

# The CLEAPSS Knitting Book



These models were designed by technicians.

Why not knit them for use in school?

Please note these patterns are presented in draft form.

With grateful thanks to Margaret Fillery, Maureen Lister, Knitting Club at Loddington CE Primary School and the St John Ambulance, New South Wales

These patterns have been designed by technicians and colleagues at CLEAPSS. While we believe that the CLEAPSS designers' patterns are original, we gratefully acknowledge inspiration from a number of patterns created by others.

The patterns have not been tested extensively. Please feedback any comments. CLEAPSS is always pleased to hear about your own designs and projects. Please email [science@cleapss.org.uk](mailto:science@cleapss.org.uk).

## Models in science and knitted anatomical parts



Knitted lung models

Scientists use models in several ways. The structures of DNA and buckminsterfullerene were elucidated with the use of physical models. And in industry, physical or virtual models are built to test the viability of aeroplane wings or racing cars.

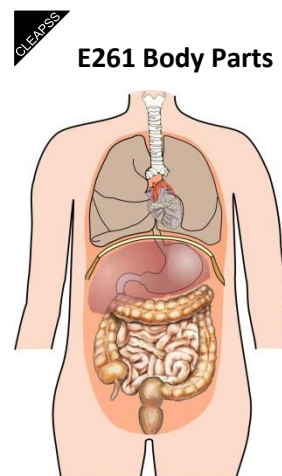
How can we use models in school and how can knitting enhance children's understanding of the parts of the body?

Guide L245 *Ourselves* says:

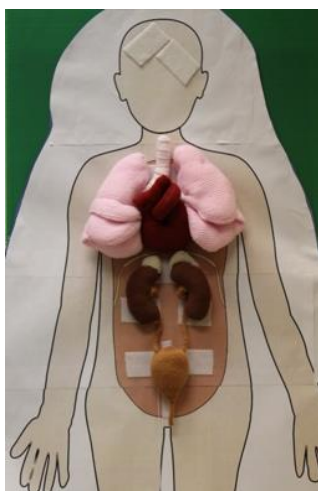
Conceptualising 3-D structures is difficult for children, and models help to represent the relative size, shape and relationship of structures. This is very revealing, especially if children share the common misconception of the body as a bag of organs, and are unaware of how closely they are packed.

## Two-dimensional models

It could be interesting for pupils to construct a body model using paper cutout organs. The CLEAPSS electronic document E261 *Body parts* includes both torso and skeleton outlines, as well as pictures of the major organs. The skeleton or body outlines could be photo-enlarged, mounted on a sturdy background and used as a template to mount the parts. Pupils could be given copies of the parts to cut out and place in the right place on the outline.



## But how well do the models represent the human body?



It's looking crowded already  
– and we haven't started  
with the digestive system!



The intestines, pancreas,  
liver and gall bladder.

Bodies, organs, tissues and cells are all 3-dimensional. Students sometimes have difficulty in picturing them when presented with the usual textbook 2-dimensional illustrations. Also, body parts naturally have texture and weight. Using physical models can help students to appreciate some of the properties of these structures. At the same time, the inevitable limitations of these models make excellent teaching points.

## Three-dimensional models of organs and tissues

Why make these models? Various body model sets are available commercially. But there is something particularly tactile about handling a life-sized liver and untangling 6 m of knitted small intestines. The act of making the models is also instructive and helps to make their structure clearer.

Some students may benefit from making models themselves. Even those who can't knit might manage French knitting, making pompoms or macramé. CLEAPSS has some patterns; some are available from CLEAPSS and others can be downloaded from other sources.



It is difficult to make them all to scale – our models were rather too big for the body outline. Obviously, real body parts are much more intricate, and have a range of different types of cells, giving them a range of textures.

Once you have made and stuffed the models, strips of the hook type of Velcro® can be stuck to the backs of the knitted and stuffed body parts, and strips of sticky-back Velcro® can be scattered around the body cavity. Pupils can then use the diagrams in guide E261 to arrange parts of the anatomy appropriately. This model can give an idea of how the parts of the anatomy are arranged – and if many parts are included, how crowded our insides are! The soft models can be handled, and pressed close together to fit in place.



