



the MODERN NATURAL DYER

A Comprehensive Guide to Dyeing Silk,
Wool, Linen, and Cotton at Home

KRISTINE VEJAR

PHOTOGRAPHY BY SARA REMINGTON





the
MODERN
NATURAL
DYER

A Comprehensive Guide to Dyeing Silk,
Wool, Linen, and Cotton at Home

KRISTINE VEJAR

PHOTOGRAPHY BY SARA REMINGTON

STC CRAFT A MELANIE FALICK BOOK NEW YORK



Published in 2015 by Stewart, Tabori & Chang
An imprint of ABRAMS

Text © 2015 Kristine Vejar

Photographs © 2015 Sara Remington

Illustrations © 2015 Patricia Pierce Stone

All rights reserved. No portion of this book may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, mechanical, electronic, photocopying, recording, or otherwise, without written permission from the publisher.

Library of Congress Control Number: 2014959126

ISBN: 978-1-61769-175-1

eISBN 978-1-61312-986-9

Editors: Melanie Falick and Valerie Shrader

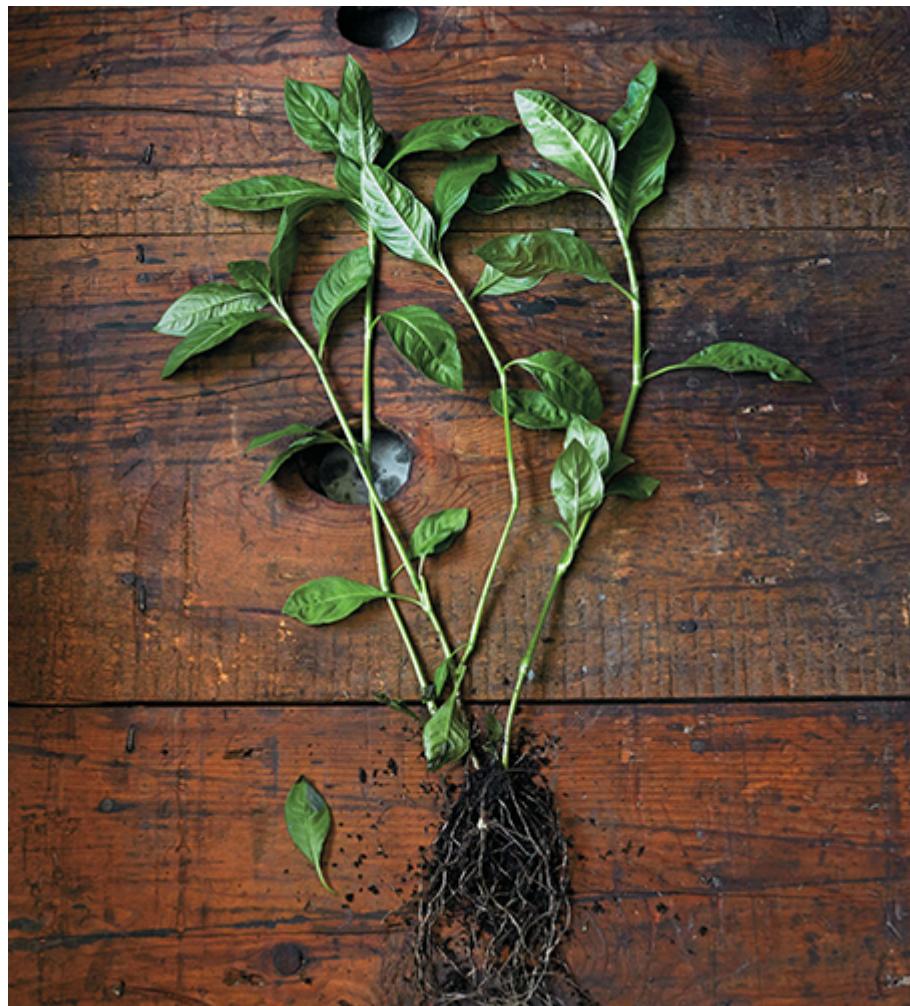
Designer: Brooke Reynolds for inchmark

Production Manager: Anet Sirna-Bruder

Abrams books are available at special discounts when purchased in quantity for premiums and promotions as well as fundraising or educational use. Special editions can also be created to specification. For details, contact specialsales@abramsbooks.com or the address below.



ABRAMS The Art of Books
195 Broadway, New York, NY 10007
abramsbooks.com



To my loves: Adrienne, Cleo, and Callie



CONTENTS

INTRODUCTION

1. DYES FROM NATURE

2. CHOOSING FIBER

3. DYEING 101

4. DYEING WITH WHOLE DYESTUFFS

MAMA'S LITTLE TEACUP ONESIE

FLOWERS AT MY FINGERTIPS SEWING KIT

FIELD AND FOREST DRESS

FIRECRACKER SLIP

5. DYEING WITH EXTRACTS

NORTHWOODS HAT

WANDERLUST BAGS

SANDSTONE SHAWL

BERRY PATCH NECKLACE

SOCK HOP! COTTON SOCKS

IRON AGE TANK AND GILDED CARDIGAN

ALFRESCO TABLE LINENS

CONFETTI COWL

6. DYEING WITH INDIGO

BLUE SKIES TOTE

INDIGO WEDGE CARDIGAN

NORTHERN LIGHTS SCARF

7. SURFACE DESIGN

WINDSWEPT TOP

WAVES BANDANA

BEACH HOUSE PILLOW
FISHBONE DRESS
SNAPSHOT QUILT
RESOURCES
BIBLIOGRAPHY
GLOSSARY
INDEX OF SEARCHABLE TERMS
ACKNOWLEDGMENTS

introduction

My infatuation with color and natural dyeing began in India. In 1999 I traveled there for the first time to study art and architecture. For three months I was based in Jaipur, a renowned center of art and craft. Stacks of brightly colored, intricately patterned fabrics were on prominent display throughout the city. With my halting Hindi, I inquired about the fabric and discovered that some of the cloth was colored using dyes derived from plants. This was a pivotal moment for me. Instantly I wanted to know more. I was full of questions: Could all colors be made—and if so, how? Could all plants be used? How was color applied to cloth? Although I grew up knitting and sewing in rural Illinois alongside my grandmother, I had never considered how fabric was made or how its color was applied. I realized I had taken color for granted! I had never thought about the dyeing process or what dye was made of, nor did I understand that there was a choice between synthetic dyes and plant-based dyes. All of a sudden, with the understanding that color could come from plants, the study of textiles grew even more meaningful to me. I had always held knitting and sewing close to my heart, but the art and application of natural dyeing presented an entirely new dimension to these processes and became a whole new way to see nature and to be with plants.

Desiring to see the practice of natural dyeing firsthand and growing weary of the hustle and bustle of busy Jaipur, I decided to travel to the remote and serene desert region of Kutch, renowned for its textiles. I visited a farm and workshop widely recognized for natural dyeing and block printing, then

called Dhamadka, today known as Ajrakhpur. There was so much going on at once that it made my head spin! Like a set of snapshots in my mind, I can still recall moments from the day: I see a concrete vat the size of a car overflowing with odiferous water; I watch men stamp dye onto fabric with wooden blocks and hear a soft thumping noise radiating around the workshop; and I marvel at long swaths of printed yellow fabric stretched out along the ground outside, held in place with rocks. It was beautiful and intriguing. I wanted to know what their dyes were made of, where they came from, in what order they were applied. I loved the palette and how every color went together harmoniously, just like in nature. Despite my enthusiasm for natural dyeing, though, I only had a month in Kutch and was soon back in the United States to complete my undergraduate degree.



Samples from my dyeing experiments, which help me design new colors.

In 2001 I was fortunate to work at the Textile Museum in Washington, D.C., writing descriptions of its collection of northern Indian textiles for its database. I often spent my lunch hour in the museum library, poring over rare and obscure books about textiles and the people who make them. Flipping through the pages of those books, I discovered that while certain styles of textiles are regional, the techniques are not—many of them are practiced worldwide. I was in awe of the artisans who had spent so much time learning about natural dyeing that they could create an incredible range of color and manipulate the application of the dyes to create a myriad of surface design patterns. I wanted to understand every aspect of the process. I figured the best way to really know how to use natural dyes was to start practicing.

In 2001, I returned to India on a Fulbright grant to continue my textile-based research. This time I spent a year and a half in Kutch, where I learned the basics of natural dyeing, block printing, and a style of resist dyeing called *bandhani*. To study natural dyeing in an area where it has been practiced for thousands of years was truly an honor. To this day, my work and my practice are informed by all that I learned in Kutch.

In 2007, I founded my naturally dyed yarn business, A Verb for Keeping Warm. I didn't begin in a studio; I started in my kitchen! I made it a viable workspace because I was so passionate about natural dyeing. I began by using a handful of natural dyes to create a dozen colors. Right away I saw others reacting to my naturally dyed yarns exactly as I reacted to what I saw in India: their faces lit up and they peppered me with questions similar to those I had asked in Kutch—the what, why, and where of natural dyes.

As the business grew, I moved to a studio and then to my current space, which encompasses an even larger studio, indoor and outdoor teaching areas, a fabric and yarn shop, a dye garden, and a wonderful staff. In the dye studio, we create more than a hundred colors, all of which need to be reproduced on demand. In the garden, we grow dye plants from around the world, including indigo and madder, and even raise the insect cochineal. Teaching others about the process of

natural dyeing, and participating in this ancient tradition, has become an extremely fulfilling and meaningful part of my life.

In India and in the U.S., I have learned so much in the past ten years about natural dyes and dyeing. For instance, I learned that thousands of colors can be made and that many plants can be used as dyes, though some make better dyes than others. I've learned hundreds of ways to apply color to cloth. From this exploration, I created this guide that includes the most accessible dyes and easiest practices. I want to share the joy and satisfaction of natural dyes with you by teaching you how to work with them at home to make projects with which you'll want to surround yourself. Natural dyes almost seem alive as they respond to a variety of elements including light, minerals, pH, metals, growing conditions—so I am constantly learning. As you learn, I encourage you to embrace the unique qualities of the natural materials. Each dyeing session yields its own distinctive, yet equally satisfying, results.

In **CHAPTER 1**, I give you an overview of dyeing with natural materials so you can understand the basics of the wonderful adventure you are embarking upon. I also present a magnificent gallery showcasing the natural dyes themselves and the colors they produce on different fibers. **CHAPTER 2** teaches you what you need to know about choosing fiber, and **CHAPTER 3** teaches you how to set up a workspace and dye. In **CHAPTERS 4–7** are a series of projects dyed using a range of my favorite techniques for home dyeing. There is a lot of information here but I have tried to make it as user-friendly as possible. I have done most of the dye recipe calculations for you so all you need to do is pick a project and begin.

The projects in **CHAPTER 4** teach about whole dyestuffs, including those found in your pantry or garden. The first project is made with basic tea dyeing, while other projects explore the possibilities of color from nature: decorating fabric by printing with flowers, foraging for materials to dye a special tunic, or crushing whole dyestuffs to yield rich, complex color.

All of the projects in **CHAPTER 5** use extracts to produce colors with greater predictability. I often prefer to use dye extracts instead of whole dyestuffs because they are easy to buy, store, and measure for consistent color results, although there are advantages to each method. The Shade Cards on [this page](#) and [this page](#) help to make dye substitutions easy.

CHAPTER 6 is all about indigo dyeing, one of the world's oldest dyeing traditions. The process of creating these distinctive shades of blue is different from working with extracts or whole dyestuffs. This fascinating process is introduced with a simple tote, but you will also learn to dye yarn and silk scarves in subsequent projects.

Each project in **CHAPTER 7** takes natural dyeing to another level by incorporating surface design techniques. These projects provide a platform for greater exploration and build on the skills presented earlier. Several different resist-dyeing techniques are presented, and you can also learn to paint with dye.

Every project features an item that is dyed. Some of these items are premade blanks, such as a tote bag, while others are sewn or knit by you, so you can understand how you can combine your knowledge of dyeing with your other creative pursuits. However, the dye recipes can be used on their own, as long as you're dyeing goods with similar characteristics, and technically the projects can stand alone as well. At its essence, the natural dyeing process can be much like making tea or cooking food. In fact, it may be helpful to think about following a favorite recipe when you are dyeing with natural materials: All the ingredients must be in harmony to cook a successful dish. So as in any good recipe, you can interchange the ingredients to a certain degree, so long as they complement each other. My goal is to teach you about natural dyeing so you can approach it with the same ease as baking a cake for a loved one's birthday.

The beauty of being a modern natural dyer is that there are so many types of dyes and dyeing available to you. There's so much to explore, but you don't need anything but curiosity to begin.



Dyeing yardage in the indigo vat.



Your garden can provide a plethora of sources for natural dyes—examples include marigolds, cosmos, and coreopsis flowers.

chapter 1

DYES FROM NATURE

Thousands of natural materials can produce glorious color. For example, the insects cochineal and lac produce pink, maroon, and purple. The root of the madder plant makes red. The leaves, stalks, and flowers of many plants make a myriad of yellows. There are more than five hundred species of plants that produce indigo blue, and bark and fungi can be used to make brown.

Natural dyes can be found as close by as your kitchen, a backyard garden, a nearby field or forest. They can also be imported from around the world. Natural dyes are available in two main forms, whole *dyestuffs* and *extracts*. A whole dyestuff comes directly from the source—a plant, fungi, lichen, or insect—and may be fresh or dried. Extracts are derivatives of these natural materials and are fine, concentrated powders or liquids.

PROPERTIES OF DYE MATERIALS

We still don't know why some plants have the ability to produce color. We do know that it has to do with pigment, which is a naturally colored compound found in the leaves, roots, or bark of a plant. We're not sure if pigment helps a plant or why it came to be present in the first place. *Tannin*, a naturally occurring astringent that can also act as a dye, may help plants protect themselves from bacterial or fungal infections. Many of the plants that have an excess of pigment have the Latin word *tinctoria* in their names, so it is safe to assume that these plants will make good dyes.

Dyeing with natural materials is a constant exploration and source of delight. Two plants within the same species may

produce slightly different color dependent upon soil, age, and weather conditions. These factors mean that the same plant may have a range of many shades and colors, which can offer many pleasant surprises when dyeing. The “recipe” to achieve a particular color is considerate of many factors, including the type and weight of the textiles used, the type of dye used, the temperature of the water, and the complementary agents that may be added to make the color more brilliant or colorfast.

THE HISTORY OF NATURAL DYEING

It is impossible to know when cloth was first dyed because textiles are perishable. The development of agriculture and use of metal occurred simultaneously around the world and so did the process of natural dyeing. *The Natural History*, written by Pliny the Elder and published circa A.D. 77–79, includes brief descriptions of dyeing. By A.D. 100, we know many plants and plant stuffs, such as alkanet, madder, weld, saffron, indigo, woad, oak bark, and walnut hulls, were being used for natural dyeing, but no known text from that time explains the practice from beginning to end.

Since the process of dyeing is so similar to cooking, it seems likely that cooking may have informed dyeing. The boiling of leaves to extract their pigment is exactly like boiling food. The understanding and use of metal must have also helped contribute to the dyeing process. Vessels became available for heating water and cloth, and the metals in the vessels worked as mordants, creating longer-lasting colors.

Color upon cloth has always been, and probably always will be, a way to identify belonging to a particular community, to signify social standing, and to mark ritual. In ancient times only royalty was allowed to wear purple, and the color came to signify great power. In India, brides wear red. In the West, mourners wear black. Historically, as a color became ritualized, an industry developed around it. And as society expanded and textiles developed into big business, people began searching for faster and more efficient ways to make textiles and dye them. The discovery of the New World by Europeans proved to be a bonanza for dyers because many of the dyes explorers brought back were more potent than the

ones being used in Europe at the time. For example, cochineal, a scale insect that gives a very potent pink, quickly replaced the Old World insect kermes as the dye of choice to make red. The yellow dye fustic was favored over the less potent weld. And logwood provided a new shade of purple that was easier and less expensive to access than the purple derived previously from murex snails. As these New World dyes gained popularity, concentrated, nonperishable extracts, which could be shipped farther distances at a lower cost than whole dyestuffs, were developed.

Synthetic dyes based on natural plant compounds were first developed in the mid-1800s when alizarin, the red pigment found in the roots of the madder plant, was synthesized into a man-made dye. The development of synthetic dyes began a whole new era in textile production, one largely influenced and guided by these new products. Due to ease of use and availability, they soon replaced natural dyes far and wide.

WHY USE NATURAL DYES TODAY?

Natural dyeing is an eco-conscious, nontoxic way to access shades of color unobtainable with synthetic dyes. It can be quite exhilarating to discover the wealth of color possibilities that nature presents in the area where you live, and potent extracts can fill in the gap for any color that cannot be sourced locally.

The practice of natural dyeing becomes another way to honor and enjoy nature—like gardening or taking a hike. Wearing naturally dyed clothing is a delightful way to be with nature throughout the day. There is a vibrant community of natural dyers who love to share their results, and it is fascinating to interface with others who are practicing natural dyeing. It is inspiring to look at the colors they achieve based upon the dyes they used, the unique qualities of their water, or how they layered and applied extracts. And of course, learning about the natural dyeing process opens up a whole new way of looking at and appreciating textiles.

CATALOG OF COLOR

Natural dyes have largely been kept in use by artisans who have continued to practice dyeing as set forth by their ancestors. Now you join this group of special creative people who use traditional dyestuffs and extracts to produce lasting color. Beginning on the next page, I present an overview of the accessible and easy-to-use dyes featured or suggested as alternatives in this book. Each photo shows the source of the dye and includes fabric and yarn samples to demonstrate the range of colors that can be achieved.



Expand your garden to include plants rich with natural dyeing potential such as weld, yarrow, and madder, shown here.



COCHINEAL

(Dactylopius coccus)

The nopal cactus, as depicted here, grows across the desert regions of the Americas. It is a favorite resting place and food source for the scale insect cochineal. The insect can be used fresh off the cactus or dried. It is also available as an extract. Sensitive to shifts in pH, cochineal turns bright red and pink when the dyebath is acidic and purple when the dyebath is alkaline. It is the only FDA-approved natural red colorant. Cochineal is quite potent, so very little is needed to create bright, saturated colors.



QUEBRACHO RED

(Schinopsis lorentzii or Schinopsis quebracho colorado)

In Central and South America lies the Gran Chaco region, a large, semi-arid plain, extending into Bolivia, Paraguay, Argentina, and Brazil. That's where the Quebracho tree grows. This member of the sumac family has red heartwood rich with tannin. It is easily found in extract form. Quebracho red gives soft, subtle lightfast corals and pinks.



MADDER

(Rubia tinctorum)

Above the ground, madder can easily be dismissed as a prickly weed. But below the surface of the soil lies the real treasure—the madder's roots. They contain a concentrated source of the red-producing pigment alizarin. Madder can be found as fresh roots, dried roots, sawdust, and extract. Depending on the amount of the dye used, madder can create peach to deep wine-colored shades of red.



DYER'S COREOPSIS

(Coreopsis tinctora)

This species grows both in the wild and in gardens across the U.S. and other temperate regions. Using its flower can yield golden yellow and rust; generally a mild alkaline agent such as soda ash helps move the color toward red. Other species of coreopsis can also be used to get yellows, including *Coreopsis grandiflora*, *Coreopsis lanceolata*, and *Coreopsis verticillata*.



ONION SKINS

(Allium cepa)

It is easy to dye with onion skins, as an onion always seems close at hand. It's simple to save the skins in a paper bag under the sink or in the pantry any time you cook with them. Peel and discard the darker, dry, or dirty skins off the surface to reveal the inner layers that work as dye. Thankfully, they don't leave an odor on the dyed materials! Depending on the quantity used, you can extract yellows to warm oranges from the skins.



CUTCH

(Acacia catechu)

The genus *Acacia* has more than a thousand species, most native to Australia yet also growing in warm temperate regions such as Africa and India. It is a small thorny tree, rich in tannin, and can be used as an astringent and dye. The wood is soaked in water to extract the dyestuff. It is available in extract form to achieve colors ranging from copper to terra cotta.



RHUBARB

(*Rheum* species)

Both the medicinal and edible forms of rhubarb are suitable for dyeing. The extract or the leaves and the roots of the plant can be used, making a range of shades from saffron yellow to sherbet orange.



DAHLIA

(*Dahlia* species)

These easy-to-grow garden plants with bright beautiful blooms can be started from seeds, tubers, or starters. Dahlias can range in size and the flowers can be a variety of colors, although the darker flowers hold the most dye. The colors achieved from the flowers are yellows, golds, and oranges.

EUCALYPTUS

(*Eucalyptus* species)

Most of the hundreds of species of this flowering tree are native to Australia. Eucalyptus is known for its essential oil, which has many uses including as a cough suppressant and disinfectant. Introduced to America, eucalyptus grows in the western states and British Columbia. Due to its invasiveness, it is recommended for foraging but not growing. The colors derived from the leaves can be yellow, orange, tan, and deep rusty brown to a rich red.



OSAGE

(Maclura pomifera)

This medium-sized, deciduous thorny tree is native to the southwestern part of the United States, but it is now planted all over the country. In the 1930s osage trees were used in the Great Plains as wind blocks and cattle fences. Osage is cherished by bow makers and other woodworkers who need strong timber. The dye is extracted from the wood of the tree and produces shades of yellow and gold.



MARIGOLD

(*Tagetes* species)

These bright orange to yellow flowers can brighten any day and are ubiquitous in the landscape of nearly every temperate environment. They flower summer into fall and make a great companion plant—grow them next to tomatoes to deter pests. In India, hundreds of marigolds are made into bright gold garlands for Hindu celebrations and rituals. Once the celebration is over and the flowers have wilted, these blooms often make their way into the dyepot to create bright yellow, gold, and chartreuse colors. Nearly every type of marigold can be used to dye. In the Oaxacan tradition of dyeing, the Mexican marigold (*Tagetes lucida*), cochineal, and indigo are used in various combinations to create a rainbow of colors.



WELD

(Reseda luteola)

The weld plant produces one of the most light-fast yellows and it is one of oldest and best-loved of dye plants. The yellow it makes is very clear and bright, and when used in large amounts, it can create a shade akin to fluorescent yellow. Weld has long spindly stalks, with cones of tiny yellow flowers. It grows in any temperate region and is commonly used as a dye to this day in Central Asia, Turkey, and Europe.



FUSTIC

(Chlorophora tinctoria)

Fustic is a potent form of yellow. The name *fustic* was first applied to the European smoketree (*Cotinus coggygria*), a relative of the sumac. With the discovery of the New World dyes, other woods also called fustic were introduced to dyers. One was the American smoketree (*Cotinus obovatus*), native to mountainous regions in the southern states. Ten to fifteen feet tall, it may be identified at nurseries as Young Fustic. These days fustic is harvested from a tall, tropical hardwood tree found in South and Central America and the West Indies. Fustic can be found in the form of wood chips or liquid extract.



GOLDENROD

(Solidago species)

Goldenrod produces showy yellow flowers that bloom in late summer and early fall. They attract many pollinators, so be careful of bees and enjoy the butterflies when harvesting the flower tops! They grow wild in various parts of the U.S., so look for them in open fields and roadsides. You can also grow them from seed; however, do not sow them too deeply, since the seeds are very small and fine. If you are not dyeing with them immediately, dry the stalks in small bundles in a well-ventilated, dry, and shady place. Depending on the quantity used, these flowers can produce yellows to chartreuse green.

YARROW

(Achillea millefolium)

This flower is one of my favorites to grow because it is drought tolerant. White-flowered yarrow grows wild in California where I live, but I prefer to cultivate the yellow and red varieties because of the dye potency in the flowers. The plant is a sun-loving perennial that can grow up to three feet tall. It is a good companion plant that attracts beneficial insects and pollinators. The flower heads can produce a warm ivory and a buttery yellow.



YELLOW COSMOS

(Cosmos sulphureus)

Sweet, sunny cosmos have bright yellow to orange flowers and can be grown easily in your garden. Native to Central America, this herbaceous flowering plant can grow several feet tall. Cosmos are drought- and heat-tolerant plants, making them low maintenance. The flowers produce shades of yellow and chartreuse green.



MYROBALAN

(Terminalia chebula)

This dyestuff is made of ground nuts. The tree producing this nut grows throughout Nepal, India, Sri Lanka, Burma, and Thailand. Commonly used in India as a mordant and a dye, it is applied in multiple layers upon cellulose-based fibers ([this page](#)) to improve colorfastness. It is a creamy sand to umber color. When combined with iron water ([this page](#)), it is used to make dark brown and black.



POMEGRANATE

(Punica granatum)

Eat the pomegranate fruit, which is high in antioxidants, and save the peel to dry in the sun. Rich with tannins, it makes one of the most lightfast dyes on cotton or linen. Chop or crush the dried peel and simmer the skins for at least one hour to make a dyebath, or you can purchase the ground extract. Pomegranate makes an especially rich color of khaki; adding iron to the dyebath ([this page](#)) produces a dark green color.



TEA

Black tea makes an excellent dye. It is rich with tannins, easy to find, and very easy to use. Bagged tea is usually made with fine particles of the dried tea leaves, which are sometimes a byproduct of the packing process. These small bits of the leaves are best for dyeing because the tea gets darker and stronger faster as there is more surface area from which to extract the tea. Use either fresh tea bags or steep a cup of tea and dye with the used tea bags. Black tea creates warm reddish-browns. Play with different types and concentrations of black tea to achieve even more colors.

OAK GALLS

(Quercus species)

An odd but common growth can appear on oak trees—a gall—that is formed after a gall wasp deposits eggs inside an oak shoot. This foreign body stimulates the tree to grow plant tissue around the gall wasp larvae and it develops into the characteristic nutlike growth. Although all parts of the oak contain tannin, oak galls contain the most, and in addition to being used as a dye, they can act as a mordant on cellulose fibers such as cotton or linen. Harvest oak galls before they turn brown and hard, as this is when tannin content is at its highest. Crush them, then soak them in water until soft. To extract tannin, simmer the galls for one hour, and strain off the solution. The dyebath will impart a faint tan color.



WALNUT BLACK WALNUT

(Juglans species and Juglans nigra)

The outer green casing of the nut gives the color, and this husk can be used fresh or dried. (Please take dropped nuts only if you're gathering your own materials. Finely pulverized walnut hulls are also available as a powder.) To use foraged materials, soak husks in water for 24 hours to make a concentrated bath. If left longer, it will ferment and yield a stronger color, but you may also find squirrels knocking at your door! Next, simmer husks for one hour and strain off the dye liquid. The husks can be reused and can be dried or left wet. To dye, put fibers in the dyebath and simmer for one hour. Leave to soak overnight for deeper colors. The color ranges from brown to soft pink.



INDIGO

(Indigofera species)

The ability to produce an extensive range of blue shades has made indigo the most successful dye plant ever known. There are hundreds of plants in the world that contain the indigo dye molecule, but dyers work with just a few notable ones whose leaves contain enough blue to warrant the time-intensive process necessary to extract the dye.

Indigofera tinctoria is a perennial shrub that grows in hot, humid environments around the world. It contains the highest concentration of indigo and produces most of the natural indigo extract available commercially.

Indigofera suffruticosa is native to tropical and subtropical America and is also known as West Indian indigo. The dye was used by Mesoamerican cultures for paintings and was called Maya Blue.

Persicaria tinctoria is the primary indigo-bearing plant grown in Japan and can also be found in Vietnam and parts of China. It has been raised successfully in drier, cooler parts of North America.

WOAD

(Isatis tinctoria)

The leaves of the woad plant contain the same type of pigment as indigo, but in lower concentrations. Woad was used to obtain the color blue until indigo became available in the 1500s, and by the end of the 1800s woad was rarely used. Powdered woad extract is used in the same way as powdered indigo extract.



LOGWOOD

(Haematoxylon campechianum)

Logwood is a tree composed of many trunks and is part of the legume family, native to Central America. Logwood is available as wood chips and extract. Logwood is sensitive to acidic modifiers ([this page](#)), so use them sparingly. I do not recommend logwood for use on cellulose-based fibers such as linen or cotton as it has poor lightfastness, but that can be improved by applying iron. The heartwood of the tree produces light to dark purples, but if you dip fibers dyed with logwood in iron, you will get black.



Protein-based fibers such as wool (left) and cellulose-based fibers like cotton (right) both make great options for natural dyeing.

chapter 2

CHOOSING FIBER

One of the most exciting parts of dyeing is choosing what to dye. The materials you dye can have as much of an impact on the color as the dye itself. By learning about and understanding fibers, you can use their inherent characteristics to your advantage during the dyeing process—especially when trying to achieve the largest possible spectrum of color. For example, wool, alpaca, silk, and even cotton come in a range of natural colors. Overdyeing these can lead to colors that are complex, nuanced, and beautiful. The texture of the fiber can also play an important role; for example, when dyed with the same amount of dye, shinier fabrics read lighter than matte fabrics. Because of their composition, synthetic fabrics aren't good candidates for dyeing with natural materials.

HOW FIBERS DIFFER

There are two types of natural fibers: protein-based fibers from animals or insects and cellulose-based fibers from plants. In order to create predictable, *lightfast* color, it is important to know the content of the yarn or fabric—the *goods*—you plan to dye. The differences between the two types of fiber affect the dyeing process and the colors you can achieve with natural dyes.

Protein-Based Fibers

Protein-based fibers come from the fur or hair of animals and the filament spun by one very special insect, the silkworm. These fibers are made mainly of protein, and are thus referred to as protein-based fibers.

ANIMAL FIBERS

Fibers in the coats of sheep, alpaca, camel, angora rabbits, and goats are composed of overlapping scales. The fur or hair from these animals must be processed in a number of ways before it is spun into yarn. First the individual fibers are tamed into a sheet by carding and

pulled into strips; at this point the unspun product is called *sliver* or *roving*. *Top* is wool fiber that has been more finely processed; in addition to being carded, top has been combed to remove small bits of debris and the raw fibers have been aligned in a single direction.

Wool from sheep is easily the most pleasant fiber to dye with natural materials. Due to the chemical composition of the protein fibers, there are many points in which mordant and dye can attach to the wool, so very little dye is needed to create saturated, vibrant color in a wide variety of shades and hues. Wool is often recommended to beginning dyers because it is easier to achieve initial success, though the threat of felting does need to be accounted for (see Special Considerations below). You will dye both wool fabric and yarn in the chapters that follow.

Exploring Animal Fibers

Besides sheep, fibers from other animals are commonly used to make yarn and fabric. Alpacas have been raised and used for their fibers for at least as long as sheep. The hair from angora goats produces silky, shiny mohair. Cashmere is a luxurious fiber that comes from the fine underdown of many types of goat breeds, all generally referred to as cashmere goats. All of these fibers are treated the same way as sheep's wool in the dyeing process, but in general all of them have less prominent scales, making their fibers less likely to felt in the dyeing process. Like wool, these fibers range from matte to smooth—each offering something unique to the natural dyeing process. Read a bit more about sheep's wool on [this page](#).

Special Considerations

On a microscopic level, a sheep's fleece is composed of fibers covered with tiny, overlapping scales. When these scales become hot and wet, as they do in the dyeing process, they expand, and as they expand and open, they are drawn to one another. They can then attach and lock together. This is felting. (You may have observed a similar phenomenon if you ever accidentally put a wool sweater through the laundry cycle.) Once fiber is felted, it is irreversible, so precautions must be taken to avoid felting while dyeing. For example, woolen goods should never be allowed to boil, and the fibers shouldn't be shocked by temperature extremes. When working through any of the projects that involve wool, be sure to read through the instructions carefully before you begin. You will learn more about precautions in Dyeing 101 ([this page](#)).

undyed PROTEIN FIBERS



1. CULTIVATED SILK 2. CAMEL 3. ALPACA 4. ANGORA 5.
CASHMERE 6. MOHAIR 7. SHEEP'S WOOL 8. TUSSAH SILK

A LITTLE ABOUT SHEEP

Sheep are sweet creatures and were one of the first animals to be domesticated by humans. There are many breeds of sheep with a wide range of natural colors: white, cream, light brown, dark brown, silver, and black. The fleeces from the various breeds are categorized according to certain characteristics. For example, Merino is one of the most well-known breeds. Their fleece is called *fine wool* because it has small scales and is very soft with a matte appearance. These attributes are notable when dyeing it; because the fiber is matte, the color will also be matte. Bluefaced Leicester is another breed of sheep whose lustrous wool is called *long wool*. The scales on this type of fleece are large and widely spaced, so they refract light easily. Color is bright and shiny on long wool fibers.

