

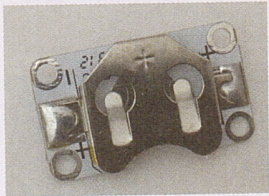
# High Tech Textiles Circuit Training!

WRITTEN BY Julie Boyd

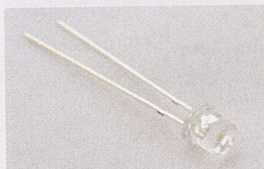
In May's issue of Sewing World we looked at how electronics are being added to textiles products for functional and fun uses. These e-textiles products can be made using ready made modules like the ones in the hanger project in May's magazine or by producing your own circuits and this is the focus of this issue's article.

Here are some of the basics you will need to know to make an electronic circuit:

- **Cell holder**  
This is the name given to the battery holder. The LEDs are connected to this using conductive thread. There are different types and the one used in this project is a flasher unit with a push button on/off switch on the back and a built in LED (which is not used in this project). This cell holder enables you to produce 2 circuits, one for each eye on the sockie.

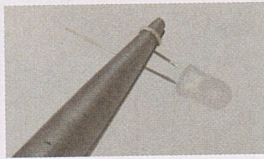


- **Cell**  
This is the name given to the battery.
- **LED**  
This consists of a small bead that lights up and 2 metal legs. The legs are twisted into loops and are sewn onto fabric. The short leg is negative and the longer leg positive. It is essential the negatives on the LED



- and cell holder are stitched together and that the positives also match.
- **Conductive thread**  
This is a special metal thread that conducts electricity. Oversewing and running stitches are used to stitch components together. A large eye needle is needed.

- **Round nosed pliers**  
These are pliers with slim pointy tips allowing you to twist the legs on the LEDs into loops. You can buy them from DIY shops or the jewellery making section of craft shops.



## Trouble shooting

- It is essential the negative side of the LED is sewn to the negative side of the cell holder (and that the positive side of the LED matches the positive on the cell holder).
- The positive and negatives rows of stitches must never touch or cross over.
- Check there are no loose ends or stray bits of thread that will short the circuit.
- Stitches must be sewn very tightly.
- Use one piece of thread for each side of the circuit with no joins (note you must use different thread for the positive and negative sides)
- Hold the cell by the edges rather than on the top and bottom.
- Make sure the cell is in the holder the right way round.

Hopefully the 'High Tech Textiles' series has shown you some of the new and exciting components and fabrics that are available to help you make your projects a little bit different and with that extra 'wow' factor.



# High Tech Textile Sockie

## Good To Know

- *The sockies are a great project to do with children as they are quick to make and a sewing machine isn't absolutely necessary. There is no risk of electrocution and the components are safe to use. Note the sockies are not designed as children's toys and should not be given to very young children.*
- *The sockie is designed to sit up on its own or to be tied to a headboard or similar item.*
- *The flasher unit has 3 light settings. Press once for both LEDs to shine, twice for the LEDs to flash simultaneously and three times for the LEDs to flash quickly out of sync. Pressing a fourth time switches the LEDs off.*
- *The electronic circuit can't be washed so remove it from the sockie before washing. Avoid overhandling the completed circuit as this can compromise the connections.*
- *For tips & advice on making electronic circuits visit the 'electronic textiles' folder at [www.denimduck.com](http://www.denimduck.com)*

**To Cut** – See pattern sheet for template

- Felt scraps: Cut 2 ears (optional)
- Calico: 6cm x 8cm piece of calico with electronic circuit traced on to it
- Iron on interfacing: 3cm x 8cm piece of calico with crosses for eyelets marked onto it



# Project Reading Light

DESIGNED BY Julie Boyd

In the final part of the 'High Tech Textiles' series learn how to create electronic circuits to make a reading light. Although the components may be new to you the techniques are familiar ones and the finished product is something different that will definitely make children want to read!



## Materials

- One ankle sock
- Scraps of felt
- 6cm x 8cm piece of calico
- 3cm x 8cm piece of iron on interfacing
- 1 1.5cm button in a contrast colour to the sock
- 20cm 0.5cm wide ribbon
- 50cm 1.5cm wide ribbon
- 7mm metal eyelets
- Cushion stuffing
- E-textiles kit (flasher controller cell holder, cell, 2 LEDs, 2m conductive thread)

### You will also need:

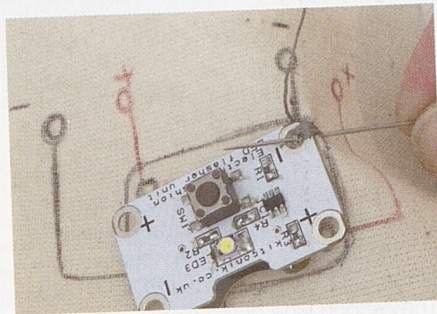
- Round nosed pliers
- A large eye needle big enough for the conductive thread

## To Sew

### e-textiles circuit

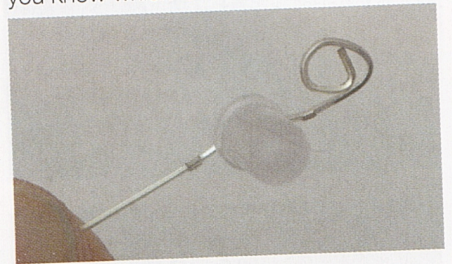
**1** Trace the circuit diagram onto a piece of calico or similar fabric. This will help you get the electronic parts in the right place.

