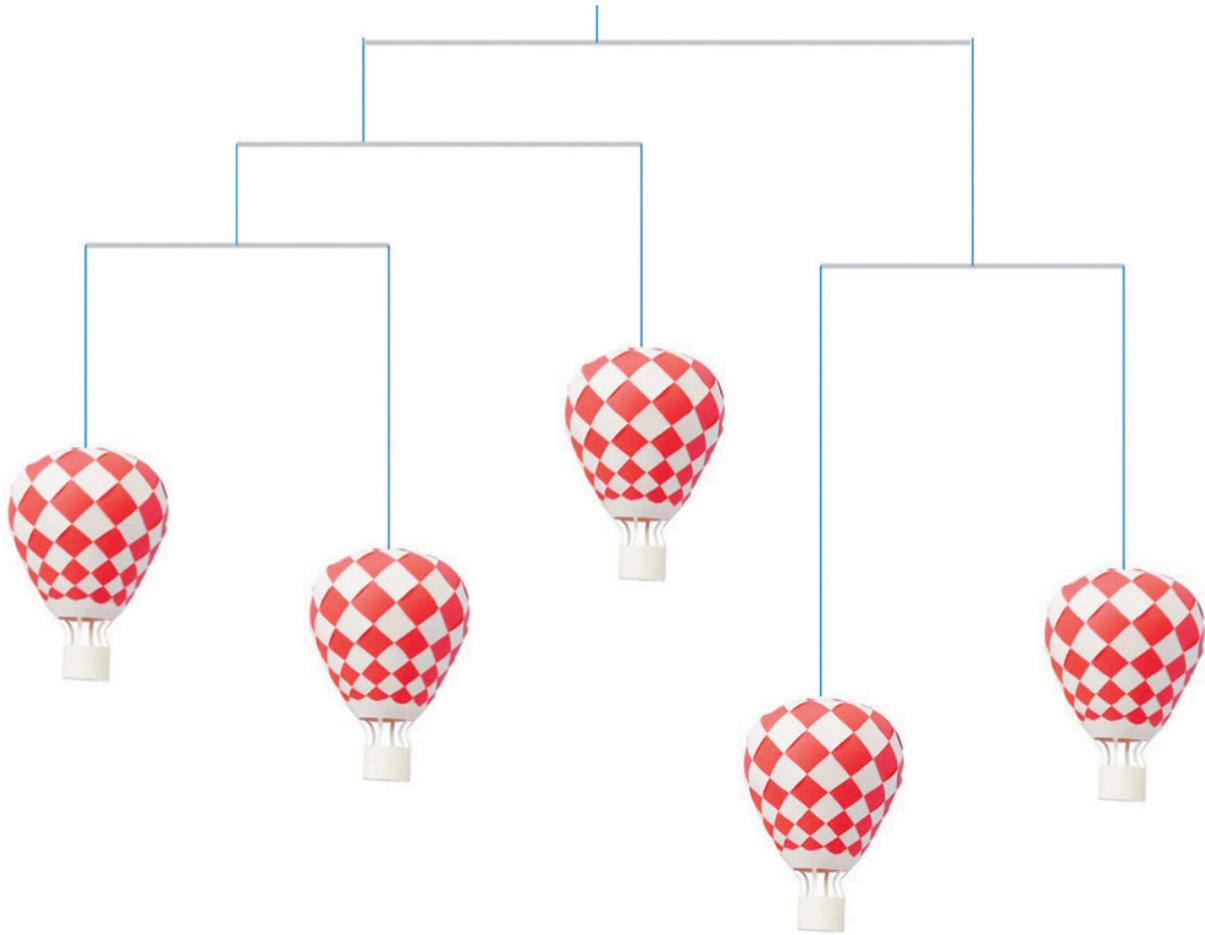
- ① Make small circles or rings at both ends of each wire length using round-nose pliers. These “eyes” will keep the balloons in place.
- ② Tie a Hot Air Balloon to each end of a $4\frac{3}{4}$ -inches (12 cm) section of wire. The fishing lines (holding the balloons) may be different lengths.
- ③ Hang this assembly from a piece of fishing line tied to the balance point of the $4\frac{3}{8}$ -inches (12 cm) wire.
- ④ Tie a Hot Air Balloon to one end of the $6\frac{3}{8}$ -inches (16 cm) wire.
- ⑤ Tie the $4\frac{3}{4}$ -inches (12 cm) wire carrying the two balloons to the other end.

MATERIALS

- 5 Hot Air Balloons strung with fishing line (*Notes:* The balloons can be strung with varying lengths of fishing line.) 4 lengths of wire, $\frac{1}{16}$ – $\frac{3}{8}$ inch (0.5–1 cm) in diameter: $4\frac{3}{4}$ inches, $4\frac{3}{4}$ inches, $6\frac{3}{8}$ inches, and $9\frac{1}{2}$ inches (12, 12, 16, and 24 cm); Round-nose pliers

If you do not have piano wire or round-nose pliers, you can use thin wooden sticks and make a notch near the ends to keep the fishing line in place.





- ⑥ Hang this assembly from a piece of fishing line tied to the balance point of the $6 \frac{3}{8}$ -inches (16 cm) wire.
- ⑦ Tie a balloon to each end of the other $4 \frac{3}{4}$ -inches (12 cm) length of wire.
- ⑧ Hang this assembly from a piece of fishing line tied to the balance point of the $4 \frac{3}{4}$ -inches (12 cm) wire.
- ⑨ Tie this assembly to one end of the $9 \frac{1}{2}$ -inches (24 cm) wire.
- ⑩ Tie the $6 \frac{3}{8}$ -inches (16 cm) wire assembly with the three balloons to the other end.

11 Hang everything from a piece of fishing line tied to the balance point of the $9\frac{1}{2}$ -inches (24 cm) wire.

MAGIC CIRCUS

The circus is an alluring attraction where you can find acrobats, elephants, tigers, and clowns—all exotic and fascinating sights. Supporting this splendor and magic, you are certain to find a spectacular setting, vibrant contrasting colors, strong and readable ornamentation—a perfect source of inspiration for a paper weaver. Stars, stripes, and spirals can be integrated with slight alterations into the most basic forms of woven paper.



Re-creating this magic atmosphere in paper will allow you to enjoy a colorful piece of this captivating world. Why not make a rocket for the daredevil, or a pedestal for your elephant, or even create your own circus tent, capable of containing all your favorite circus items, or perhaps, your colorful nuts and bolts.

SPHERE WITH SPIRALS

For the Sphere with Spirals, we have designed an arm half the width of the arm for the Basic Sphere (see [page 32](#)). The sphere may be woven from two layers of twenty-four narrow arms, twelve wide arms (as in the Basic Sphere), eight wide and eight narrow arms, six wide and twelve narrow arms, or four wide and sixteen narrow arms, as well as many other combinations. You may mix arms in any way you prefer; just remember that the arms of the second layer must match those of the first one in size.

The section “On Colors & Patterns” (see [page 122](#)) introduces you to basic principles of color planning. For the Sphere with Spirals, we have taken variations one step further by varying the width of the strips.





MATERIALS

- Paper in four colors (W, X, Y, and Z), 80–130 g/m² in weight
- Glue stick

FROM YOUR TOOLBOX

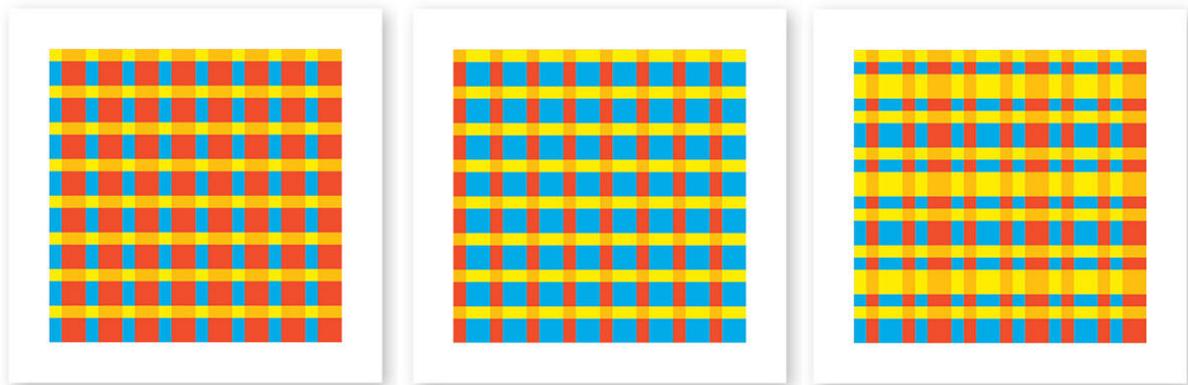
- 12–24 paper clips (for weaving)
- Tweezers (for weaving)

TEMPLATES & PIECES

- For the project templates, see [page 141](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - K16 (wide arm): 8 in color W (shown in red)
 - K16 (mirror or reverse image of template): 8 in color × (shown in yellow)
 - K17 (narrow arm): 8 in color Y (shown in orange)
 - K17 (mirror or reverse image of template): 8 in color Z (shown in blue)
 - K18 (circular piece to start sphere): 1 in color W
 - K18 or K19 (circular piece to close sphere): 1 in color × (choose the size of K19 that fits best)

Follow steps 1–7 for the Basic Sphere on [page 32](#). The difference is that when you fix the arms to the circular piece (step 1) before weaving, you must fix one wide K16, one narrow K17, and so on, alternating a wide with a narrow arm. When adding the second layer of arms, the mirrored wide K16 arms must go exactly above the wide K16 arms, and the mirrored narrow K17 arms must go

above the narrow K17 arms; otherwise, the arms of the first row cannot be woven. When you finish weaving the sphere (step 6), fix the small triangle of the mirrored narrow arms in color Z onto one half of the triangle of the wide arms of color W; then, in the same way, fix all the wide arms of mirrored color \times to the narrow arms of color Y. Finally, the sets of color X/Y will be fixed to the sets of color W/Z. Finish by covering the opening with a circular piece in color \times in the size that fits best.



The sphere made from eight wide and eight narrow arms may turn out quite differently even if made from the same colors.



A sphere with six wide and twelve narrow arms may have a pattern as shown. There are numerous other options with the same colors.

STAR WITH CIRCLES

The star with circles is made from four different templates. You may combine them in various ways to get very different stars. When you use more than two pieces for a point, the layers in between may be woven together with either the layer showing in the point or the layer showing in the holes. Your choice determines the color that shows between the circles.



MATERIALS

- Paper in four contrasting colors or patterns (colors W, X, Y, and Z), 80–100 g/m² in weight
- 16 inches (40 cm) of string or fishing line (for hanging)
- Glue stick

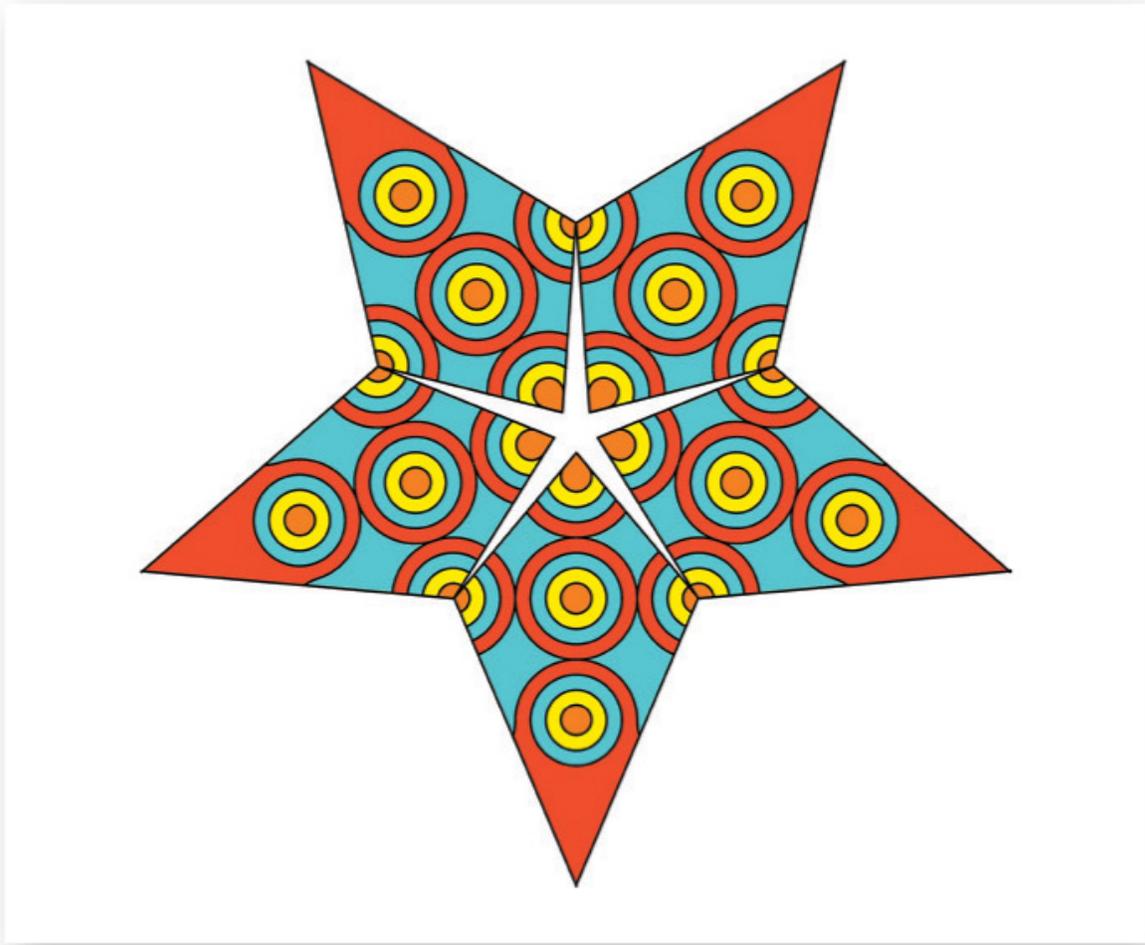
FROM YOUR TOOLBOX

- Tweezers (for weaving the last squares and assembling the star)

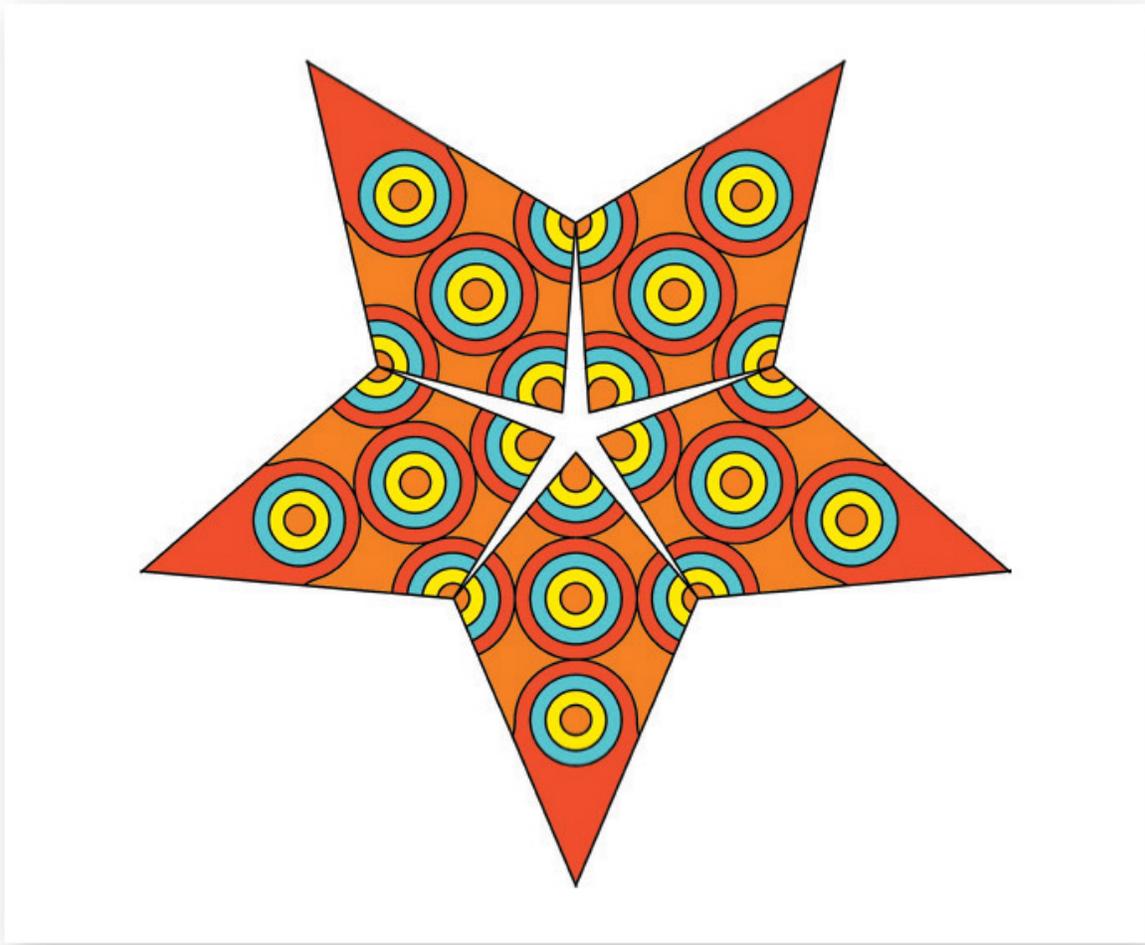
TEMPLATES

- For the project templates, see [page 140](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces, placing the dashed line on the paper fold, to make a star with four layers:
 - E3 (no holes): 5 in color W (shown in orange)
 - E4 (small holes): 5 in color X (shown in yellow)
 - E5 (medium holes): 5 in color Y (shown in blue)
 - E6 (large holes): 5 in color Z (shown in red)

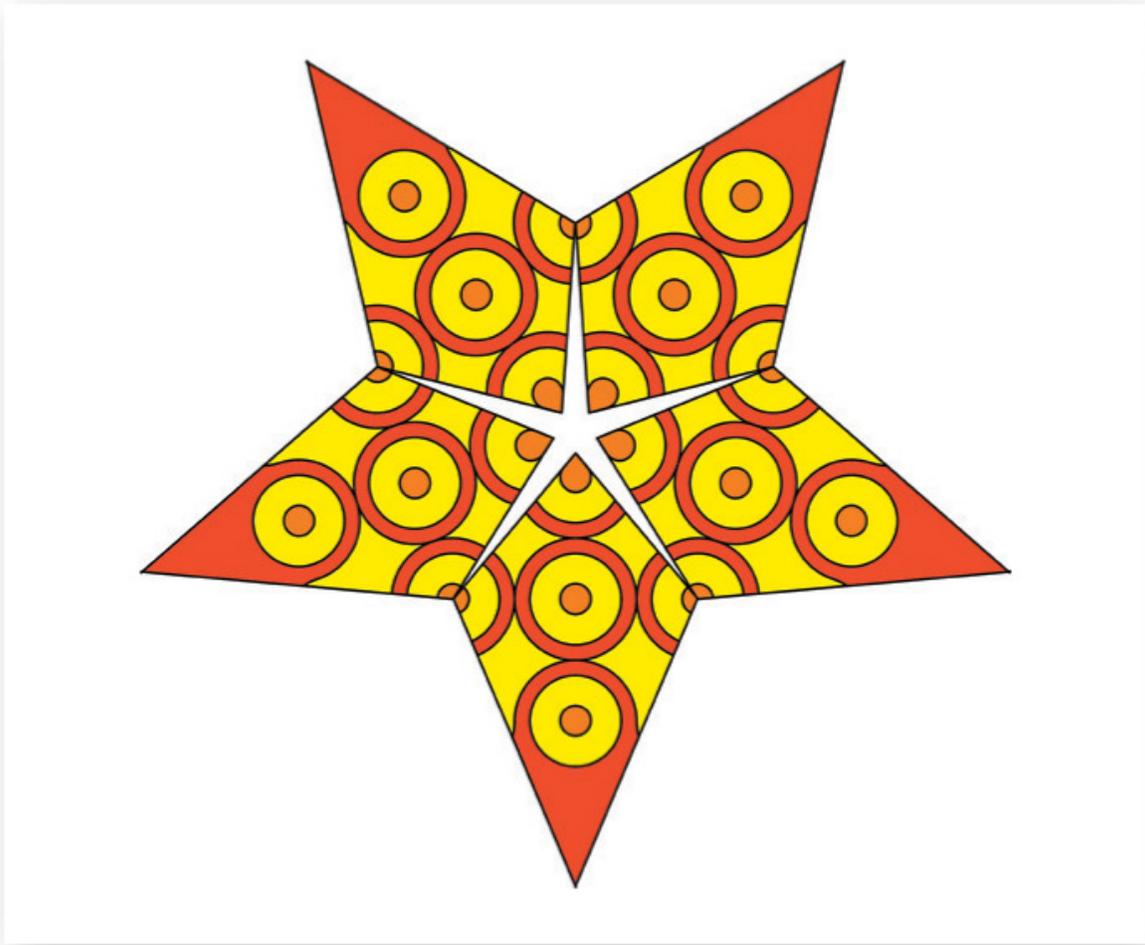
Weave and assemble this star following steps 1–9 for the Basic Star (see [page 24](#)). For each of the star's points, layer the pieces to form two parts: E3 inside E4, and E5 inside E6. When you start weaving, keep in mind that the color of the piece with the largest holes must show at the tip of the point.



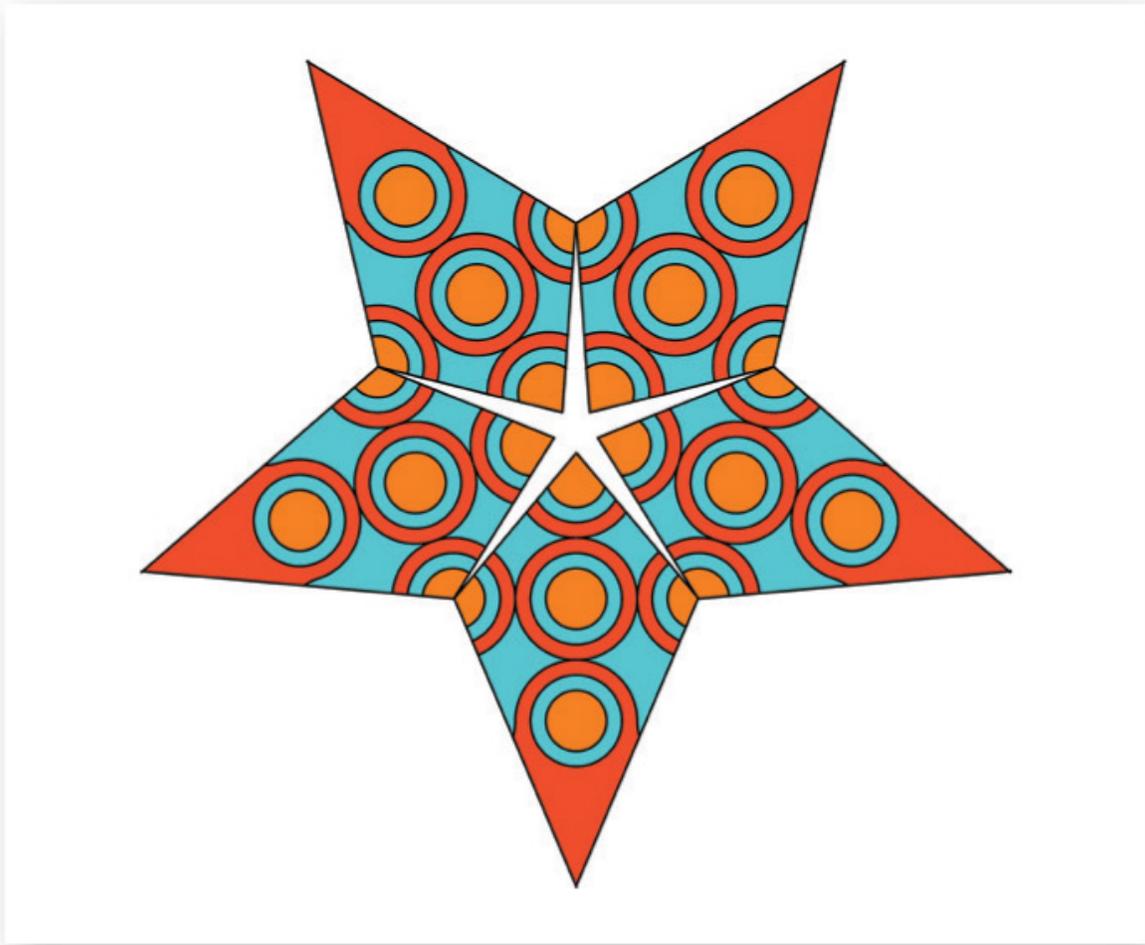
Star woven from four layers: The two parts are a three-layer piece and a one-layer piece: E3 goes inside E4, which goes inside E5. Then, E3/E4/E5 is woven with E6.



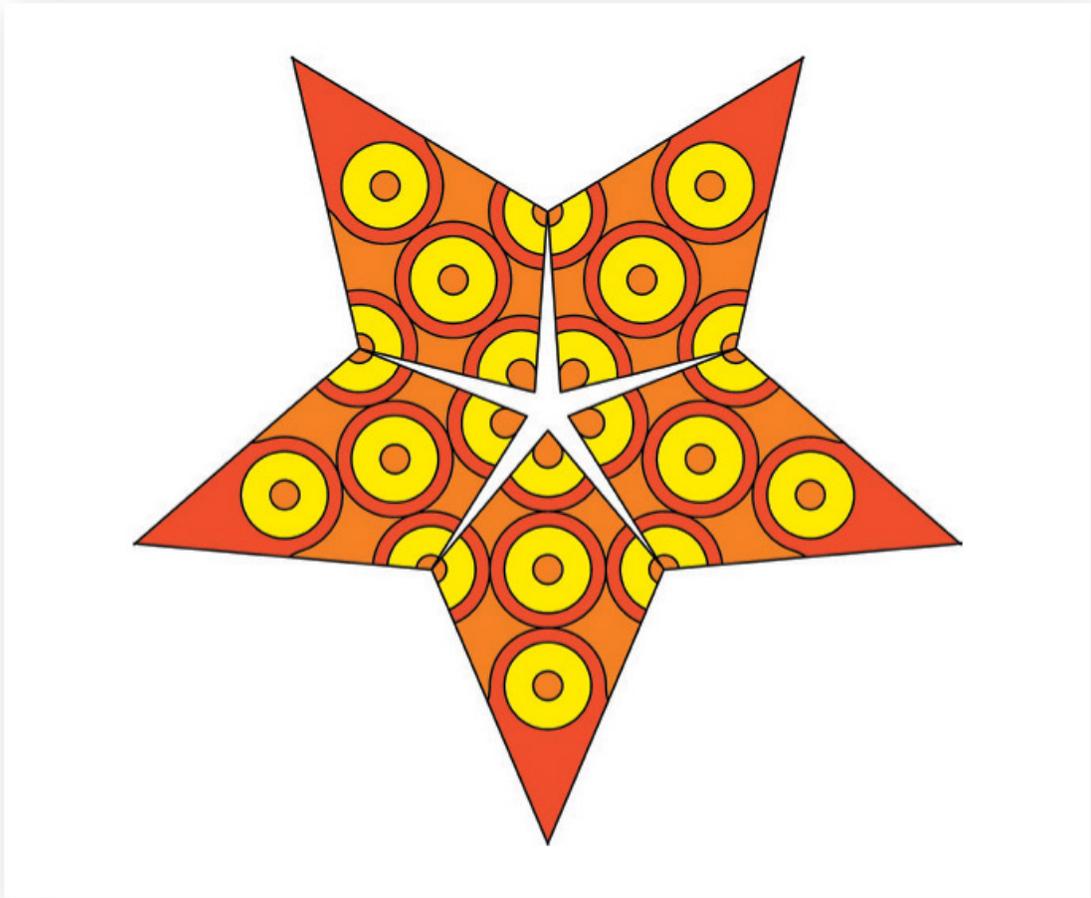
Star woven from four layers: The two parts are a one-layer piece and a three-layer piece. E4 goes inside E5, which goes inside E6. Then, E3 is woven with E4/E5/E6.



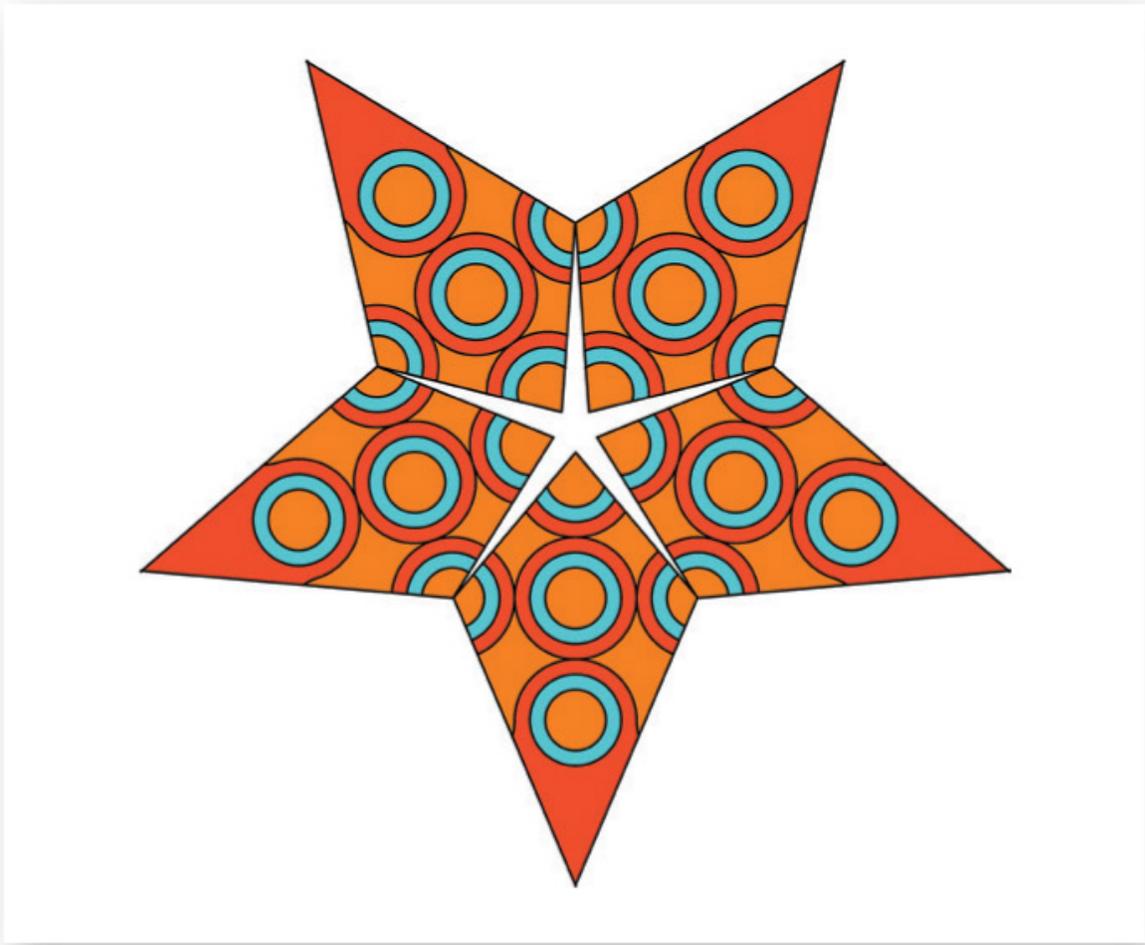
Star woven from three layers: The two parts are a two-layer piece and a one-layer piece. E3 goes inside E4. Then, E3/E4 is woven with E6.



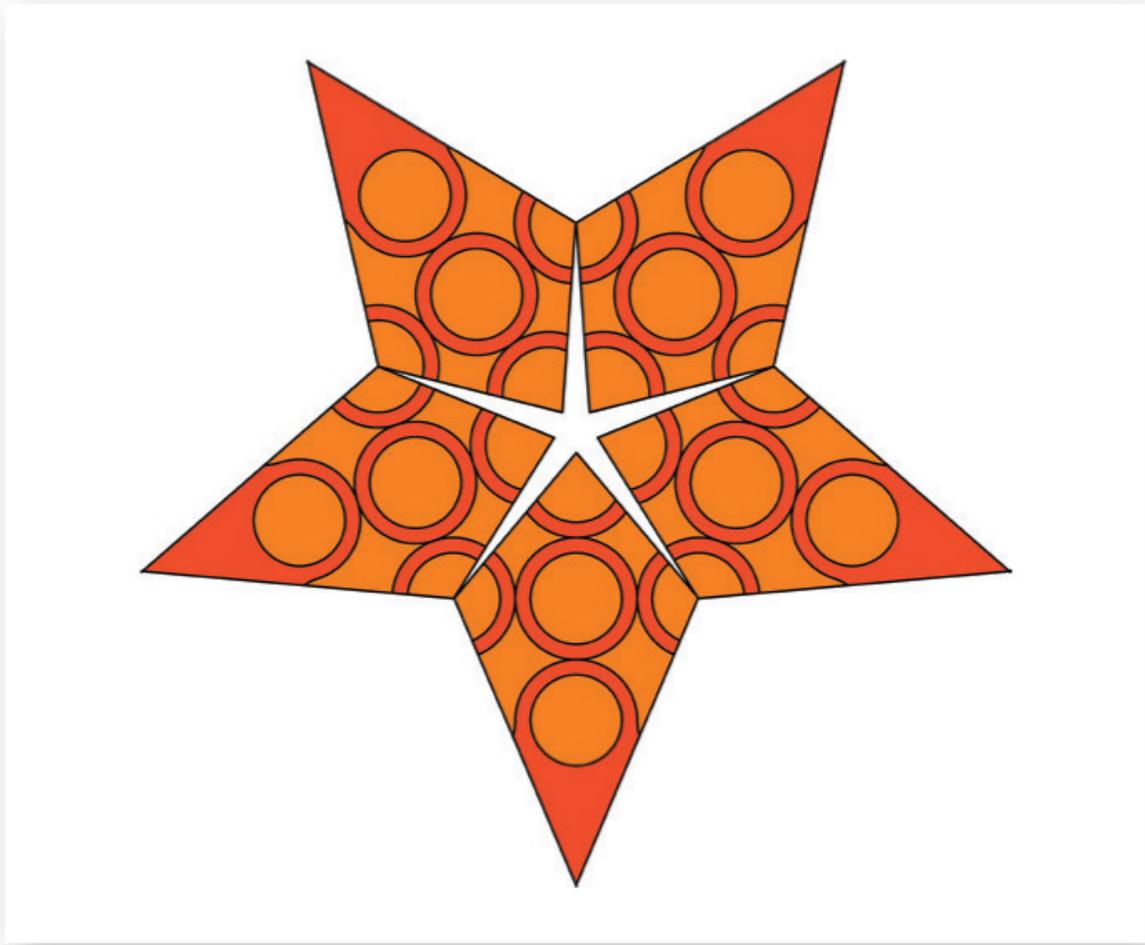
Star woven from three layers: The two parts are a two-layer piece and a one-layer piece. E3 goes inside E5. Then, E3/E5 is woven with E6.



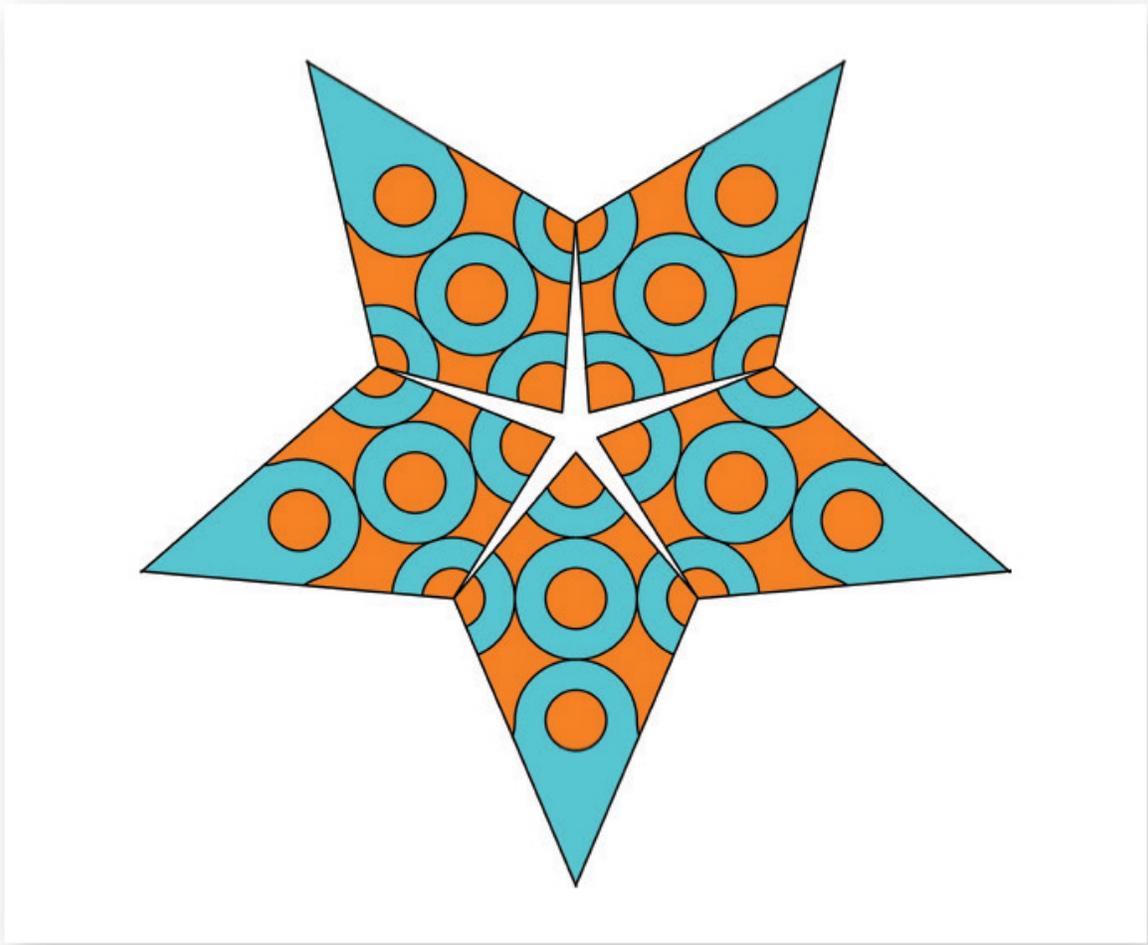
Star woven from three layers: The two parts are a one-layer piece and a two layer piece. E4 goes inside E6. Then, E3 is woven with E4/E6.



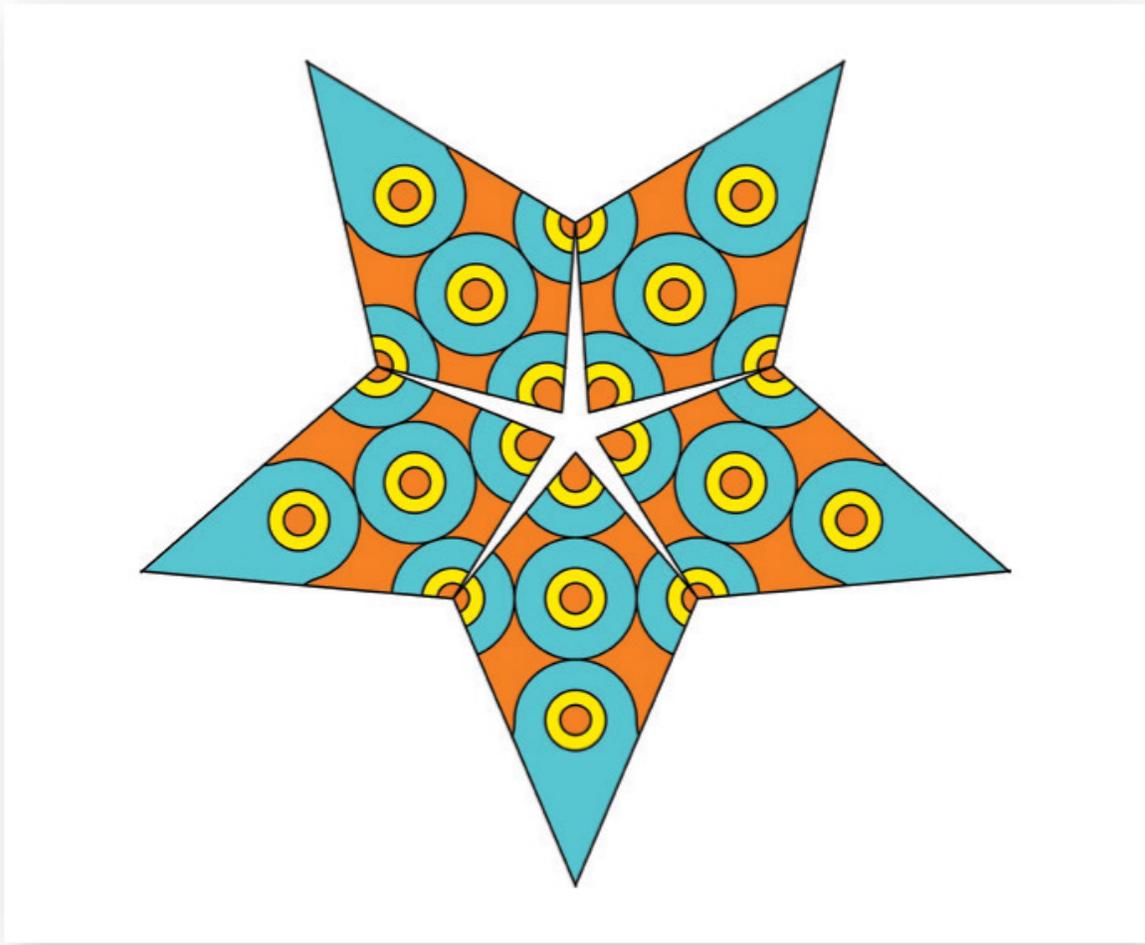
Star woven from three layers: The two parts are a one-layer piece and a two-layer piece. E5 goes inside E6. Then, E3 is woven with E5/E6.



Star woven from two layers: Layer E3 is woven with E6.



Star woven from two layers: Layer E3 is woven with E5.



Star woven from three layers: The two parts are a one-layer piece and a two-layer piece. E4 goes inside E5. Then E3 is woven with E4/E5.

CANDY CANE CONE

The swirling Candy Cane Cone is made with eight arms and is very pointed, as the tip of the cone template is only 48 degrees (this section of the Basic Cone [[page 28](#)] is 60 degrees).



MATERIALS

- Paper in two contrasting colors (colors X and Y), 80–110 g/m² in weight
- Glue stick

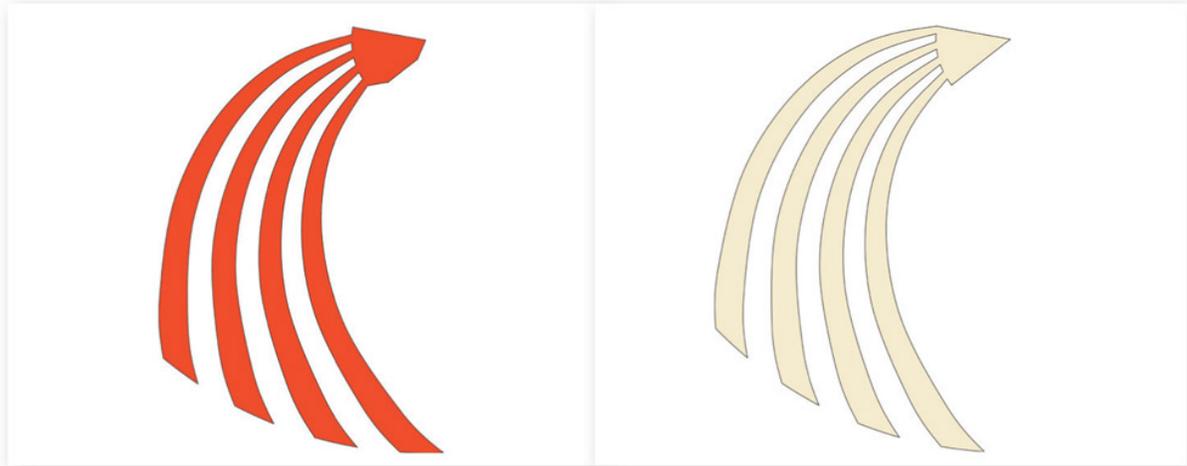
FROM YOUR TOOLBOX

- 8 paper clips (for weaving)
- Darning needle and ruler (for scoring)
- Knitting needle or conic item (to form the cone)
- Tweezers (for lining up and tightening the strips)

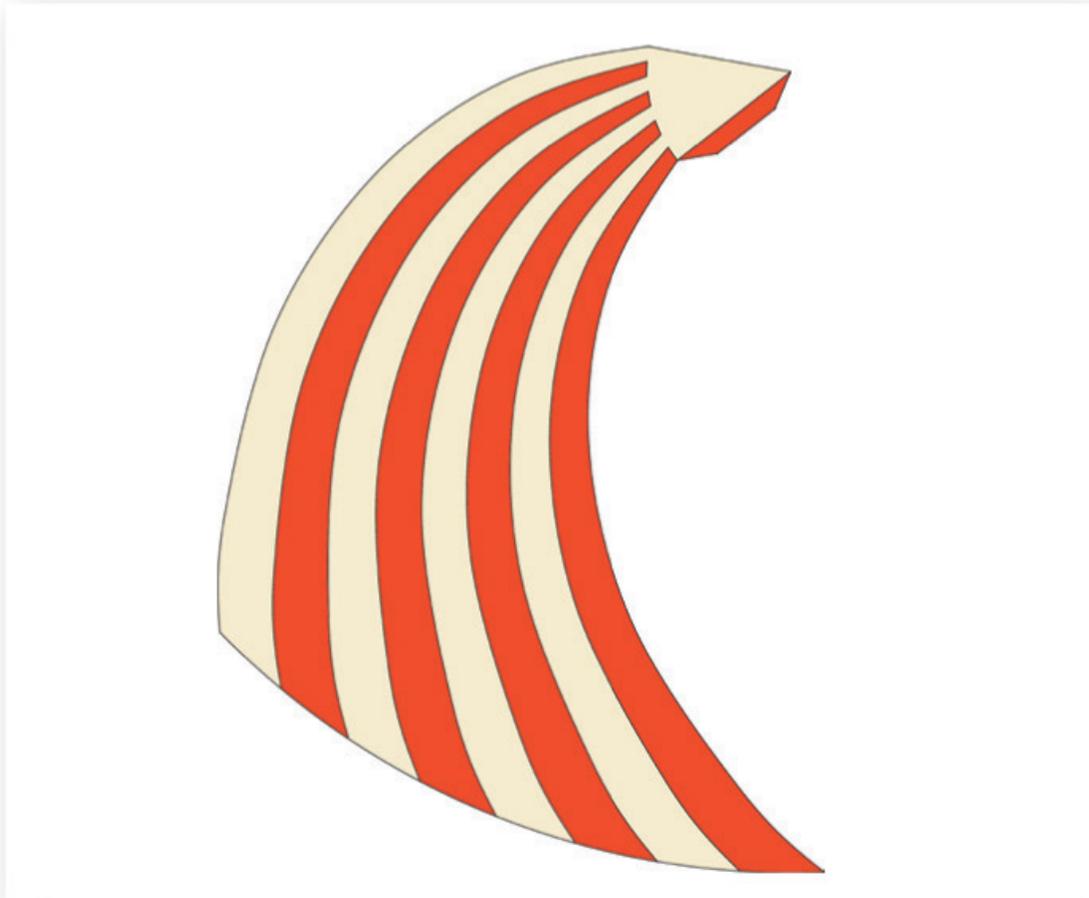
TEMPLATES & PIECES

- For the project templates, see pages [143](#)–[144](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - F1 (large piece with arms): 1 in color X (shown in red)
 - F1 (mirror or reverse image of template, without flap): 1 in color Y (shown in white)
 - F2 (large piece with arms): 1 in color Y
 - F2 (mirror or reverse image of template): 1 in color X
 - F3 (arched strip): 2 in color X
 - F4 (form): 1 in any color
 - 1 handle in color X, 3/8-inch wide × 9 1/2-inches long (1 × 24 cm)

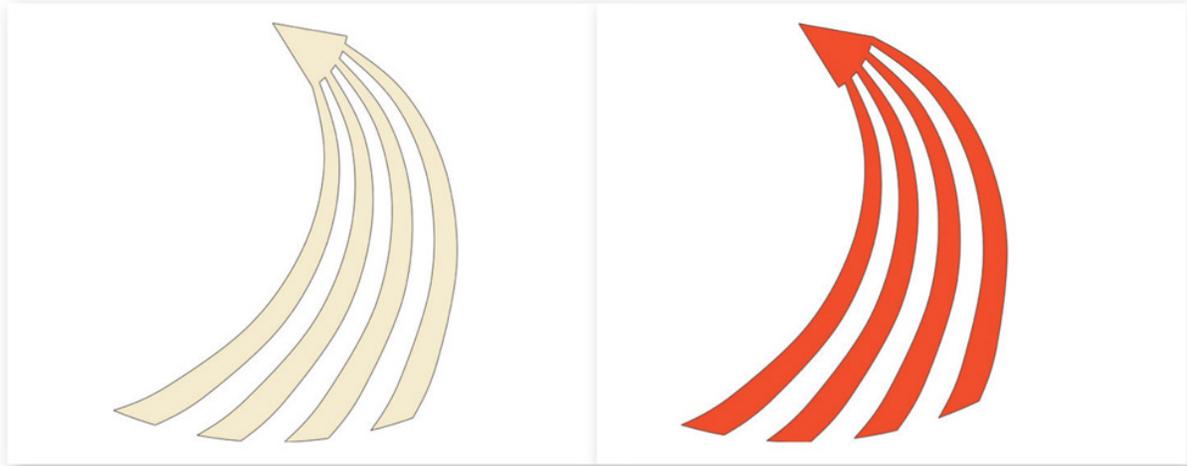
Before you weave the cone, you need to prepare the parts from the pieces you cut out.