Though Merino may be one of the most widely known, commercially available wools, there are many other lovely types you can explore. Look to your local fiber shop, nearby farmers, sheep and wool festivals, or trade shows to find different types of wool fibers to experiment with. Overdyeing the wool's natural color is a superb way to add depth and nuance when dyeing. Sometimes yarn is made of multiple natural colors of fleece, and overdyeing these yarns will give a heathered appearance, with light and dark color speckled throughout.

SILK FIBER

Strong and lustrous silk is made by an insect, the silkworm. Due to its unique composition, silk requires its own body of knowledge for natural dyeing. The process of making silk was discovered by the Chinese in 2700 B.C. and was kept a court secret for centuries. Silk fabric was such a precious item that the four-thousand-mile Silk Road, the series of trade routes connecting China to the West, was named for it.

Though there are hundreds of different types of silk fabric, silk fiber is produced in two ways, from either cultivated or wild silkworms, which are actually larvae. Cultivated silk is created from the cocoons of *Bombyx mori*, the most common silkworm. While in their larval stage, silkworms are given only leaves from the mulberry tree to eat. When the fattened caterpillars spin their cocoons, their specialized diet results in a very fine, soft, white fiber with consistent texture. To gain the unbroken silk fiber—nearly a mile in length—the pupa must be stifled, or extinguished, so it doesn't break

through the cocoon. In an age-old process, the filament is extracted from the cocoon, reeled onto a bobbin, and twisted with other filaments for strength. Finally, the silk thread is treated to remove the sericin that lubricated the filament as it was spun by the silkworm. The final product is the supple, soft silk that has been prized for thousands of years.

Wild silk is produced by hundreds of different types of silkworms that eat a wide variety of leaves. Unlike the cultivated silkworm, wild silkworms complete their metamorphosis and emerge from the cocoons as moths. Their silk is naturally brown or beige due to their varied diet, and their fiber tends to be coarser with more textural nuances. Since the moth breaks through the cocoon, the filament can't be reeled like cultivated silk. Instead it is treated like wool and multiple strands are combed and carded. This becomes silk top, which can be spun into yarn. Waste from cultivated silk cocoons that have been damaged and cannot be reeled are also turned into silk top.

Exploring Silk

All types of silk, and all forms in which it can be found—top, hankies (a single stretched cocoon), thread, yarn, or fabric—can be dyed. Goods made of reeled or cultivated silk have strong luster and reflect light, making the dye read lighter. Silk fabrics that contain both wild and cultivated silk behave more like wool in the dyepot, because they are more matte; reeled silk will require more dye to reach the same color as spun silk. It is important to understand the difference in how these two types of silk respond to color in the dyepot.

Fabrics made from reeled silk include habotai, chiffon, and charmeuse. (Although sand-washed silk and silk crepe are also made from reeled silk, their texture allows them to pick up dye more easily.) Tussah, shantung, and pongee contain both wild and cultivated silk, and they feel more like cotton. In the textile industry, momme (Mm), is a unit of measure used to describe the weight of silk fabric. The higher the momme, the heavier the fabric.

Silk fabric provides an excellent option for someone who doesn't want to or can't wear wool but would like the saturation of color that wool provides. See the Shade Card on [this page](#) for color comparisons between silk and wool fabrics.

Special Considerations

Though silk doesn't felt as wool does, it is very sensitive to temperatures higher than 180°F (82°C). If exposed to temperatures higher than 180°F (82°C), silk can become brittle and break and the fiber will turn from shiny to matte, losing its characteristic luster.

Cellulose-Based Fibers

Fibers made from plants are composed mainly of cellulose, and are thus referred to as cellulose-based fibers. You know them as cotton, linen, ramie, hemp, bamboo, and rayon. They are available as raw fiber, yarn, and/or fabric. Based on evidence unearthed through archaeological excavations, we know that these plants have been cultivated and their fibers woven into fabric for thousands of years: linen since 8000 B.C., ramie since 5000 B.C., and cotton since 3000 B.C.

On a microscopic level, cellulose-based fibers are very smooth and quite different from protein-based fibers. They require more dye and a different mordanting process than protein-based goods because they lack the chemical structure that captures color so successfully in wool. Even with a greater amount of dye, colors tend to be more muted on plant-based fibers. Just as with protein fibers, different cellulose fibers will take dye differently. For example, bast fibers such as linen and hemp (see below) are porous and are the most responsive to natural dyes. They exhibit a wider range of shades than cotton.

On the bright side, cellulose goods can endure boiling water without harm and they won't felt. So you don't have to be as careful about shifts in water temperature as you do with protein-based goods and you can jump from one step to the next faster without fear. All forms of unspun and spun cellulose fibers can be naturally dyed: sliver, top, yarn, and fabric.

BAST FIBERS

Linen, ramie, and hemp are bast fibers, meaning they come from the stem or stalk of the plant. Bast fibers are long, stiff, and strong, and the length of the raw fiber is determined by the height of the plant when it is harvested. The fibers are pulled from the stalk through a process called *retting*, in which the stalk is submerged in water until it can be pulled apart. Bast fibers, especially linen, tend to be lustrous because of the fiber's length and because it is combed before it is spun. These properties make naturally dyed linen look luminescent and exceptionally beautiful.

undyed CELLULOSE FIBERS



1. BAMBOO 2. LINEN 3. RAYON 4. COTTON 5. HEMP 6.
RAMIE

SEED FIBER

Cotton is a seed fiber that is actually a form of lint protecting the cottonseed, which is found within the cotton boll. Its raw fibers are short, fuzzy, matte, and soft. Using a cotton gin, the fiber is pulled from the seed and it is then carded, combed, and spun into yarn just like protein-based fibers. Cotton originally came in many natural colors, including brown, green, and lavender, but farmers were encouraged by the textile industry to cultivate only white cotton. Today it is once again possible to find cotton in these lovely natural shades. When you dye them, you can achieve more shades of color with greater depth.

MAN-MADE FIBERS

Rayon and most forms of bamboo found in stores are considered man-made because the fiber is manufactured. For example, rayon is made of wood pulp, which is broken down by chemicals and extruded through a series of small holes to form a long filament. This can then be spun into yarn and made into fabric. Bamboo is treated similarly. Because each is made of natural materials, however, rayon and bamboo can be naturally dyed even though they are technically manufactured.

Exploring Cellulose Fibers

Just as with the protein-based fibers, the natural dyeing process can be made even more exciting and interesting if you explore the many plant-based yarns and fabrics at your disposal. If you're familiar with chambray or oxford cloth, you know that there are two colors of threads woven into the fabric, one being white. Dye this fabric and the nuances between these two threads will come forth, creating a heathered fabric with depth and complexity. Corduroy and velveteen offer a fuzzy texture due to the cut-pile weaving technique used to make them, and will showcase natural dyes much differently than plain woven fabrics. As your skills grow, do not hesitate to experiment with a wide variety of fabrics.

Special Considerations

Cellulose fibers can endure dyebaths with high alkalinity, unlike protein-based fibers, although acidic dyebaths weaken them. Use with caution. You will learn more about pH in [chapter 3](#). Cellulose-based fibers mildew quickly, so don't keep them in water for more than 48 hours.

DYEING VINTAGE LINENS

A protective coating surrounds the outside of plant-based fibers—pectin for bast fibers and wax for cotton. This protective layer provides somewhat of an obstacle for the mordant and dye, but over time, repeated washing and wear breaks down this coating. Because they have been laundered so many times, vintage linens are great for dyeing. Their well-loved nature makes them much more receptive to natural dyes than newly made fabrics.



Follow the steps in Dyeing 101 to achieve bright, vibrant color as seen in this linen dress dyed with osage.

chapter 3

DYEING 101

Natural dyeing is the act of adding a dye material to a vessel of water, immersing a textile in the pot, and applying heat. Though textiles take to color easily, retaining the color over time can be quite another story. Several key terms are used to describe the various properties of a dyed textile:

lightfastness, *washfastness*, and *colorfastness*. Lightfastness refers to what happens to a color over time as it is exposed to light, while washfastness refers to how a color is affected by laundering. The overall measurement of both of these qualities is referred to as colorfastness. The choice of dyes and dyeing techniques used on a given textile have a direct effect on its colorfastness. To help dyed goods achieve and retain their desired color, the processes of scouring and mordanting are included along with the basic dyeing steps.

STEPS IN THE DYEING PROCESS

In order to teach natural dyeing in a simple way, I developed a series of twenty projects, each of which highlights a different aspect of the process. You will follow the steps below to complete each project.

STAGE 1: WEIGHING AND PREPARATION. The goods to be dyed—fabric or yarn, for example—are weighed so the proper amount of dye, water, and associated substances are used during the dyeing process. Then the goods must be prepared and pre-wet before proceeding. Learn more about this stage on [this page](#).

STAGE 2: SCOURING. *Scouring*, or prewashing, removes any oil, starch, or other agents left in the goods from the manufacturing process. Read all about scouring on [this page](#).

STAGE 3: MORDANTING. *Mordanting* is the process of applying a naturally occurring, water-soluble metallic salt to create a bond between the fiber and the dye—think of a mordant as glue. This process helps you obtain more uniform results with greater color saturation and colorfastness. (If you’re working with indigo, you won’t need this step.) See [this page](#) for more information.

STAGE 4: DYEING. The actual dyeing process will vary depending on which dye you're using. For example, if you're working with a whole dyestuff, the process can be much like brewing tea. When you are working with extracts, you simply dissolve the powder in hot water. Each project will include specific dyeing instructions, but the general process is explained on [this page](#).

STAGE 5: WASHING. After dyeing, textiles must be washed to remove any excess dye. See [this page](#) for details.

SETTING UP A WORKSPACE

Before we get into the nitty-gritty of dyeing, let's examine the possibilities for creating a comfortable workspace. All you need are a few important features, whether you work inside or outside.

Indoor Options

My kitchen was my first dye studio. I weighed fibers on the counter, used water from the kitchen faucet to mix the dyes, and heated the goods on the stove (fortunately I had a hood for ventilation). I also used my bathroom to pre-wet fibers, rinse out my dyed materials, dispose of old dyebaths, and hang materials to dry. Even though I now have a designated dye studio at my shop, sometimes I still dye in my kitchen when I am experimenting with new ideas and want to enjoy the comforts of home.

The key elements of a functional dyeing workspace can be found in most kitchens:

- a counter for weighing, recording, and dissolving dyes
- easy access to water for dissolving dye, creating dyebaths, and pre-wetting/washing fibers
- a source for heating water to dissolve and set dyes
- good ventilation
- surfaces that are easy to clean or protect

Other areas in the house with similar attributes might be a garage, a laundry room, or a basement.

Outdoor Options

Dyeing outdoors is always a great option. There's something wonderful about spending the day in the fresh air dyeing, enjoying the sunshine, and creating colors from nature. In particular, I

recommend dyeing outside when using indigo. To create those brilliant deep blues, each piece is hand-dipped multiple times into the indigo dyebath and must rest on a drying line between dips. So it's fabulous to be outside in a space that can get messy! That way you focus on the dyeing and the beautiful color of blue rather than worrying about the drips. Also, indigo is smelly and working outside makes the odor less bothersome.

To set up an outdoor workspace:

- use a folding table as a counter
- carry water from indoors or bring a garden hose to your work area
- use a hot plate if you have access to electricity; if you don't, use a butane stove

TOOLS

Before beginning to acquire tools and materials for dyeing, it may be helpful to look through the projects (beginning on [this page](#)) to see what catches your eye. The first item you decide to dye can inform which tools and materials to gather first. The type of dye you work with—whole dyestuffs, extracts, or indigo—is a major factor in the related materials you need.

The tools listed below as “recommended” are used in the majority of the projects in this book. The tools listed as “optional” may be used only a couple of times or may only be needed for certain types of workspaces. All of the tools can be purchased at your local hardware or kitchen store. Or, if you keep your eyes peeled, you can collect many of them inexpensively at a garage sale or thrift store.

An important note: Natural dyes are sensitive to metal and this can affect the color. To obtain colors similar to what is shown in this book, it's important to use tools made of nonreactive materials, such as stainless steel, glass, or plastic.

Never use a tool for cooking if it has been used for dyeing. Always keep the tools you use for dyeing separate from those that you use to cook—store them separately and mark them clearly.

Recommended Tools

KITCHEN SCALE

You must weigh your fiber goods to identify how much scour and mordant to use—remember our cooking analogies, because all the ingredients must be present in the proper proportions to have success. Acquire a digital scale that measures in both grams and

ounces and can weigh up to five pounds, although note that we are using metric weight measurements in this book, as is the custom in my professional studio. If you begin to get very serious about dyeing, and switch from measuring dye with measuring spoons to measuring dye by weight, a scale that measures to a tenth of a gram provides the most reliable results. Read more about measuring dye by weight on [this page](#).



Most of the tools you need for dyeing are very easy to source from kitchen and hardware stores.

DYEING JOURNAL

A dyeing journal has proven to be one of my most useful tools, as it helps me plan my projects and recreate my results. See [this page](#) for detailed information on organizing your journal.

BUCKETS

Plastic buckets from the hardware store are useful for carrying water, holding your wet goods, and washing them out after dyeing. An 11-quart (10L) bucket is helpful to pre-wet and wash small-to-medium-sized projects. Five-gallon (19L) buckets are good for larger projects.

STAINLESS-STEEL POTS WITH LIDS

To establish an environment that will create the best lightfastness and provide the most even application of dye, choose a dyepot big enough to allow water and dye to move freely and easily around the fiber.

A well-equipped dye studio has pots in a variety of sizes. When deciding which pot to use, consider how much material and what type of material you would like to scour, mordant, or dye. When first experimenting with dyeing, choose a project from the book and purchase the pot advised to create that project. If you find yourself drawn to the process, and believe that you will dye more things, it's a good idea to have three pots: one for scouring and mordanting, at least one for dyeing, and if indigo dyeing protein-based fibers, one for indigo dyeing. Here are some suggested sizes:

- 3 quart (2.8L)—for small projects and samples
- 5 quart (4.7L)—for small to medium projects
- 11 quart (10.4L)—for medium-sized projects
- 16 quart (15.1L)—for indigo dyeing large amounts of protein-based fibers or if working with 1-yard (.9m) lengths of fabric
- 20 quart (18.9L)—for working with 2- to 3-yard (1.8 to 2.8m) lengths of fabric

KETTLE

It is necessary to use water 150°F (66°C) or hotter when dissolving agents used in scouring and mordanting and when using extracts. Use a kettle to warm water on your stovetop.

CANNING JARS WITH LIDS

Canning jars are useful for mixing and dissolving dye or storing leftover dyebaths for future use. Use a canning jar to create and store the concentrated indigo solution.

MEASURING CUP

I prefer a clear, glass liquid measuring cup, which comes in handy for measuring water and as a vessel for dissolving dyes. Remember that you need a dedicated measuring cup for dyeing.

MEASURING SPOONS

You will need a dedicated set of measuring spoons to measure dyes, ranging from $\frac{1}{8}$ teaspoon to 1 tablespoon.

STIRRING SPOONS OR SMALL STAINLESS-STEEL WHISKS

Use these tools to dissolve dyes.

TONGS

To turn fiber while dyeing, use a pair of nonreactive tongs.

COOKING THERMOMETER

Water must reach the correct temperature to ensure colorfastness (the desired temperature will be provided in the project recipes). Use an all-purpose cooking thermometer (but don't use it for food after using it for dyeing) to take the temperature of the water while scouring, mordanting, and dyeing.

TIMER

Once the designated temperature is reached, it is important to maintain that temperature for the correct amount of time to ensure lightfastness.

PH STRIPS

PH strips measure the acidity or alkalinity of water or a water-based solution. To learn how to use pH strips, measure the pH of your water. Take a cup of water from your tap and dip the end of the pH strip into the water. Watch the strip change color and compare it to the scale found on the packaging; 7 is neutral, 0–6 is acidic, and 8–12 is alkaline.

ASSISTS

Quite a few materials can be used to influence the pH of a given dyebath—they assist, or aid, the dyeing process. Here are some materials that are often used to adjust pH.

ACID: Lemon juice, Vinegar, Cream of tartar, Tartaric acid, Citric acid

ALKALI: Wood ash, Soda ash (sodium carbonate), Lime (calcium hydroxide), Chalk (calcium carbonate), Ammonia, Lye (sodium hydroxide)



Natural dyes are especially responsive to pH. A dyebath's acidity or alkalinity can affect the color and the texture of the fiber. Alkalinity higher than 10 can be damaging, especially when combined with high heat, and it can destroy protein-based fibers. Throughout the projects, you will learn about how the various shifts in pH will affect color and texture—this is important information to use as you develop a repertoire of skills. You will see notes when it is necessary to be aware of shifts in pH. Recording pH in your dye journal ([this page](#)) will help you understand your color results.

Throughout the dyeing process, materials are added to affect the pH. Sometimes these materials are referred to as assists. See [this page](#) for a list of materials commonly used to affect the pH.

CLOTHESLINE, DRYING RACK, OR SHOWER CADDY

Once the dyed goods are washed, you need to be able to let them drip dry. Any of these items are good options for that purpose. Also, during the indigo dyeing process, you need a space to allow the goods to sit between dips in the indigo dyebath. Either a clothesline or a drying rack works well for this purpose.

RUBBER GLOVES

My favorite gloves are Casabella Water Stop Premium. They have a rim that helps keep the water from dripping down my arm (and they fit nicely). Gloves help protect the hands from heat and keep them soft.

MASK

When working with natural dyes, there are some powders that are particularly fine. You should avoid breathing in powders, so have a mask on hand to protect your upper respiratory system. Always wear a mask when weighing aluminum acetate (a mordant) and using sodium hydrosulphite (a reducing agent used when indigo dyeing).

PROTECTIVE EYEWEAR

It is important to protect your eyes when working with lye, which is used in the indigo dyeing process.

Optional Tools

MORTAR AND PESTLE

You may use these tools for grinding whole dyestuffs, such as cochineal.

SINGLE CUP COFFEE CONE AND PAPER FILTERS

This pour-over set-up can be helpful to strain fine sediment that can cause spotting or staining.

SIEVE OR CHEESECLOTH

Use one of these items to strain medium-sized sediment than might cause spotting or staining.

PLASTIC BAGS

A repurposed plastic shopping bag makes a great alternative to a bucket as a way to carry and store wet goods.

MASKING OR PAINTER'S TAPE AND PERMANENT MARKER

If you have multiple projects going at once, it's helpful to label pots and buckets with their contents.

SURVEYOR'S (OR FLAGGING) TAPE

Sometimes I fill a scour, mordant, or dyebath with different types of yarn and fabric. When working with a variety of fabric and yarn in the same vessel, I like to make water- and heatproof labels to keep them organized. See the sidebar below to learn how I make and use the labels.

CALCULATOR

For the most part, this book employs very simple math, but as you become more advanced in dyeing and begin to dye larger amounts

of goods, you may find that a calculator is handy.

FOLDING TABLE

If you plan to work outside, a folding table makes a great portable surface.

HOT PLATE, EXTENSION CORD, AND HOSE

If working outdoors on a beautiful day, these tools can be helpful.

DROP CLOTH, PLASTIC OR VINYL TABLECLOTH, OR PLACEMATS

If using your kitchen table as a workspace, have a plastic or vinyl tablecloth ready to protect your table from occasional spills. If using your counter to mix dyes, plastic or vinyl placemats will also do the trick.

DISTILLED WATER

Your tap water's pH, mineral content, and any metals introduced from your pipes (like iron or copper) can affect the colors achieved with natural dyes. If you're having a hard time obtaining the same colors I am, and would like to get the colors as established in the book, try using filtered or distilled water.

LABELING MATERIALS

When I work with multiple goods at the same time, I identify them with a label. When goods are white (undyed), as they are in the scouring and mordanting steps, it can be easy to lose track of which phase they are in. This is especially important when mordanting protein-based fibers because if they go through the step twice, the fiber will be permanently sticky. The solution is marking. Here is how I do it: I take a piece of surveyor's tape and loosely tie it to the fiber or yarn. If working with fabric, I make a small snip in the corner of the material, thread the tape through, and knot it. I use a permanent marker to record the fiber content and the weight of the item, and as I work through the process, I continue to add information to the tape—an "S" for scour and an "M" for mordant. I make a circle around the letter once the process is complete. Later I can review it to help explain or replicate the color outcome.



Organizing a Dye Journal for Project Planning

I have found that documenting my dyeing process has given me a deep understanding of how dyes work with a wide variety of fibers. When I first learned to use natural dyes, I was so excited by the possibilities that all I wanted to do was collect plants or dissolve extracts, get a pot of water, and throw in some yarn or fabric. As my pile of swatches grew, I came to learn there were colors I loved to make, colors I wanted to avoid, and new colors I wanted to explore. The problem was that I only had a vague memory of how I made the colors! I began to record the process of dyeing in a journal and included a few key pieces of information that have helped me grow tremendously as a dyer. I am better able to understand my results and to predict the outcome of colors.

A dye journal can be a designated area for planning your projects. This is especially helpful when developing projects that require multiple steps or when you need or want to alter the recipes I used—when your goods don't weigh the same as mine, for example ([this page](#)). The dye journal gives you a place to record everything related to the process, and can help you make a shopping list and plan your time.

If you work through the book and follow the recipes exactly as written, it is still helpful to keep a journal to record your path and to look back on once the project is complete. Make notes of your findings and observations during the dyeing process, recording tips and tricks for the next time you dye.

A NOTE ABOUT MEASUREMENTS

Scour, mordant, and dyes can be measured in two ways: by volume (teaspoon) or by weight (grams). Volume is used as the primary form of measurement in this book because it doesn't require weighing extracts or dyestuffs, making it easier for you to start dyeing. Because volume can fluctuate depending on how hard you pack the measuring tool, the most accurate way to measure—and how I measure in the studio—is by weight. On [this page](#), I explain how the professionals use weight to make changes in dye recipes should you become interested in that method, but you don't need to know how to do this to make any of the projects in the book. When recording your measurements, use the way that makes the most sense to you.

INFORMATION TO RECORD

Here are a few key pieces of information you should record in your journal. Through recording this data, it is possible to analyze the dyeing results and build an informed foundation for mapping color. It is a powerful tool that makes it much more feasible to re-create colors and to build new colors by combining multiple plants or extracts.

Date

Recording the date gives a frame of reference for your progress. The date indicates the season when the dyeing was done, which can be meaningful if you harvested the dyes as the amount of pigment in the plant can fluctuate seasonally.

Content of goods

Identifying the fiber content is an important step because it can have a tremendous effect on the outcome of the color and also dictate the amount of dye needed. Cellulose-based fibers take dye much lighter, and sometimes in different shades, than protein-based fibers. Even within these two classifications, each type of fiber can produce different results; Merino wool will dye differently than Bluefaced Leicester wool, for instance.

Tools used

Make a list of tools used—and take note of tools you wish you had!



A page from my dye journal containing thorough notes.

Weight of goods

Record the weight of dry fiber, yarn, and fabric.

Scour material and amount used/date

Record the type and amount of soap and water used.

Mordant material and amount used/date

Record the type and amount of mordant and water used.

Bath material and amount used/date

If you used a special bath ([this page](#)) such as chalk, bran, or iron, record the information.

Dye material/type and amount used/date

Record the type and amount of dye and water used. When dyeing, there are many different forms dyes can take—leaves, flowers, stems, bark, roots, peel, wood chips, sawdust, or concentrated powders called extracts. It is important to record the dye's form you are using, including descriptors. For example, it takes more madder sawdust than madder extract to obtain a medium shade of red. To understand your results, you must include specific information about the form and amount used.

If you have gathered a plant, identify it by its Latin name if possible. The Latin name allows more specificity in the identification process because common names fluctuate regionally.

Wash material and amount used/date

Record the type and amount of soap or detergent and water used.

Sample

Once your dyed goods are dry, take a little snip and add it to your journal entry to record your results.

PLANNING YOUR TIME

Since the entire dyeing process takes time, this chart should help you organize your workflow. You can break up the process after scouring or mordanting if necessary.

Weighing and scouring: Prep time = 30 minutes. Cooking time = 1 hour + cooling time.

Mordanting: Prep time = 30 minutes. Cooking time = 1½ hours + cooling time.

Dyeing: Prep time = 15 minutes. Cooking time = 1½ hours. If you have more than one pot and burner, you can do multiple dye pots at once. Allow time for cooling.

Washing: Time = 30 minutes. Drying time = 24 hours from when hung to dry, at most.

stage 1: WEIGHING AND PREPARATION

Now that you have learned about dyes, fiber, and the tools and materials involved in natural dyeing, it is time to take a look at the actual process from start to finish.

Weigh the Goods

Although I have done much of the math for you and provided specific dye recipes in the project section, it is very important to weigh the goods you plan to dye before you get started. The amount of scour ([this page](#)) and mordant ([this page](#)) you will use is based on the weight of goods (*WOG*). Record this measurement. In addition to helping with the scouring and mordanting steps, *WOG* is an important principle to understand as your skills develop and you are creating your own dye recipes or altering those provided in the book.

Prepare the Goods

Take the following precautions to make the goods easier to handle while dyeing.

UNSPUN FIBER

Unspun fiber is a particularly sensitive form as it can easily tangle or come apart. It is best to separate it into 1- to 2-ounce (28 to 56g) increments for ease of handling during the dyeing process.

YARN

Yarn can be found in two forms, a ball and a skein, but it should be dyed in the skein form. To prepare the skein, lay it flat on a table and open it into a large loop. Take a piece of scrap yarn and thread it through the skein in the shape of a figure 8. In this manner, tie the skein snugly in four places that are spaced equally apart. (A)

If the skein is tied too tightly, the dye won't reach the yarn under the tie. Make sure the knots are secure so the ties do not loosen and float away in the dyeing process. Preparing the yarn keeps it from becoming tangled when wet.



A.

B.

C.

FABRIC

Once fabric absorbs water, it can become quite heavy and unwieldy. Cutting a piece of fabric into sections and then dyeing it makes the process more manageable. Be especially careful when dyeing knit fabric, as it can stretch out of shape. Make sure to always hold it with both hands when transferring it from one pot to the next, and try not to wring it or stretch it. Due to its construction, knit fabric takes dye more readily than woven fabric. (B—knit fabric on the left, woven fabric on the right)

Pre-wet the Goods

It is necessary to thoroughly pre-wet all goods before starting any of these steps in the process: scouring, mordanting, or dyeing. If possible, move on to the successive steps right away, but if not, you can keep the goods wet for a little while. In most environments, protein-based fibers can stay wet for 5 to 7 days and cellulose-based fibers can stay wet 2 to 3 days. But dry them immediately if you see any mold or mildew.

It can be convenient to scour and mordant the materials for multiple projects simultaneously—it is okay to dry the goods and store them until you're ready to dye them. It's a good idea to mark them so you can identify them and to remember which stage the goods have gone through. If you have dried out any of the materials after scouring or mordanting, re-wet them and jump right into the next step of the process.

To judge when the goods are thoroughly pre-wet, notice when they sink on their own accord. Once they sink, they are ready to dye. It doesn't hurt fibers a bit to soak for hours or even a couple days in a dyebath. Rather the longer the goods sit in mordant or dye, the greater the chance of obtaining better colorfastness. (C)

BEWARE OF FELTING

Felting is the permanent locking together of woolen fibers. This has a variety of ramifications; if working with unspun fiber, the fiber cannot be spun into yarn; if working with yarn, felting can cause a lump in the strand; and if working with fabric, felting can change the texture of the fabric and it will shrink.

To keep this from happening at any stage, follow all directions carefully. Remember these cautions:

- Add woolen goods to the pot before applying heat and raise the temperature of the dyepot slowly.
- Never allow the goods to boil.
- Allow the goods to cool before moving them or before beginning the washing process.
- Never pour water over the top of woolen goods.
- Use the same temperature of lukewarm water throughout the washing process.
- Never go directly from hot water to cold water.

Unspun fibers such as fleece or top felt more easily than yarn, so I suggest working with yarn when you're beginning to dye wool. Practice the guidelines above. Once you're confident, move to more open (unspun) fiber types such as fleece or top if you'd like. If you really want to avoid any chance of felting, there is also the option of using washable wool called superwash, which has been treated to prevent felting.

stage 2: SCOURING

It is important to scour (prewash) all fibers and fabrics before beginning the mordanting and dyeing process—especially cellulose-based fibers and any protein-based fibers such as wool, where lanolin may be present. Scouring removes any residue from the manufacturing process, so the mordant and dye can adhere to the material thoroughly and uniformly. Scouring helps ensure more saturated colors with better colorfastness.

A note on pot size: The size of the pot you use for scouring and mordanting is dependent upon the amount of goods you are working with. Unless you are scouring and mordanting for multiple projects, use the size called for in the project's dyeing instructions.

Scouring Protein-Based Goods

Laundry detergent and soap are usually alkaline and can damage protein-based fibers. Use only mild dishwashing detergent with a neutral pH level; a few drops of dishwashing detergent work well.

MATERIALS

Mild dishwashing detergent (I use Ecover or Dawn)

TOOLS

3-quart (2.8L) or larger stainless-steel pot with lid (size dependent on the amount of goods)

Measuring spoons

Thermometer

Tongs

Rubber gloves

1. Fill a stainless-steel pot with enough water so the goods are covered and can move freely once added to the pot.
2. For each 500g of dry goods, add ½ teaspoon (2.5mL) dishwashing liquid to the pot of water and stir.
3. Add the goods to the pot. Slowly, over 30 minutes, bring the water in the pot to 180°F (82°C), keeping the water just under a simmer. Hold at this temperature for an additional 30 minutes, rotating goods gently from the top to the bottom of the pot every 10 minutes. Make sure the goods remain submerged when rotating. (D)

4. Turn off the heat. Allow the goods to cool. Rinse the fibers or fabric in cold water to remove excess detergent. If the water in the pot is dark yellow or brown after scouring, repeat the process until the water is clear.
5. Squeeze excess scouring water from the goods. You can either proceed to mordanting the goods or store them wet in a plastic bag or bucket; in a cool dark place, they will be fine up to 7 days. If you need to wait longer than this, allow the goods to dry and store them until you are ready to mordant.



D.

Scouring Cellulose-Based Goods

The process for scouring plant-based goods is a bit different from scouring animal-based goods. Cellulose-based goods can endure and in fact benefit from being washed in an alkaline environment.

The stove-top method suggested is the best way to thoroughly scour, due to the high temperature achieved by boiling the goods. That said, it may be more convenient to use your washing machine to scour cellulose-based goods. Simply use the hot water/long cycle setting.

MATERIALS

Soda ash (also known as washing soda or sodium carbonate)

TOOLS

3-quart (2.8L) or larger stainless-steel pot with lid (size dependent on the amount of goods)

Measuring spoons

Measuring cup

Stirrer, such as whisk or spoon

Thermometer

Tongs

Rubber gloves

1. Fill a stainless-steel pot with enough water so the goods are covered and can move freely when they are added to the pot.
2. For every 100g of dry goods, add $\frac{1}{4}$ cup (60mL) of hot water to a measuring cup and then add $1\frac{1}{4}$ teaspoons (5g) soda ash. Stir with a small whisk or spoon until dissolved.
3. Add the dissolved soda ash mixture to the pot of water and stir.
4. Add the goods to the pot. Slowly, over 30 minutes, bring the water in the pot to 180°F (82°C), keeping the water just under a simmer. Hold at this temperature for an additional 30 minutes, rotating goods gently from the top to the bottom of the pot every 10 minutes. Make sure the goods remain submerged when rotating.
5. Turn off the heat. Allow the goods to cool. Rinse the goods in warm water to remove excess soda ash. If the water in the pot is dark yellow or brown after scouring, repeat the process until the water is clear.
6. Squeeze excess scouring water from the goods. You can either proceed to mordanting the goods or store them wet in a plastic bag or bucket; in a cool dark place, they will be fine for 2 to 3 days. If you need to wait longer than this, allow the goods to dry and store them until you are ready to mordant.

stage 3: MORDANTING

A mordant is a naturally occurring, water-soluble metallic salt that bonds the dye to the fiber. During the mordanting step, this salt is applied to the fiber. For the recipes in this book, I use aluminum-based mordants as they are nontoxic, safe for the environment, accessible, and produce bright, long-lasting color. In addition to aluminum, iron, copper, tin, and chrome have been used historically as mordants. You will not need to mordant goods that you will be dyeing with indigo, as the indigo dyeing process is very different. You will learn about indigo dyeing on [this page](#).

Mordanting Protein-Based Fibers

Use food-grade aluminum potassium sulfate for this step, because it is free of iron and other impurities.