The trachea of this lung model is made from cotton and is not very flexible, representing asthmatic lungs. Rubber tubing, a Y junction and plastic bags have been added to enable inflation of the lung to be demonstrated.



Individual cells can also be modeled. These neurons can complement teaching about the importance of dendrites and axons in nerve transmission.

Please let us know how you get on, and tell us about any ideas you have or other patterns you come across. You can write to

[science@cleapss.org.uk](mailto:science@cleapss.org.uk)

## CLEAPSS draft knitting pattern:

### Complete Gut



The completed model

### You will need

Double knit wool, peach, cream, light brown, dark brown

3.50mm needles

Stuffing

### Abbreviations

Sts- stitches

K-knit

P- purl

Inc- increase

Dec- decrease

Stst- stocking stitch

Beg-beginning

### **Oesophagus:**

Using the pink wool Cast on 16sts and knit in garter stitch for 23cms

Cast off and sew sides together and stuff leaving both ends open.

### **Stomach**

With the cream wool cast on 8sts

K1 row

P1 row

Knit the next row increasing in every stitch

P1 row

Repeat the last 2 rows until you have 64sts on your needle

Continue in stst until you have 16cms in length from the beginning

Next row k2tog across the row

P1 row

Repeat the last 2 rows until you have 8sts left on your needle

Cast off and sew together and stuff. Attach the oesophagus. See the photos (next page).





The stomach, showing how to sew it up



The oesophagus sewn to the stomach

### **Small Intestine**

CLEAPSS draft knitting pattern January 2015



With the peach wool cast on 14 stitches and knit in stst for 6 metres and then cast off

Sew sides together but do not sew the ends

Do not stuff this part. Sew to the stomach as in the photo guide:



The small intestine sewn to the stomach

### **Large Intestine**

With the light brown wool cast on 10 stitches

Knitting in stst increase at each end of every row until you have 34 stitches

Continue in stst until you have 5cms from the beginning.

Cast off

Sew sides together and attach to the end of the small intestine (see the photo on the next page).

