

# Flower Power

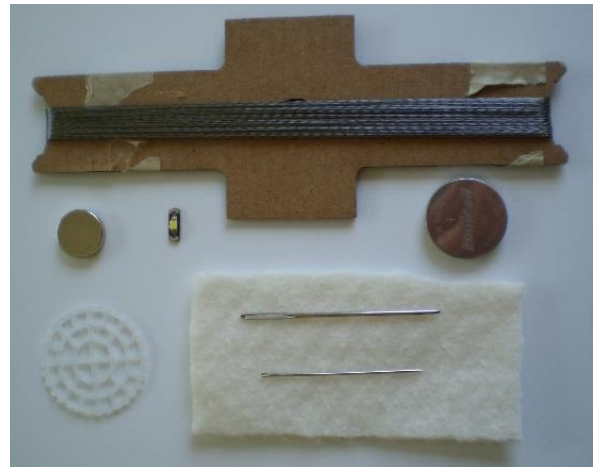
This pretty little project will light up your life (literally!). When the bumblebee lands on the flower, an LED lights up in the center of the flower. Attached to a pin or hair clip, this flower would be a one-of-a-kind statement piece. A great introduction to soft circuitry, project is a fun combination of knitting and a simple electronic circuit.



The flower is knit in several small pieces, then assembled around a base of plastic canvas, giving the flower shape and strength. Conductive thread, a nickel-sized battery and a tiny LED (available through [Sparkfun](https://www.sparkfun.com) and other online retailers) make up a simple circuit. Two little neodymium magnets (available at most well-stocked craft stores) hold the bumblebee in place on the petal, completing the circuit.

## Materials:

- Stroll Sock in Dandelion, Dogwood Heather and Midnight Heather (or other sock-weight yarn)
- 1 set of US1 double-pointed needles
- 2 small stitch markers
- Yarn needle
- Cotton batting (about 2" x 4")
- A small amount of fiberfill
- Plastic canvas-cut in a 1 1/4" circle
- 1 3V coin battery
- 2 1/2" circular neodymium batteries
- 1 white or yellow LED
- Conductive thread (about 2 yards)
- Large-eyed embroidery needle
- Optional: 1 pin back, hair clip, or headband



## Gauge:

9 stitches/inch in stockinet

13 rows/inch in stockinet

## Instructions:

*Knit the following pieces:*

*Center:* Make 1 in Dandelion

- CO 15, work flat.
- K1 (P1, K1) across.
- Repeat 22 more times.
- Bind off, leaving the tails loose.

*Petal:* Make 5 in Dogwood Heather

- CO 12, work in the round.
- K around
- (K1, inc 1) around (24 sts)
- PM, k12, PM, k12
- \*PM, inc 1, k to marker, inc. Repeat from \*
- K around.
- Repeat last two steps until 36 stitches remain.
- K even for 6 rounds
- \*PM, K2tog, K to 2 before marker, ssk. Repeat from \*
- K 2 rows.
- Repeat last 2 steps until 8 stitches remain.
- Break yarn and pull tail through the 8 active loops. Weave in end. Leave CO tail loose.

*Magnet Pocket:* Make 1 in Dogwood Heather

- CO 8, join in the round.
- K 8 rounds even.
- BO, leaving the tails loose.

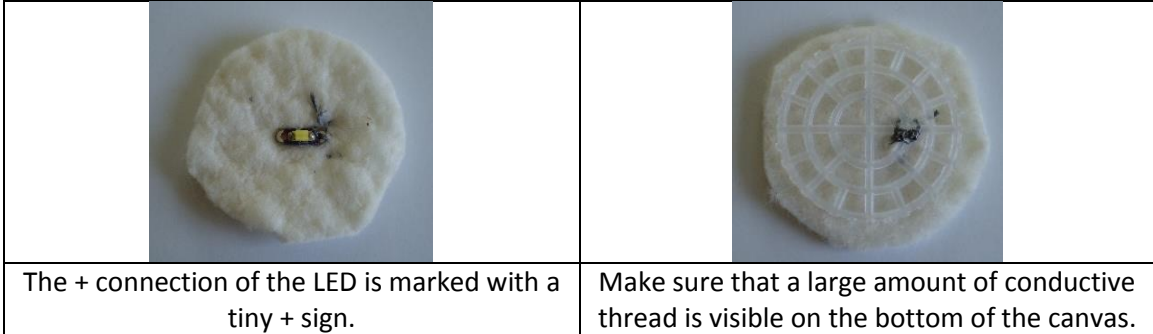
*Bee:* Make 1 in Dandelion and Midnight Heather.

- With Midnight Heather, CO 8 and join in the round.
- Knit around.
- (Kfb) around.
- Knit 1 round in Dandelion.
- Knit 1 round in Midnight Heather.
- Knit 1 round in Dandelion.
- Knit 1 round in Midnight Heather.
- Knit 1 round in Dandelion.
- Knit 2 rounds in Midnight Heather.
- K2tog around.
- Break tail and pass through loops. Slip a magnet into the bee, and fill with fiberfill so that the magnet is snug against the knit "skin" of the bee. Pull the tail tight and weave in the ends.