MATERIALS

Aluminum potassium sulfate

TOOLS

3-quart (2.8L) or larger stainless-steel pot with lid (size dependent on the amount of goods)

Measuring spoons

Measuring cup

Stirrer, such as whisk or spoon

Thermometer

Tongs

Rubber gloves

1. Fill a stainless-steel pot with enough water so the goods are covered and can move freely when they are added to the pot.

2. For every 100g of dry goods, add $\frac{1}{4}$ cup (60mL) of hot water to a measuring cup and then add 1 tablespoon (14g) aluminum potassium sulfate. Stir with a small whisk or spoon until dissolved. (E)

3. Add the dissolved aluminum potassium sulfate mixture to the pot of water and stir.

4. Add scoured, wet goods. Slowly, over 30 minutes, bring the water in the pot to 180°F (82°C) for silk and 190°F (88°C) for wool, keeping the water just under a simmer. Hold at this temperature for

an additional hour, rotating the goods gently every 10 minutes. Make sure the goods remain submerged.

5. Turn off the heat. Allow the goods to cool.
6. Squeeze excess mordant water from the goods and rinse with cool water. You can either proceed to dyeing the goods or store them wet in a plastic bag or bucket; in a cool dark place, they will be fine for up to 7 days. If you need to wait longer than 7 days, allow the goods to dry and store them until you are ready to dye.



E.

Mordanting Cellulose-Based Fibers

To mordant cellulose-based fibers, I recommend using aluminum acetate followed by a bath ([this page](#)) to remove excess mordant. After a series of tests, I found that aluminum acetate created the brightest colors on plant-based fibers, with the best colorfastness.

MATERIALS

Aluminum acetate

TOOLS

3-quart (2.8L) or larger stainless-steel pot or bucket with lid (size dependent upon the amount of goods)

Measuring spoons

Measuring cup

Stirrer, such as whisk or spoon

Thermometer

Tongs

Rubber gloves

Mask

1. You need only hot tap water for this recipe, so you can use either a pot or a bucket. Fill the vessel with enough hot water so the goods are covered and can move freely once added to the pot.
2. Be sure to wear a mask when weighing and dissolving aluminum acetate. For each 100g of dry goods, add $\frac{1}{4}$ cup (60mL) of hot water to a measuring cup and then add 2 teaspoons (6g) aluminum acetate; stir with a small whisk or spoon until dissolved.
3. Add the dissolved aluminum acetate mixture to the pot of water and stir.
4. Add scoured, wet goods. Cover the pot to help retain the heat.
5. Stir the goods, rotating every 10 minutes. Make sure the goods remain submerged.
6. Let the goods sit for 2 to 24 hours. The longer you allow the goods to sit, the better lightfastness you will achieve.
7. Squeeze excess mordant water from the goods. You can either proceed to dyeing the goods or store them wet in a plastic bag or bucket in a cool dark place for up to 3 days. If you need more than 3 days, allow the goods to dry and store them until you are ready to dye.

REUSING YOUR MORDANT BATH

Your mordant bath can be saved and reused again. Next time you want to mordant, use $\frac{1}{2}$ teaspoon (2g) aluminum potassium sulfate per 100g of protein-based goods or $\frac{1}{4}$ teaspoon (1g) aluminum acetate per 100g of cellulose-based goods. After using the mordant bath twice, discard it. It is safe to pour it down the drain.

Baths for Cellulose-Based Fibers

Baths of wheat bran and chalk are used to remove excess aluminum acetate mordant. If you do not remove excess mordant, the fabric may look chalky and the color may be dull. This step takes place after the mordanting process, and before the dyeing process. The choice of bath impacts the dyed color. See the Shade Cards on [this](#)

[page](#) for more information. You will be referred back to these baths as you work through the projects.

The directions below are for the smaller-sized projects in the book, such as the socks on [this page](#). For larger-sized projects that weigh more than 500g, use 5-gallon (18.9L) buckets and double the recipes.



Wheat Bran Bath

This bath can be used for up to 500g of goods. Discard after 12 hours.

MATERIALS

2 cups (100g) wheat bran

20 cups (4.7L) warm water

TOOLS

Two 11-quart (10.4L) buckets

Measuring cup

Stirrer, such as whisk or spoon

Sieve

1. Mix 100g wheat bran in 20 cups (4.7L) warm water. After 5 minutes, strain out the wheat bran using a sieve.

2. Dip the mordanted goods into the strained bath, making sure to wet thoroughly.

3. Wring the goods. Rinse. Proceed to the dyeing step.



Chalk Bath

This bath can be used for up to 10g of goods. Discard after 1 week.

MATERIALS

2 tablespoons (28g) chalk (calcium carbonate)

20 cups (4.7L) warm water

TOOLS

11-quart (10.4L) bucket

Measuring cup

Stirrer, such as whisk or spoon

1. Dissolve 50g chalk in 20 cups (4.7L) warm water.

2. Dip the mordanted goods into the bath, making sure to wet thoroughly.

3. Wring the goods. Rinse. Proceed to the dyeing step.

Alternate Method for Mordanting Cellulose-Based Fibers

Using aluminum acetate to mordant cellulose-based fibers produces the clearest colors. That said, another way of mordanting cellulose-based fibers is to use a combination of tannin-rich plants and aluminum potassium sulfate—the same agent used in the mordanting of protein-based fibers. Just note that tannins generally

impart a beige or coral hue, which can shift the colors normally achieved with aluminum acetate.

Certain plants and trees produce tannin in high concentrations; this astringent helps protect the plants against bacterial or fungal infections. Tannin bonds well with cellulose, aluminum potassium sulfate, and other dyes. So in this case, tannin and aluminum potassium sulfate both act as mordants, doubling the capacity for cellulose-based fibers to capture the dye. Plants rich in tannin which can double as mordants and dyes include: tea, cutch, myrobalan, acorns, oak galls, walnuts, and quebracho red.

If you find yourself desiring to work with tannin instead of aluminum acetate, here are a couple things to note.

- If you would like to work with a dye that is rich with tannin, you can use it as both a mordant and a dye. To achieve the deepest, most lightfast colors, you would first apply the tannin-rich dye, then the aluminum potassium sulfate, and then apply the tannin-rich dye again.
- If you would like to work with a dye that is not rich with tannin, such as madder, you would first apply a tannin-rich dye, then the aluminum potassium sulfate, and then the dye (in this case madder).

MATERIALS

Myrobalan (or any of the tannin-rich dyes listed above)

TOOLS

3-quart (2.8L) or larger stainless-steel pot with lid (size dependent on the amount of goods)

Measuring spoons

Measuring cup

Stirrer, such as whisk or spoon

Thermometer

Tongs

Rubber gloves

1. Fill a stainless-steel pot with enough water so the goods are covered and can move freely when they are added to the pot.

2. For every 100g of dry goods, add $\frac{1}{4}$ cup (60mL) of hot water to a measuring cup and then add $1\frac{1}{2}$ tablespoons (15g) myrobalan. Stir with a small whisk or spoon until dissolved.

3. Add the dissolved myrobalan mixture to the pot of water and stir. Add the scoured, wet goods.
4. Slowly, over 30 minutes, bring the water in the pot to 200°F (93°C). Hold at this temperature for an additional hour, rotating the goods gently every 10 minutes.
5. Turn off the heat. Allow the goods to cool.
6. Squeeze excess mordant water from the goods and rinse with cool water.

After applying the tannin as described above, follow the directions for using aluminum potassium sulfate on protein-based fibers, [this page](#). If using this recipe, you do not need to use the chalk or bran baths.

stage 4: DYEING

Now that all the prep work is done, it is time for the magic to happen. Since the book is project-based, the specific information you need to prepare the dyebath itself is included in each individual project (they begin on [this page](#)). But here is an explanation of the general process so you can familiarize yourself with the steps of dyeing with dyestuffs, extracts, or indigo.

Directions for Dyeing with Dyestuffs or Extracts

1. Place the scoured, mordanted goods into the vessel holding the prepared dyebath. (F)
2. Bring the pot to the appropriate temperature as indicated in the instructions. The goods will need to be rotated in the dyepot and will need to simmer for a set amount of time. (G)
3. After the heat is turned off, the goods need to rest and cool before being washed ([this page](#)).

Directions for Dyeing with Indigo

If you're using indigo, the dyeing steps are a little different because the process involves making a *reduction*, which requires an alkaline environment and an absence of oxygen in the dyebath. I examine this process in detail on [this page](#), but here is a quick overview.

1. Make the indigo *mother*, a highly concentrated solution of indigo.
2. Bring the water in the dyepot to the proper pH.
3. Add the indigo mother to the dyebath (called the *vat*) and then add the agent to reduce the oxygen. (H)
4. Dip the goods into the vat as specified in the directions.
5. Let the goods rest and oxidize, then continue to dip as required.
6. Wash the goods ([this page](#)).



F.



G.



H.

stage 5: WASHING

After your goods have been dyed, they need to be washed to remove any excess dye. If you have a laundry room, wonderful: it's a great place to wash out your newly dyed fabrics and projects. Use your utility sink to wash the dyed materials and use your washer to spin out extra water. If you don't have a laundry room, wash your goods in your bathtub or sink. If you're washing different batches of color at the same time, start with lightest colors first and then move to darker colors to save water. You can use the greywater left from the lighter colors to wash the darker colors.

Washing Protein-Based Fibers

Because protein-based fibers are prone to felting, it is best to wash yarn and fabric by hand. If indigo was used, see [this page](#).

MATERIALS

Dishwashing detergent

TOOLS

Two or three 11-quart (10.4L) buckets

Large sink or bathtub

Drying rack or clothesline

1. Place 2 or 3 buckets in a bathtub or large sink. Fill them three-quarters full with lukewarm water. Add a dab of dishwashing detergent to each bucket; it will wash out during this process without any additional rinsing.

2. Work with one piece of dyed goods at a time. Immerse the room-temperature dyed goods into the water. Pull the material out, pressing it flat between your hands to squeeze out the water into the sink or tub. Avoid wringing or stretching the goods. (I) If the water becomes too saturated with dye, replace following instructions in Step 1.

3. Repeat step 2 until the water pressed out of the goods runs clear.

4. Dry the goods on a drying rack or clothesline. (J)



I.



J.

Washing Cellulose-Based Fibers

Because cellulose-based fibers aren't prone to felting like protein-based fibers, a washing machine is an easy option for washing fabric. However, you should wash yarn by hand in the same fashion as described for protein-based fibers, because it will tangle in the washing machine.

MATERIALS

Mild laundry detergent or soda ash

TOOLS

Washing machine

Dryer, drying rack, or clothesline

1. Wash fabric in cool water in the washing machine for a full wash cycle, using 1 teaspoon (4g) mild detergent or soda ash per 100g of goods. If the fabric has been dyed a dark shade, wash it in an extra-long cycle, with an extra rinse cycle if possible.
2. As you get to the end of the washing cycle, stop the machine, open the lid, and check to see what color the water is. If the water is colored, add another wash cycle. Once the fabric has stopped releasing dye, you can stop washing.
3. Dry the fabric in the dryer if you prefer, but air drying it in a shaded place will extend the life of the color.

Washing Indigo-Dyed Goods

If you have dyed cellulose-based fibers with indigo, use the same washing instructions as above. No additional steps are needed. If you have dyed protein-based fibers, you need to return the goods to pH neutral before washing because they are especially sensitive to alkaline environments.

MATERIALS

Vinegar

TOOLS

11-quart to 5-gallon (10.4 to 18.9L) bucket (depending on size/amount of dyed materials)

1. Add 1 tablespoon (15mL) vinegar per gallon (3.8L) of water to the bucket. Add the dyed goods.

2. Let the goods sit for 15 minutes, then proceed to the protein-based fiber washing instructions on [this page](#).

Caring for Naturally Dyed Goods

Naturally dyed cellulose-based goods are more prone to fading than protein-based goods. Only wash when necessary, using the smallest amount of detergent required to get the job done. Never use detergent with bleach on any of your naturally dyed goods. Dry in the shade.

Clean-up Practices

All the scour, mordant, and dyebaths used in this book can be safely disposed of down the drain. They are nontoxic.

Once you are done indigo dyeing, you have two choices: dispose of the vat or keep it for reuse. To keep your vat, cover it and store in a dark, cool space for up to three months. When ready to reuse it, recalibrate the vat ([this page](#)).

To dispose, pour the vat down the drain. If you find yourself doing this frequently, be kind to your pipes and add lemon juice to the vat to neutralize it first.



To maintain the rich color of naturally dyed goods, wash only when needed and air dry out of the sun.

WIDENING THE SPECTRUM

There are a number of ways to expand your knowledge of basic dyeing techniques. Here are a couple of practices that are explored further in the projects.

Adapting Recipes

In the following chapters, I provide the precise weight of the goods I am dyeing, along with the amount of the dye and water used. That said, you may find yourself in the following scenarios:

The goods you are working with are lighter or heavier than mine and you would like to get as close as possible to the shade I have gotten:

You can add a pinch more or less of dye to compensate for the difference in weight.

If you would like to get into the details of production dyeing, see [this page](#) for information on using dye by weight—instead of by volume—to establish results. This is how we work in my professional dye studio.

You would like a lighter or darker shade than shown:

If you are working with whole dyestuffs, refer to [this page](#) for guidelines on how much dyestuff I recommend by WOG. Use less or more dye to get a lighter or darker shade.

If you are working with extracts, I have created two Shade Cards for your reference: one for use with protein-based fibers, one for use with cellulose-based fibers. The Protein Shade Card gives you recipes to make three shades of color on both wool and silk, while the Cellulose Shade Card offers recipes for achieving four shades on cotton and linen. Use these references to scale up or down to get different colors and shades.

The Shade Cards are examined more thoroughly in [chapter 5](#), when the projects featuring dye extracts are presented. But I want to introduce the concept now so you understand that you will have tools to help you express more creative freedom with color.

You would like to substitute a color in a project:

So long as you're working with dye extracts, you can use the Shade Cards to switch colors within the projects. As previously mentioned, you can read more about the versatility the tools offered in [chapter 5](#).

Although dyeing is a science, it can be tricky to be exact. That's why I suggest the practical step of keeping a journal of your results ([this page](#)), and I also suggest embracing your results with love and compassion! Give yourself the permission to play.



The Shade Cards give you a visual reference for altering dye recipes.

Using Iron Water

Iron water is the combination of either granular iron (ferrous sulfate) or scrap metal and water. It is an optional step in the dyeing process. Goods, once dyed, are dipped into the bath to create darker shades and sometimes entirely new colors—for instance, pink shifts to purple and yellow shifts to green. This additional step is a welcome one when trying to create the largest range of colors and shades of color possible. Iron also increases colorfastness. (K + L)



K.



L.

SPECIAL PRECAUTIONS

Despite its utility, iron can have quite an impact upon natural dyes and fibers. A number of precautions are advised when working with it. Iron will leave a mark any time it comes into contact with naturally dyed goods (or goods that are going to be naturally dyed). To avoid unintended dark spots on your dyed goods, thoroughly wash the tools used in the process of applying iron water. If using iron often, it may be worthwhile having a set of tools used only for the application of iron.

Iron—especially in combination with heat—can have a great effect on the texture and the hand of the goods. When used in large amounts or over medium-to-high heat, iron can destroy both cellulose- and protein-based fibers. The key is to use as little iron possible to achieve the desired color and to use low heat in the application of iron. Typically, I heat the iron water to make sure it is thoroughly mixed, and then I remove the bath from the heat before

placing goods in it. I never use iron water hotter than 140°F (60°C). And I never leave goods in iron water longer than 30 minutes.

Protein-based fibers are especially prone to damage during the iron application process. Iron can make the texture feel rough and the fibers feel brittle. Instead of using iron to achieve green and purple, I use logwood purple or indigo. If you would like to experiment using iron on protein-based fibers, practice the method using scrap metal presented on [this page](#), as it is generally weaker than the ferrous sulfate mixture, and keep the temperature of the bath low—below 100°F (38°C).

Cellulose-based fibers stand up quite well to the application of iron as long as the above precautions are employed. Because logwood purple does not have very good lightfastness when applied to cellulose-based goods, iron is especially helpful to achieve a larger spectrum of color—and those beautiful greens and purples.

My instructions call for a light application of iron water only. If a darker shade is desired, increase the amount of iron. But when experimenting on your own, increase iron and heat with caution. Ferrous sulfate, the granular form of iron, is available for purchase from your local textile or crafts shop or online. If you make your own iron water from scrap metal, allow at least a few weeks for the mixture to strengthen before use. See the results of applying iron water in the projects on [this page](#) and [this page](#).

Iron Water Using Ferrous Sulfate



MATERIALS

Ferrous sulfate

TOOLS

Single-cup coffee cone and filter

3-quart (2.8L) or larger stainless-steel pot with lid (size dependent upon the amount of goods)

Measuring spoons

Measuring cup

Stirrer, such as whisk or spoon

Thermometer

Tongs

Rubber gloves

1. Fill a stainless-steel pot with enough water so the goods are covered and can move freely when they are added to the pot.

2. For every 100g of dry goods, add $\frac{1}{4}$ cup (60mL) hot water to a measuring cup and then add $\frac{1}{4}$ teaspoon (1.5g) ferrous sulfate. Stir with a small whisk or spoon until dissolved. Strain through a coffee filter. Discard the coffee filter.

3. Add the dissolved ferrous sulfate mixture to the pot of water and stir. Heat the water to between 120°F and 140°F (49°C and 60°C). Turn off the heat.

4. Add the dyed goods. Rotate the goods constantly in the pot. After 15 minutes, pull the goods from the pot and wash ([this page](#)).

Iron Water Using Scrap Iron

MATERIALS

Rusty scrap iron, such as railroad spikes

Vinegar

TOOLS

Large container (big enough for the scrap iron)

Bottle or jar to hold iron water mixture (a recycled wine bottle with cork works nicely)

Measuring cup

3-quart (2.8L) or larger stainless-steel pot with lid (size dependent upon the amount of goods)

1. Collect rusty scrap iron. Add iron to the container and pour vinegar on top until the iron is fully immersed.
2. Let it sit for at least a few weeks; the mixture will turn a rusty orange color. The stronger it is, the better.
3. To use the solution, add equal parts water and equal parts scrap iron solution to a pot that is big enough to let the goods float freely. Add the goods and turn constantly. Leave in the bath for as little as 5 minutes. If a darker shade is desired, leave in for 15 to 20 minutes. Pull the goods from the pot and wash ([this page](#)).

THE GOLDEN RULES OF NATURAL DYEING



1. Keep notes. There is a direct correlation between the weight of fiber, the amount of dye, and the amount of water to the color you achieve. When you record your process, you will become a better dyer.
2. Be careful with protein-based fibers. To prevent felting, don't let protein-based fibers boil, and don't shock them by moving them from hot water to cold water or vice versa.
3. For the best results, mordant. A mordant helps the dye bond with the fabric and provides better lightfastness and colorfastness.
4. Water acts as the color white. If you add more water to your dyebath, you will get a lighter shade.

- 5.** Be mindful of your fiber. The process of dyeing protein-based fibers is quite different than that for cellulose-based fibers.
- 6.** Colors change as they dry. Wool dries one value lighter, silk two values lighter, and cotton and linen three values lighter than when wet.
- 7.** Be aware of pH level, metals, and minerals. Each of these three elements can affect the outcome of the color and texture of the fiber during the dyeing process.
- 8.** Exercise caution when using iron. I recommend using iron on cellulose-based fibers only with low heat. Using it on protein-based fibers can make the texture rough and brittle. Clean up well after using iron, because it can cause spots on future dyeing projects.
- 9.** Take your time. Allow pots to cool before handling the goods, as it is safer to handle room-temperature water and fiber. Plus, allowing the goods to sit in the pot means better lightfastness and more saturated color.
- 10.** Have fun and love your results!



A collection of plants foraged from my Northern California landscape that work as natural dyes, including oak galls, black walnuts, yarrow, and eucalyptus.

chapter 4

DYEING WITH WHOLE DYESTUFFS

Your pantry, garden, or the forests and fields surrounding your house are great sources for dye plants. Learning to identify these materials in their natural settings and recognizing their color potential will enhance and change the way you experience these places. Natural dyes are referred to as whole dyestuffs when plucked from nature and used as is or when they have undergone minimal processing. Whole dyestuffs can be found in the following forms: roots, stems, leaves, bark, flowers, seeds, galls, wood chips, sawdust, insects, fungi, and ground minerals. They may be used fresh, dried, or frozen.

EXTRACTING COLOR FROM WHOLE DYESTUFFS

The process of extracting color from whole dyestuffs is very similar to making tea; in fact, tea is a dyestuff. A vessel of water is heated to a low simmer and the whole dyestuff is added. The amount of time needed to extract the dye depends on the texture and thickness of the whole dyestuff. Flowers may need only 15 minutes, while a thick leaf like eucalyptus could take two or more hours. To extract dye from wood chips you must cover them with boiling water and let them soak overnight (or for up to a few days), then simmer for 15 to 20 more minutes and discard the chips (retaining the dye water).

Textiles can be added during the extraction process to save time. However, this can lead to uneven color or whole dyestuffs becoming embedded in the goods; removing dyestuffs from yarn can be especially difficult. The other option is to strain the whole dyestuffs from the dyebath, then add the goods (as for the wood chips).

To decide how much dyestuff is needed to create a medium shade of color, you need to know the weight of goods (WOG) you intend to dye ([this page](#)). Bear in mind that cellulose-based goods can require up to twice as much dye as protein-based goods. Here is a general list of recommended amounts to use as a starting point:

- Cochineal bugs, madder root, weld flowers and stalks, osage sawdust, logwood chips—weigh the goods and use an amount of dyestuff that equals 10% of that weight (WOG).
- Coreopsis, onion skins, dahlia, marigold, yellow cosmos, tea, eucalyptus, goldenrod, yarrow, pomegranate rinds, oak galls, walnut—weigh the goods and use an amount of dyestuff that equals 50 to 100% of that weight (WOG).

It's okay if you aren't able to gather the exact quantity called for; just be sure to note the amount you use in your dye journal and the form (fresh or dried) so you have a comparison the next time you try this dye.

MINDFUL GATHERING

The fields and forests surrounding your home are filled with potential color. Take a hike and see what you find. Use the Catalog of Color ([this page](#)) to help identify the plants and trees in your area, what they look like, and the colors they give. Some common examples are walnut, galls from oak trees, eucalyptus, yarrow, and osage. Save a piece of any plant you gather by pressing it into your dye journal, along with a record of where and when you found it. When gathering, remember these safety and etiquette guidelines:

- If you decide to experiment with foraged plants not listed in this book, be sure to identify the plant before working with it. Some plants and mushrooms are dangerous and are better left in the wild.
- If a plant has *tinctoria* in its name, it is likely to be a good dye plant. A single common name such as coreopsis can be misleading as there are nuances within the family that affect the dyeing process: *Coreopsis tinctoria* produces a rich orange and mahogany color, while *Coreopsis grandiflora* produces yellow.
- Learn your local laws about gathering on private or public land; it may be against the law to gather on public land without permission from the agency in charge. Even with permission, be considerate of the many creatures large and small that may be living in the place where you are gathering.
- Gathering windfall—what has already fallen to the ground—is a kind way to interface with nature.
- Learn which plants are considered invasive species and gather those first.
- Collect only what is necessary to complete your project.



A variety of whole dyestuffs, some drying and some ready to use.



MAMA'S LITTLE TEACUP ONESIE

SKILLS LEARNED: BASIC DYEING SKILLS, USING WHOLE DYESTUFFS FROM THE KITCHEN

Your kitchen can be a source for dyes—and a fun place to start exploring the potential color in your immediate surroundings. One of the easiest, long-standing traditional natural dyeing techniques is tea dyeing. For centuries, stained and worn garments and linens have been thrown into a pot of tea and emerged refreshed as a subtle, warm taupe.

Tea, rich with tannin, attaches to cotton quite nicely and can be used without a mordant (though the color won't last as long); in fact, in the spirit of playful exploration, mordanting is optional in this project. When the color begins to fade, just make another batch of tea and throw your fabric back in!

I chose a onesie as the first project because it's small and easy to work with. And since it's a garment that gets a lot of use, learning to revive it with dye is a skill that you'll practice again and again. If you don't have a baby in your life, try this simple method of dyeing with any white or light-colored cotton garment, such as a T-shirt.

See Dyeing 101 for information on scouring ([this page](#)) and mordanting ([this page](#))

GOODS

White 100% cotton onesie or similar cotton garment, 43g, scoured (mordanting is optional)

DYEING MATERIALS AND TOOLS

Black tea, at least 4 bags, or the equivalent of loose black tea—the more tea added, the darker the color

7 to 10 cups (1.7 to 2.4L) water

3- to 5-quart (2.8 to 4.7L) stainless-steel pot with lid

Measuring cup

Tongs

Timer

Thermometer

Rubber gloves



A.



B.



C.

DYEING DIRECTIONS

1. Add tea bags and water to the pot and then add the onesie. There should be enough water so the onesie floats freely in the pot. (A–C)
2. Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 200°F (93°C), turning the onesie every 15 minutes. Heat for an additional hour, continuing to turn the onesie every 15 minutes.
3. Turn off the heat. Let the onesie rest until cool.
4. Wash the goods ([this page](#)) and allow to dry.
5. If you would prefer, add some cute embroidery. The embellishment shown on [this page](#) is a simple combination of straight and couched stitches.

NOTE: If a solid, consistent color is desired, first make the tea dyebath without adding the onesie. Let simmer for 15 minutes and remove the tea bags. Add the onesie and then bring the dyebath to 200°F (93°C) for 1 hour.

TRY

Onion skin is another dye material generally found in the pantry. I have a paper bag in my kitchen to collect leftover onion skins, both yellow and red. To figure out how many onion skins to use, weigh the material you plan to dye. Use the equivalent of half the material's weight for a medium shade or its full weight for a dark shade—you'll get yellow to warm orange. When using onion skins as a dyestuff, I always scour and mordant the material to be dyed. Use the same dyeing instructions as presented in the instructions above.





FLOWERS AT MY FINGERTIPS SEWING KIT

SKILLS LEARNED: GATHERING WHOLE DYESTUFFS FROM YOUR GARDEN,
GROWING A DYE GARDEN, ECO PRINTING

For this project, you will print flowers directly onto fabric. How? You will press flowers into fabric and tightly roll the fabric into a bundle so the flowers make an impression. Then you will apply heat so the flowers release their color. This is a technique popularized by the great natural dyer India Flint. I love the way it captures the beauty of a moment on cloth.

Many common flowers make great dye, including marigolds, cosmos, dahlias, yarrow, and coreopsis. You can use these plants directly from the garden, either at their peak or just past their prime. You can store them in the freezer or dry them for storage. Just remember to keep a few ripe seed heads for next year's crop.

I love this sewing kit because it holds all of the essentials—scissors, needles, pins, thread, and a thimble—and gives me a way to take part of my garden with me wherever I go. I do a lot of hand-sewing, so I put this kit to good use.

FINISHED MEASUREMENTS 11½" × 11½" (29.2 × 29.2 cm)

See Dyeing 101 for information on scouring ([this page](#)) and mordanting ([this page](#))

GOODS

¾ yard (34.5 cm) white wool flannel, 135g, at least 44" (1.1 m) wide, scoured and mordanted

½ yard (11.5 cm) white cotton fabric, 23g, at least 44" (1.1 m) wide, scoured and mordanted

DYEING MATERIALS AND TOOLS

Fresh flowers (I used marigolds, cosmos, and coreopsis)

7 to 10 cups (1.7 to 2.4L) water

PVC pipe or branch, approximately 1" to 2" (2.5 to 5 cm) in diameter

Strong cotton string

3- to 5-quart (2.8 to 4.7L) stainless-steel pot with lid

Tongs

Timer

Thermometer

Rubber gloves

SEWING MATERIALS AND TOOLS

Cotton thread in the color of your choice

Scissors

Pins

Measuring tape

Hand-sewing needle

Sewing machine and related supplies (optional)

Iron



A.



B.



C.



D.



E.



F.



G.



H.

DYEING DIRECTIONS

1. Pluck flowers from your choice of plants until you have gathered 10 to 20 flowers. (A)
2. Make a fabric bundle from the flannel. If the fabric is not still wet, dampen it. Lay the fabric flat on your work surface. Place a row of flowers along the middle of the fabric. Fold the top third of the fabric over it. (B) Press each flower into the fabric with the palm of your hand. (C) Fold the bottom third of the fabric to enclose the flowers. (D)
3. To form the bundle, starting at one end, roll the fabric around the pipe or branch. As you roll, add more flowers to the bundle, using petals or greenery. (E) Tie the rolled fabric bundle tightly with string. (F) Place the bundle and the cotton fabric in the pot.
4. Add water to the pot, enough to completely submerge the bundle and the cotton fabric. Add flowers to the dyebath as you wish. (G)
5. Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 190°F (88°C), turning the bundle every 15 minutes. Simmer for an additional hour, turning the bundle every 15 minutes.
6. Turn off the heat. Let the goods rest until cool.
7. Unroll the bundle. Remove the flowers and admire the results! (H and below)
8. Wash the goods ([this page](#)) and allow to dry.





L.



J.



K.



L.



M.



N.



O.



P.



Q.

SEWING DIRECTIONS

- 1.** Cut two $11\frac{1}{2}''$ (29.2 cm) squares and one $3\frac{1}{2}'' \times 16''$ (8.9 \times 40.6 cm) strip from the wool fabric. Cut four $2'' \times 18''$ (5 \times 47 cm) strips from the cotton fabric.
- 2.** Fold one of the wool squares in half so it now measures $11\frac{1}{2}'' \times 5\frac{3}{4}''$ (29.2 \times 14.6 cm); it will form the pockets. Align it on top of the remaining square for placement purposes. (I)
- 3.** To make the pincushion, fold the $3\frac{1}{2}'' \times 16''$ (8.9 \times 40.6 cm) wool strip in half lengthwise, then adjust it so that one end extends $\frac{1}{2}''$ (1.3 cm) past the other. Center the folded strip on the folded square with approximately $4''$ (10.2 cm) on either side, about $1''$ (2.5 cm) above the bottom edge. Accordion fold the strip to make three rolls, each about $\frac{3}{4}''$ (1.9 cm) tall, and pin to the pocket only. (J) Stitch the rolls in place to the pocket only, sewing along the side and bottom edges and in between the rolls to secure them.
- 4.** Put the pocket back in place on the unfolded $11\frac{1}{2}''$ (29.2 cm) square as you had it in step 2. Align the raw edges. Make a row of running stitches along the right and left sides of the pincushion, stitching through all layers to create the three individual pockets. Sew either by hand or by machine.
- 5.** Make binding tape to finish the edges. Sew 3 of the cotton strips together on the short ends, right sides facing, to make one long strip. With the wrong side up, fold the long edges in $\frac{1}{2}''$ (1.3 cm) and press. Fold the strip in half again lengthwise and press.
- 6.** Make a tie with the remaining $2''$ (5 cm) strip of cotton. Fold and press as in step 5. Stitch the tie closed along the folded edges, turning in one end for a finished edge. You will stitch the tie to the kit when you sew on the binding tape. To mark the spot for sewing, place a pin at the midpoint of the pocket on the right side of the kit.
- 7.** Enclose the raw edges with the binding tape. Starting near the midpoint of the pocket on the left side of the kit, stitch the tape to the kit, pinning if necessary. (K) When you reach a corner, fold the tape into a miter and continue stitching.
- 8.** When you reach the pin, slip the unfinished end of the tie under the binding tape on the outside of the kit. Attach the tie securely as you sew that section of the binding, being sure to sew through all the layers and catch the end between the layers. When you reach your starting point, trim the tape if needed, fold under the raw end, and stitch.

9. To fold the sewing kit, see the series of photos. (L–Q)

TRY

Sometimes I like to explore my garden to see if I can discover a plant with hidden dyeing potential. I experiment by plucking flowers and leaves not known for their dyeing capabilities and place them within a bundle just to see the outcome, knowing that sometimes the color is fleeting. I've tried this using lavender and rosemary and achieved very soft, pale greens and yellows. Not only is it exciting to discover the colors created in this process, but you also get to marvel over the shapes made by the flowers and leaves.



FIELD AND FOREST DRESS

SKILLS LEARNED: FORAGING FOR DYESTUFFS, WORKING WITH IRON WATER, GARMENT DYEING, LEARNING TO ADAPT RECIPES FOR DIFFERENT FIBERS AND WEIGHTS OF GOODS

When researching ancient textiles for this book, I found myself captivated by boxy, angular tunics. This classic style worn for thousands of years uses nearly every bit of the fabric it's cut from and fits a wide variety of people. This project, my interpretation of the ancient tunic, is garment-dyed, meaning that it is dyed after it is sewn. When working with garments and large pieces of fabric, make sure there is plenty of space in the dyepot and turn the goods often.