## **Rectum**

At one end of the finished colon pick up and knit 34 stitches in dark brown wool

Knitting in stst k2tog at each end of the knit row until you have 6sts

Cast off

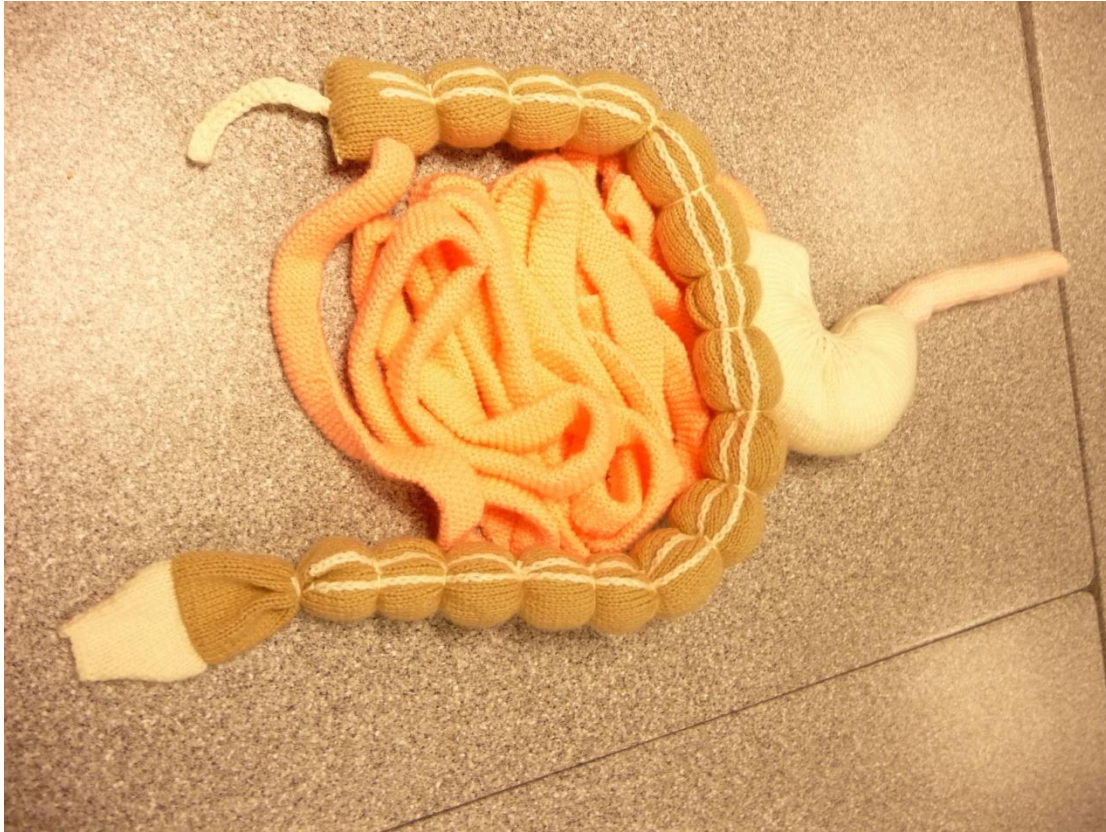
Sew the sides together

## **Appendix**

Using a 3.50mm crochet hook and the dark brown wool make 10 loops

Do 2 rounds and cast off.

Sew the appendix onto the large intestine



The large intestine, connected to the small intestine and the appendix. Embroidery has been added to represent muscles.



**CLEAPSS draft knitting pattern:**

**Gall Bladder**



The completed gall bladder

**Instructions**

Cast on 6sts

Knitting in stocking stitch, increase 1 stitch each end until you have 12 stitches on your needle

Knit 10 rows

Decrease each end until you have 6stitches

Cast off, sew together and stuff.

## Heart Pattern



Plain knitted heart



Heart with arteries and veins embroidered on

### Contents

**Instructions for plain knitted heart**

**Further details on completing the model**

**Adaptation with aorta extended**

### Instructions for plain knitted heart

Front of heart: 3mm needles, D.K wool in red, blue, pink, dark pink

Cast on 2sts in red

K1 row

P 1 row

Continue in st st increasing 1 st at each end of the k rows until you have 34 sts on the needle

Join in the blue wool and p16 sts

St st eight rows decreasing 1<sup>st</sup> at each end of the k rows until you have 8sts left

St st 8 rows

Cast off.

Join in pink wool and p9sts

St st 12 rows

Cast off.

Put the last 9 sts on a pin.

With the right side facing you, join in the pink wool at the right side of the pink piece you have just knitted, pick up and k 6sts

Starting with a p row st st 15 rows

Cast off.

With the right side facing you rejoin the pink wool at the left side of the pink knit

Pick up and k6sts

Starting with a p row st st 15 rows

Cast off.



With the right side facing slip the 9sts off the pin and onto a needle

Rejoin the red wool

St st 16 rows

Separate the 9sts into 3 sets of 3 sts

Rejoin the red wool at the first 3sts

St st 4 rows

Cast off.

Rejoin the red wool at the second set of 3sts and st st 4 rows

Cast off.

Rejoin the red wool at the last 3sts and st st 4 rows

Cast off.

With the blue wool cast on 18sts

St st 20 rows

Cast off.

Make 2: with the dark pink wool cast on 10sts

St st 44 rows

Cast off.

### **Back of Heart**

Cast on 2sts in the red wool

K1 row

P1 row

Continue in st st and increase 1<sup>st</sup> at each end of the k rows until you have 34sts on the needle

P 18sts, break yarn and leave these sts on a pin

Join blue wool to sts left on the needle

St st 8 rows decreasing 1<sup>st</sup> at each end of the k rows until you have 8sts left

St st 8 rows

Cast off.

Join the pink wool to the red and k9sts

St st 12 rows

Cast off

With the right side of the work facing you pick up and k 6sts

Continue in st st for 15 rows

Cast off.

With the right side of the work facing you pick up and k6sts along the other side of the pink knit

Continue in st st for 15 rows

Cast off.

With right side of work facing you rejoin the red wool to the last 9sts

St st 16 rows

Separate the 9sts into 3 sets of 3 sts

St st the first 3sts for 4 rows

Cast off.

Rejoin the wool to the next 3sts and st st for 4 rows

Cast off.