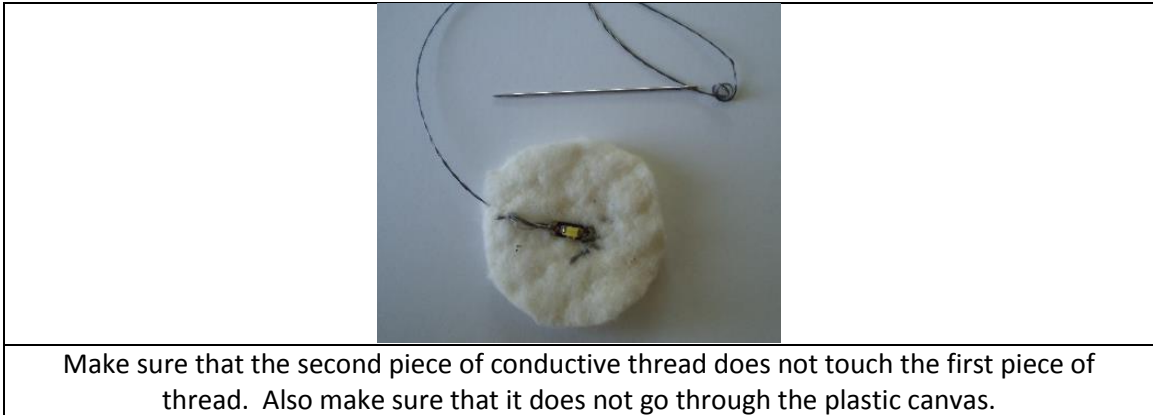


### Assembly Instructions:

1. Cut a circle of batting slightly larger than the plastic canvas. Place the batting on top of the plastic canvas. Cut a 1 foot length of conductive thread. Place the LED on top of the batting, and sew from the + connection of the LED, through the batting and through the plastic canvas. Sew the connection several times to make a thick knot of conductive thread on the underside of the plastic canvas. Tie off end and trim short.



2. Cut a second piece of conductive thread, and sew through the – connection of the LED. Sew a running stitch to the edge of the batting. Do not cut tail.



3. Cut a second circle of batting, and place it over the LED. Cover with the yellow piece of knitting. Use the sewing needle to pass the long piece of connective thread through the batting and knitting, so that it once again hangs free.



4. Use the tail and the yarn needle to catch each of the four corners. Slip the battery into the pocket formed by the center, with the + side touching the plastic canvas. Close up the center using the needle and yellow yarn.



When it's closed up, the battery will be totally enclosed. So, be sure that you orient the battery the right way before closing up the center.

5. Cut a third piece of conductive thread, and sew through the back of the center piece several times, making sure to make good contact with the – side of the battery (the bottom of the battery).



Check that you have good connections by touching the two conductive threads together. The LED should light up when they touch.

6. Set aside the center for a moment and pick up the magnet pocket. Insert a magnet into the pocket and use the tails to sew both ends shut. Slip the pocket inside one of the petals and tack it in place in the center of the widest part of the petal.



Neodymium magnets conduct electricity. The pocket will insulate the magnet, and prevent short circuiting.

7. Sew the petal with the magnet to the edge of the center, between the two conductive threads, using the tail yarn.



Make sure that the top of the petal is oriented correctly. Use the bee to check. The bee should sit easily on the front of the petal. If you have to fight the magnet, flip the petal over before sewing in place

8. Sew the conductive threads up either side of the petal using a running stitch, being sure not to let them touch. Run the threads across the petal to either side of the magnet, and bring the threads out about half an inch from each other. Using the satin stitch, sew two little knots of conductive thread on the outside of the petal just at the edge of the magnet. Avoid actually touching the magnet or crossing the conductive threads.



This is what your petal should look like from the outside.

This is the path your conductive threads should take. Use a pin or a scrap of conductive thread to check that your circuit is working. The LED should light up when the two contacts are joined.

9. Sew the remaining petals around the flower center.



10. Take one more piece of conductive thread, and, using the satin stitch, sew a half-inch patch of conductive thread across the bottom of the bee.



11. (Optional) Attach a hair clip, pin back or other fastener to the back of the flower.

12. Check that the circuit works by attaching the bee to the petal using the magnet. The LED should light up when the bee lands on the petal.



<b>Abbreviations</b>					
BO	Bind off	Kfb	Knit front and back	Ssk	Slip slip knit
CO	Cast on	K2tog	Knit 2 together	Sts	Stitch(es)
Inc	Increase	P	Purl		
K	Knit	PM	Place Marker		

Questions? Comments? Mistakes? Contact me through my blog: [www.ontheneedles.com](http://www.ontheneedles.com), or via email: [knittingontheneedles@gmail.com](mailto:knittingontheneedles@gmail.com)