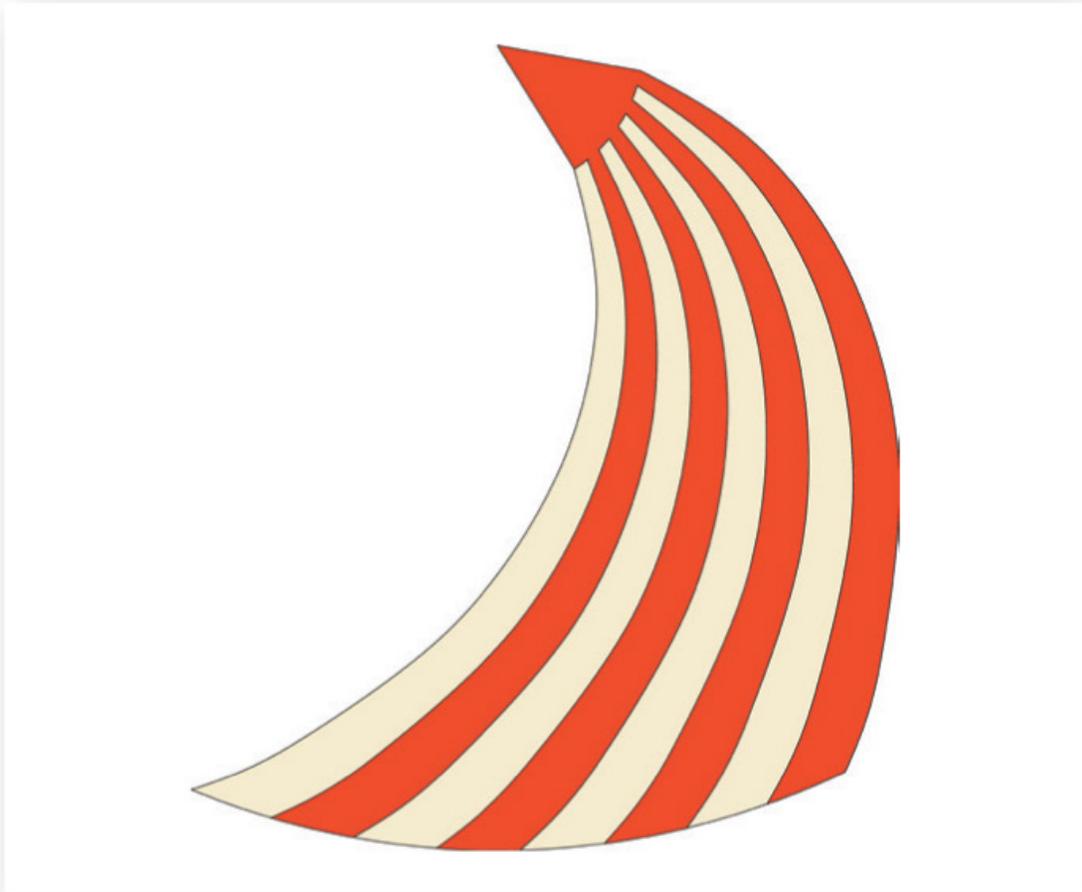
- 1 Piece F1 with the flap is used to create the surface of the small cone tip. Place this piece flat on the table, back side up. Place the piece F2 next to this, back side up with arms swirling in the same direction.



- ② Place piece F2 on top of piece F1, back sides still facing up, forming a full part with eight arms side by side with no large gaps between them.
- ③ Fix the two pieces with a little glue at the small cones. Now you have a part resembling the large E8 piece of the Basic Cone.



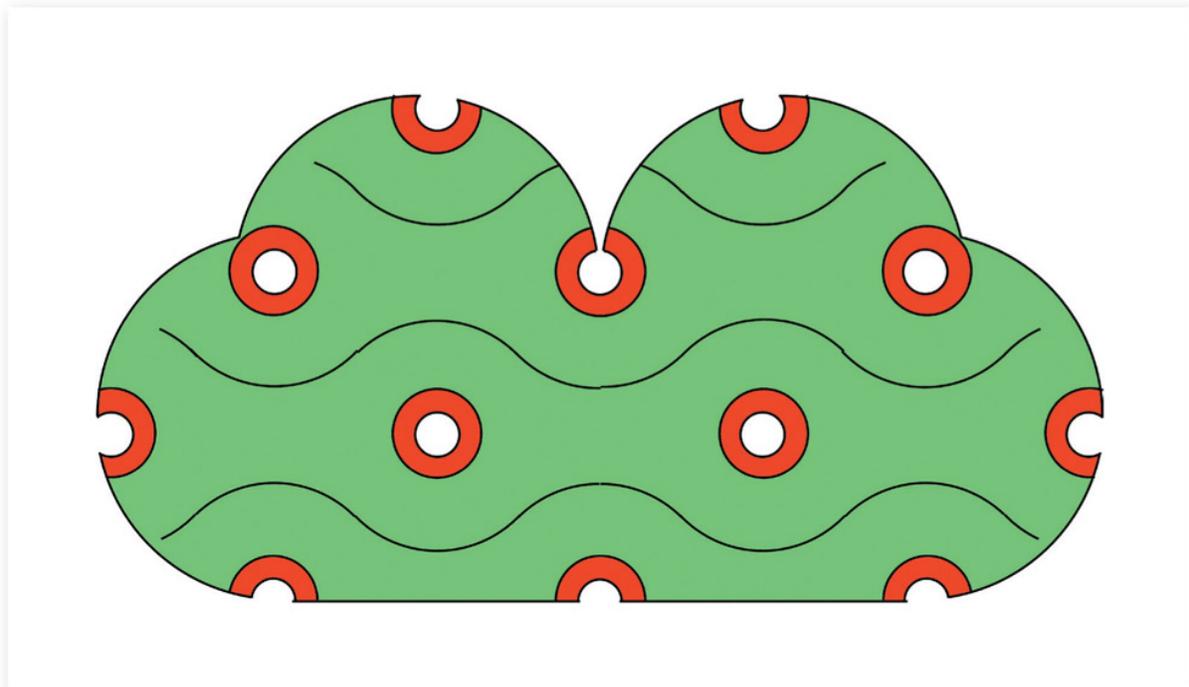
- 4 Place the mirrored F1 and mirrored F2 pieces flat on the table, back side up, arms swirling in the same direction.



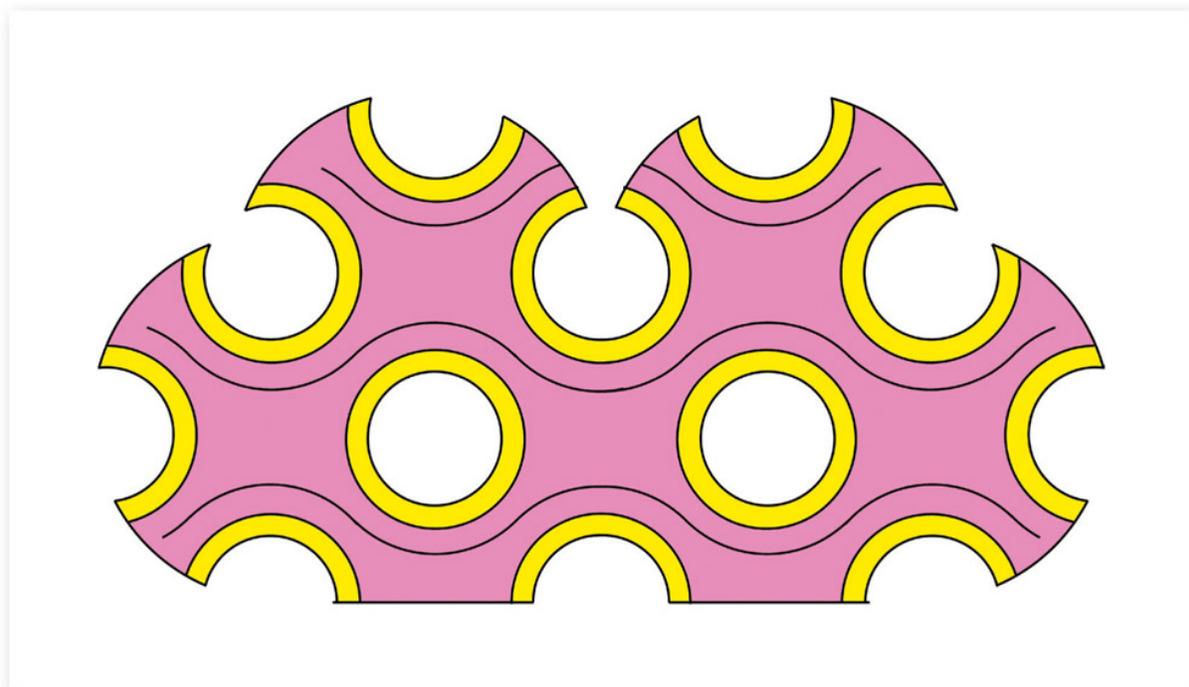
- ⑤ Assemble as explained above in steps 2 and 3. This makes a part resembling the mirrored E8 piece of the Basic Cone.
- ⑥ Weave the cone as explained in steps 2–21 for the Basic Cone (see [page 29–31](#)).
- ⑦ Add the F3 edge strips and the handle as described in steps 22–24 for the Basic Cone.

HEART WITH CIRCLES

Because the individual parts for the Heart with Circles are rather small, this is a nice opportunity to use small pieces of paper you did not have the heart to throw away; you can also reuse pieces of pretty gift wrapping paper without creases and scars from tape. Try to find and match colors so that contrasts are placed next to each other. It is often quite surprising how this heart turns out. You may become so curious that you need to try out one color combination after another.



The Heart with Circles is woven almost like the Basic Heart with Circles (see [page 21](#)). The only difference is that each part for the Heart with Circles consists of two pieces that are stacked before you start weaving.



Layer the two pieces with the smallest holes (B6 and B7) together. Layer the two pieces with the largest holes (B8 and B9), too. Crease each part along the shorter dashed line (the pieces with the largest holes must go outside) and place them side by side. Weave the heart following steps 2–9 for the Basic Heart with Circles on [page 22–23](#).

MATERIALS

- Paper in four colors (colors W, X, Y, and Z), 70–100 g/m² in weight
- Glue stick

TEMPLATES & PIECES

- For the project templates, see [page 139](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - B6 (smaller holes): 1 in color W (shown in red)
 - B7 (medium holes): 1 in color X (shown in green)
 - B8 (large holes): 1 in color Y (shown in orange)
 - B9 (largest holes): 1 in color Z (shown in pink)
 - 1 handle in color W, 3/8-inch wide × 9 1/2-inches long (1 × 24 cm)

ROCKET SHIP

You decide how you want to display and use this rocket. You may stand it, fly it, or hang it from a piece of string.



MATERIALS

- Paper in two contrasting colors (colors X and Y), 80–110 g/m² in weight
- Glue stick
- Optional: String for hanging

FROM YOUR TOOLBOX

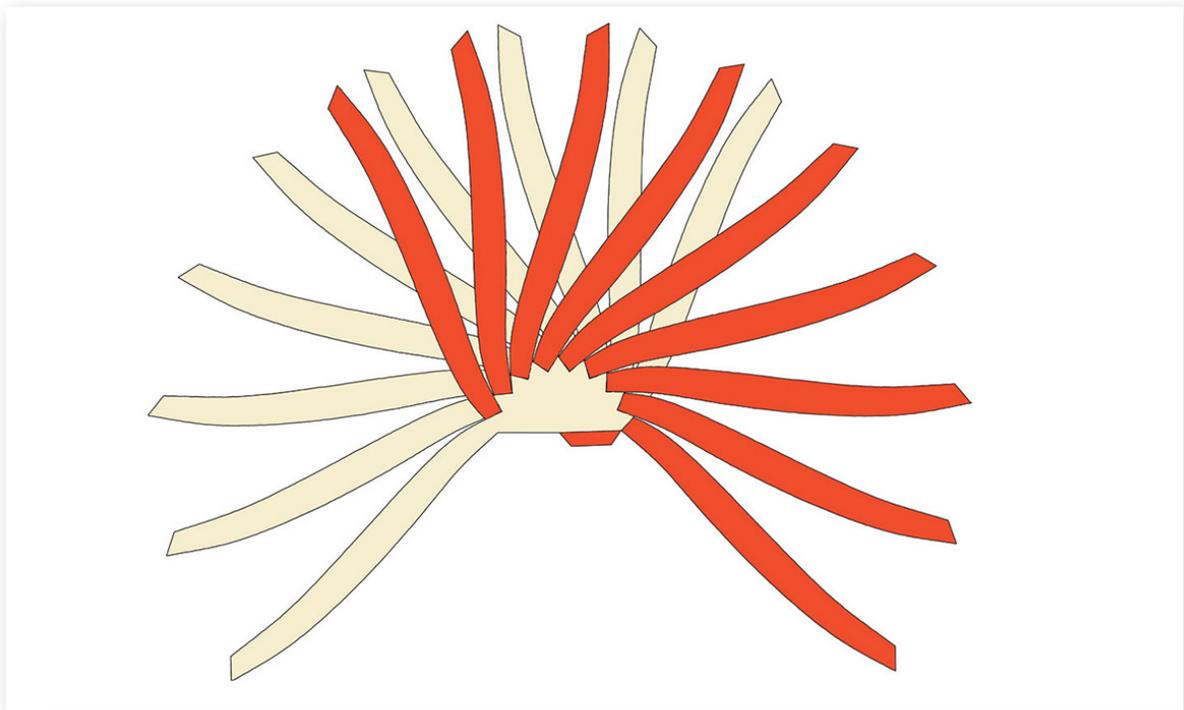
- Knitting needle or other conical item (for shaping the cone)
- Darning needle and ruler (for scoring paper)
- 12 paper clips (for weaving)
- Tweezers (for lining up pieces)

TEMPLATES & PIECES

- For the project templates, see [page 146](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - N1 (main swirling piece with arms): 1 in color X (shown in red) (*Note: This piece in color X includes the Rocket Ship's visible top cone.*)
 - N1 (mirror or reverse image of template): 1 in color Y (shown in white)
 - N2 (narrow strip): 1 in color X
 - N3 (leg): 3 in color X
 - N3 (mirror or reverse image of template): 3 in color X

Start the Rocket Ship like the Basic Cone (see [page 28](#)) and weave it like the Basic Sphere (see [page 32](#)).

- ① Place the N1 piece in color X (the color you planned for the rocket's top cone) on the table, back side up. Place the mirrored N1 piece (in color Y) next to it, also back side up. Check that the arms swirl in opposite directions; this is crucial to weaving.
- ② With back sides still up, place the mirrored N1 piece on top of the N1 piece in color X, aligning the tips and straight edges.



- ③ Weave the first row like step 3 of the Basic Sphere (see [page 32](#)).
- ④ Align the pieces again and fix the two layers with glue along the inside edge.
- ⑤ Crease the flap along the edge to the inside of the cone. It is important to be very precise. The crease must start at the tip and end in the corner where the arms start. To get it right, you may score the creasing line using a darning needle and a ruler. After creasing, sharpen the edge with your finger.

- ⑥ Form the cone using a knitting needle or other conical item to get a nice smooth, rounded cone; the two edges should meet with ease.
- ⑦ Apply glue to the flap and inside edge of N1.
- ⑧ Bend the cone so that the two edges align precisely; the first arms from both sets should also align perfectly. Press down and hold until the glue has dried. It is important that the fit is perfect so that the arms flow evenly around and over the line where the cone is glued; there must be no empty space. Take care not to make a crease in the opposite side of the small cone because that will show permanently on the front—this is difficult to avoid, however, in the pointed end of the cone.
- ⑨ Open and form the cone by inserting the knitting needle. Flatten the assembly line using the knitting needle as a counterweight.
- ⑩ Turn so that the point is downward and the arms fall out and down.
- ⑪ Weave the rocket, using the paper clips to keep the woven pairs of arms together as you did for the Basic Sphere. Continue until all arms have been woven up to the edge.
- ⑫ Now you must tighten the body. Remove one paper clip at a time and pull the two loose arms gently; use a pair of tweezers, if necessary. Replace the paper clip. Continue tightening the arms around the edge a couple of times until you are satisfied with the result. Try to get an even edge of equally long arms.
- ⑬ Fix the arms, pair by pair, all around the body's edge.
- ⑭ Apply glue to the narrow rounded N2 strip and fix it onto the outside edge of the body; preferably only squares and half squares of the woven pattern will be visible.
- ⑮ Crease the flaps on the rocket's legs (N3 and mirrored N3) along the dotted lines.

- ⑩⑩⑩ Make three double legs, each consisting of a right N3 and a left mirrored N3 piece. Fix the two pieces with glue, but do not apply glue to the two sets of flaps near the top.
- ⑩⑩⑩ The flaps are creased outward to form two diamonds. These diamonds fit exactly above the diamonds on the rocket's sides and will be used to fix the legs.
- ⑩⑩⑩ Place the legs onto the rocket's sides. You must insert the edge of the rocket into the slit in the leg and move the leg until the diamonds fit exactly above diamonds on the rocket's sides.
- ⑩⑩⑩ Apply glue on the flaps and hold until the glue dries.
- ⑩⑩⑩ Fix the other legs in the same way. The rocket is made from parts with nine arms, thus, there will be two diamonds in color × between each pair of legs attached to the rocket to distribute them evenly around the body.
- ⑩⑩⑩ If you want to hang your Rocket Ship, use the darning needle to pull the string through a loop of paper at the rocket's surface. Count three woven diamonds from the tip, insert the needle with string and knot it, and the rocket will aim at the stars.

STAR DRUM

The Star Drum consists of a cylinder that forms its sides and two drumheads that are made exactly the same way as the bottoms of the Basic Basket (see [page 35](#)). If you want to hang your drum, use a needle to make a small hole just below its zigzag edge, then thread a length of string through the hole and tie it closed with a small knot.



MATERIALS

- Paper in four colors (colors W, X, Y, and Z), 80–130 g/m² in weight
- Glue stick
- Optional: Thread or string for hanging the finished drum

FROM YOUR TOOLBOX

- 12 paper clips (for weaving)
- Tweezers (for aligning pieces)
- Optional: Needle (for making a hole to hang the drum)

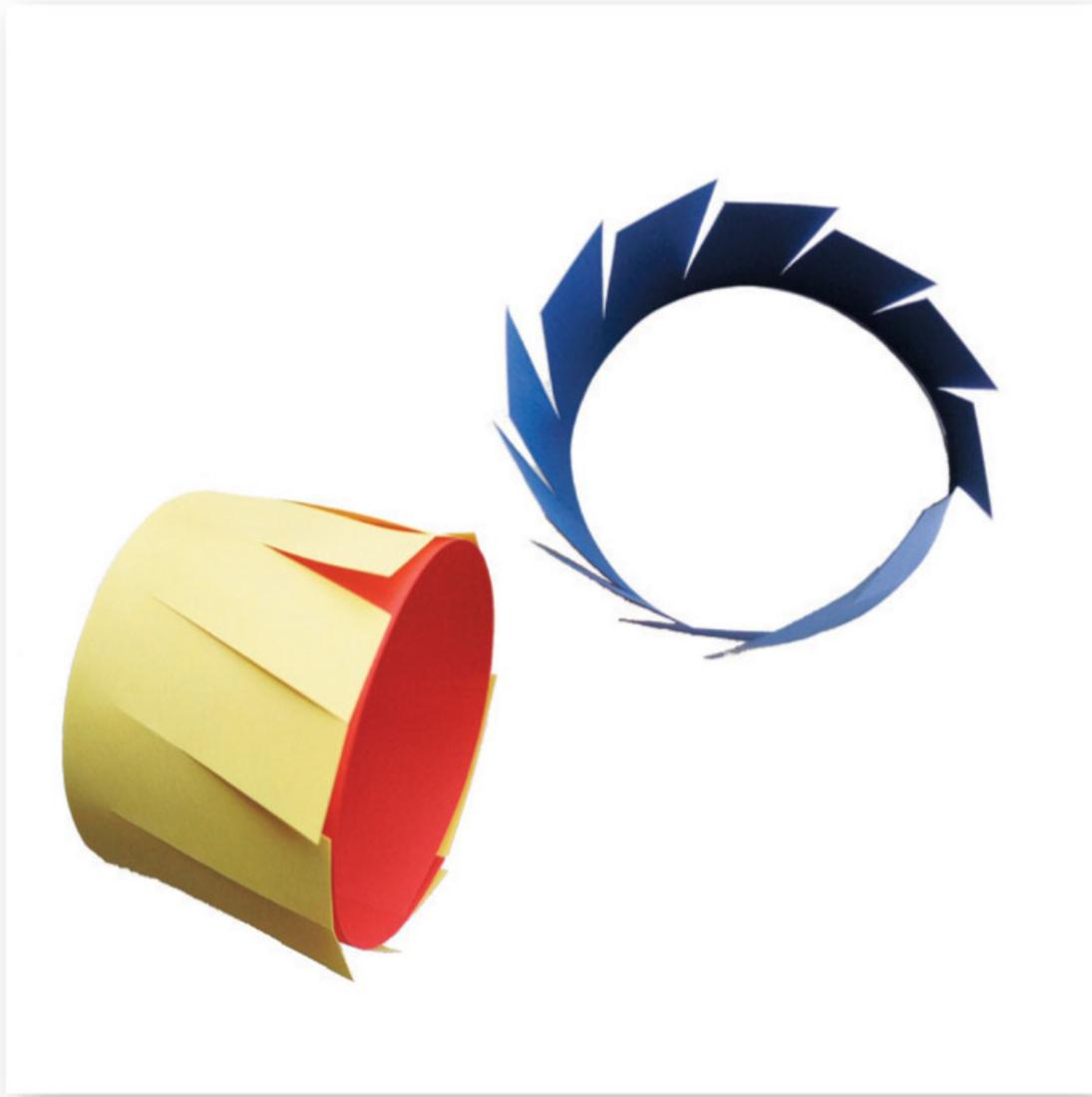
TEMPLATES & PIECES

- For the project templates, see [page 155](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - J1 (side): 1 in color W (shown in dark blue)
 - J1 (mirror or reverse image of template): 1 in color × (shown in yellow)
 - J2 (form): 1 in any color (shown in red)
 - J3 (narrow strip): 2 in color Y (shown in red)
 - J4 (zigzag strip): 2 in color Z (shown in light blue)
 - J5 (round piece): 1 in color W (shown in dark blue)
 - J5 (mirror or reverse image of template): 1 in color × (shown in yellow)
 - J6 (round piece): 1 in color W (shown in dark blue)
 - J6 (mirror or reverse image of template): 1 in color × (shown in yellow)
 - J7 (narrow strip with notches): 2 in color Z (shown in light blue)

DRUM CYLINDER



- 1 Form the two side pieces (J1 and J1 mirrored) into cylinders, making sure that the arms on each swirl in opposite directions. Attach with glue.



② Place the form (J2) inside one of the side pieces and align the edges precisely. Mark the overlap, then remove the form, glue its ends to make a cylinder, and slide it back into the same side piece.



③ Place the other cylinder over the first so that the glued ends are opposite one another.



- ④ Weave the arms, using paper clips if desired to keep the arms in place. Tighten the weaving so the edges of the form align exactly with those of the sides.



⑤ Apply glue along both edges of the drum, keeping the form inside to help support its structure.



⑥ Apply glue to one of the narrow strips (J3, shown in color C) and apply it along one of the drum's edges. Repeat with the other narrow strip.



⑦ Apply glue to the small triangles of one of the zigzag strips (J4, shown in color D) and apply it to the top of the narrow strip. The point on every other small triangle should align with the point of a large triangle on the side of the drum; any excess should extend out from the drum's edges.



⑧ Crease the zigzag strip against the edge of the drum, and then glue it to the insides of the drum. Repeat steps 7 and 8 with the second zigzag strip (J4) on the drum's opposite edge.

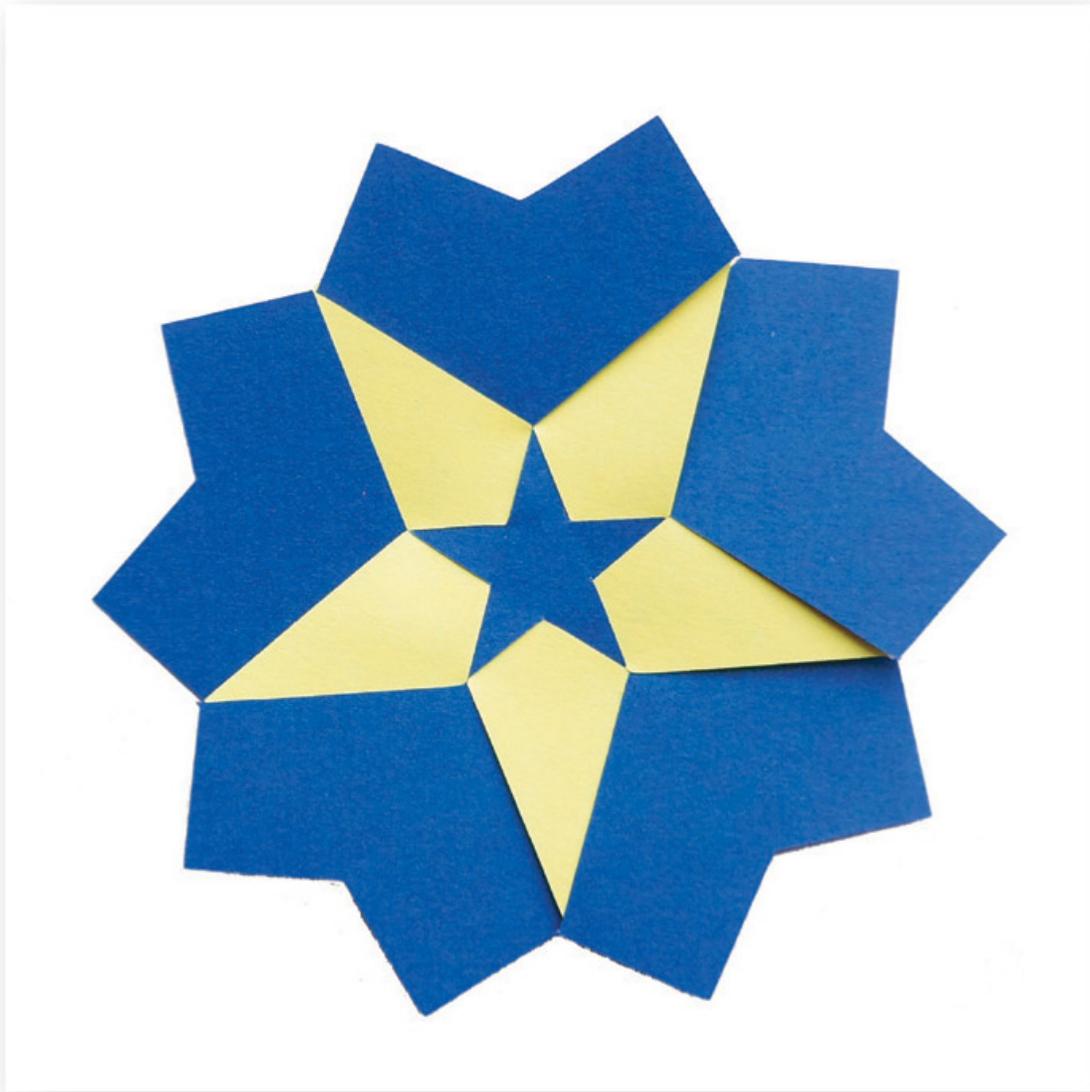
DRUMHEADS



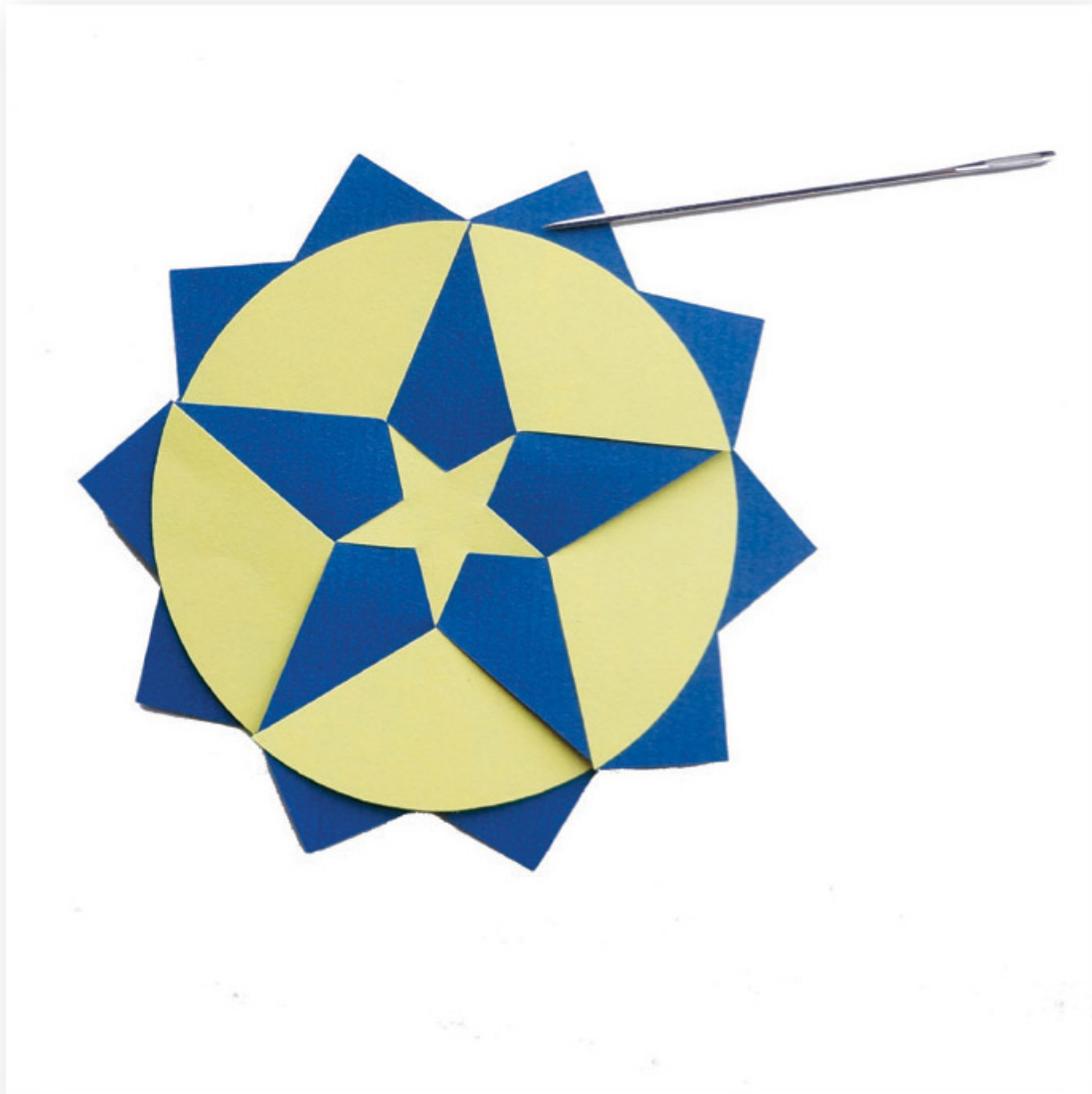
- ⑨ Stack a round J5 and J6 piece in different colors on top of each other, arms swirling in opposite directions, and weave the first row.



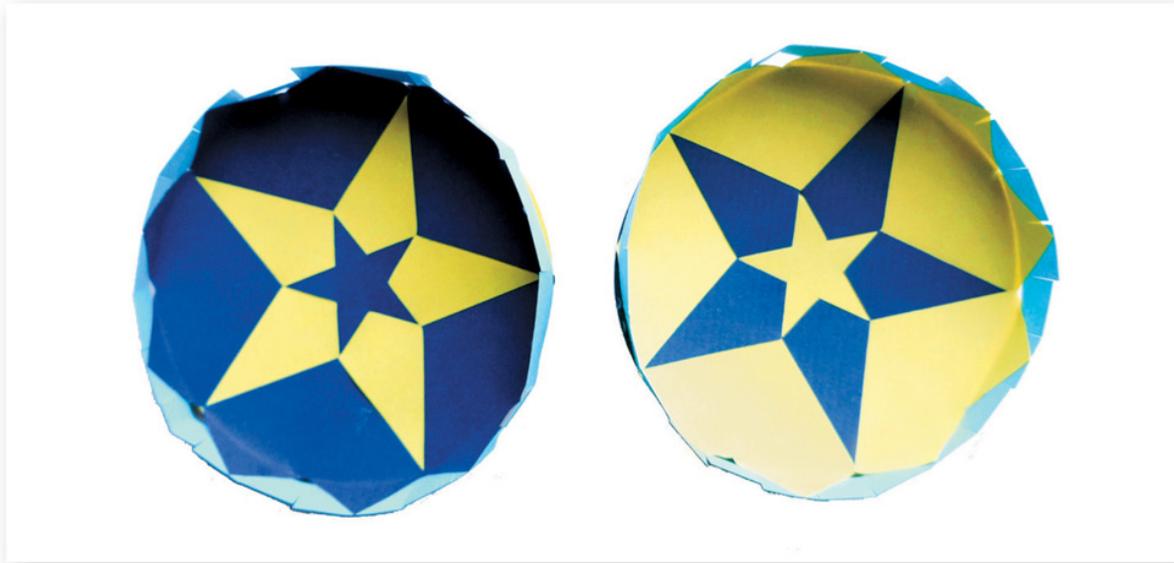
10 Tighten the weaving until the star becomes as small as possible and no unused slit remains.



11 Weave the remaining part of the arms making another and larger star.
Fix the pieces with glue.



12 Score on the back side using the edge of the round piece J6 as a form.



13 Repeat for the remaining J5 and J6 pieces. Complete the drumheads by following the instructions for the Bottom Face (step 12) and the Bottom Sides (step 13–15) of the Basic Basket (see [page 37](#)). The narrow strip with notches is piece J7.

ASSEMBLY



- 14 To attach the drumheads to the sides of the drum, apply a slow-drying glue along the drum's inner edge and to the outside of the overlap on the drumhead. Place the drumhead inside the drum cylinder and align the two so the edges fit, using a pair of tweezers if needed. Repeat to attach the other drumhead.

CIRCUS TENT

The Circus Tent is an apt box for storing your secret Magic Circus objects. It is made from a top and a cylindrical container with a circumference of $20 \frac{5}{8}$ inches (52.4 cm). In this size, the templates for many of the parts and pieces it requires are shared with the projects included for the Exotic Palace (see [page 100](#)).



MATERIALS

- Paper in three contrasting colors (colors X, Y, and Z), 80–130 g/m² in weight
- Glue stick
- Toothpick (for the flagpole)

FROM YOUR TOOLBOX

- 48 paper clips

TEMPLATES & PIECES

- For the project templates, see pages [142](#), [152](#), [154](#), and [156](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces for the top:
 - S4 (cone with arms): 1 in color X (shown in red)
 - S5 (arm): 3 in color X and 6 in color Y (shown in yellow)
 - S5 (mirror or reverse image of template): 6 in color X and 6 in color Y
 - P14 (strip): 2 in color Z (shown in blue) (*Note:* Cut this piece from folded paper with the dashed line placed on the fold.)
 - S6 (top cone): 1 in color Z
 - S12 (flag): 1 in color X
 - S13 (flag): 1 in color Y
- Using the templates, cut the following pieces for the container:
 - S2 (side piece): 4 in color X
 - S2 (mirror or reverse image of template): 4 in color Y
 - Form (no template) in any color: 1 rectangle, 2 3/4-inches wide × 21 3/16-inches long (7 × 54 cm)
 - P15 (narrow strip): 2 in color Y (*Note:* Cut this piece from folded paper with the dashed line placed on the fold.)

- P16 (zigzag strip): 2 in color Z (*Note:* Cut this piece from folded paper with the dashed line placed on the fold.)
- R11 (neck): 2 in color Z (*Note:* Cut this piece from folded paper with the dashed line placed on the fold.)
- S1 (bottom piece): 1 in color × (*Note:* Cut this piece from folded paper with the dashed line placed on the fold.)
- R5 (large red circle, largest inner red circle is hole): 1 in color Z
- R6 (large red circle, middle inner red circle is hole): 1 in color Y
- R7 (large red circle, smallest inner red circle is hole): 1 in color X
- R8 (large red circle, no hole): 1 in color Y
- R10 (strip with notches): 2 in color × (*Note:* Cut this piece from folded paper with the dashed line placed on the fold.)

CIRCUS TENT CONTAINER

- ① Using the four S2 side pieces in color X, the four S2 side pieces in color Y, and the form, prepare, align, weave, and fix the S2 strips into a cylinder following the same procedure as described in steps 1–4 for the Star Drum.
- ② To finish the upper edge, fix the two narrow P15 strips in color Y into one long strip with glue. Smear glue on the back side of the strip and fix it to the outside of the cylinder just above the points in color X.
- ③ Smear glue on the triangles of both P16 zigzag strips in color Z and fix the strip to P15; place the excess P16 paper (with the notches) above the edge of the cylinder. Crease the notches at the cylinder's edge and glue them to the inside.
- ④ Crease the two wider R11 strips in half lengthwise; unfold them. Fix them with glue into one long strip. Smear glue on the upper inside edge of the cylinder. Fix the unnotched edge of R11 inside the cylinder, so that the distance from the edge of the cylinder to the crease is about $\frac{3}{8}$ -inch (1 cm) high. Fold the part of R11 with notches to the inside of the container forming a standing two-layer neck and fix with glue.
- ⑤ To make the bottom, stack the R5, R6, R7, and R8 pieces to form a pattern of concentric circles. Fix all the layers with glue.
- ⑥ Fix the stack of circular pieces to the large circular S1 bottom piece in color X, continuing the pattern of concentric circles. Crease and fold all flaps on piece S1 upward from the front side of S1 showing the circles and smear glue on the back side of all flaps. Place the bottom inside the cylinder so that the edge of the flaps aligns with the lower part of the sides and press the flaps into the sides of the cylinder until the glue dries.

⑦ Smear glue on the half of the R10 strip without notches. Fix the strip to the lower part of the cylinder's sides so that the edge is just below the points in color Y. Smear glue on the part of the strip with notches, crease around the edge, and press down inside the cylinder, keeping the large bottom piece and all the flaps in place.

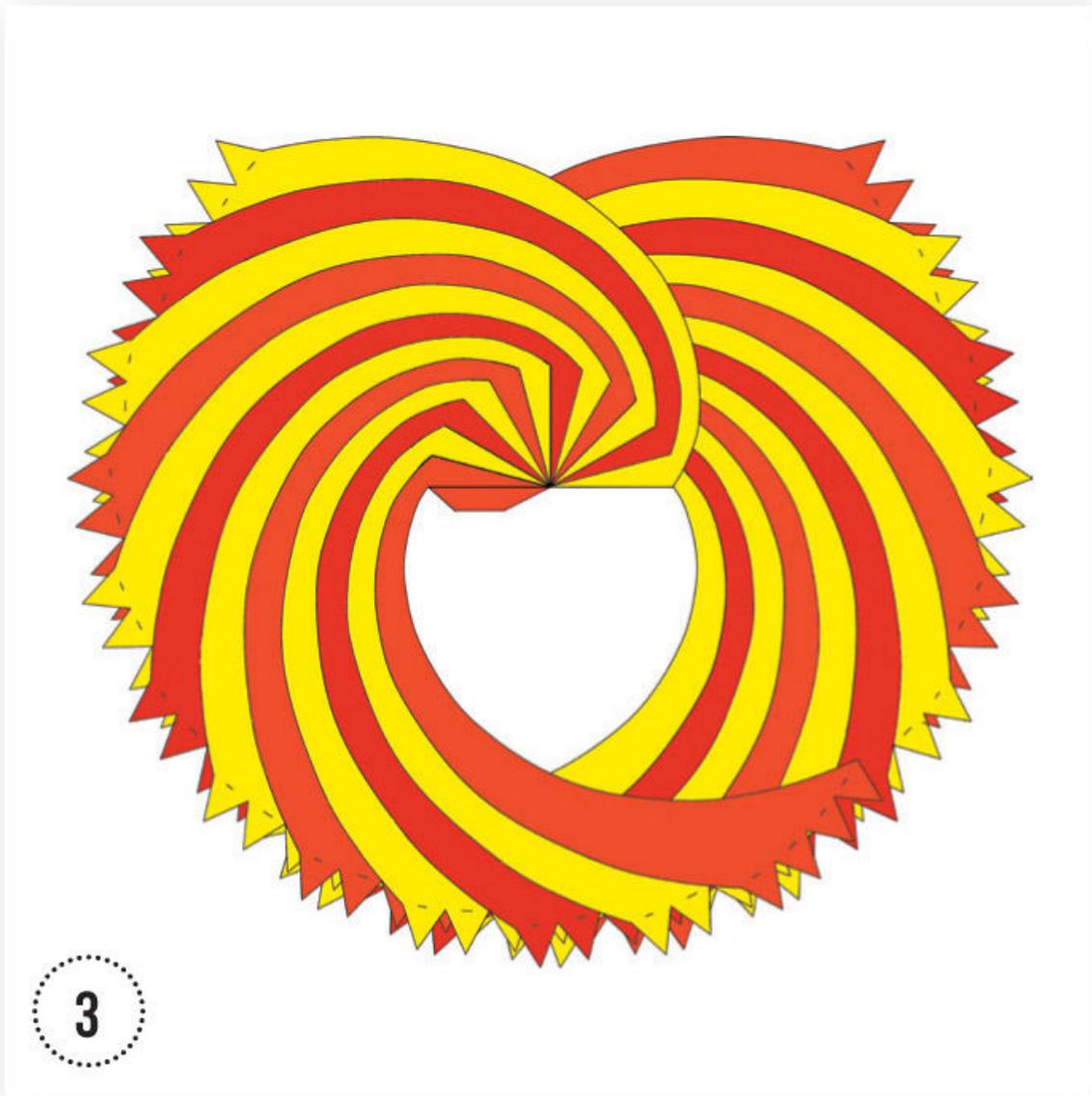
CIRCUS TENT TOP



- 1 Using the large S4 piece with arms in color × and the three S5 arms also in color × (shown in darker red to clarify), fix the S5 arms to S4 so that they will be exactly right between the arms of S4, all arms swirling in the same direction



② Turn S4 back side up and fix the six S5 arms in color Y into the spaces between arms, all arms swirling in the same direction.



- ③ Fix the twelve mirrored S5 arms to the back side of S4 on top of the arms already fixed; place color × on × and Y on Y, with arms swirling in the opposite direction
- ④ Form the piece into a cone with the front side of S4 showing, and secure the shape by fixing the flap to the inside of the cone with glue.
- ⑤ Weave the arms and tighten the weaving. The four small triangles at the end of the arms should meet triangles of the same color. Fix all the triangles

with glue.

⑥ Crease the small triangles toward the inside of the tent top, forming a vertical zigzag edge below the top.

⑦ Crease each P14 strip in color Z in half lengthwise. Fix the strips with glue to make a ring with a circumference of $20 \frac{5}{8}$ inches (52.4 cm).

⑧ Place the P15 ring on the inside of the small triangles; the crease will form the tent top's lower edge. Use paper clips to distribute the small triangles evenly around the ring. Secure with glue.

⑨ Shape the S6 top cone piece into a cone and secure it with glue. Fix to the top of the tent.

⑩ Crease the flag pieces on the dot-dash line, layer them, glue them to the toothpick flagpole, and insert at the top of the tent.

TIVOLI GARDENS

Tivoli in Copenhagen is a world-famous amusement park. The name Tivoli originated in a small, ancient Italian town just outside Rome. The town's reputation as a stylish resort and the fame of the gardens of the Villa d'Este from the 16th century has inspired the naming of other sites. Among these was the Jardin de Tivoli in Paris (1795–1842) that inspired Georg Carstensen to open the Tivoli Gardens in Copenhagen in 1843. The Danish park features garden styles from

throughout history as well as a variety of attractions, including carousels, roller coasters, and carnival games such as the wheel of fortune. This rich visual feast is topped off by the magnificent Chinese-style Pantomimeteatret, or the Pantomime Theatre, which is inhabited by a Danish version of the traditional Italian commedia dell'arte characters and guarded by a beautiful peacock on the stage's curtain. Renowned Danish author Hans Christian Andersen visited the park on October 11, 1843. Inspired by the Chinese gardens, he immediately returned to his lodgings and wrote the fairy tale "The Nightingale" in only two days. We find Tivoli, now more than 170 years old, with its amazing collection of decorative ornaments and attractions, to be as inspiring as ever.



PEACOCK

When planning the Peacock, you have the option of using small remains of beautiful paper you didn't have the heart to throw away. Plan the colors so that you do not use the same color for pieces that will be adjacent to each other in the finished bird. A dark body makes this peacock look like a real peacock; one piece of the woven basket is lovely when made from shiny metallic paper.



MATERIALS

- Paper in eleven colors or patterns (colors U1, U2, V1, V2, W1, W2, X1, X2, Y, Z1, and Z2), 80–110 g/m² in weight
- Glue stick

TEMPLATES & PIECES

- For the project templates, see pages [143](#) and [144](#). Copy the templates using your preferred method as described on [page 135](#).

- Using the templates, cut the following pieces:

- D1 (tail fan): 2 in color U1 (shown in dark purple)
- D2 (tail fan): 1 in color U2 (shown in light purple)
- D3 (tail fan): 2 in color V1 (shown in green)
- D4 (tail fan): 1 in color V2 (shown in metallic blue)
- D5 (tail fan): 2 in color W1 (shown in light green)
- D6 (tail fan): 1 in color W2 (shown in dark turquoise)
- D7 (tail fan): 2 in color X1 (shown in purple)
- D8 (tail fan): 1 in color X2 (shown in turquoise)
- D9 (tail fan): 1 in color Y (shown in light purple)
- D10 (body basket): 1 in color Z1 (shown in dark blue) and 1 in color Z2 (shown in metallic blue).
- D11 (head): 2 in color Z1
- D11 (mirror or reverse image of template): 2 in color Z1
- D12 (handle): 1 in color Z1

(*Note:* Many pieces (D2, D4, D6, D8, and D9) can be cut by placing the dashed line on the fold of doubled paper. Making them from one piece is not a requirement, however; if your pieces of paper are not large enough, cut two mirrored pieces instead.)

The Peacock is made in two parts. One part is a basket consisting of the peacock's head, body, and a handle. The other part is the peacock's tail that is dropped into the basket.

The tail of the Peacock is made from fans slid together in the same way as you prepare the third Basic Triangle Bunting (see [page 17](#)), though in this case the stripes radiate from a center.

BASKET

- ① Weave the basket from the two D10 pieces following the instructions for the Basic Woven Heart (see [page 18](#)).
- ② Fix the handle with glue near the top ends so that the edges of the basket and the handle are aligned.
- ③ For both sides of the basket, fix a D11 head to the handle where it meets the basket. (*Note: When you vary the angle of the head, you change the expression of the bird.*)
- ④ Fix a mirrored head to the back side of the head and handle; if you prefer a colored eye (instead of the plain eyehole), glue a small piece of paper in the desired color between the two layers of the head to show inside the eye.

TAIL FAN

- ① Slide the following pieces together: both D1s and D2, both D3s and D4, both D5s and D6, and both D7s and D8.
- ② Crease all the double fans created in step 1 along the dashed line of symmetry.
- ③ Pack the fans according to size: the largest D1/D2 fan should be at the innermost position and the smallest D9 should go outside.
- ④ Align the center of the fans to show the desired pattern (see photo above) and fix the pieces with a little glue on an area somewhat below the center of the fans so that they remain in place. This location will later be covered by the basket, so if the glue makes the paper buckle, it will not be visible.
- ⑤ Drop the peacock's tail in the basket and align it. You may want to secure the tail inside the basket with a little glue.

HARLEQUIN CONE

Combine six of your favorite colors to get a Harlequin Cone. The cone is made just like the Basic Cone (see [page 28](#)) except that you prepare the parts from individual arms.



MATERIALS

- Paper in six colors (X1, X2, X3, Y1, Y2, and Y3), 80–110 g/m² in weight
- Glue stick

FROM YOUR TOOLBOX

- Knitting needle or other conical item (for shaping the cone)
- Darning needle and ruler (for scoring)
- 9 paper clips (for weaving)
- Tweezers (for pulling the strips)

TEMPLATES & PIECES

- For the project templates, see pages [141](#) and [142](#); for the handle templates, see [page 132](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - O4 (large piece with 3 arms): 1 in color X1 (shown in black)
 - O5 (triangle and arm): 3 each in colors X2 (shown in dark green) and X3 (shown in green), and 3 mirrored arms each in colors Y1 (shown in yellow), Y2 (shown in orange), and Y3 (shown in red). (*Note:* You need 15 single arms in total.)
 - O6 (arched strips): 2 in color X1
 - O7 (cone form): 1 in any color
 - 1 handle in color X1, ³/₈-inch wide × 10-inches long (1 × 25 cm)



- 1 Make a full cone piece with nine arms by attaching the six O5 pieces one by one, all swirling in the same direction, to the back side of the large O4 piece. Place the O5 pieces between the arms of the O4 piece, alternating colors.



② Add the next layer of mirrored arms, now swirling in the opposite direction and alternating colors. Form, weave, and finish the cone as explained in steps 3–23 for the Basic Cone (see [page 29–31](#)).

SCALLOPED SPHERE

The Scalloped Sphere may be woven freestyle like the Basic Sphere (see [page 32](#)), or you may use a polystyrene (Styrofoam) sphere, 4 inches (10 cm) in diameter, as an inner form. (*Note: Scale the pattern accordingly to use any other size sphere.*) Using a form inside the finished project is the easiest option for a beginner or if you want a more-perfect sphere.



MATERIALS FOR WEAVING FREESTYLE

- Four colors of paper (W, X, Y, and Z), 80–150 g/m² in weight. (*Note:* If you have chosen to enlarge the template you may even use heavier papers. Heavier paper is required for larger spheres. For the size of the templates, 120 g/m² paper is appropriate.)
- Glue stick

FROM YOUR TOOLBOX

- 12 paper clips

MATERIALS FOR WEAVING USING A POLYSTYRENE SPHERE

- Four colors of paper (W, X, Y and Z), 80–100 g/m² in weight for any size sphere.
- A polystyrene sphere, 10 cm in diameter. (*Note:* Using a sphere with a different diameter than exactly 10 cm requires you to rescale the templates. The sidebar on [page 95](#) indicates the scale factors.)
- Glue stick

FROM YOUR TOOLBOX

- 12 straight pins with large heads

TEMPLATES & PIECES

- For the project templates, see [page 141](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - K9 (arm): 6 each in colors W (shown in pale yellow) and × (shown in yellow)
 - K9 (mirror or reverse image of template): 6 each in colors Y (shown in red) and Z (shown in pink)
 - K10 or K11 (circular piece for starting): 1 in color Y (*Note:* The template you use depends on which end of the arms you plan to start

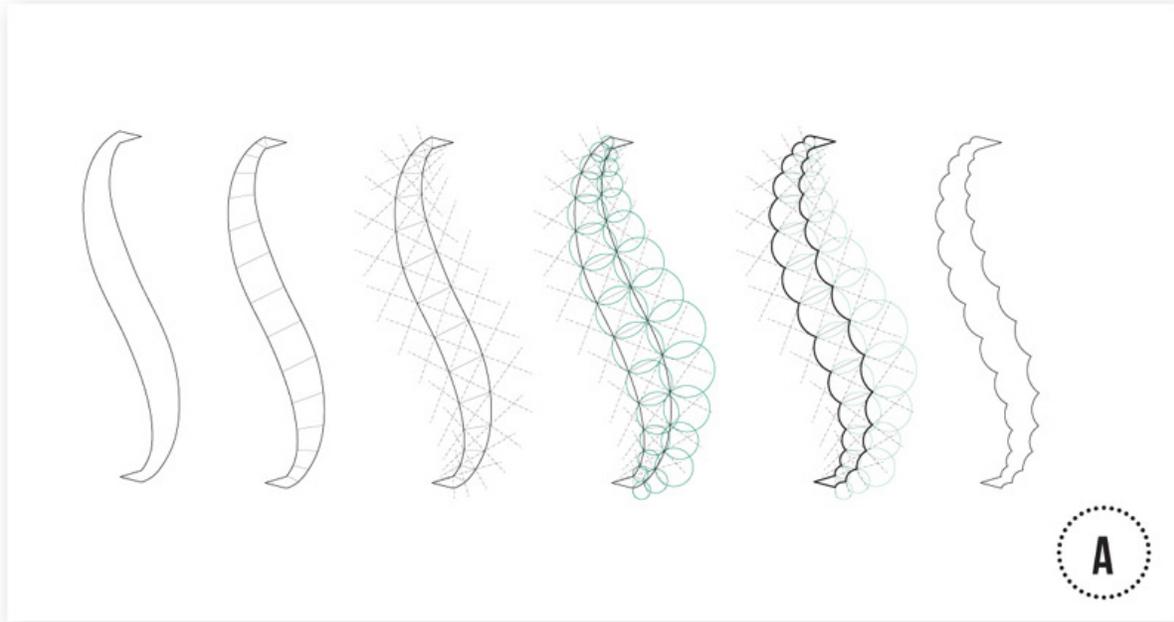
from. The piece will fit the size of the small triangles.)