Rejoin the red wool to the last 3sts and st st for 4 rows

Cast off.

Sew the back and front together and stuff with toy acrylic stuffing.

Sew the dark pink knits and lightly stuff

Sew the blue knit and lightly stuff

Sew the dark pink knits to the back of the heart

Sew the blue knit to the back of the heart.


Optional extra: use coloured wool to embroider more veins and arteries.

*For further details on completing the model, see the following pages....*


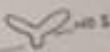


## Further details on completing the model


- Sew red heart shape and fill; leaving the top end not sewn.


- Sew and fill No 1 (two of them) Sew them to the back of the red heart shape, half way down. 

- Sew and fill No 2 and sew to the top of the red heart on the left side of the heart. Leaving a space to sew on No 3.

 Sew and fill No 3. 

- Sew on No 3 to the top of the left side of the red heart.

- Sew and fill No 4. 

 front bit  
Sew this part to the top of the right side of the red heart.  
Leaving this part unsewn.

- Sew No 5 and fill. Sew this part to the upper blue part No 4 that has not been sewn to the heart.

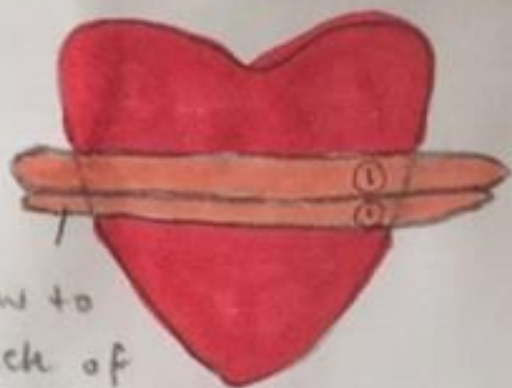


- Sew No 4 to the side of No 2 leaving a gap at this point pass one of the tubes of No 3 through the gap.  
Stitch No 5 to the bottom of back of heart.

Embroider veins if wish to.

- ① Pulmonary veins
- ② Aorta
- ③ Pulmonary artery
- ④ Superior Vena Cava
- ⑤ Inferior Vena Cava

①



Sew to  
back of  
heart.

Sew on red,  
leaving for next  
part



next part. Sew to  
end tube not heart



front

Sew blue to  
red (just one  
side of  
the  
opening)



sew  
this area  
both sides  
together,  
do not sew  
to the other  
parts.

— leave  
to put pink  
part through  
the gap.

back

5



Sew  
second  
part of  
the top  
blue opening  
to the  
bottom  
blue  
section.

## Adaptation with aorta extended



Foam hair curlers were used to stuff the aorta

DRAFT





## **CLEAPSS draft knitting pattern:**

### **Liver**



The completed model

### **You will need**

3.5mm needle

Double knit dark brown wool

Stuffing

### **Abbreviations**

Stst-stocking stitch

K-knit

P- purl

Dec-decrease

Inc-increase

K2tog-knit 2 together

## **Instructions**

The model is made in four pieces then assembled.