I've found that using iron water on cellulose-based fabrics can widen the spectrum of color available from locally foraged dye materials. Here I chose to use eucalyptus leaves in combination with a chalk bath and iron water to obtain a rich earthy green. I became so enthralled with the possibilities for this project that I prepared variations in both plant- and animal-based fabrics with a spectrum of foraged dye materials. The variations allow you to compare how the diverse materials react with one another; see the TRY note on [this page](#) for more information about the different combinations of dyestuffs and goods shown in the photo.

FINISHED MEASUREMENTS

Length 34" (86.3 cm), circumference at hem 51½" (130.8 cm), V-neck 9½" (24.1 cm) deep, arm opening circumference 19" (48.3 cm)

SEWING MATERIALS AND TOOLS

1½ yards (1.4 m) white handkerchief linen, at least 54" (1.4 m) wide

100% cotton thread in a neutral color

Note: Be sure to use 100% cotton thread, as polyester thread will not dye.

Scissors

Ruler or measuring tape

Pins

Fabric marking pen

Sewing machine and related supplies

DYEING MATERIALS AND TOOLS

See **Dyeing 101** for information on scouring ([this page](#)), mordanting ([this page](#)), preparing a chalk bath ([this page](#)), and preparing an iron bath ([this page](#)); see **Extracting Color from Whole Dyestuffs** on [this page](#)

Dress, 196g, scoured and mordanted, dipped in chalk bath

100g fresh eucalyptus leaves

3½ gallons (13.2L) water

Kitchen scale

16-quart (15.1L) stainless-steel pot with lid

Measuring cup

Measuring spoons

Sieve

Stirrer, such as spoon or whisk

Tongs

Timer

Thermometer

Rubber gloves

SEWING DIRECTIONS

Use ½" (1.3 cm) seam allowance throughout unless noted otherwise.

1. Cut two 27" × 36" (68.6 × 91.4 cm) panels from the linen. Set one aside for the back. Take the other and cut it in half lengthwise so you have two panels measuring 13½" × 36" (34.3 × 91.4 cm); these are the front pieces. Cut two 4" × 54" (10.2 × 137.1 cm) pieces from the remaining linen for the belt.

2. Using [this](#) schematic as a guide, mark the back panel and then clip notches at the following places:

a. 10½" (26.7 cm) in from each outer edge

b. 11" (27.9 cm) down from each outer edge

c. 15" (38.1 cm) down from each outer edge

3. Take the front pieces and place them right sides together. Using [this](#) schematic as a guide, mark and then clip notches (cutting through both pieces) at the following places:

a. $5\frac{1}{2}$ " (14 cm) in from the upper right edge

b. 11" (27.9 cm) down each side

c. 15" (38.1 cm) down from the upper left edge

4. Place the front pieces right sides together. On the side with only one notch at 11" (27.9 cm), sew down from the notch to the bottom hem, backstitching at the beginning and the end of the seam. Press the seam open. The unsewn portion forms the V-neck opening. Finish the V-neck with a narrow hem by folding under $\frac{1}{4}$ " (6 mm) to the wrong side, and then folding under another $\frac{1}{4}$ " (6 mm). Clip the seam allowance below the notch so it lies flat. (A) Press and stitch in place.

5. Using a long stitch length, sew two rows of gathering stitches between the finished V-neck and the notch, leaving long thread tails. (B) Place the back and the front pieces right sides together, matching the outer edges and pinning together. Place the finished edges of the V-neck at the $10\frac{1}{2}$ " (26.7 cm) notches on the back piece and pin, then gather to fit as needed. Stitch the shoulder seams together, backstitching at each end. Fold the raw edge of the back neckline under as in step 4 and pin. (C) Stitch along the back neckline to finish the edge with a narrow hem. Leave the dress with right sides facing.



A.

B.

C.

6. To make the belt ties, take each $4" \times 54"$ (10.2 \times 137.1 cm) piece and finish both long edges with a narrow hem as in step 4; also finish one of the short edges on each tie with a narrow hem. If you prefer a shorter belt, trim it now.

7. To stitch the side seams, match all notches. Insert the belt ties between the front and back at the 15" notch, raw edges even, with the wrong sides of the ties facing out. Sew from the 11" notch to the hem on each side, backstitching at the beginning and the end.

8. Finish the arm openings with narrow hems as in step 4.

9. Finish the hem by turning under $\frac{1}{2}$ " (1.3 cm) to the wrong side and then another 1" (2.5 cm). Press. Sew the hem, backstitching at the beginning and the end to secure.

10. Weigh the finished dress in preparation for dyeing and jot down the weight.

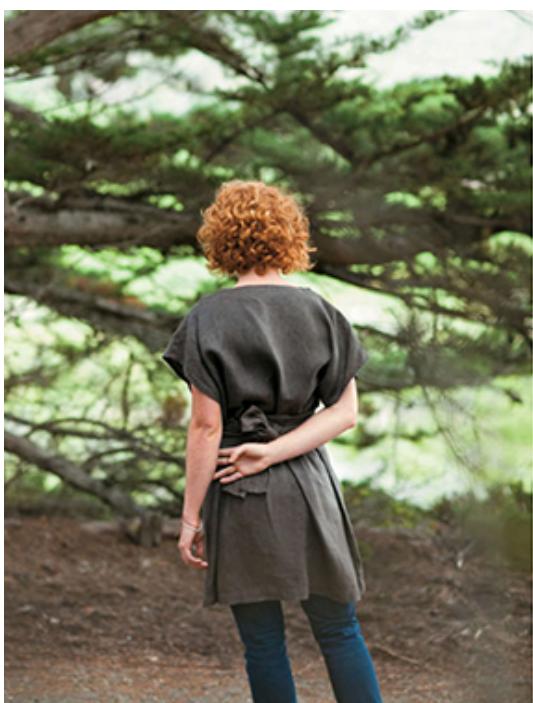
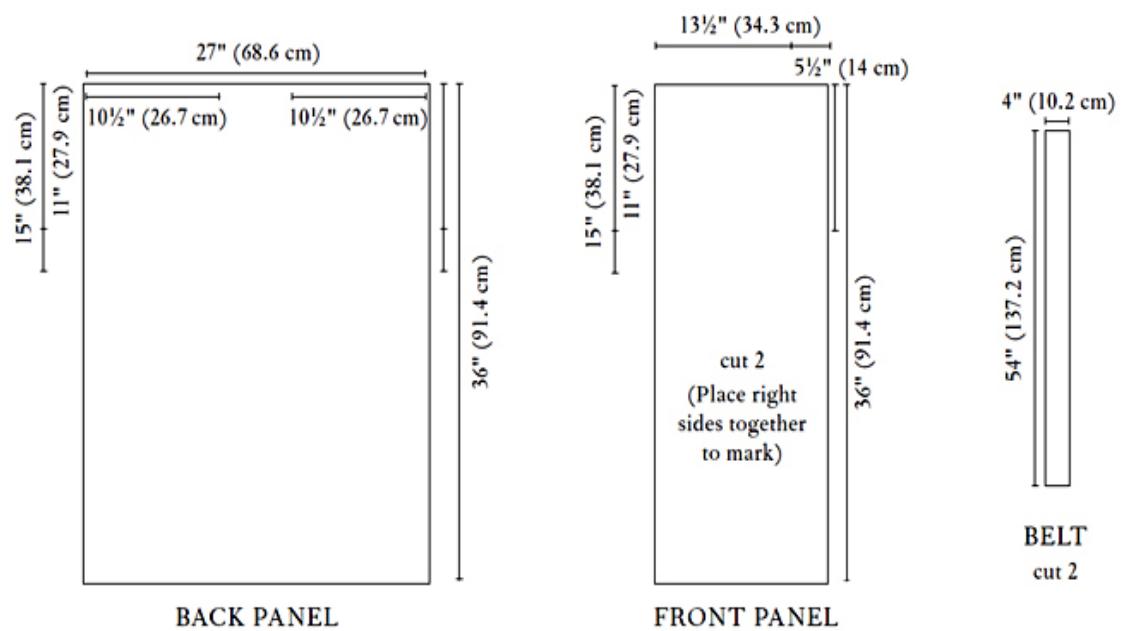


Fig. 1



DYEING DIRECTIONS

1. Gather 100g fresh eucalyptus leaves and remove their stems. (D)
2. Add the leaves and water to the pot. (E) Simmer for at least 1 hour. Strain. (F) Add the strained dye liquid back to the pot and add the tunic.
3. Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 200°F (93°C). Hold at that temperature for an additional hour, turning the dress every 5 minutes.
4. Turn off the heat. Let the dress rest until cool. Transfer the dress to a bucket.
5. Dip the dress in the iron water prepared using your method of choice ([this page](#)).
6. Wash the goods ([this page](#)) and allow to dry.



D.



E.



F.

TRY

This incredibly versatile dress can be made in a wide variety of fabrics, from lightweight linen (as dyed on [this page](#)) to silk. I took this opportunity to sew and dye a number of samples to demonstrate the range of possibilities—and to show you how I adapted my recipes to suit the different dresses.

A couple of things to remember:

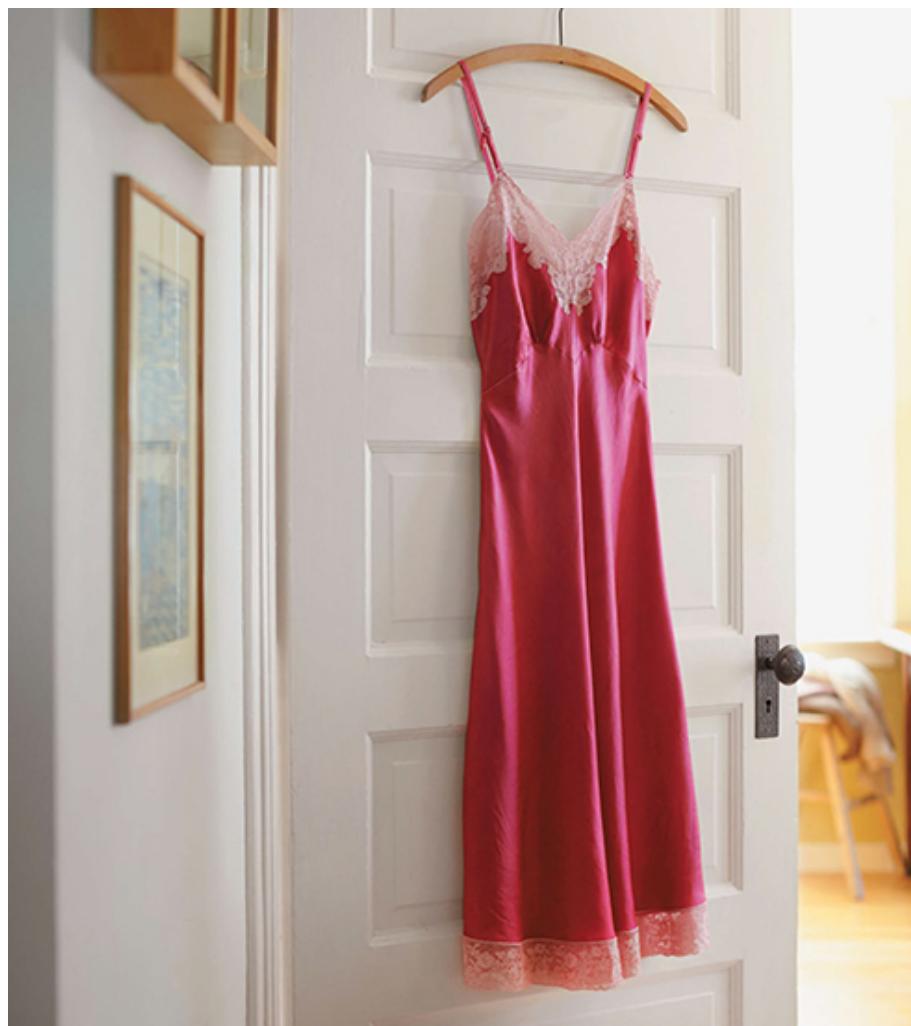
- Plant-based goods may need twice the amount of dyestuffs as animal-based fabrics and must be scoured and mordanted differently.
- The weight of dyestuff used is based upon the weight of your dry dress. Refer to the recommended amounts on [this page](#). For example, the featured dress weighed 196g, so I gathered and used 100g fresh eucalyptus leaves.

There are so many exciting options for this project, and you can't go wrong!



Here is what I used on each of the tunics, from left to right:

- Pale pink—goods: lightweight linen (sewn dress 196g); chalk bath; dyestuff: walnut (2 tablespoons walnut extract)
- Ivory—goods: silk crepe (sewn dress 224g); dyestuff: dried yarrow (112g)
- Gold—goods: silk/wool blend (sewn dress 254g); dyestuff: osage (50g)
- Olive green—goods: lightweight linen (sewn dress 196g); chalk bath; dyestuff: eucalyptus (100g); iron water
- Olive green—goods: lightweight linen (sewn dress 196g); wheat bran bath; dyestuff: eucalyptus (100g); iron water
- Brown—goods: medium-weight linen (sewn dress 387g); chalk bath; dyestuff: oak galls (186g); iron water



FIRECRACKER SLIP

SKILLS LEARNED: USING DRIED COCHINEAL BUGS, USING AN ASSIST TO ALTER PH, ALTERING PH TO GET A WIDER RANGE OF COLOR

I find that using cochineal as a whole dyestuff yields richer, deeper, more complex colors than using the extract; it's also economical because cochineal extract is expensive. Even a few bugs, ground with a mortar and pestle, pack a powerful pink punch!

The vibrant and varied shades of pink produced by cochineal always make me think of beautiful, decadent lingerie, so for this project I decided to refresh a vintage slip by making it hot pink. When choosing a slip, check for any metal pieces because a metal slider on the strap might alter the color of the dye and also stain the fabric. If you do find a metal piece, you can choose a different slip, embrace the metal and see what happens, or remove the metal and re-attach the straps when you're done.

See Dyeing 101 for information on scouring ([this page](#)), mordanting ([this page](#)), and adapting recipes ([this page](#))

GOODS

White or light-colored 100% silk slip, 89g, scoured and mordanted

DYEING MATERIALS AND TOOLS

1 tablespoon (6g) cochineal bugs

¼ teaspoon (1.5g) cream of tartar

¼ cup (60mL) hot water

16 cups (3.8L) water

Note: Cochineal cannot develop to its full spectrum of pink if you are using hard water with high mineral content. If you are using an acid in the dyebath and are still having a hard time getting pink, use distilled or filtered water.

Mortar and pestle

5-quart (4.7L) stainless-steel pot with lid

Cheesecloth

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Tongs

Timer

Thermometer

Rubber gloves

11-quart (10.4L) bucket



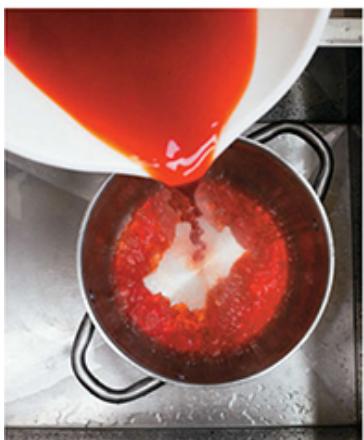
A.



B.



C.



D.



E.



F.

DYEING DIRECTIONS

1. If your dry slip is a different weight than the one used here, remember that you can alter the recipe ([this page](#)) to get a color close to the one I achieved. If you would prefer to follow my recipe as is and experiment with the results, feel free; remember that your slip may be darker than shown here if it weighs less or lighter if it weighs more.
2. Extract the color. Using a mortar and pestle, grind the cochineal bugs into a fine, sandlike texture. (A) Add $\frac{1}{4}$ cup (60mL) hot water to a measuring cup. Add the cream of tartar; stir with a spoon or small whisk until dissolved. Combine the ground cochineal, cream of tartar, and water in a pot. (B) Simmer at 190°F (88°C) for 30 minutes. Use the cheesecloth to strain the dyebath into a bucket. (C). Clean the pot and pour the strained cochineal dye liquid back into it. (D)
3. Add the slip and place the pot on a burner. (E) Slowly, over 30 minutes, bring the dyebath to 180°F (82°C), turning the slip every 15 minutes. Heat for an additional hour, continuing to turn the slip every 15 minutes. (F)
4. Turn off the heat. Let the slip rest until cool.
5. Wash the goods ([this page](#)) and allow to dry.

TRY

To make darker or lighter shades, use more or less dyestuff. Or make a variety of colors by enhancing the pH of this dyebath. Once the color has been extracted from the dyestuff and is ready to be used, make the dyebath more acid (pH 4–6) by adding more cream of tartar or tartaric acid. This will create bright pink, magenta, and red. Make it more alkaline (pH 8) by adding a sprinkle of soda ash and the dyebath will turn purple. To see a range of ingredients that shift pH, and to refresh your memory on how to check your pH, refer to [this page](#).

Madder is another dye that is also very sensitive to shifts in pH. A slightly acidic bath creates orange, whereas a slightly alkaline bath produces a more blue-red.

What fun!



Although this madder extract is brown in color, it will create a vibrant shade of red.

chapter 5

DYEING WITH EXTRACTS

Extracts are highly concentrated powders or liquids derived from whole dyestuffs. To dye with extracts, they are measured or weighed, dissolved in water, and added to the dyebath. The goods to be dyed are added to the dyepot, heat is applied, and the color is absorbed and set. Extracts expand your dyeing horizons past what is available in your immediate environment. They are also faster to use than whole dyestuffs and easy to store (see sources for extracts on [this page](#)).

Because each type of plant contains varying concentrations of pigment, the amount of extract needed to create different colors varies from plant to plant. It's easy to substitute colors when using extracts, as you'll see when you review the Protein and Cellulose Shade Cards on the following pages.

SHADE CARD for protein-based fibers

This card shows a spectrum of colors you can achieve with nine different extracts (see [this page](#) for more details). The samples shown are wool and silk. The projects on [this page](#) are all made with protein fibers.

WOOL			SILK		
1/8 tsp (.25g)	1/4 tsp (.5g)	1 tsp (2g)	1/8 tsp (.25g)	1/4 tsp (.5g)	1 tsp (2g)
1/8 tsp (.5g)	1/4 tsp (1g)	1 tsp (3g)	1/8 tsp (.5g)	1/4 tsp (1g)	1 tsp (3g)
1/4 tsp (1g)	1 1/2 tsp (3.5g)	1 tbsp (8g)	1/4 tsp (1g)	1 1/2 tsp (3.5g)	1 tbsp (8g)
1 tsp (2g)	1 tbsp (8g)	1 1/2 tbsp (12g)	1 tsp (2g)	1 tbsp (8g)	1 1/2 tbsp (12g)
1/4 tsp (1g)	1 1/2 tsp (3.5g)	1 tbsp (8g)	1/4 tsp (1g)	1 1/2 tsp (3.5g)	1 tbsp (8g)
1/8 tsp (.25g)	1/4 tsp (.5g)	1 tsp (1g)	1/8 tsp (.25g)	1/4 tsp (.5g)	1 tsp (1g)
1 tsp (5 mL)	1 tbsp (15 mL)	2 tbsp (30 mL)	1 tsp (5 mL)	1 tbsp (15 mL)	2 tbsp (30 mL)
1/4 tsp (1g)	1 1/2 tsp (4g)	1 tbsp (9.5g)	1/4 tsp (1g)	1 1/2 tsp (4g)	1 tbsp (9.5g)
1/8 tsp (.25g)	1/4 tsp (.5g)	1 tsp (2.5g)	1/8 tsp (.25g)	1/4 tsp (.5g)	1 tsp (2.5g)

* All recipes based on 100g of goods and 8 cups (1.9L) water



SHADE CARD for cellulose-based fibers

This card shows a spectrum of colors you can achieve using the same nine dye extracts that I used for the Protein Shade Card, plus chalk and wheat baths (see [this page](#); for details about the Shade Cards, see [this page](#)). The samples shown are linen and cotton. The projects on [this page](#) are all made with cellulose fibers.

LINEN				COTTON			
CHALK	WHEAT	CHALK	WHEAT	CHALK	WHEAT	CHALK	WHEAT
<i>1tsp</i> (2g)	<i>1tsp</i> (2g)	<i>1tbsp</i> (6g)	<i>1tbsp</i> (6g)	<i>1tsp</i> (2g)	<i>1tsp</i> (2g)	<i>1tbsp</i> (6g)	<i>1tbsp</i> (6g)
<i>1tsp</i> (3g)	<i>1tsp</i> (3g)	<i>1tbsp</i> (9g)	<i>1tbsp</i> (9g)	<i>1tsp</i> (3g)	<i>1tsp</i> (3g)	<i>1tbsp</i> (9g)	<i>1tbsp</i> (9g)
<i>1tsp</i> (3g)	<i>1tsp</i> (3g)	<i>1tbsp</i> (9g)	<i>1tbsp</i> (9g)	<i>1tsp</i> (3g)	<i>1tsp</i> (3g)	<i>1tbsp</i> (9g)	<i>1tbsp</i> (9g)
<i>1tsp</i> (3g)	<i>1tsp</i> (3g)	<i>1tbsp</i> (9g)	<i>1tbsp</i> (9g)	<i>1tsp</i> (3g)	<i>1tsp</i> (3g)	<i>1tbsp</i> (9g)	<i>1tbsp</i> (9g)
<i>1tsp</i> (3g)	<i>1tsp</i> (3g)	<i>1tbsp</i> (9g)	<i>1tbsp</i> (9g)	<i>1tsp</i> (3g)	<i>1tsp</i> (3g)	<i>1tbsp</i> (9g)	<i>1tbsp</i> (9g)
<i>1tsp</i> (3g)	<i>1tsp</i> (3g)	<i>1tbsp</i> (9g)	<i>1tbsp</i> (9g)	<i>1tsp</i> (3g)	<i>1tsp</i> (3g)	<i>1tbsp</i> (9g)	<i>1tbsp</i> (9g)
<i>1tsp</i> (4g)	<i>1tsp</i> (4g)	<i>1tbsp</i> (12g)	<i>1tbsp</i> (12g)	<i>1tsp</i> (4g)	<i>1tsp</i> (4g)	<i>1tbsp</i> (12g)	<i>1tbsp</i> (12g)
<i>1tsp</i> (5 mL)	<i>1tsp</i> (5 mL)	<i>1tbsp</i> (15 mL)	<i>1tbsp</i> (15 mL)	<i>1tsp</i> (5 mL)	<i>1tsp</i> (5 mL)	<i>1tbsp</i> (15 mL)	<i>1tbsp</i> (15 mL)
<i>1tsp</i> (3g)	<i>1tsp</i> (3g)	<i>1tbsp</i> (9g)	<i>1tbsp</i> (9g)	<i>1tsp</i> (3g)	<i>1tsp</i> (3g)	<i>1tbsp</i> (9g)	<i>1tbsp</i> (9g)
<i>1tsp</i> (2.5g)	<i>1tsp</i> (2.5g)	<i>1tbsp</i> (7.5g)	<i>1tbsp</i> (7.5g)	<i>1tsp</i> (2.5g)	<i>1tsp</i> (2.5g)	<i>1tbsp</i> (7.5g)	<i>1tbsp</i> (7.5g)

* All recipes based on 100g of goods and 8 cups (1.9L) water



USING THE SHADE CARDS

I developed the Protein and Cellulose Shade Cards on [this page](#) and [this page](#) to make natural dyeing with extracts easy and versatile. If you prefer a different color than the one I used in any given project, choose your color and use the amount of dye given on the card. Since I have found that beginners prefer to work with volume measurements ($\frac{1}{4}$ teaspoon, 1 tablespoon, etc.) rather than weight measurements, that is how I have set up these cards. Once you have some experience, you may want to switch to the more scientific—yet completely optional—method of measuring by weight that can give you more freedom (see below).

Each of the colors on the Shade Cards is based on the weight of 100 grams of goods (yarn, fabric, repurposed garments, etc.) as dyed in 8 cups (1.9L) water. If you want to scale these recipes for goods of a different weight, all you need to do is multiply or divide accordingly. For example, if you want to dye 200 grams of wool yarn in a deep shade of red that calls for 1 teaspoon (3g) madder on the Protein Shade Card, you will scale up the madder recipe by a factor of 2 and also multiply the amount of dye and water you need by 2. So you will dye your 200 grams of wool yarn in 16 cups (2.8L) water with 2 teaspoons (6g) madder extract. When scaling up or down, remember to record your dyeing process to understand any shifts or changes encountered. To read more about adapting dye recipes, see [this page](#).

OPTIONAL SHADE CARD CONVERSION CHARTS

In a professional dye studio, all the ingredients in a dye recipe are broken down into percentages by metric weight, making it easy to scale a recipe to suit any amount of goods. If you want to work this way to achieve the colors shown on the Shade Cards on [this page](#) and [this page](#), you can use the charts on [this page](#) to convert the volume measurements, but again, working in this way is completely optional. The recipes provided in the project instructions give you all the information you need.

Here's how to use these optional charts:

Let's say you want to make the Alfresco Table Linens project on [this page](#) in a similar shade, but your set of 4 napkins weighs 550g. Since the recipe was created for the weight of 448g, use the conversion chart to understand how much dye you will need. First, find the shade closest to the one you would like to achieve, in this instance, it's the 1 tbsp (9g) entry on the Cellulose Shade Card on

[this page](#). The conversion chart on the opposite page tells you that 1 tbsp of cutch is equivalent to 9% of the weight of 100 grams of fiber. So complete this simple equation to determine how much dye you need:

$WOG \times dye\% = \text{amount of dye needed to reach a given shade}$

$$550g \times 9\% = 49.5g$$

So 49.5g is the amount of cutch needed to reach the shade used in the project.

PROTEIN-BASED CONVERSION CHART

COCHINEAL			MADDER			QUEBRACHO RED		
$\frac{1}{16}$ tsp (.25g)	$\frac{1}{4}$ tsp (.5g)	1 tsp (2g)	$\frac{1}{8}$ tsp (.5g)	$\frac{1}{4}$ tsp (1g)	1 tsp (3g)	$\frac{1}{4}$ tsp (1g)	$1\frac{1}{2}$ tsp (3.5g)	1 tbsp (8g)
0.25%	0.50%	2.00%	0.50%	1.00%	3.00%	1.00%	3.50%	8.00%
CUTCH			RHUBARB			WELD		
1 tsp (3g)	1 tbsp (9g)	$1\frac{1}{2}$ tbsp (12g)	$\frac{1}{4}$ tsp (1g)	$1\frac{1}{2}$ tsp (3g)	1 tbsp (8g)	$\frac{1}{16}$ tsp (.25g)	$\frac{1}{4}$ tsp (1g)	1 tsp (4g)
3.00%	9.00%	12.00%	1.00%	3.00%	8.00%	0.25%	1.00%	4.00%
FUSTIC			POMEGRANATE			LOGWOOD		
1 tsp (5mL)	1 tbsp (15mL)	2 tbsp (30mL)	$\frac{1}{4}$ tsp (1g)	$1\frac{1}{2}$ tsp (4g)	1 tbsp (9.5g)	$\frac{1}{16}$ tsp (.25g)	$\frac{1}{4}$ tsp (1g)	scant 1 tsp (2.5g)
4.50%	13.00%	27.00%	1.00%	4.00%	9.50%	0.25%	1.00%	2.50%

CELLULOSE-BASED CONVERSION CHART

COCHINEAL		MADDER		QUEBRACHO RED	
1 tsp (2g)	1 tbsp (6g)	1 tsp (3g)	1 tbsp (9g)	1 tsp (3g)	1 tbsp (9g)
2.00%	6.00%	3.00%	9.00%	3.00%	9.00%
CUTCH		RHUBARB		WELD	
1 tsp (3g)	1 tbsp (9g)	1 tsp (3g)	1 tbsp (9g)	1 tsp (4g)	1 tbsp (12g)
3.00%	9.00%	3.00%	9.00%	4.00%	12.00%
FUSTIC		POMEGRANATE		WALNUT	
1 tsp (5mL)	1 tbsp (15mL)	1 tsp (3g)	1 tbsp (9g)	1 tsp (2.5g)	1 tbsp (7.5g)
4.00%	12.00%	3.00%	9.00%	2.50%	7.50%



NORTHWOODS HAT

SKILLS LEARNED: DYEING WITH EXTRACTS ON PROTEIN-BASED GOODS, WORKING WITH THE PROTEIN SHADE CARD

For the first project using extracts, I wanted to create something fun, easy, and versatile—a simple knitted hat. Made from chunky weight yarn, this hat knits up in a flash. Due to the speed with which this hat can be completed, it is a great project to work through many of the colors and shades found on the Shade Card—try it in shades of purple (logwood purple), red (madder), yellow (weld), or pink (quebracho red). A hat to go with every outfit! Or great gifts for your loved ones. You can see the full range of colors I created on [this page](#).

SIZE

One size fits most

FINISHED MEASUREMENTS

17½" (44.5 cm) circumference; 8¾" (22 cm) tall

Note: Hat will stretch to fit up to a 22" (56 cm) head circumference.

GAUGE

13 sts (stitches) and 16 rnds (rounds) = 4" (10 cm) in Stockinette stitch (St st)

12 sts and 16 rnds = 4" (10 cm) in 1x1 Rib, without stretching

See Dyeing 101 for information on scouring (56) and mordanting (58); see Protein Shade Card on [this page](#) if you want to dye your yarn a different color

GOODS

Quince & Co Puffin (100% American wool; 112 yards [102 meters / 100 grams]): 1 hank #101 Egret, scoured and mordanted

DYEING MATERIALS AND TOOLS

1 scant teaspoon (2.5g) logwood purple extract

¼ cup (60mL) hot water

6 to 7 cups (1.4 to 1.7L) water

3- to 5-quart (2.8 to 4.7L) stainless-steel pot with lid

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Tongs

Timer

Thermometer

Rubber gloves

KNITTING TOOLS

One 16" (40 cm) circular needle size US 10½ (6.5 mm) or size needed to obtain gauge

One set of four double-pointed needles (dpns) size US 10½ (6.5 mm) or size needed to obtain gauge

Stitch marker

Darning needle



DYEING DIRECTIONS

1. Add $\frac{1}{4}$ cup (60mL) hot water to a measuring cup. Add the extract in the amount to reach the shade of your choice; the recipe in the directions yields a dark purple color. Stir with a small whisk or spoon until dissolved. (A + B)
2. Combine the dissolved dye mixture and 6 to 7 cups (1.4 to 1.7L) water in a pot. (C) Add the scoured and mordanted yarn. (D)
3. Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 190°F (88°C)—just under a simmer—turning the yarn every 10 minutes. Hold at that temperature for an additional hour, continuing to turn the yarn every 10 minutes. (E)
4. Turn off the heat. Let the yarn rest until cool.
5. Wash the goods ([this page](#)) and allow to dry. (F)

KNITTING DIRECTIONS

Stitch Pattern

1x1 Rib

(even number of sts; 1-rnd repeat)

All Rnds: *K1 (knit 1), p1 (purl 1); repeat from * to end.

HAT

Using circular needle, CO (cast on) 64 sts. Join for working in the rnd, being careful not to twist sts; pm for beginning of rnd.

Begin 1x1 Rib; work even until piece measures 4" (10 cm) from the beginning.

Change to St st (knit every rnd); work even until piece measures 5½" (14 cm), from the beginning.

Shape Crown

Note: Change to dpns when necessary for number of sts on needle.

Set-Up Rnd: *K6, k2tog (knit 2 stitches together), pm (place marker); repeat from * to end—56 sts remain. Knit 1 rnd.

Decrease Rnd: *Knit to 2 sts before marker, k2tog, sm (slip marker); repeat from * to end—48 sts remain.

Repeat Decrease Rnd every other rnd 5 more times—8 sts remain.

Cut yarn, leaving a 12" (30.5 cm) tail; thread tail through remaining sts, pull tight, and fasten off. Weave in ends and block as desired.





WANDERLUST BAGS

SKILLS LEARNED: DYEING WITH EXTRACTS ON PROTEIN-BASED GOODS, CREATING THE COLOR GREEN FROM TWO DIFFERENT DYES, WORKING WITH THE PROTEIN SHADE CARD

You may have noticed that the shade card is missing green. Ironically, although natural dyeing uses plants, there isn't an extract that can be used on its own to make green. It has to be created by combining two dyes—logwood purple plus any dye that produces yellow. Combine other dyes on the shade card to create a wider spectrum of color.