– K12, K13, K14, or K15 (circular piece for closing): 1 in color Y
(*Note:* Choose the one that fits the woven sphere in size.)

For freestyle weaving, follow steps 1–7 for the Basic Sphere (see [page 32](#)). Consider that the colors of the W/X and Y/Z arms will alternate when you start the sphere.

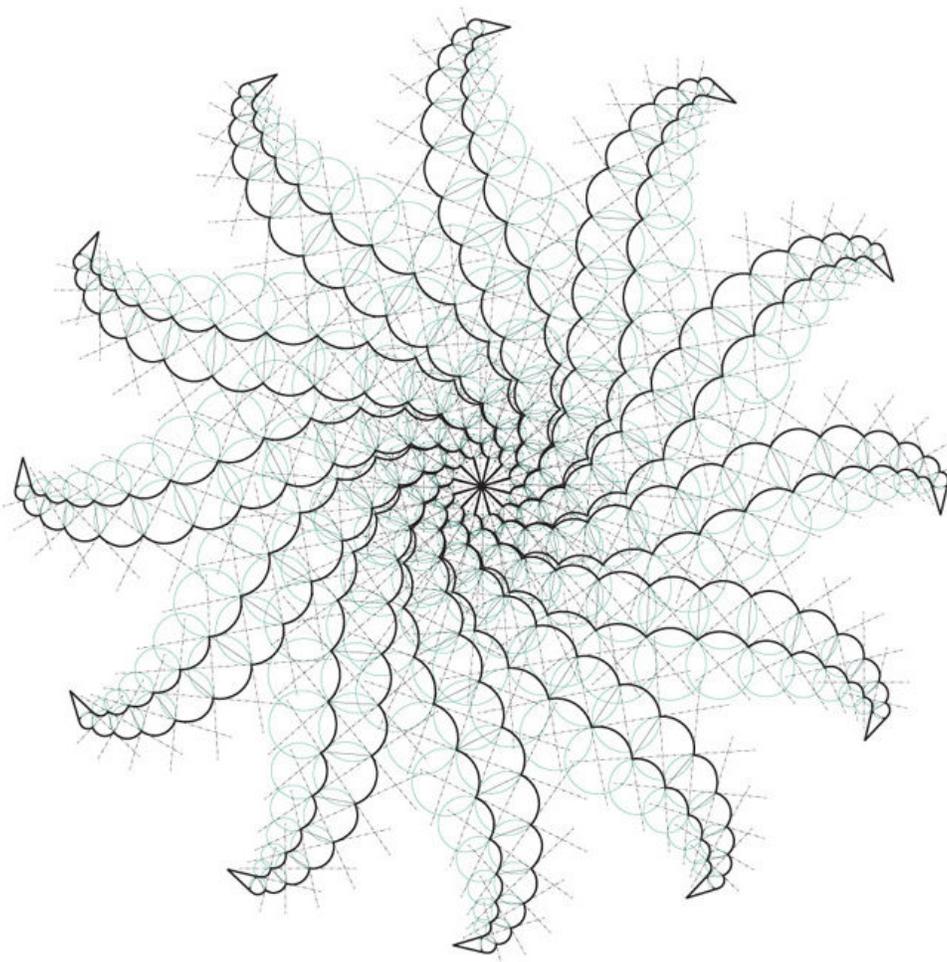
If you use a polystyrene sphere as a form, start as for the Basic Sphere and then tighten the weaving to follow the shape of the sphere. Fix the project to the polystyrene sphere with straight pins as you weave along but do not perforate the arms; instead pin through the small spaces where the strips meet. After weaving, fix the arms with glue where they meet. You may cover the closure with a circular piece. Finally, remove the pins. The polystyrene sphere remains enclosed in the paper sphere.

Transforming the Basic Sphere pattern into the Scalloped Sphere pattern requires several steps. First, the pattern is divided into squares, which resemble the finished pattern on a sphere. Diagonals are then drawn; they serve as tangents to the circles that generate the pattern. Using one-fourth of the circles produces the final scalloped sphere pattern (A).



One might think this is a drawing of an amoeba with tentacles surrounding it, but no, this is the Scalped Sphere when flattened. The lines and circles are the underlying pattern for generating the geometry (B).

B



SCALING TEMPLATES

The templates for weaving the Scalloped Sphere can be scaled to fit polystyrene (Styrofoam) spheres of any size. The templates included fit a sphere with a diameter of exactly 10 cm. This corresponds to a circumference of 12.4 inches (31.4 cm). We have learned that the spheres available from stores and online shops are not always exactly the size indicated. Measure the circumference of the sphere you intend to use carefully, and scale using one of the following formulas:

- Metric units: Scale factor = circumference in cm/31.4
- U.S. units: Scale factor = circumference in inches \times 2.54/31.4
- An ideal 4" sphere has a circumference of $12 \frac{9}{16}$ inches or 31.9 cm. This means that to make the template fit a 4" sphere, it must be scaled with a factor of $31.9/31.4 = 1.02$.

LAMPSHADE

These small lampshades are designed as an embellishment for a string of LED lights. The process is simple and it is perfectly possible to produce ten or even twenty within a few hours. Make them from transparent paper.

① Place one L8 upper strip flat on the table and fix six L6 arms to this, colors alternating and all arms swirling in the same direction. It is crucial to be very precise in this.

② Fix the second layer of arms on top of this, arms swirling in the opposite direction and colors alternating so that the same color meets in the large diamonds. The arms must be offset and slid along the edge so that the upper point of each large woven diamond shape starts just below the curved L8 strip (see photo).

③ Add the other curved L8 strip on top of the arms where they are glued and aligned with the first L8 strip.

④ Shape this into a ring and secure with glue on the extra paper of the L8 strips. There must be no gap where the arms meet.

⑤ Pull out the arms from the inner layer to the front through the closest slit in the outer layer. Fix each arm temporarily with a paper clip. Weave



one more row, still fixing the arms with paper clips. Align and tighten the weaving. Secure the woven arms with glue.

⑥ Glue the L7 strips inside and outside along the lower edge of the lampshade guided by the points of the large, fully woven diamonds.

⑦ Trim the edges of the lampshade if necessary.

⑧ Inspect your string of lights and figure out how to attach the lampshade. If the light fixture is not large enough to keep the lampshade in place by itself, make two small holes in the upper rim of the shade and tie it to the wires with a piece of string.



The lit lamps will look most colorful if the transparent-paper arms are woven with same-color arms in the large diamonds. If not, the

lampshade will present the same color all over when the light is turned on. Consequently, the colors of the L6 arms must alternate in the large parts to be woven. The L6 arms are the same shape as the upper part of a cone; they are woven following a simplified process like the one for the Basic Cone (see [page 28](#)).

MATERIALS

- Transparent paper in two contrasting colors (W and X) and ordinary paper in two colors (Y and Z), all 80–130 g/m² in weight
- Glue stick

FROM YOUR TOOLBOX

- 6 paper clips (for weaving)

TEMPLATES & PIECES

- For the project templates, see [page 135](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces for each lampshade:
 - L6 (arm): 6 in color W and 6 in color X
 - L7 (lower strip): 2 in color Y
 - L8 (upper strip): 2 in color Z

ZEPPELIN

The Zeppelin may fly on its own or be accompanied by other zeppelins in vivid colors.

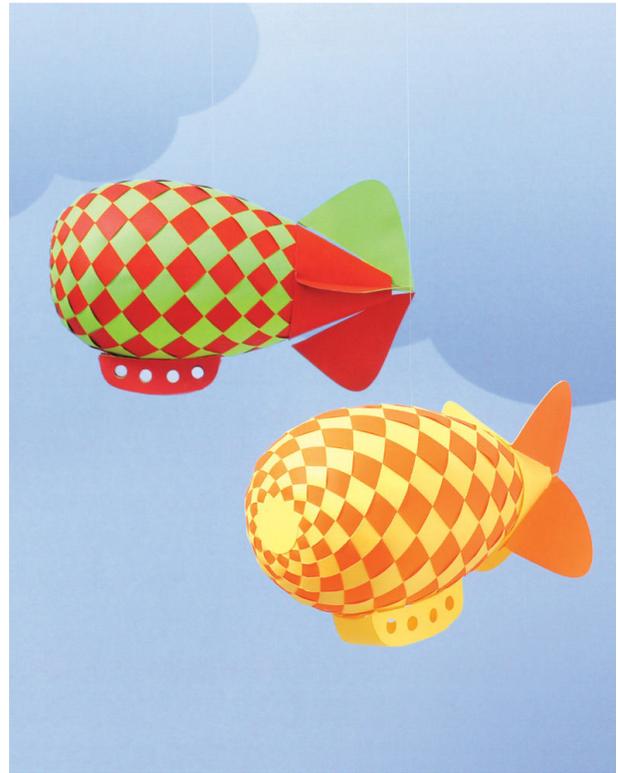
① Fix the two T18 pieces in color X with glue at the circular center part to form one swirling piece with twelve arms. Do the same for the two mirrored pieces in color Y.

② Weave the Zeppelin as indicated in steps 3–6 for the Basic Sphere (see [page 32](#)). The form will bend so that the visible central star at the front end will be color X. Weave as much as possible. When everything is woven and lined up, the end of the arms should make an exact overlap and fit two by two. Fix them with glue.

③ Using glue, fix the arched S10 strip into a conical band or ring. The size of the overlap is marked with a small notch. Fix the ring to the open end of the project following the shape of the body. The strip should start just above the points in color Y.

④ Crease the small flaps on the T20 gondola sides up on both sides. Shape T20 to follow the curved lower edge of the T21 gondola bottom piece. Using glue, fix the T21 pieces on T20's flaps to form the gondola.

⑤ Glue the gondola to the belly of the zeppelin using the four flaps on the top and ends of the gondola.



⑥ Form the S11 piece into a cone shape and secure it by applying glue to the flap.

⑦ Strengthen the T19 tail fins by gluing two together in different colors. Crease the small triangular flap at one corner of the fin as indicated by the short notches. Color Y must face the outside.

⑧ Find the two sets of four small notches at the two edges of the completed tail cone (S11).

⑨ Next, add the T19 fins to the tail cone one by one. Smear glue on each fin's small triangular flap. Insert the long narrow strip of the fin into the tail cone's top using the small notch in S11 to keep it in place. Press down the small triangular flap onto S11 using the notch in the wider edge of S11 as a guide.

⑩ Smear glue on the arched strip at the zeppelin's tail. Smear glue along the inside of the tail cone's edge. Place the tail cone so that it covers the arched strip, align the fins, and hold the pieces in place until the glue dries.

⑪ To hang the Zeppelin, thread the needle with a length of string. The string must be secured at the exact point of balance, which is along the line of diamonds in color × running on top of the Zeppelin. Count six diamonds from the front end; the point of balance will be between the sixth and seventh diamonds. Insert the needle and string into the Zeppelin at the point of balance and pull it out through the center hole in the tail cone. Remove the needle and tie the small bead to the string. Pull the bead into the Zeppelin at the point of balance by pulling on the other free end of the string. Tie a loop on the string to hang the Zeppelin. Now you are ready to fly.

MATERIALS

- Paper in two contrasting colors or patterns (colors X and Y), 80–130 g/m² in weight
- A piece of string (for hanging)
- A small bead, or the like, no more than 1/16 inch (2 mm) in diameter (for securing the string)
- Glue stick

FROM YOUR TOOLBOX

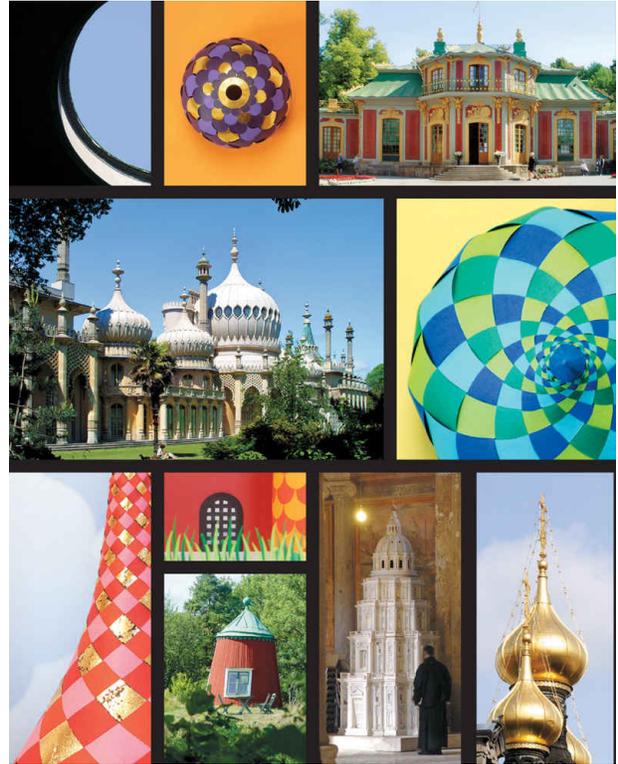
- 12 paper clips (for weaving)
- Needle (for threading the string)

TEMPLATES & PIECES

- For the project templates, see pages [140](#) and [142](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - T18 (arms): 2 in color X (shown in red) (*Note: The T18 template is too large to fit on one book page. When copying the template, use the two pieces shown and join them along the dotted line.*)
 - T18 (mirror or reverse image of template): 2 in color Y (shown in green)
 - S10 (arched tail strip): 1 in color X
 - S11 (tail cone): 1 in color X
 - T19 (tail fins): 4 in color X and 4 in color Y
 - T20 (gondola sides): 2 in color X
 - T21 (gondola bottom): 1 in color X

EXOTIC PALACE

The awesome antique Pantheon, the grandiose Royal Pavilion in Brighton, the eccentric King Gustav III's colorful and theatrical follies in Stockholm, the wondrous onion-shaped domes beautifying churches, temples, and mosques worldwide all display a richness of color and imagination in architecture. What better inspiration for an exciting play castle or just for ornamental boxes. Remaking these exotic inspirations allows the paper weaver to remix the geometries of the architecture and fuse their ideas into a microcosm in paper.



You will find a selection of towers in different styles and some very simple tower and wall bases. There are portals, a portcullis, and windows to add. The towers are, in fact, boxes consisting of a top (the lid) and a cylinder base (the container)—you may prefer just to make the boxes. To make an ultrahigh tower you may add one or more open cylinder parts in between the top and base.

DOMES & CONE TOPS

The templates provided for the domes and cone tops are made to fit a container with a circular opening $3 \frac{1}{4}$ inches (8.3 cm) in diameter. In addition, you will find a large checkered dome that fits an opening twice this size. In general, you may rescale the templates to fit other sizes, but then remember to rescale everything, including the container. The edges shown here are a suggestion; you can find inspiration for additional Beautiful Edges on [page 134](#). In these tutorials, the woven parts frequently use only two colors of paper; however, you may use as many colors you prefer. The section “On Colors & Patterns” on [page 122](#) shows you a range of different options. There are plenty of options and no “correct” way. Use your skills and imagination to produce entirely your own project.



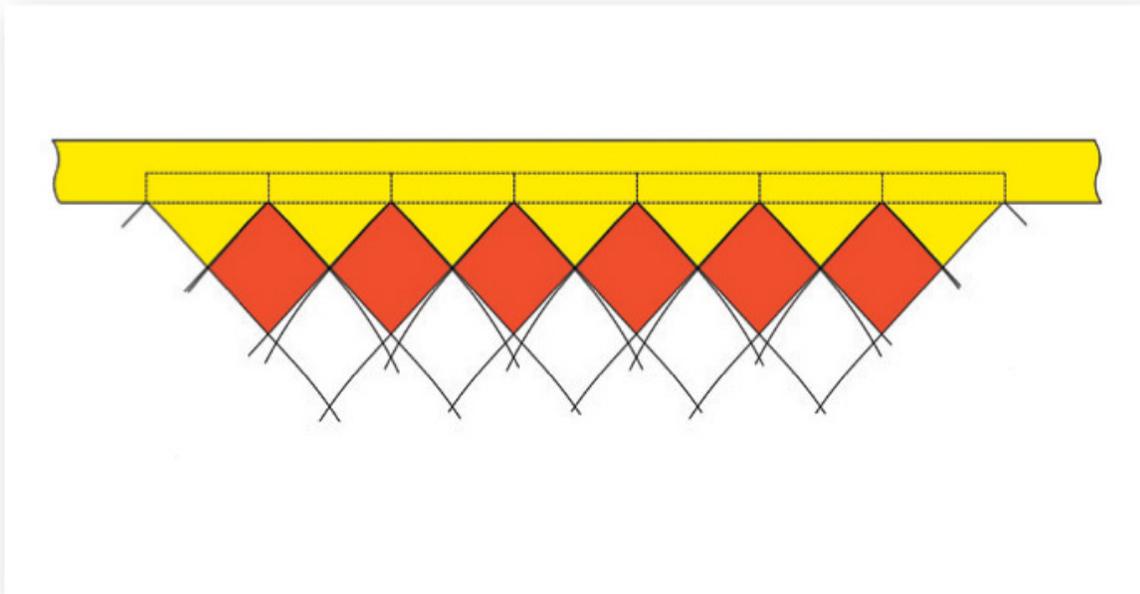
From left: Scalloped Cylinder with Low Cone Top; High Cone Top; Drum Cylinder Wall with Checkered Dome; Scalloped Cylinder Wall with Scalloped Dome; Wall section with Door; Large Simple Cylinder with Large Checkered Dome.

(Note: The drawings showing the steps for preparing the edges are flattened sections of the three-dimensional object. The woven arms are only shown in a flat projection and do not line up all the way.)

CHECKERED DOME

① Start and weave the dome from the two P10 pieces. The process is the same as that used for the Basic Sphere (see [page 32](#)), except that the individual arms are already fixed to the center piece; use paper clips to keep the woven arms together as you weave. Color X will show at the top of the dome. Stop when all weaving is done but before you fix the arms at the edge.

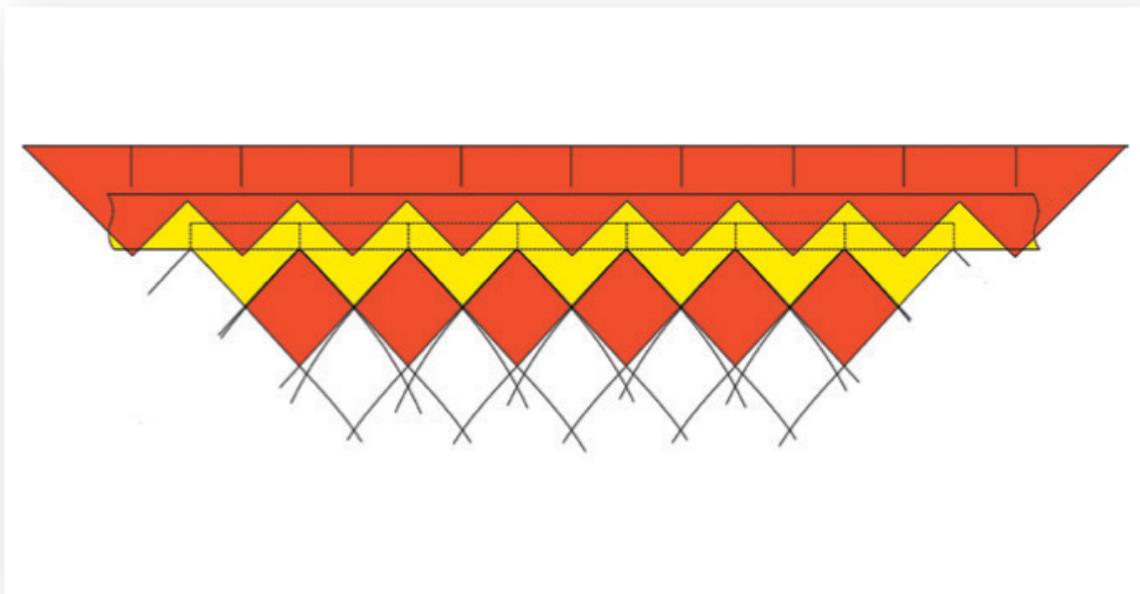
EDGE 1 (SIMPLE)



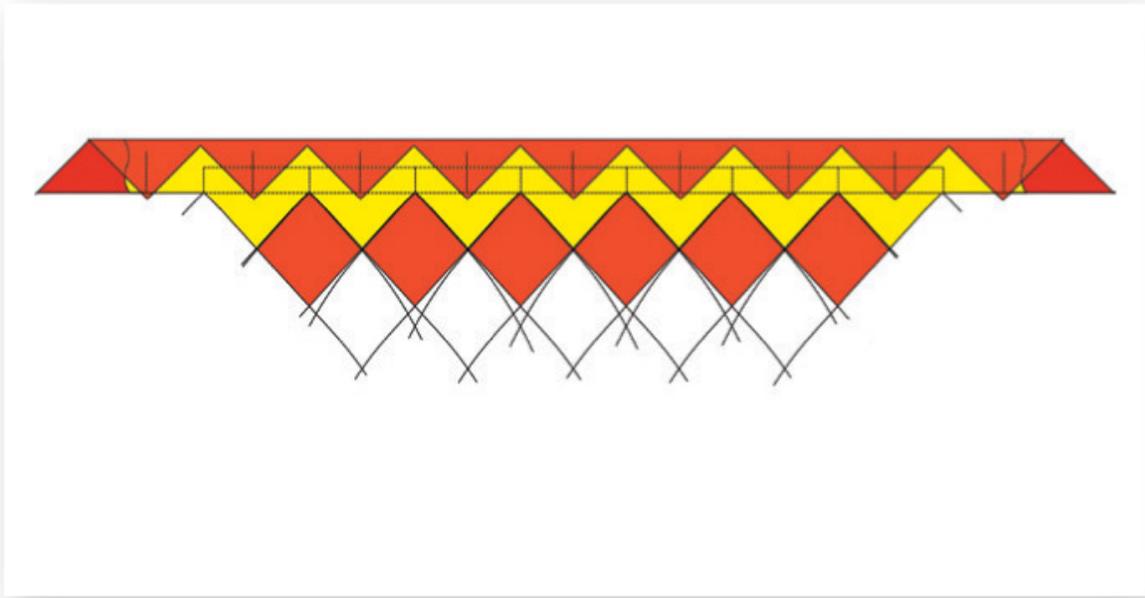
① Measure $10 \frac{5}{16}$ inches (26.2 cm) on a narrow P15 strip in color Y, make a pencil mark, and fix it into a ring with this exact circumference. Fix the ring to the outside of the dome's opening with paper clips, distributing the woven arms evenly and lining up the lower edge with the points of the squares in color X. Fix the arms to the strip, one by one, using glue.

② Fix the remaining narrow P15 strip, to the inside of the dome, edges lined up.

EDGE 2, WITH A ZIGZAG STRIPE



- ① Follow step 1 of edge 1.
- ② Fix the zigzag strip P16 in color \times to the outside of the dome. Place the triangles in between the diamonds in color \times but $\frac{3}{16}$ inch (5 mm) from the zigzag edge. In this way, you have a zigzag ribbon in color Y.



- ③ Crease the other edge of P16 around the straight edge of P15 and secure the folded paper to the inside of the dome with glue.

MATERIALS

- Paper in two, three, four or even more colors or patterns, 80–130 g/m² in weight
- Glue stick

FROM YOUR TOOLBOX

- 12 paper clips (for weaving)
- Pencil (for marking)

CHECKERED DOME

- The Checkered Dome may be prepared from two colors (X and Y).

TEMPLATES & PIECES

- For the project templates, see [page 152](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - P10 (main piece with arms): 1 in color X (shown in red)
 - P10 (mirror or reverse image of template): 1 in color Y (shown in yellow) (*Note:* If you want to use two colors for each P10 main piece, you can cut away every other arm following the red lines—P11—and prepare two half pieces instead.)
- There are two options for finishing the edge of the Checkered Dome:
 - Edge 1
 - P15 (narrow strip): 2 in color Y
 - Edge 2
 - P15 (narrow strip): 1 in color X
 - P16 (zigzag strip): 1 in color Y

SCALLOPED DOME

The Scalloped Dome may be prepared from paper in two colors (X and Y). A photo of this dome is on [page 102](#).

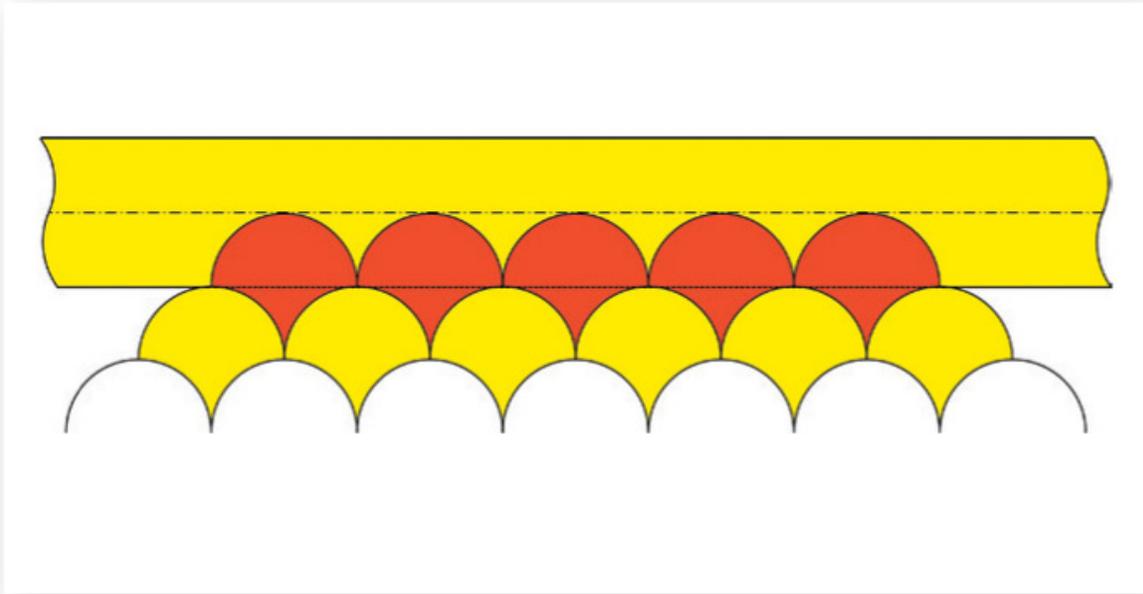
TEMPLATES & PIECES

- For the project templates, see [page 152](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - P12 (arm): 12 in color × (shown in red)
 - P12 (mirror or reverse image of template): 12 in color Y (shown in yellow)
 - P13 (ring piece): 1 in color × and 1 in color Y
 - There are two options for finishing the edge of the Scalloped Dome:
 - Edge 3
 - P14 (wide strip): 1 in color Y
 - Edge 4
 - P14 (wide strip): 1 in color Y
 - P15 (narrow strip): 1 in color Y
 - P16 (zigzag strip): 1 in color X

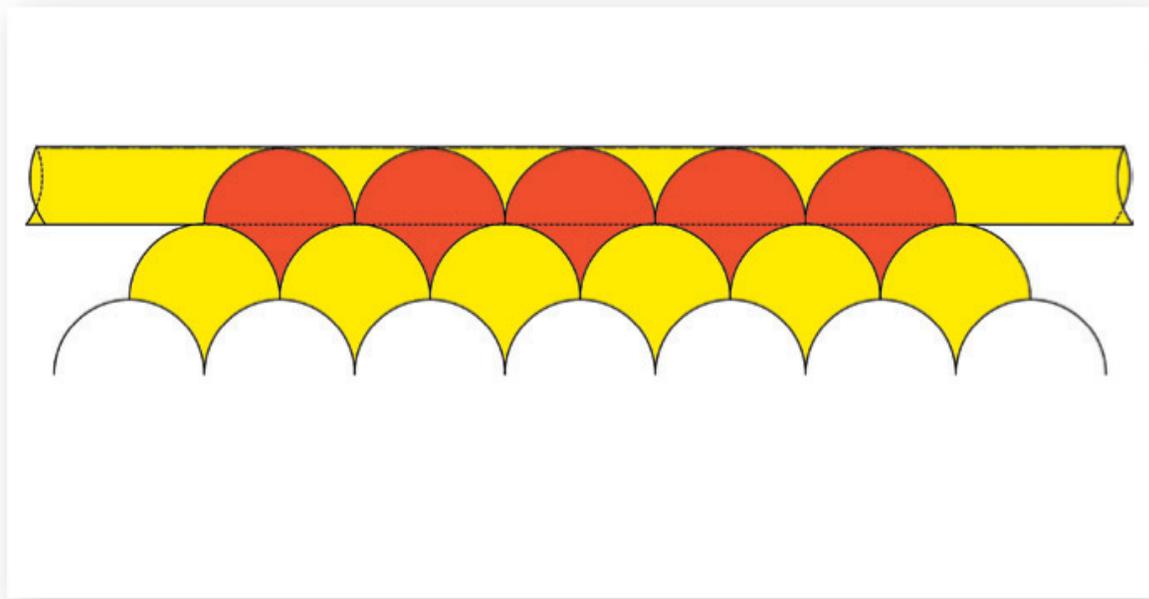
Fix the twelve P12 arms in color × to the P13 ring piece in color Y, all arms swirling in the same direction. Add the twelve mirrored P12 arms in color Y, bases lined up with those below, but arms swirling in the other direction. Center and fix the ring piece in color × on top. With the ring piece in color × on the outside, weave the

arms as for the Basic Sphere (page 32). Line up the arched ends of the arms and keep together with paper clips—not glue.

EDGE 3 (SCALLOPED)

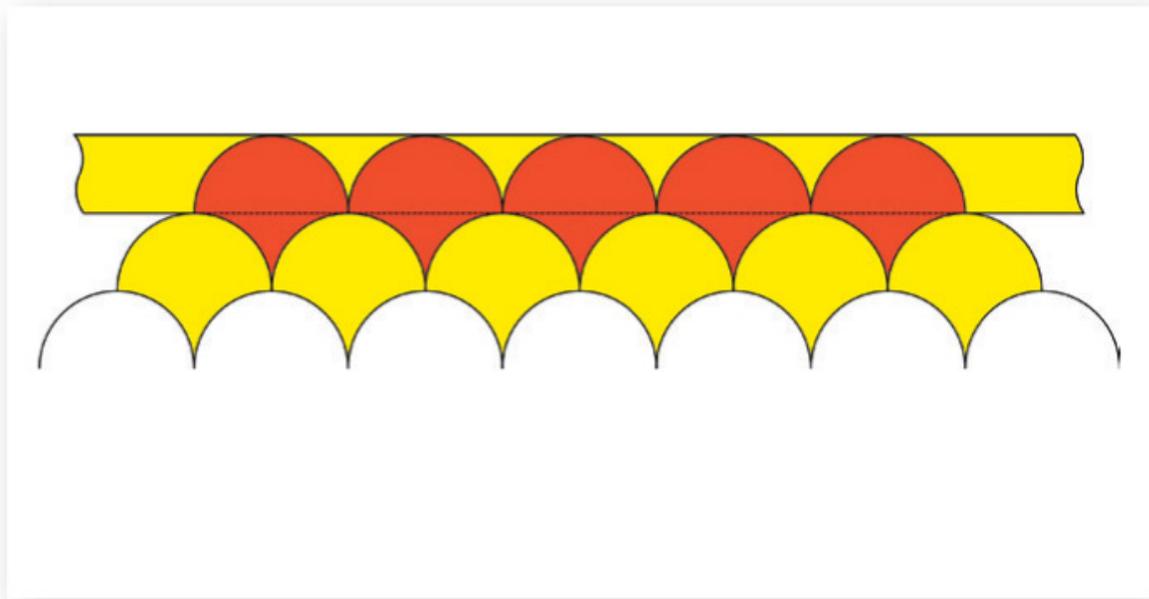


① Crease the wide P14 strip in half length-wise. Unfold and measure $10 \frac{5}{16}$ inches (26.2 cm), make a pencil mark, and fix it into a ring with this exact circumference. Place the ring inside the dome's opening, distributing the woven arms evenly (using paper clips to hold them) and lining up the crease with the top points of the half circles in color X; fix with glue.

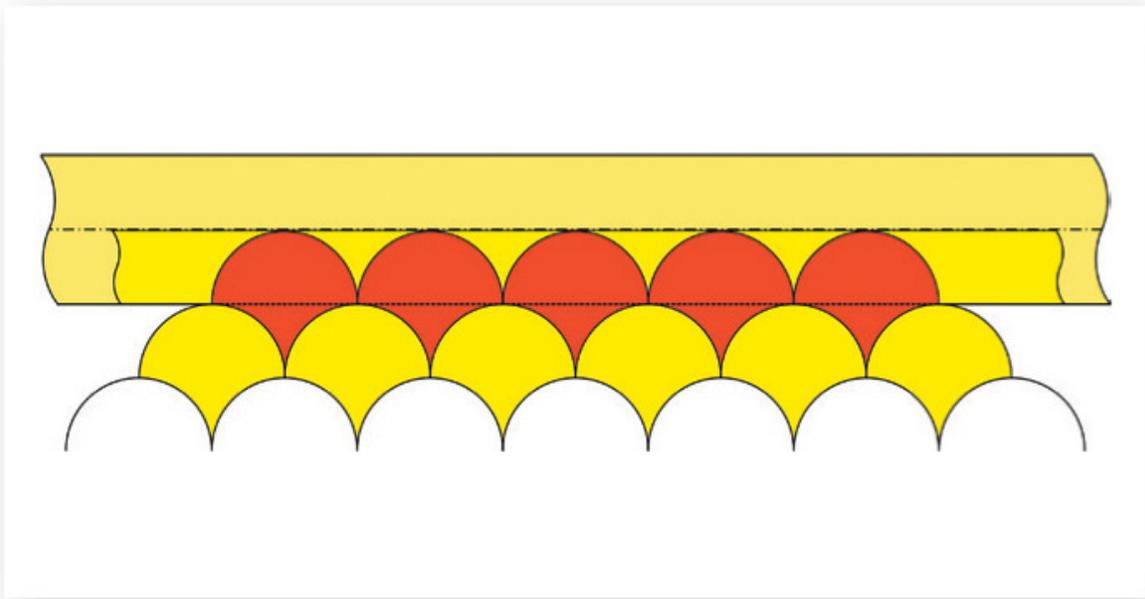


- 2 Fold back the other half of the wide P14 strip along the crease to the inside of the dome and fix with glue.

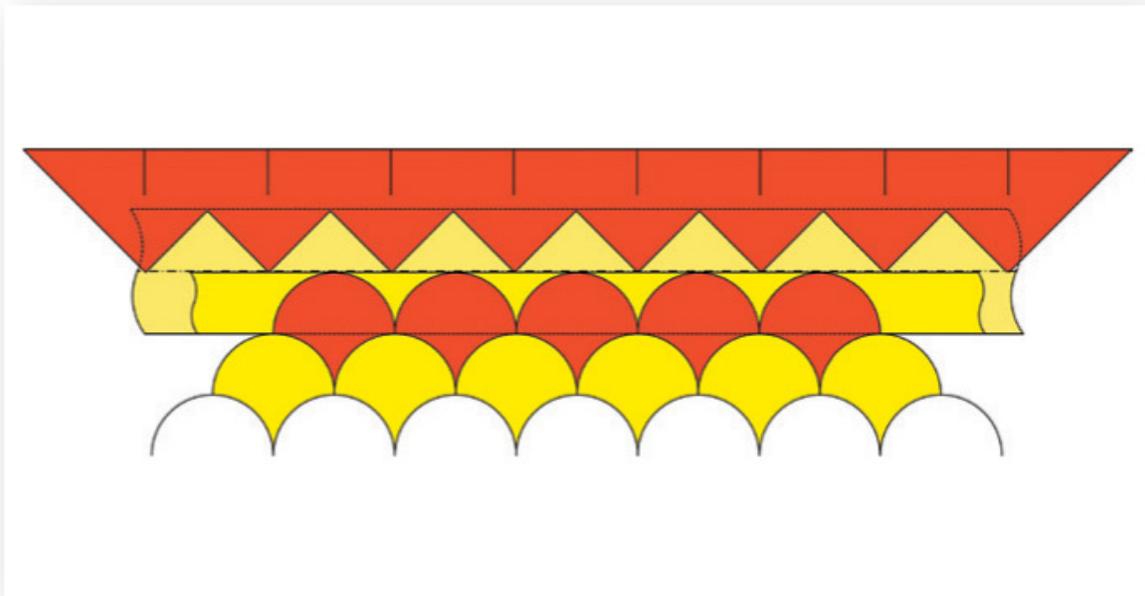
EDGE 4 (SCALLOPED WITH TRIANGLES)



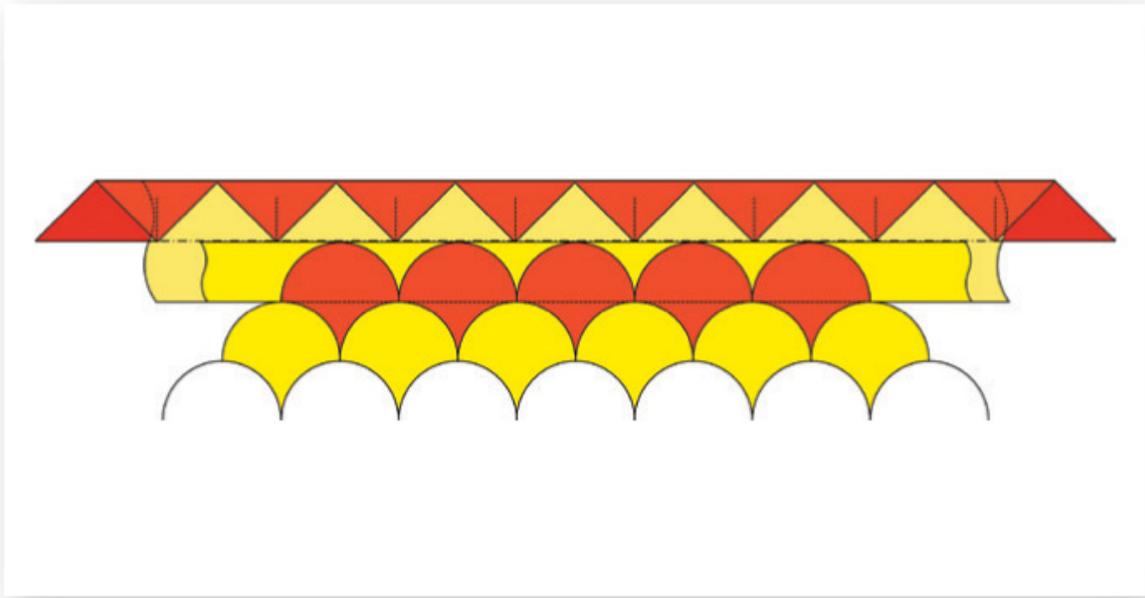
- 1 Measure $10 \frac{5}{16}$ inches (26.2 cm) on a narrow P15 strip in color Y, make a pencil mark, and fix it to a ring with this exact circumference. Fix the ring to the inside of the dome's opening with paper clips, distributing the woven arms evenly and aligning the upper edge with the top points of the circles in color X; fix with glue.



- ② Add the wide P14 strip in color Y on the inside and line it up with the lower edge of the narrow strip.



- ③ Add the P16 zigzag strip in color X on the outside, its points meeting the center of the space between arches.



- ④ Crease the P16 zigzag strip around the edge of the P14 wide strip, guided by the points of the triangles in color Y. Fix with glue.

LOW CONE TOP

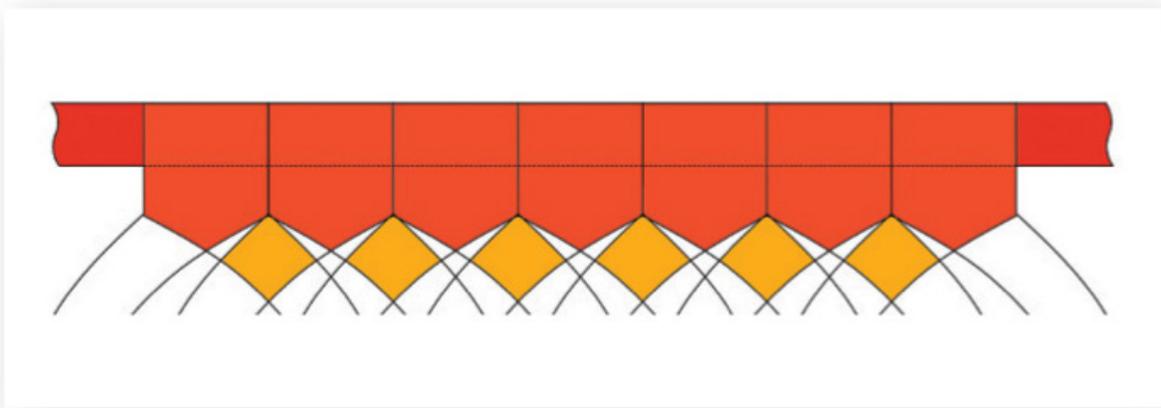
TEMPLATES & PIECES

- For the project templates, see pages [150](#) and [152](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - Q6 (main piece with arms): 1 in color × (with edge 5 shown in white, with edge 6 shown in dark red)
 - Q6 (mirror or reverse image of template): 1 in color Y (with edge 5 shown in black, with edge 6 shown in orange)
- There are two options for finishing the edge of the Low Cone Top:
 - Edge 5
 - P14 (wide strip): 1 in color Y
 - P15 (narrow strip): 1 in color X
 - P16 (zigzag strip): 1 in color Y
 - Edge 6
 - P15 (narrow strip): 1 in color X
 - P16 (zigzag strip): 1 in color × and 1 in color Y

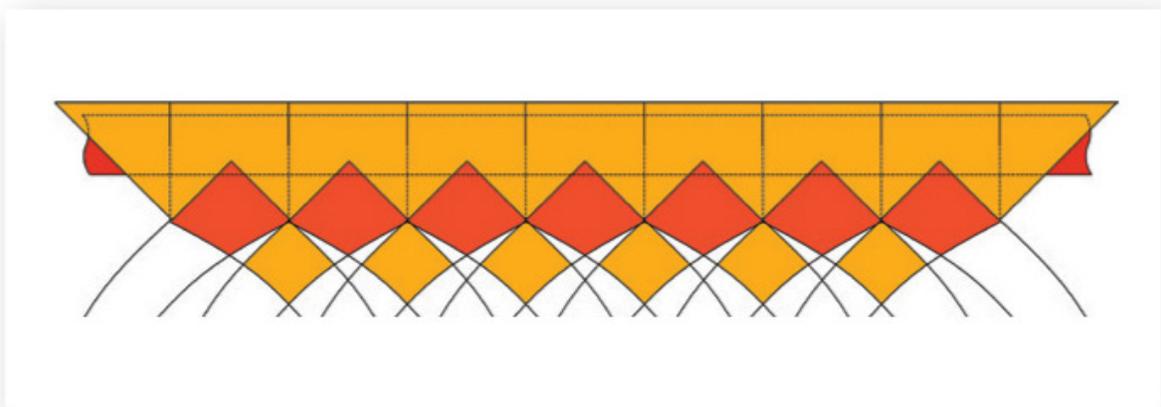
The Low Cone Top is made from paper in two colors (X and Y). A photo of the top with Edge 5 and with Edge 6 is on [page 102](#).

Start and weave the cone as described for the Basic Cone (see [page 28](#)); with this cone, however, you need no form. Color × shows on the cone's point. Stop the process just before fixing the arms at the edge.

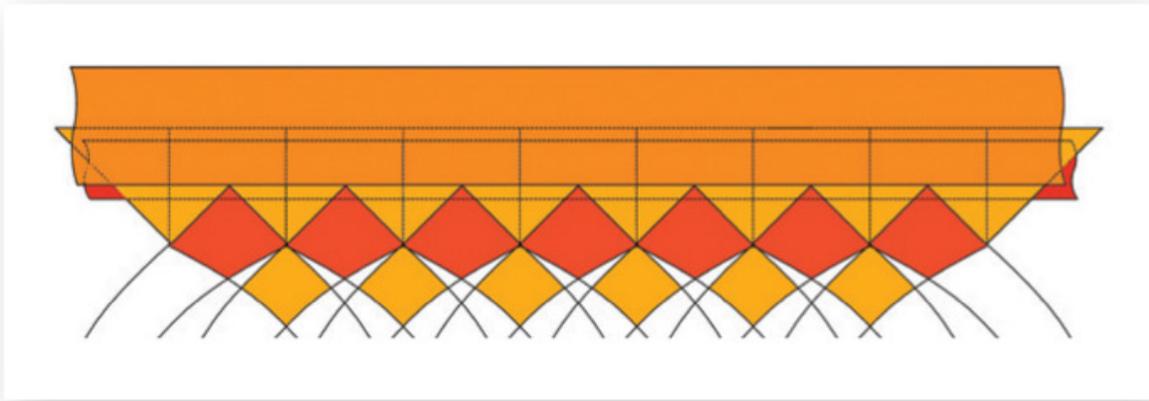
EDGE 5 (WIDE MONOCHROME)



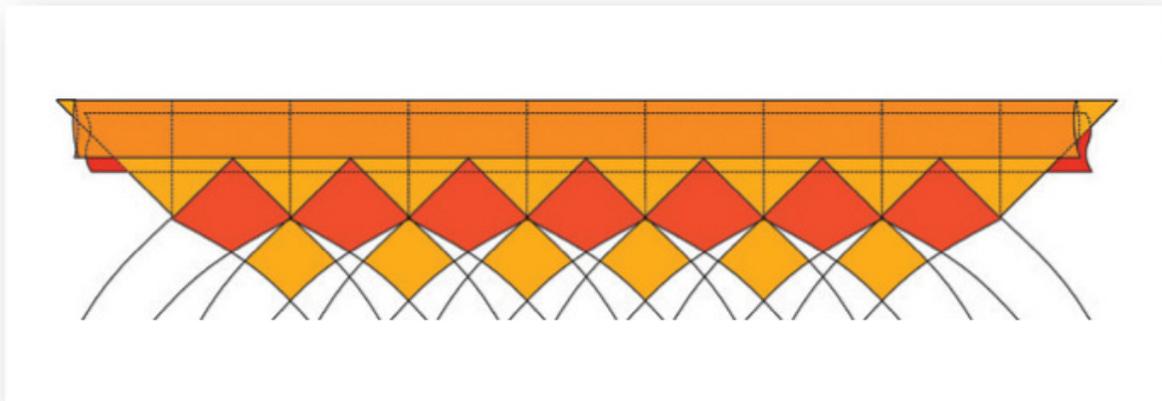
- 1 Measure $10 \frac{5}{16}$ inches (26.2 cm) on a P15 narrow strip in color X, make a pencil mark, and fix it into a ring with this exact circumference. Fix the ring to the inside of the cone's opening with paper clips, distributing the woven arms evenly and aligning the upper edge with the edge of the cone. Secure with glue.



- 2 Add the P16 zigzag strip in color Y on the outside of the cone using the top points of the color Y squares as a guide.



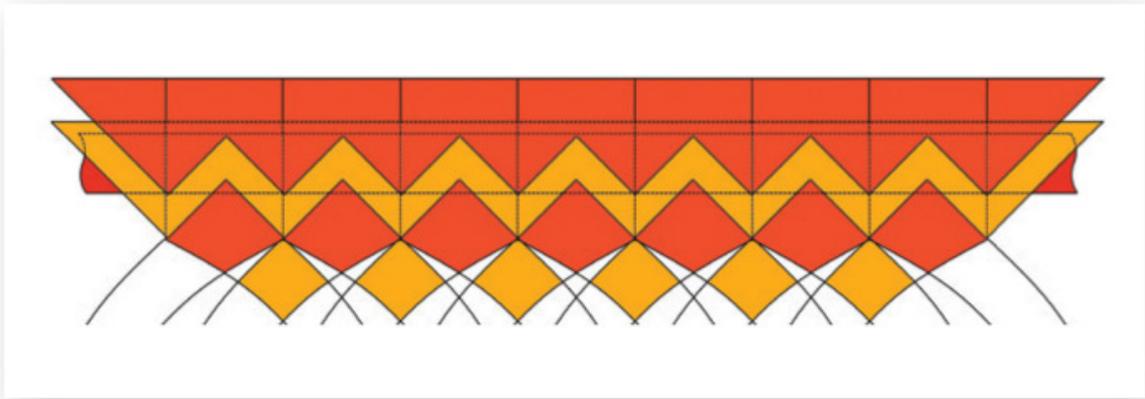
- 3 Add the wide strip in color Y (darker color only clarifying process) on the outside of P16. The lower edge lined up with the top of the last row of diamonds in color X.



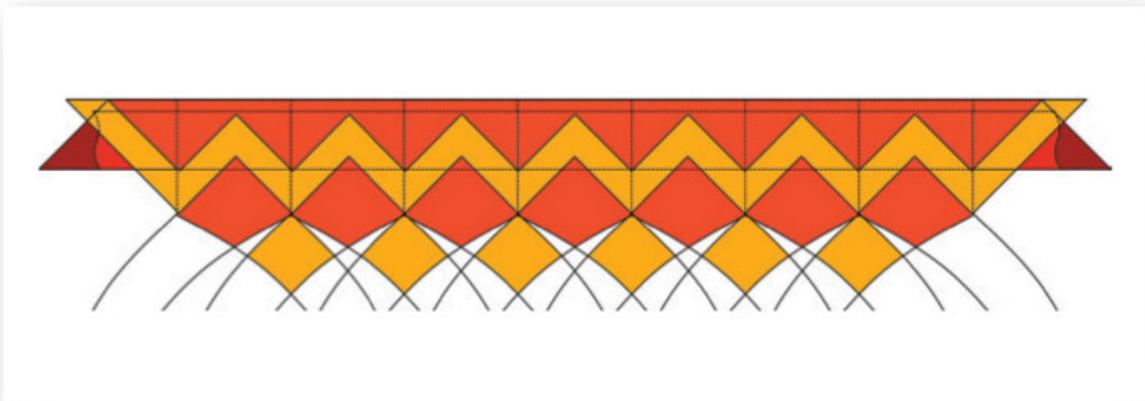
- 4 Crease the wide strip in color Y around the edge of the zigzag strip in color Y, pressing it to the inside of the cone. Sharpen the edge and secure the glue.