**2** Begin by stitching the right hand side of the circuit which will be the right eye as you look at the sockie. Use the conductive thread to oversew the negative hole on right hand side of the cell holder to the calico. Make sure it is positioned on top of the diagram on the calico. Trim the beginning thread close to the fabric and pull all stitches tight.

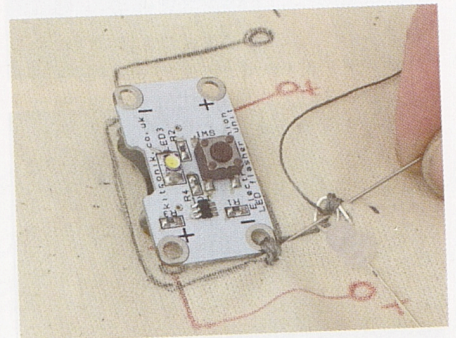


**3** Using the same thread do small running stitches up the black line to reach the negative point where the LED will sit.

**4** Use round nosed pliers to twist the negative leg on the LED (the shorter one) into a small loop. Push the loop so it sits at 90 degrees to the LED bulb which will enable it to sit flat against the fabric when it is sewn. It is easy to confuse the negative and positive legs so make sure you know which is which.

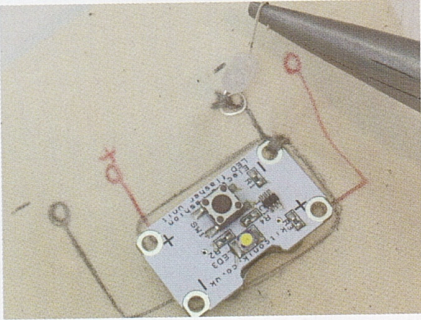


**5** Use the same thread to oversew the negative leg onto the calico. Pull all stitches tight. Cut the thread off at the end making sure there are no loose ends.

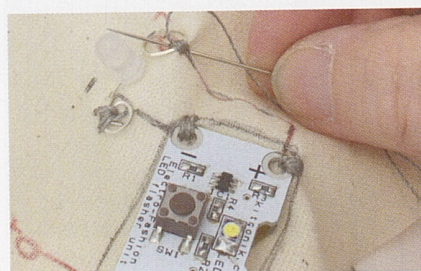
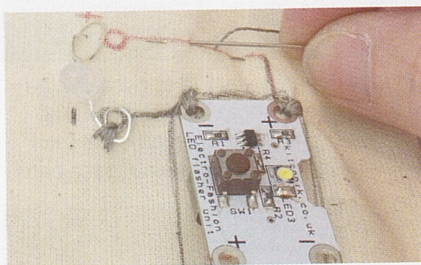
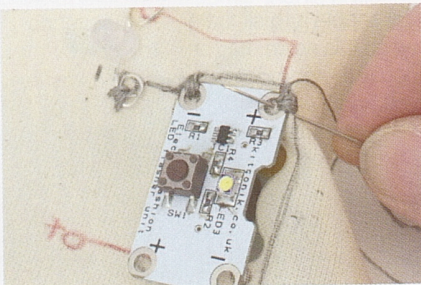




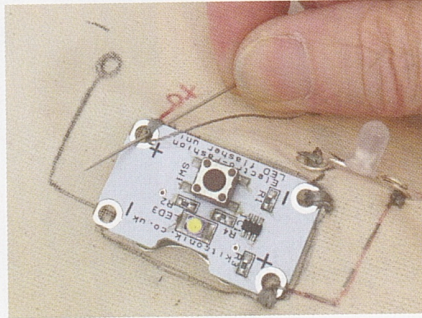
**6** Use the round nosed pliers to twist the positive leg into a loop. Push the loop so it sits at 90 degrees to the LED bulb so it is flat against the fabric.



