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# Knit a Neuron!

with Stoke Mandeville Spinal Research  
and the National Spinal Injuries Centre

Stoke Mandeville Spinal Research and the  
National Spinal Injuries Centre invite you to  
**KNIT, CROCHET or 'CRAFT' a neuron.**

Together we can create a spectacular creative spinal cord  
to go on display which will reflect the importance of quality  
of life research in spinal cord injury.

Please take part with family, friends and community groups  
by downloading the easy patterns and where possible  
raising money for our vital research.

The finished neurons will be on display at  
the end of the year.

Visit [www.justgiving.com/smsr](http://www.justgiving.com/smsr) to take part!

Email [knit@smsr.org.uk](mailto:knit@smsr.org.uk)

or call 01296 315255

to find out more.



*All neurons can  
be delivered to:  
SMSR at the National  
Spinal Injuries Centre,  
Stoke Mandeville  
Hospital, Aylesbury, Bucks  
HP21 8AL*

*Deadline: mid-November -  
lots of time to  
take part!*



Buckinghamshire Healthcare  
NHS Trust



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## Knit a Neuron

We used 3.5 mm needles (US4, UK10) & Double Knitting wool - but have fun trying out anything else! You will also need a darning needle & a small bit of stuffing. Any wool or colours are welcome!

**AXON:** Cut 15 equal lengths of wool 10-20cm/4-8". Knot together, divide into 3x5, & plait. Knot ends together.

**CELL BODY:** Cast on 6

Row 1: Increase by knitting back & front loop of each stitch (12 stitches)

R2: Pearl to end

R3: As row 1 (24st)

R4: P to end

Rows 5-18: Stocking Stitch, starting on K row

R19: K2 tog, K2 to end (=18 st)

R20: P

R21: K2tog, K1 to end (12st) R22: P

R23: K2 tog to end (=6st)

R24: P to end

Cast off: Cut wool with 15-20cm/6-8" length left. Use darning needle to bring wool through remaining 6st. Slide off needle.

**MAKING UP CELL BODY:** Place knotted end of the axon (plait) in the loop of cast-off stitches, pull tight & stitch together. Sew together sides of cell body, stuff with kapok/ cotton wool stitch over top.

**DENDRITES:** Cut 6 equal lengths of wool of e.g. 15cm/6". With darning needle, pull strands through a few stitches on the cell body so that you have 12 free ends hanging out.

Divide into 3x2 strands & start plaiting. Make the dendrite branched by separating out & tying off strands at intervals, continuing to plait with remaining strands. Knot the end. Repeat many times!

### KNITTING ABBREVIATIONS

K=knit; M1=Make 1 by knitting both front & back loop of stitch; P=pearl R=Row; Rnd=Round; st=stitch; StSt=stocking stitch (1 row knit, 1 row pearl); tog=together. If you wanted to do it in garter stich, knit every row.



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## Crochet a Neuron

The whole pattern is worked in UK double crochet, or US single crochet.  
Work this pattern continuously, do not join at the end of each round.  
A stitch marker may be useful. Gauge is not important but you want it to be fairly tight so the stuffing is contained.

### *You will need:*

- \* Small amount of yarn
- \* Hook of appropriate size to get a dense fabric
- \* Stitch markers (optional)
- \* Needle for sewing in ends
- \* Small amount of stuffing - you can use plastic bags or bubble wrap if you don't have toy stuffing

### **CELL BODY**

Start with an adjustable loop

Row 1 6dc into the loop and pull the adjustable loop tight

Row 2 2dc into each dc (12 stitches)

Row 3 (1dc into next dc, 2dc into next dc) repeat 5 times (18 stitches)

Row 4 1dc into every dc (18 stitches)

Row 5 same as row 4

Row 6 same as row 4

Row 7 (1dc into next dc, 1dec) repeat 5 times (12 stitches)

Row 8 1dc into each dc (12 stitches)

Row 9 pull tail through the centre so it is inside the body. Stuff body well.

Row 10 (1dc into next dc, 1 dec) repeat until you have 4 stitches

**AXON:** Working in a continuous spiral, 1 dc into each dc until your axon is the length you want it. This one is about 10cm. Or you can just plait a few strands of yarn together like in the knitting patterns.