I love to wander—even if it means setting out on foot and walking through nearby neighborhoods. I always bring an in-progress sewing or knitting project just in case I feel the need to stop at a nearby coffee shop and craft a little bit. I find these bags to be the perfect way to carry my projects in transit and keep everything tidy and untangled. They are also perfect for toiletries or art supplies when traveling. Here's to better organization!

FINISHED MEASUREMENTS

Small chartreuse green bag: 7" × 3" × 3" (17.8 × 7.5 × 7.5 cm)

Large forest green bag: 10" × 5" × 5" (25.4 × 12.7 × 12.7 cm)

See Dyeing 101 for information on scouring ([this page](#)) and mordanting ([this page](#)); see Protein Shade Card on [this page](#) if you want to dye your fabric a different color

GOODS AND DYEING MATERIALS

Small Chartreuse Green Bag—

1/4 yard (23 cm) white 100% wool flannel, 90g, at least 44" (1.1 m) wide, scoured and mordanted

1/16 teaspoon (.25g) logwood extract

2 tablespoons (30mL) fustic extract

1/4 cup (60mL) hot water

7 cups (1.7L) water

Large Forest Green Bag—

½ yard (45.5 cm) white 100% wool flannel, 180g, at least 44" (1.1 m) wide, scoured and mordanted

¼ teaspoon (1g) logwood extract

1 tablespoon (15mL) fustic extract

¼ cup (60mL) hot water

7 cups (1.7L) water

DYEING TOOLS FOR BOTH BAGS

3- to 5-quart (2.8 to 4.7L) stainless-steel pot with lid

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Tongs

Timer

Thermometer

Rubber gloves

SEWING MATERIALS AND TOOLS FOR BOTH BAGS

8½" × 11" (21.6 × 27.9 cm) paper for the pattern—1 sheet for small bag and 2 sheets for large bag

Tape (for the large pattern)

Cotton thread, in matching or contrasting color

Zipper—11" (27.9 cm) zipper for the small bag or 16" (40.6 cm) zipper for the large bag, in matching or contrasting color

Lightweight fusible interfacing

Scissors

Measuring tape

Hand-sewing needle

Pins

Iron

Sewing machine and related supplies



A.



B.

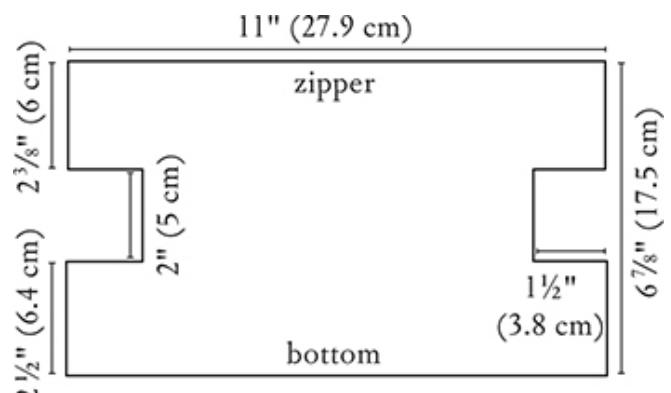


C.

DYEING DIRECTIONS

Note: The dyeing directions are the same for either color you wish to make.

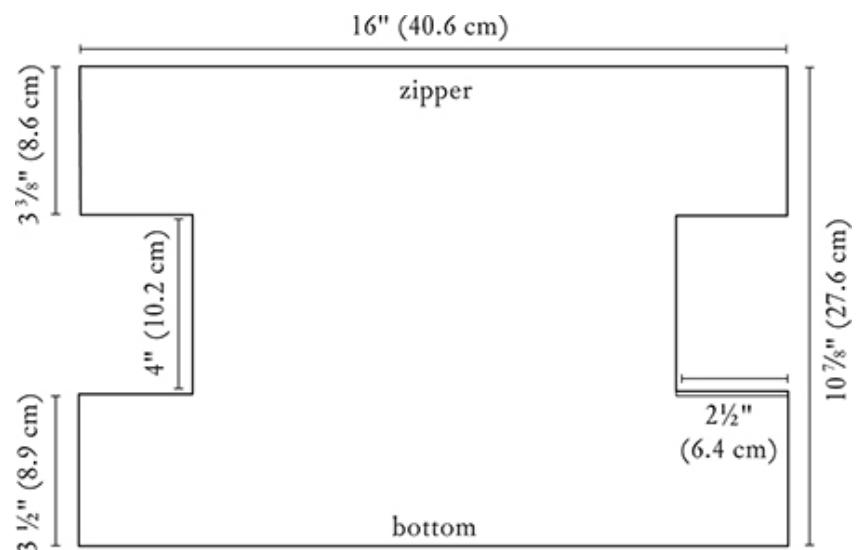
1. Add $\frac{1}{4}$ cup (60mL) hot water to a measuring cup. Add the logwood extract to the measuring cup; stir with a spoon or small whisk until dissolved. Now add the fustic extract to the measuring cup; stir with a spoon or small whisk until combined. (A)
2. In the pot, add the dissolved dye mixture to 7 cups (1.7L) water. Add the scoured and mordanted fabric. (B)
3. Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 190°F (88°C), just under a simmer, turning the fabric every 5 minutes. Hold at that temperature for an additional hour, turning the fabric every 10 minutes. (C)
4. Turn off the heat. Let the fabric rest until cool.
5. Wash the fabric ([this page](#)) and allow to dry.



SMALL BOX BAG

cut 2

Fig. 1



LARGE BOX BAG

cut 2

Fig. 2



D.



E.



F.

SEWING DIRECTIONS

Note: A $\frac{1}{2}$ " (1.3 cm) seam allowance is included in the pattern and is used throughout. The sewing directions are the same for either bag.

1. Using the schematic in [figure 1](#) or [figure 2](#) as a guide, draft a pattern for the bag you want to make. To draft the pattern for the large bag, you'll need to tape two sheets of paper together along the long edges.
2. Cut two pattern pieces from the flannel, using your pattern. Mark the edges "Bottom" and "Zipper" as shown in the schematic. Also cut two pieces that are each $\frac{3}{4}$ " \times 3" (1.9 \times 7.5 cm) for the tabs. Cut two strips of fusible interfacing each 1" \times 16" (2.5 \times 40.6 cm) for the large bag or 1" \times 11" (2.5 \times 27.9 cm) for the small bag.
3. With right sides together, sew the two bag pieces together along the marked bottom edge. Zigzag each edge of the seam allowance to finish it cleanly. Press the seam open.
4. You will install the zipper along the edge marked "Zipper." Begin by applying the strips of interfacing to the wrong side of fabric along each "Zipper" edge. Fold each edge under $\frac{1}{2}$ " (1.3 cm) and press in place. Pin the zipper to the pressed edges, with the zipper teeth close to the fold. Baste if you prefer and then machine stitch the zipper in place. Remove basting stitches if necessary. (D)
5. Turn the bag inside out. Align the seams and match the cut edges. Sandwich a tab between the layers at each end of the zipper; the exposed raw edges of the tabs do not need to be finished. Pin in place. Be sure the tabs are between the layers of the bag facing in.
6. Sew the seam and then finish the raw edges of the seam allowance by zigzagging them together. Press the seam away from

the zipper. Repeat to sew the seam on the opposite end. (E)

7. Fold the end of the bag in the opposite direction and pinch one of the corners so the seam is in the middle. Stitch the seam, making sure the seam allowance is pressed toward the bottom of the bag. (F) Repeat to stitch the other three corners. Zigzag the seam allowances to finish them cleanly. Turn the bag right side out.



SANDSTONE SHAWL

SKILLS LEARNED: DYEING WITH EXTRACTS ON PROTEIN-BASED GOODS, CREATING COLOR USING THREE DIFFERENT DYES, DYEING THREE DIFFERENT FIBERS IN THE SAME DYEPOOT, CREATING MULTIPLE SHADES IN THE SAME DYEPOOT, EXHAUSTING A DYEBAH

To dye the yarn for this shawl, each of the three skeins is added gradually to the same dyepot during the dyeing process, creating three shades of the same color. This technique is a great way to use all of the dye in the pot, known as “exhausting the dyebath.” Another way to create subtle variation is to vary the yarn used. In the shawl shown, I combined merino, baby alpaca, and a silk-mohair blend. Of course, in terms of color, the sky is the limit. Use the Shade Card on [this page](#) to create your own special color.

FINISHED MEASUREMENTS

57 $\frac{1}{4}$ " (145.5 cm) wide \times 24" (61 cm) long at center

GAUGE

13 sts (stitches) and 24 rows = 4" (10 cm) in Garter stitch, using 1 strand of A

See Dyeing 101 for information on scouring ([this page](#)) and mordanting ([this page](#)); see Protein Shade Card on [this page](#) if you want to dye your yarn a different color

GOODS

Malabrigo Yarn Rios (100% superwash merino wool; 210 yards [192 m / 100g]): 1 hank #63 natural, scoured and mordanted (A)

Shibui Knits Silk Cloud (60% kid mohair / 40% silk; 330 yards [300 m / 25g]): 1 hank Ivory, scoured and mordanted (B)

Blue Sky Alpacas Sport Weight (100% baby alpaca; 110 yards [100 m / 50g]): 1 hank #500 Natural White, scoured and mordanted (C)

DYEING MATERIALS AND TOOLS

$\frac{1}{2}$ cup (125mL) hot water

$\frac{1}{8}$ teaspoon (.5g) madder extract
1 tablespoon (8g) rhubarb extract
1 tablespoon (15mL) fustic extract
10 cups (2.4L) water
5-quart (4.7L) stainless-steel pot with lid

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Tongs

Timer

Thermometer

Rubber gloves

KNITTING TOOLS

One 36" (90 cm) circular needle size US 7 (4.5 mm) or size needed to obtain gauge

Darning needle



A.



B.



C.

DYEING DIRECTIONS

1. Add $\frac{1}{2}$ cup (125mL) hot water to a measuring cup. Add the madder extract and stir with a small whisk or spoon until dissolved. Next add the rhubarb extract and stir until dissolved. Lastly, add the fustic extract and stir until dissolved.
2. Combine the dissolved dye mixture and 10 cups (2.4L) of water in a pot. Add the scoured and mordanted Rios (Yarn A) to the pot.

3. Note: You will work on steps 3 and 4 somewhat simultaneously, so please be sure to read through both steps before beginning. Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 190°F (88°C), just under a simmer, turning the yarn every 10 minutes. Hold at that temperature for an additional hour, turning the yarn every 10 minutes.

4. While following the dyeing sequence in step 3, add the second and third yarns at intervals. After 20 minutes add the Sport (Yarn C) to the pot; after 40 minutes, add the Silk Cloud (Yarn B). (A)

5. Turn off the heat. Let the yarn rest until cool. (B)

6. Wash the goods ([this page](#)) and allow to dry. (C)

KNITTING DIRECTIONS

Stripe Pattern

Working in pattern as instructed, work with 1 strand of A for 2½" (6.5 cm). Join B and with 1 strand each of A and B held together, work in pattern for 2" (5 cm), or until you run out of A, ending at side edge. Cut A and join C, and with 1 strand each of B and C held together, work in pattern for 4¼" (11 cm), or until you run out of C, ending at side edge. Cut C and with 1 strand of B, work in pattern to the end.

SHAWL

Using A, CO (cast on) 186 sts.

Row 1: Knit.

Row 2: K1 (Knit 1), ssk (slip 2 stitches 1 at a time knitwise, slip stitches back to left needle in their new orientation; knit these 2 stitches together through the back loops), knit to last 3 sts, k2tog (knit 2 stitches together), k1—2 sts decreased.

Working in Stripe Pattern, repeat Rows 1 and 2 until piece measures 15" (38 cm) from the beginning, then repeat Row 2 every row until 4 sts remain.

Next Row: K4tog (knit 4 stitches together). Fasten off.

FINISHING

Weave in ends. Block as desired.



BERRY PATCH NECKLACE

SKILLS LEARNED: DYEING WITH EXTRACTS ON PROTEIN-BASED GOODS, DYEING UNSPUN FIBER, WET FELTING, WORKING WITH THE PROTEIN SHADE CARD

For this project, you will do something that may seem counterintuitive—you will work carefully to keep unspun wool fiber from felting while you are dyeing it and then after you dye it, you will felt it *intentionally*. This will help you thoroughly understand how felting happens, so you can prevent it when you are dyeing protein-based fibers.

Felt balls are fun and easy to make—and they're a perfect project for kids. When making the balls, I always think of ripe, juicy fruits and berries such as cherries, raspberries, strawberries, and blueberries. Be inspired to make a wide range of colorful necklaces, experimenting with multiple shades and colors from the Protein Shade Card on [this page](#).

If you vary the size of the felt balls, they can take on another personality. Smaller ones can become earrings, while larger ones might be holiday ornaments when decorated with sequins and beads. If you want to make this project in a hurry, use premade felt balls and skip to step 4 on [this page](#) after dyeing.

FINISHED MEASUREMENTS

Necklace approximately 36" (91.4 cm) in length; beads approximately 1" (2.5 cm) in diameter

See Dyeing 101 for information on mordanting ([this page](#)); see Protein Shade Card on [this page](#) if you want to dye the fiber and ribbon a different color

GOODS

1 ounce (28g) wool top, such as Merino or Corriedale, mordanted

Note: 1 ounce (28g) top will make about 28 balls, depending on the size you want.

1 yard (91.5 cm) 1" (2.5 cm) wide silk ribbon, mordanted

DYEING MATERIALS AND TOOLS

¼ cup (60mL) hot water

¼ teaspoon (.5g) cochineal extract

8 cups (1.9L) water

3- or 5-quart (2.8 or 4.7L) stainless-steel pot with lid

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Tongs

Timer

Thermometer

Rubber gloves

FELTING TOOLS

Bar of olive oil soap

Sharp tapestry needle

When dyeing unspun fiber for this project or any other, follow these guidelines:

- Work with top only, not roving ([this page](#)).
- Skip the scouring step.
- Always add the fiber to the water, never water to fiber.
- Don't let the dyepot boil.
- Don't handle the fiber until the dyepot is completely cool.
- When washing out the fiber, use lukewarm water.

DYEING DIRECTIONS

1. Add ¼ cup (60mL) hot water to a measuring cup. Add the cochineal extract to the measuring cup; stir with a whisk or spoon until dissolved.

2. Combine the dissolved dye mixture and 8 cups (1.9L) water in a pot. Add the mordanted goods (fiber and silk ribbon) to the pot.

3. Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 190°F (88°C), just under a simmer, turning the fiber every 10 minutes. Hold at that temperature for an additional hour, continuing to turn the fiber every 10 minutes. (A + B)

4. Turn off the heat. Let the fiber rest until completely cool.

5. Wash the goods ([this page](#)) and allow to dry.



A.



B.



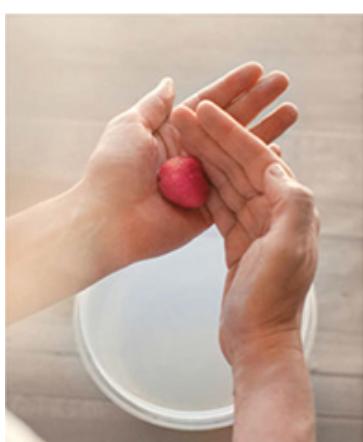
C.



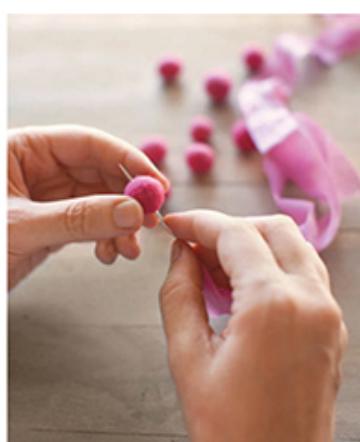
D.



E.



F.



G.



H.

FELTING DIRECTIONS

- 1.** Pull off a small amount of dyed fiber. Mold it into a ball with your fingers. (C + D)
- 2.** Wet your hands with warm water. Rub a small amount of soap on your hands. Sprinkle warm water on the little ball of fiber. (E) Applying light pressure, slowly start to rub it between your hands using a circular motion. (F) As the fibers felt together, the ball will begin to feel firmer and denser. Now you can apply a greater amount of pressure. Keep your hands wet with soapy water as you work.
- 3.** Once the ball is thoroughly felted, allow to dry. Repeat steps 1–3 to make the remainder of the balls.
- 4.** Trim one end of the ribbon so it fits through the eye and thread the needle. Pierce through the center of one ball and pull it to the middle of the ribbon. Make a knot on either side. Add more balls to the left and right in this manner until it suits you. (G + H)



SOCK HOP! COTTON SOCKS

SKILLS LEARNED: BASIC DYEING ON CELLULOSE-BASED GOODS, WORKING WITH THE CELLULOSE SHADE CARD, USING A WHEAT BRAN BATH

See Dyeing 101 for information on scouring ([this page](#)), mordanting ([this page](#)), and preparing a wheat bran bath ([this page](#)); see the Cellulose Shade Card on [this page](#) to choose your dye

GOODS

White 100% cotton socks, 64g, scoured and mordanted, dipped in wheat bran bath (I used Maggie's Organics Socks)

DYEING MATERIALS AND TOOLS

¼ cup (60mL) hot water

Dye extract (see right for measurement)

10 cups (2.4L) water

Kitchen scale

5-quart (4.7L) stainless-steel pot with lid

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Tongs

Timer

Thermometer

Rubber gloves

Use this project to become acquainted with the process of using extracts on cellulose-based fibers, and refer to the Cellulose Shade Card to make these socks in the colors and shades of your choice. Remember that the extracts listed on the Shade Card can be combined to make even more colors.

These socks are perfect for a first project dyeing cotton because the knit fabric soaks up dye easily. If you are using new socks, wash them several times before dyeing to prepare the fibers. Or dye some

comfy old socks to brighten them up. Seeing a pop of color under a pant leg is nearly always uplifting. Use a teaspoon of the following dyes (or use the Shade Card for Cellulose-Based Fibers on [this page](#) if dyeing by weight) to create the colors shown at the left—weld (yellow), cochineal (magenta), or madder (red).

DYEING DIRECTIONS

Note: The dyeing directions are the same for any color you choose. The materials at left will dye approximately one pair of socks.

1. Remember to dip the socks in the wheat bran bath before beginning to dye.
2. Add the $\frac{1}{4}$ cup (60mL) hot water to a measuring cup. Add the dye extract of your choice to the cup and stir until dissolved.
3. Combine the dissolved dye and 10 cups (2.4L) of water in a pot. Add the scoured and mordanted socks.
4. Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 200°F (93°C), turning the socks every 15 minutes. Simmer for an additional hour, continuing to turn the socks every 15 minutes.
5. Turn off the heat. Let the socks rest until cool.
6. Wash the goods ([this page](#)) and allow to dry.



IRON AGE TANK AND GILDED CARDIGAN

SKILLS LEARNED: DYEING WITH EXTRACTS ON CELLULOSE-BASED GOODS, CREATING THE COLOR GREEN ON CELLULOSE-BASED FIBERS, EXHAUSTING A DYEBAATH, WORKING WITH IRON WATER

In the world of protein-based fibers, green can be made from the combination of a yellow dye and logwood purple (see the Wanderlust Bags on [this page](#)). But this combination doesn't work as well on cellulose-based fibers; I've found that logwood dye extract has poor lightfast results on plant-based fibers so I don't advise using it on cotton or linen. Instead, make green on cellulose-based fibers by using a yellow dye and applying iron water. As an added bonus, iron increases colorfastness when added to all dyes, which is always beneficial.

To make this tank and cardigan set, use a single pot to dye both garments. First, add the tank, so it absorbs the most dye. Then, after a few minutes, add the cardigan. The color will still be saturated and the cardigan will soak up most of the remaining dye in the pot. Once the garments are done in the dyepot, dip the tank in a bath of iron to make it green.

To refresh your memory about the two different ways to make an iron bath, see [this page](#). I used ferrous sulfate in this project, but use whichever method you prefer. And remember—keep the application of iron light to keep the knit cotton fabric soft and supple.

See Dyeing 101 for information on scouring ([this page](#)), mordanting ([this page](#)), preparing a wheat bran bath ([this page](#)), and preparing an iron bath ([this page](#)); see Cellulose Shade Card on [this page](#) if you want to dye the tank or cardigan in a different color

GOODS

100% cotton tank, 150g, scoured and mordanted, dipped in wheat bran bath (I used an A. Chanin V-Neck Cotton Tank, color natural)

100% cotton cardigan, 150g, scoured and mordanted, dipped in wheat bran bath (I used an A. Chanin Long Sleeve Cardigan, color natural)

DYEING MATERIALS AND TOOLS

1/4 cup (60mL) hot water

1½ teaspoons (6g) weld extract

32 cups (7.6L) water

11-quart (10.4L) stainless-steel pot with lid

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Tongs

Timer

Thermometer

Rubber gloves



A.



B.



C.



D.



E.



F.

DYEING DIRECTIONS

Note: You will dye the tank and cardigan in the same dyepot.

1. Remember to dip the goods in the wheat bran bath before beginning to dye. (A)
2. Add $\frac{1}{4}$ cup (60mL) hot water to a measuring cup. Add the weld extract; stir with small whisk or spoon until dissolved. (B + C)
3. Combine the dissolved dye and 32 cups (7.6L) water in a pot. Add the tank top.
4. Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 200°F (93°C), turning the top every 15 minutes. (D) Once the pot has been on the heat for 30 minutes, add the cardigan. (E) Simmer at 200°F (93°C) for an additional hour, turning the goods every 15 minutes.
5. Turn off the heat. Let the goods rest until cool.
6. Add the dyed tank top to the iron water, prepared by your method of choice ([this page](#)). (F) To achieve a darker shade of green, leave for up to 30 minutes.
7. Wash the iron-washed tank separately from the cardigan ([this page](#)) and allow each to dry.

TRY

Throughout history iron has been used to modify color. In the dyeing process, it adds a gray filter. As seen in the photo below, reds and pinks tend to go purplish brown, while yellows tend to go greenish gray. Use iron judiciously with any of the dyes listed on the Cellulose Shade Card to widen the spectrum of color.

If you have a pot larger than 11-quart (10.4L) at your disposal, you may find it useful for the iron water application. Though more expensive to purchase and not absolutely necessary, a larger pot allows the garment more room to soak and helps produce uniform color.





ALFRESCO TABLE LINENS

SKILLS LEARNED: DYEING WITH EXTRACTS ON CELLULOSE-BASED GOODS, WORKING WITH TANNIN-RICH DYES, USING A CHALK BATH

See Dyeing 101 for information on scouring ([this page](#)), mordanting ([this page](#)), and preparing a chalk bath ([this page](#)); see Cellulose Shade Card on [this page](#) if you want to dye the linens a different color

GOODS

4 linen placemats and 4 napkins (448g), scoured and mordanted, dipped in chalk bath

DYEING MATERIALS AND TOOLS

½ cup (125mL) hot water

4 tablespoons (36g) cutch extract

25 cups (6L) water

11-quart (10.4L) stainless-steel pot with lid

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Tongs

Timer

Thermometer

Rubber gloves

Tannin-rich dye and cellulose fibers make a beautiful combination, which is why I chose cutch and linen for this placemat and napkin set. (To learn more about tannin, see [this page](#).) When I was dyeing this cloth I was thinking about sharing long, relaxing meals with friends on the patio.

DYEING DIRECTIONS

1. Remember to dip the linens into the chalk bath before dyeing.

- 2.** Add $\frac{1}{2}$ cup (125mL) hot water to a measuring cup. Add the cutch extract and stir with a small spoon or whisk until dissolved.
- 3.** Combine the dissolved dye mixture and 25 cups (6L) water in the pot. Add the linens.
- 4.** Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 200°F (93°C), turning the napkins and placemats every 15 minutes. Simmer for an additional hour, turning the linens every 15 minutes.
- 5.** Turn off the heat. Let the goods rest until cool.
- 6.** Wash the goods ([this page](#)) and allow to dry.

TRY

Cutch is widely used in India, where my passion for natural dyeing was sparked. That said, you don't have to go far to find tannin-rich plants to use for dyeing, and in fact you may even be able to find them in your backyard—for example, look for acorns, green walnuts, or oak galls. Dip goods dyed with these materials into iron and watch the colors come to life as they turn chocolate brown and gray. Make your tabletop more dynamic by dyeing your napkins one color and your placemats another!



CONFETTI COWL

SKILLS LEARNED: DYEING WITH EXTRACTS ON CELLULOSE-BASED GOODS, USING SIMPLE SURFACE DESIGN TECHNIQUES WHILE DYEING

This simple, reversible cowl is the perfect accessory—and it is easy to dye and easy to knit!

To prepare a skein of yarn for the dyepot and keep it from tangling, it is always a good idea to tie it loosely with scrap yarn in three or four places. In this project, do just that, with one exception—instead of tying the skein loosely, tie it tightly every few inches (cm). The dye cannot reach the areas under the ties. Once dyeing is done, take all the ties off and *voilà!* A pattern on the yarn appears that looks like tiny bits of confetti when it is knit.

As always, you can use the Cellulose Shade Card to make more colors. The darker the color, the easier it is to see the little flecks of white left by the ties.

FINISHED MEASUREMENTS

25½" (65 cm) circumference × 6" (15 cm) tall

GAUGE

17 sts (stitches) and 32 rnds (rounds) = 4" (10 cm) in Diagonal Rib, using smaller needle

See **Dyeing 101** for information on scouring ([this page](#)); mordanting ([this page](#)); and preparing a chalk bath ([this page](#)); see the Cellulose Shade Card on [this page](#) if you want to dye the yarn a different color

GOODS

Blue Sky Alpacas Skinny Cotton (100% organic cotton; 105 yards [137 m / 65g]): 1 hank #30 Birch, scoured and mordanted, dipped in chalk bath

DYEING MATERIALS AND TOOLS

¼ cup (60mL) hot water

½ tablespoon (3g) cochineal extract

7 cups (1.7mL) water

Scrap yarn or string

5-quart (4.7L) stainless-steel pot with lid

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Tongs

Timer

Thermometer

Rubber gloves

KNITTING TOOLS

One 24" (60 cm) long circular needle size US 7 (4.5 mm) or size needed to obtain correct gauge

One size US 8 (5 mm) needle in any style, for BO (optional)

Stitch marker

Darning needle



A.



B.



C.

DYEING DIRECTIONS

1. To prepare the yarn for dyeing, use scrap yarn or string to tie a series of tight knots around the skein, placing each knot 3" to 4" (7.5 to 10.2 cm) apart. (A) The yarn will act as a resist to the dye, creating the "confetti" marks.

2. Dip the yarn in a chalk bath before you dye.

3. Add $\frac{1}{4}$ cup (60mL) hot water to the measuring cup. Add the cochineal extract and stir with a small whisk or spoon until

dissolved.

4. Combine the dissolved dye mixture and 7 cups (1.7mL) of water in a pot. Add the yarn. (B)

5. Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 200°F (93°C), turning the yarn every 10 minutes. Hold at that temperature for an additional hour, turning the yarn every 10 minutes.

6. Turn off the heat. Let the yarn rest until cool.

7. Wash the goods ([this page](#)) and allow to dry. (C)

TRY

Use different weights of string to get different sizes of white flecks; thick string will make larger confetti, while thin string will make more delicate marks.

KNITTING DIRECTIONS

Diagonal Rib

(multiple of 4 sts; 4-rnd repeat)

Rnd 1: *K2 (Knit 2), p2 (purl 2); repeat from * to end.

Rnd 2: *P1, k2, p1; repeat from * to end.

Rnd 3: *P2, k2; repeat from * to end.

Rnd 4: *K1, p2, k1; repeat from * to end.

COWL

Using smaller needle, CO (cast on) 108 sts. Join for working in the rnd, being careful not to twist sts; pm (place marker) for beginning of rnd.

Knit 2 rnds.

Begin Diagonal Rib; repeat Rnds 1–4 eleven times.

Knit 2 rnds.

BO all sts loosely, using larger needle.

FINISHING

Weave in ends carefully so that cowl is reversible. Block as desired.



The drying leaves of Persicaria tinctoria, one of the many varieties of indigo grown throughout the world.

chapter 6

DYEING WITH INDIGO

With a history spanning more than three thousand years, indigo dyeing, which requires a different process than all other natural dyes, is one of the world's most revered dyeing traditions. People have dedicated their lives to working solely with indigo and mastering its many nuances. Indigo is quite magical—when goods are pulled from the dyebath, they undergo an amazing transformation from bright green to dazzling blue right before your eyes.

Indigo dye can come in many forms: fresh leaves, dried leaves, composted material, or powdered extract. Like other natural dyes, indigo is combined with water to create a dyebath, which is traditionally referred to as the *vat*. For indigo dyeing to occur, the following two criteria must be met:

- The vat must be made alkaline, with a pH between 10 and 11. Any substance known to be basic can create an alkaline environment of pH 10–11, including wood ash, soda ash, or lye.
- All of the oxygen must be removed from the vat. This reduction process can be accomplished through the use of chemicals, such as sodium hydrosulfite, fructose, or bacteria (when bacteria is used, it is known as the fermentation technique).

Once this environment has been established within the indigo vat, the dyebath will shift from blue to green. This indicates that the vat is ready to use. One of the most interesting aspects of indigo-dyeing is exploring the number of ways in which people around the world establish these two characteristics in the vat.

FIBERS AND INDIGO DYEING

Cellulose-based fibers respond to indigo differently than protein-based fibers. Cellulose-based fibers can be dyed in a cooler bath (100°F [38°C]). Protein-based fibers benefit from a warmer bath (120°F to 140°F [49°C to 60°C]). Cellulose-based fibers need less dye than protein-based fibers. The first two projects in this chapter

([this page](#) and [this page](#)) help you learn the nuances of dyeing each fiber type.

STEPS IN THE INDIGO-DYEING PROCESS

Here is an overview of the practices followed in *The Modern Natural Dyer*.

STAGE 1: WEIGHING AND PREPARATION. Refer to [this page](#) for detailed instructions.

STAGE 2: SCOURING. Information on scouring is found on [this page](#). Mordanting is not necessary in the indigo-dyeing process since it doesn't help indigo chemically bond to fiber or increase colorfastness. However, you can safely indigo-dye mordanted goods.

STAGE 3: MAKING THE MOTHER. The first step in starting an indigo vat is to make the mother, a highly concentrated indigo solution. Read about this step on [this page](#).

STAGE 4: MAKING THE VAT. After you have made the mother, follow the directions in the individual projects to make the vat by adding water, the mother, and associated substances.

STAGE 5: DIP THE GOODS. Once the vat has been created, the goods are dipped into the vat and left there for about 5 minutes. Then the material is taken from the vat and hung for 5 to 10 minutes. As it is exposed to the oxygen in the air, the goods shift from green to blue—this is the magical oxidation process. To create darker shades, the goods are dipped into the vat multiple times. Details on dipping the goods are on [this page](#).

STAGE 6: WASH THE GOODS. Read about washing on [this page](#).

Making the Mother

MATERIALS

¼ cup (60mL) hot water

3 tablespoons (22g) natural indigo extract

Cool water

1 tablespoon (18g) lye (sodium hydroxide) (see note below)

1 tablespoon (14g) sodium hydrosulphite

TOOLS

1 quart-size (liter-size) canning jar

White plastic spoon

Measuring spoons

Stirrer, such as whisk or spoon

Rubber gloves

Protective eyewear

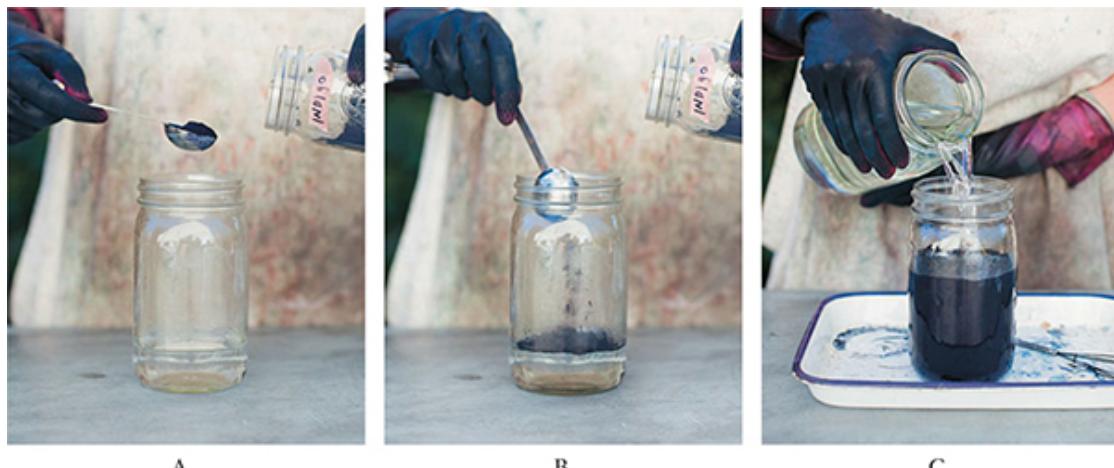
DIRECTIONS

Note: You must always take proper precautions when working with lye. Please read before proceeding.