EDGE 6 (WIDE WITH ZIGZAG STRIPE)

- 1 Follow step 1 of Edge 5.
- 2 Follow step 2 of Edge 5.



- ③ Add the remaining P16 zigzag strip in color × about $\frac{3}{16}$ inch (5 mm) from the previous one, forming a zigzag pattern near the cone's edge.



- ④ Crease the zigzag strip in color × around the edge of the zigzag strip in color Y, pressing it to the inside of the cone. Sharpen the edge and secure with glue.

HIGH CONE TOP

The High Cone Top is woven from arms in two colors (X and Y). Two other colors (W and Z) are used for the edge. The top is shown on [page 102](#).

TEMPLATES & PIECES

- For the project templates, see pages [149](#) and [152](#). Copy the templates using your preferred method as described on [page 135](#).
 - Using the templates, cut the following pieces.
 - Q1 (main piece with arms): 1 in color × (shown in dark green)
 - Q1 (mirror or reverse image of template): 1 in color Y (shown in light green)
- (Note: The Q1 template is larger than this book's page, so the template is shown in two pieces. The template should be cut and taped together before cutting the actual piece as one.)
- P15 (narrow strip): 1 in color W (shown in red)
 - P16 (zigzag strip): 1 in color W and 1 in color Z (shown in orange)
 - Q2 (form): 1 in any color

Weave the cone as described for the Basic Cone (see [page 28](#)). Color × shows on the cone's top. Stop the weaving process just before fixing the arms at the edge. Finish the High Cone Top with Edge 6 as described on [page 105](#). The process for making the edge is the same, except that the flap at the end of the arms is shorter; thus, in step 2 you must glue the triangles of strip P16 in color Z to the flaps with great care.

LARGE CHECKERED DOME

The Large Checkered Dome has twice the circumference of the other domes and tops. The dome is made from three colors (X, Y, and Z), while the edge is made from two contrasting colors (W1 and W2).

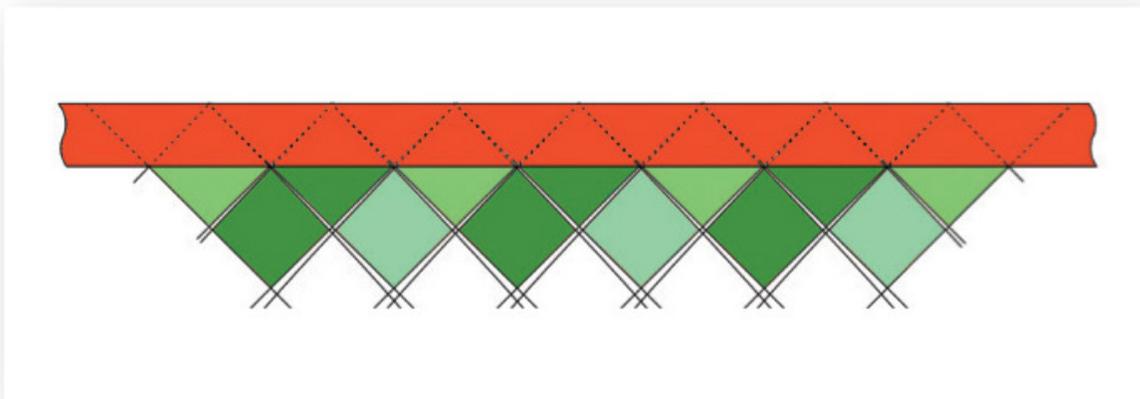
Fix the twenty-four arms in color X and Y alternating, all swirling in the same direction, to the Q8 ring piece in color Y. Add the twenty-four arms in color X and Z also alternating, bases lined up with those below, but arms swirling in the other direction. Center and fix the ring piece in color X on top. With the color X ring piece on the outside, weave the arms as described for the Basic Sphere ([page 32](#)). Line up the arched ends of the arms and hold them together with paper clips (not glue).

The Large Checkered Dome with Edge 6 is prepared from arms in three colors. The edge is shown on photo [page 102](#). Find more ways to plan colors in “On Colors & Patterns” (see [page 122](#)).

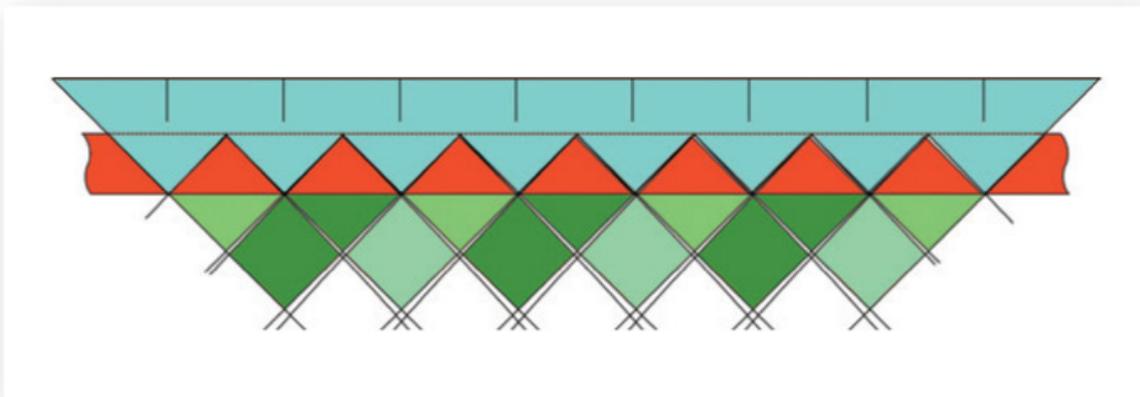
TEMPLATES & PIECES

- For the project templates, see pages [150](#) and [152](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - Q7 (arm): 12 in color × (shown in dark green) and 12 in color Y (shown in light green)
 - Q7 (mirror or reverse image of template): 12 in color × and 12 in color Z (shown in green)
 - Q8 (ring piece): 1 in color × and 1 in color Y
- Edge 7
 - P15 (narrow strip): 2 in color × and 2 in color W1 (shown in red)
 - P16 (zigzag strip): 2 in color W2 (shown in turquoise)

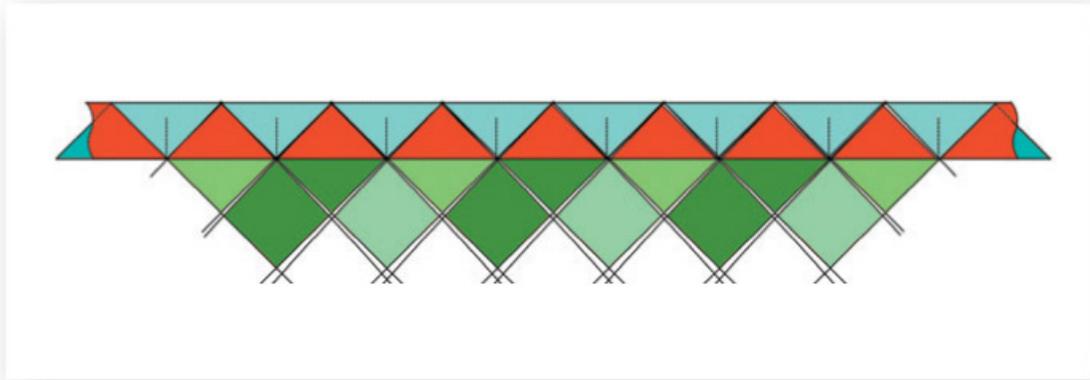
EDGE 7 (TRIANGLES)



① Fix the two P15 narrow strips in color W1 into one long strip. Measure $20 \frac{5}{8}$ inches (52.4 cm) on this strip, make a pencil mark, and fix it into a ring with this exact circumference. Fix the ring to the outside of the dome's opening with paper clips, distributing the woven arms evenly and aligning the upper edge with the end of the strips and the points of the last row of diamonds. Fix with glue.



② Add the P16 zigzag strips in color W2 on the outside, with points meeting points of the squares.



- ③ Crease the upper part of the P16 zigzag strip around the edge of the P15 narrow strip and secure with glue inside the dome.
- ④ Finally, add the two P15 narrow strips in color X, following the edge on the inside of the dome.

ONION DOMES

Templates for two onion domes are included, a low and a tall version. Please observe that only the templates of the Low Onion Dome are scaled to have a base circumference of $10 \frac{5}{16}$ inches (26.2 cm). The base of the Tall Onion Dome is scaled to a circumference of $6 \frac{7}{8}$ inches (17.5 cm).



From left: High Simple Cylinder with Windows and Tall Onion Dome;
Scalloped Cylinder with Low Onion Dome; High Simple Cylinder with Tall
Onion Dome; Wall section with Portcullis; Checkered Cylinder Container with
Drum Cylinder Wall and Low Onion Dome.

MATERIALS

- Paper in four colors (colors W, X, Y, and Z), 80–110 g/m² in weight
- Glue stick

FROM YOUR TOOLBOX

- Knitting needle or other conical item (for shaping)
- Darning needle and ruler (for scoring)
- 12 paper clips (for weaving)
- Tweezers (for pulling the strips)

LOW ONION DOME

The Low Onion Dome is shown on the rightmost tower in the photo on [page 107](#).

TEMPLATES & PIECES

- For the project templates, see pages [149](#), [150](#), and [152](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - Q9 (arm): 6 in color W (shown in blue) and 6 in color × (shown in dark green)
 - Q9 (mirror or reverse image of template): 6 in color Y (shown in yellow) and 6 in color Z (shown in turquoise)
 - Q10 (top cone): 1 in color W
 - P15 (narrow strip): 1 in color X
 - P16 (zigzag strip): 1 in color Y
 - Q3 (form): 1 any color (*Note: The template is a smaller section of Q2 as indicated by the blue line.*)

The onion dome is started using the same procedure as the Basic Cone (see [page 28](#)); however, you cannot cut this shape in one piece from a single sheet of paper. You must cut the arms individually and fix them, one by one, to the top cone. This is because the diameter of the onion dome does not increase in a linear way from the point; instead, it increases faster, which requires extra paper.

- ① Fix the first set of twelve Q9 arms in colors W and X, side by side, to the Q10 top cone; use the small rectangle at one end of the arm to attach it. Alternate the colors of the arms, which must all swirl in the same direction.
- ② Fix the mirrored set of twelve Q9 arms, alternating in colors Y and Z, so that each arm's rectangle is just above one in the layer below but swirling in the opposite direction.
- ③ Weave as much as possible while the item is still flat. Form the cone and fix it by gluing the flap under the edge.
- ④ Form and fix the Q3 form. Inset the form in the cone and weave; use paper clips to temporarily keep the arms and form together. Take care not to crease the point of the small outer top cone.
- ⑤ Stop weaving when the project becomes wider than the form. Tighten up the woven cone using a pair of tweezers to make a firm and even fit.
- ⑥ Continue weaving now as if you were making a Basic Sphere (see [page 32](#)), again using paper clips to hold the arms in place. Leave the form inside the dome to ensure stability. Continue until all arms are woven.
- ⑦ Tighten and align the weaving so that the shape of the onion dome and the weaving are even. Fix each set of arms thoroughly with glue and allow it to dry.
- ⑧ Crease the arms outward, along the template's dash-dot line, forming a rectangular flap at the end.
- ⑨ Using the P15 narrow strip, form a ring with a circumference of $10 \frac{5}{16}$ inches (26.2 cm). Place the ring outside the rectangular flaps on the woven onion dome. The strip must form a rim standing perpendicular to the dome's bottom. Fix the arms to this strip using paper clips, distribute the

arms evenly, and fix with glue. Cut away any surplus arm material protruding outside the rim.

⑩ Smear glue on the part of the P16 zigzag strip with the small triangles and fix it all along the dome's rim. Align the points of the triangles and the points on the dome. Smear glue on the rest of the strip and crease it along the edge; take care to make an even and smooth crease. Fix to the inside of the dome.

TALL ONION DOME

To establish variation in the appearance of the Exotic Palace, we have made a Tall Onion Dome with a smaller base than the others. You find a photo of the dome on [page 107](#). The base of the dome is scaled to a circumference of $6 \frac{7}{8}$ inches (17.5 cm). Thus, this top will fit a container with a neck matching only this size or a maximum circumference of $6 \frac{3}{4}$ inches (17.3 cm), so we have provided the Flattened Checkered Container (see [page 117](#)) for this purpose. You may also prepare one or more simple cardboard cylinders (see [page 119](#)) with the same circumference.

TEMPLATES & PIECES

- For the project templates, see pages [149](#), [150](#), and [154](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - Q11 (arm): 5 in color W (shown in orange) and 5 in color × (shown in red)
 - Q11 (mirror image of template): 5 in color Y (shown in yellow) and 5 in color Z (shown in turquoise)
 - Q12 (top cone): 1 in color X
 - R19 (narrow strip): 1 in color Z
 - Q5 (zigzag strip): 1 in color X
 - Q4 (form): 1 any color

Start and weave the dome using the same principles as described for the Low Onion Dome (see opposite).

HOW THE CROWNS AND BASES FIT TOGETHER

The basic principle for constructing the cylindrical towers is that the crown and base of any part have an outer circumference of $10 \frac{5}{16}$ inches (26.2 cm). In this way, the tops, open cylinders, and containers may be stacked, with a smooth transition from part to part. In order to keep two parts together, each lower part is provided with an inner neck that stands about $\frac{3}{8}$ inch (1 cm) tall. The circumference of this inner neck is $10 \frac{1}{4}$ inches (26 cm). Thus, the upper part—whether open cylinder or top—fits outside the neck and rests upon the upper edge of the part below.



CYLINDER CONTAINERS

The arms are made so that the Cylinder Container has a circumference of $10 \frac{5}{16}$ inches (26.2 cm). The neck will have an inner circumference of not more than $10 \frac{1}{4}$ inches (26 cm).

MATERIALS

- Paper in two contrasting colors or patterns, 80–110 g/m² in weight. More colors may be used for ornamental strips to get a lively expression.
- Glue stick

FROM YOUR TOOLBOX

- 12 paper clips (for weaving)
- Darning needle (for scoring)



From left: Large Simple Cylinder Container with Double Checkered Dome;
Wall section with Door; High Simple Cylinder with Tall Onion Dome;
Checked Cylinder Container with Low Onion Dome; Checked Cylinder
Container with Scalloped Cylinder and High Cone Top; Drum Cylinder Wall
with Checkered Dome; Scalloped Cylinder Container with High Cone Top.



Checked Cylinder Containers with tops; from left: Scalloped Dome with Edge 3, Scalloped Dome with Edge 4, and Low Cone Top with Edge 5.



Six different bottoms for Cylinder Containers

CHECKERED CYLINDER CONTAINER

The checkered cylinder container is woven from two colors (X and Y). You will find the container in the photo on [page 110](#).

TEMPLATES & PIECES

- For the project templates, see pages [152](#), [153](#), and [154](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - R3 (large piece with arms): 2 in color × (shown in red)
 - R3 (mirror or reverse image of template): 2 in color Y (shown in yellow) (*Note: The R3 template is larger than the book's page and consists of two parts that must be taped together before cutting the full piece.*)
 - P16 (zigzag strip): 1 in color Y
 - P15 (narrow strip): 1 in color X
 - R10 (strip with notches): 2 in color X
 - R4 (black circle with hole and notches): 1 in color X
 - R5 (large red circle, largest inner red circle is hole): 1 in color Y
 - R6 (large red circle, middle inner red circle is hole): 1 in color X
 - R7 (large red circle, smallest inner red circle is hole): 1 in color Y
 - R8 (large red circle, no hole): 1 in color X
 - R11 (wide strip with notches): 1 in color Y
 - Form (no template): $10 \frac{5}{16}$ inches × 6 inches (26.2×15 cm), plus flap along shorter edge for gluing, in any color

(*Note: You may choose any number of colors and color combinations you like.*)

Start the cylinder following the same principles explained for the Drum Cylinder of the Star Drum (see [page 83](#)) and weave the cylinder like a Basic Cone (see [page 28](#)).

- ① To prepare the cylinder sides, align and glue together the two R3 pieces in color × to form a continuous row of strips. Form a ring without any gap between the strips where joined and fix with glue. Do the same to the two mirrored R3 pieces in color Y, but swirl the strips in the other direction.
- ② Place the ring in color Y inside the ring in color × and weave the first row following the instructions for the Drum Cylinder on [page 83](#).
- ③ Fix the form into a cylinder 10 ⁵/₁₆ inches (26.2 cm) in circumference and 6-inches (15 cm) high and secure it with glue. It is crucial that the cylinder's circumference is consistent along its height. Place the form inside the rings created in step 2, align the lower edges of all three layers, and keep them in place with paper clips.
- ④ Weave the sides using the form and paper clips in the same way as described for the Basic Cone (see [page 28](#)). Tighten and align the weaving until it is even and the strips fit along the upper edge. Fix the strips with glue along the upper edge.
- ⑤ Crease an R10 strip with notches in half lengthwise. Smear glue on the half without notches. Fix the glued strip to the front of the cylinder sides just above the upper set of squares in color Y. Smear glue on the other half of the strip (with notches), crease around the upper edge, and press inside the cylinder.
- ⑥ Smear glue on the half of the P16 zigzag strip with the triangles. Place the strip, triangles pointing downward, so that the points fit into the cylinder's pattern of squares and press the points down. Smear glue on the other half of the zigzag strip with notches, crease around the upper edge, and press inside the cylinder.
- ⑦ Smear glue on the P15 narrow strip and fix it along the edge inside the cylinder.

⑧ Crease the R11 wide strip in half lengthwise. Unfold R11. Smear glue on the P15 narrow strip that is fixed to the upper inside edge of the cylinder. Fix the long uncut edge of R11 to the P15 strip, lower edges aligned. Smear glue on the face of R11 showing inside the container and crease the free half part of R11 down. Press onto the sides of the container until the glue has dried. In this way, R11 forms a two-layer neck about $\frac{3}{8}$ inch (1 cm) tall.

⑨ Next, prepare the lower edge for the cylinder bottom. Crease an R10 strip with notches in half lengthwise. Smear glue on the half without notches. Fix the strip to the lower part of the cylinder sides on the outside so that the edge without notches is just below the points of the lowest set of squares. Smear glue on the rest of the strip (with notches), crease, and press it inside the cylinder.

⑩ Finally, you will make and fix the bottom. Stack the R4–R8 pieces to form a pattern of concentric circles. Fix the layers with glue. Crease and fold all flaps on the R4 piece upward from the pattern. Smear glue on all flaps. Place the bottom inside the cylinder so that the edge of the flaps aligns with the lower part of the sides and press down until the glue dries.

SCALLOPED CYLINDER CONTAINER

The scalloped cylinder is woven from two colors (X and Y). A two-color (Z and W) ornamental edge is added. You may find the container in the photo below.

The sides of the Scalloped Cylinder, the neck, and the bottom are made in the same way as described for the Checkered Cylinder, steps 1–3 and 6–9. The difference is that the upper edge is started like this in steps 4 and 5:



From left: Scalloped Cylinder Container with Low Onion Dome; Drum Cylinder Wall with Scalloped Dome Top; Scalloped Cylinder Container with High Cone Top; Scalloped Cylinder Wall with Low Cone Top

④ Measure $10 \frac{5}{16}$ inches (26.2 cm) on the narrow P15 strip, mark with a pencil, and form and fix a ring with this exact circumference. Place the ring outside the cylinder woven in steps 1–3. Align the upper edge of P15 with the upper edge of the last row of scallops (circles). Using paper clips, distribute the arms to form a smooth circle and secure with glue.

5 Smear glue on the half of the P16 zigzag strip with the triangles. Place the strip, triangles pointing downward, so that the points fit into the pattern of scallops and press down. Smear glue on the other half of the zigzag strip with notches, crease around the upper edge, and press to the inside of the container.

TEMPLATES & PIECES

- For the project templates, see pages [152](#), [153](#), and [154](#). Copy the templates using your preferred method as described on [page 135](#).
 - Using the templates, cut the following pieces:
 - R1 (large piece with strips): 2 in color X (shown in dark red)
 - R1 (mirror or reverse image of template): 2 in color Y (shown in yellow) (*Note: The R1 template is larger than the book's page and consists of two parts that must be taped together before cutting the full piece.*)
 - P16 (zigzag strip): 1 in color Z (shown in red)
 - P15 (narrow strip): 1 in color W (shown in turquoise)
 - R10 (strip with notches): 1 in color W and 1 in color X
 - R4 (black circle with hole and notches): 1 in color X
 - R5 (large red circle, largest inner red circle is hole): 1 in color Y
 - R6 (large red circle, middle inner red circle is hole): 1 in color X
 - R7 (large red circle, smallest inner red circle is hole): 1 in color Y
 - R8 (large red circle, no hole): 1 in color X
 - R11 (wide strip with notches): 1 in color Z
- (*Note: No form is required as the scalloped pattern guides the shape.*)

LARGE SCALLOPED CYLINDER CONTAINER

The large scalloped cylinder is woven from two colors (X and Y). A two-color (Z and W) ornamental edge is added. You may find the container in the photo below.

TEMPLATES & PIECES

- For the project templates, see [page 142](#), [152](#), [153](#), and [154](#). Copy the templates using your preferred method as described on [page 135](#).
 - Using the templates, cut the following pieces:
 - R2 (large piece with strips): 4 in color × (shown in red)
 - R2 (mirror or reverse image of template): 4 in color Y (shown in yellow) (*Note: The R2 template uses the R1 template with its arms reduced in length.*)
 - P16 (zigzag strip): 2 in color Z (shown in orange)
 - P15 (narrow strip): 2 in color W (shown in dark green)
 - R10 (strip with notches): 2 in color W and 2 in color X
 - S1 (circle): 1 in color X
 - R5 (large red circle, largest inner red circle is hole): 1 in color Y
 - R6 (large red circle, middle inner red circle is hole): 1 in color X
 - R7 (large red circle, smallest inner red circle is hole): 1 in color Y
 - R8 (large red circle, no hole): 1 in color X
 - R11 (wide strips with notches): 2 in color Z (shown in orange)
- (*Note: No form is required as the scalloped pattern guides the shape.*)

The Large Scalloped Cylinder Container is made following the procedure for the Scalloped Cylinder (see [page 112](#)). The difference is the height of the cylinder's sides and the diameter, which is the double the Scalloped Cylinder's, thus requiring strips of double length. The circles with concentric holes of different size embellishing the bottom are identical to those used for the Scalloped Cylinder. They are not large enough to reach to the edge of the S1 circle, but must be fixed with glue to the back side of S1. The flaps of the S1 circle should be creased using the depth of their cut as a guide, not the much smaller circles with holes fixed at the center.



From left: Large Scalloped Cylinder Container with Large Checkered Dome; Wall section with Windows; tall Simple Cylinder with Tall Onion Dome.

SHAPED CONTAINERS

SPHERICAL CHECKERED CONTAINER

Templates are provided for two shaped containers: a Spherical Container and a Flattened Container. Only the Spherical Container has an opening with a circumference of $10 \frac{5}{16}$ inches (26.2 cm). The opening of the Flattened Container is scaled to a circumference of $6 \frac{7}{8}$ inches (17.5 cm).



Spherical Checkered Container with Checkered Dome Top

MATERIALS

- Paper in four colors (colors W, X, Y, and Z), 80–130 g/m² in weight
- Glue stick

FROM YOUR TOOLBOX

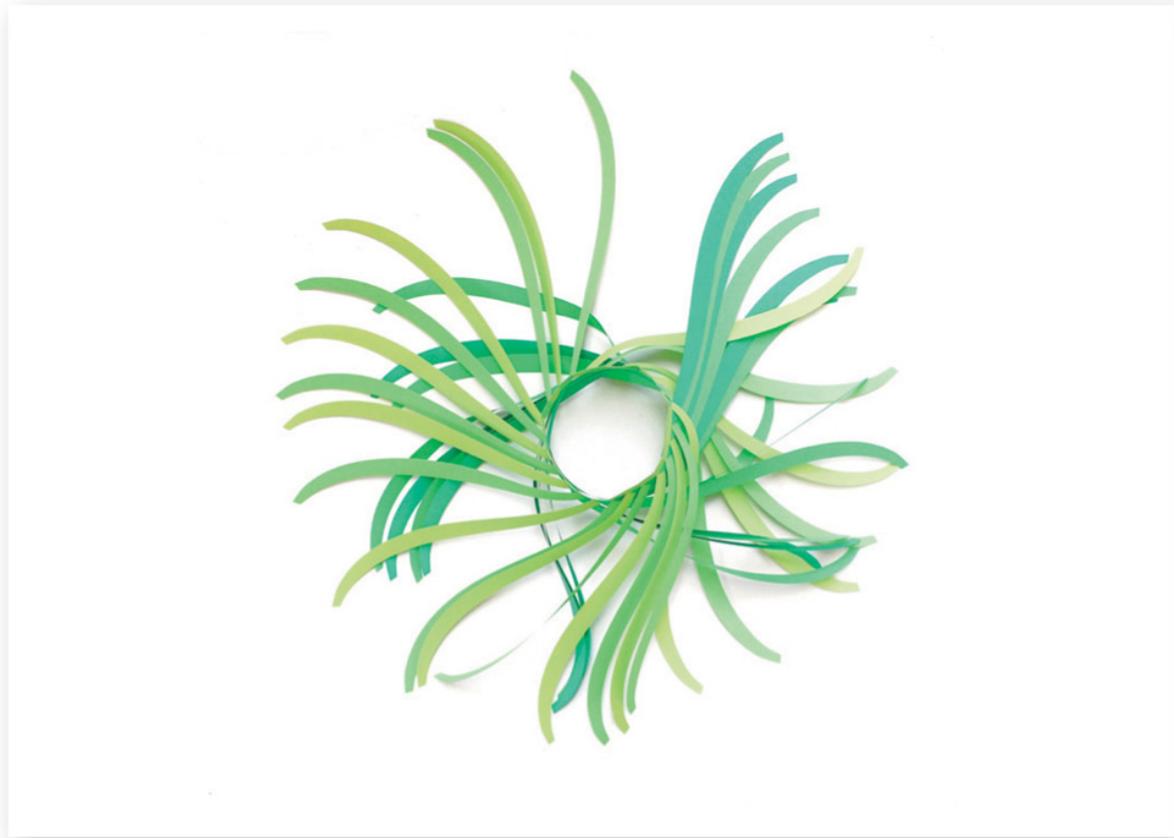
- 24 paper clips (for weaving)
- Pencil (for marking)
- Table knife (for creasing)
- Tweezers (for pulling flaps and strips)

TEMPLATES & PIECES

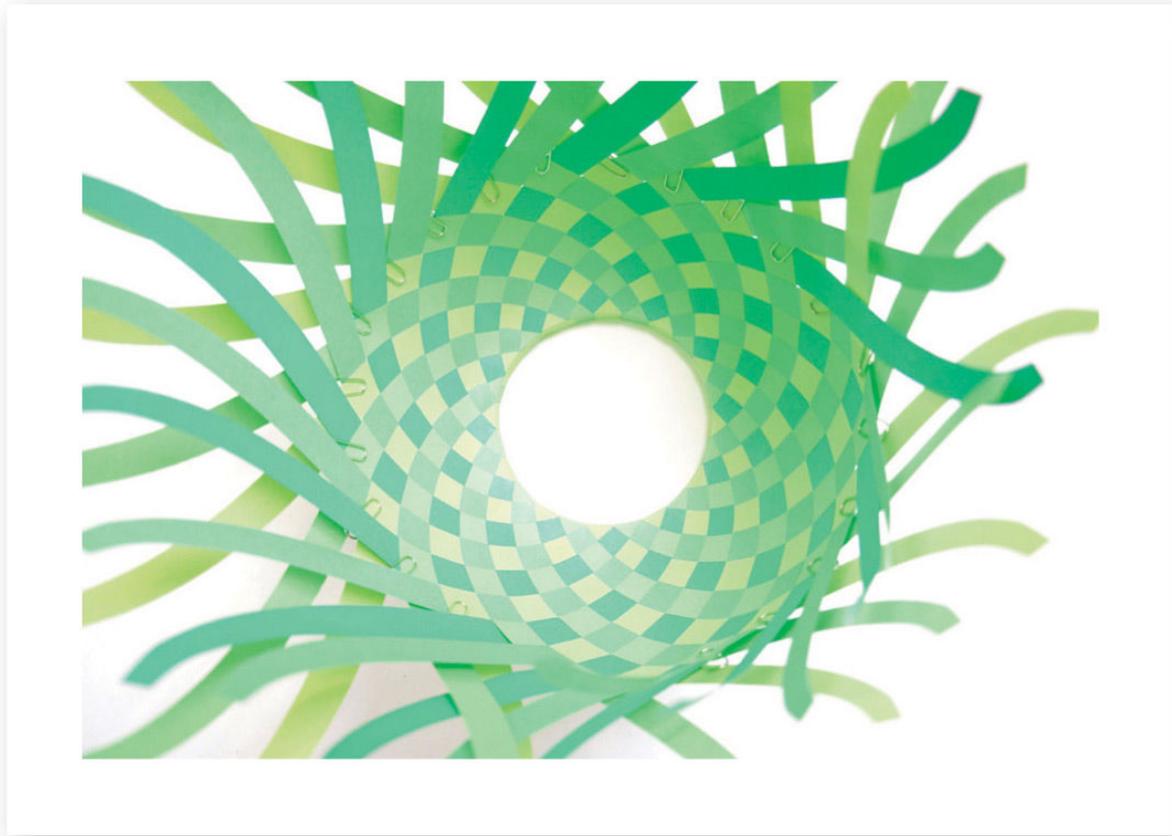
- For the project templates, see pages [152](#) and [154](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - R9 (arm): 12 in color W (shown in dark green) and 12 in color × (green)
 - R9 (mirror or reverse image of template): 12 in color Y (light green) and 12 in color Z (yellow)
 - R4 (black circle with hole and notches): 1 in color W
 - R5 (large red circle, largest inner red circle is hole): 1 in color Y
 - R6 (large red circle, middle inner red circle is hole): 1 in color X
 - R7 (large red circle, smallest inner red circle is hole): 1 in color Z
 - R8 (large red circle, no hole): 1 in color W
 - P15 (narrow strip): 3 in color W and 1 in color X
 - P16 (zigzag strip): 1 in color W
 - R11 (wide strip with notches): 1 in color W



① First, you will make the spherical sides. Attach the first set of twenty-four R9 arms to a P15 narrow strip in color W, alternating colors W and × and fixing the small squares of the arms to the strip. The arms must be right next to each other, all swirling in the same direction. Fix the second set of twenty-four mirrored R9 arms in alternating colors Y and Z so that each arm's square is just above one in the layer below but swirling in the opposite direction.



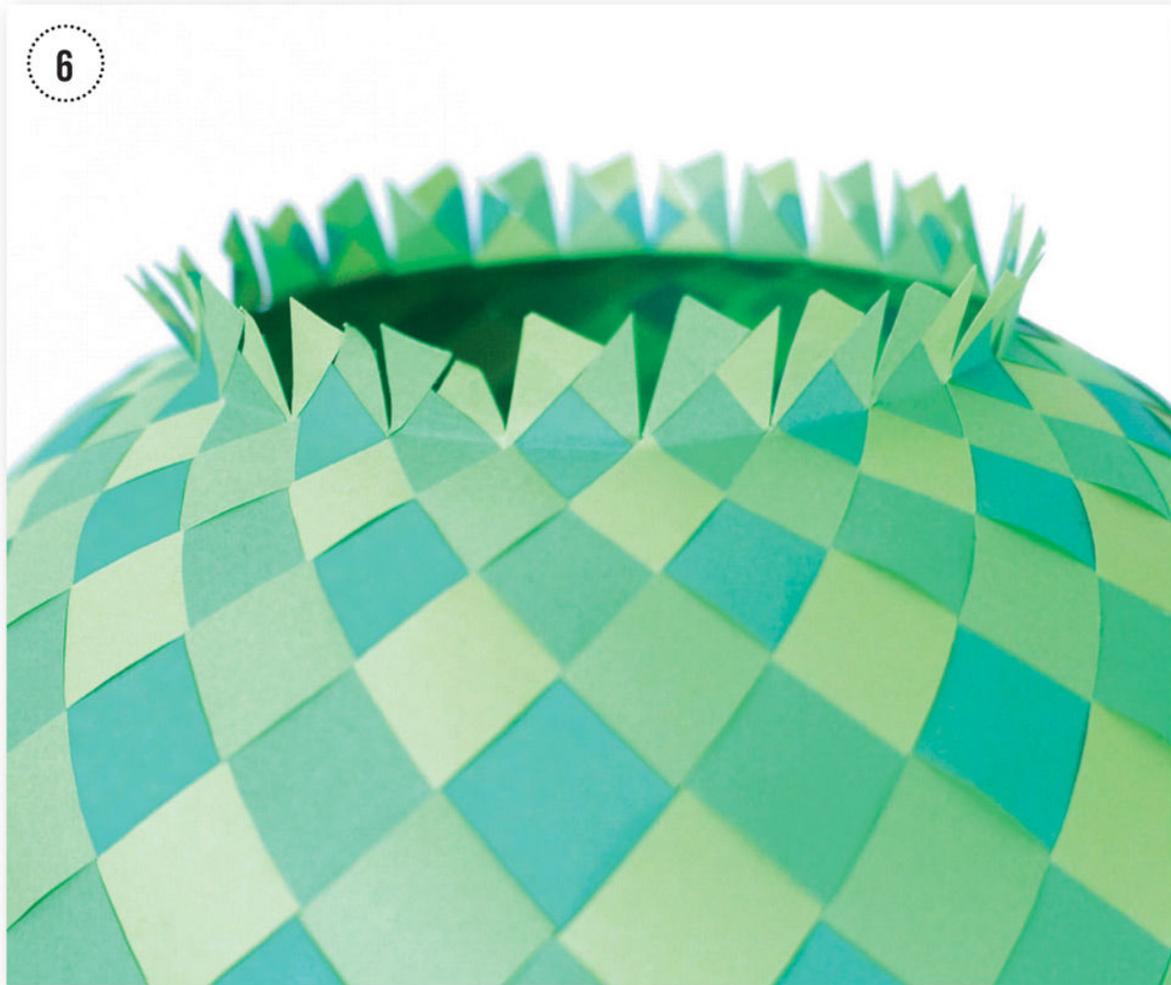
② Crease all arms over the P15 strip and turn them back. Form and fix a circle from the strip so that the plain smooth side is on the inside and the arms radiate outward. Fix the P15 narrow strip in color × to the outside. This will stabilize the arms and prevent them from breaking loose during weaving. This end of the sides will become the upper part.



③ Weave as if this was a sphere (see step 3, [page 34](#)) using paper clips to hold pairs of the arms together. The weaving must be tight and even. The small squares will be perpendicular to the direction of weaving, forming straight lines running from top to bottom.



- ④ When you have woven to the end of the arms, you need to determine where the lower edge will be placed. Tighten up the arms so that the sides are rounded and the weaving is even. Count the number of squares from the upper edge to the middle, or “equator”; if you look at the line of squares in colors W and X, there will be four and a half (if there are fewer than this, the weaving must be tightened). The number of squares below the container’s equator must be the same as the number above the equator.
- ⑤ Fix the arms securely with glue. The glue must be distributed on the entire area below the last fully woven square and the rest of the arms. Allow the glue to dry.



- ⑥ With a pair of scissors, cut slits perpendicular from the top edge to the side points of the last woven set of full squares in colors W and X.
- ⑦ Using a table knife, precisely place the knife's edge from the end of one cut to the next all around the top, creasing these new arms around the knife edge. The arms will point directly upward. Do this for all twenty-four new arms.
- ⑧ Fix the new arms, one by one, to a P15 narrow strip in color W. The strip will be on the outside end and must stand up from the container. Cut away any little pieces of paper protruding farther than the P15 strip.

- ⑨ Add another P15 narrow strip in color W to the inside of the edge to stabilize it.
- ⑩ Now you will make the bottom. The templates are made so that the circles should fit the opening you have made, but your sides may have turned out slightly different, leaving the opening a little smaller or larger. If the circles are too small, the pattern will allow for this. If the circles are too large, either (1) cut down the circles R5, R6, R7, and R8 or (2) rescale the pattern slightly and cut a new set. First, test how R8 fits inside the bottom opening you made.
- ⑪ Layer the five round pieces (R4–R8) so that you get a pattern of concentric circles with the large R4 circle on top. Secure with glue.
- ⑫ Crease the flaps of the outer R4 circle, using the other circles as a form, so that they stand up from the side of the pattern of circles.
- ⑬ Fix the bottom to the container's sides by smearing glue on the outside of the flaps. Place the bottom inside the bottom opening. The ends of the creased sides will follow the edge of the base on the sides. Use a pair of tweezers to get a precise fit by pulling the flaps wherever needed. Press and hold the bottom's flaps against the inside of the ring until the glue is dry.
- ⑭ Finally you will finish the top opening. Turn the container upside down. Smear glue on the triangles of the P16 zigzag strip. Fix the strip so that every second triangle point meets a point of a square on the sides of the container. This means that the other half of the strip will stand up from the top of the container. Smear glue on the remaining part of the strip and crease it to the inside. In this way, two sets of triangles will show on the upper edge of the container.

15



15 Crease the R11 wide strip in half lengthwise. Form a ring from the strip and place it inside the ring on the upper part of the container. Size the ring so that it follows the container's ring exactly and tightly; mark the overlap. Remove the ring and fix it with glue so that it is the correct circumference. Refold and fix the ring inside the container so that you get a neck about $\frac{5}{16}$ -inch (8 mm) tall.

FLATTENED CHECKERED CONTAINER

The opening of the Flattened Checkered Container is scaled to a circumference of $6 \frac{7}{8}$ inches (17.5 cm). Among the tops and templates provided, only the Tall Onion Dome (see [page 109](#)) matches this size. If you wish to use one of the tops provided for a circumference of $10 \frac{5}{16}$ inches (26.2 cm), you need to rescale the templates required for the top to 67 percent.



Flattened Checkered Container with Tall Onion Dome Top



- 1 Start and weave the Flattened Checkered Container following the process of steps 1–3 for the Spherical Checkered Container (see [page 114](#)). Continue weaving until your container looks like the photograph above. Continue and finish the container following steps 5–13 for the Spherical Checkered Container. The top opening is finished as it is.



② You may also choose to add the R13 zigzag strip to the outside of the base, crease it around the edge, and fix it inside the round bottom piece.

MATERIALS

- Paper in four colors (colors W, X, Y, and Z), 80–130 g/m² in weight
- Glue stick

FROM YOUR TOOLBOX

- 20 paper clips (for weaving)
- Pencil (for marking)
- Table knife (for creasing)
- Tweezers (for pulling strips and flaps)

TEMPLATES & PIECES

- For the project templates, see [page 154](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - R12 (arm): 10 in color W (shown in orange) and 10 in color × (shown in red)
 - R12 (mirror or reverse image of template): 10 in color Y (shown in yellow) and 10 in color Z (shown in turquoise)
 - R19 (narrow strip): 2 in color W and 1 in color Z
 - R13 (zigzag strip): 1 in color X
 - R14 (blue circle with hole and notches): 1 in color X
 - R15 (large red circle, largest inner red circle is hole): 1 in color Y
 - R16 (large red circle, middle inner red circle is hole): 1 in color Z
 - R17 (large red circle, smallest inner red circle is hole): 1 in color W
 - R18 (large red circle, no hole): 1 in color X

ADDITIONAL PALACE COMPONENTS

Drum Cylinder Wall

The Drum Cylinder Wall is but one way of preparing a cylindrical section apt for making a higher tower. The section is a ring with a top having a neck like a container. You may use the same principles to prepare cylindrical walls as for the sides of the Checkered Cylinder Container (see [page 111](#)) and the Scalloped Cylinder Container (see [page 112](#)).

MATERIALS

- Paper in four colors (colors W, X, Y, and Z), 80–130 g/m² in weight
- Glue stick

FROM YOUR TOOLBOX

- 12 paper clips (for weaving)

TEMPLATES & PIECES

- For the project templates, see pages [142](#), [152](#), and [154](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - S2 (side): 2 in color W (shown in yellow)
 - S2 (mirror image of template): 2 in color X (shown in red)
 - P15 (narrow strip): 2 in color Y (dark green)
 - S3 (zigzag strip): 2 in color Z (light green)
 - R11 (wide strip with notches): 1 in color Z
 - Form (no template) in any color: 1 rectangle, 2 3/4 inches × 11 inches (7 × 28 cm)



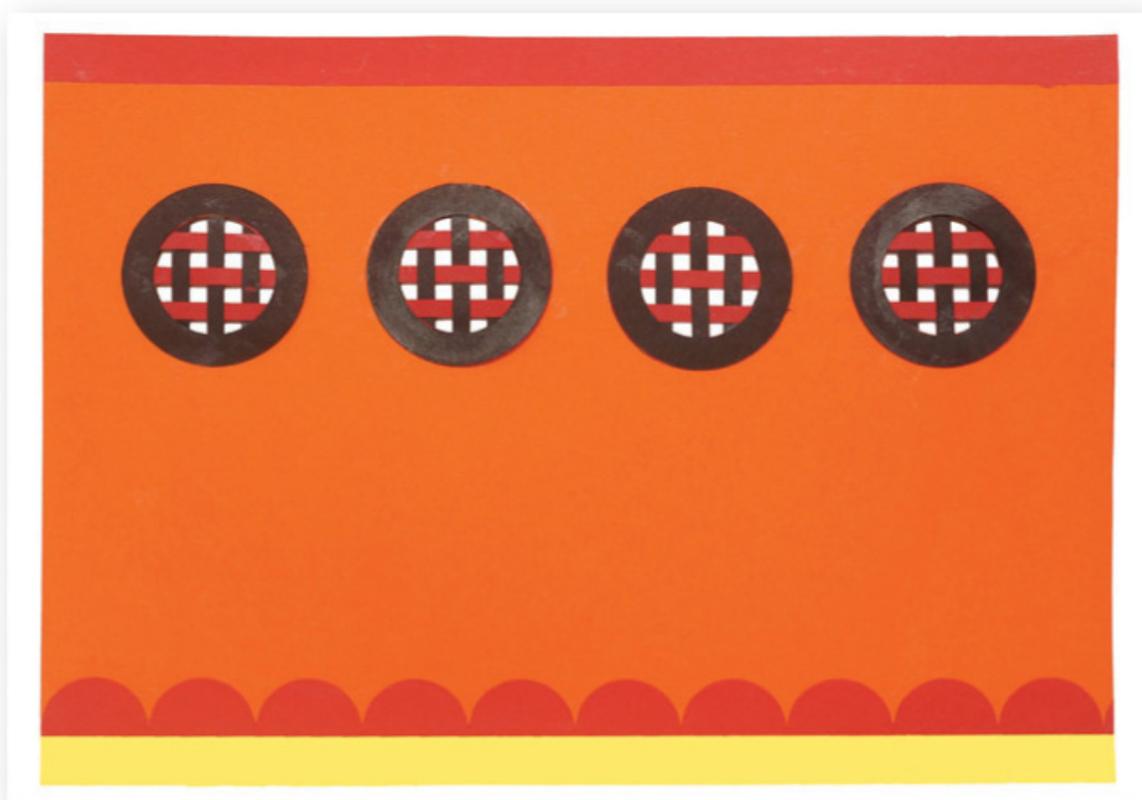
From left: Checkered Cylinder Container with High Cone Top; Wall section with Door; Narrow Simple Cylinder with Tall Onion Dome; Scalloped Cylinder Wall with Low Onion Dome; Simple Cylinder Container with Drum Cylinder Wall and Low Onion Dome (the Simple Cylinder Container supports a hinged wall with a flap cut in a zigzag pattern).

Prepare the cylinder sides in the same way as explained for the Star Drum (see [page 83](#)). To make the neck, crease the R11 wide strip in half lengthwise. Smear glue on one of the inside edges of the cylinder. Affix the half of R11 without notches to the cylinder's

inside. Crease R11 lengthwise forming a neck about $\frac{3}{8}$ -inches (1 cm) tall. Secure with glue.

SIMPLE CYLINDER WALLS & CONTAINERS

Prepare simple nonwoven cylinders from cardboard. A circumference of $10 \frac{5}{16}$ inches (26.2 cm) will accommodate most tops; a $6 \frac{7}{8}$ -inch (17.5 cm) circumference will fit the Tall Onion Dome (see [page 109](#)).



Prepare a rectangular piece in a size to accommodate the desired function of the cylinder. When you are making a freestanding cylinder, add $\frac{7}{16}$ inch (1.1 cm) to the width for a flap. If you want the cylinder to support a Palace Wall, add another $\frac{7}{16}$ inch (1.1 cm) to the width for a flap to hinge the wall. Use the various strips and handles (for example, I7, R13, R19, S3, T4, and T8) for embellishment.

Use circular bottom pieces (for templates, see [page 154](#).) For more detailed instructions, see the Checkered Cylinder Container, step 10, on [page 111](#).

When you form the cylinder, do not crease the flap used for securing it; a smooth transition amplifies the circular shape. Crease the flap for supporting only a hinged Palace Wall (see below). You may turn this flap into an embellishment by cutting it in a zigzag or wave pattern.

MATERIALS

- Colored cardboard and paper
- Glue stick

FROM YOUR TOOLBOX

- Ruler and pencil (for measuring and marking)

TEMPLATES & PIECES

- No specific templates are provided.

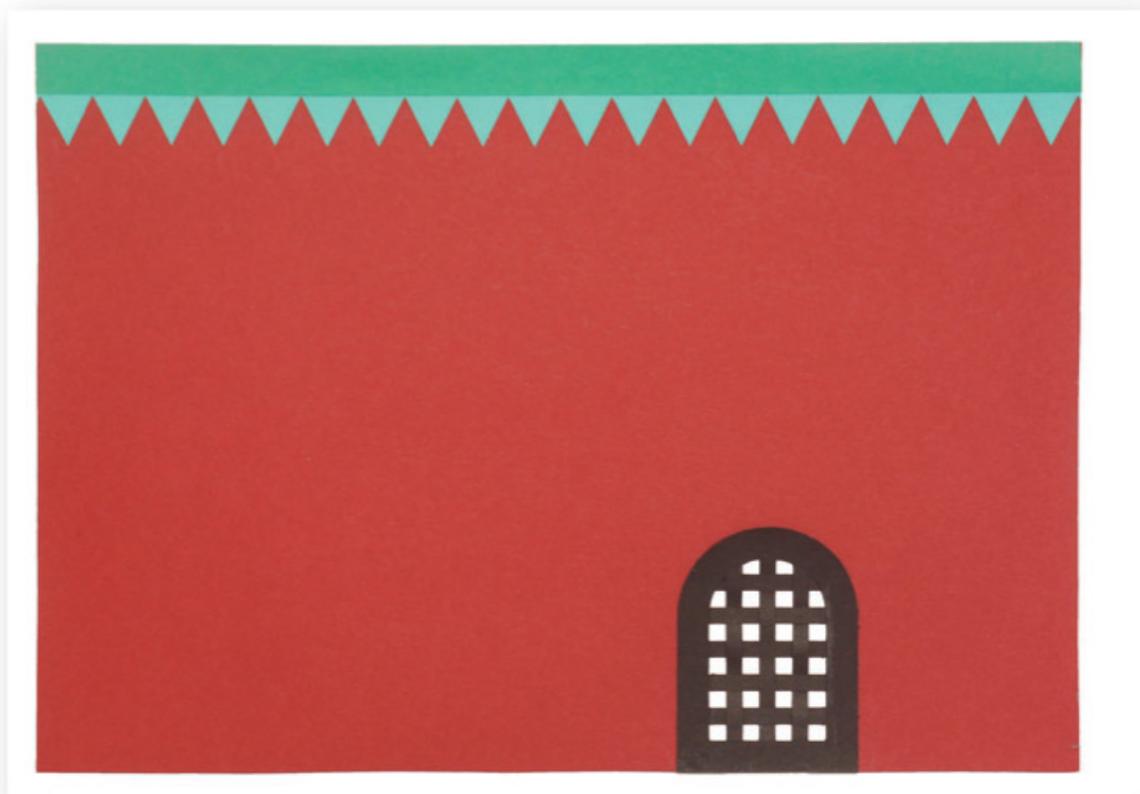
PALACE WALLS

Prepare flat Palace Walls from cardboard. Heights of 6–8 inches (15–20 cm) fit the tower pieces. The width of the wall may be 6–10 inches (15–25 cm), or even more depending on the quality of the cardboard. Support the wall with a Simple Cylinder Container (see above). Fix the wall to the cylinder using the cylinder's flap.



PORTCULLIS, DOOR & WINDOW

Templates for the Portcullis, Door, and Window are provided on [page 151](#). The area framed has a woven pattern of bars.



Align the two main pieces and weave the bars in the traditional one-over, one-under way for a firm structure. Take the intended wall and use the frame as a form when marking the inner circumference of the item where you want it to be placed. Cut away the material $\frac{1}{16}$ inch (2 mm) on the outside of the mark. Fix the woven section to one side of the wall and add frames on both sides.

FOR THE PORTCULLIS, CUT OUT THE FOLLOWING PIECES:

- P1 (portcullis with vertical bars): 1 in color X
- P2 (portcullis's upper half with horizontal bars): 1 in color × or Y, as you prefer
- P3 (frame): 2 in color X

FOR THE DOOR, CUT OUT THE FOLLOWING PIECES:

- P4 (door with vertical bars): 1 in color X
- P5 (door with horizontal bars): 1 in color × or Y, as you prefer
- P6 (frame): 2 in color X

FOR THE WINDOW, CUT OUT THE FOLLOWING PIECES:

- P7 (window with bars): 1 in color × and another in color × or Y, as you prefer
- P8 (frame): 2 in color X

ADVANCED DESIGNS

Once you have learned the basic skills and techniques and your experience increased self-confidence in mastering some of the more detailed woven-paper projects, you are then ready to attempt more advanced techniques. In this final chapter, two novel weaving techniques are presented, as well as customization tools to spark new ideas and tips on how to generate your own woven-paper projects.



Early in the nineteenth century, the German pedagogue Friedrich Fröbel saw the potential of introducing basic geometry to children through paper weaving. The idea grew in popularity with children as well as adults. Woven paper would create ornamental two-dimensional graphics that could then be organized into books or displayed as small art pieces. Applying these patterns to three-dimensional objects is an advanced and difficult practice, but the final result will definitely amaze and astonish the observer.