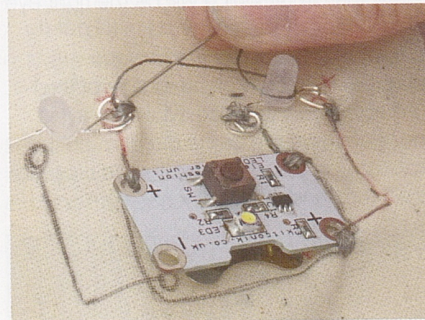
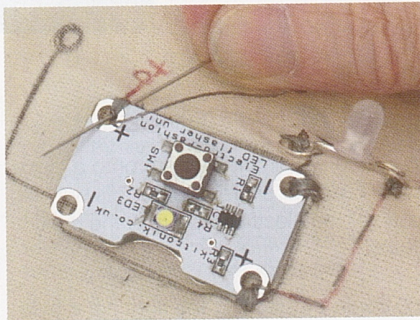
**7** Oversew the positive side of the right hand side of the cell holder to the calico and use small running stitches to stitch along the red line to get to the positive point where the LED will sit and oversew the LED onto the fabric. The right hand side of the circuit is now complete and one LED is sewn into place. You can test the circuit by putting the battery into the cell holder and the LED will light up (remove after testing). Check the 'trouble shooting' section if it doesn't.



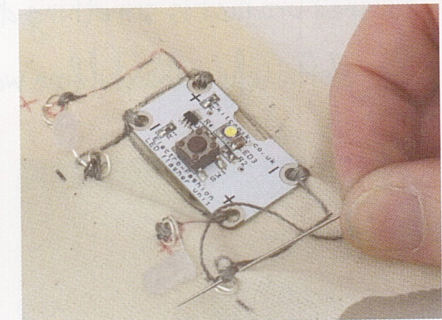
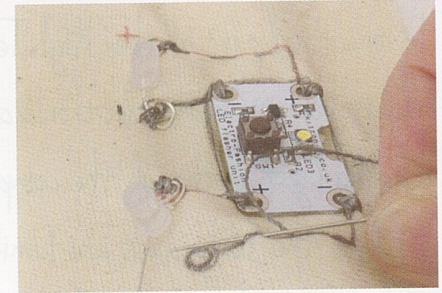
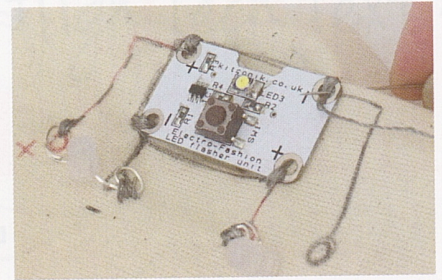
**8** Using a new piece of thread oversew the positive side on the left hand side of the cell holder to the calico. This will be the left eye of the sockie as you look at it.



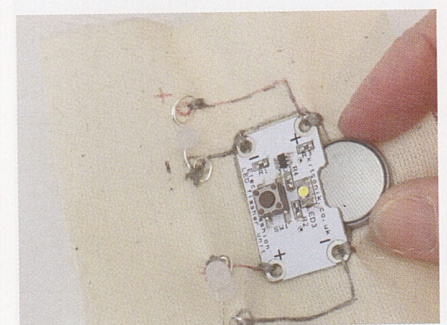
**9** Use round nosed pliers to twist the positive leg on the LED. Push the loop so it sits at 90 degrees to the LED bulb so it sits flat against the fabric. Use small running stitches to take the thread to the positive side of the LED and oversew into place. Cut the thread close to the stitches.



**10** Use a new piece of thread to oversew the negative hole on the left hand side of the cell holder to the calico. Sew small running stitches along the black line to get to the negative side of the LED. Over sew the LED into place. The second side of the circuit is now complete. Test the circuit by putting the battery into the cell holder and both LEDs will light up. Check the 'trouble shooting' section if they don't.

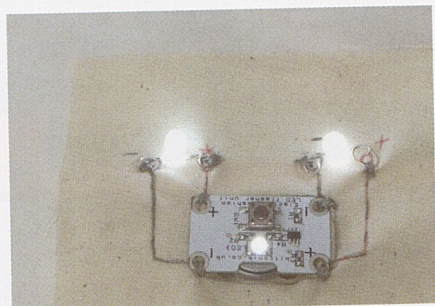


**11** Hold the cell by its sides like you might a CD. Slide the cell into the holder with the positive marking on the cell facing away from you.



**12** This is what your finished circuit will look like. The cell holder has an additional flat LED built into the board. You can leave this in position if you wish e.g. for example be used as a shiny nose as the light shines through most fabrics. If you don't want this LED cover it up by stitching thick ribbon across the cell holder using hand or machine stitches.