### **SYNAPTIC TERMINAL**

Work 2dc into each dc (8 stitches) Work 2dc into each dc (16 stitches)

Join with a slip stitch and sew end in.

### **DENDRITES**

Make as many as you like, there are 7 on this neuron.

Make a slip knot with a longish tail so you can use it for sewing in.

Make a starting chain (it doesn't matter how long, these ones are about 9 long), turn 2dc into 2nd stitch from the hook, 2dc into every chain

Finish off

Sew these on at random over the cell body

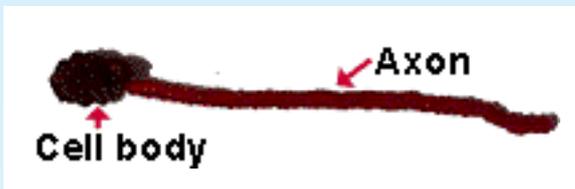
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## Craft a Neuron

**PIPE CLEANER NEURONS:** *Get out those pipe cleaners and make a neuron!* This neuron pipe cleaner shows 5 different colours: one colour each for the dendrites, cell body, axon, myelin sheath and synaptic terminal.

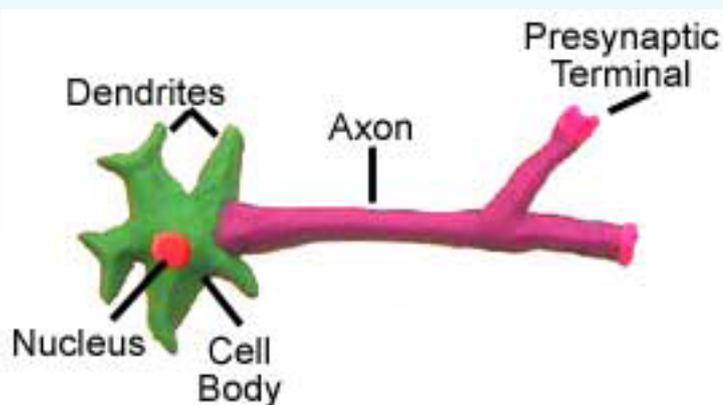
*Materials: assorted pipe cleaners*



1. Take one pipe cleaner and roll it into a ball. This will be the cell body.
2. Take another pipe cleaner and attach it to the new "cell body" by pushing it through the ball so there are two halves sticking out. Take the two halves and twist them together into a single extension. This will be the axon.
3. Take other pipe cleaners and push them through the "cell body" on the side opposite the axon. These are dendrites. These can be shorter than your axon and you can twist more pipe cleaners to make more dendrites.
4. Wrap small individual pipe cleaners along the length of the axon. These will represent the myelin sheath.
5. Wrap another pipe cleaner on the end of the axon. This will be the synaptic terminal.

**PLAYDOUGH NEURONS:** Create a model of a neuron by using clay, playdough, styrofoam, recyclables, food or anything else you can get your hands on.

*Materials: clay or Playdough or Styrofoam or Recyclables (bottle caps, buttons )  
OR Food (fruit, jelly beans etc)*



Use pictures from books to give you an idea of where the components of a neuron should go and what shape they should be.

Use different colours to indicate different structures. Make a neural circuit with a few of the neurons.

Create sensory or motor systems.  
Eat your model if you made it out of food!!