- Always wear gloves and protective eyewear.
- Do not let lye touch your skin, as it is caustic and can burn. If lye touches your skin, rinse immediately.
- Only add lye to water; never add water to lye.
- Use only cool water when working with lye.
- Never add lye to boiling water. It can explode.

1. Add $\frac{1}{4}$ cup (60mL) hot water to the canning jar. Add the indigo powder to the jar; stir with a small whisk or spoon until dissolved. (A + B)

2. Fill the jar with cool water. Stir. (C)



3. Add 1 tablespoon (18g) lye. Be careful not to get any lye on your skin. Stir until dissolved. (D)

4. Add 1 tablespoon (14g) sodium hydrosulphite. Stir until dissolved. Let it rest for 20 minutes. (E)

5. After 20 minutes, the color of the mother will have changed from blue to green. Use the white spoon to dip into the surface of the

mother to check the color. (F) Leftover mother can be sealed and stored in a dark space for up to 2 months.



D.

E.

F.

INDIGO VAT SIZE

Indigo vats can be a plethora of sizes, from a small pot to dye things like thread to a large vat, the size of a trash can, to dye long dresses and fabric yardage. I call for a medium-size indigo vat for the projects in this book. That way, everything from a tote or a T-shirt to a dress can be dyed in the same vessel. In a vat this size, you will be able to dip a medium-sized object many times, or dip many medium-sized objects a few times.

Dipping the Goods

To maintain the oxygen-free environment of the indigo vat, care must be taken when introducing the goods to the dyepot. The vat should only be stirred as much as is needed to mix the mother when it is introduced to the vat; I take a spoon and go twice around the edge of the vat. When adding the goods to be dyed, dip them smoothly into the vat and leave them immersed for the amount of time suggested in the project instructions. While the goods are submerged in the vat, any sort of up-and-down movement will introduce oxygen.

Yarn should be treated carefully when it is dyed in an indigo vat. As you will see in the Indigo Wedge Cardigan ([this page](#)), it is helpful to use a dowel to keep the yarn organized and prevent tangling. It should not be allowed to drop to the bottom of the pot because it won't dye uniformly, and retrieving it from the vat will introduce lots of oxygen. Rather than hanging the yarn on a dowel, you can instead drape it over the side of the pot.

Of course, some oxygen will be introduced to the vat during the course of dyeing, and the vat can quickly be returned to its optimum state through the process of *recalibration* (see below for more information).

Special Precautions

Sodium hydrosulphite is light- and heat-sensitive, so be sure to close the container immediately after use. If the heat of the water in the vat is too high (above 150°F [66°C]), the sodium hydrosulphite loses its strength and will be ineffective. However, none of the instructions in this book call for temperatures in that range when dyeing with indigo.

It is possible to add too much sodium hydrosulphite to the vat. Work to achieve the color green. If the vat is yellow (in which case the indigo will not adhere properly to the goods), stir the vat, introducing oxygen until you reach the color green.

Ambient temperature can affect the indigo-dyeing experience. Indigo should not be heated to 180°F to 200°F (82°C to 93°C) like other natural dyes, although a small amount of heat will help the process along. To indigo-dye cellulose-based fibers, the vat should be 90°F to 100°F (32°C to 38°C), and to work with protein-based fibers, the vat should be 120°F to 140°F (49°C to 60°C). Keep this in mind when working on the projects in this section, as well as those that use indigo in the Surface Design chapter ([this page](#)).

If you live in a warm environment or are dyeing in the summer, and you are working with cellulose-based fibers, there is a good chance you will only need to use hot water from the tap and can spend the afternoon dyeing without another thought. If you live in a cooler environment, you can start with hot tap water. But probably within 30 minutes the vat will cool due to the outside temperature, making it harder to keep the vat green for dyeing. In this case, it would be best to have the vat over heat.

AVOIDING CROCKING

The indigo molecule is larger than those of the other natural dyes. Because indigo is not attached to the fibers with a chemical bond, any sort of repeated pressure can cause the indigo to be pushed out of the fiber, resulting in crocking. Crocking occurs with goods that are freshly dyed and is the release of excess indigo that was not removed during the washing process. This occurs mostly with protein-based fibers and with cellulose-based fibers that have been dipped into the vat many times. To help prevent crocking, apply dye

gradually through successive dips and make sure the vat is created properly, as described previously. Typically, after applying pressure to the goods, whether knitting indigo-dyed yarn or wearing indigo-dyed clothing, the excess indigo will wear off and it will stop transferring.

Fading is the loss of indigo over time, which is expected. You've probably observed this happen to the knees of your favorite pair of blue jeans. This quality has been recognized for centuries: years ago in Japan, it was common for people to bring their indigo clothing back to the village dyer once a year to have it re-dyed.



RECALIBRATING THE INDIGO VAT

Throughout the indigo-dyeing process, the magical combination of indigo, pH, and reduction must be in balance for the indigo to take hold. That said, no matter how careful you are during the indigo-dyeing process, every time fiber is dipped into the indigo vat the dyebath's state shifts ever so slightly; its pH slides closer to neutral and oxygen reenters. This is the natural evolution of the process. The practice of bringing the vat back to its optimum state is called *recalibration*. Here are the signs that the vat needs to be recalibrated:

- The water in the vat is blue instead of green.
- The goods are blue instead of green when pulled out of the vat.

At this point, a new vat can be made, or the current vat can be revived and brought back to its original state by shifting the pH, removing the oxygen, and adding new indigo. If you intend to dye large amounts of textiles or would like to reuse your vat, it's helpful to become comfortable with recalibrating the vat. I've discovered that the more I practice indigo dyeing, including recalibrating, the more I understand the timing of the vat. Knowing when to check the

vat's pH or temperature becomes second nature. When it comes to indigo dyeing, practice really does make perfect!

DIRECTIONS

1. Check the pH of your dyebath with a pH strip. If the alkalinity has fallen below 10, add $\frac{1}{4}$ cup (60mL) hot water to a measuring cup and stir in 3 teaspoons (12g) soda ash with a small whisk or spoon until dissolved. Add the mixture to the vat. Stir.

Tip: Dip only the tip of the pH strip into the vat, so you don't dye the entire strip. pH strips are made of absorbent paper, so once you dip the tip into the vat, flip the paper up to allow the liquid to run and cover the entire strip.

2. Check the pH again. If the pH is still too low, repeat step 1. If the pH is too high, add a drop or two of an acid, such as lemon juice.

3. If the vat is still blue after correcting the pH, add $\frac{1}{4}$ teaspoon (1.5g) sodium hydrosulphite. Stir. Wait 10 minutes.

4. Check the vat to see if the color has shifted from blue to yellowish green. If not, repeat step 3. Once the vat is green, you can dye again.

5. If the vat is still not turning green, check the temperature. If dyeing cellulose-based goods and the vat has fallen below 100°F (38°C), heat the vat until it is 100°F (38°C). If dyeing protein-based goods and the vat has fallen below 120°F (49°C), heat the vat until it is between 120°F and 140°F (49°C to 60°C).

6. If the vat is green, and the goods you are trying to dye are not getting darker after dipping, the vat needs more indigo dye extract. Pour $\frac{1}{4}$ to $\frac{1}{3}$ cup (60 to 85mL) of the mother into the dyebath. Stir.

ALTERNATE METHOD FOR DYEING WITH INDIGO

This technique, popularized by Michel Garcia, reduces indigo with henna instead of a chemical agent. You do not make a mother with this method; you simply make the vat and begin dyeing when it reaches the appropriate stage.

MATERIALS

4½ tablespoons (30g) natural indigo extract

8 tablespoons (60g) henna

11½ tablespoons (90g) lime (calcium hydroxide)

Hot water

TOOLS

16-quart (15.1L) stainless-steel pot with lid

Measuring cup

Measuring spoons

Small whisk

Rubber gloves

Thermometer

Drying rack or clothesline

DIRECTIONS

1. Add 1 cup (250mL) hot water to a measuring cup. Add the henna and stir with a small whisk until dissolved. Add to the pot.
2. Add $\frac{1}{2}$ cup (125mL) hot water to a measuring cup. Add the powdered indigo extract and stir with the whisk until fully wet. Add to the pot.
3. Add 1 cup (250mL) hot water to the measuring cup. Add the lime and stir with a small whisk until dissolved. Add to the pot. Stir gently.
4. Fill the pot with hot water to within 2" (5.1 cm) from the top. Heat to 120°F (49°C). Make sure the vat stays between 90°F and 120°F (32 and 49°C) during the dyeing process.
5. Allow the dyebath to sit for 30 minutes, stirring gently every 10 minutes. It should shift from blue to yellowish green. If the bath has turned a yellowish-green color after 30 minutes, start dipping the goods into the indigo dyebath. If it is not yellowish green after 30 minutes, verify that the temperature in the pot is 120°F (49°C). If not, heat until it reaches this temperature.
6. Dip the goods into the dyepot. Allow the goods to sit for 5 minutes. Pull the goods from the pot and hang on a drying rack or clothesline for 20 minutes. Continue to dip and let hang as needed to reach the desired shade of blue.



BLUE SKIES TOTE

SKILLS LEARNED: BASIC DYEING WITH INDIGO ON CELLULOSE-BASED GOODS, CREATING A RANGE OF SHADES WITH INDIGO DYE

Cellulose-based fibers and indigo are a match made in heaven. Fibers like linen, cotton, and hemp easily soak up the indigo. I chose a small linen tote, but this indigo vat can be used with any kind of cellulose-based fiber, so you could dye a cotton tote instead, for instance. If you don't have a tote, that's okay—feel free to dip a T-shirt or really anything your heart desires, so long as it is a plant-based fiber.

The instructions in this recipe are specific to cellulose-based fibers. To learn how to dye protein-based fibers with indigo, refer to the next project, the Indigo Wedge Cardigan ([this page](#)).

Spend the afternoon playing with the indigo vat and create an array of blues, mirroring the sky above. Here is how I reached the shades shown in the photo on the opposite page:

- Light Blue Tote: 3 dips
- Medium Blue Tote: 6 dips
- Dark Blue Tote: 9 dips
- Even Darker Blue Tote: 12 dips

See Dyeing 101 for information on scouring ([this page](#)); see Dyeing with Indigo for information on making the mother ([this page](#))

GOODS

White 100% linen tote bag, 55g, scoured

DYEING MATERIALS AND TOOLS

Indigo mother

3 gallons (11.4L) hot water

5 teaspoons (20g) soda ash

1/8 teaspoon (.5g) sodium hydrosulphite, or more if needed

3-gallon (11.4L) bucket

White plastic spoon

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

pH strips

Thermometer

Drying rack or clothesline

Rubber gloves



A.



B.



C.



D.



E.



F.



G.



H.



I.

DYEING DIRECTIONS

1. Wring excess water out of the scoured goods to avoid adding water and oxygen to the vat.
2. Create the indigo vat by filling the bucket with hot tap water (100°F [38°C]).
3. Add 5 teaspoons (20g) soda ash to increase pH and stir. Check pH; it should now be just under 11. (A + B)
4. If dyeing linen, pour $\frac{1}{4}$ cup (60mL) of the mother into the bucket of hot water. If dyeing cotton, pour $\frac{1}{3}$ cup (85mL) of the mother into the bucket of hot water. (C)
5. Add $\frac{1}{8}$ teaspoon (.5g) sodium hydrosulphite. Stir. Let it sit for 15 minutes. (D)
6. After 15 minutes, the dyebath should have shifted from blue to green, with a coppery, bluish-purple layer at the surface. If so, it is time to dye. If not, add another $\frac{1}{8}$ teaspoon (.5mL) sodium hydrosulphite. Stir. Let it sit for another 15 minutes. (E)
7. Dip the tote slowly and smoothly into the vat. Leave it submerged for 5 minutes. (Always remember, the more oxygen you introduce into the vat, the sooner you will have to recalibrate it. Avoid any unnecessary agitation.) (F)
8. Oxidize the tote by pulling it slowly from the vat. It should be green. Wring to release the excess indigo dyebath. Hang the tote on a clothesline or drying rack. Allow it to rest about 5 minutes—until all of the green has disappeared—before dipping again. (G–I)
9. Repeat steps 7 and 8 until the desired shade is reached.
10. Use the white plastic spoon to check the vat after 5 to 10 dips to verify that it is still green. Refer to [this page](#) for directions on recalibrating the vat if necessary.
11. Wash the tote ([this page](#)) and allow to dry.



INDIGO WEDGE CARDIGAN

Sweater Design by Julie Weisenberger

SKILLS LEARNED: BASIC DYEING WITH INDIGO ON PROTEIN-BASED GOODS, OVERDYEING WITH INDIGO, SPACE DYEING WITH INDIGO

Dyeing protein-based fibers with indigo is a little different than working with cellulose-based fibers. For example, protein-based fibers respond well to warmer temperatures. Using a warmer vat creates darker shades of indigo faster and helps the vat stay “green” longer. For this sweater designed by the wonderful Julie Weisenberger of Cocoknits, I chose yarn made of undyed brown wool. The resulting blue is richer than if I had started with white wool. A few of the skeins were only partially dipped—space-dyed—which creates a watery pattern when the yarn is knit. Julie used the space-dyed yarn in the pockets and “wedge” shape of the sweater.

SIZES

Small (medium, large, 1X, 2X, 3X)

FINISHED MEASUREMENTS

Bust: 36 (40, 44, 48, 52, 56)” (91.5 [101.5, 112, 122, 132, 142] cm)

Length: 21½ (22½, 23½, 24, 24½, 25)” (54.5 [58, 60.5, 62, 63.5, 65] cm)

Cardigan is intended to have an ease of 2–4” (5–10 cm).

GAUGE

16 sts (stitches) and 25 rows = 4” (10 cm) in Stockinette st (St st) using size US 8 (5 mm) needle

See Dyeing 101 for information on scouring ([this page](#)); see Dyeing with Indigo for information on making the mother ([this page](#))

GOODS

See sizes and finished measurements before obtaining yarn.

A Verb for Keeping Warm Pioneer (100% organic merino wool; 160 yards [146 m / 50g]): 8 (8, 9, 10, 11, 12) skeins Tree Fort, scoured (MC [main color])

A Verb for Keeping Warm Pioneer (100% organic merino wool; 160 yards [146 m / 50g]): 1 (1, 2, 2, 2, 3) skein(s) Tree Fort, scoured (A)

DYEING MATERIALS AND TOOLS

Indigo mother

16 quarts water (15.1L)

4 teaspoons (16g) soda ash

1/8 teaspoon (.5g) sodium hydrosulphite, or more if needed

16-quart (15.1L) stainless-steel pot with lid

Hot plate and extension cord (if working outside)

White plastic spoon

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

pH strips

Thermometer

Rubber gloves

Wooden dowel or similar object

Drying rack or clothesline

KNITTING TOOLS

One 32" (80 cm) long or longer circular needle size US 7 (4.5 mm)

One 32" (80 cm) long or longer circular needle size US 8 (5 mm) for body

One set of five double-pointed needles (dpns) size US 8 (5 mm)

One 40" (102 cm) long or longer circular needle size US 0-2 (2-2.75mm), for picking up stitches

Change needle size if necessary to obtain correct gauge.

Crochet hook size US H/8 (5 mm)

Waste yarn

Stitch markers and stitch holders



A.



B.



C.



D.



E.



F.

DYEING DIRECTIONS

1. Gently squeeze out excess water from the scoured yarn.
2. Create the indigo vat by filling the pot with water to within 2" (5.1 cm) of the top. Heat to 120°F (49°C). Make sure the vat stays around 120°F (49°C) throughout the dyeing process.
3. Add 4 teaspoons (16g) soda ash to increase pH and stir. Check pH; it should now be just under 11.
4. Pour $\frac{1}{3}$ cup (85mL) of the indigo mother into the pot.
5. Add $\frac{1}{8}$ teaspoon (.5g) sodium hydrosulphite. Stir. Let it sit for 15 minutes.
6. After 15 minutes, the dyebath should have shifted from blue to green, with a coppery, bluish-purple layer at the surface. If so, it is time to dye. If not, add another $\frac{1}{8}$ teaspoon (.5g) sodium hydrosulphite. Stir. Let it sit for another 15 minutes.
7. Dye variegated yarn (A): Drape 1 (1, 2, 2, 2, 3) skeins of yarn over the wooden dowel and dip slowly and smoothly into the vat, stopping when approximately half of the length of the yarn is submerged. Leave it submerged for 5 minutes, avoiding any unnecessary agitation of the vat. (A)
8. Oxidize the yarn by pulling it from the vat. Gently twist and squeeze the yarn to remove the excess indigo dyebath. (B + C) Hang the yarn on a clothesline or drying rack. Allow the yarn to rest until all of the green has disappeared (about 5 minutes) before dipping again.
9. Repeat steps 7 and 8 until the desired shade is reached.
10. Dye solid color yarn (MC): Working with 4 or 5 skeins at a time, dip the yarn slowly and smoothly into the vat, stopping when approximately half of the length of the yarn is submerged as you did step 7. Leave the yarn submerged for 5 minutes. (D) Now, rotate the yarn so the undyed half is now submerged. Leave for another 5 minutes. (E)
11. Oxidize the yarn by pulling it from the vat. Gently twist the yarn to release the excess indigo dyebath. Hang the yarn on a clothesline or drying rack. Allow it to rest about 5 minutes—until all of the green has disappeared—before dipping again.
12. Repeat steps 10 and 11 until the desired shade is achieved.

13. Continue dyeing until all MC skeins needed for your size sweater are complete.
14. Remember to check the vat every few dips with a white spoon to verify that it is still green. (F) Refer to [this page](#) for directions on recalibrating the vat if needed. When working with protein-based fibers, the vat needs to be recalibrated often.
15. Wash the goods ([this page](#)) and allow to dry.

KNITTING DIRECTIONS

Special Abbreviations

LLI (left lifted increase): Pick up the stitch two rows below the last stitch on the right-hand needle, as follows: If the last stitch on the right-hand needle is a knit stitch, insert the left-hand needle from back to front under the top strand of the stitch, and knit the picked-up stitch through the back loop to increase 1 stitch. If the last stitch is a purl stitch, insert the left-hand needle from front to back under the top strand of the stitch and knit the picked-up stitch through the front loop to increase 1 stitch.

RLI (right lifted increase): Pick up the stitch below the next stitch on the left-hand needle, picking up from the bottom up into the back of the stitch, and place it on the left-hand needle; knit the picked-up stitch through the front loop to increase 1 stitch.

Special Techniques

BACKWARD LOOP CO (CAST ON): Make a loop (using a slip knot) with the working yarn and place it on the right-hand needle (first st CO [first stitch cast on]), *wind yarn around thumb clockwise, insert right-hand needle into the front of the loop on thumb, remove thumb and tighten st on needle; repeat from * for remaining sts to be CO, or for casting on at the end of a row in progress.

MAGIC LOOP: It is best to work Magic Loop on a 32" (80 cm) long or longer circular needle with a flexible cable. Divide the stitches roughly in half and fold the piece flat, holding the two halves together, with the needles at the right. At the halfway point (on the left opposite the loose cables), pull the cable out between two stitches until you have a large loop. Pull the loop until the stitches are at both needle tips, then pull the back needle out until the

back stitches are on the cable, and you have a loop large enough to allow you to work across the stitches on the front needle with the back needle; you will still have the loop at the halfway point on the left side of the piece. Work across the stitches on the front needle until you get to the loop on the left side. Turn the piece so that the front needle becomes the back needle; slide the stitches on the new front needle to the needle tip, and pull the back needle out until it is long enough to work the stitches on the front needle.

To turn the corner in a piece with tight corners, pull out a loop as follows: When you come to the corner, pull the right-hand needle out so that the stitches on that needle are on the cable and you have a loop long enough to allow you to work across the stitches that are along the other edge of the corner. Once you have worked around the corner for several rows, the work will have eased enough to enable you to work back and forth without pulling out the loop.

MATTRESS STITCH: Lay two pieces of knitting side by side, with RSs (right sides) facing up. *Bring threaded needle under 2 strands of yarn (also called “bars” or “ladders”) near edge of first piece of fabric. Bring needle under 2 corresponding strands of yarn on second piece of fabric. Repeat from *, reinserting needle into a piece of fabric at the point from which the needle last exited the fabric.

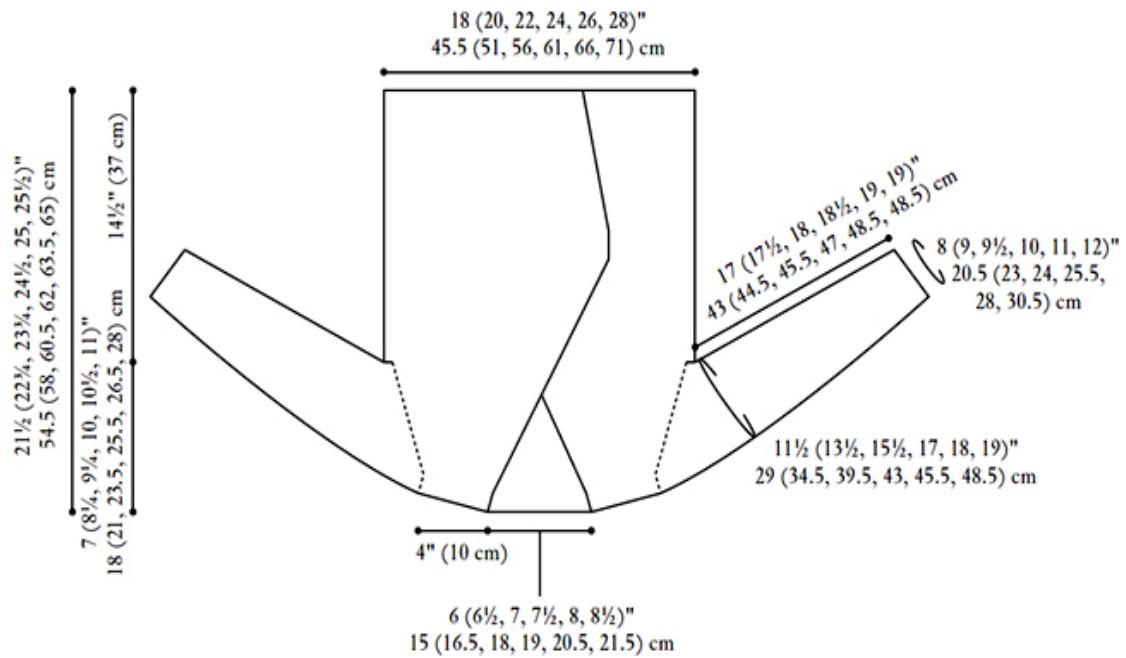
PROVISIONAL (CROCHET CHAIN) CO: Using a crochet hook and smooth yarn (crochet cotton or ravel cord used for machine knitting), work a crochet chain with a few more chains than the number of sts needed; fasten off. If desired, tie a knot on the fastened-off end to mark the end that you will be unraveling from later. Turn the chain over; with a needle 1 size smaller than required for piece and working yarn, starting a few chains in from the beginning of the chain, pick up and knit one st in each bump at the back of the chain, leaving any extra chains at the end unworked.

Change to needle size required for project on first row.

When ready to work the live sts, unravel the chain by loosening the fastened-off end and “unzipping” the chain, placing the live sts on a spare needle.

THREE-NEEDLE BO (BIND OFF): Place the sts to be joined onto two same-size needles; hold the pieces to be joined with the right sides facing each other and the needles parallel, both pointing to the right. Holding both needles in your left hand, using working yarn and a third needle of the same size or one size larger, insert third needle into first st on front needle, then into first st on back

needle; knit these two sts together; *knit next st from each needle together (two sts on right-hand needle); pass first st over second st to BO one st. Repeat from * until one st remains on third needle; cut yarn and fasten off.



Note: Piece is worked from the top down.

Notes

The cardigan is worked from the top down. The space-dyed back wedge is worked first, then set aside. The upper back is worked next, and then stitches are picked up from each side edge of the upper back for the shoulders. Once the shoulders are complete, you will work across the left shoulder stitches (which are now the front stitches), pick up stitches along the side edge of the left shoulder for the left sleeve, work across the back stitches, pick up stitches for the right sleeve, and then work across the right front. The yoke is worked in one piece to the beginning of the body, at which point the sleeves are placed on hold while the body is completed. Then the sleeves are worked down to the cuffs.

When picking up stitches (without knitting them) for the shoulders and collar, pick up the same horizontal bars or “ladders” that you would pick up for working Mattress st. Once you’re ready to knit the picked-up sts, knit the bars as if they were sts; you may knit into either the front or back of the bars, but be consistent in whichever you do.

DIRECTIONS

BACK WEDGE

Using crochet hook, Provisional CO, and A, CO 56 (64, 72, 80, 88, 96) sts. Begin St st (Stockinette stitch), beginning with a purl row; work even for 3 rows.

Shape Wedge

Next Row (RS [right side]): Decrease 2 sts on this row, then every 4 rows 20 more times, as follows: K2, ssk (slip 2 stitches knitwise, slip stitches back to left needle in their new orientation; knit these 2 stitches together through the back loops), knit to last 4 sts, k2tog (knit 2 stitches together), k2—14 (22, 30, 38, 46, 54) sts remain. Transfer sts to st holder and set aside; do not cut yarn.

UPPER BACK

Using size US 8 (5 mm) circular needle and MC, CO 24 (26, 28, 30, 32, 34) sts. Begin St st, beginning with a knit row; work even for 2 rows.

Shape Back

Row 1 (RS): K1, [k1-f/b (knit into front and back of stitch)] twice, knit to last 4 sts, [k1-f/b] twice, k2—4 sts increased.

Row 2: Purl.

Repeat Rows 1 and 2 six more times—52 (54, 56, 58, 60, 62) sts.

Row 15 (RS): K1, k1-f/b, knit to last 3 sts, k1-f/b, k2—2 sts increased.

Row 16: Purl.

Repeat Rows 15 and 16 once more—56 (58, 60, 62, 64, 66) sts. Cut yarn and transfer sts to st holder or waste yarn.

Shoulder

With RS of Back facing, CO edge away from you and sts on hold closest to you, and using size US 0–2 (2–2.75 mm) needle, pick up (but do not knit) 16 sts along right-hand edge of piece.

Change to size US 8 (5 mm) needle. With RS still facing, join MC and work 10 (14, 16, 18, 20, 22) rows in St st, beginning with a knit row. Cut yarn and set aside.

Repeat for left shoulder. Set aside but do not cut yarn.

Top of Sleeve

With RS facing, using size US 0–2 (2–2.75mm) circular needle, pick up (but do not knit) 6 (8, 10, 12, 14, 16) sts along side edge of right shoulder; set aside.

Repeat for top of left sleeve.

Yoke

Note: You will be turning sharp corners a few times while working the beginning of the Yoke; you might find it easier to work around those corners if you pull out a loop as when working Magic Loop.

Next Row (RS): Knit across 16 left shoulder sts, 6 (8 10, 12, 14, 16) sts picked up along side edge of left shoulder, 56 (58 60, 62, 64, 66) Upper Back sts, 6 (8 10, 12, 14, 16) sts picked up along side edge of right shoulder, then 16 right front sts—100 (106, 112, 118, 124, 130) sts.

Next Row: P15 (purl 15) for Right Front, pm (place marker), p8 (10, 12, 14, 16, 18) for Right Sleeve, pm, p54 (56, 58, 60, 62, 64) for Back, pm, p8 (10 12, 14, 16, 18) for Left Sleeve, pm, p15 for Left Front.

Shape Front Neck and Yoke

Note: Front neck shaping and Yoke shaping will be worked at the same time, but each is worked at different intervals, so the instructions for each shaping element are given separately. Please read entire section through before beginning. Front neck shaping will not be completed until after piece is divided for Sleeves and Body.

Shape Front Neck

Neck Increase Row (RS): Continuing in St st, increase 1 st at each neck edge on this row, then every 4 rows 3 more times, then every RS row 23 (26, 29, 31, 32, 33) times, as follows: K2, RLI, work to last 2 sts, LLI, k2. AT THE SAME TIME, beginning on first row of Front neck shaping, work Yoke shaping as follows:

Shape Yoke

Note: The first set of increases will be worked on the Sleeves only; the second set of increases will be worked on the entire Yoke.

Sleeve Increase Row (RS): Working Front neck shaping, increase 2 sts on each Sleeve on this row, then every 4 rows once more, then every RS row 8 (8, 8, 7, 5, 3) times, as follows: [Work to marker, sm (slip marker), k1, RLI, knit to 1 st before marker, LLI, k1, sm] twice, work to end.

Work even for 1 row.

Yoke Increase Row (RS): Working Front neck shaping as established, increase 1 st on each side of each Yoke marker on this row, then every other row 4 (7, 10, 13, 16, 19) more times, as follows: [Work to 1 st before marker, LLI, k1, sm, k1, RLI] 4 times, work to end—38 (46, 54, 60, 64, 68) sts each Sleeve; 64 (72, 80, 88, 96, 104) sts for Back. *Note: When Yoke shaping is complete, there will be 33 (39, 45, 50, 54, 58) sts for each Front, if row gauge was matched exactly. You may have a few sts more or less at this point due to differences in row gauge.*

Work even for 1 row.

DIVIDE FOR BODY

Next Row (RS): Continuing Front neck shaping, [work to marker, place Sleeve sts on st holder or waste yarn (removing markers), CO 4 sts for underarm using Backward Loop CO, pm for side, CO 4 sts for underarm] twice, work to end—72 (80, 88, 96, 104, 112) sts for Back, 38 (44, 50, 55, 59, 63) sts for each Front.

Work even for 1 row.

LEFT FRONT/BACK

Next Row (RS): Work to side marker, sm, k8, CO 1 st for Back selvage, turn. Transfer remaining sts to st holder or waste yarn.

Working on Left Front/Back sts only, purl 1 row.

Shape Back Edge

Next Row (RS): Continuing Front neck shaping, increase 1 st at Back edge on this row, then every 4 rows until you have completed all Front neck increases, as follows: Work to last 2 sts, LLI, k2—51 (57, 63, 68, 72, 76) Left Front sts.

When Front neck shaping is complete, work even at Front neck edge for 2 rows, while continuing to increase 1 st at Back edge as established.

Next Row (WS [wrong side]): Work to end, CO 7 sts—58 (64, 70, 75, 79, 83) Left Front sts.

Note: Work even for 2 rows if necessary, so that you end ready to work an increase at the Back edge.

Shape Front Neck and Back Edge

Row 1 (RS): [K1, p1] 3 times, k1, ssk, knit to last 2 sts, LLI, k2—57 (63, 69, 74, 78, 82) Left Front sts remain.

Row 2: Purl to last 6 sts, [k1, p1] 3 times.

Rows 3 and 4: Work even.

Repeat Rows 1 and 2 once—56 (62, 68, 73, 77, 81) Front sts remain.



Work Right Side of Pocket Slit

Row 1 (RS): [K1, p1] 3 times, k38 (38, 40, 43, 45, 47), [k1-f/b] twice, k1, turn; transfer remaining sts to st holder or waste yarn—49 (49, 51, 54, 56, 58) sts remain.

Row 2: [P1, k1] twice, purl to last 6 sts, work in rib to end.

Row 3: [K1, p1] 3 times, ssk, knit to last 4 sts, [slip 1 wyif (with yarn in front), k1] twice—48 (48, 50, 53, 55, 57) sts remain.

Row 4: Repeat Row 2.

Row 5: [K1, p1] 3 times, knit to last 4 sts, [slip 1 wyif (with yarn in front), k1] twice.

Row 6: Repeat Row 2.

Repeat Rows 3–6 eight more times—40 (40, 42, 45, 47, 49) sts remain. Transfer sts to st holder or waste yarn and set aside; do not cut yarn.

Work Left Side of Pocket Slit

With RS facing, transfer remaining Left Front/Back sts to needle. Join a new ball of yarn, CO 1 st for pocket selvage, and work to end.

Continuing to work Back edge increases every 4 rows as established, work even for 37 rows. Cut yarn. Transfer Left Front held sts back to needle.