### **Side 1a**

Cast on 3 sts

K1 row

P1 row

Inc 1 st at each end of K row

Inc 1 stitch at each end of P row

Repeat the last 2 rows

Inc 1 st, K to the end

P1 row

Inc 1 st, K to end

P1 row

Inc 1 st, k to end

P1 row

Inc 1 st, K to end

P1 row

K1 row, P1 row twice

Inc 1 st, K to end

P1 row

Inc 1 st, K to end

P1 row

Inc 1 st, K to end

P1 row

Inc 1 st, K to end

P to the end, inc 1 st

Inc 1 st, K to end

P to end, inc 1 st

K1 row

P to end, inc 1 st

K1 row

P to end, inc 1 st

K1 row

Inc 1 st at each end

K1 row

Inc 1 st at each end

K1 row

Inc 1 st at each end

K1 row

Stst 10 rows

P to end, dec 1 st

K1 row

P to end, dec 1 st

K1 row

P to end, dec 1 st

St st 8 rows

Cast off

### **Side 1b**

Cast on 3 sts

K1 row

P1 row

Inc 1 st at each end of K row

Inc 1 st at each end of P row

Repeat the last 2 rows

K1 row

Inc 1 stitch, P to the end

K1 row

Inc 1 st, P to the end

K1 row

Inc 1 st, P to the end

K1 row

Inc 1 st, P to the end

K1 row, P1 row twice

K1 row

Inc 1 st, P to the end

K1 row

Inc 1 st, P to the end

K1 row

Inc 1 st, P to the end

K to the end, inc 1 st

Inc 1 st, P to the end

K to the end, inc 1 st

Inc 1 st, P to the end

K1 row

Inc 1 st, P to the end

K1 row

Inc 1 st, P to the end

K1 row

Inc 1 st at each end of P row

K1 row

Inc 1 st at each end of P row

K1 row

Inc 1 st at each end of P row

Stst 10 rows



K1 row

Dec 1 st, P to end

K1 row

Dec 1 st, P to the end

K1 row

Dec 1 st, P to end

Stst 8 rows

Cast off

## **Side 2a**

Cast on 3 sts

K1 row

P1 row

Inc 1 st, K to end

P1 row

K1 row

P1 row

Inc 1 st each end of K row

Inc 1 st each end of row P row

Repeat the last 2 rows twice

Inc 1 st at beginning of K row, K to the end

P to end, inc 1 st at end

Inc 1 st at beginning of K row, K to end

P to end, inc 1 st

Inc 1 st at beginning of K row, K to end

P to end, inc 1 st

Stst 10 rows

Dec 1 st at the beginning of row, K to end

P1 row

Dec 1 st at the beginning of row, K to end

P1 row

Cast on 3 sts, K to end dec 1 st

P1 row

Cast on 2 sts, K to end

P1 row

Cast on 2 sts, k to last 2 sts k2tog

P1 row

K1 row, P1 row twice

K to end of row, dec 1 st

P1 row, K1 row twice

P1 row

K to end, dec 1 st

P1 row, K1 row twice

P1 row

K1 row to end, dec 1 st

P1 row, K1 row twice

P1 row

K1 row to end, dec 1 st

P1 row, K1 row twice

P1 row

K1 row to end, dec 1 st

Dec 1 st, P to end

K1 row to end, dec 1 st

Dec 1 st, P to end

Cast off loosely

## **Side 2b**

Cast on 3 sts

K1 row

P1 row

K1 row

Inc 1 st, P to the end

K1 row

P1 row

Inc at each end of K row

Inc at each end of P row

Inc at each end of K row  
Inc at each end of P row  
Inc at each end of K row  
Inc at each end of P row  
K to end of row, inc 1 st  
Inc 1 st, P to end  
K to end of row, inc 1 st  
Inc 1 st, P to end  
K to end, inc 1 st  
Inc 1 st, P to end  
Stst 10 rows  
K1 row  
Dec 1 st, P to end  
K1 row  
Dec 1 st, P to end  
K1 row  
Cast on 3 sts, P to end dec 1 st  
K1 row  
Cast on 2 sts, p to end  
K1 row  
Cast on 2 sts, P to end P2tog  
K1 row, P1 row twice



K1 row

P to end, dec 1 st

K1 row, P1 row twice

K1 row

P to end, dec 1 st

K1 row, P1 row twice

K1 row

P to end, dec 1 st

K1 row, P1 row twice

K1 row

P to end, dec 1 st

K1 row, P1 row twice

K1 row

P1 to end, dec 1 st

Dec 1 st, K to end

P to end, dec 1 st

Dec 1 st, K to end

P1 row

Cast off

## **Making up**

Sew 1a and 1b together

Sew 2a and 2b together

Stuff each piece

Sew the two pieces together



**CLEAPSS® draft pattern**  
**Lung structure: pompom alveoli**



In the lungs, carbon dioxide produced in respiration within cells is removed from the blood and replaced with oxygen from inhaled air.

The internal surface of the lungs is designed to provide a very large surface area for gas exchange. The trachea – the tube bringing air in and out of the lungs – divides into two bronchi, which are further split into many bronchioles, each consisting of many air sacs (alveoli). A copious blood supply is provided via many capillaries (fine blood vessels which form a network between the larger blood vessels: arteries and veins), arranged around the alveoli to make exchange quicker.