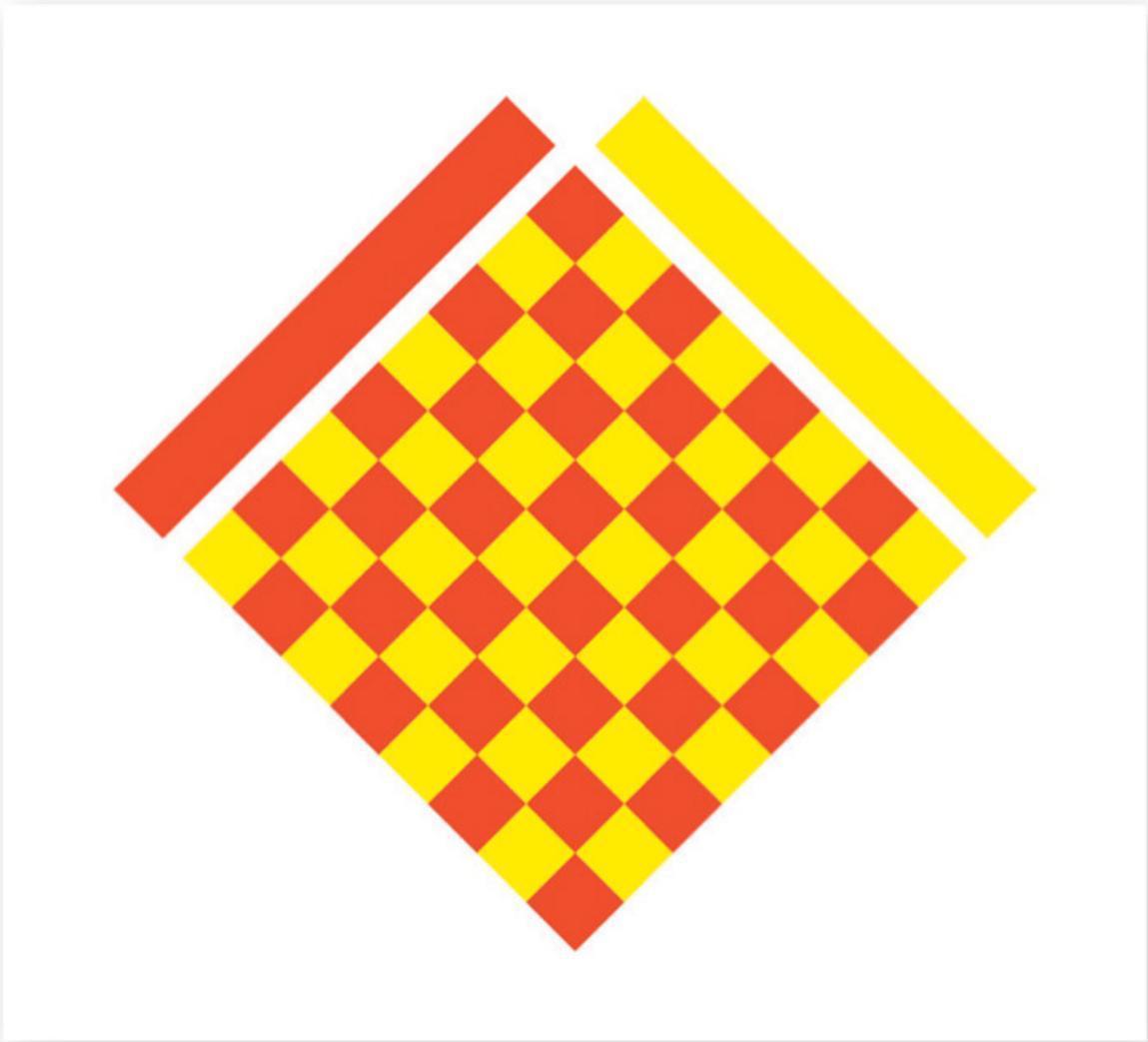
By far, the most difficult, but also the most fascinating, pattern we have come across in Fröbel's woven-paper universe is the technique of weaving three colors together in a triaxial (involving three axes) directional system. We present insight into this

technique here, but keep in mind that this is a truly challenging mind puzzle for any paper weaver.

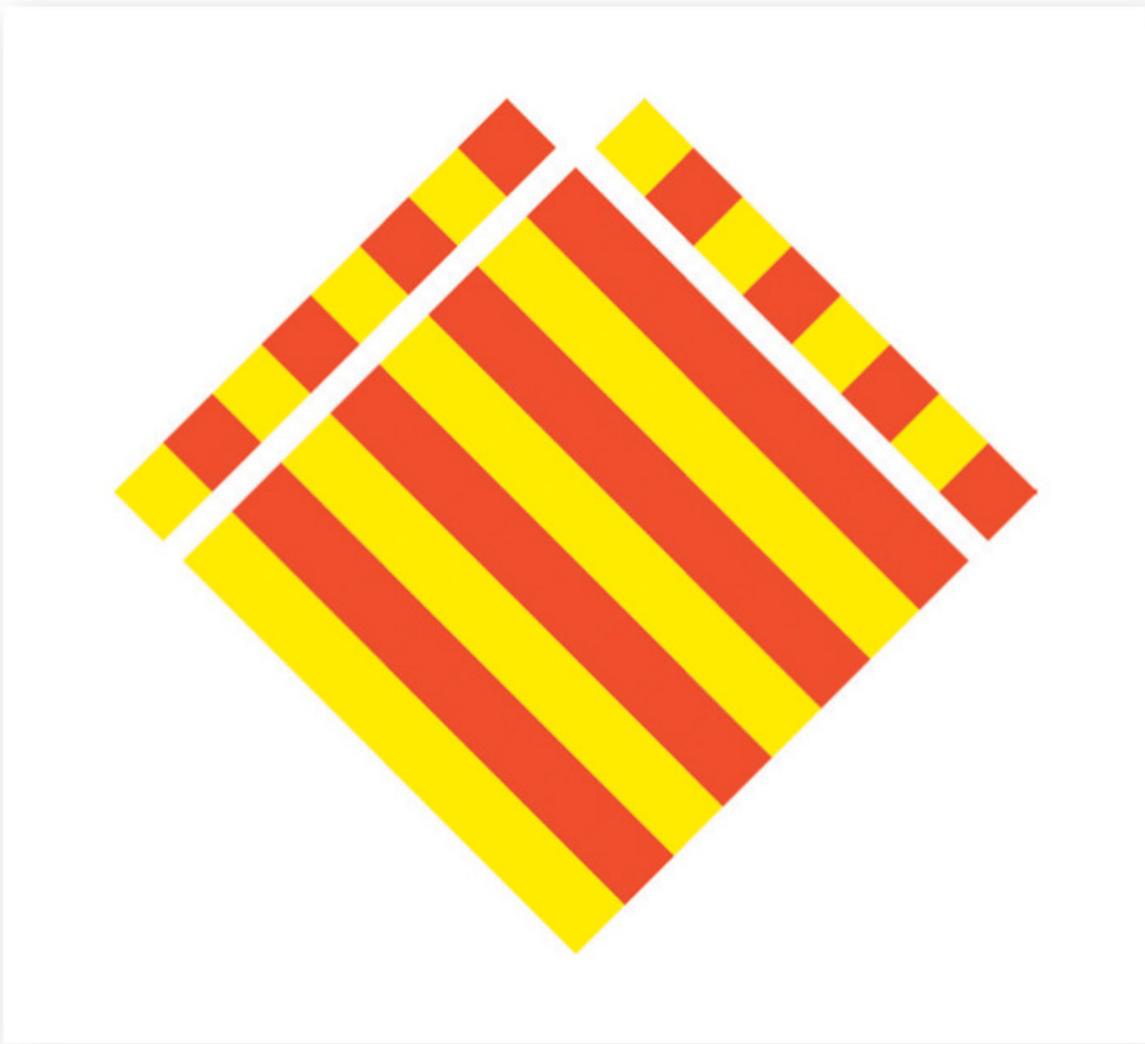
ON COLORS & PATTERNS

You may make a project in one or more colors. When you weave together two layers in the traditional way (one-over, one-under), the result turns out very different depending on the colors you choose and how you mix them. The number of combinations is almost endless. Below, we describe the results and effects of some simple groupings.

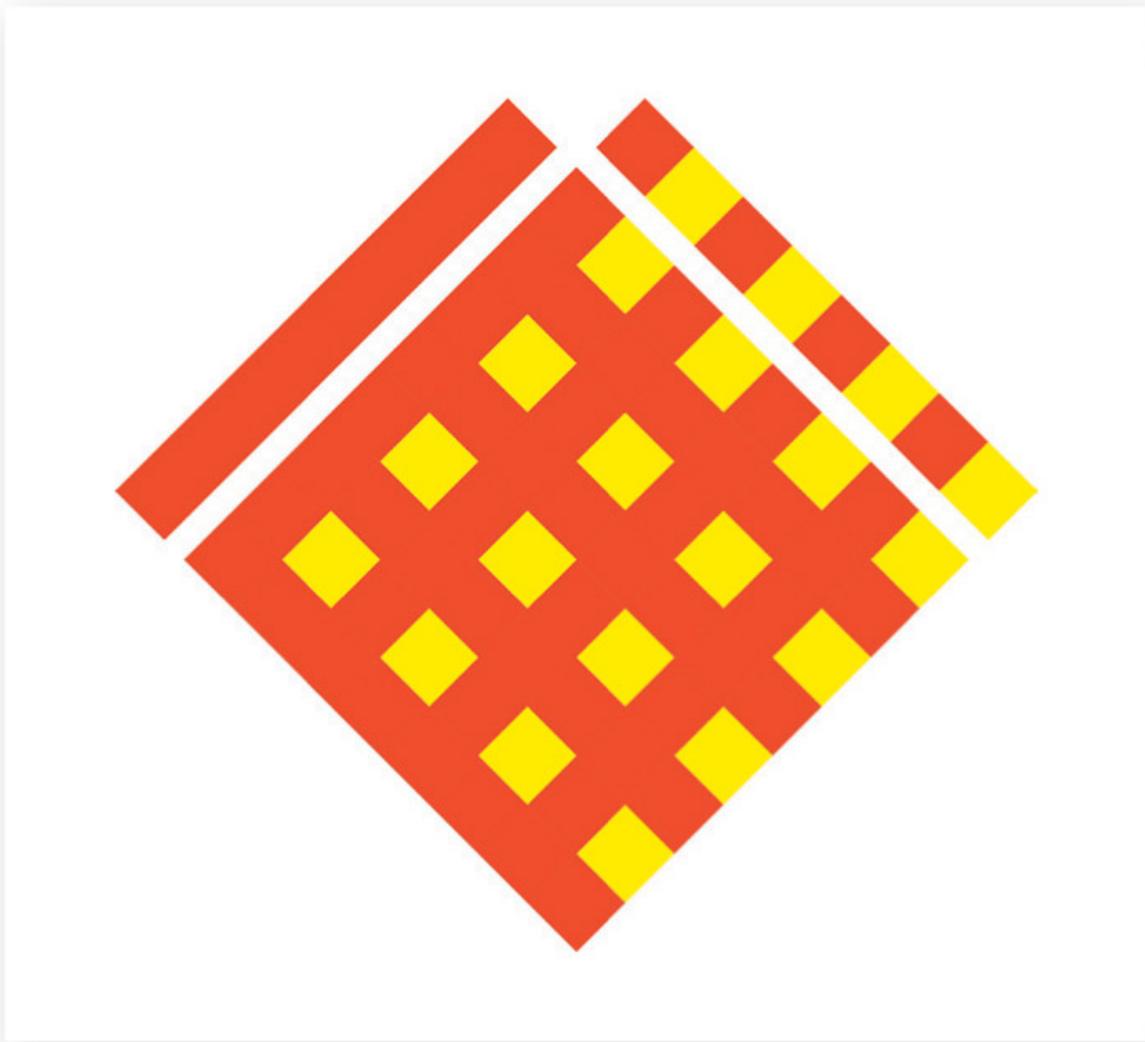
One color only: The item will be monochrome, and in this way, you emphasize the shape of the item. The woven pattern will make the paper reflect the light somewhat differently than smooth paper, but the general impression will be the item's silhouette.



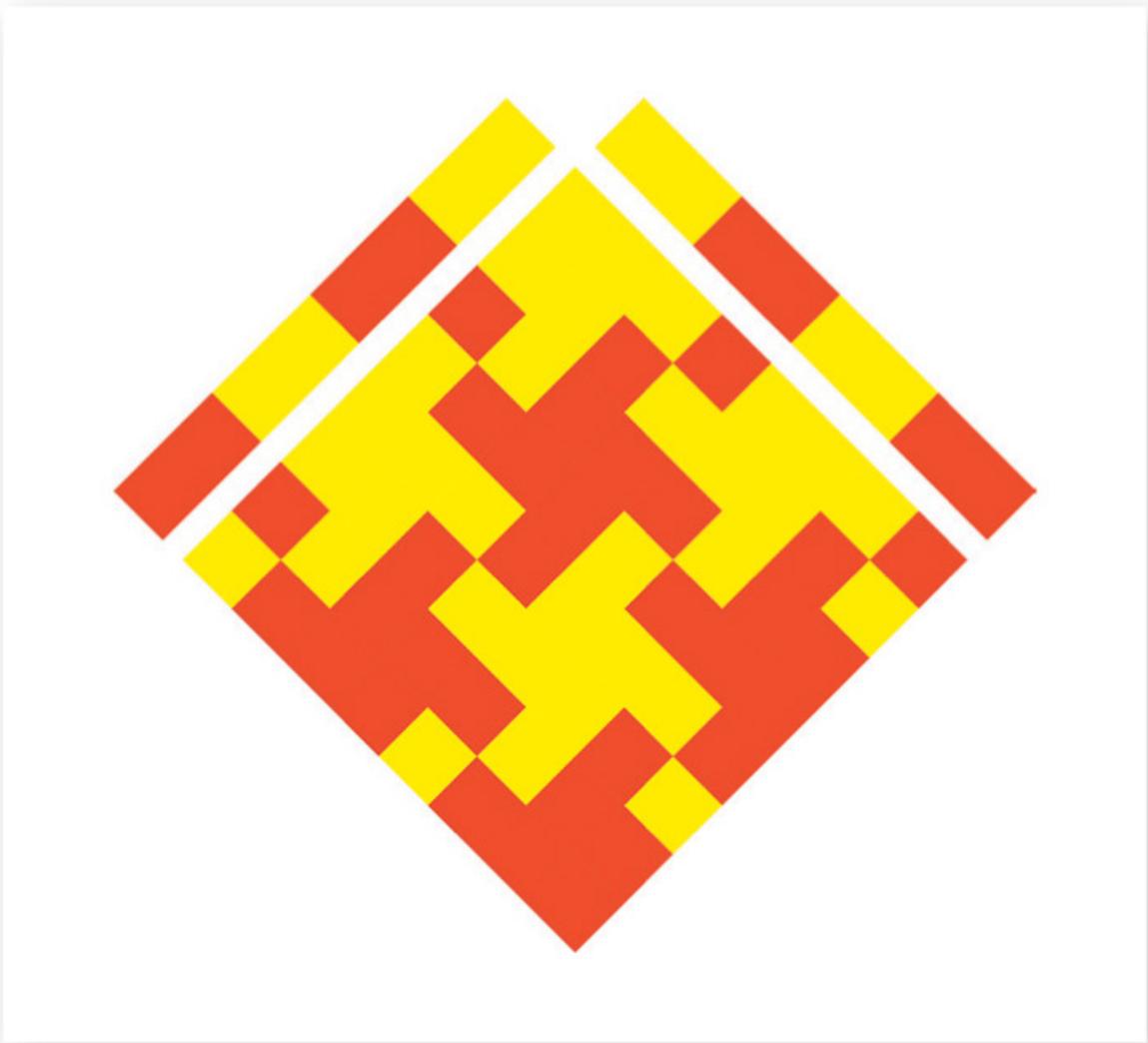
Two colors, one in each layer. The project will be checkered. This is the classic and simplest weaving pattern.



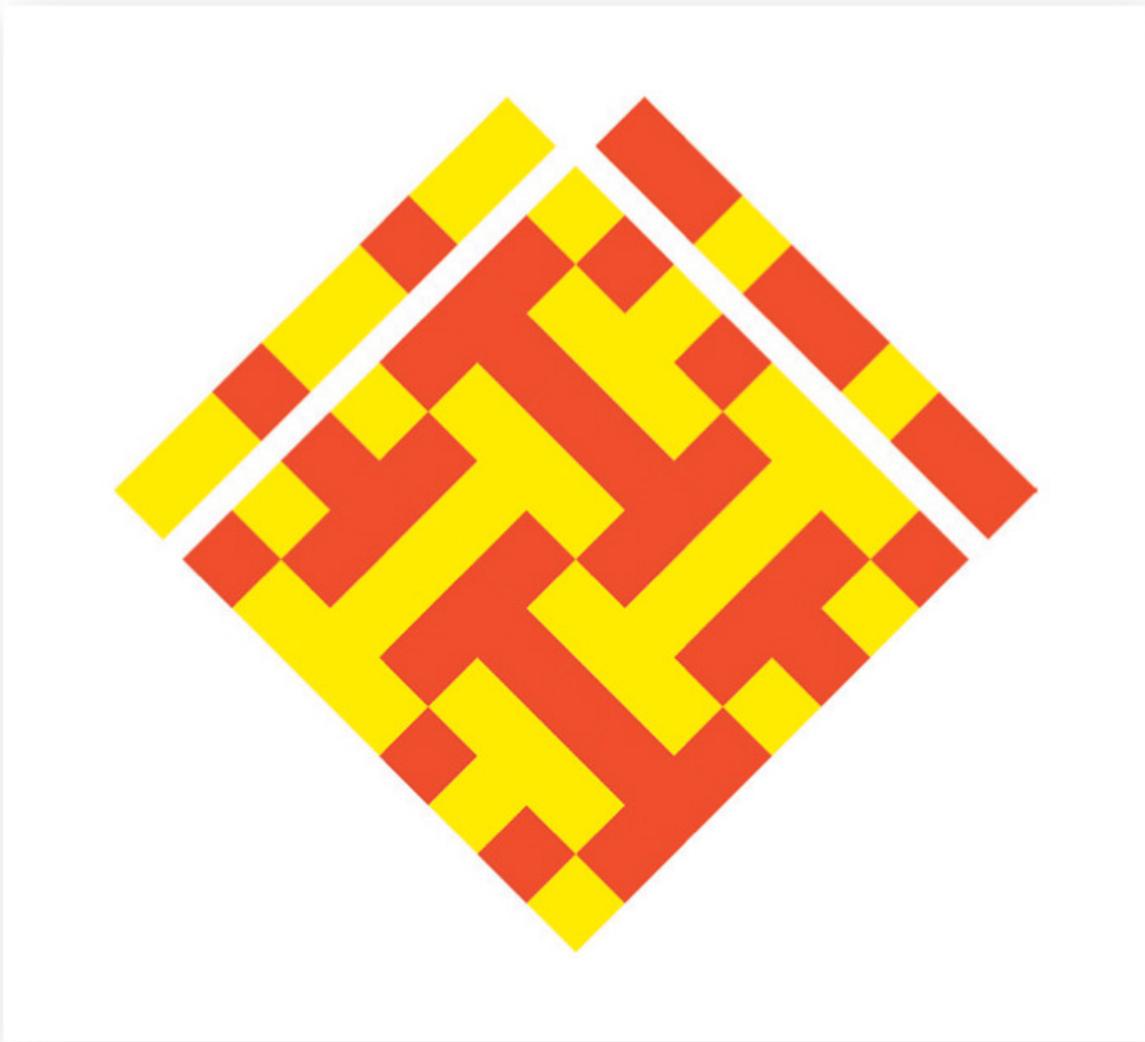
Two colors, every other strip in each layer is the same color. The project will be striped. This may be somewhat surprising but very useful, particularly if you want a candy-cane effect.



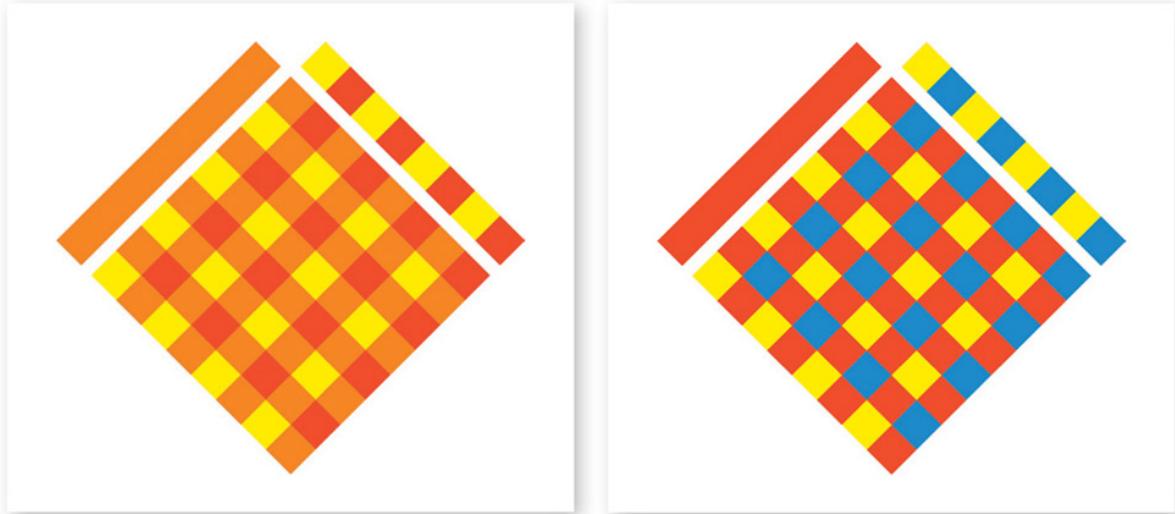
Two colors, one layer is monochrome, the other layer has both colors, and every other strip is the same color. The project will become checkered with islands of the more scarce color.



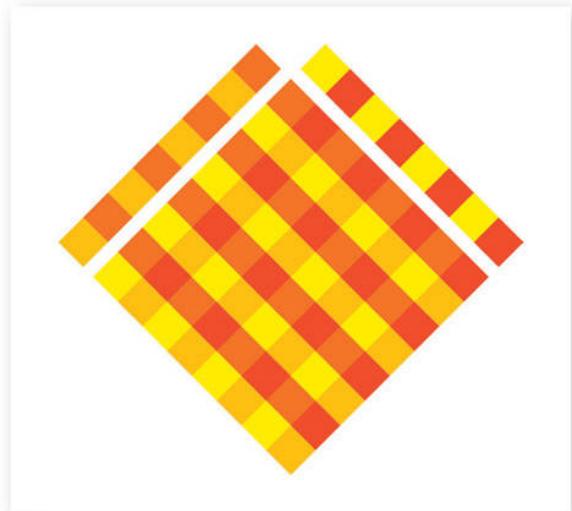
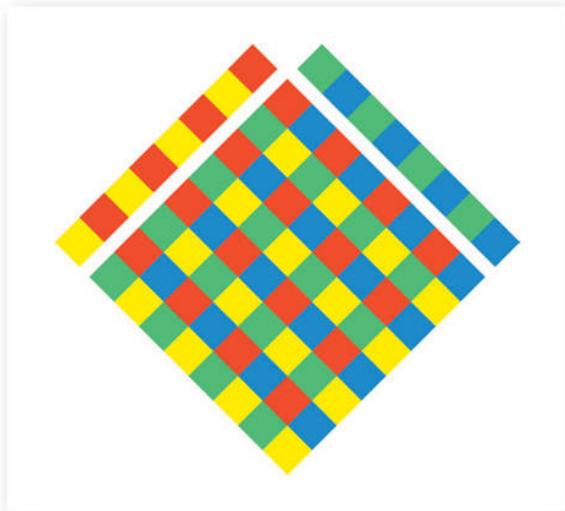
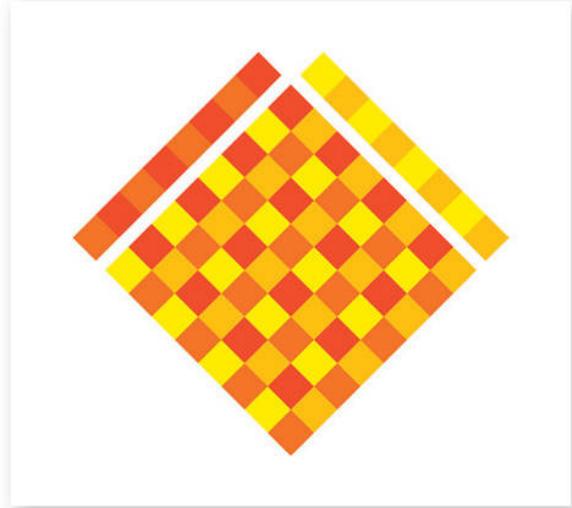
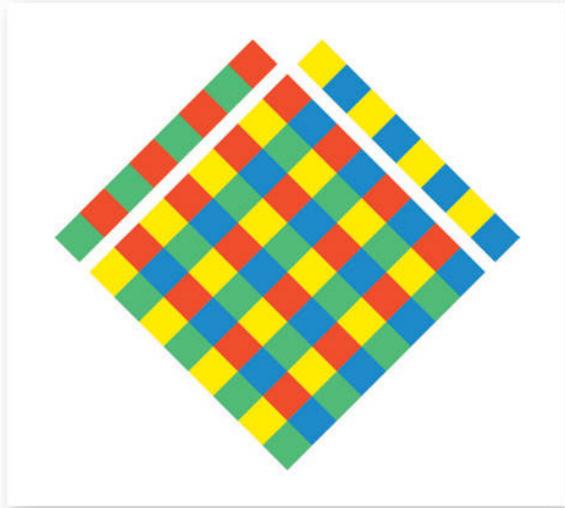
Two colors, both layers have both colors and two strips of the same color next to each other. This will make a pinwheel pattern.



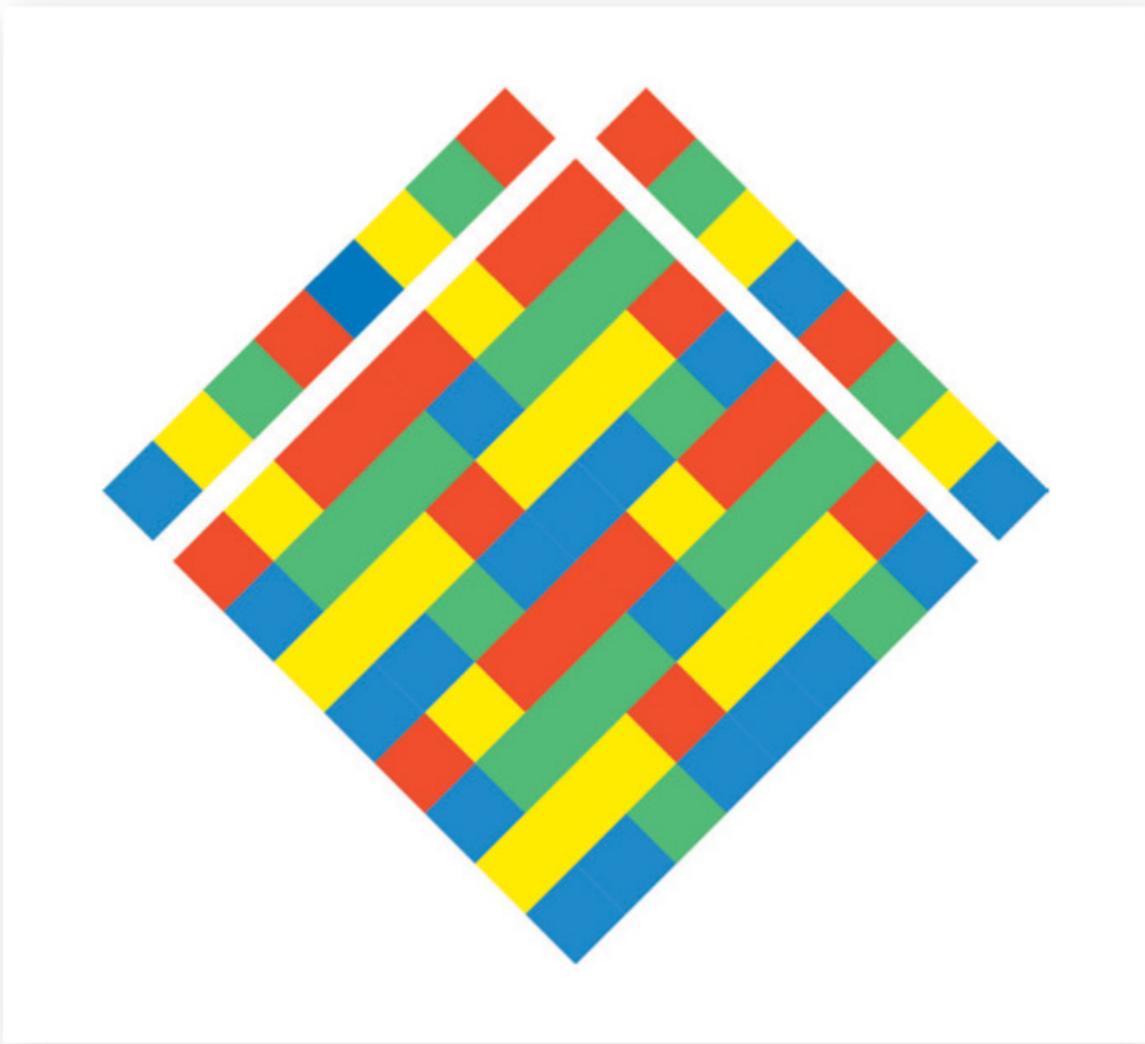
Two colors in both layers, but there are two strips of one color for every one of the other. The two layers are different, and each is dominated by one color. This will make a log cabin-type pattern.



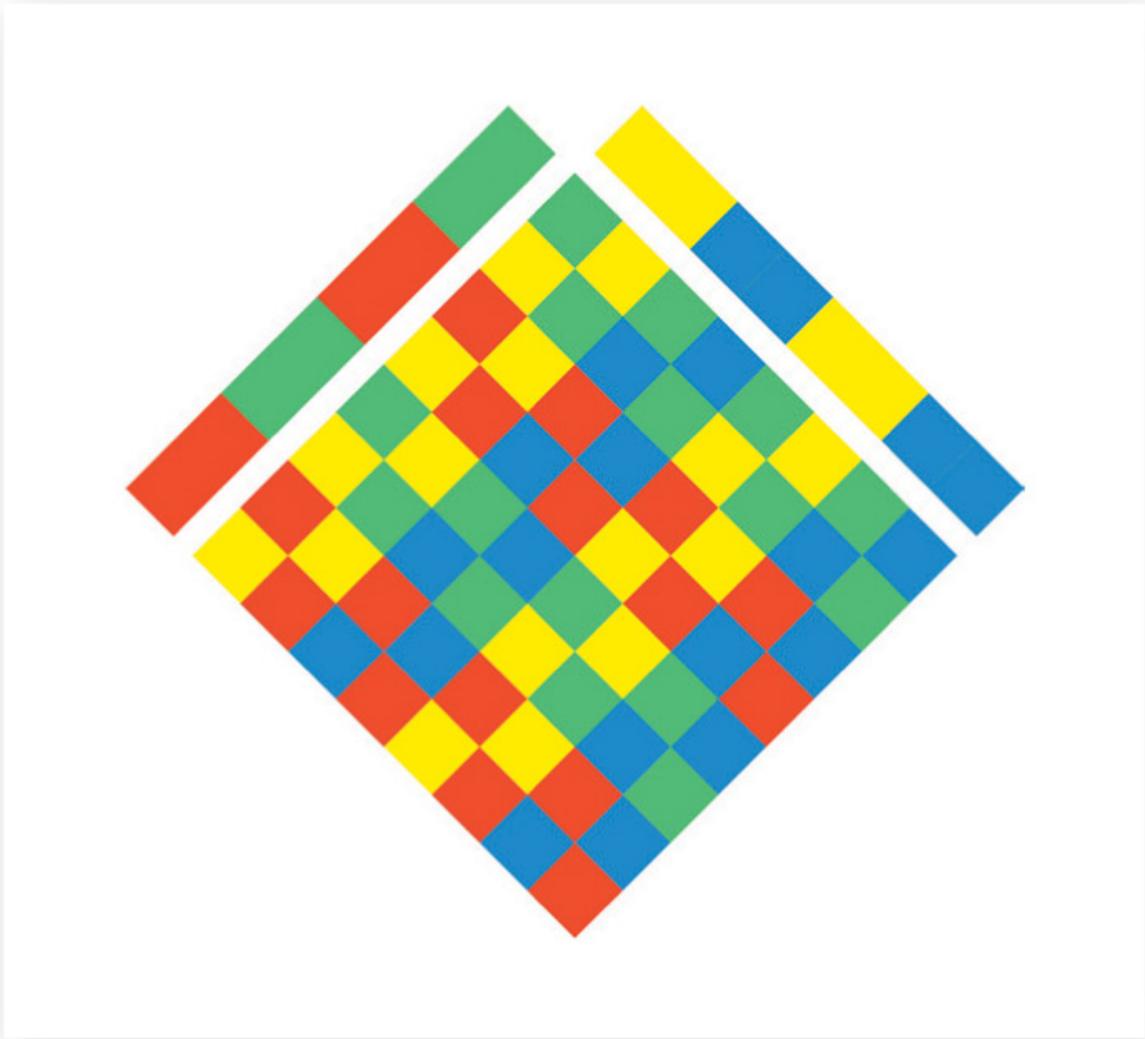
Three colors with one color in one layer and the two other colors alternating in the other layer. The item is checkered but more colorful and complex than if it only had two colors. If you choose the color in the monochrome layer as a blend of the two other colors, you will get a gingham-type pattern.



Four colors with two colors alternating in each layer. The item may appear both checkered and striped. What is dominant depends on the colors chosen and how they are mixed.



Four colors in each layer that follow the same sequence; however, the color order is mirrored in the layers. The pattern has complex two-colored stripes best suited for items with many strips.



Four colors with two colors in each layer and two strips of the same color next to each other. The pattern appears more random and will be distinct only if many strips are used.

FRÖBEL CONE

Fröbel encouraged children to test and develop various ways of weaving straight strips. This cone has the same potential for test and exploration. The Fröbel Cone has fifteen straight arms. The many arms permit you to vary the weaving method from the traditional one-over, one-under and explore the outcome of more advanced weaving strategies.

The cone on the left is woven in the traditional way (one-over, one-under), the cone in the center is woven two-over, two-under, and the cone on the right is woven two-over, one-under, thus showing more red than white.



MATERIALS

- Paper in two contrasting colors or patterns (colors X and Y), 80–130 g/m² in weight
- Glue stick

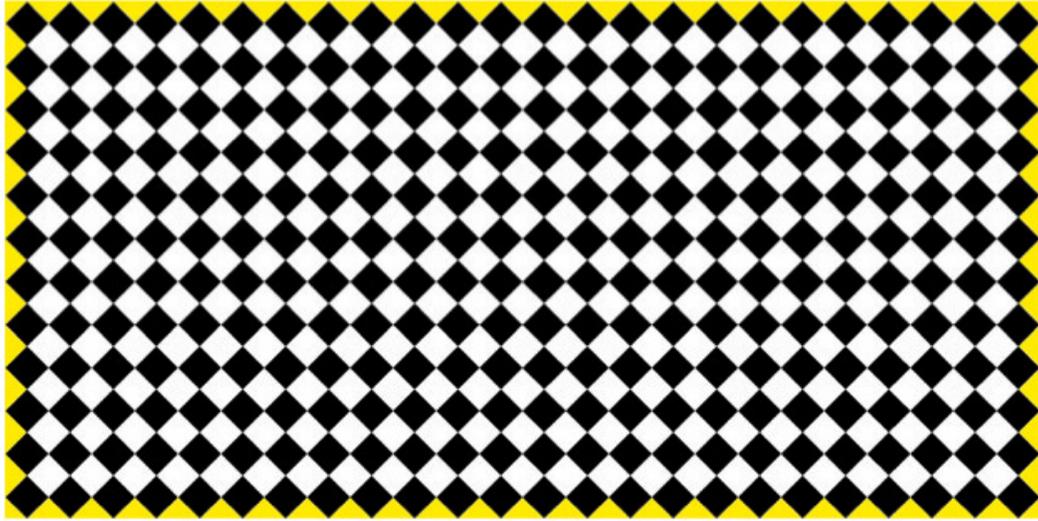
FROM YOUR TOOLBOX

- 15 paper clips (for weaving)
- Darning needle and ruler (for scoring)
- A knitting needle or conical item (to shape the cone)
- Tweezers (for pulling strips)

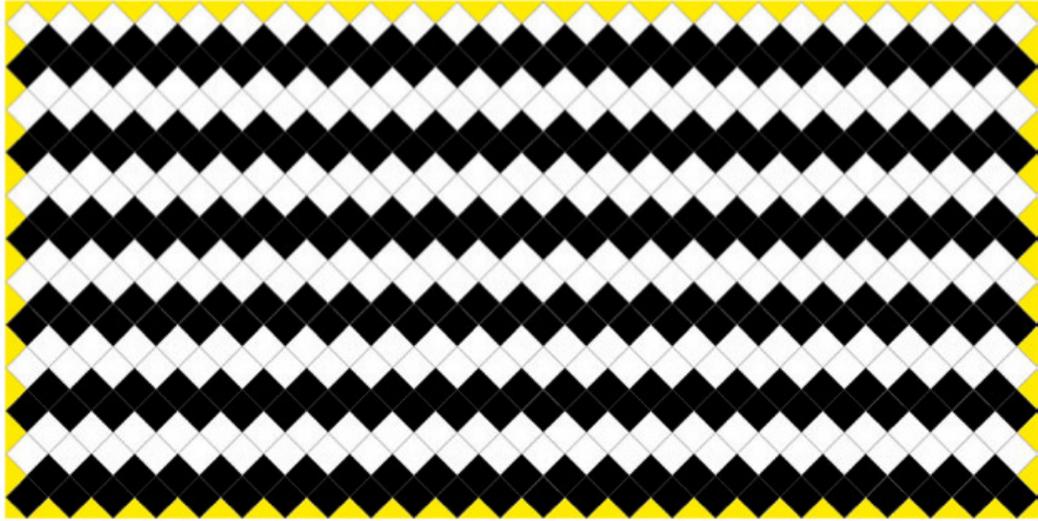
TEMPLATES & PIECES

- For the project templates, see pages [141](#) and [151](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - H1 (main part with arms): 1 in color X
 - H1 (mirror or reverse image of template, no flap): 1 in color Y
 - H2 (arched strip): 1 in color X and 1 in color Y
 - H3 (cone mold): 1 any color
 - 1 handle in color X, 3/8 inch wide × 9 1/2 inch long (1 × 24 cm)

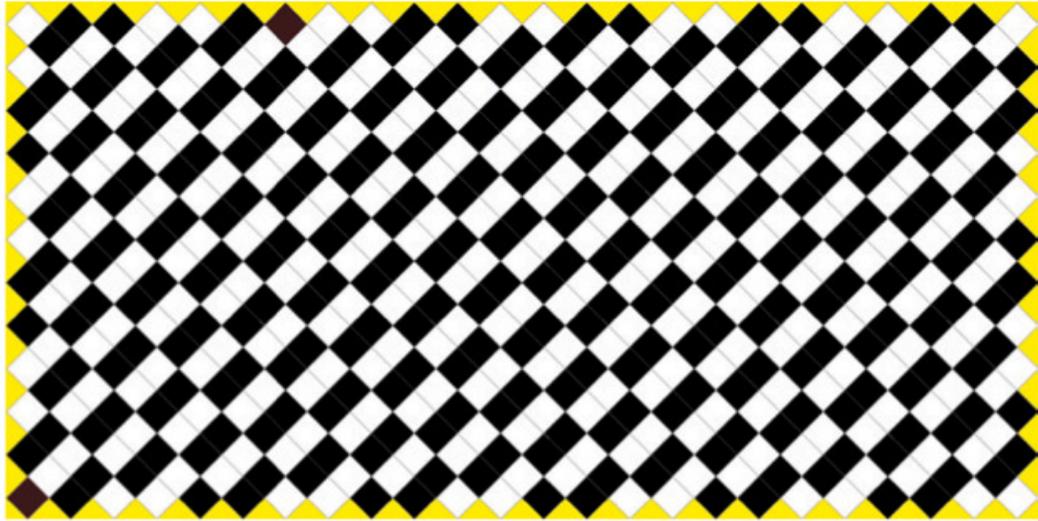
Weave the Fröbel Cone following the same principles as for the Basic Cone (see [page 28](#)).



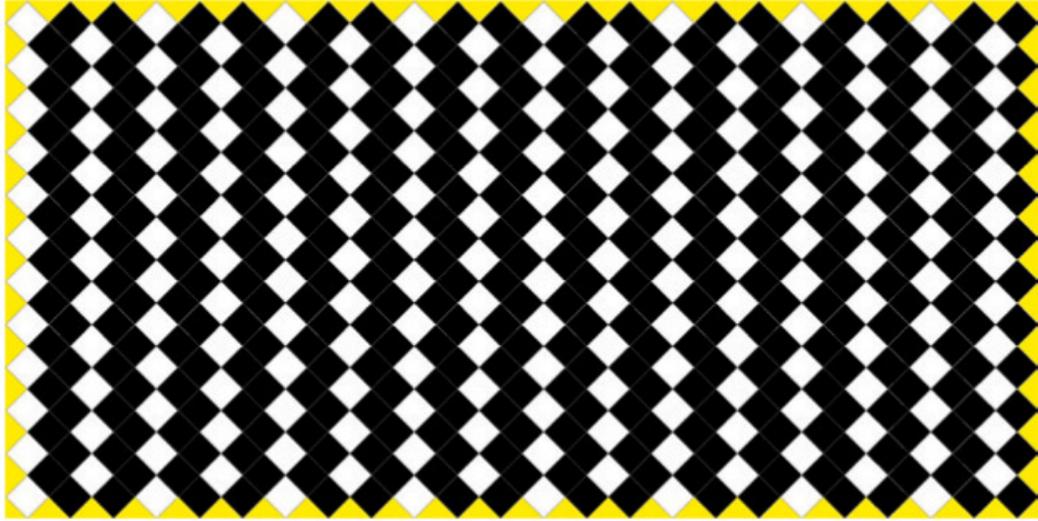
You may weave the cone in the classic checker-board pattern: one-over, one-under, and so on.



Because the cone has many arms, you may also weave more elaborate patterns. You may weave two-over, two-under and so on. When you start weaving, make sure the same colors overlap forming the zigzag pattern.



This pattern is also two-over, two-under, and so on. When you start weaving you'll make a checkered pattern.



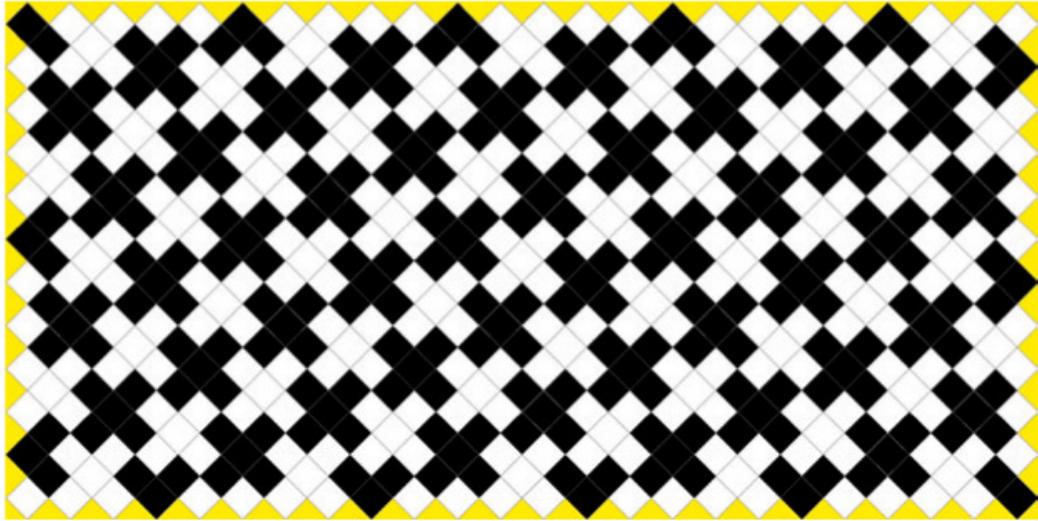
This example is woven two-over, one-under, and so on. Consider how you start the next strip to make the stripes run horizontal or vertical.



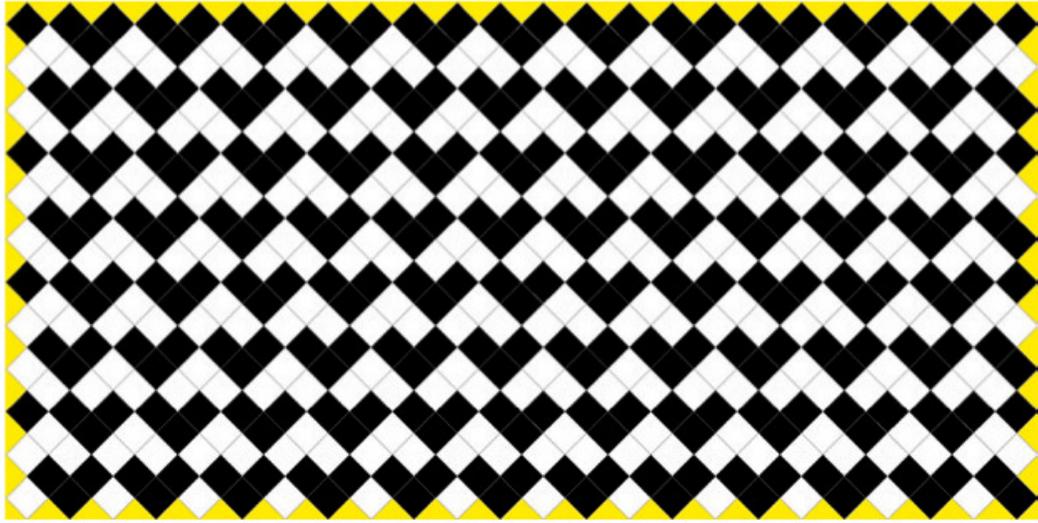
For this example, strips are woven in two alternating ways. One strip is woven three-over, one-under. The other strip is woven one-over, three-under, and so on. Look carefully at the pattern when you start weaving the strips to make sure you get the pattern right.



Try any other variation you can imagine. Look to these illustrations for inspiration.



Refer to the example and your project carefully when you start weaving and as you go along.



Some patterns are very elaborate to weave.



Consider, however, that if you make the arms cross over too many arms of the other color, the cone may easily become loose and misshapen as you weave.

TRIAXIAL BOX

The Triaxial Box is woven from three layers, and this kind of weaving is called triaxial weaving. In this project, the angle between the strips measures 120 degrees, and the strips are simple and equal in width. This permits you first to weave the two layers and then insert the strips of the third. In this way, the weaving process is straightforward.