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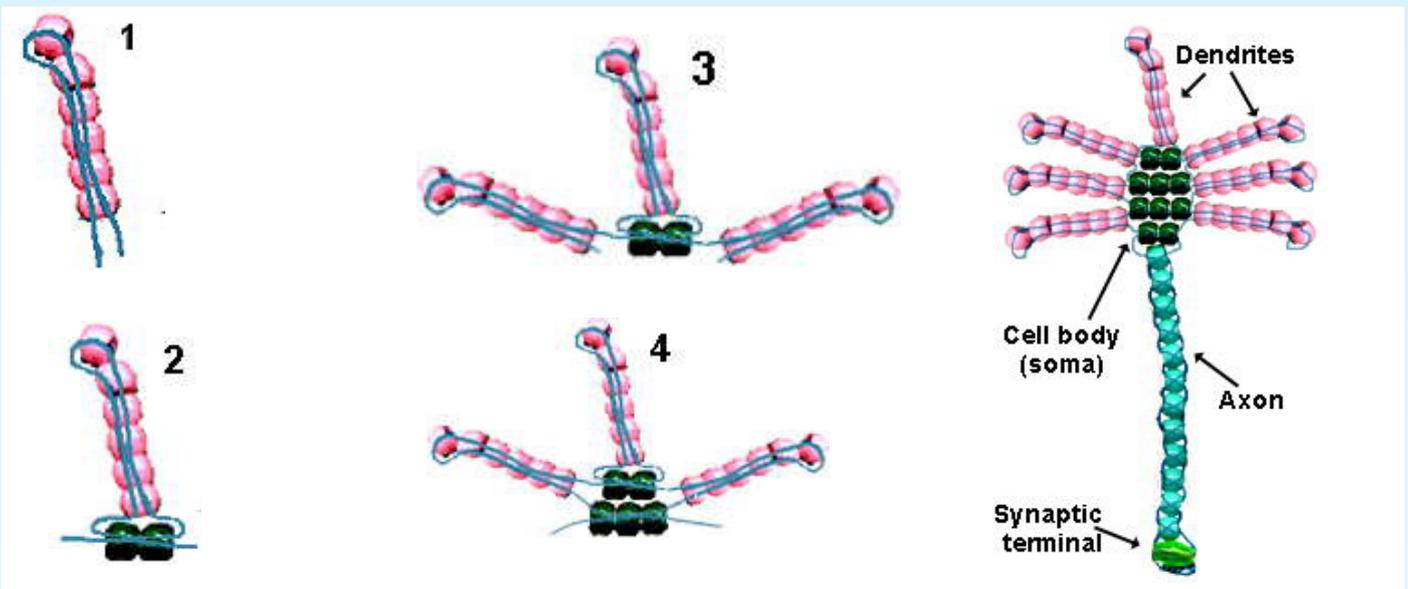
## Craft a Neuron

**BEADY NEURONS:** *Find some beads and make a neuron!*

This neuron with seven dendrites requires 65 beads: 42 beads for the dendrites, 10 beads for the cell body, 12 beads for the axon and 1 bead for the synaptic terminal.

**Materials:** wire, 65 beads

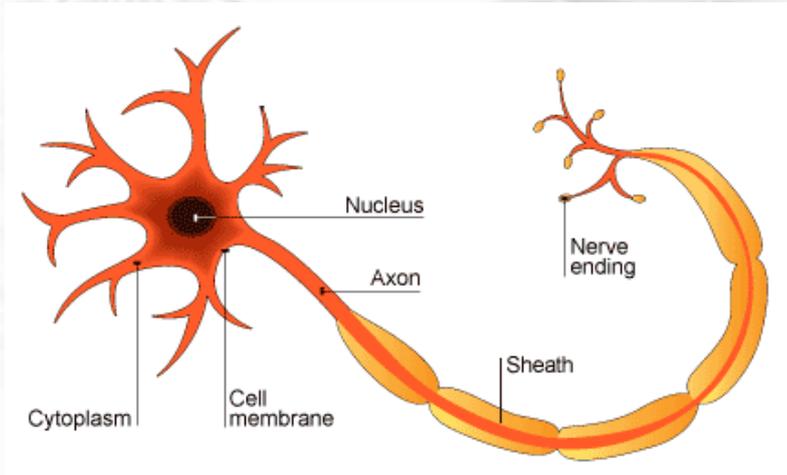
String the beads using the pattern in the diagrams below. The string can be yarn, rope, or for the best result use flexible wire. You can also create your own pattern or use a different coloured bead for a nucleus in the cell body.



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## What is a Neuron?



A neuron is a nerve cell that is the basic building block of the nervous system. Neurons are similar to other cells in the human body in a number of ways, but there is one key

difference between neurons and other cells. Neurons are specialized to transmit information throughout the body.

These highly specialized nerve cells are responsible for communicating information in both chemical and electrical forms.

There are also several different types of neurons responsible for different tasks in the human body.

Sensory neurons carry information from the sensory receptor cells throughout the body to the brain. Motor neurons transmit information from the brain to the muscles of the body. Interneurons are responsible for communicating information between different neurons in the body.