Indigo Dye Demos:

Materials needed:

- Indigo Dye Kit: read all instructions thoroughly before starting, and be sure to check out all the additional resources available at www.JacquardProducts.com (videos, FAQs, galleries, projects, etc.)
- Extra rubber gloves for attendees (long kitchen rubber gloves are nice because we are submerging fabric in a bucket)
- Paper towels or rags for cleaning up
- Plastic sheeting to protect floors and tables
- Clothes pins or binder clips
- Twine or string for tying
- Jacquard Reusable Zip Ties
- T-shirts, tea towels, or other cotton items for dyeing
- Two 5-gallon buckets (one for the dye bath, one for the rinsing)
- The kit comes with Rubber Bands, but it doesn't hurt to have extras
- Plastic bags to carry home dyed items
- Post-Its
- Clothesline or a drying rack can be useful, if possible, for hanging during oxidation
- White Washable School glue (for easy faux-batik techniques) or Jacquard Water-based Resist
- Applicator bottles (for the glue or resist)
- Hairdryer (only for school glue version)

Trivia:

- Indigo is the oldest known dye. Famously found in ancient Egyptian tombs, the oldest known Indigo was actually discovered in Peru, and dates back more than 5,000 years.
- Indigo has been used all over the world in many different cultures.
- Indigoids, which are found in many different plants, are the basis for all-natural blue dyes. Even the famously odd blue dye found in sea snails are indigoid-based. In other words, Indigo can be extracted from all sorts of organisms, which is why countless cultures on earth have a history with indigo.
- Indigo is the only dye that makes fabric stronger. That is why it was chosen for Blue Jeans, which were originally pants for people working in mines. In Japan, indigo-dyed kimonos became an everyday essential, as they provided protection from mosquitos, as the fabric essentially becomes impenetrable to bites once dyed.
- Indigo was one of the main products sought by the British when colonizing India.
- In the 18th and 19th centuries, as indigo became a major import for Europe, it was embraced as a more robust a practical alternative to white clothing. The French army famously used it for their uniforms during the French Revolution, as did the Union army in the US during the Civil War.

Indigo Dye Demos (cont'd):

- Indigo culture is deeply entwined with patterning traditions like shibori and batik for two main reasons: 1) unlike most other dyes, the dye bath is used at room temperature, so waxed fabric is not jeopardized with submersion in the dye bath, and 2) unlike other dyes, all you have to do to resist color is keep oxygen off the dipped fabric. This is why the faux-batik school glue technique works—even school glue is enough to keep oxygen off the fabric, even though it is isn't enough to keep the dye from penetrating the fiber.
- Non-soluble indigo powder was also embraced by oil painters in 15th and 16th century Europe as an inexpensive blue pigment, prior to the discovery of Prussian Blue. The near-black background of Vermeer's "Girl with the Pearl Earring," for example, was achieved using layer upon layer of indigo. Indigo was also used to paint the heavens in Shakespeare's Globe theater in London.
- The indigo process is an oxidation/reduction reaction where the reduced form of the dye (the "leuko" form) is green and soluble in water, while the oxidized form is a blue, insoluble crystal. The dye penetrates the fiber like water in the reduced state, but as it reacts with the oxygen in the air, it turns blue, crystalizing and getting "stuck" in the fiber. The green form can be washed out, but the blue form is permanent. A healthy indigo vat has a transparent green color; but on the surface, where the dye meets the air, oxidization occurs, creating a "lid" of blue bubbles often referred to as the "bloom" or "flower."
- Reducing indigo to its soluble form is achieved by using a chemical that removes oxygen from the dye molecule, often called a "reducer" or "reducing agent." The Jacquard kit utilizes Sodium Hydrosulfite for this purpose. Another way to remove oxygen is by taking advantage of the aerobic respiration of bacteria. This is why most traditional indigo recipes call for aging and for ingredients like fruit juice, and why fermentation is such an integral part of indigo's history. In many cultures, each village kept a swimming-pool size dyeing vat, which they would continuously "feed" with sugar and dye. This would keep the bacteria alive, which in turn kept the indigo reduced. Like sourdough bread starter in Europe, some cultures have kept the same indigo vat alive for centuries, simply by cultivating a healthy colony of bacteria.
- Indigo dye is a "vat dye." Vat dyes often start one color or colorless and end up fixing themselves as another color. They are very lightfast and usually very washfast, too. The other vat dyes that Jacquard offers are the SolarFast dyes. In the case of SolarFast, the color change is not performed by the oxygen in the air, but by UV light, and that is why it can be used for photography.