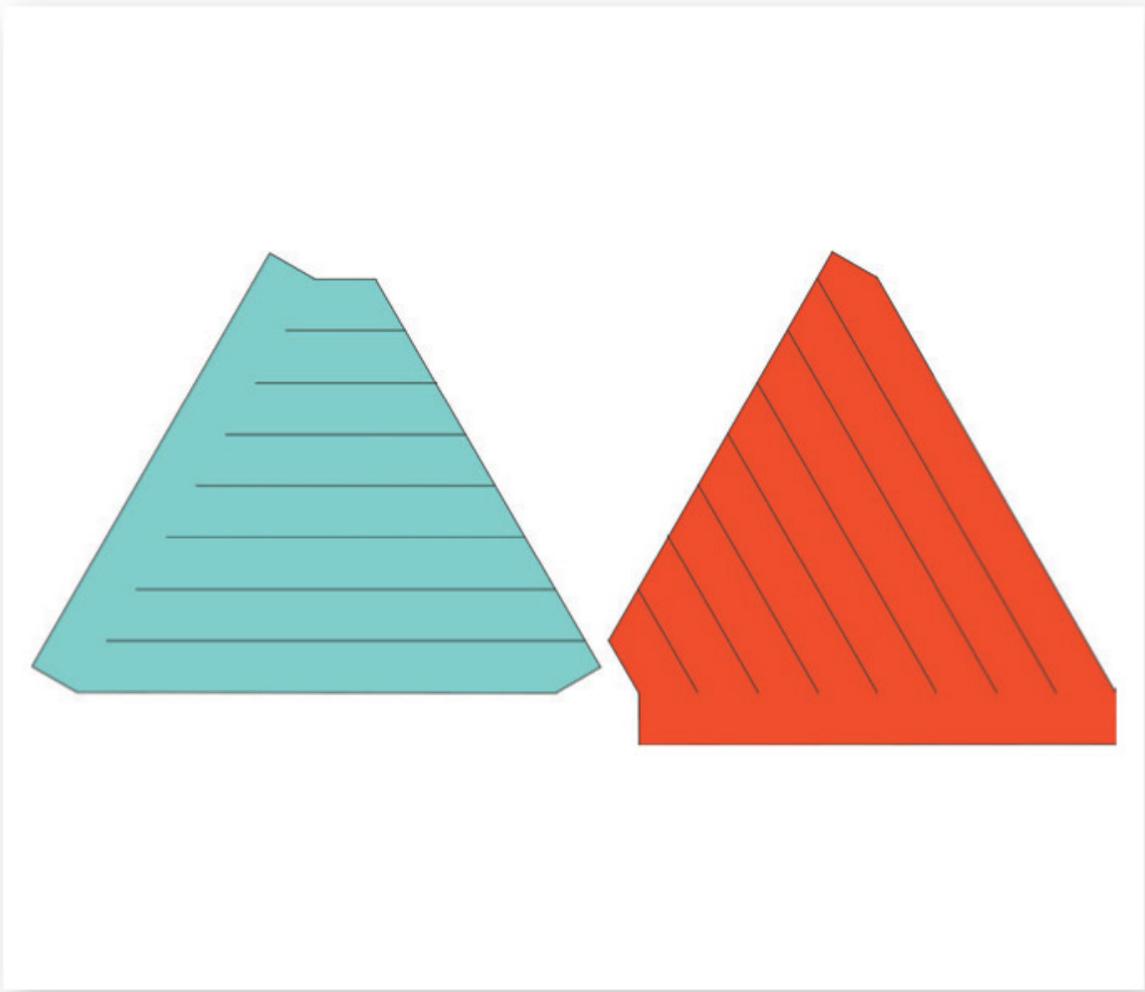
MATERIALS

- Paper in three contrasting colors or patterns (colors X, Y, and Z), 80–110 g/m² in weight
- Glue stick

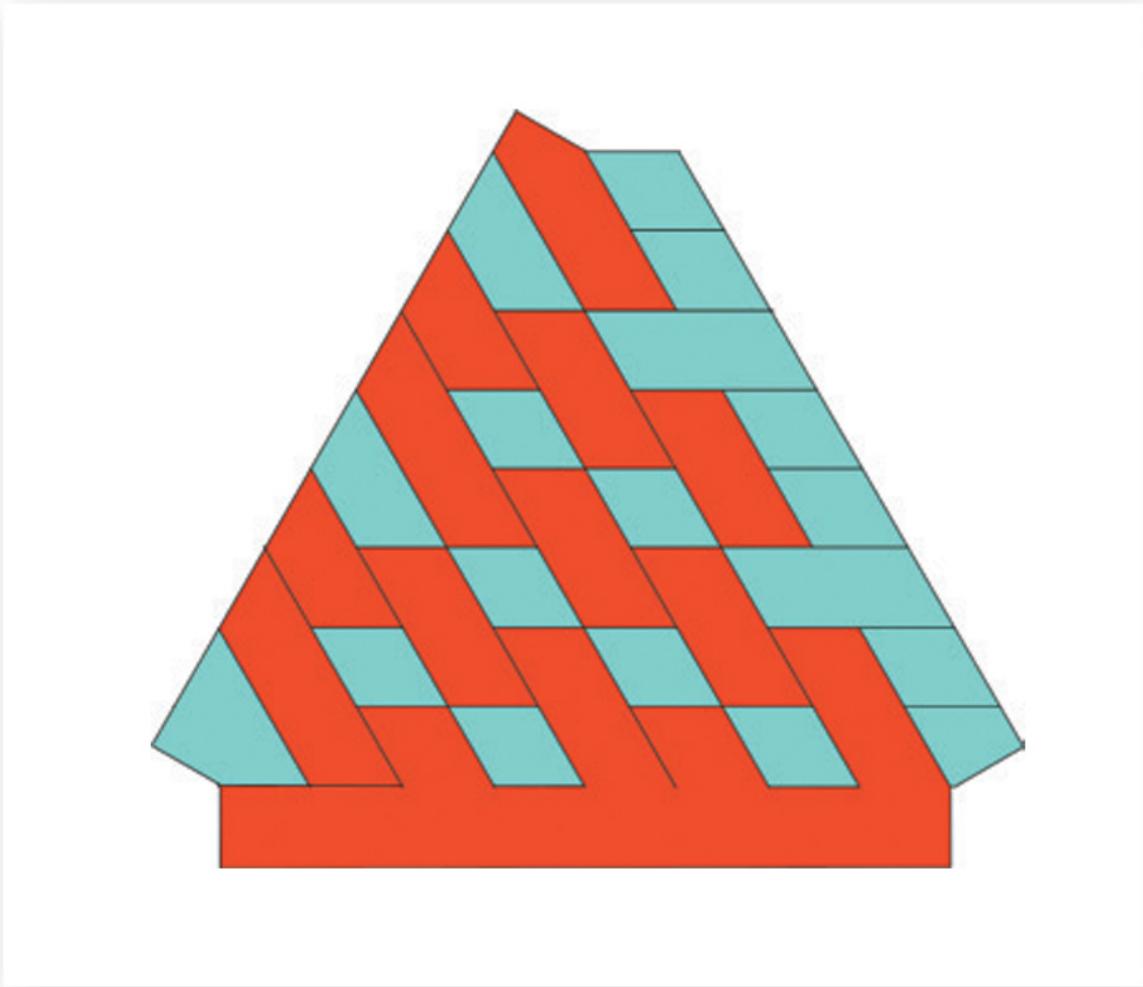
TEMPLATES & PIECES

- For the project templates, see [page 138](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - A10 (lid): 1 in each of three colors × (shown in red), Y (shown in blue), and Z (shown in yellow)
 - A11 (lid side): 1 in each of three colors X, Y, and Z
 - A12 (container): 1 in each of three colors X, Y, and Z (*Note: The template has a small circle in one corner so it is not confused with template A10.*)
 - A13 (container side): 1 in each of three colors X, Y, and Z

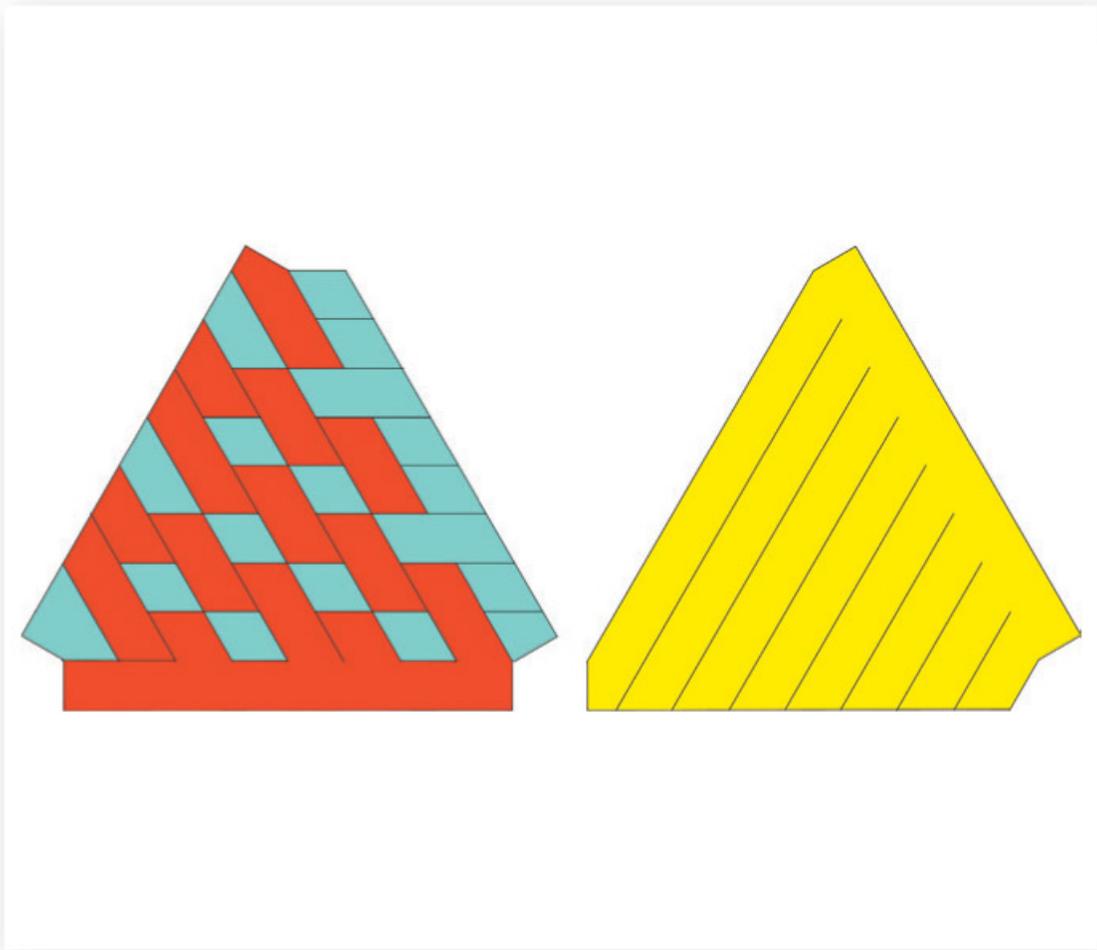
The lid and the container are made in the same way; the container is just a little smaller than the lid, and the sides are higher.



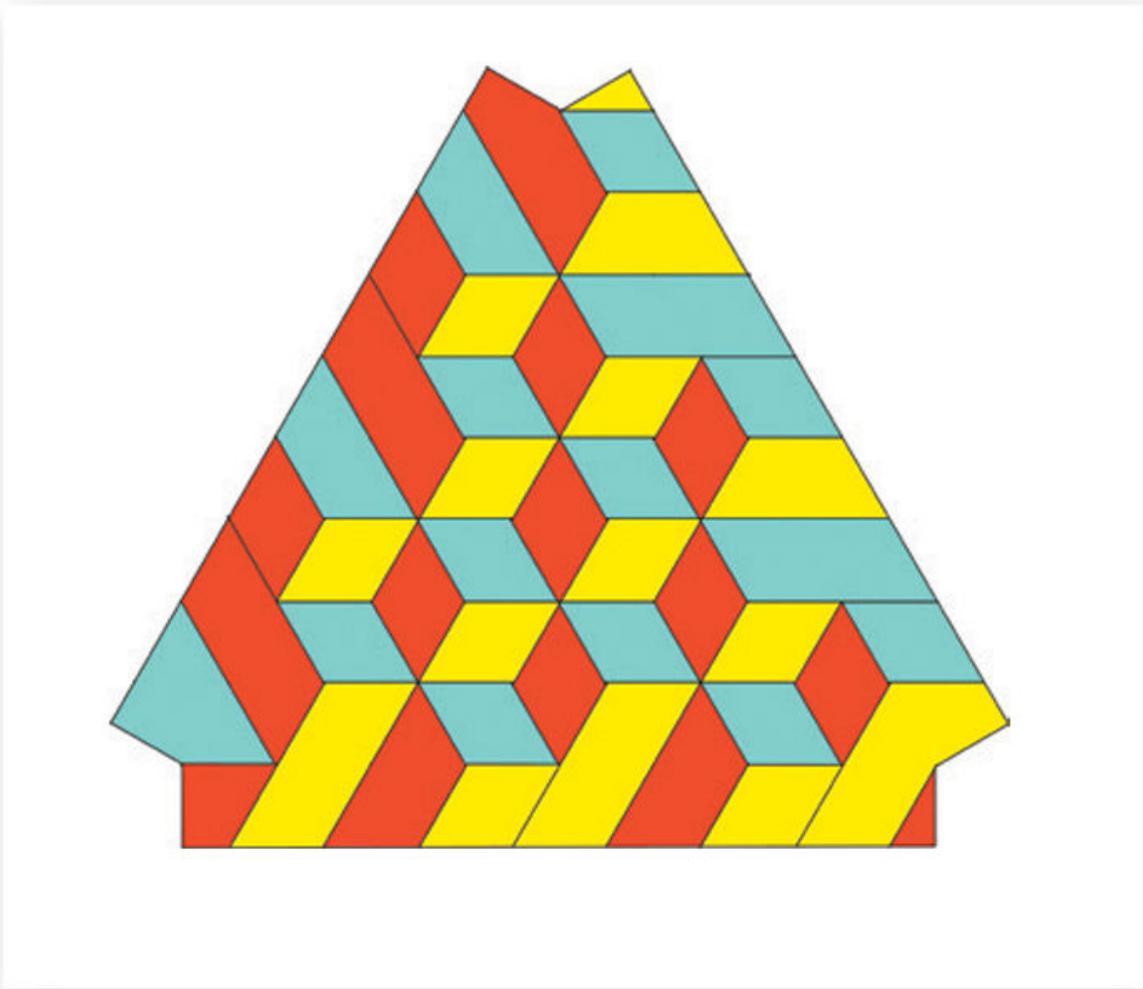
① Place the two A10 pieces in color × (red) and Y (blue) as indicated.



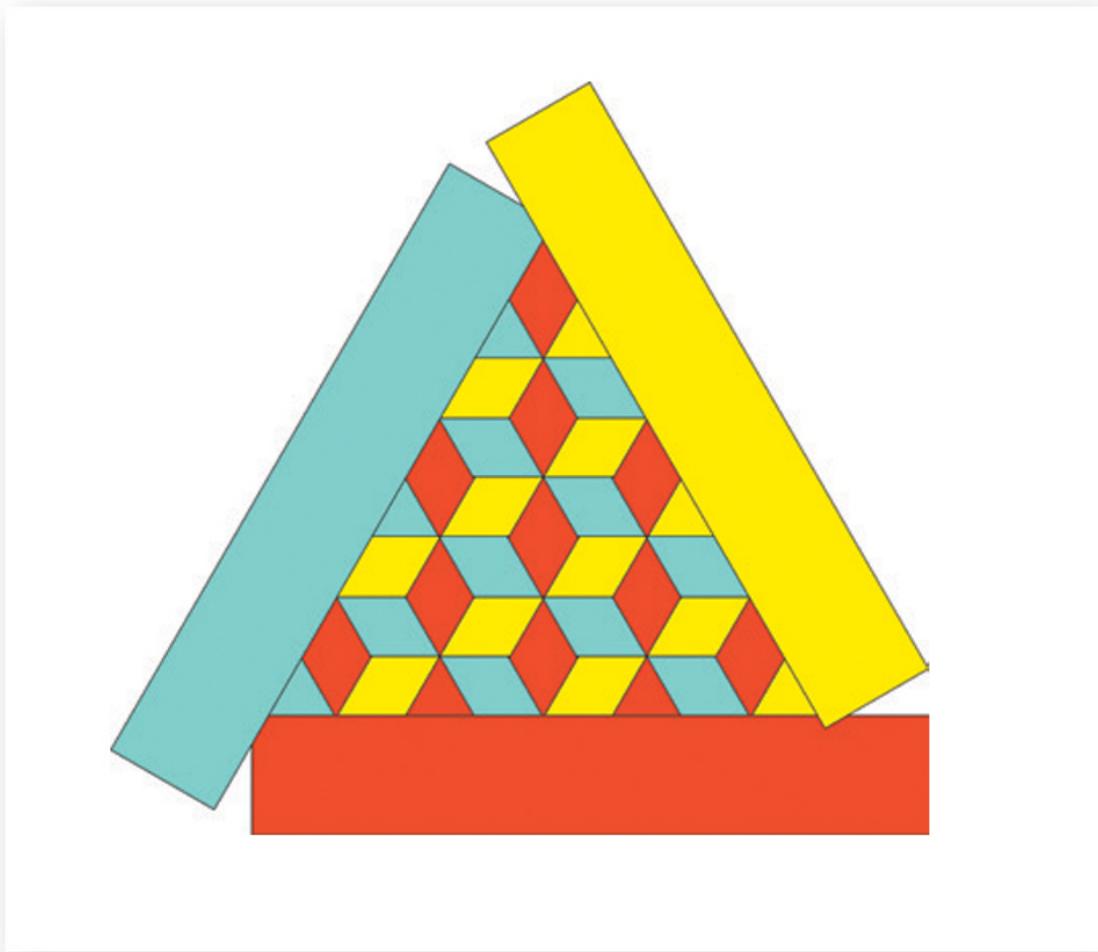
② Weave the two pieces together to create the pattern shown. The strips in color Y are woven one-over, two-under, and so on.



③ Place the third A10 piece in color Z (yellow) as indicated.



④ Weave in the color Z strips, one by one, as shown, starting with the longest. Because you are weaving in three layers, sometimes the color Z strip will disappear between the others and not show immediately on the back side.



⑤ Align the A10 pieces precisely. Place the woven piece flat on the table, the face woven in step 4 up, the base of the red piece horizontal as shown. Smear glue on the back side of the color × (red) A11 lid side piece and align it with the lower edge of the longest color Y (blue) strip, placing it a little outside the left side of the color × base. Press down to adhere. Glue the color Y and color Z A11 lid side pieces in the same way, as shown in the illustration.

⑥ Turn the project back side up and place it flat on the table. Smear glue on the visible part of the color × (red) A11 lid side. Crease in half lengthwise and press down. Do the same for the color Y and color Z strips. Turn the project front side up. Trim the left end of the three folded A11 strips to end at the woven strip. Trim the right ends to make a flap

protruding $\frac{11}{16}$ inch (1.8 cm) from the woven part. Crease the three sides to make them stand up from the woven piece. Close the three corners of the lid using the flaps.

- 7 Make the box container in the same way from the A12 and A13 pieces. If you want the colors on the edge of the lid and container to match, the face showing on the bottom will be the one visible inside the lid.

TRIAxIAL CONE

The angle between the two base strips is 120 degrees, and the third strip is perpendicular. Because the strips of the cone get wider and wider, they cannot be added after weaving the two first layers, as was done in the Triaxial Box (see [page 126](#)). For the cone, the third layer must be woven in as you weave the other two.

Weaving in this way actually is less difficult than explaining how. The basic principle is that the order of the strips must always be the same: × (red) on top of Y (blue), Y on top of Z (yellow), and Z (yellow) on top of × (red). If the strips do not appear in that order, they must be changed. Take a good look at the illustrations while weaving.

The Triaxial Cone is made almost in the same way as the Basic Cone (see [page 28](#)); the difference is that you have three layers instead of two and you weave following the “Principles of Triaxial Weaving” (see below). The pretty woven pattern should not be spoiled by adding an arched strip on the front; only add one on the inside.



MATERIALS

- Paper in three contrasting colors (colors X, Y, and Z), 80–110 g/m² in weight
- Glue stick

FROM YOUR TOOLBOX

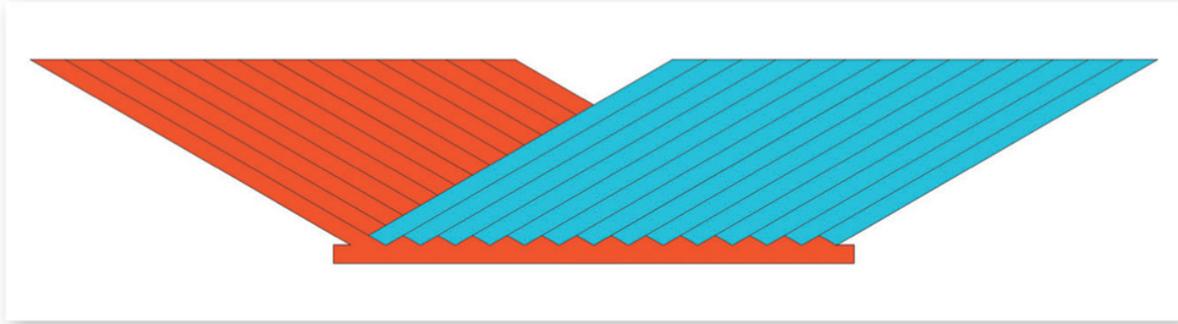
- 5 paper clips (for weaving)
- Knitting needle or other conical item (for shaping the cone)
- Darning needle and ruler (for scoring)

TEMPLATES & PIECES

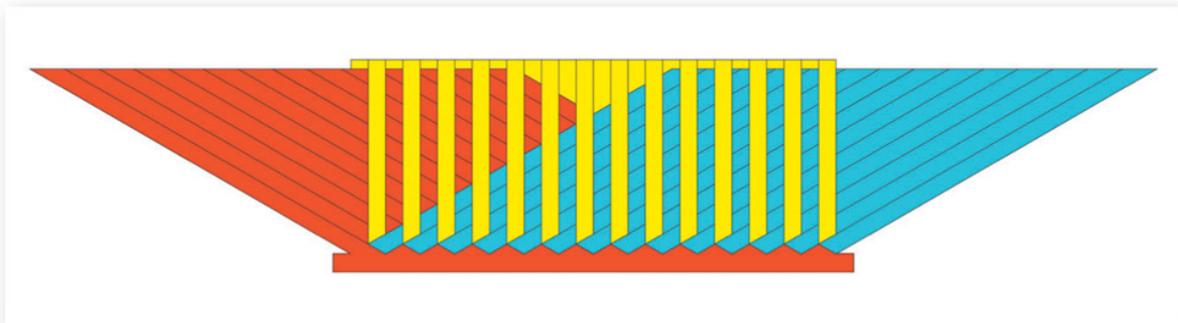
- For the project templates, see pages [141](#) and [148](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - H4 (main piece with arms): 1 in color X
 - H4 (mirror or reverse image of template, with no flap): 1 in color Y
 - H5 (main fanlike piece): 1 in color Z
 - H6 (arched strip): 1 in color X
 - H7 (mold): 1 any color
 - 1 handle in color X, 3/8-inch wide × 9 1/2-inches long (1 × 24 cm)

PRINCIPLES FOR TRIAXIAL WEAVING

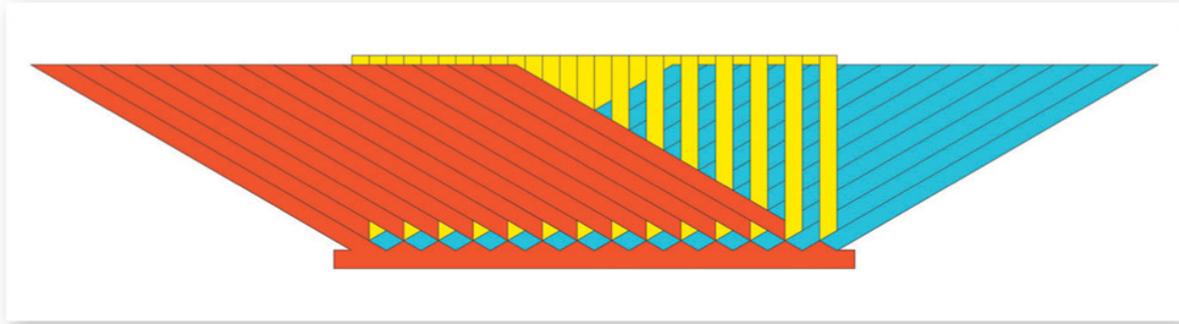
Starting is the most difficult, and after a while you will not need instructions. Just look constantly at your weaving to see if the pattern is turning out correct.



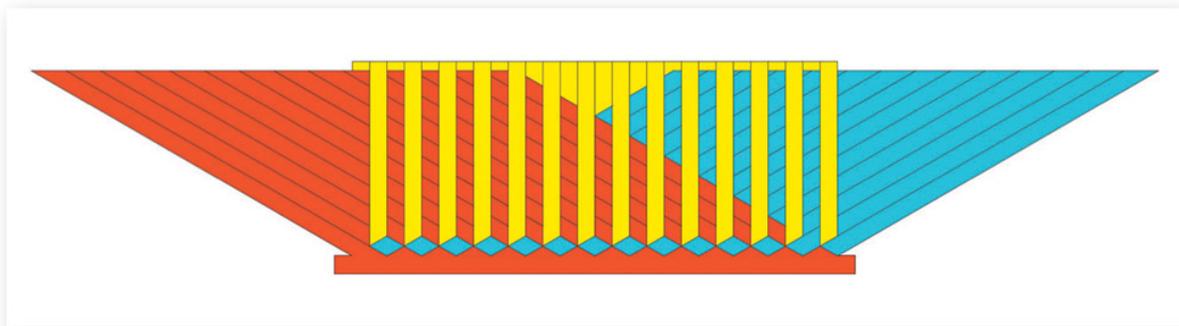
- 1 Place the red piece on top of the blue one, arms going in opposite directions. Red strips go the bottom up to the left; pull each blue strip to the front through the nearest slit between the red arms.



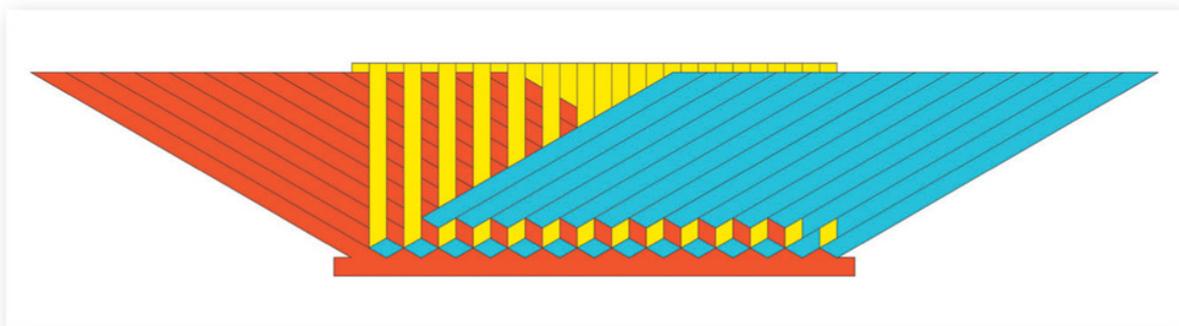
- 2 Place the yellow piece behind the two other layers. Now you will pull every second yellow strip to the front; choose the set of yellow strips that are in line with the left half of the blue diamond. Shift the strips so that the yellow strip moves forward and appears just above the left half of the blue diamond and in front of the red strips. The set of yellow strips pulled forward here is named yellow-1; the remaining set of yellow strips is named yellow-2.



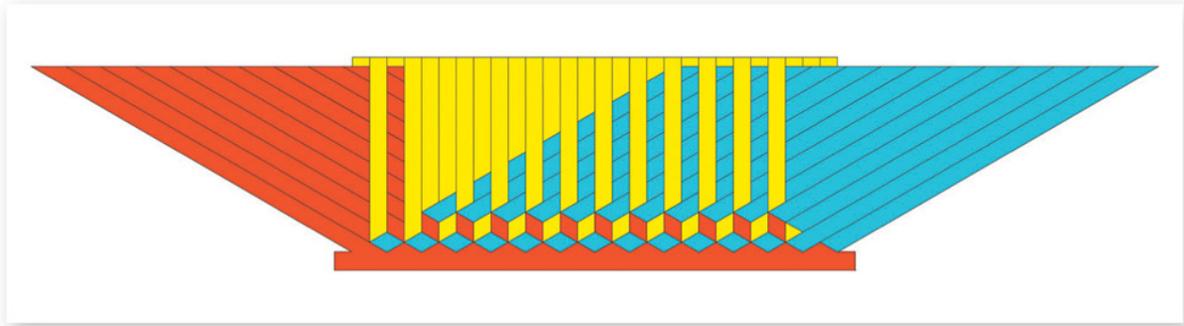
③ Pull the red strips out in front of the blue and yellow through the nearest slit.



④ Pull the yellow-1 strips out in front of the red strips.



⑤ Pull the blue strips out in front of the red and yellow-1 strips starting a new row of blue diamonds.



⑥ Pull the yellow-2 strips out in front of the red just above the left half of the blue diamond.

⑦ In principle, you are now back to step 3; however, now you are working with the yellow-2 strips. You are on your own from here. Continue the weaving, constantly watching that the pattern turns out right.

TRIAxIAL SPHERE

The Triaxial Sphere is possibly the most difficult object to make in the book. It is crucial that the shape of the strips is correct. Some strips are long and tend to get entangled. Using a polystyrene sphere as a form facilitates the process, but it is crucial that the strips make a tight fit as you weave. The polystyrene sphere stays inside the finished project. If you want a different size of the sphere, you must rescale the templates.



MATERIALS

- Paper in three contrasting colors (colors X, Y, and Z), 80–110 g/m² in weight
- Polystyrene sphere, exactly 10 cm in diameter (*Note:* If you want to use a different size of sphere you must rescale the templates for the project using the scale factors indicated on [page 95](#).)
- Glue stick

FROM YOUR TOOL BOX

- 36 straight pins with large heads

TEMPLATES & PIECES

- For the project templates, see pages [140](#), [141](#), and [156](#). Copy the templates using your preferred method as described on [page 135](#).
- Using the templates, cut the following pieces:
 - S7 (swirling arms): 9 in color × (shown in red)
 - S7 (mirror or reverse image of template): 9 in color Y (shown in blue)
 - T17 (straight arms): 3 sets of each 6 arms in color Z (shown in yellow)
 - S8 (circular piece for start): 1 in color X
 - S9 (circular piece for closure): 1 in color X

① Using glue, fix the nine mirrored S7 arms in color Y around the S8 circular piece, with all arms swirling in the same direction.

② Fix the nine S7 arms in color × on top of the same circular piece, arms swirling in the opposite direction and the small triangles perfectly aligned. The triangles in color × will show on the front and form the sphere's pole where you start weaving.

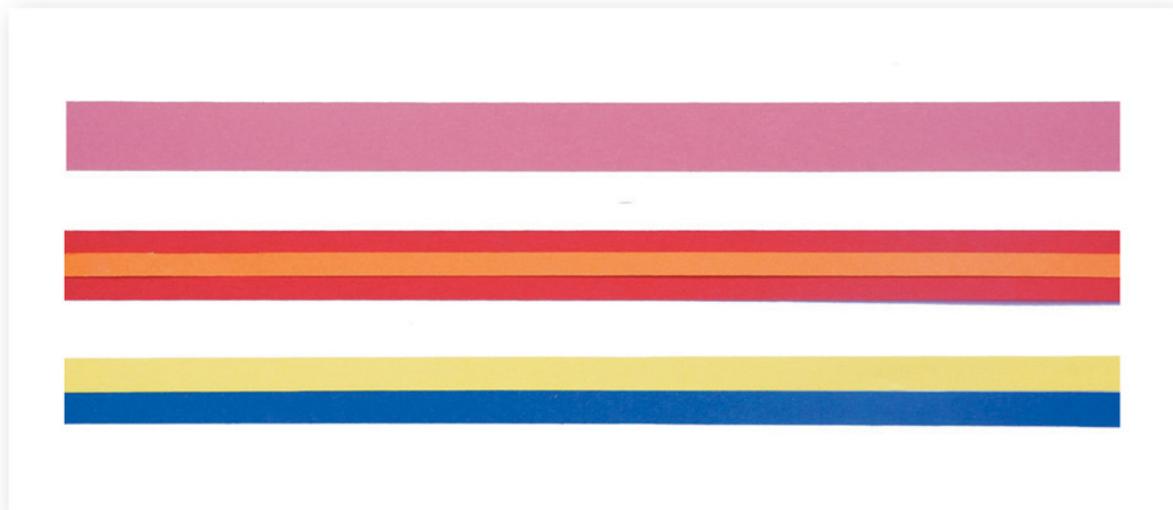
- ③ Pull each arm in color Y forward through the nearest slit between the arms in color X.
- ④ Fix the three T17 parts in color Z together with glue so that the straight arms radiate outward 360 degrees in a circular form.
- ⑤ Place the circular piece from step 4 behind the swirling piece in colors × and Y. Turn the project so that the back side is up, showing T17 with S7 in color × and S7 in color Y underneath.
- ⑥ Pull out the arms in color × through every second slit between the straight arms in color Z. Tighten the weaving so that no unused slit remains.
- ⑦ Turn the project front side up. Fix the woven pieces to the polystyrene sphere with one straight pin through the center of the pole.
- ⑧ Continue weaving the triaxial pattern following steps 1–7 in “Principles for Triaxial Weaving” (see pages [128–129](#)). Tighten the weaving to follow the shape of the sphere. Fix the project to the polystyrene sphere with straight pins as you weave along, but do not perforate the arms; pin through the small spaces created where the three strips meet.
- ⑨ After weaving, secure the arms with glue and cover the closure with the S9 circular piece.



PRETTY HANDLES

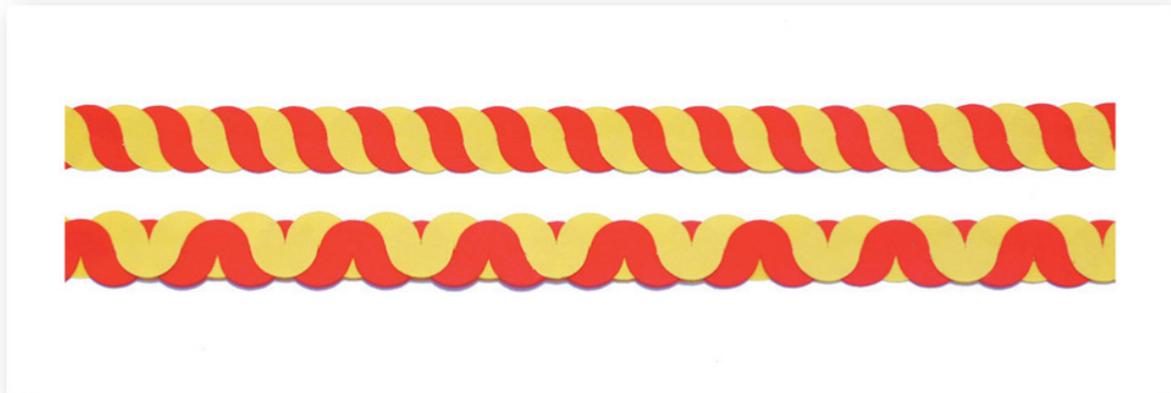
A basket should have a beautiful handle that matches the colors, shapes, and detailing of the project. We have included a range of handles, from the simplest monochrome straight strips to elaborate multicolored woven, twisted, or slide types. The handles are all made from the same paper as the baskets.

STRAIGHT STRIPS



A simple handle is made from a plain strip of paper in a width matching the project (T1 or wider). The strip may be varied by adding a T2 narrow strip, or you may use two parallel T3 narrow strips in colors matching the project.

TWISTED HALF-CIRCLES



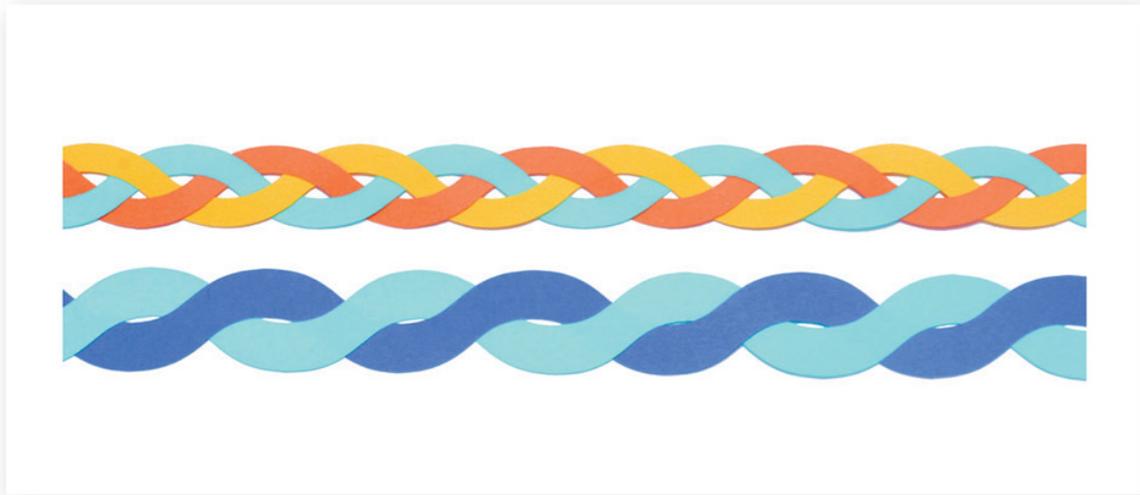
Two strips of offset T6 semicircles can be twisted together in different ways. If all the grooves are used, you will get a ropelike handle; if you use only every other groove, a floral pattern appears.

TWISTED QUARTER CIRCLES



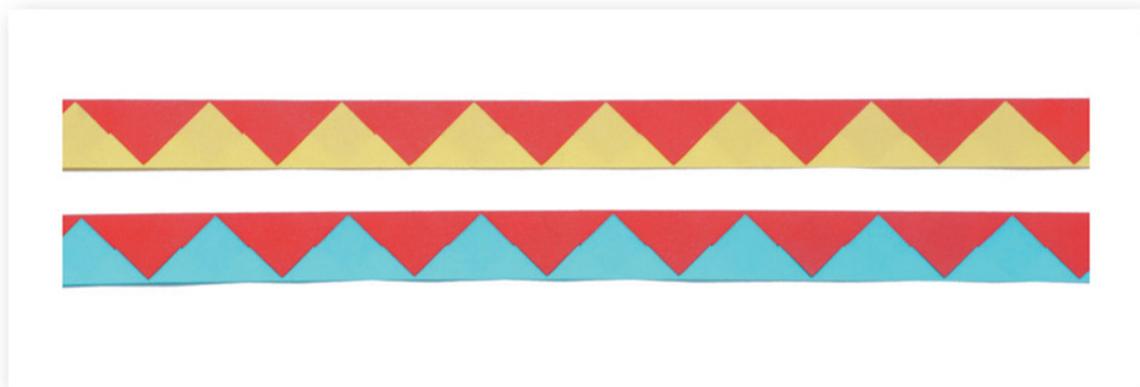
Twisting together two strips of offset T7 quarter circles will give you another ropelike handle. When starting to twist, consider in which direction you prefer the rope to swirl.

CURVED STRIPS



Three narrow, wavy T4 strips can be woven into a braid. Two of the wider curved T5 strips may be twisted to form a ropelike handle.

TWO ZIGZAG STRIPS



Two T8 zigzag strips with a straight trailing edge are woven together into a handle with a pattern of large triangles.

TWO TWISTED ZIGZAG STRIPS



Twisting together two T11 strips will make a handle with stripes. Consider how the stripes will run before you start.

THREE ZIGZAG STRIPS



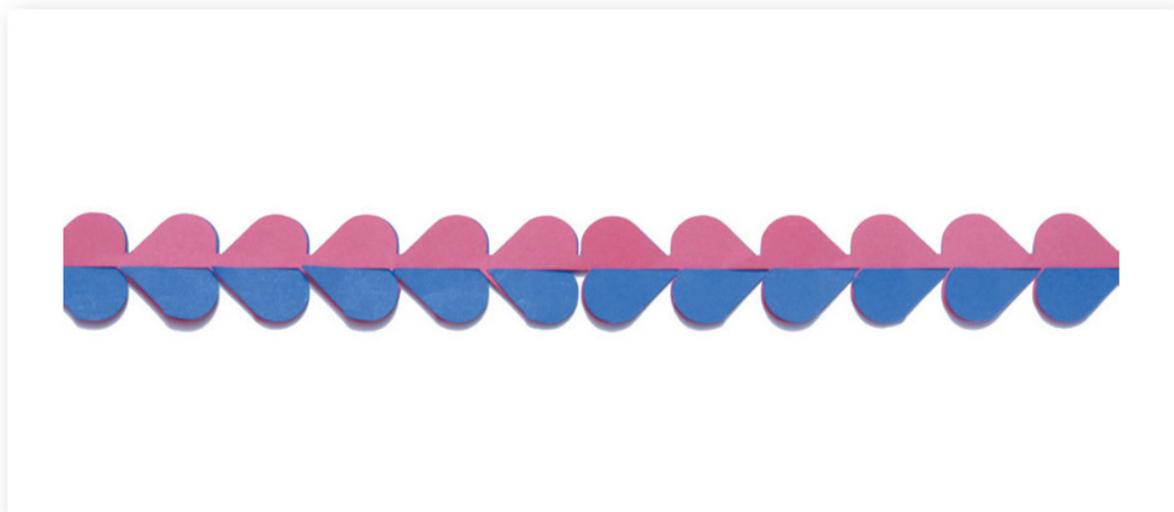
Two T10 zigzag strips with straight trailing edge and one double T9 strip may be woven together in two ways. You may make a pattern of squares, or you may weave a zigzag pattern.

THREE TWISTED ZIGZAG STRIPS



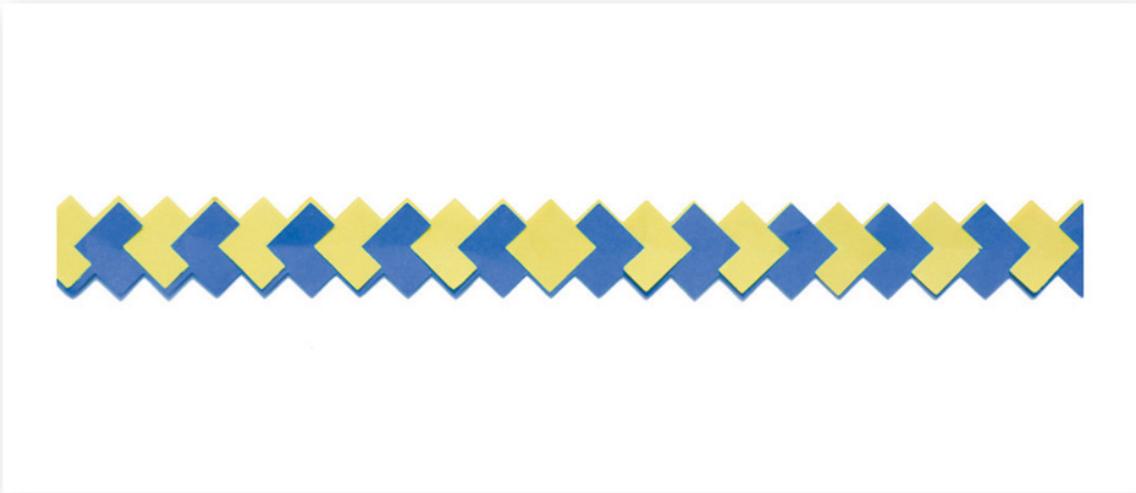
Twisting together three T12 strips will make a handle with stripes in three colors.

SLIDING HEARTS



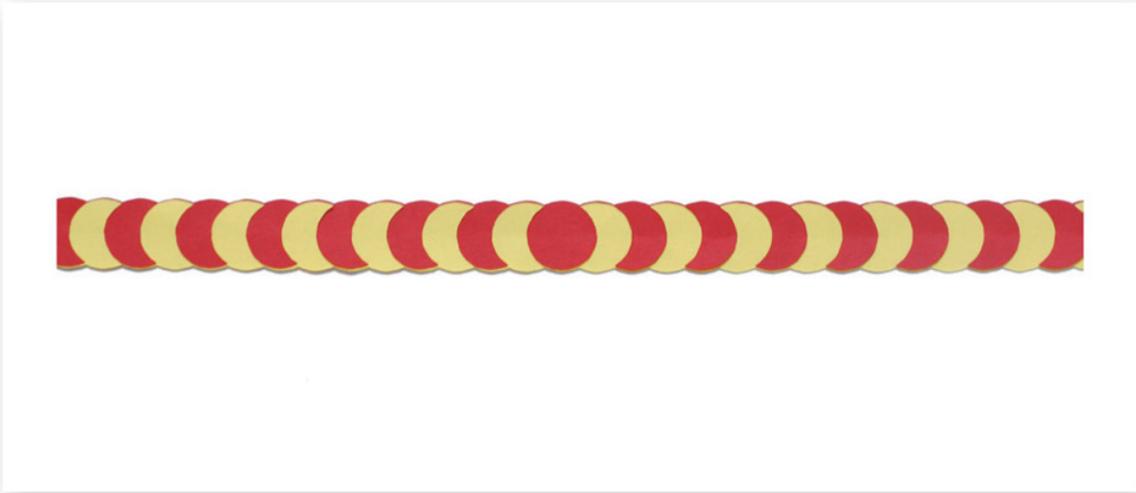
Sliding together two T14 strips will make a handle with hearts of two colors.

SLIDING SQUARE STRIPS



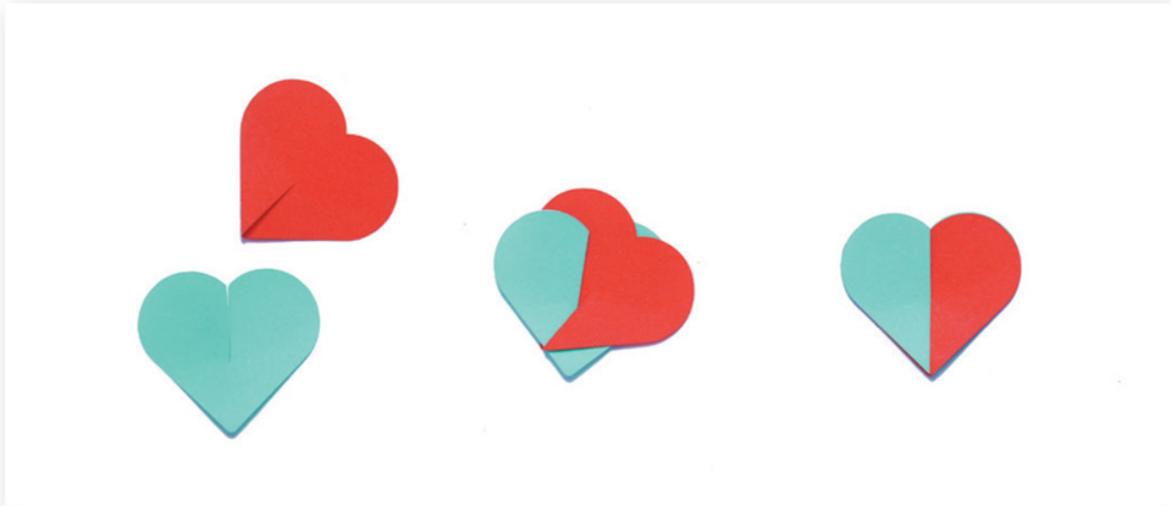
The handle with squares is made from two T13 strips slid together. The process is a bit tricky, and you have to take care that the woven pieces do not open again while working.

SLIDING CIRCLES



A handle with circles is made by sliding together two T15 strips.

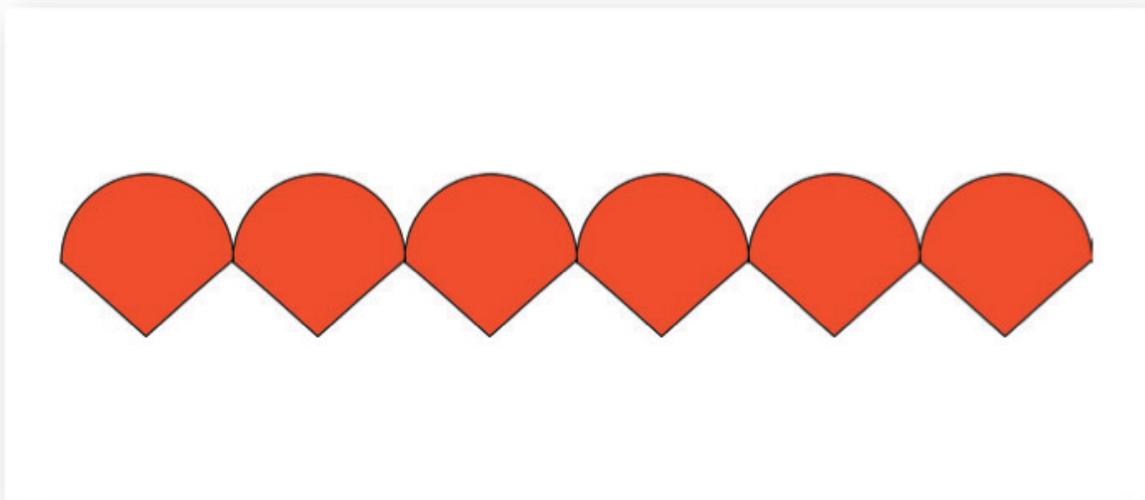
SMALL HEARTS



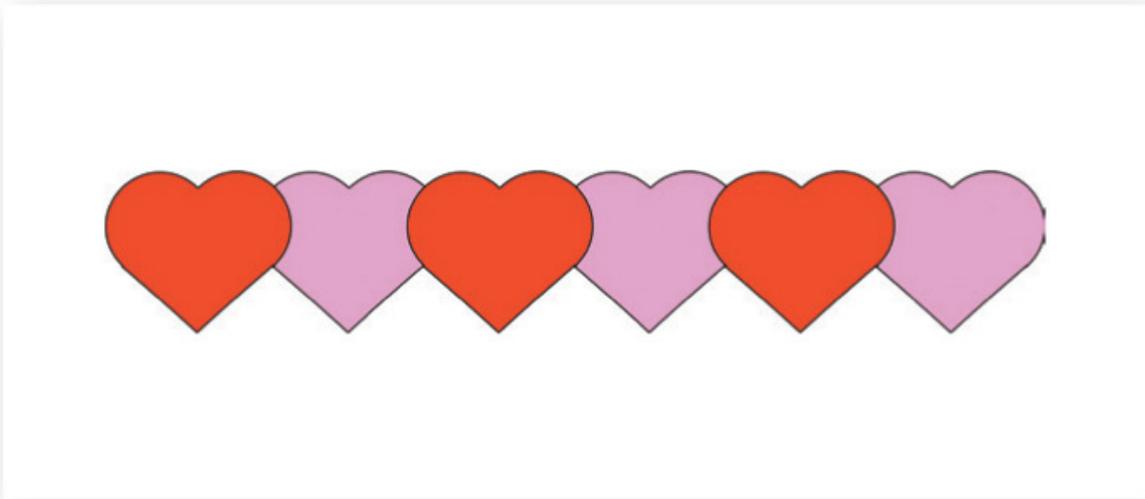
The basket will look pretty inside, too, if you cover the bases of the handle with a small heart. The heart is made by sliding together the two different-color T16 heart pieces.

BEAUTIFUL EDGES

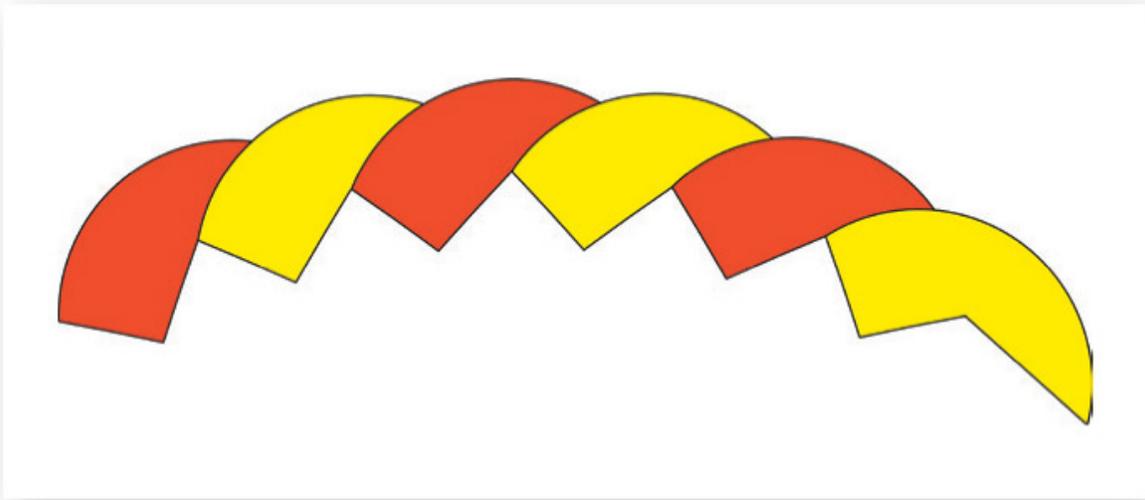
You can create a beautiful edge to finish a basket or cone woven from individual arms by adding an embellishment to each arm. The edges shown illustrate the principles and are meant to inspire you. We hope you will design some of your own and make your projects unique. We have used the arm of the Basic Basket (see [page 35](#)) in the examples below. For other projects, you may have to rescale the finishing details from the templates included on pages [151](#), [152](#), and [156](#).



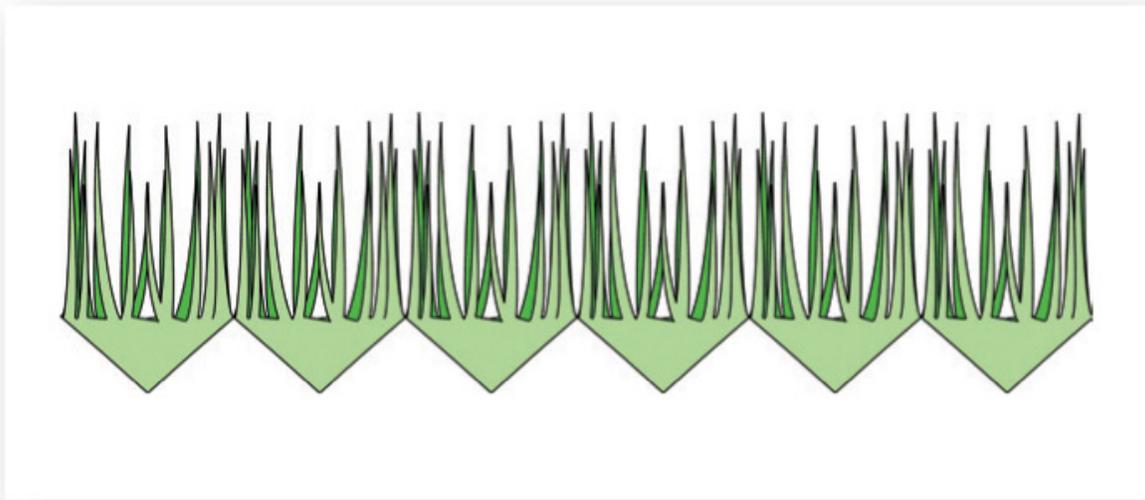
Template P9. An edge with curves is formed when all arms are finished by a half circle.