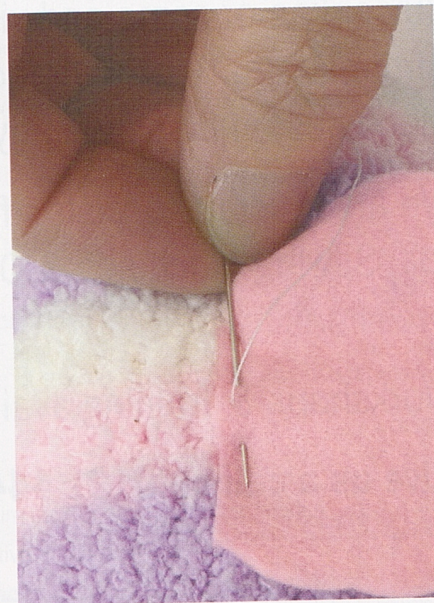
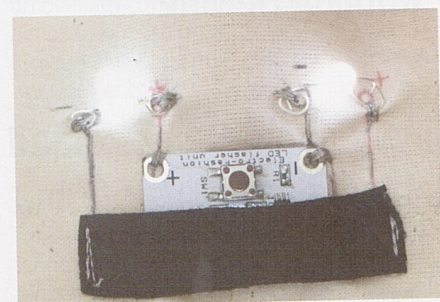




**5** Stuff the legs and the heel. To make the sockie sit on its own, fold the sock in half along the heel line. Stitch the button into place on top of the ribbon onto the folded sock about 3cm below the fold (this ribbon is used to tie the sockie onto a headboard or something similar).

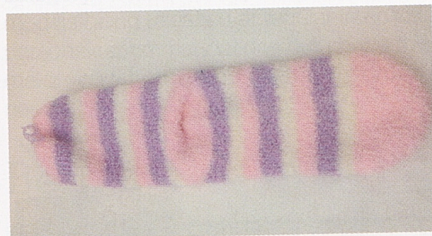
**7** Tie the top of the sockie with ribbon. This can easily be untied to replace the battery.

**8** The sockie can be decorated with ears and other features using felt shapes which are hand stitched to the surface of the finished sockie.



### Sockie

**1** Lay the sock flat and create legs by stitching down the centre of the foot section stitching from the bottom of the toe to the bottom of the heel section. The stitching can be done by hand or machine.



**6** Finish stuffing the sock leaving a space at the top for the ribbon tie. Carefully slide the e-textiles circuit inside the sock poking the LEDs through the eyelets. The stuffing will hold it in place but fabric glue can be placed around the LEDs if desired.

**2** Mark the crosses for the eyes onto a piece of iron interfacing 3cm x 8cm. Apply the iron on interfacing to the inside of the sock behind where you want the eyes to be. This is important as your sock may ladder when the hole is cut for the eyelet without it.

**3** Attach the eyelets through the layer of sock fabric and interfacing according to the manufacturer's instructions.

**4** Stitch the button nose into position about 1cm below the eyeline taking care only to stitch into the front layer of the sock.



### Stockist Details

Fabric, thread and other components – Coles Sewing Centre, [www.colessewingcentre.co.uk](http://www.colessewingcentre.co.uk), tel: 0115 9881550

E-textiles kit [www.denimduck.com](http://www.denimduck.com), tel: 01159 607061

✕✕  
✕ Name Julie Boyd

All About Me... I am a secondary school teacher now working as an education consultant running training for teachers and textiles workshops for adults and children. I am the author of several school textbooks and have also written articles for magazines. I am passionate about all areas of textiles and about triggering that interest in others. I am particularly keen to update the image of textiles and show people the amazing high tech fabrics and components that are now available. [www.julieboyd.co.uk](http://www.julieboyd.co.uk)



left Eye

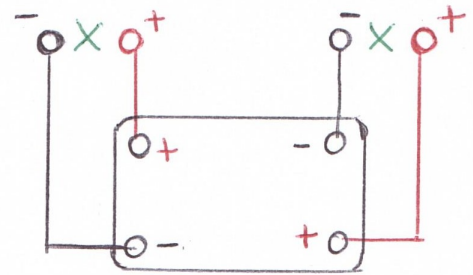
Right eye

Draw circuit onto a  
6x8cm piece of calico

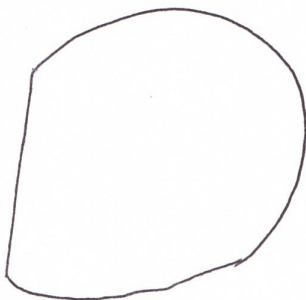
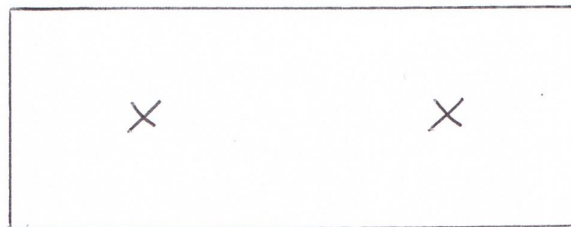
Red indicates positive side  
of the circuit

Black indicates negative side  
of the circuit.

X indicates where the  
LED bulb is



Draw the markings for the  
eyelets onto a 3x8cm  
piece of van or interfacing.



Ear  
cut 2 in felt.