School Glue Batik Option:

This faux-batik method is an excellent **alternative version** of this demo. For a best impact, make a drawing with washable school glue on cotton during your demo, but have another, identical drawing or design ready to go that is already dry (like they have a finished roast coming out of the oven on a cooking show). The glue must be dry before submerging in the dyebath, so this preparation will keep the demonstration portion short and efficient. Immerse the cotton with the dry glue on it in the dye, pull it out, allow it to oxidize to blue, then wash all the school glue out in the rinse bucket with a small amount

Indigo Dye Demos (cont'd):

of agitation. Show the audience how the glue leaves white lines wherever it was because it kept oxygen off the fiber during the oxidation process. Jacquard **Resistad** or **Removable Water-based Resist** will function in the same way, and you can achieve finer lines with it than you can with the school glue. These Resists are also screen printable, which you can bear in mind if you want to incorporate a screen-printing demonstration into your indigo workshop. This the fastest and easiest batik method, and it is great way to introduce the concept to children without exposing them to heated wax and boiling water.

Tips:

- Squeezing the fabric while it is in the bath with a pulsating motion helps get the dye into the fiber deeper, resulting in a darker color.
- The more times you dip and oxidize the fabric, the darker it will get. Just remember to allow enough time between dips for the fabric to fully oxidize.
- If you allow the color change to happen on a table covered in plastic, rather than on a line, the area touching the table may oxidize more slowly. As the top turns blue, turn the items over to get the bottom to change as well.
- When dipping, avoid letting the fabric touch the bottom of the vat. That is where the solid crystals tend to settle, which can cause spotting on the fabric.
- Dipped indigo items may look alike, and it can be difficult to keep track of which piece belongs to whom, especially in a big group. Have each attendee fill out a Post-It with their name on it to keep next to each of their developing items. You can stick a Post-It to itself on a clothesline if you are hanging items.
- Use the rinse bath bucket to wet items before folding. You can get tighter folds in wet fabric than you can with dry fabric, and it helps the dye penetrate faster. Dipping dry fabric also introduces more oxygen to the dyebath, which is something you want to avoid.
- Using hot tap water instead of cold water when setting up the dye vat will accelerate every step of the process and may yield darker shades.
- Stirring the indigo vat is fine, but you don't want to introduce too much oxygen as it will reduce the amount of available dye in the vat. Stir slowly and gently.
- If you are using glue or resist to do a faux batik for your demo or workshop, get going on the glue immediately so there is time for it to dry. Use a hairdryer to accelerate the process and encourage people to use thin lines. Fat blobby lines of glue take forever to dry.
- The reducing agent used in the dye bath is the same chemical used for Color Remover. This means that, sometimes, the indigo bath will bleach out colored fabric and replace that color with indigo. Experiment with colored fabrics for cool effects.

How to Make This Demo into a Workshop:

You can get a lot of mileage out of a single Indigo kit. One kit could be enough to run an entire 10-15 person workshop. Classrooms use it for several classes all day. The Indigo vat can last a few days. It will be noticeably weaker after a week.

Indigo Dye Demos (cont'd):

The best way to turn this activity into a workshop or class is to dive deeper into shibori. Shibori is a Japanese style of patterning fabric using deliberate folding, sewing, and/or clamping techniques to block oxygen and/or dye penetration, leaving white areas on the fabric. It is a precursor to tie dye with a rich history. "Shibori" is an umbrella term for many different patterning techniques, from binding with string like you would with tie die (Kanoko), to wrapping fabric around a pole and "scrunching" it down before dyeing (Arashi), to clamping shapes through folds to great snow-flake-like patterns (Itajime), and many others . There are lots of tutorials for these different patterning techniques on YouTube and across the internet. It makes a nice workshop because shibori is well known outside of the art materials industry, especially in home décor and fashion. It is a gateway art supply to get creative people who may not currently shop at your store in the door.

Using Elmer's glue or Jacquard's Water-based Resist as a batiking method is also a great way to extend this demo into a workshop. These methods require drying time, so it is important to have enough time for people to sketch their designs, draw it out on the fabric with white washable glue or Jacquard's Water-based Resist, allow them to dry, then dip them. That by itself is probably a 2-hour project.

<u>Indigo Dye Demo Potential Add-on sales:</u>

Batik Wax
Applicator bottles
Tjanting tools
School Glue
Resistad
Removable Water-based Resist
Reusable Zip Ties
Sodium Hydrosulfite (reducing agent for Indigo bath)
Soda Ash
Open stock Pre-Reduced Indigo
Rubber Gloves
Stencils