Close Pocket Slit

With RS facing, using yarn attached to Left Front, working across all sts and continuing to work Front neck and Back edge shaping as established, work to last 4 sts of pocket slit, [k2tog] 3 times, work to end—46 (52, 58, 63, 67, 71) Front sts.

Work even for 3 rows.

Change to smaller circular needle.

Row 1 (RS): *K1, p1; repeat from * to last 2 sts, LLI, k2.

Row 2: P1, work in pattern to end, working increased st into pattern.

Row 3: Work to last 2 sts, k2.

Row 4: P1, work to end.

Repeat Rows 1–4 two more times.

BO (bind off) all sts in pattern.

RIGHT FRONT/BACK

Carefully unpick Provisional CO and place 56 (64, 72, 80, 88, 96) Wedge sts on smaller circular needle (including 1 st picked up below last st to restore original CO st count). Hold these sts parallel to and behind center Back sts, so that WSs of 2 pieces are together. Using 1 strand each of MC and A held together, work Three-Needle BO across pieces. Cut A. Continuing with MC, CO 1 st for Back selvage, work to end, continuing Front neck shaping as established.

Purl 1 row.

Shape Back Edge

Next Row (RS): Continuing Front neck shaping, increase 1 st at Back edge on this row, then every 4 rows until you have completed all Front neck increases, as follows: K2, RLI, work to end—51 (57, 63, 68, 72, 76) Front sts.

When Front neck shaping is complete, work even at Front neck edge for 4 rows, while continuing to increase 1 st at Back edge as established. *Note: Work even for 2 more rows if necessary, so that you end ready to work an increase at the Back edge.*

Shape Front Neck and Back Edge

Row 1 (RS): K2, RLI, knit to last 3 sts, k2tog, k1—50 (56, 62, 67, 71, 75) Right Front sts remain.

Row 2: Purl.

Row 3: Knit.

Row 4: Purl.

Repeat Rows 1 and 2 once—49 (55, 61, 66, 70, 74) Right Front sts remain.

Work Right Side of Pocket Slit

Next Row (RS): Knit to 8 (14, 18, 20, 22, 24) sts after side marker, CO 1 st for pocket selvage, turn; transfer remaining sts to st holder or waste yarn.

Continuing to work Back edge increases every 4 rows as established, work even for 37 rows. Transfer sts to st holder or waste yarn and set aside; do not cut yarn.

Work Left Side of Pocket Slit

Row 1 (RS): With RS facing, transfer remaining Right Front/Back sts to needle. Join a new ball of yarn, [k1-f/b] twice, knit to end—43 (43, 45, 48, 50, 52) sts remain.

Row 2: Purl to last 4 sts, [k1, p1] twice.

Row 3: [K1, sl 1 wyif] twice, knit to last 3 sts, k2tog, k1—42 (42, 44, 47, 49, 51) sts remain.

Row 4: Repeat Row 2.

Row 5: [K1, sl 1 wyif] twice, knit to end.

Row 6: Repeat Row 2.

Repeat Rows 3–6 eight more times—34 (34, 36, 39, 41, 43) sts remain. Cut yarn. Transfer Right Front held sts back to needle.

Close Pocket Slit

With RS facing, using yarn attached to Right Back, working across all sts and continuing to work Front neck and Back edge shaping as established, work to last 2 sts of pocket slit, [ssk] 3 times, work to end—40 (46, 52, 57, 61, 65) sts.

Work even for 3 rows.

Change to smaller circular needle. Count the number of sts you have on the needle.

If you have an even number of sts:

Row 1 (RS): K2, RLI, *p1, k1; repeat from * to end.

If you have an odd number of sts:

Row 1 (RS): K2, RLI, *k1, p1; repeat from * to last st, k1.

Even or odd number of sts:

Row 2: Knit the knit sts and purl the purl sts to last 2 sts, working increased st into pattern, p2.

Row 3: K2, work to end.

Row 4: P1, work to end.

Row 5: K2, RLI, work to end.

Row 6: Repeat Row 2.

Repeat Rows 3–6 once more, then repeat Rows 3 and 4 once.

BO all sts in pattern.

SLEEVES

Transfer Sleeve sts from st holder or waste yarn to larger needle(s). With RS facing, join MC at underarm; CO 8 sts, knit to end, k4, pm for beginning of rnd (round)—46 (54, 62, 68, 72, 76) sts.

Working in St st (knit every rnd), work even for 9 rnds.

Shape Sleeve

Decrease Rnd: Decrease 2 sts this rnd, then every 10 (8, 6, 6, 6, 6) rnds 6 (8, 11, 13, 13, 13) more times, as follows: K1, ssk, knit to last 3 sts, k2tog, k1—32 (36, 38, 40, 44, 48) sts remain.

Work even until piece measures 14 (14½, 15, 15½, 16, 16)"/[35.5 (37, 38, 39.5, 40.5, 40.5) cm], or to 3" (7.5 cm) less than desired length from underarm.

Next Rnd: *K1, p1; repeat from * to end.

Repeat last rnd for 3" (7.5 cm).

BO all sts in pattern.

POCKET LININGS (MAKE 2)

Using dpns and A, CO 26 sts. Begin St st, beginning with a knit row; work even for 36 rows. BO all sts. Set aside.

FINISHING

Sew sides of Wedge to Back using Mattress st. Adjust length of Wedge if necessary to match length of Back, then BO Wedge sts. Sew underarm seams.

Sew 1 side edge of pocket lining to selvage edge of pocket slit. Sew remaining 3 sides of lining to WS of front, being careful not to let sts

show on RS.

Collar

CO 8 sts.

Row 1 (RS): [K1, p1] 3 times, k2.

Row 2: P2, [k1, p1] 3 times.

Repeat Rows 1 and 2 until piece matches length of Left Front rib, ending with Row 2. Set aside, leaving sts on needle; do not cut yarn. With RS facing, using Mattress st, and beginning at lower Right Front edge, sew Collar to Right Front so that it matches Left Front rib. Set aside.

With RS facing, using size US 0–2 (2–2.75 cm) circular needle, and beginning just above end of Right Front rib, pick up (but do not knit) 68 (74, 80, 84, 86, 88) sts from end of rib to beginning of Back neck, 24 (26, 28, 30, 32, 34) sts in Back neck CO sts, then 68 (74, 80, 84, 86, 88) sts to top of Left Front rib—160 (174, 188, 198, 204, 210) sts.

Change to size US 7 (4.5 mm) circular needle.

Set-up Row (RS): With yarn attached to Collar, work in pattern across collar sts, then knit across picked-up sts—168 (182, 196, 206, 212, 218) sts.

Next Row: P2, *k1, p1; repeat from * to end.

Shape Collar

Note: Collar is shaped using shadow wrap short rows.

Short Row 1 (RS): Work 44 (50, 56, 60, 62, 64) sts, RLI, slip st back to left-hand needle, turn;

Short Row 2: Work to end.

Short Row 3: Work to RLI from previous RS row, knit RLI together with next st, work 1 st, RLI, slip st back to left-hand needle, turn;

Short Row 4: Work to end.

Repeat Short Rows 3 and 4 fourteen more times.

Short Row 5 (RS): Work to RLI from previous RS row, knit RLI together with next st, work 33 (41, 49, 55, 59, 63) sts, RLI, slip st back to left-hand needle, turn;

Short Row 6: Work to end.

Short Row 7: Work to RLI from previous RS row, knit RLI together with next st, work 5 sts, RLI, slip st back to left-hand needle, turn;

Short Row 8: Work to end.

Repeat Short Rows 7 and 8 eight more times.

Next Row (RS): Work to RLI from previous RS row, knit RLI together with next st, work to end.

Work even for 3 rows, or until height of rib matches width of Left Front rib where they meet.

BO all sts in pattern. Sew top of Left Front rib to side edge of Collar.

Block to measurements ([this page](#)).



NORTHERN LIGHTS SCARF

SKILLS LEARNED: BASIC DYEING WITH INDIGO ON SILK, COMBINING INDIGO WITH OTHER NATURAL DYES, OVERDYEING USING THE PROTEIN SHADE CARD

To create this scarf, inspired by a dark, night sky, the fabric is first dyed with logwood purple. After the first dyebath, the scarf is then overdyed with indigo. By adding a twist to the scarf before it is placed in the dyepot, it is possible to create small flecks and nuances of color. Though I chose to use logwood purple for this scarf, any natural dye can be used as the base color. The combination of these two processes can produce extraordinary results.

I offer three different variations on this light, airy accessory. The lighter-colored version is perfect for casual daytime wear, while the darker versions add elegance for an evening out on the town.

See Dyeing 101 for information on scouring ([this page](#)) and mordanting ([this page](#)); see Dyeing with Indigo for information on making the mother ([this page](#)); see Protein Shade Card on [this page](#) if you want to dye the scarf a different base color

GOODS

White 100% silk scarf, 27g, 33" × 33" (83.8 × 83.8 cm), scoured and mordanted

DYEING MATERIALS AND TOOLS

***Light Purple Scarf*—dipped 1 time in the indigo vat**

1/4 cup (60mL) hot water

1/16 teaspoon (.25g) logwood extract

7 cups (1.7L) water

***Medium Purple Scarf*—dipped 2 times in the indigo vat**

1/4 cup (60mL) hot water

1/4 teaspoon (1g) logwood extract

7 cups (1.7L) water

***Dark Purple Scarf*—dipped 3 times in the indigo vat**

¼ cup (60mL) hot water

Scant 1 teaspoon (2.5g) logwood extract

7 cups (1.7L) water

For any shade of the scarf: Indigo mother

3 gallons (11.4L) hot water

5 teaspoons (20g) soda ash

½ teaspoon (.5g) sodium hydrosulphite, or more if needed

3-quart (2.8L) stainless-steel pot with lid

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Single-cup coffee cone and filter

Tongs

Timer

Thermometer

Rubber gloves

3-gallon (11.4L) bucket

White plastic spoon

pH strips

Drying rack or clothesline



A.



B.



C.



D.



E.



F.



G.



H.



I.

DYEING DIRECTIONS

1. Fold a scarf in half diagonally. Twist the fabric; when fully twisted, let the scarf wrap back on itself. Secure by folding one end of the fabric into the twist. The tighter the twist, the less the dye will reach the inside of the scarf. (A + B)
2. Add $\frac{1}{4}$ cup (60mL) hot water to a measuring cup. Use the amount of logwood extract for the shade of your choice and add the dye to the measuring cup; stir with a small whisk or spoon until dissolved. Pour the mixture through a coffee filter to remove any sediment to prevent spots on the fabric.
3. Combine the filtered, dissolved dye mixture and 7 cups (1.7L) water in a pot. Add the scoured and mordanted scarf. (C)
4. Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 180°F (82°C), turning the scarf every 10 minutes. Hold at that temperature for an additional hour, turning the fabric every 10 minutes.
5. Turn off the heat. Let the fabric rest until cool.
6. To prepare the scarf for indigo dyeing, untwist the fabric and fold it along the opposite diagonal. Twist the scarf again and secure the fabric as in step 1. (D + E)
7. Prepare the indigo vat by filling the bucket with hot tap water, approximately 100°F (38°C).
8. Add 5 teaspoons (20g) soda ash to raise the pH to 11. Stir.
9. Pour $\frac{1}{3}$ cup (85mL) of the mother into the bucket of hot water.
10. Add $\frac{1}{8}$ teaspoon (.5g) sodium hydrosulphite. Stir. Let it sit for 15 minutes.
11. After 15 minutes, the dyebath should have shifted from blue to green, with a coppery, bluish-purple layer at the surface. If so, it is time to dye. If not, add another $\frac{1}{8}$ teaspoon (.5g) sodium hydrosulphite. Stir. Let it sit for another 15 minutes.
12. Dip the scarf slowly and smoothly into the vat. Leave it submerged for 5 minutes. (F)
13. Oxidize the scarf by pulling it from the vat. Squeeze to release excess indigo dyebath. (G) Hang the scarf on a clothesline or drying rack. Allow the scarf to rest until all of the green has disappeared before dipping again, about 5 minutes.

14. Repeat steps 12 and 13 until the desired shade is reached.

15. Wash the scarf ([this page](#)) and allow to dry. (H + I)

TRY

Combining dye processes can create some memorable colors. For instance, the yellow dyes fustic and weld produce emerald greens when overdyed with indigo. The red dyes create purple: cochineal produces a jewel-tone shade, whereas madder yields a dusky color. Explore the range of colors found on the Protein Shade Card ([this page](#)), overdye with indigo, and discover an entirely new color palette!



Tools like wood blocks and clamps, or even something as simple as thread, can be used to create a vast array of patterns upon cloth.

chapter 7

SURFACE DESIGN

Once you've become familiar with the process of natural dyeing and the colors that can be achieved, the next horizon is to learn to make patterns on yarn or fabric with natural dyes. One simple way to do this is to use dye like paint, as in the Windswept Top on [this page](#); here, logwood purple does double-duty as a fabric paint and dye. You can also explore resist dyeing, in which a resist, such as thread, yarn, or wooden blocks, is applied to the fabric so that dye cannot penetrate in those areas. If you've ever done tie-dye, then you have some experience with resist dyeing. The patterns of color created with resist dyeing can be somewhat random or they can be deliberately planned and executed. I made each of the resist projects presented in this chapter with indigo, but they can also be made with any other dye featured in this book.



WINDSWEPT TOP

SKILLS LEARNED: PAINTING ON FABRIC WITH NATURAL DYES, CREATING VARIEGATED YARN

This boxy, versatile top is made of hand-painted silk fabric and yarn. Using a paintbrush and a concentrated dye solution, the fabric is first painted with either lines, as shown here, or with a design of your choice. Then, the yarn is dipped into two different dyes (one dye on each end). The fabric is loosely pleated and placed in the dyepot, and the skein of yarn is placed on top. The excess dye from the yarn trickles into the pot to create a pattern on the fabric reminiscent of watercolors. After dyeing, the center panel of the top is knit with the painted yarn and then sewn to the fabric. The fabric ties in the back let you adjust the fit as you like, and the billowy silk fabric drapes beautifully across the body.

FINISHED MEASUREMENTS

Finished Top: Length 23¼" (59 cm); circumference 121" (307.3 cm)

Knit Panel: 14¼" (35.5 cm) wide × 22" (56 cm) long

Note: The length of the knit panel is shorter than the length of the silk sleeve panel to compensate for the knit fabric's give.

GAUGE FOR KNIT PANEL

30 sts (stitches) and 36 rows = 4" (10 cm) in Stockinette stitch (St st), using larger needles

See Dyeing 101 for information on scouring ([this page](#)) and mordanting ([this page](#)); see Protein Shade Card on [this page](#) if you want to dye the fabric and yarn a different color

GOODS

1½ yards (1.4 m) white 100% silk stonewashed crepe de chine, 143g, at least 52" (1.3 m) wide, scoured and mordanted

A Verb for Keeping Warm Reliquary II (80% superfine merino wool / 20% silk; 875 yards [800 m / 100g]): 1 hank Snow, scoured and mordanted

DYEING MATERIALS AND TOOLS

To paint fabric

¼ teaspoon (1g) logwood purple

½ tablespoon (7mL) hot water

10 cups (2.4L) water

To dye yarn

⅛ teaspoon (.5g) logwood purple

⅛ cup (30mL) hot water

⅛ cup (30mL) cool water

½ tablespoon (4.5g) cutch

⅛ cup (30mL) hot water

⅛ cup (30mL) cool water

Flat angled paintbrush, ½" (1.3 cm) wide

Small container

5-quart (4.7L) stainless-steel pot with lid

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Tongs

Timer

Thermometer

Rubber gloves

KNITTING TOOLS

One pair straight needles size US 3 (3.25 mm)

One pair straight needles size US 4 (3.5 mm) or size needed to obtain correct gauge

Stitch markers

SEWING TOOLS

100% cotton thread in a matching color

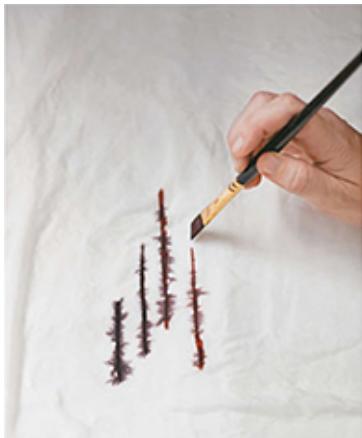
Hand-sewing needle

Pins

Ruler or tape measure

Iron

Sewing machine and related supplies



A.



B.



C.



D.



E.



F.

DYEING DIRECTIONS

1. To paint the fabric, fold it in half, selvedge to selvedge. Place on a table, protecting the surface if necessary. Dissolve $\frac{1}{4}$ teaspoon (1g) logwood purple in $\frac{1}{2}$ tablespoon (7mL) hot water. Using a flat-angled brush, paint vertical stripes: if you want straight lines, work on dry fabric; if you prefer wavy lines, work on damp fabric. Unfold the fabric to finish painting the yardage, using the lines that bled through as guides. Dry completely to set the dye before continuing. (A + B)

2. To paint the yarn, add $\frac{1}{8}$ cup (30mL) hot water to a measuring cup. Add $\frac{1}{8}$ teaspoon (.5g) logwood purple to the measuring cup; stir with a spoon or small whisk until dissolved. Add $\frac{1}{8}$ cup (30mL) cool water to the measuring cup. Take one end of the skein of yarn and place it in the measuring cup to soak up the dye. Remove the skein without squeezing out the excess dye. (C)

3. To paint the other end of the skein, add $\frac{1}{8}$ cup (30mL) hot water to a measuring cup. Add $\frac{1}{2}$ tablespoon (4.5g) cutch; stir with a small whisk or spoon until dissolved. Add $\frac{1}{8}$ cup (30mL) cool water to the

measuring cup. Place the other end of the skein of yarn in the measuring cup to soak up the dye as in step 2. Remove the skein, being careful not to squeeze any excess dye from the yarn. (D)

4. To dye the fabric, add 10 cups (2.4L) water to the 5-quart (4.7L) pot. Lightly roll or pleat the fabric and place in the pot. Add the yarn to the pot on top of the fabric; remember that it's the excess dye in the skein of yarn that will color the fabric. (E)

5. Place the pot on a burner. Slowly, over 30 minutes, bring the dyebath to 180°F (82°C), just under a simmer. Gently lift the fabric every 10 minutes but do not turn it; make sure it has not settled to the bottom of the pot or become stuck there. Hold at that temperature for an additional hour.

6. Turn off the heat. Let the goods rest until cool.

7. Wash the goods ([this page](#)) and allow to dry. (F)

KNITTING DIRECTIONS

Special Abbreviation

M1P (MAKE 1 PURLWISE): With the tip of the left-hand needle inserted from back to front, lift the strand between the 2 needles onto the left-hand needle; purl the strand through the front loop to increase 1 stitch.

Special Techniques

SLOPED BO: To eliminate the stair-step look of standard bind-offs along a neck, armhole, or shoulder edge, work the sloped bind-off as follows: Bind off the first row in the usual manner. On the following row, work to the last stitch, slip the last stitch purlwise, turn. Slip the first two stitches purlwise, then pass the first slipped stitch over the last stitch to bind off the first stitch. Continue binding off the rest of the stitches in the usual manner.

Stitch Pattern

2x2 Rib

(multiple of 4 sts + 2; 2-row repeat)

Row 1 (RS [right side]): K2 (knit 2), *p2 (purl 2), k2; repeat from * to end.

Row 2: P2, *k2, p2; repeat from * to end.

Repeat Rows 1 and 2 for 2x2 Rib.

Note: The Knit Panel is worked in one piece from the lower Front edge, over the shoulders, to the lower Back edge.

Front

Using smaller needles, CO (cast on) 106 sts.

Begin 2x2 Rib; work even until piece measures 2" (5 cm) from the beginning, ending with a WS (wrong side) row.

Change to larger needles and St st (Stockinette stitch); work even until piece measures 18½" (47 cm) from the beginning, ending with a RS row.

Next Row (WS): P43, pm (place marker), p20, pm, purl to end.

Shape Neck

Next Row (RS): Knit to 1 st before marker, k1-f/b (knit into front and back of stitch), remove marker, join a second ball of yarn, k1, pass second st on right-hand needle over first next st to BO (bind off) 1 st, BO sts normally to next marker, remove marker, BO 1 more st, knit to end—43 sts remain each side.

Next Row (WS): Working both sides at the same time, and using Sloped BO (see instructions on [this page](#)), BO 5 sts at each neck edge twice, 4 sts once, 2 sts twice, then 1 st twice—23 sts remain each side.

Work even until piece measures 22" (56 cm) from the beginning, ending with a WS row.

Back

Next Row (RS): K23, CO 58 sts using Backward Loop CO (see instructions on [this page](#)), k23—104 sts.

Next Row: P23, M1P (see instructions on [this page](#)), p58, M1P, purl to end—106 sts.

Work even in St st until piece measures 20" (51 cm) from Back neck, ending with a WS row. Continue to Back.

Change to smaller needles and 2x2 Rib; work even for 2"; (5 cm). BO all sts loosely in pattern.

FINISHING

Weave in ends. Block to measurements in knit schematic below. Proceed to sewing directions to complete this project.

Schematic

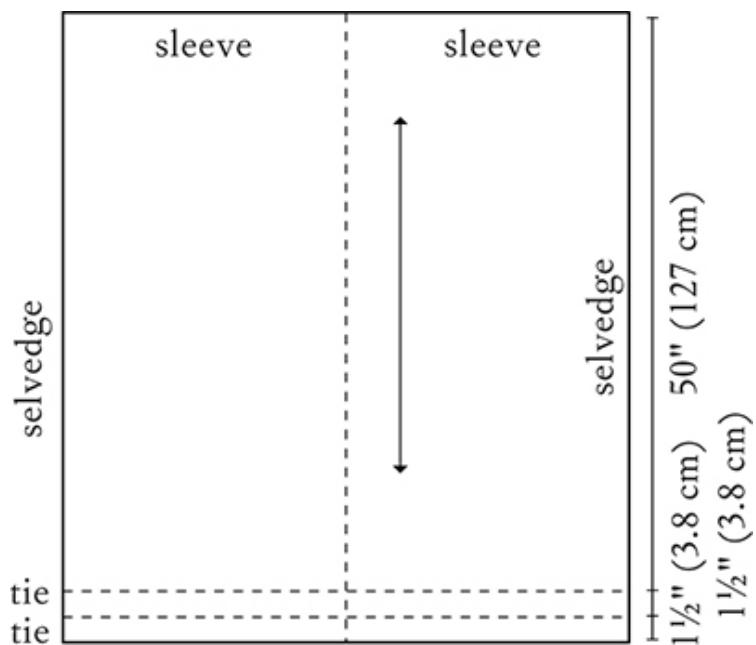
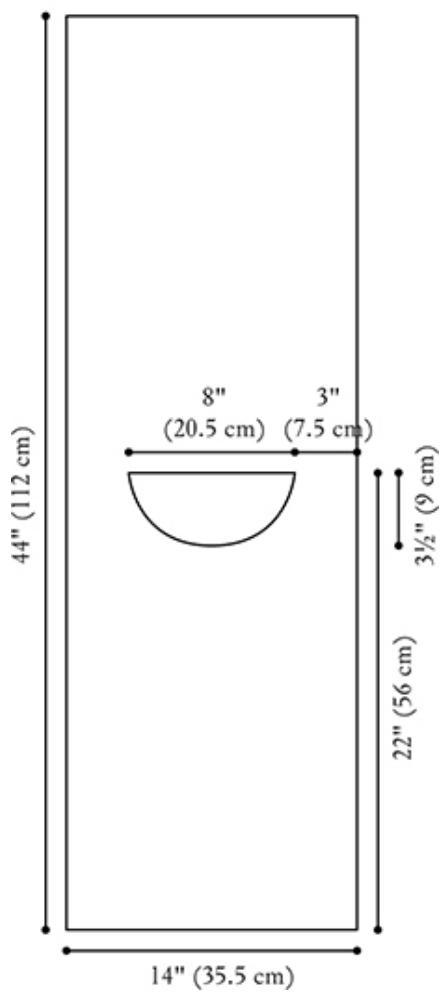


Fig. 1

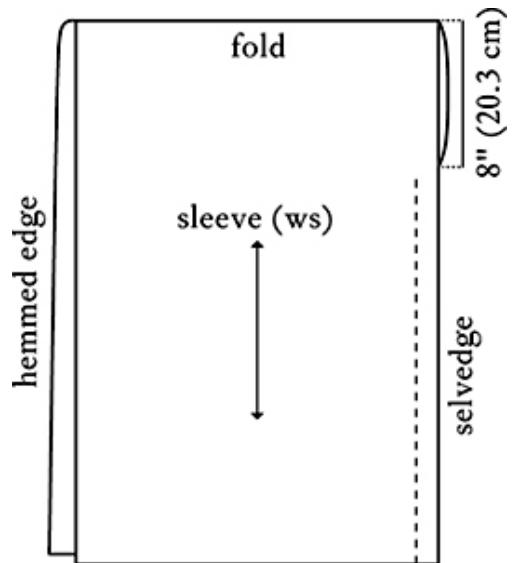


Fig. 2

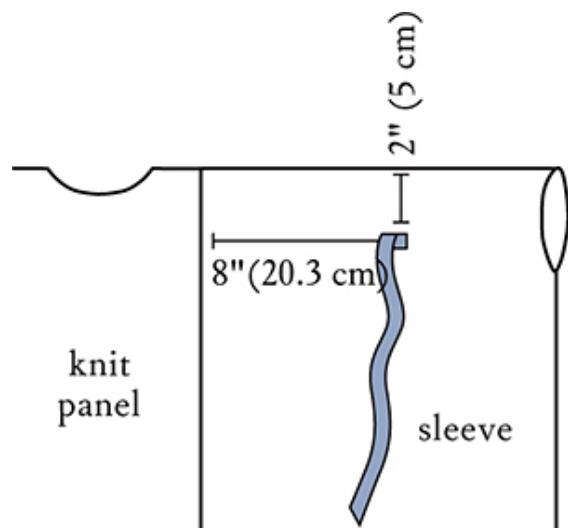


Fig. 3



G.



H.



I.

SEWING DIRECTIONS

Use $\frac{1}{2}$ " (1.3 cm) seam allowance throughout unless noted otherwise.

1. Cut the fabric according to the schematic in [figure 1](#). Cut the two ties first, then cut the remaining silk in half lengthwise. Do not remove the selvedges.
2. Fold each tie in half lengthwise and stitch along the long edge and one end to form a tube. Turn the tube inside out using your favorite method and press.
3. The two panels remaining from step 1 in the Sewing Directions will be the sleeves. Make a narrow hem along the long cut edge by folding under $\frac{1}{2}$ " (1.3 cm) to the wrong side, then folding under another $\frac{1}{2}$ " (1.3 cm). Press and stitch in place. Measure the sleeve and trim to 48" (90.5 cm) if necessary. Repeat with the other sleeve panel.
4. With right sides together, pin the knitted center panel to the hemmed edge of one of the sleeve panels, having 1" (2.5 cm) of the sleeve panel extend beyond the finished edge of the knitted panel on each end. Using a backstitch, hand-sew the sleeve to the knitted panel, using the line of machine stitching as a guide. Be sure to sew just past the line of machine stitching so it will not show on the outside of the garment. Repeat with the other sleeve panel. (G)
5. With right sides together, align the outer edges of a sleeve panel and pin together as in [figure 2](#). Measure down 8" (20.3 cm) from the fold and pin. Stitch from the pin to the hem. Repeat for the other sleeve. Press the seams open.
6. To hem the top, fold under $\frac{1}{2}$ " (1.3 cm) to the wrong side and press, then fold under another $\frac{1}{2}$ " (1.3 cm)—this should align it with

the knitted panel. Stitch the sleeve hem and tack it to the knitted panel. (H)

7. Stitch the ties to the back of the top as shown in [figure 3](#). Turn under the raw edges as you sew it in place. Tie as desired. (I)



WAVES BANDANA

SKILLS LEARNED: RESIST DYEING WITH INDIGO—BOUND RESIST

This project explores a popular type of resist dyeing known as bound resist in which fabric is wrapped, or bound, so the dye cannot touch it in certain places. While in India studying textiles, this was the first style of resist dyeing I learned. With only thread and nimble fingers, a tiny bundle is created, then another and another.

The iconic bandana—instantly identified by its printed paisleys and swirls of polka dots—has its name derived from the word *bandhani*, which means “bind” in Hindi. The Waves Bandana shown here is a fun adaptation of the traditional Indian process.

See **Dyeing 101** for information on scouring ([this page](#)); see **Dyeing with Indigo** for information on making the mother ([this page](#))

GOODS

White 100% cotton bandana or similar-size scarf blank, 36g, 21" × 21" (53 × 53 cm), scoured

DYEING MATERIALS AND TOOLS

Indigo mother

3 gallons (11.4L) hot water

5 teaspoons (20g) soda ash

½ teaspoon (.5g) sodium hydrosulphite, or more if needed

Heavyweight polyester/cotton thread (I used Coats & Clark Dual Duty Plus Button and Carpet Thread)

Scissors

3-gallon (11.4L) bucket

White plastic spoon

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Rubber gloves

pH strips

Thermometer

Drying rack or clothesline



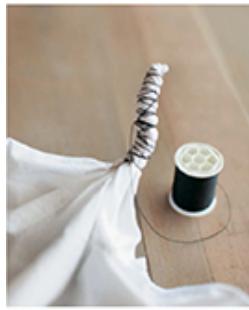
A.



B.



C.



D.



E.



F.



G.



H.



I.

DYEING DIRECTIONS

1. To bind the fabric, pinch it into a cone 3" (7.6 cm) long. Starting at the middle of the cone, wrap the fabric with the thread, twisting to the tip of the cone, back down to the base of the cone, and finally back to the middle. Secure the thread with a slipknot. Continue to wrap cones in this manner until all fabric has been bound. (A–D)
2. Prepare the indigo vat by filling the bucket with hot tap water, approximately 100°F (38°C).
3. Add 5 teaspoons (20g) soda ash to raise the pH to 11. Stir.
4. Pour $\frac{1}{3}$ cup (85mL) the mother into the bucket of hot water.
5. Add $\frac{1}{8}$ teaspoon (.5g) sodium hydrosulphite. Stir. Let it sit for 15 minutes.
6. After 15 minutes, the dyebath should have shifted from blue to green, with a coppery, bluish-purple layer at the surface. If so, it is time to dye. If not, add another $\frac{1}{8}$ teaspoon (.5g) of sodium hydrosulphite. Stir. Let it sit for another 15 minutes.
7. Dip the bandana slowly and smoothly into the vat. Leave it submerged for 5 minutes. (The more oxygen you introduce into the dyebath, the sooner you will have to recalibrate it, so avoid any unnecessary agitation of the vat.) (E)
8. Oxidize the bandana by pulling it from the vat. (F) Allow the bandana to rest about 5 minutes—until all of the green has disappeared—before dipping again.
9. Repeat steps 7 and 8 until the desired shade is reached.
10. Remove the resists, being careful not to cut the fabric when you snip the thread. (G–I)
11. Wash the bandana ([this page](#)) and allow to dry.

TRY

Pinch and wrap less fabric to make smaller circles. The tighter you tie, the less dye can reach the fabric, which makes the overall piece look more white. The opposite is true as well: the looser you tie, the more dye can reach the fabric, which makes the finished piece more blue.



BEACH HOUSE PILLOW

SKILLS LEARNED: RESIST DYEING WITH INDIGO—POLE WRAPPING

Throw pillow covers provide an excellent canvas for showing off dyed patterns. These pillow covers are dyed using a technique called pole wrapping, in which the fabric is pleated and tied tightly to a pole (in this case PVC pipe) to create the resist. Play with the size of the pleats to create larger or smaller stripes. To add more complex layers to the surface design, repeat the process of wrapping the fabric around the pole in between dips in the vat, changing the resists each time.

FINISHED MEASUREMENTS

16" × 16" (40.6 × 40.6 cm)

See Dyeing 101 for information on scouring ([this page](#)); see Dyeing with Indigo for information on making the mother ([this page](#))

GOODS

¾ yard (68.5 cm) white heavyweight 100% cotton twill, 225g, at least 57" (1.4 m) wide, scoured

DYEING MATERIALS AND TOOLS

Indigo mother

3 gallons (11.4L) hot water

5 teaspoons (20g) soda ash

¼ teaspoon (.5g) sodium hydrosulphite, or more if needed

PVC pipe, at least 17" (43.2 cm) long and 1½" (3.8 cm) in diameter

Heavyweight polyester/cotton thread (I used Coats & Clark Dual Duty Plus Button and Carpet Thread)

Hand-sewing needle with large eye

Scissors

3-gallon (11.4L) bucket

White plastic spoon

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Rubber gloves

pH strips

Thermometer

Drying rack or clothesline

SEWING MATERIALS AND TOOLS

Thread in a matching color

Sewing machine and related supplies

16" x 16" (41 x 41 cm) pillow insert



A.