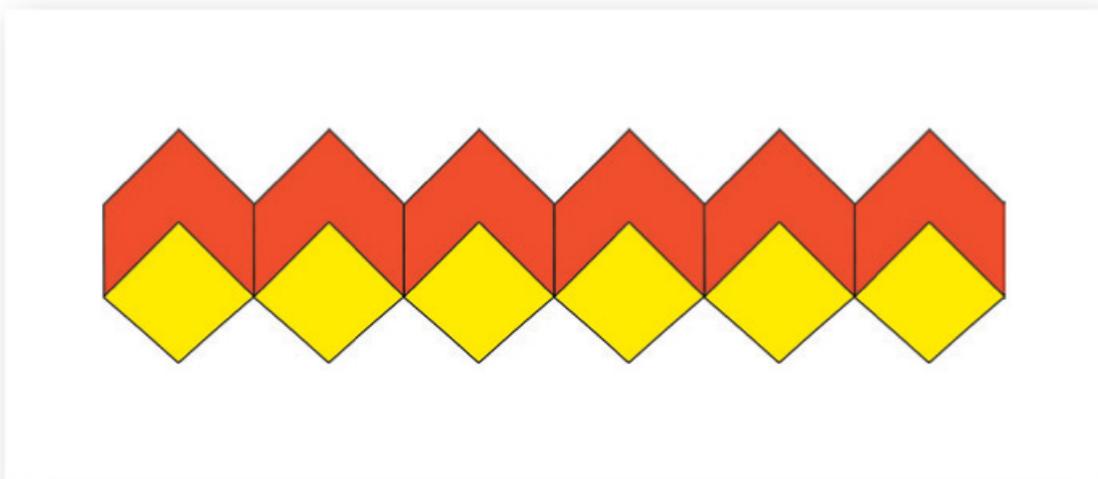
Template P18. When two half circles are set at an angle, pretty hearts are formed. The hearts are overlapping, and the pattern becomes clearer if you use two colors for the layer showing.



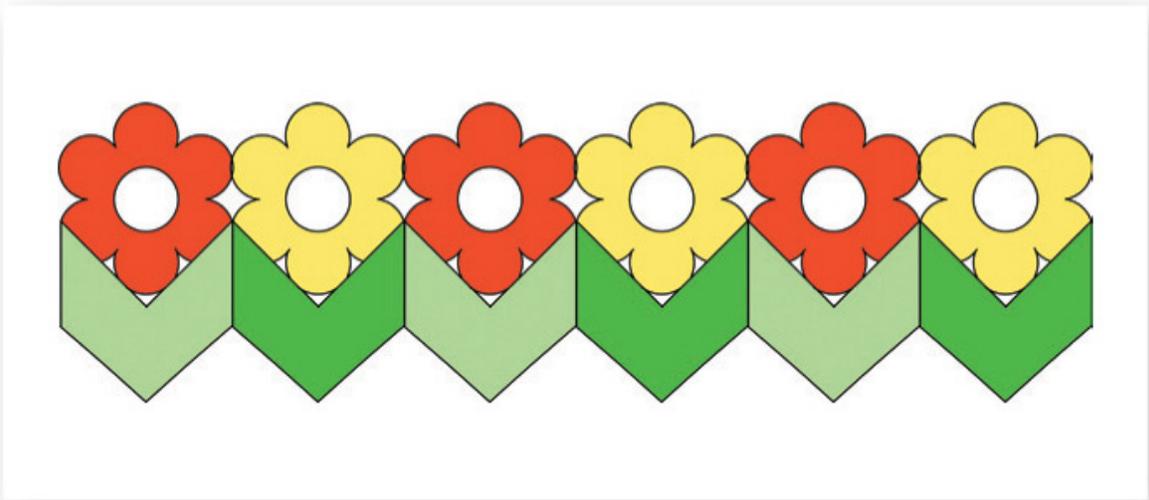
Template P19. A twisted edge emerges from this template. Weave your projects from arms in two alternating colors in both sets and twist the edge on the inside of the project.



Template P20. Making a fringed edge that looks like grass may show parts of the arms in the layer behind.



Templates P17 and P21. When using two different templates, the layer behind shows. Here, a zigzag edge appears. When you start the project, consider which layer will be in front when you reach the edge.



Templates I8 and I12. You may make a vivid edge with flowers using four colors.

TEMPLATES

All templates in the book are presented in the actual size intended. You may, however, rescale the templates to any size as desired. The templates in the book may be transferred to the paper you have chosen for your model, and the required parts and pieces generated using a wide range of methods. Following we introduce you to those we prefer. Full-size downloadable templates are also available at <http://www.quarrybooks.com/pages/paper-weaving>.

TRACING PAPER, PENCIL & SCISSORS

A simple way of transferring a template is to use transparent tracing paper. When all the marks and shapes are transferred, cut out the parts and pieces by hand.



- 1 Place a piece of tracing paper over the template in the book.



- ② Trace the outline carefully with an HB pencil. The pencil point must not be too soft or the outline will blur and you will not get an exact copy, nor should it be too hard or it will not leave enough graphite on the paper.



③ Place the paper you want to use for your model on the table, back side up. Turn the traced template over onto the project paper so that the pencil markings are in contact with the back of the paper. Trace the outline carefully with a 2H pencil.



④ When you have finished, remove the tracing paper; the original pencil line on the transparent paper should have transferred onto the project paper. Lightly redraw the lines, if necessary, so you can see them clearly, and cut the pieces out by hand using a pair of scissors or a craft knife.

Many projects are made from pairs of parts, one being a mirrored version of the other; therefore, only one template is included (such as K1).



Some pieces are symmetrical (such as B1), and only half the piece is shown. The "line of symmetry" is indicated by dashes.



The dash-dot-dash line indicates a crease in the cut-out piece (such as E1).



A few templates are larger than the book's pages. They come in two sections, named -a and -b. The dash-dot-dot lines indicate where the two sections must be joined.

PHOTOCOPIER & SCISSORS

If you have access to a photocopier, you may use it to produce sheets with the templates you need, then photocopy them directly onto the paper you intend for your models and cut them out by hand. Just make sure your desired project paper will feed through the copier. With a photocopier, you also have an easy opportunity to scale the templates up or down as you prefer.

- ① Photocopy the templates you need for the project onto ordinary white copy paper. Check that the templates are not distorted. If a page includes overlapping templates, make as many copies as you need so that you can cut out every template required. If the instructions require you to cut out several pieces from the same template, simply you may choose to make more copies.
- ② Cut out each template you will use $\frac{1}{32}$ inch– $\frac{1}{16}$ inch (1–2 mm) outside the outline. Consider cutting away lines from other templates that might confuse or distract you.
- ③ Arrange and fix each template to a sheet of paper using glue or transparent tape. Make sure to consider if some pieces are symmetrical (that is, they have a dashed edge); in that case, leave enough space on the paper for the other half.
- ④ Place the photocopied template face down on the copier glass. Feed the paper you intend to use for your model (again, make sure it will be accepted by the copier machine) into the paper tray. Consider printing on the back side of the project paper so no lines are visible on the front. Copy the sheet of templates, making as many copies as necessary.
- ⑤ Cut out the pieces by hand using a pair of scissors or a craft knife.

SCANNER, PRINTER & SCISSORS

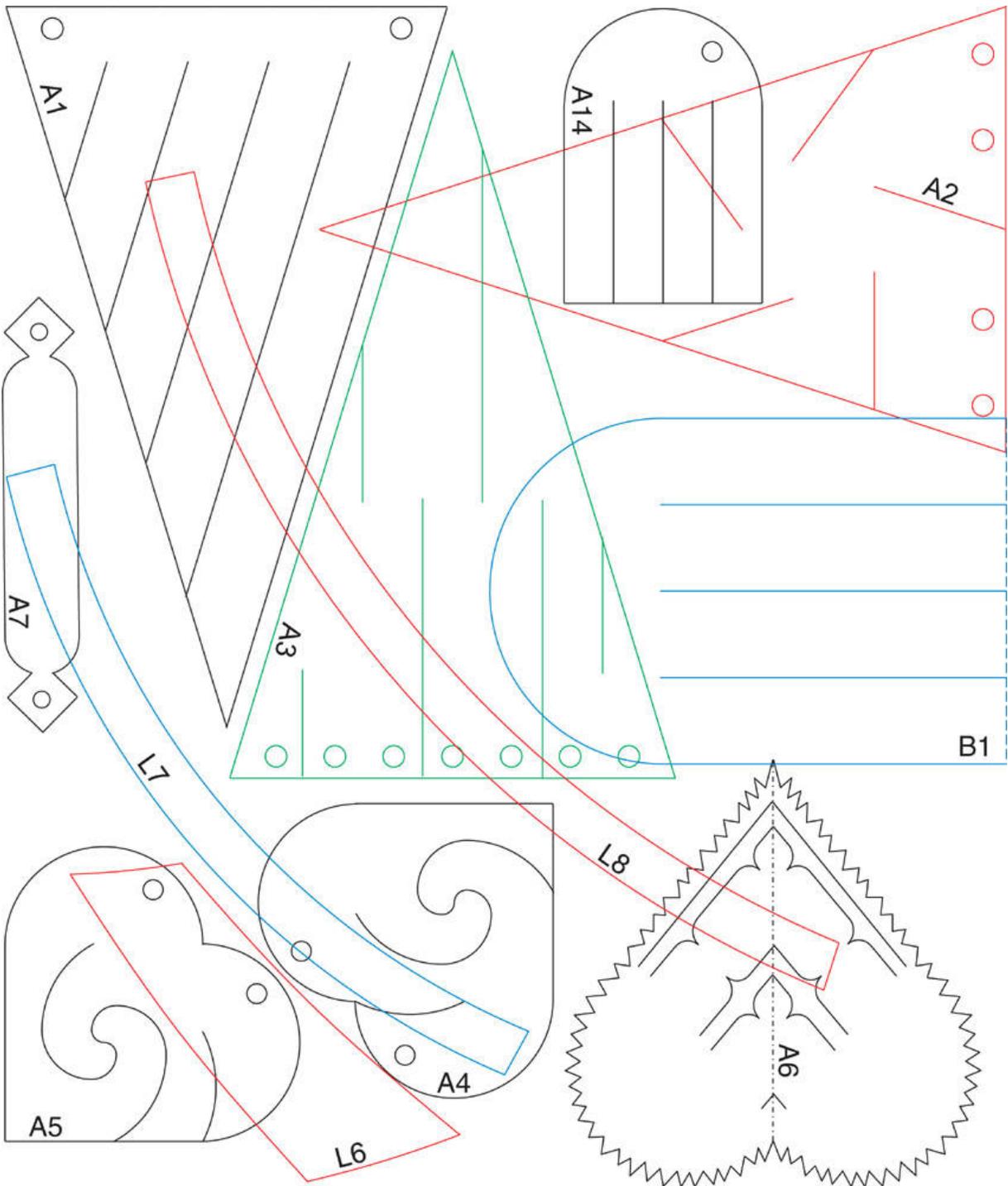
You may make a digital sheet of templates, print it out, and then cut out the templates by hand.

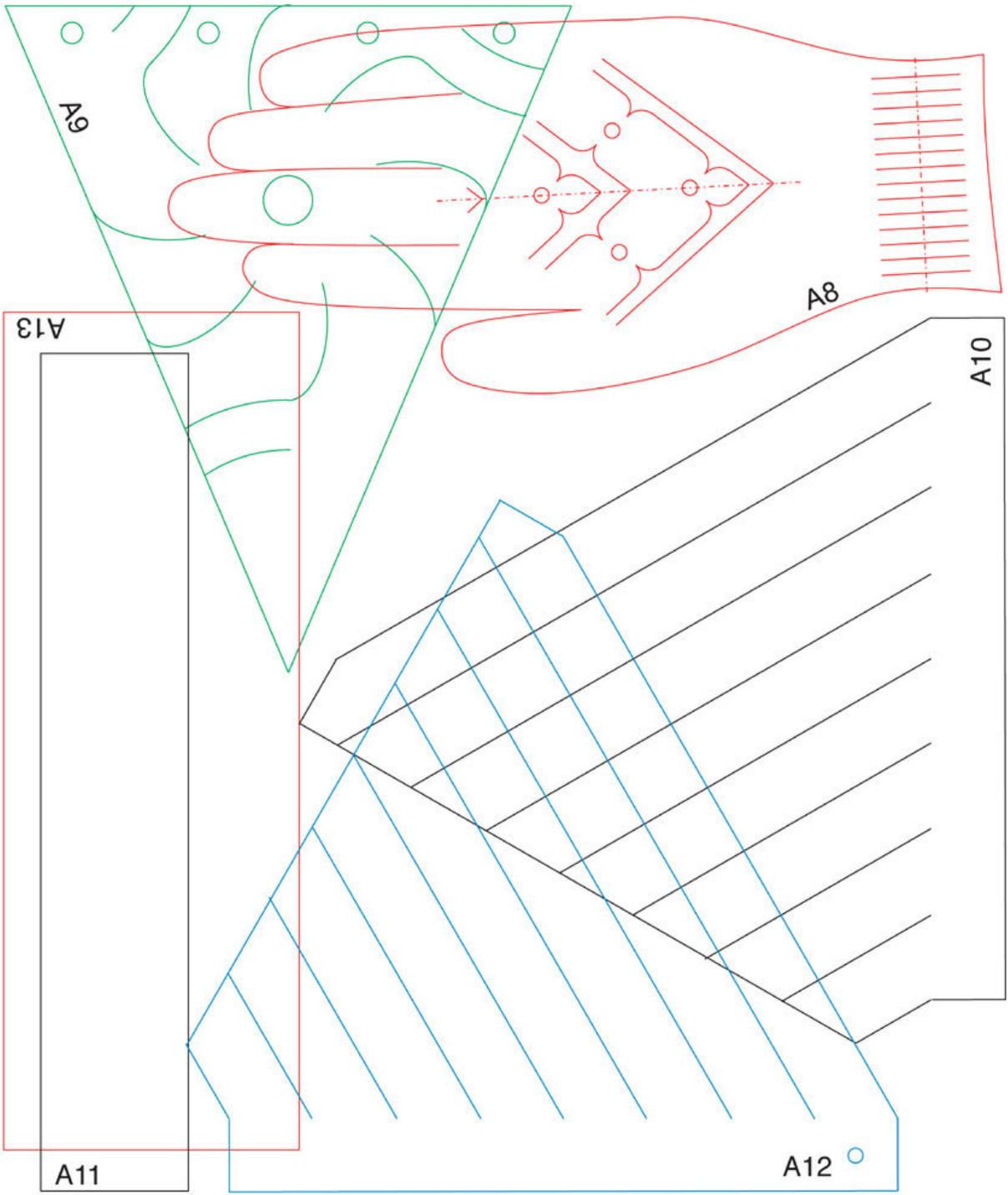
- ① Scan the pages with the templates you need. Make sure that the templates are not distorted.
- ② Feed the paper you intend to use for your project (make sure it's accepted by the printer) into the printer and print out the sheet of templates. Make as many copies you like.
- ③ Cut out the templates by hand using a pair of scissors or a craft knife.

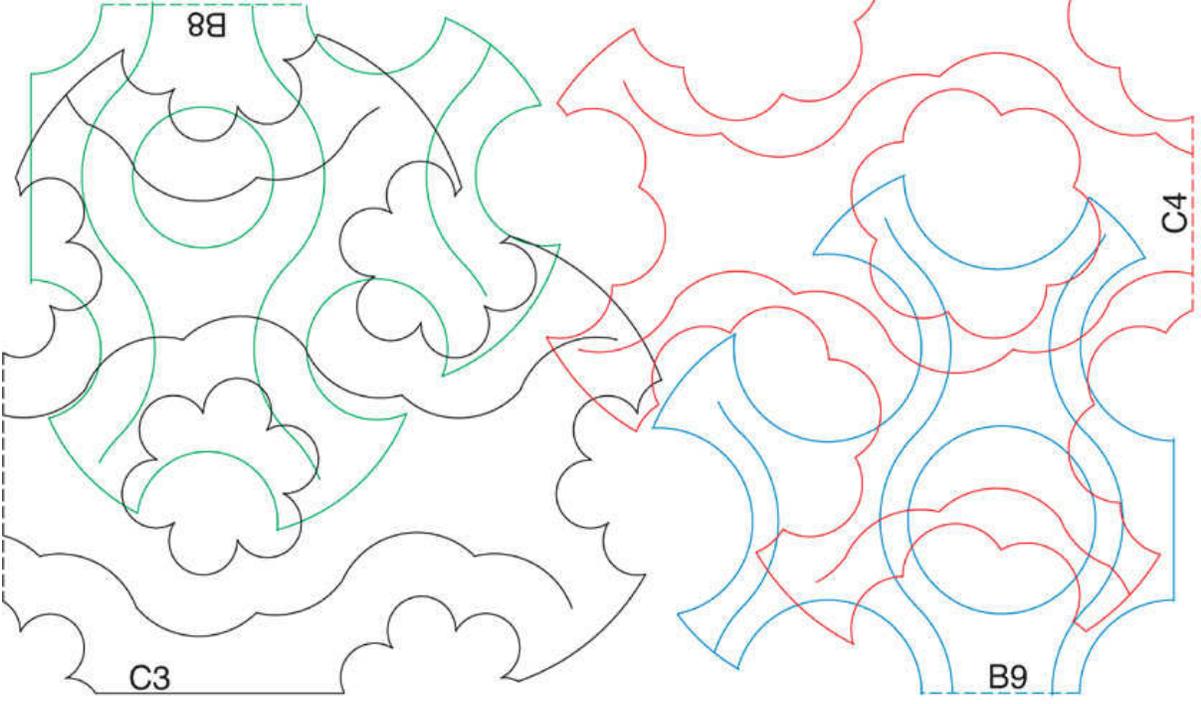
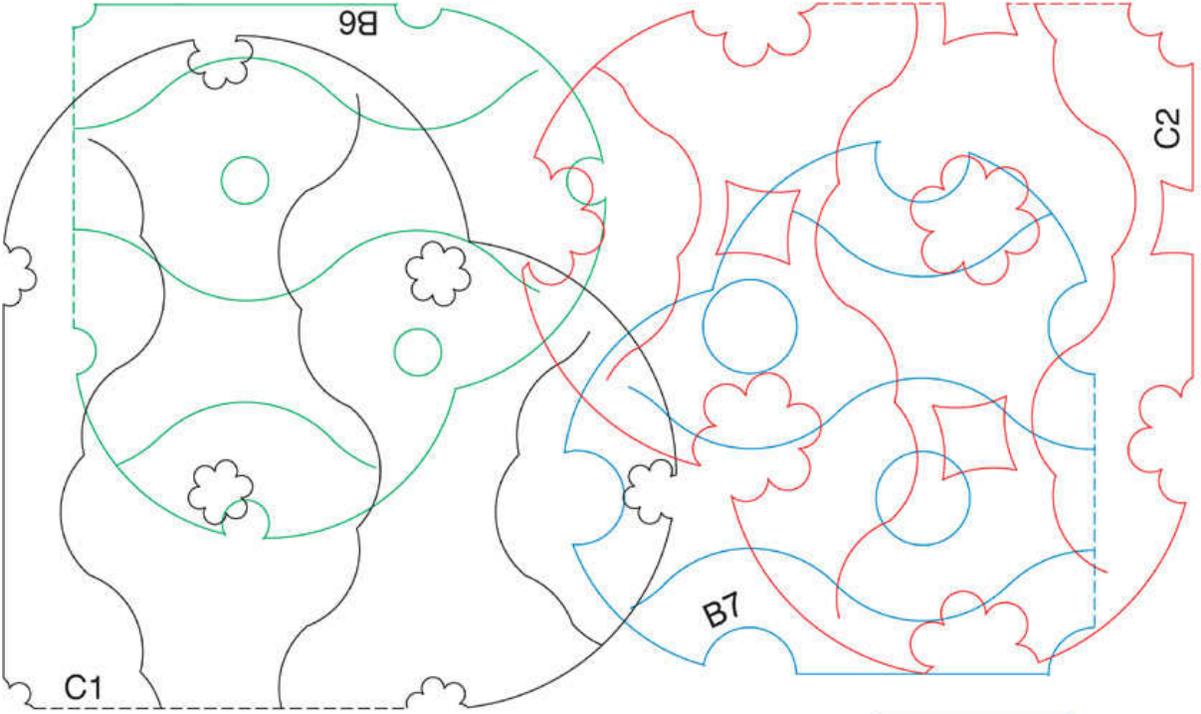
SCANNER & DIGITAL CUTTER

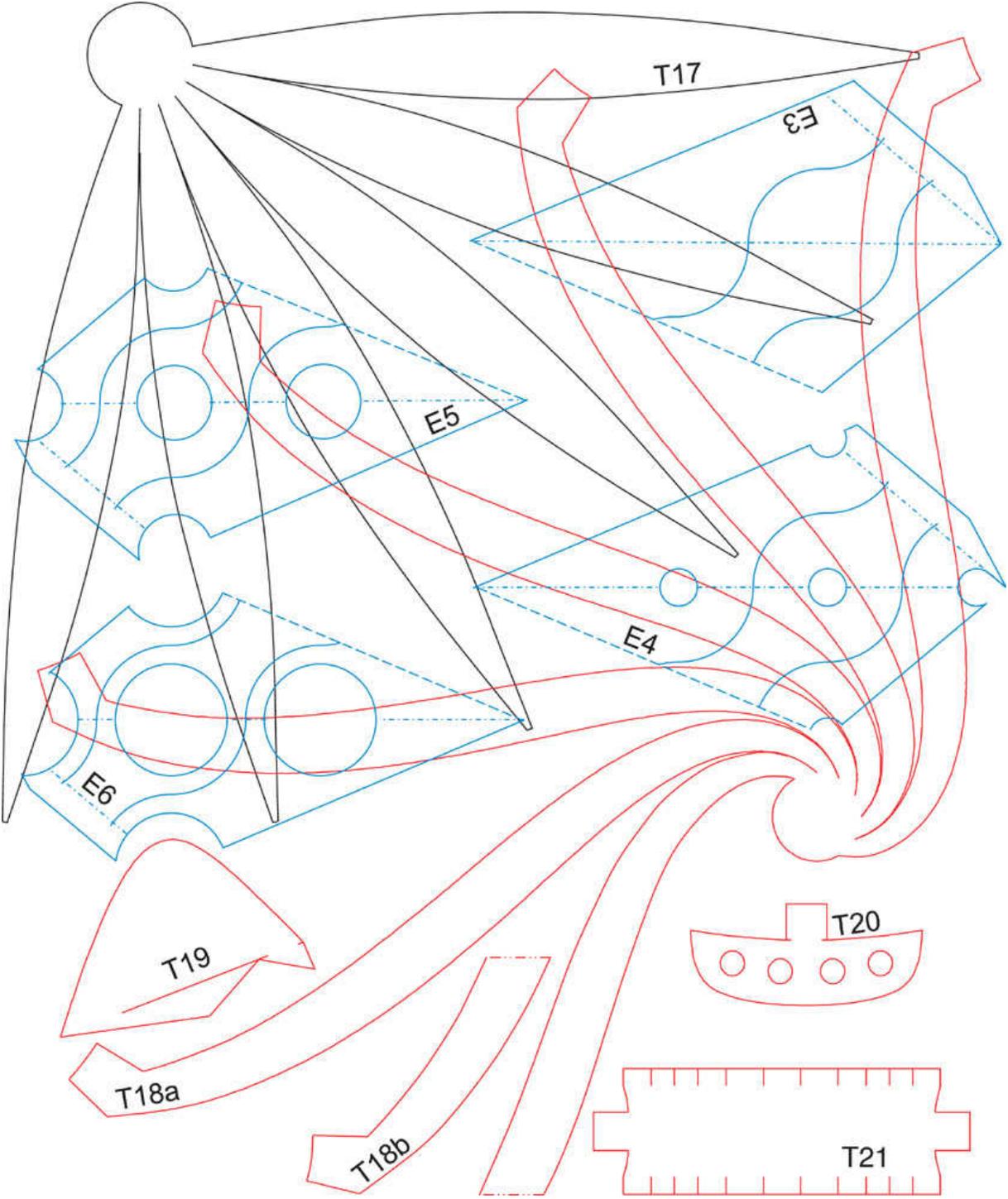
Some crafters are fortunate to have a digital cutter. The cutter works like a printer; however, the pen has been replaced with a small knife that cuts the paper instead of drawing onto it. The cutter is operated by a computer with specific software.

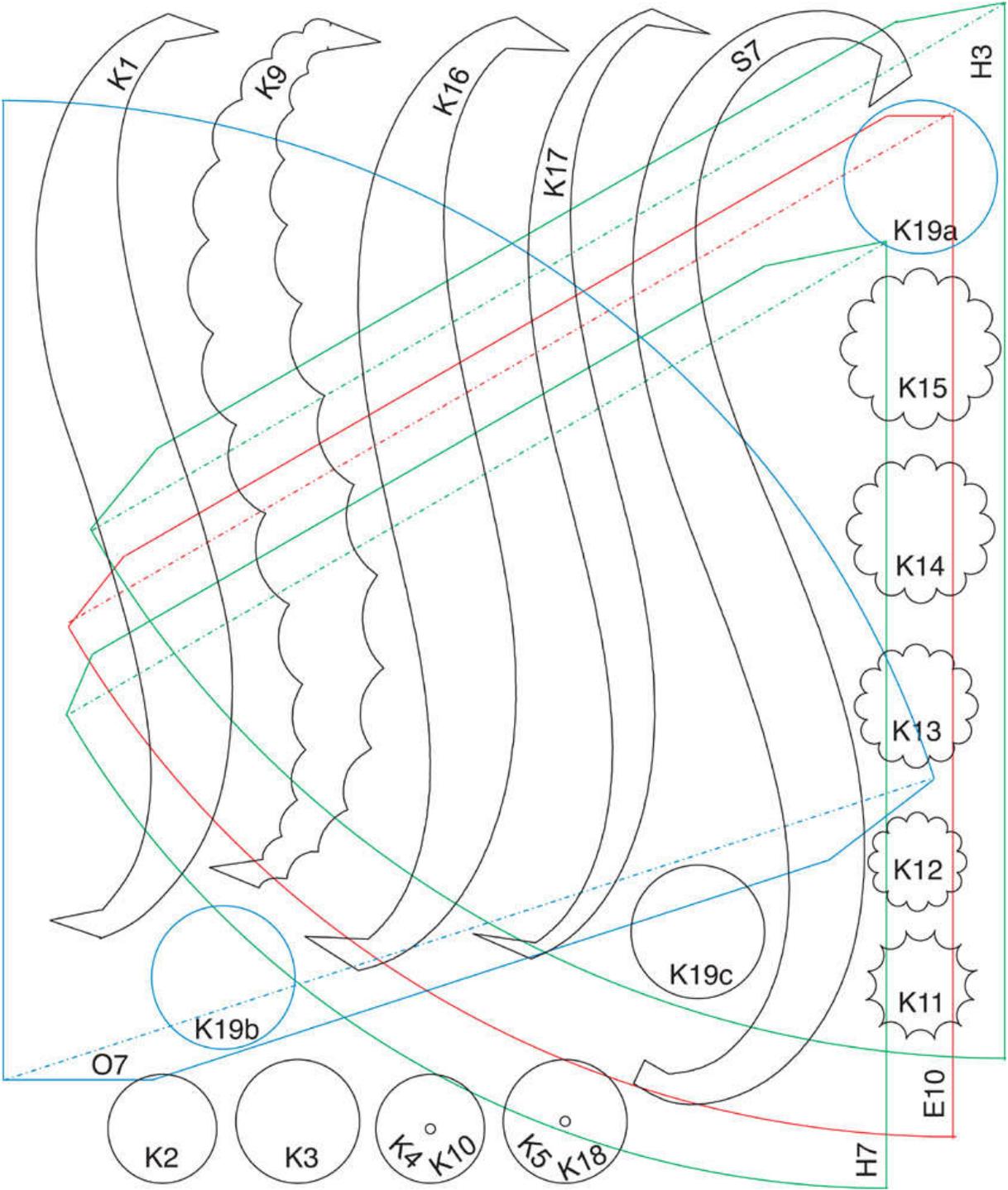
- ① Scan the pages with the templates you need. Make sure that the templates are not distorted.
- ② Use the software of the cutting machine to generate cut files from the scans. Figuring out the process that works for you and your cutting machine may take some effort, but once you know how, you may use the process for re-creating and cutting any template.
- ③ Feed your project paper into the cutting machine to cut out the parts and pieces.

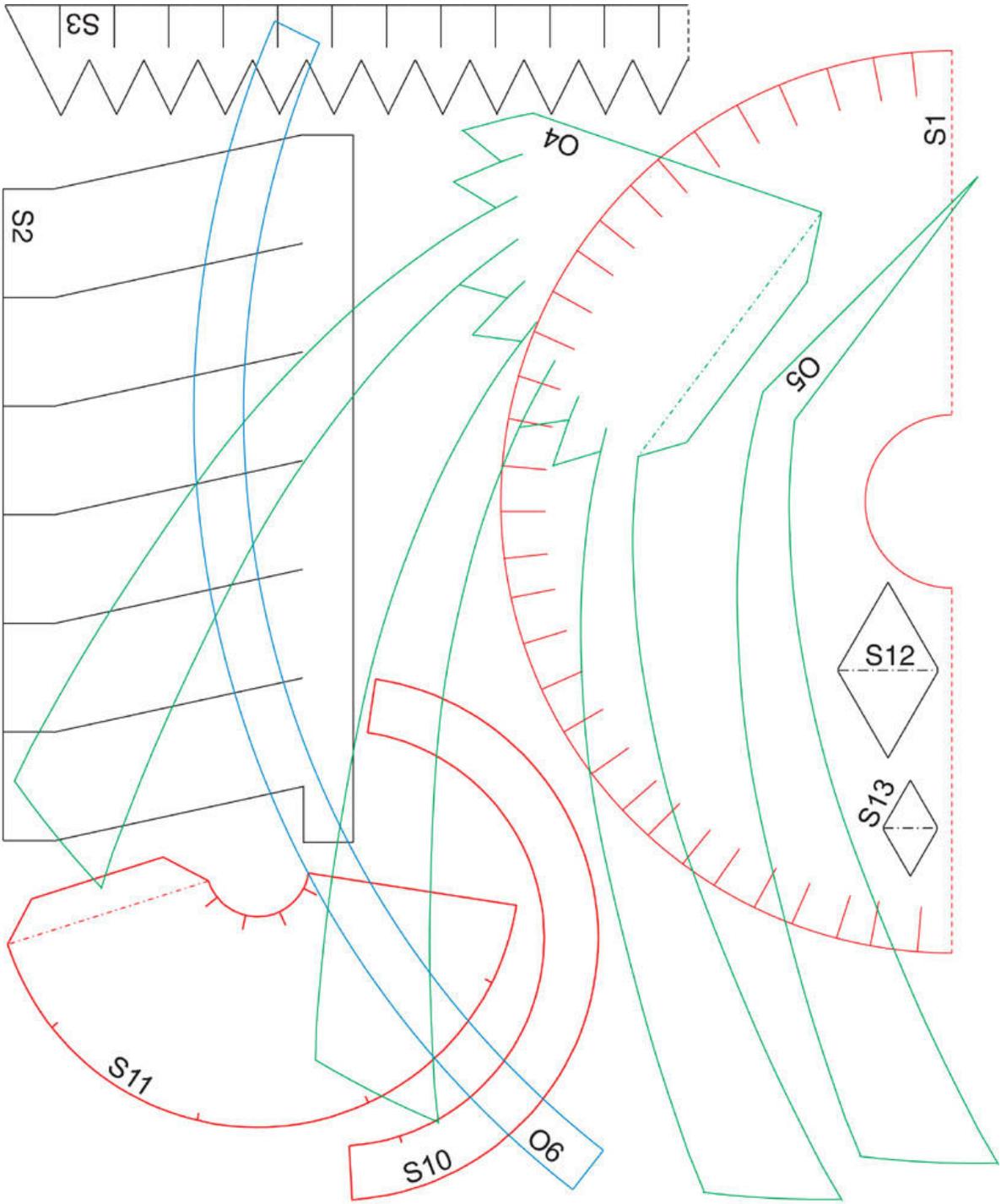


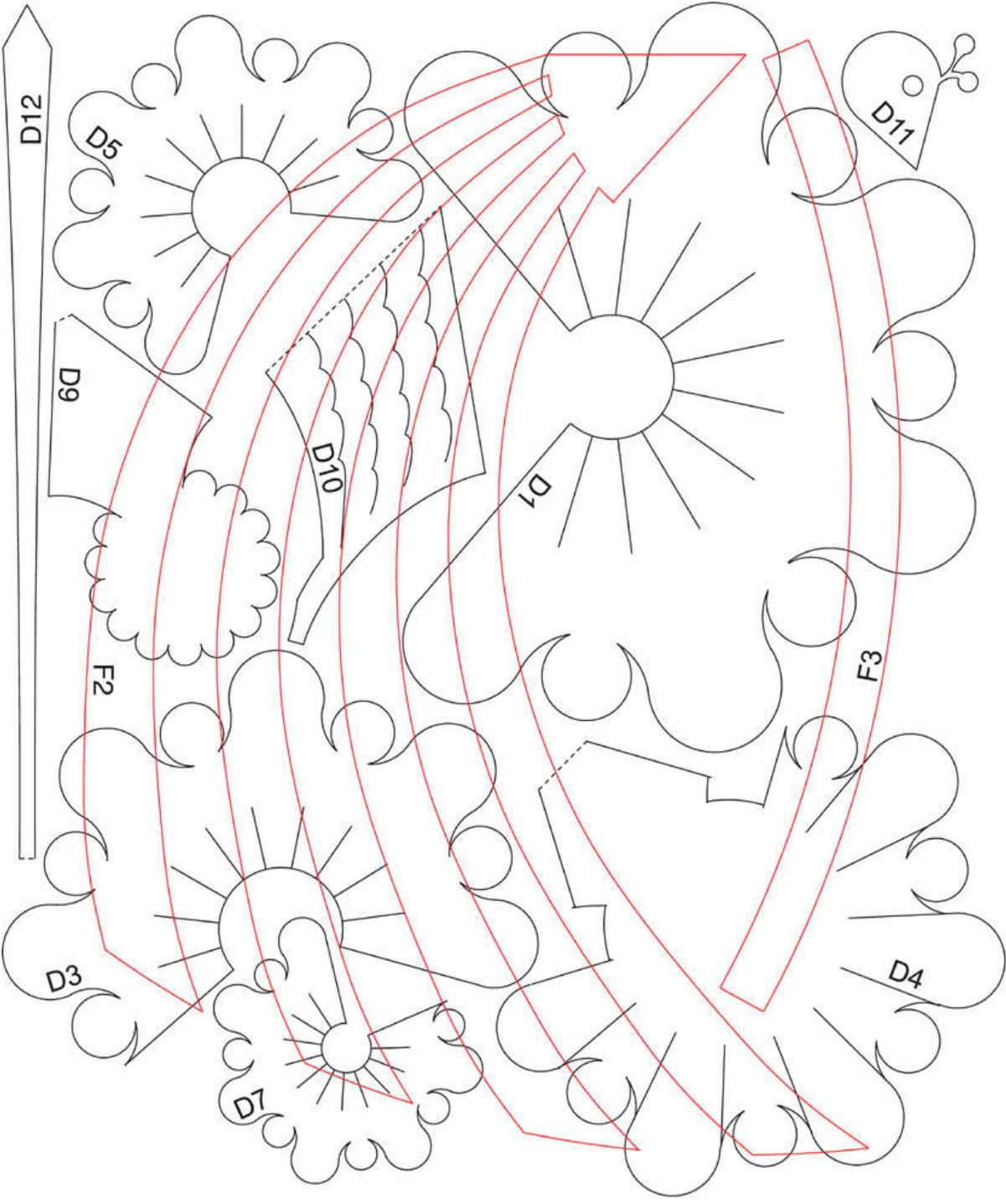


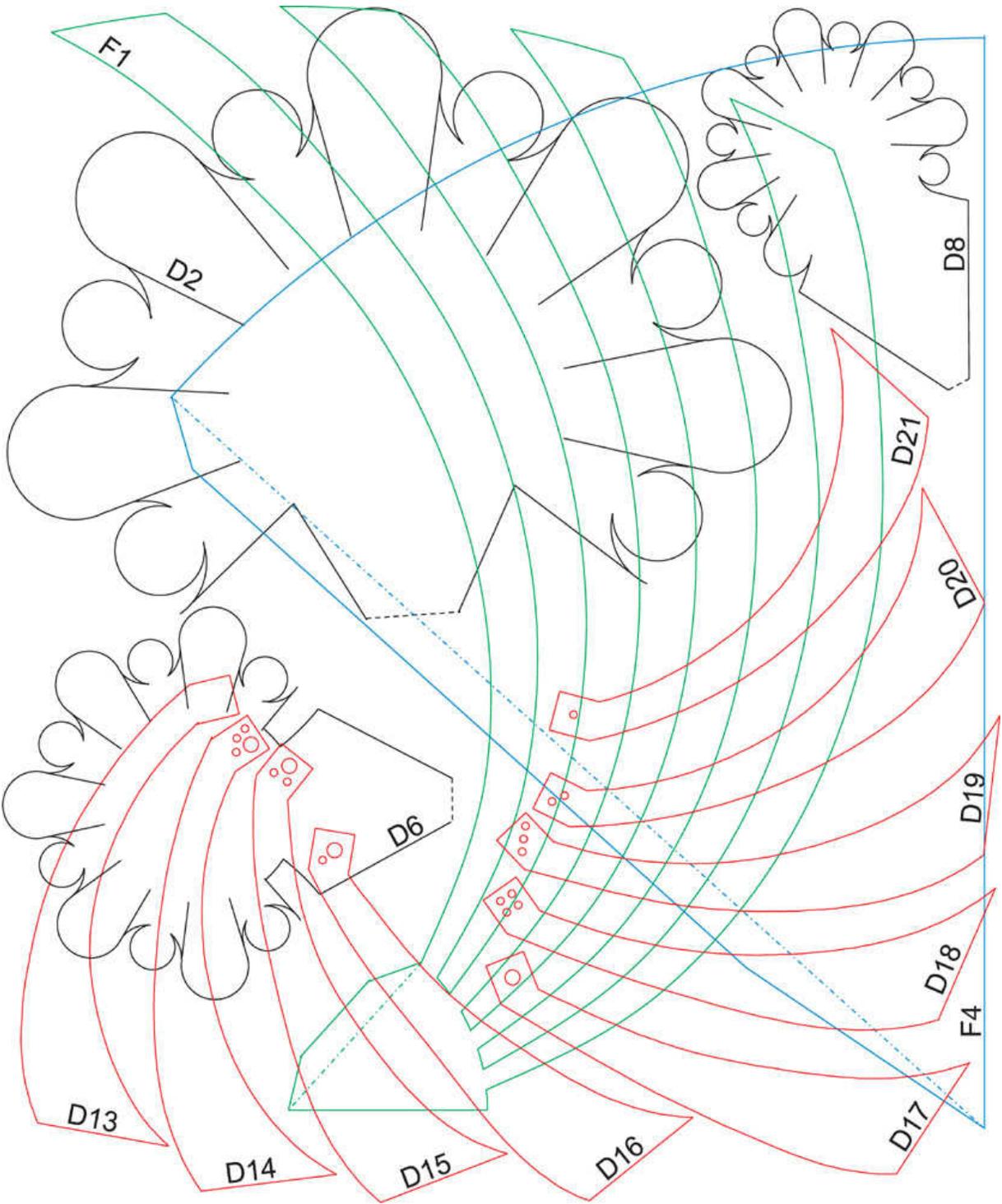


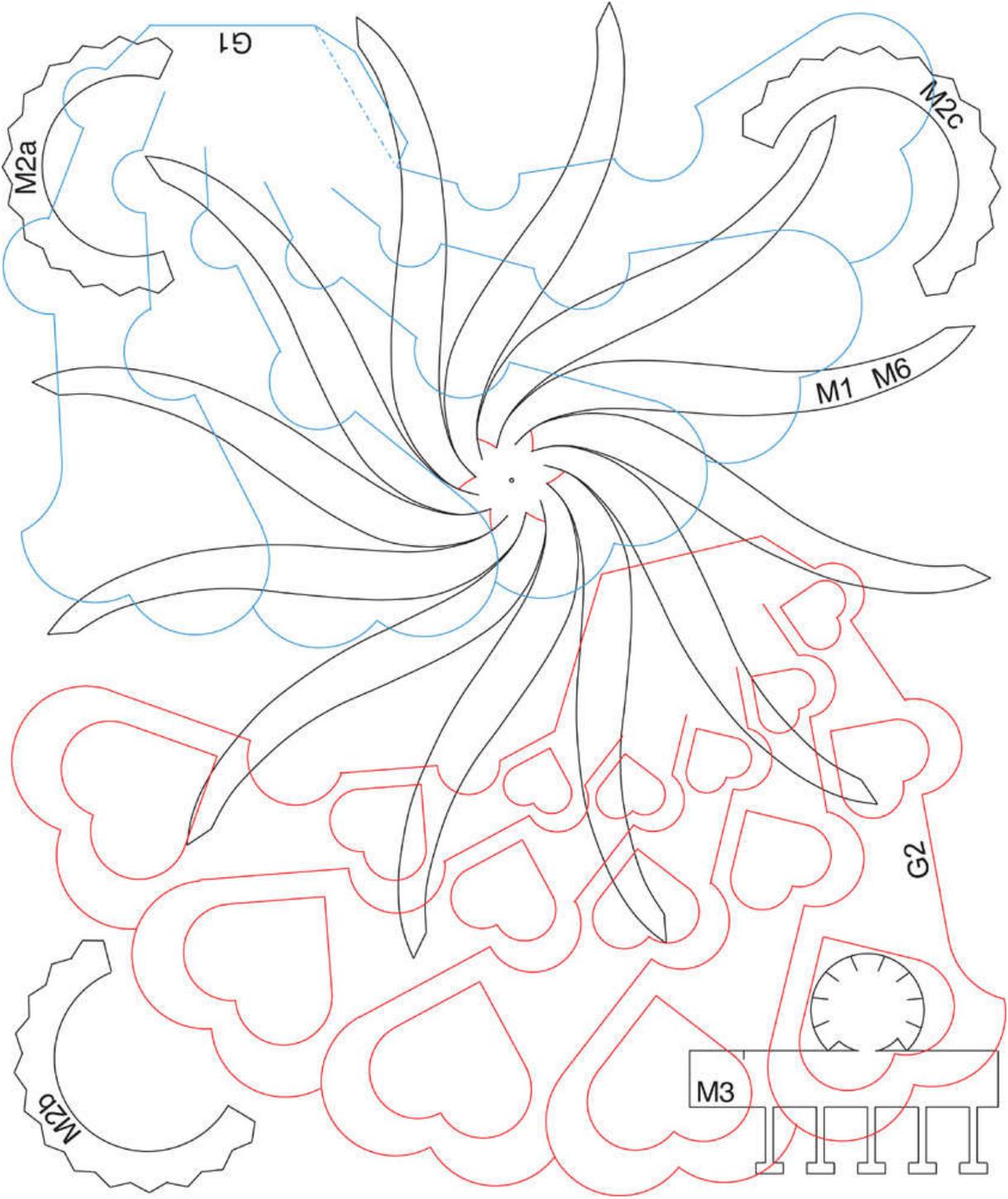


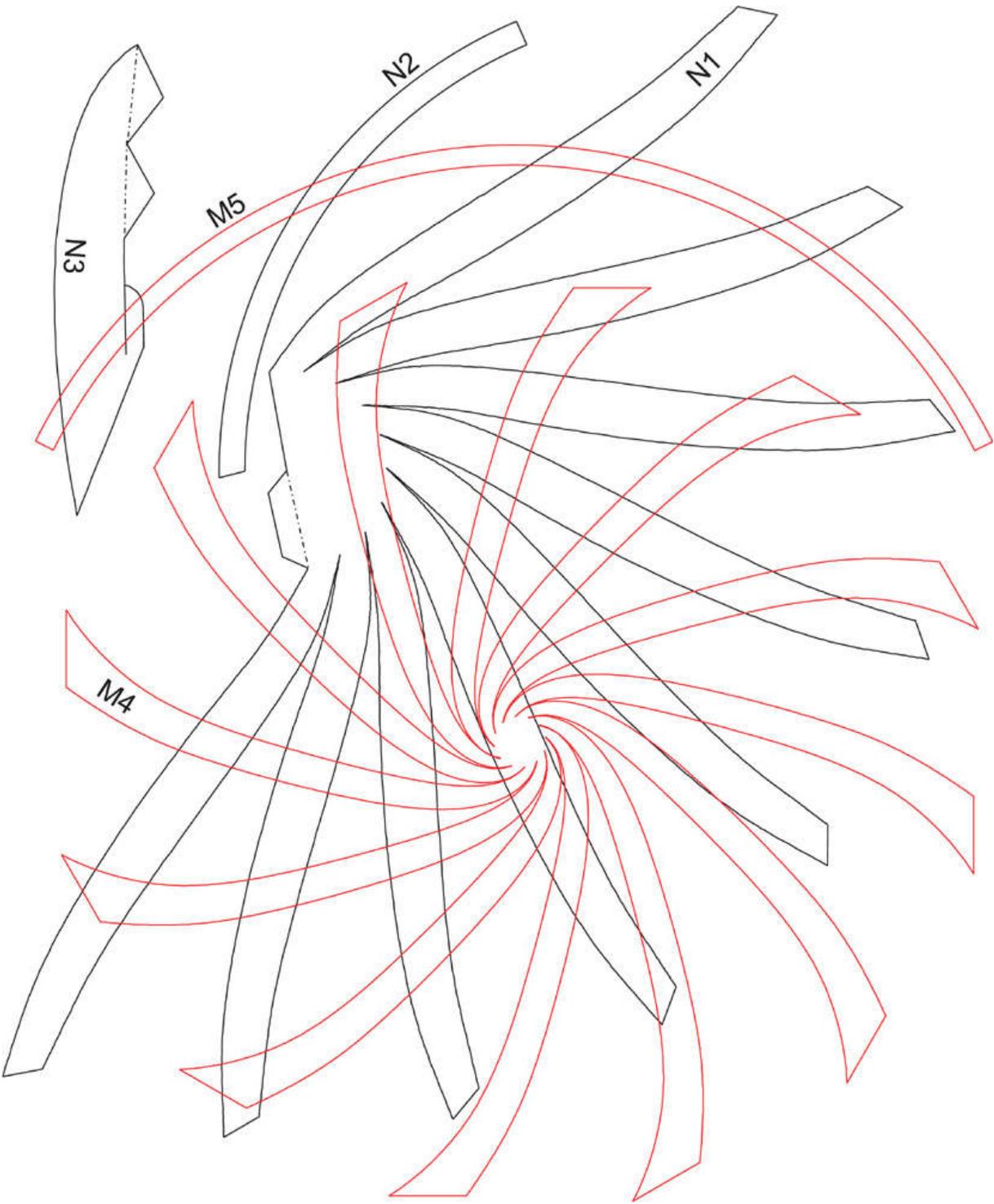


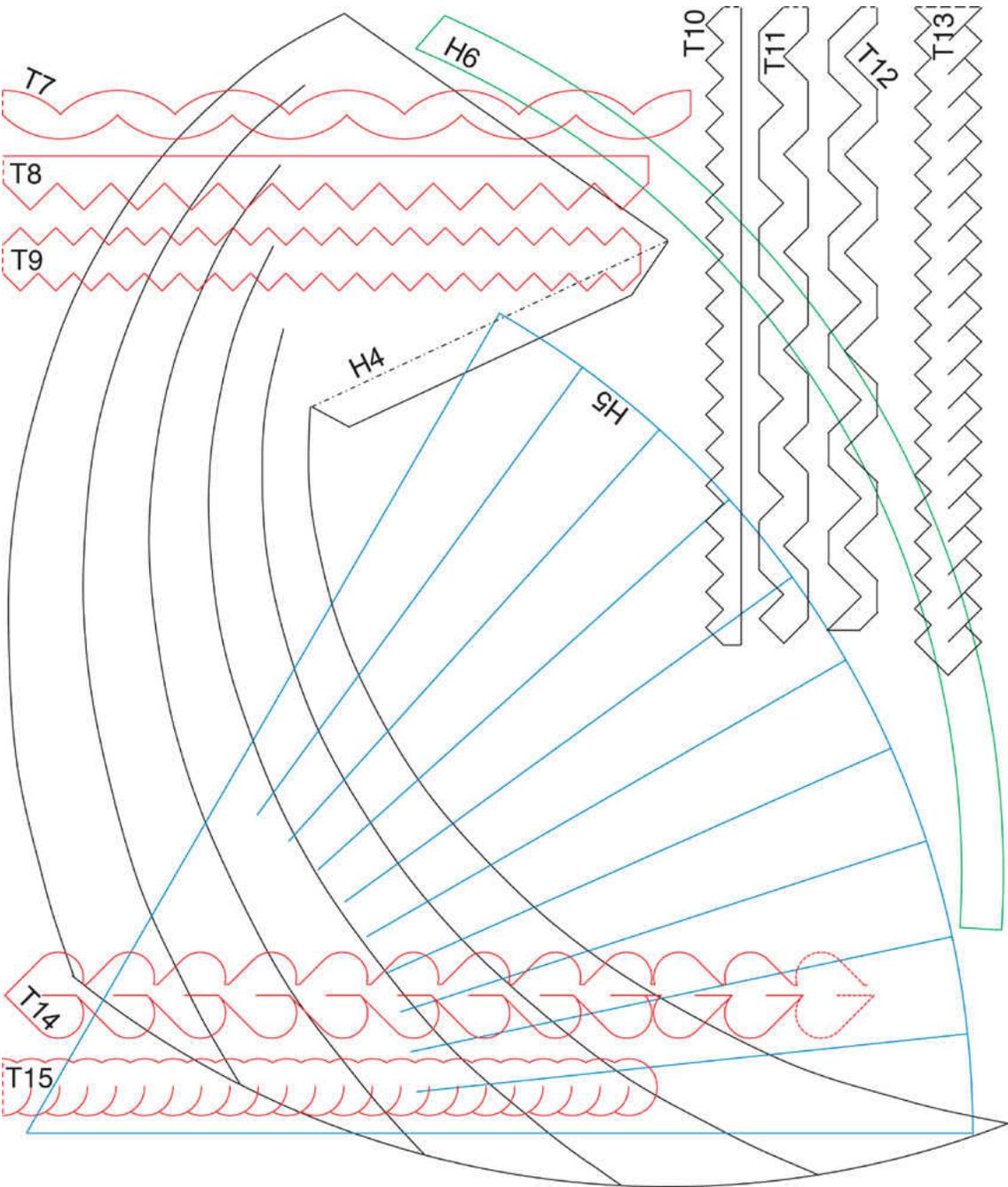


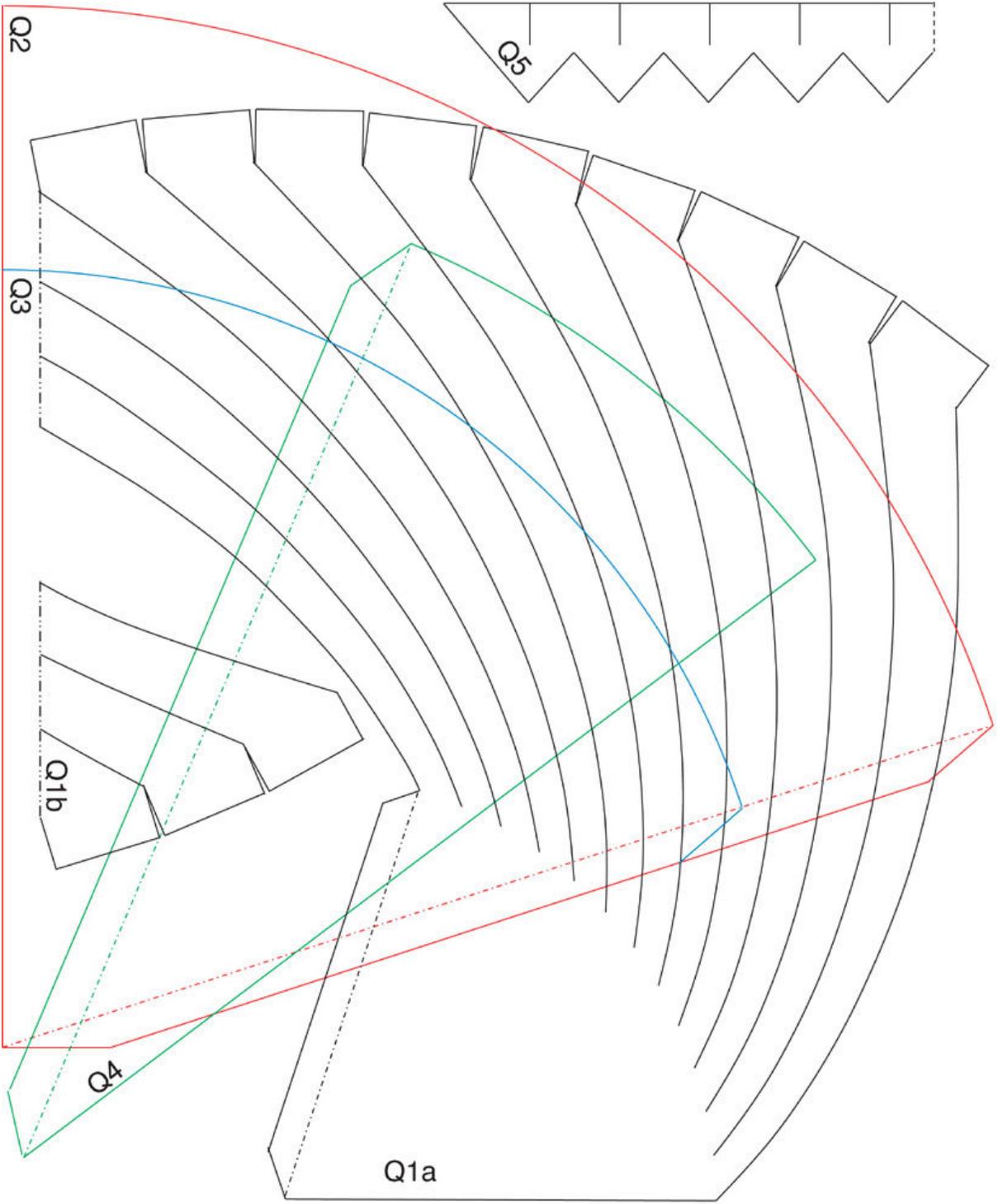


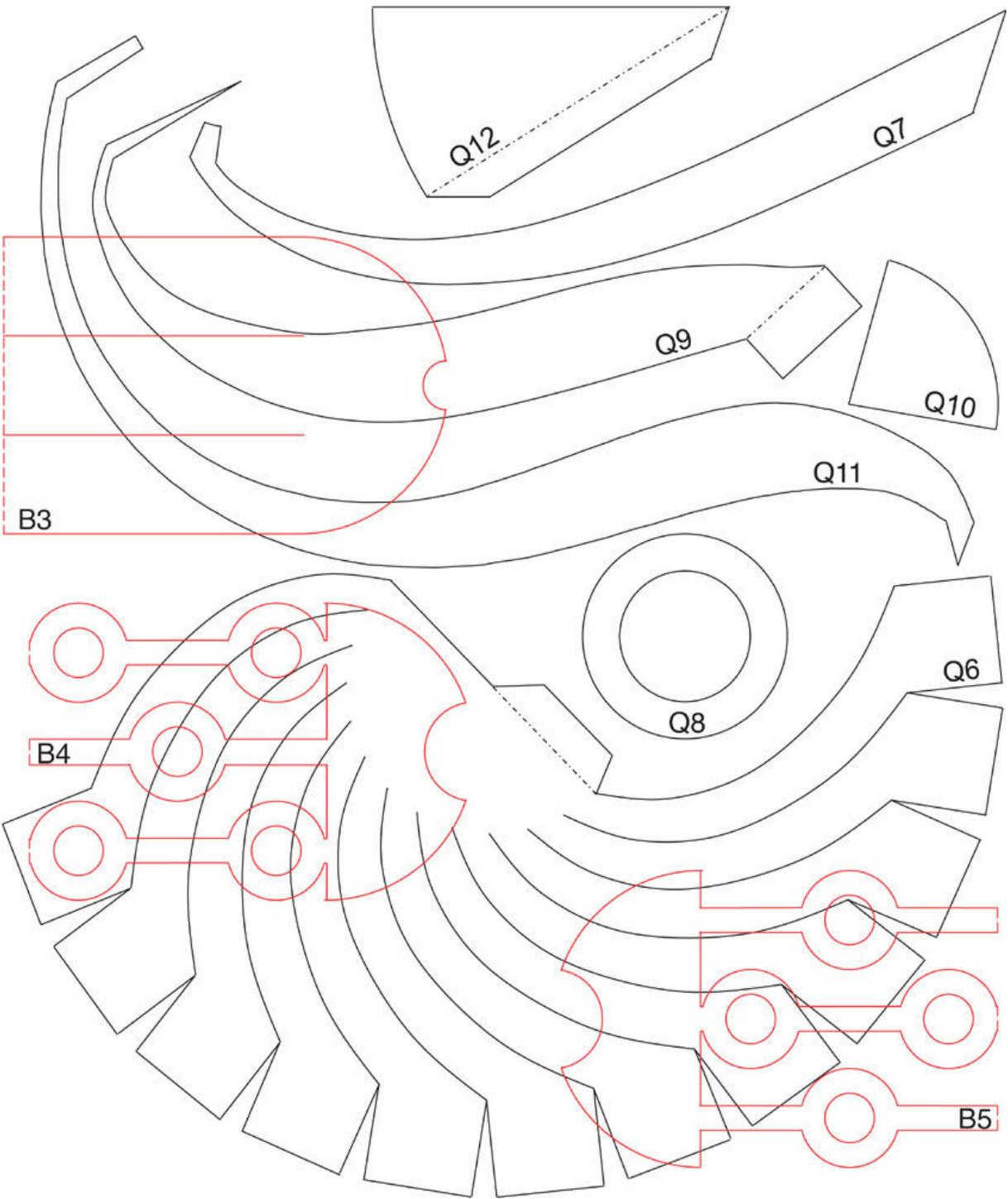


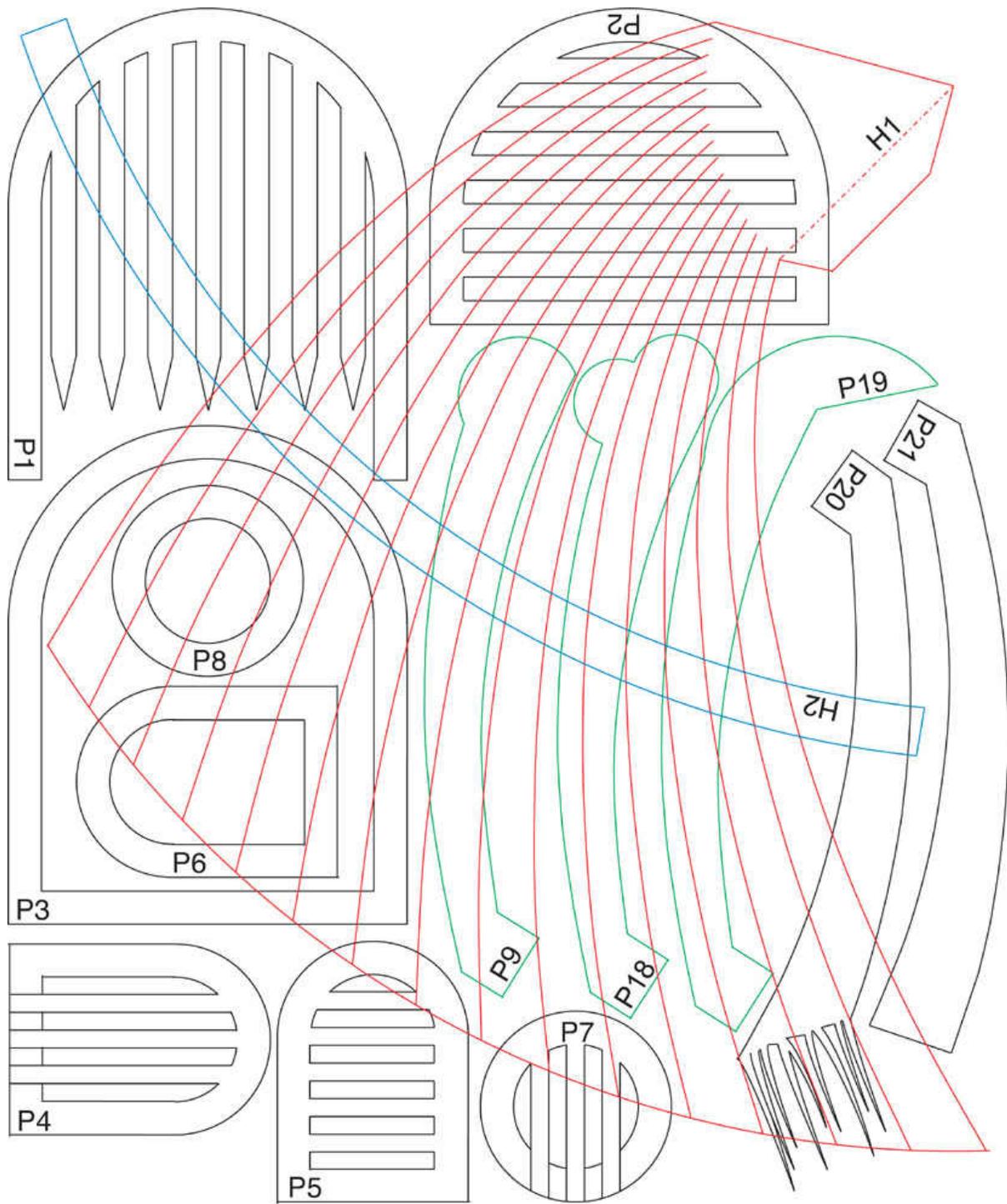


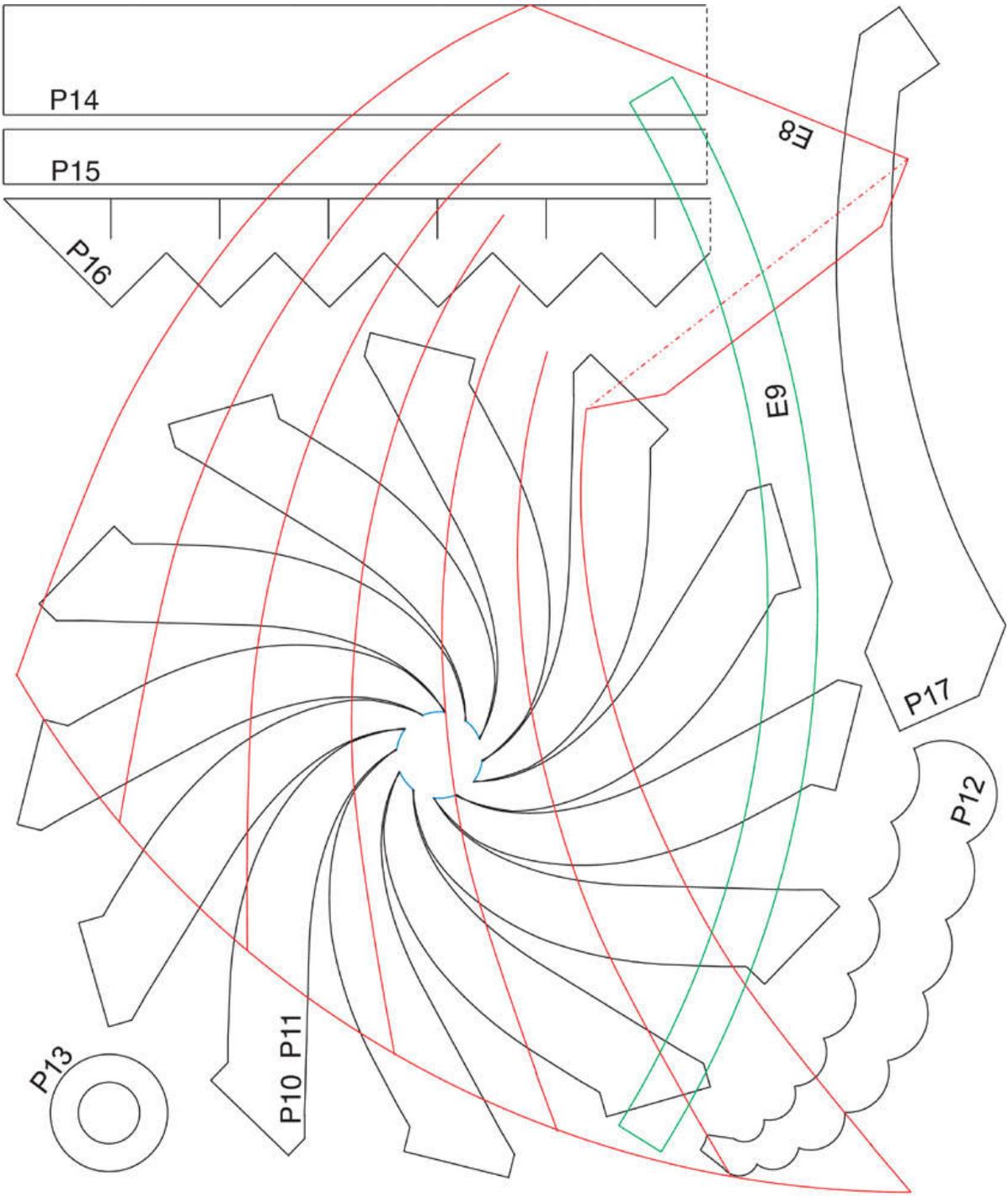




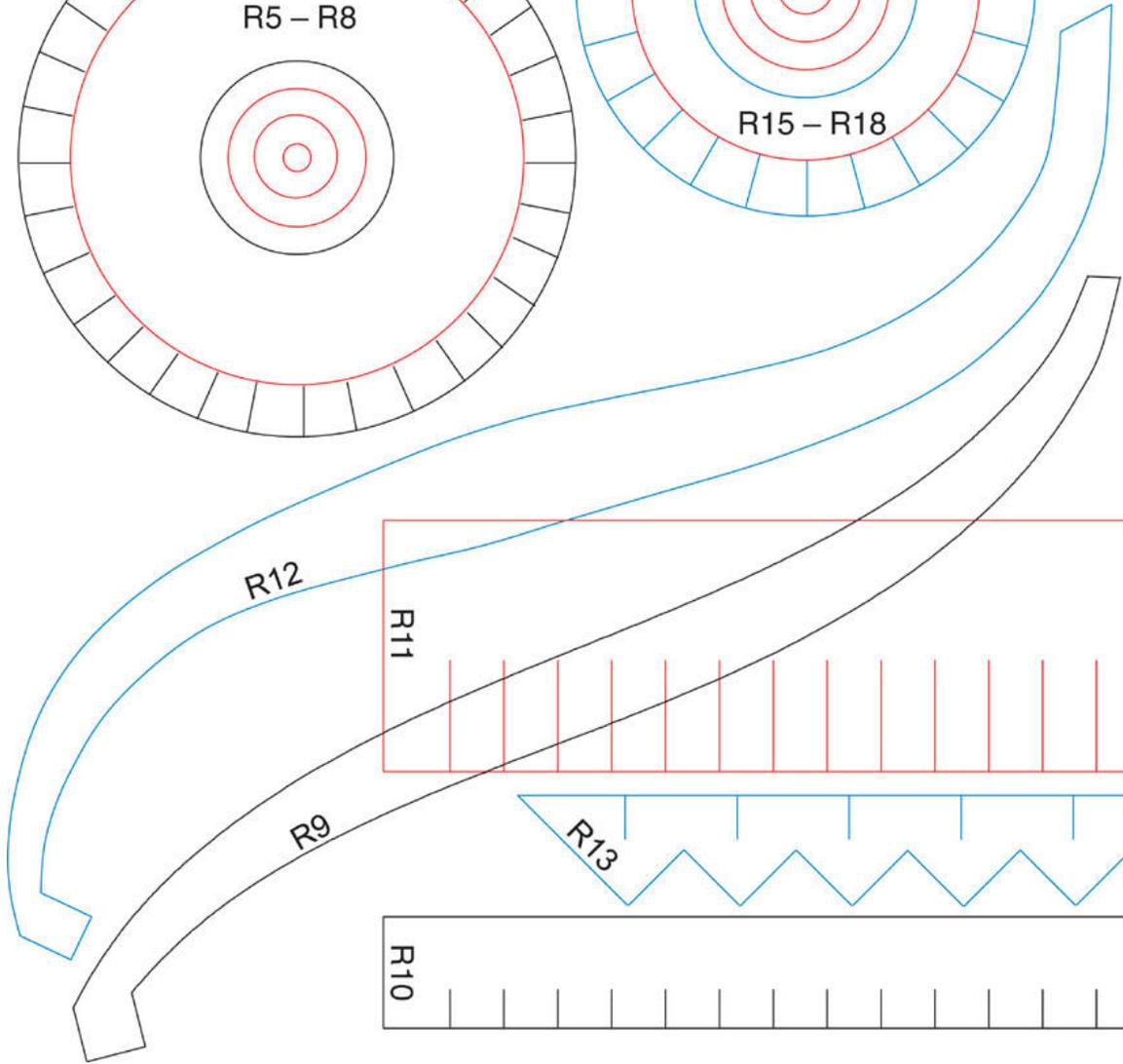
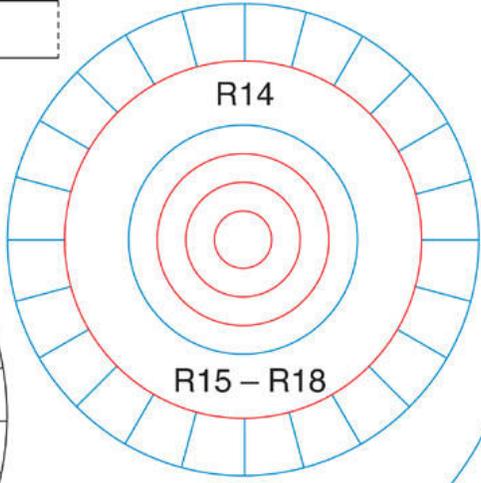
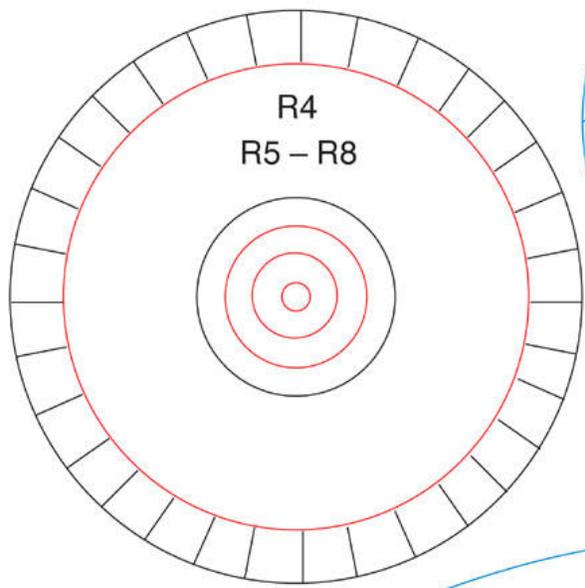


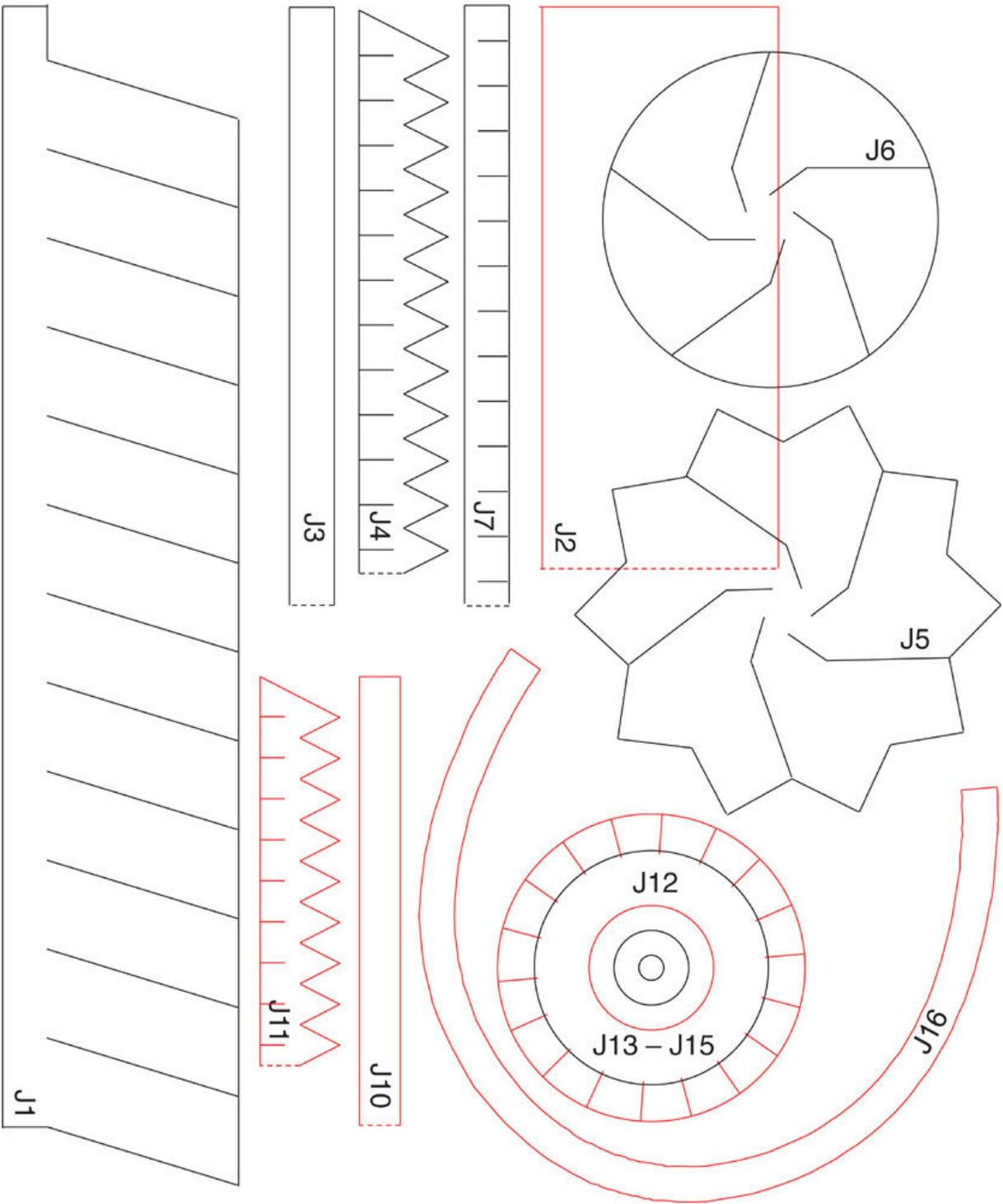


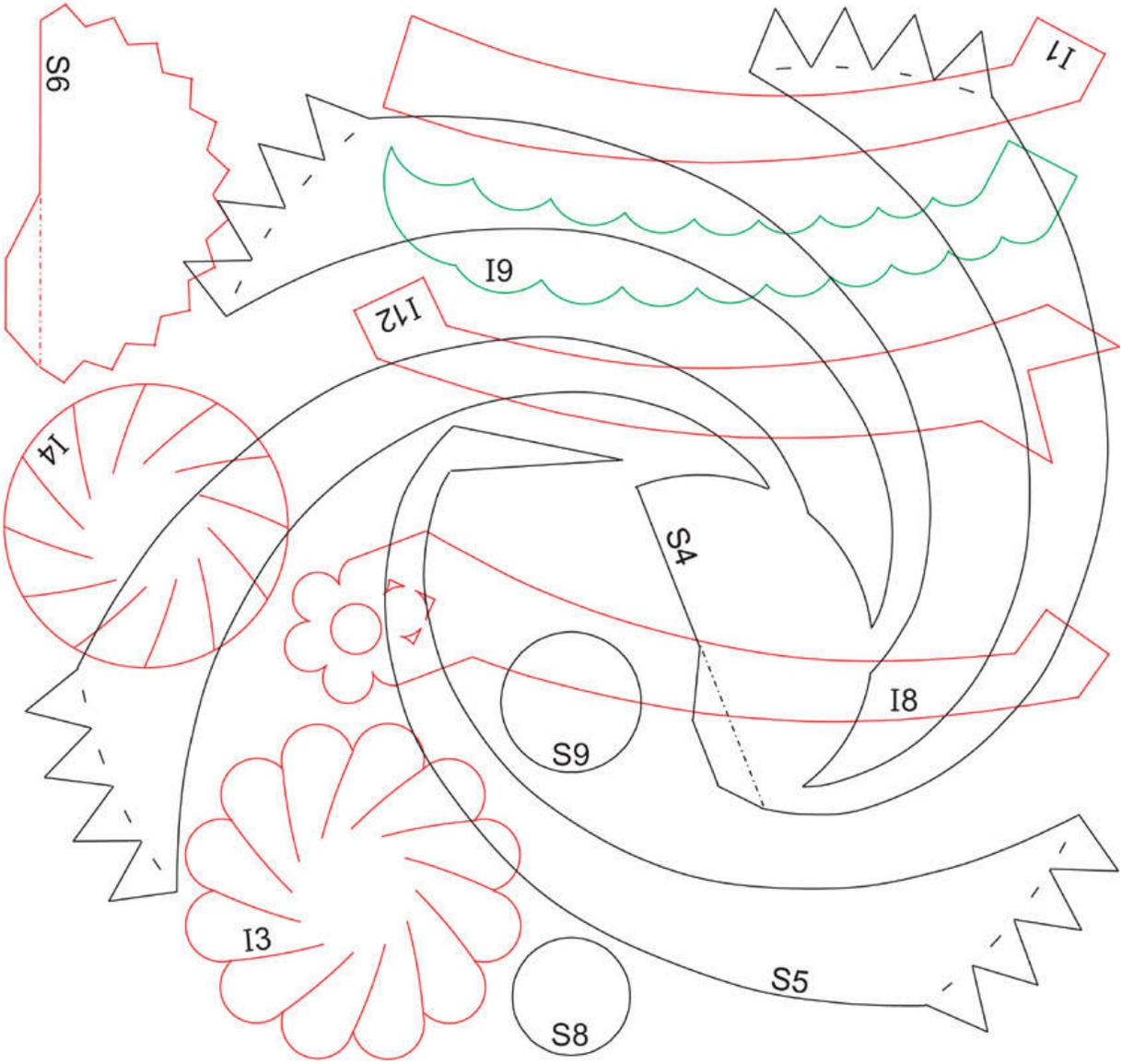
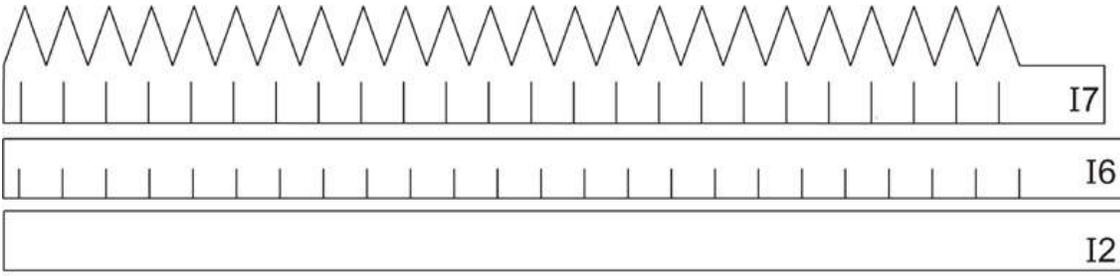




R19







ABOUT THE AUTHORS



PAPERMATRIX

Visit our blog, *PaperMatrix* (papermatrix.wordpress.com), to find sheets to print out as well as pdf (vector) files appropriate for generating files for digital cutters. On the blog, you will find some of the templates from this book, and there are many others, too.

ANNA SCHEPPER (Lene's daughter) graduated from London's Architectural Association School of Architecture (AA) in 2009 and now lives and works in Copenhagen. During her education, she focused on sustainability and new technologies within architecture, and, through her work, she has been involved in the design of the city's new Bicycle Snake Bridge, world renowned for its functionality and sculptural aesthetics. Twice she has presented sculptures at the Spring Exhibition at Charlottenborg Palace in Copenhagen.

Understanding the geometry of spatial volumes has been a theme throughout her studies and supported her development of 3-D items for the *PaperMatrix* blog with the use of advanced computer-aided design software.

LENE SCHEPPER has been fascinated since childhood with geometry, both in planes and space. She also has been an eager Christmas heart weaver and designer; however, only when the blog *PaperMatrix* (papermatrix.wordpress.com) was established in 2010 did weaving take a serious turn for her. Now she is *primus motor* (prime mover) behind the blog, where she and Anna steadily develop and test new weaving designs and ideas. Today, Lene lives in Copenhagen and is a chemical engineer with a Ph.D. in X-ray crystallography; in her professional life, she prepares risk analyses for infrastructure systems.

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INDEX

70–100 g/m² paper

Bell, [64–65](#)

Flower Heart, [48–49](#)

Heart with Circles, [78–79](#)

70–110 g/m² paper. *See* Heart with Circles Overlay, [46–47](#)

70–120 g/m² paper. *See* Hot Air Balloon, [68–69](#)

70–130 g/m² paper. *See* Cone Hat, [66–67](#)

80–100 g/m² paper

Heart in Hand, [42–45](#)

Star with Circles, [74–75](#)

80–110 g/m² paper

Candy Cane Cone, [76–77](#)

Checkered Cylinder Container, [111](#)

Cylinder Containers, [110–113](#)

Harlequin Cone, [92–93](#)

Large Scalloped Cylinder Container, [113](#)

Low Onion Dome, [108](#)

Onion Domes, [107–109](#)

Peacock, [90–91](#)

Rocket Ship, [80–81](#)

Rose Basket, [54–55](#)

Scalloped Cylinder Container, [112](#)

Tall Onion Dome, [108](#)

Triaxial Box, [126–127](#)

Triaxial Cone, [128–129](#)

Triaxial Sphere, [130–131](#)
80–130 g/m² paper
Basic Basket, [35–39](#)
Basic Cone, [28–31](#)
Basic Heart with Circles, [21–23](#)
Basic Star, [24–27](#)
Basic Triangle Bunting, [14–17](#)
Basic Woven Heart, [18–20](#)
Checkered Dome, [103](#)
Circus Tent, [86–87](#)
Domes & Cone Tops, [102–106](#)
Drum Cylinder Wall, [118](#)
Flattened Checkered Container, [117](#)
Flower Bunting, [60–61](#)
Fröbel Cone, [124–125](#)
Heart Bunting with Spirals, [62–63](#)
High Cone Top, [106](#)
Lampshade, [96–97](#)
Large Checkered Dome, [106](#)
Low Cone Top, [105](#)
Magic Circus, [82–85](#)
Scalloped Basket, [52–53](#)
Scalloped Dome, [104](#)
Simple Heart Bunting, [58–59](#)
Sphere with Spirals, [72–73](#)
Spherical Checkered Container, [114–116](#)
Star Drum, [82–85](#)
Zeppelin, [98–99](#)
80–150 g/m² paper. *See* Scalloped Sphere, [94–95](#)

80–200 g/m² paper. See Basic Sphere, [32–34](#)

Advanced Designs

Beautiful Edges, [134](#)

Colors & Patterns, [122–123](#)

Fröbel Cone, [124–125](#)

Handles, [132–133](#)

introduction to, [121](#)

Triaxial Box, [126–127](#)

Triaxial Cone, [128–129](#)

Triaxial Sphere, [130–131](#)

Andersen, Hans Christian, [6](#), [7](#), [89](#)

Austria, [6](#)

Basic Basket

bottom assembly, [38](#)

bottom face, [37](#)

bottom sides, [38](#)

handle, [39](#)

interior, [39](#)

lower edge, [37](#)

materials, [35](#)

paper weight, [35](#)

sides, [36](#)

templates, [35](#), [148](#), [156](#)

tools, [35](#)

weaving, [36–39](#)

Basic Cone

materials, [28](#)

templates, [28](#), [141](#), [152](#)

tools, [28](#)
weaving, [29–31](#)

Basic Heart with Circles

materials, [21](#)
templates, [21](#), [139](#)
weaving, [22–23](#)

Basics

Basic Basket, [35–39](#)
Basic Cone, [28–31](#)
Basic Heart with Circles, [21–23](#)
Basic Sphere, [32–34](#)
Basic Star, [24–27](#)
Basic Triangle Buntings, [14–17](#)
Basic Woven Heart, [18–20](#)
introduction to, [9](#)

Basic Sphere

materials, [32](#)
sizing, [32](#)
templates, [32](#), [141](#)
tools, [32](#)
weaving, [33–34](#)

Basic Star

alternate finish, [27](#)
materials, [24](#)
templates, [24](#), [147](#)
tools, [24](#)
weaving, [25–27](#)

Basic Triangle Buntings

materials, [14](#)

sliding, [17](#)
templates, [14](#), [137](#)
weaving around a center, [16](#)
weaving in rows [15](#)

Basic Woven Heart

materials, [18](#)
templates, [18](#), [137](#)
tools, [18](#)
weaving, [19–20](#)

Beautiful Edges. *See* Edges.

Bell

materials, [64](#)
templates, [64](#), [146](#)
tools, [64](#)
weaving, [64](#)

Biedermeier period, [7](#)

calipers, [11](#)

Candy Cane Cone

materials, [76](#)
templates, [76](#), [143](#), [144](#)
tools, [76](#)
weaving, [77](#)

Carstensen, Georg, [89](#)

Celebrations

Bell, [64–65](#)
Cone Hat, [66–67](#)
Flower Bunting, [60–61](#)
Heart Bunting with Spirals, [62–63](#)

Hot Air Balloon, [68–69](#)

introduction to, [57](#)

Simple Heart Bunting, [58–59](#)

Checkered Cylinder Container

materials, [110](#)

templates, [111](#), [152](#), [153](#), [154](#)

tools, [110](#)

weaving, [111](#)

Checkered Dome

Edge 1 (Simple), [103](#)

Edge 2, with a Zigzag Stripe, [103](#)

templates, [103](#), [152](#)

tools, [103](#)

weaving, [103](#)

Circus Tent

container, [87](#)

materials, [86](#)

templates, [86](#), [142](#), [152](#), [154](#), [156](#)

tools, [86](#)

top, [87](#)

weaving, [87](#)

colors

Advanced Designs, [122–123](#)

paper, [12](#), [13](#)

computers, [11](#)

Cone Hat

materials, [66](#)

templates, [66](#), [147](#)

tools, [66](#)

craft knives, [11](#)

Curved-Strip Handles, [132](#)

Cute Hearts Cone

templates, [50](#), [145](#)

tools, [50](#)

weaving, [50](#)

cutting machines, [11](#), [136](#)

Cylinder Containers

Checkered Cylinder Container, [111](#)

Large Scalloped Cylinder Container, [113](#)

Scalloped Cylinder Container, [112](#)

Denmark, [4](#), [6](#), [7](#), [89](#)

digital cutting machines, [11](#), [136](#)

Domes & Cone Tops

Checkered Dome, [103](#)

High Cone Top, [106](#)

Large Checkered Dome, [106](#)

Low Cone Top, [105](#)

Scalloped Dome, [104](#)

Drum Cylinder Wall

materials, [118](#)

templates, [118](#), [142](#), [152](#), [154](#)

tools, [118](#)

Edges

Basic Basket, [37](#)

Checkered Dome, [103](#)

Large Checkered Dome, [106](#)

Low Cone Top, [105](#)

Scalloped Dome, [104](#)
templates, [134](#), [151](#), [152](#), [156](#)

Exotic Palace

Checkered Cylinder Container, [111](#)
Checkered Dome, [103](#)
Cylinder Containers, [110](#)–[113](#)
Domes & Cone Tops, [102](#)–[106](#)
Drum Cylinder Wall, [118](#)
Flat Checkered Container, [117](#)
High Cone Top, [106](#)
introduction to, [101](#)
Large Checkered Dome, [106](#)
Large Scalloped Cylinder Container, [113](#)
Low Cone Top, [105](#)
Low Onion Dome, [108](#)
Onion Domes, [107](#)–[109](#)
Palace Door, [119](#)
Palace Portcullis, [119](#)
Palace Walls, [119](#)
Palace Window, [119](#)
Scalloped Cylinder Container, [112](#)
Scalloped Dome, [104](#)
Shaped Containers, [114](#)–[117](#)
Simple Cylinder Walls & Containers, [119](#)
Spherical Checkered Container, [114](#)–[116](#)
Tall Onion Dome, [109](#)

Flattened Checkered Container
materials, [117](#)

templates, [117](#), [154](#)

tools, [117](#)

weaving, [117](#)

Flower Bunting

materials, [60](#)

templates, [60](#), [138](#)

Flower Heart

materials, [48](#)

templates, [48](#), [139](#)

Fröbel Cone

materials, [124](#)

templates, [124](#), [141](#), [151](#)

tools, [124](#)

weaving, [125](#)

Fröbel, Friedrich, [7](#), [121](#)

Germany, [6](#), [7](#), [121](#)

glazed paper, [13](#)

glue, [11](#), [13](#)

Goethe, Johann Wolfgang von, [7](#)

Gundermann, Jesper, [7](#)

Handles

Basic Basket, [39](#)

Curved Strips, [132](#)

Rose Basket, [55](#)

Sliding Circles, [133](#)

Sliding Hearts, [133](#)

Sliding Square Strips, [133](#)

Small Hearts, [133](#)

Straight Strips, [132](#)
templates, [148](#), [153](#)
Three Twisted Zigzag Strips, [133](#)
Three Zigzag Strips, [133](#)
Twisted Half-Circles, [132](#)
Twisted Quarter Circles, [132](#)
Two Twisted Zigzag Strips, [132](#)
Two Zigzag Strips, [132](#)

Harlequin Cone

materials, [92](#)
templates, [92](#), [141](#), [142](#)
tools, [92](#)
weaving, [93](#)

HB pencils, [10](#)

Heart Bunting with Spirals

materials, [62](#)
templates, [62](#), [137](#)
weaving, [62–63](#)

Heart in Hand

materials, [42](#)
templates, [42](#), [137](#), [138](#)
tools, [42](#)
weaving, [43–45](#)

Heart with Circles

materials, [79](#)
templates, [79](#), [139](#)
weaving, [79](#)

Heart with Circles Overlay

materials, [46](#)

templates, [46](#), [150](#)

tools, [46](#)

High Cone Top

materials, [103](#)

templates, [106](#), [149](#), [152](#)

tools, [103](#)

weaving, [106](#)

Hot Air Balloon

materials, [68](#)

mobile, [68–69](#)

swirling stripes, [68](#)

templates, [68](#), [145](#)

tools, [68](#)

weaving, [68–69](#)

Japanese paper, [13](#)

Jardin de Tivoli, [89](#)

Koch, Hans Henrik, [7](#)

Lampshade

materials, [96](#)

templates, [96](#), [137](#)

tools, [96](#)

weaving, [96](#)

Large Checkered Dome

Edge 7 (Triangles), [106](#)

materials, [103](#)

templates, [106](#), [150](#), [152](#)

tools, [103](#)

weaving, [106](#)

Large Scalloped Cylinder Container, [113](#)

materials, [110](#)

templates, [113](#), [142](#), [152](#), [153](#), [154](#)

tools, [110](#)

weaving, [113](#)

Love & Friendship

Cute Hearts Cone, [50–51](#)

Flower Heart, [48–49](#)

Heart in Hand, [42–45](#)

Heart with Circles Overlay, [46–47](#)

introduction to, [41](#)

Rose Basket, [54–55](#)

Scalloped Basket, [52–53](#)

Low Cone Top

Edge 5 (Wide Monochrome), [105](#)

Edge 6 (Wide with Zigzag Stripe), [105](#)

materials, [103](#)

templates, [105](#), [150](#), [152](#)

tools, [103](#)

weaving, [105](#)

Low Onion Dome

connecting to base, [109](#)

materials, [107](#)

templates, [108](#), [149](#), [150](#), [152](#)

tools, [107](#)

weaving, [108](#)

Magic Circus

Candy Cane Cone, 76–77
Circus Tent, 86–87
Heart with Circles, 78–79
introduction to, 71
Rocket Ship, 80–81
Sphere with Spirals, 72–73
Star Drum, 82–85
Star with Circles, 74–75
May, Leslie S., 7, 41
metallic paper, 13
 Cute Hearts Cone, 50

needles, 10
“Nightingale, The” (Hans Christian Andersen), 89
Norway, 4

Onion Domes
 Low Onion Dome, 108
 Tall Onion Dome, 109
origin, 6

Palace Door, 119, 151
Palace Portcullis, 119, 151
Palace Walls, 119
Palace Window, 119, 151
Pantomimeteatret, 89
paper. *See also metric measurements.*
 colors of, 12, 13
 glazed paper, 13
 Japanese paper, 13

- metallic paper, [13](#)
- patterns on, [13](#)
- purchasing, [12–13](#)
- quality of, [12](#)
- scraps, [11](#)
- tracing paper, [135](#)
- transparent paper, [13](#)
- weight of, [12](#)
- wrapping paper, [13](#)

paper clips, [10](#)

paper trimmers, [11](#)

patterned paper, [13](#)

Peacock

- basket, [90](#)
- materials, [90](#)
- tail fan, [91](#)
- templates, [90](#), [143](#), [144](#)
- weaving, [90–91](#)

pencils, [10](#)

photocopiers, [11](#), [136](#)

Pretty Handles. *See* Handles.

printers, [11](#)

Rocket Ship

- materials, [80](#)
- templates, [80](#), [146](#)
- tools, [80](#)
- weaving, [81](#)

Romanticism, [7](#)

Rose Basket

handle, [55](#)

materials, [54](#)

templates, [54](#), [144](#), [153](#), [155](#)

tools, [54](#)

weaving, [55](#)

rulers, [11](#)

Scalloped Basket

materials, [52](#)

templates, [52](#), [153](#), [156](#)

tools, [52](#)

Scalloped Cylinder Container

materials, [110](#)

templates, [112](#), [152](#), [153](#), [154](#)

tools, [110](#)

weaving, [112](#)

Scalloped Dome

Edge 3 (Scalloped), [104](#)

materials, [103](#)

templates, [104](#), [152](#)

tools, [103](#)

weaving, [104](#)

Scalloped Sphere

freestyle weaving, [94](#), [95](#)

materials, [94](#)

polystyrene sphere weaving, [94](#), [95](#)

scaling, [95](#)

templates, [94](#), [141](#)

- tools, [94](#)
- weaving, [95](#)
- scalpels, [11](#)
- scanners, [136](#)
- scissors, [10](#)
- scrap paper, [11](#)
- Shaped Containers
 - Flattened Checkered Container, [117](#)
 - Spherical Checkered Container, [114–116](#)
- silhouette scissors, [10](#)
- Simple Cylinder Walls & Containers, [119](#)
- Simple Heart Bunting
 - materials, [58](#)
 - templates, [58](#), [137](#)
 - weaving, [59](#)
- sliding, [17](#)
- Sliding Circle Handles, [133](#)
- Sliding Heart Handles, [133](#)
- Sliding Square-Strip Handles, [133](#)
- Small Heart Handles, [133](#)
- Sphere with Spirals
 - materials, [72](#)
 - templates, [72](#), [141](#)
 - tools, [72](#)
 - weaving, [73](#)
- Spherical Checkered Container
 - materials, [114](#)
 - templates, [114](#), [152](#), [154](#)
 - tools, [114](#)

weaving, 115–116

Star Drum

assembly, 85

cylinder, 83–84

drumheads, 84–85

materials, 83

templates, 83, 155

tools, 83

weaving, 83–85

Star with Circles

materials, 74

templates, 74, 140

tools, 74

weaving, 75

straight pins, 10

Straight-Strip Handles, 132

surgical scissors, 10

Switzerland, 6

table knives, 11

Tall Onion Dome

connecting to base, 109

materials, 107

templates, 109, 149, 150, 154

tools, 107

weaving, 109

templates

Basic Basket, 35, 148, 156

Basic Bunting Triangles, 14, 137

Basic Cone, [28](#), [141](#), [152](#)
Basic Heart with Circles, [21](#), [139](#)
Basic Sphere, [32](#), [141](#)
Basic Star, [24](#), [147](#)
Basic Woven Heart, [18](#), [137](#)
Beautiful Edges, [151](#), [152](#), [156](#)
Bell, [64](#), [146](#)
Candy Cane Cone, [76](#), [143](#), [144](#)
Checkered Cylinder Container, [111](#), [152](#), [153](#), [154](#)
Checkered Dome, [103](#), [152](#)
Circus Tent, [142](#), [152](#), [154](#), [156](#)
Cone Hat, [66](#), [147](#)
crease lines, [136](#)
Cute Hearts Cone, [50](#), [145](#)
digital cutters, [11](#), [136](#)
downloading, [135](#)
Drum Cylinder Wall, [118](#), [142](#), [152](#), [154](#)
Edges, [134](#), [151](#), [152](#), [156](#)
Flattened Checkered Container, [117](#), [154](#)
Flower Bunting, [60](#), [138](#)
Fröbel Cone, [124](#), [141](#), [151](#)
Handles, [148](#), [153](#)
Harlequin Cone, [92](#), [141](#), [142](#)
Heart Bunting with Spirals, [62](#), [137](#)
Heart in Hand, [42](#), [137](#), [138](#)
Heart with Circles, [79](#), [139](#)
Heart with Circles Overlay, [46](#), [150](#)
High Cone Top, [106](#), [149](#), [152](#)
Hot Air Balloon, [68](#), [145](#)

joined sections, [136](#)
Lampshade, [96](#), [137](#)
Large Checkered Dome, [106](#), [150](#), [152](#)
Large Scalloped Cylinder Container, [113](#), [142](#), [152](#), [153](#), [154](#)
lines of symmetry, [136](#)
Low Cone Top, [105](#), [150](#), [152](#)
Low Onion Dome, [108](#), [149](#), [150](#), [152](#)
Palace Door, [119](#), [151](#)
Palace Portcullis, [119](#), [151](#)
Palace Walls, [119](#)
Palace Window, [119](#), [151](#)
Peacock, [90](#), [143](#), [144](#)
photocopying, [136](#)
Rocket Ship, [80](#), [146](#)
Rose Basket, [54](#), [144](#), [153](#), [155](#)
Scalloped Basket, [52](#), [153](#), [156](#)
Scalloped Cylinder Container, [112](#), [152](#), [153](#), [154](#)
Scalloped Dome, [104](#), [152](#)
Scalloped Sphere, [94](#), [141](#)
scanning, [136](#)
Simple Cylinder Walls and Containers, [119](#)
Simple Heart Bunting, [58](#), [137](#)
Sphere with Spirals, [72](#), [141](#)
Spherical Checkered Container, [114](#), [152](#), [154](#)
Star Drum, [83](#), [155](#)
Star with Circles, [74](#), [140](#)
Tall Onion Dome, [109](#), [149](#), [150](#), [154](#)
tracing, [135](#)
Triaxial Box, [126](#), [138](#)

Triaxial Cone, [128](#), [141](#), [148](#)

Triaxial Sphere, [131](#), [140](#), [141](#), [156](#)

Zeppelin, [98](#), [140](#), [142](#)

Three Twisted Zigzag-Strip Handles, [133](#)

Three Zigzag-Strip Handles, [133](#)

Tivoli Gardens

Georg Carstensen and, [89](#)

Harlequin Cone, [92–93](#)

introduction to, [89](#)

Lampshade, [96–97](#)

Peacock, [90–91](#)

Scalloped Sphere, [94–95](#)

Zeppelin, [98–99](#)

tools

calipers, [11](#)

computers, [11](#)

craft knives, [11](#)

digital cutting machines, [11](#), [136](#)

glue, [13](#)

needles, [10](#)

paper clips, [10](#)

paper trimmers, [11](#)

pencils, [10](#)

photocopiers, [11](#), [136](#)

printers, [11](#)

rulers, [11](#)

scalpels, [11](#)

scanners, [136](#)

scissors, [10](#)

- silhouette scissors, [10](#)
- straight pins, [10](#)
- surgical scissors, [10](#)
- table knives, [11](#)
- tweezers, [10](#)
- tracing, [135](#)
- transparent paper, [13](#)
- Triaxial Box
 - materials, [126](#)
 - templates, [126](#), [138](#)
 - weaving, [127](#)
- Triaxial Cone
 - materials, [128](#)
 - templates, [128](#), [141](#), [148](#)
 - tools, [128](#)
 - weaving, [128](#)–[129](#)
- Triaxial Sphere
 - materials, [131](#)
 - templates, [131](#), [140](#), [141](#), [156](#)
 - tools, [131](#)
 - weaving, [131](#)
- tweezers, [10](#)
- Twisted Half-Circle Handles, [132](#)
- Twisted Quarter-Circle Handles, [132](#)
- 2H pencils, [10](#)
- Two Twisted Zigzag-Strip Handles, [132](#)
- Two Zigzag Strip Handles, [132](#)
- United States, [4](#), [6](#)

U.S. Civil War, [7](#)

weaving around a center, [16](#)

weaving in rows, [15](#)

work surface, [11](#)

wrapping paper, [13](#)

Zeppelin

materials, [98](#)

templates, [98](#), [140](#), [142](#)

tools, [98](#)

weaving, [98](#)

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