B.



C.



D.



E.



F.



G.



H.



I.

DYEING DIRECTIONS

1. Cut one 17" x 17" (43.2 x 43.2 cm) front piece and two 17" x 22" (43.2 x 55.9 cm) back pieces from the fabric. The front piece will be pole wrapped, but the two back pieces will be dyed solid blue.
2. Accordion pleat the fabric, making the pleats about 2" (5.1 cm) wide. (A)
3. Spread the pleats 1" (2.5 cm) apart. (B) Baste the pleats together. (C)
4. Starting at one end of the pipe, use the heavyweight thread to wrap fabric tightly to the pipe. (D) Once you reach the opposite end, wind the thread back down the pipe. Secure the thread with a slipknot. Slide the fabric down toward the bottom of the pipe, but be careful not to push it off. (E) Wet the fabric bundle by submerging it into a bucket of water.
5. Prepare the indigo vat by filling the bucket with hot tap water, approximately 100°F (38°C).
6. Add 5 teaspoons (20g) soda ash to raise the pH to 11. Stir.
7. Pour $\frac{1}{3}$ cup (85mL) of the mother into the bucket of hot water.
8. Add $\frac{1}{8}$ teaspoon (.5g) sodium hydrosulphite. Stir. Let it sit for 15 minutes.
9. After 15 minutes, the dyebath should have shifted from blue to green, with a coppery, bluish-purple layer at the surface. If so, it is time to dye. If not, add another $\frac{1}{8}$ teaspoon (.5g) of sodium hydrosulphite. Stir. Let it sit for another 15 minutes.
10. Dip the goods slowly and smoothly into the vat. Leave the fabric submerged for 5 minutes. (Remember, avoid any unnecessary agitation.)
11. Pull the fabric from the vat to oxidize. (F) Allow it to rest for about 5 minutes until all of the green has disappeared.
12. Repeat steps 10 and 11 until the desired shade is reached.
13. To dye the two pieces for the pillow backing, dip one piece slowly and smoothly into the vat. Leave it submerged for 5 minutes.
14. Pull the piece from the vat and hang it on a clothesline or drying rack. Allow the fabric to rest until all of the green has disappeared before dipping again.

15. Repeat steps 13 and 14 until the desired shade is reached. Repeat steps 13 and 14 for the second backing piece.
16. Once dyeing is completed, snip off all thread and remove the fabric from the pole, being careful not to snip fabric. (G) Pull apart the fabric and admire your results. (H + I)
17. Wash the fabric ([this page](#)) and allow to dry.



SEWING DIRECTIONS

1. Fold each back piece in half with wrong sides together so each measures 17" x 11" (43.2 x 29.2 cm).
2. Place each back piece right sides together with the front piece, matching raw edges. The folded edges of the back pieces will overlap at the center back of the cover. Stitch around all edges, using a $\frac{1}{2}$ " (1.3 cm) seam allowance. Clip the corners.
3. Turn the pillow cover right side out and place the insert inside.

TRY

Consult the Shade Cards ([this page](#) and [this page](#)) to create pillow covers from other fibers and different dyestuffs: linen, silk, and even fine woolens can also be used to make beautiful statement pieces.



FISHBONE DRESS

SKILLS LEARNED: RESIST DYEING WITH INDIGO—STITCH RESIST

Here is another traditional resist technique using just a needle and thread. By stitching along lines on the fabric using a variation of a whipstitch, you can make this unique stripe. Once you establish the rhythm of the stitches, the work passes quickly. I added vertical stripes, but you can try other stitching patterns, like diagonal lines or circles, or use larger or smaller stitches to create different effects.

Using a resist technique is a great way to dip larger pieces of fabric into the indigo vat. As you stitch and cinch the fabric, the garment gets smaller and easier to manage. In this project, you stitch the front and back simultaneously, creating a pattern on both sides.

I chose to add this pattern to a simple linen tunic, but you could use it on a basic tank or skirt to show off the design with equal success. Because of the amount of pulling and tugging on the fabric, this technique works best on woven fabrics.

See Dyeing 101 for information on scouring ([this page](#)); see Dyeing with Indigo for information on making the mother ([this page](#))

GOODS

White 100% linen woven dress, 117g, scoured

DYEING MATERIALS AND TOOLS

Indigo mother

3 gallons (11.4L) hot water

5 teaspoons (20g) soda ash

½ teaspoon (.5g) sodium hydrosulphite, or more if needed

Water-soluble fabric marker

Heavyweight polyester/cotton thread (I used Coats & Clark Dual Duty Plus Button and Carpet Thread)

4 hand-sewing needles with large eyes

3-gallon (11.4L) bucket

White plastic spoon

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Rubber gloves

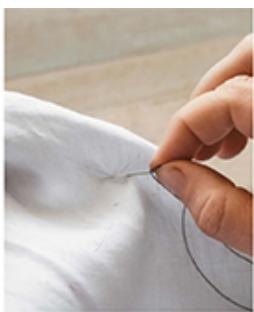
Thermometer

pH strips

Drying rack or clothesline



A.



B.



C.



D.



E.



F.



G.



H.



I.

DYEING DIRECTIONS

1. Using a water-soluble fabric marker, mark the front of the dress with the design: Starting in the middle of the dress, draw a vertical line approximately 13" (33 cm) long. Draw another line on either side of the center line, approximately 1" (2.5 cm) away from the center. Continue working outward until the entire bodice of the dress is marked with lines. Thread each of the four needles with a double strand of thread about the length of your arm. Make a large, secure knot at the end of each strand.

2. Pin the front and back layers of the dress together. The front and back of the dress is worked at the same time, so make sure to catch both layers when stitching. (A)

3. When creating this stitch resist, the stitching is done with a circular motion of the needle. As the stitching occurs, the thread gathers around the fabric, creating a ridge.

Start at the right side of the bodice, at the bottom of the marked line. The needle is inserted through the front of the bodice to the back, and then back to the front, working diagonally from the right side of the marked line to the left side. The stitch length should be approximately $\frac{1}{4}$ " (6 mm). (B) Repeat this stitch by inserting the point of the needle into the fabric diagonally, $\frac{1}{4}$ " (6 mm) to the right of the drawn line. Continue to stitch along the marked row in this fashion, forming a ridge in the fabric as you work from one side of the line to the other. (C)

4. Use separate needles to make the next three rows as you did in step 2. When all four rows are complete, return to the first row and gather the fabric as tightly as possible. (D). Knot securely to hold. Snip the thread. Stitch the 5th row, then gather the 2nd row.

5. Continue in as in steps 3 and 4 until all rows are stitched and gathered. (E)

6. Prepare the indigo vat by filling a 3-gallon (11.4L) bucket with hot tap water (about 100°F [38°C]).

7. Add 5 teaspoons (20g) soda ash to raise the pH to 11. Stir.

8. Pour $\frac{1}{4}$ cup (60mL) of the mother into the bucket of hot water.

9. Add $\frac{1}{8}$ teaspoon (.5g) sodium hydrosulphite. Stir. Let it sit for 15 minutes.

10. Check the color of the dyebath. If it's green, it is time to dye! If not, add another $\frac{1}{8}$ teaspoon (.5g) sodium hydrosulphite. Stir. Let it

sit for another 15 minutes.

11. Dip the dress slowly and smoothly into the vat. Leave it submerged for 5 minutes. (Avoid any unnecessary agitation of the vat so you don't introduce more oxygen.) To get the saturated blue color seen in the project, spread the rows apart while the dress is under the water, helping the dye reach in between them. If this is not done, the fabric between the rows will be a lighter blue. (F)

12. Pull the tunic from the vat to oxidize. Lightly squeeze the fabric to release extra dye. (G) Hang the goods on a clothesline or drying rack. Allow the tunic to rest until all of the green has disappeared before dipping again.

13. Repeat steps 10 and 11 until the desired shade is reached.

14. Once dyeing is complete, snip off all the thread and undo the resists. (H + I) Be careful to avoid snipping the tunic. Wash the dress ([this page](#)) and allow to dry.



SNAPSHOT QUILT

SKILLS LEARNED: RESIST DYEING WITH INDIGO—FOLDING AND CLAMPING

In this type of resist dyeing, the combination of accordion-pleated fabric, wood blocks, and clamps create patterns reminiscent of refracting light. While I love the pattern that emerges on the fabric when the clamps are taken off, for this project I wanted to push the possibilities even more so I cut apart the fabric to make a quilt. This adds more dimension to the geometric play between the dyed (positive) and undyed (negative) spaces.

To introduce the technique of clamping, the instructions focus on two basic shapes, a square and a triangle, and two styles of folding. These components make seven different designs. I created the resist for the fabric for my quilt primarily using wood blocks and clamps, although clothespins and other ordinary objects will also work. I encourage you to experiment. The possibilities are endless and the process is addictive in the best possible way.

FINISHED MEASUREMENTS

38½" (97.8 cm) wide × 42¼" (107.3 cm) tall

See **Dyeing 101** for information on scouring ([this page](#)); see **Dyeing with Indigo** for information on making the mother ([this page](#))

GOODS

3½ yards (3 m) white 50% linen / 50% cotton blend, 753g, at least 43" (109.2 cm) wide, scoured

2 skeins white DMC Pearl Cotton

DYEING MATERIALS AND TOOLS

Indigo mother

3 gallons (11.4L) hot water

5 teaspoons (20g) soda ash

½ teaspoon (.5g) sodium hydrosulphite, or more if needed

12 wooden blocks, each 3" × 3" (7.6 × 7.6 cm)

5 C-clamps, each 2½" (6.4 cm)

1 spring clamp, 3½" (8.9 cm)

3 clothespins

4¼-gallon (16L) bucket

White plastic spoon

Measuring cup

Measuring spoons

Stirrer, such as whisk or spoon

Rubber gloves

Thermometer

pH strips

Drying rack or clothesline

SEWING MATERIALS AND TOOLS

Cotton thread in a matching color

Batting, at least 46" × 49" (117 × 124 cm)

Clear plastic quilting ruler

Rotary cutter

Sewing machine and related supplies

Hand-sewing needle

Safety pins

Iron



A.



B.



C.



D.



E.



F.



G.



H.



I.

DYEING DIRECTIONS

1. Cut a 45" x 43" (114.3 x 109.2 cm) piece for the quilt back and seven 18" x 21½" (47 x 54.6 cm) squares for the quilt front. From the remaining fabric, cut enough 2½" (6.4 cm) strips to bind the entire quilt—at least 170" (4.3 m).
2. To create the designs, you will either fold the cut pieces into squares or triangles and then apply the clamps and blocks in a specific spot. Begin with an 18" x 21½" (47 x 54.6 cm) piece of fabric folded into equal-size accordion pleats (I made approximately 4 folds). (A)

Here is the sequence to fold into squares:

- Fold in one end to the middle of the rectangle. (B)
- Fold the opposite end in to meet it. (C)
- Fold the two halves back to make one square. (D)

Here is the sequence to fold into triangles:

- Fold one end on the diagonal, one-quarter of the length of the pleated fabric. (E)
- Fold the triangle up the length of the pleated fabric, flipping the fabric as needed. (F)
- Fold any excess behind the triangle. (G)

Clamp each folded piece with a block as shown on [this page](#); note that some of the clamps are off-centered and offset. This is intentional. Make sure that the clamps are tight. (H) Clamp the remaining square with clothespins.

3. Fill a 4¼-gallon (16L) bucket with hot tap water (about 100°F [38°C]).
4. Add 5 teaspoons (20g) soda ash to raise the pH to 11. Stir.
5. Pour ¼ cup (60mL) of the mother into the bucket of hot water.
6. Add ⅛ teaspoon (.5g) sodium hydrosulphite. Stir. Let it sit for 15 minutes.
7. Check the color: the dyebath should be green. If so, it's time to dye! If not, add another ⅛ teaspoon (.5g) sodium hydrosulphite. Stir and let sit for 15 minutes.
8. Dip the clamped fabric slowly and smoothly into the vat; you can add all seven pieces at the same time. Leave them submerged for 5

minutes. (Avoid any unnecessary agitation as best you can.)

9. Pull the fabric from the vat to oxidize. Allow each piece to rest until all of the green has disappeared before dipping again.

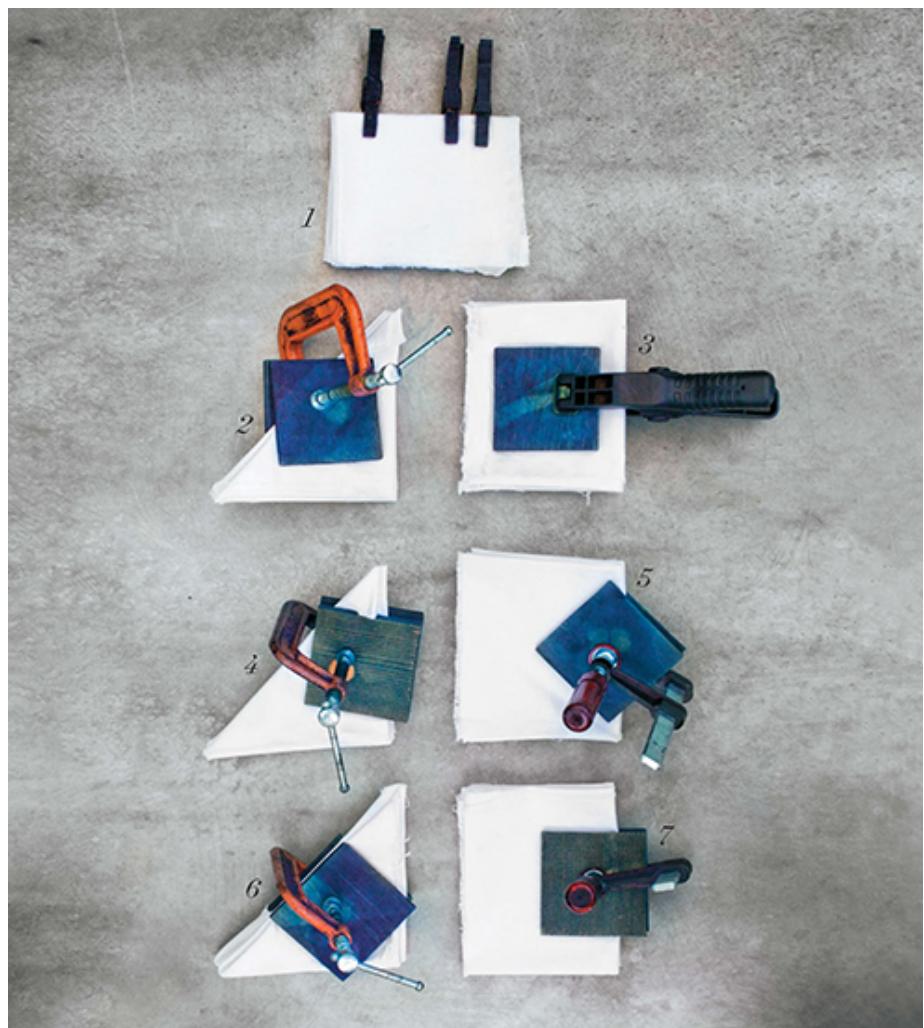
10. Repeat steps 8 and 9 until the desired shade is reached.

11. Dye the backing fabric, binding strips, and floss: dip the fabric slowly and smoothly into the vat. Dip only half the length of the thread into the vat to result in a playful, variegated pattern when quilting. (I) Leave the goods submerged for 5 minutes.

12. Pull the goods from vat to oxidize. Hang the fabric on a clothesline or drying rack. Allow the goods to rest until all of the green has disappeared before dipping again.

13. Repeat steps 11 and 12 until three dips are completed or the desired shade is reached.

14. Once dyeing is completed, unclamp the fabric and unfold. Wash the fabric ([this page](#)) and allow to dry.



The seven different designs created by the clamped resists are shown on these pages.



1. CLOTHESPINS



2. OFFSET TRIANGLE



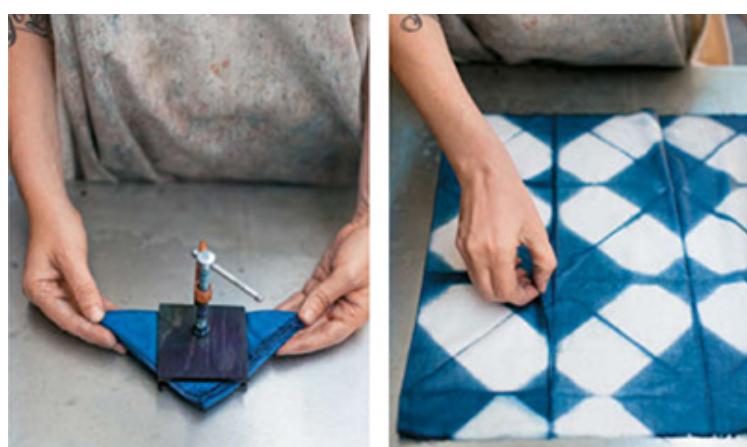
3. CENTERED SQUARE



4. OFF-REGISTERED TRIANGLE



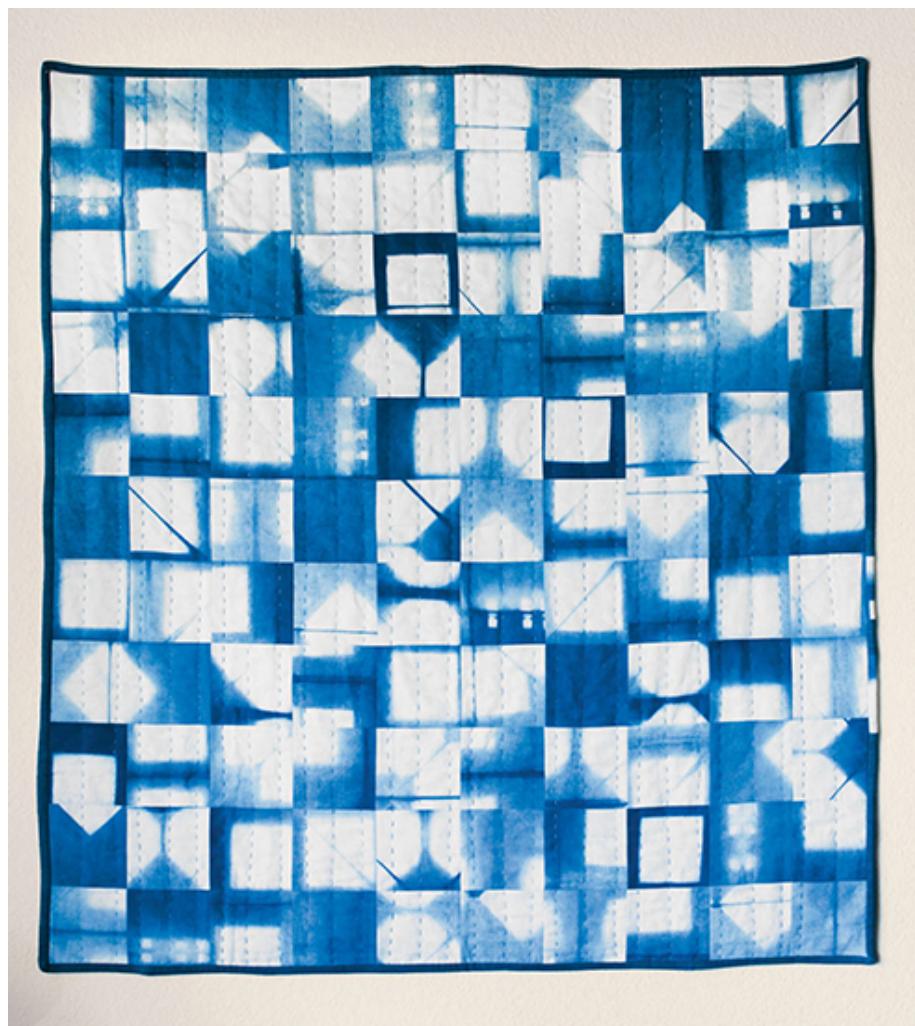
5. OFF-REGISTERED SQUARE



6. CENTERED TRIANGLE



7. OFFSET SQUARE





J.



K.

SEWING DIRECTIONS

Use a $\frac{1}{4}$ " (6 mm) seam allowance throughout unless otherwise indicated.

1. Using a clear plastic quilting ruler and a rotary cutter, cut each piece of the resist-dyed fabric into 20 blocks, each $4\frac{1}{4}$ " (10.8 cm) square. You will cut a total of 140 blocks. (J)

If you are not using fabric you have dyed, cut the yardage as follows: cut a $45" \times 43"$ (114.3 \times 109.2 cm) piece for the quilt back; cut at least $170"$ (4.3 m) of $2\frac{1}{2}$ " (6.4 cm) binding strips; and cut 140 blocks that are each $4\frac{1}{4}$ " (10.8 cm) square from the remaining fabric.

2. Arrange the squares into your desired pattern; it should be 10 squares wide and 11 squares tall. You will have some extra blocks so you can finesse your design. Save the leftover blocks for another project!

3. Stitch each row of squares together, right sides facing. (K) Press the seam allowances open.

4. Stitch each of the rows together, right sides facing and seams matching. Press the seam allowances open.

5. Place the quilt backing down with the wrong side facing up. Place the batting on top, and then add the quilt top, right side up. Secure the layers with basting stitches or safety pins.

6. Using a basic running stitch, quilt the three layers together as desired. Trim the layers to match as necessary.

7. Stitch the binding strips together into one long strip, including scraps from the bound-resist fabrics if desired. Fold the strip in half lengthwise and press. Pin to the front of the quilt with right sides

facing; stitch to the quilt. When you reach the beginning of the binding, fold under the end of the binding to cover the raw end. Press to the inside and hand-sew the binding to the back of the quilt.

TRY

Create more patterned fabrics by using the resist techniques in the other projects in this chapter and add these fabrics to your quilt to create a sampler.

RESOURCES

All dyes, yarn, fabric, and blanks featured in this book can be found at:

A VERB FOR KEEPING WARM

6328 San Pablo Avenue

Oakland, CA 94608

www.averbforkeepingwarm.com

Most of the common tools and materials used in *The Modern Natural Dyer* can be found at your favorite hardware store or kitchen shop. To find a local source for the specialized items used in this book or to order online, contact the following companies:

ALABAMA CHANIN (Clothing used in the Iron Age Tank and Gilded Cardigan project)

www.alabamachanin.com

ASHLAND BAY (Undyed fiber used in the Berry Patch Necklace project)

www.ashlandbay.com

B. BLACK & SONS (Undyed fabric used in the Flowers at My Fingertips Sewing Kit and Wanderlust Carry-All Bags projects)

www.bblackandsons.com

BLUE SKY ALPACAS (Yarn used in the Sandstone Shawl and Confetti Cowl projects)

www.blueskyalpacas.com

BOTANICAL COLORS (Mordant and natural dye supplier)

www.botanicalcolors.com

DHARMA TRADING CO. (Natural dyes, undyed fabric, yarn, and clothing blanks used in the Mama's Little Teacup

Onesie, Sock Hop! Cotton Socks, Northern Lights Scarf, Windswept Top, and Waves Bandana projects)

www.dharmatrading.com

EARTHUES (Mordant and natural dye supplier)

www.earthues.com

MAIWA HANDPRINTS LTD. (Mordant and natural dye supplier)

www.maiwa.com

MALABRIGO (Yarn used in the Sandstone Shawl project)

www.malabrigoyarn.com

QUINCE & CO. (Yarn used in the Northwoods Hat project)

www.quinceandco.com

ROBERT KAUFMAN FABRICS (Undyed fabric used in the Field and Forest Dress, Beach House Pillow, Fishbone Dress, and Snapshot Quilt projects)

www.robertkaufman.com

SHIBUI (Yarn used in the Sandstone Shawl project)

www.shibuiknits.com

BIBLIOGRAPHY

Alabama Stitch Book by Natalie Chanin

Alabama Studio Style by Natalie Chanin

Alabama Studio Sewing + Design by Natalie Chanin

Cloth and Human Experience ed. Annette B. Weiner and Jane Schneider

A Dyer's Garden by Rita Buchanan

Dyes and Fabrics by Joyce Storey

Eco Colour: Botanical Dyes for Beautiful Textiles by India Flint

The Extraordinary in the Ordinary ed. Mary Hunt Kahlenberg

The Handbook of Natural Plant Dyes by Sasha Duerr

Harvesting Color by Rebecca Burgess

Indigo: Egyptian Mummies to Blue Jeans by Jenny Balfour-Paul

Indigo: The Color that Changed the World by Catherine Legrand

Indigo, Madder, and Marigold by Trudy Van Stralen

The Knitter's Book of Wool by Clara Parkes

Koekboya by Harald Bohmer

The Maiwa Guide to Natural Dyes by Maiwa Handprints Ltd.

Natural Dyes by Dominique Cardon

Natural Dyes and Home Dyeing by Rita J. Adrosko

The Natural Knitter by Barbara Albright

Second Skin by India Flint

Shibori: The Inventive Art of Japanese Shaped Resist by Yoshiko Wada, Mary Kellogg Rice, and Jane Barton

Sindh Jo Ajarak by Noorjehan Bilgrami

A Weaver's Garden by Rita Buchanan

Wild Color by Jenny Dean

Women's Work by Elizabeth Wayland Barber

GLOSSARY

CALCIUM CARBONATE. More commonly known as chalk, this agent helps remove excess mordant.

CALCIUM HYDROXIDE. An agent used to make a fructose indigo vat; also known as lime.

CHALK. *See calcium carbonate.*

COLORFAST. The quality of keeping the same color, even if washed or placed in the light.

DYESTUFF. A substance used for changing the color of fiber; in this book, a dyestuff refers to a natural material, not a synthetic one.

EXTRACT. Fine, concentrated dye in the form of powder or liquid.

FIBER. A generic term used to refer to a form of material that has yet to be spun into yarn. Fiber may be found in the forms of fleece, sliver, roving, or top.

GOODS. The tangible material items used in the dyeing process.

LIGHTFAST. The quality of maintaining color when exposed to light.

LIME. *See calcium hydroxide.*

LYE. *See sodium hydroxide.*

MORDANT. The material used to fix the dye to the fiber. Mordants may be made of a metallic salt, like aluminum potassium sulfate or aluminum acetate. Tannin-rich plant materials also have the ability to act as mordants.

MOTHER. A concentrated and reduced starting solution for creating the indigo vat.

RECALIBRATE. The process of returning the indigo vat to its optimum dyeing environment.

REDUCTION. The process of removing the oxygen from an indigo dyebath.

ROVING. A long and narrow bundle of fiber that has been carded (pulled into strips).

SCOUR. The process of pre-washing textiles to remove agents that may interfere with the dyeing process.

SLIVER. A small, thin, narrow piece of fiber. It is a thinner version of roving.

SODA ASH. *See sodium carbonate.*

SODA CRYSTALS. *See sodium carbonate.*

SODIUM CARBONATE. A highly alkaline substance used in the scouring process. It is also referred to as washing soda, soda ash, and soda crystals.

SODIUM HYDROSULPHITE. An effective reducing agent that works in the indigo vat to remove excess oxygen and prepare it for dyeing.

SODIUM HYDROXIDE. A concentrated, potent basic substance used in the creation of the indigo mother; also known as lye.

TANNIN. A reddish acid that comes from plants; tannin-rich plants can act as both mordant and dye.

TOP. Roving that has been pulled through a set of combs for additional processing.

VAT. A large tank or tub used to hold liquid; traditionally, vat is the name used for the vessel used in indigo dyeing as well as the indigo dyebath found inside this vessel.

WASHFAST. The quality of being resistant to fading or discoloration by washing.

WASHING SODA. *See sodium carbonate.*

WOG. The acronym stands for *weight of goods*, which is the total weight of goods to be dyed.

Index of Searchable Terms

A

acorns
animal fibers

B

bast fibers
black walnut

C

cellulose fibers
iron baths
mordanting
scouring
shade card
washing and care
chalk bath
cleanup
cochineal
projects
colorfastness
coreopsis
cosmos
cotton
shade card
utch
D
dahlia

dye journal
dyeing process
 basic steps
 cleanup
 dyeing
 golden rules
 indigo
 iron modification
 mordanting
 preparation
 scouring
 washing
dyer's coreopsis

E

eco printing
eucalyptus
extracts
 projects

F

felting
Flint, India
fustic
 projects

G

Garcia, Michel
goldenrod
greens

H

hemp

I

indigo

 dyeing process

 projects

 washing dyed goods

iron baths

 projects

L

labeling

linen

 shade card

logwood

 projects

M

madder

 projects

marigold

mordanting

myrobalan

O

oak galls

onion skins

osage

overdyeing

P

painting with dye

pH

indigo and
pomegranate
protein fibers
iron baths
mordanting
scouring
shade card
washing dyed goods
weight conversions

Q

quebracho red

R

resist dyeing

projects

rhubarb

S

scouring

shade cards

silk

shade card

surface design

projects

T

tannin-rich dyes

tea

tools

V

vintage linens

W

walnut

 projects

washing dyed goods

water

weight conversions

Weisenberger, Julie

weld

 projects

wheat bran bath

whole dyestuffs

 projects

woad

wool

 shade card

workspace setup

Y

yarrow

yellow cosmos

ACKNOWLEDGMENTS

I am incredibly indebted to my family, friends, and colleagues at Verb for their endless support, encouragement, and laughter.

Thank you to my grandmother, Lorene, who taught me how to knit and sew early in my life, and who instilled in me the joy of crafting with others. Mom! Thanks for believing in this journey! And for always encouraging me to explore, reflect, and grow.

Thank you to the Khatris for welcoming me into their home while I was thousands of miles away from mine, and for sharing with me their vast expertise with natural dyes. To Kathy Hattori, for her advice and support over the years as I learned about natural dyes. To my local natural dyeing community, for their incessant exploring and pushing the boundaries of what it means to be a natural dyer. They have provided constant inspiration and motivation.

To Sarah Ollikkala Jones, Tasa Gleason, and Adrienne Rodriguez, who work at Verb, thank you for sharing your knowledge, for your friendship, and for all of your tremendous help during this process. I could not have written this book without you. Thank you for holding up the shop, running the dye studio, and helping with the research.

Tasa, thank you for drafting the sewing patterns used in this book. Julie Weisenberger, a close friend and confidante who is always full of humor, thank you for sharing your incredible talent and for creating the Indigo Wedge Cardigan and the knitted portion of the Windswept Top.

To my friends Stephen Houghton, Michelle Mojoros, Michael Wade, and Nancy Ottenstein, thanks for being by my side since the day I opened Verb. And to Karen King, thank you for knitting the samples for the book and for having such a wonderful heart.

To Clara Parkes and Natalie Chanin, two incredibly talented people who have dedicated their lives to the study of fibers

and making, I am eternally grateful for your advice, expertise, and support.

I am deeply grateful to Melanie Falick for being willing to go on this wild ride of natural dyeing and for making my dream of writing a book about natural dyes a reality. I am grateful to her for helping put together an extraordinary team of experts to help with the book-making project. This includes Valerie Shrader—thank you for jumping in, understanding the work, and making every sentence better. Thank you to Brooke Reynolds for providing the beautiful design for this book. Thank you, Sara Remington, my photographer, for cheerfully taking photos and giving 110%! Alessandra Mortola, master stylist and artist, brought the Catalogue of Color to life. Thank you, Kristin of iKO iKO, for creating my dyeing smock. And to my models—thank you for sharing your beauty: Aleishall Girard Maxon, Deepa Natarajan, Sierra Reading, Kenya Miles, Lydia Lavinia Lennebacker, and Olivia Carrigan.

And last but certainly not least, to the community that supports and surrounds Verb, thank you for filling it with your creative spirit, for joining me on this journey, and for making this work possible!



In *The Modern Natural Dyer*, expert Kristine Vejar shares the most user-friendly techniques for dyeing at home with foraged and garden-raised dyestuffs as well as with natural dye extracts. Demystifying the “magic,” Vejar explains in explicit, easy-to-follow detail how to produce consistent, long-lasting color. With stunning photography of the dyes themselves, the dyeing process, and twenty projects for home and wardrobe, *The Modern Natural Dyer* is a complete resource for aspiring and experienced dye artisans.