Bronchioles can be constructed from pompoms. The capillaries around them can be made by knotting wool, macramé style.

## Materials

For the alveoli

- Two pieces of card, cut into circles approximately the size required for the model, with the centres cut out circularly. These make the template.
- Wool. A pale colour is best.

For the capillaries

- Wool. Variegated wool can give the impression of the difference between oxygenated and non-oxygenated blood. Ideally, blue and red could be used but it is difficult to arrange the yarn to represent this accurately.
- A knitting dolly, with something to help make the stitches. If a device is not provided, use a crochet hook or large needle as used in toy sewing kits.

Other equipment

- Scissors

## Instructions

Alveoli

Place the two pieces of card together. Secure a length of yarn between the two pieces and wind the yarn round the template. Cut further lengths of yarn and continue to wind them around the template, winding over the ends to keep them in place, until it is no longer possible to add more yarn. Insert the points of the scissors through the outer layers of wound yarn and between the pieces of card. Cut the yarn all round the pompom, leaving it held by the two templates at the centre and forming a bundle of threads. Insert another piece of yarn between the two pieces of the template and wind it securely round the central bundle a couple of times then tie it securely. The bundle should take on a spherical shape. Release the completed pompom from the template pieces. Leave the ends of the central ties, but you can trim any out-of-place threads to improve the shape of the alveolus.

Capillaries

Prepare several strands of yarn (double the yarn if it is thin) to yield 4 or 6 'capillaries' and tie them all together at one end.

Place a pompom on the central knot and ease the capillaries evenly around it.

Tie adjacent capillaries a short distance from the top, creating junctions between pairs of capillaries.

Taking one capillary each from adjacent junctions, tie it to one capillary from its adjacent junction. Continue round the alveolus till all capillaries are paired to make a new set of junctions.



Continue to tie the capillaries in this way till you have surrounded the alveolus. Tie the capillaries together, ready to join into a 'blood vessel'.

When capillaries have been created around several alveoli, combine their tied capillaries and insert into an artery or vein (see below).

Arteries and veins

These are made by French knitting using a Knitting Dolly



Knitting dollies can be bought in different sizes. You can also make one using an old-fashioned cotton reel or similar device.

A knitting dolly with 6 loops makes a wider-guage blood vessel which can take a number of capillaries from a group of alveoli. Make a short length of blood vessel. Insert the loose ends of the capillaries from the alveoli into a blood vessel and secure it neatly.

Draft instructions 2015

## CLEAPSS draft knitting pattern:

### Ovum and sperm



The sperm has a detachable tail. The ovum has a pocket to receive the sperm during fertilisation.

### Abbreviations

Sts- stitches

K-knit

P- purl

Inc- increase

Dec- decrease

Stst- stocking stitch

k2tog- knit 2 together

## **Ovum**

### **You will need**

3.50mm crochet hook

Double knit wool, white and pink

### **Instructions**

With the hook and pink wool make 3 loops/chains

1<sup>st</sup> chain double the chains by making 2 loops in each loop until end of round

1<sup>st</sup> round crochet in first loop, make 2 loops in the 2<sup>nd</sup> loop, continue around the round to the end of the round, and mark where the first round ends with a safety pin

2<sup>nd</sup> round crochet in 1<sup>st</sup> and 2<sup>nd</sup> loop, make 2 loops in 3<sup>rd</sup> loop, continue this until you reach the safety pin

3<sup>rd</sup> round crochet in the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> loops, make 2 loops in the 4<sup>th</sup> loop and continue this until you reach the safety pin

Continue this sequence making 2 loops in the 4<sup>th</sup> loop, next round 5<sup>th</sup> loop, next round 6<sup>th</sup> loop until you reach the round of 20 loops. Fasten off.

Make 2 of these in white wool

Make a smaller circle of about 6 rounds in a dark colour

With the pink circle, using the crochet hook, use the latch loop technique to pull broken off pieces of the pink wool through the circle. Do this until the whole of the circle is full

(it is best to work from the inside of the circle outwards working around the circle.

Sew of the white circles to the pink circle and stuff.

Sew the small 6 round circle to the second white circle and sew this to the top of the first white circle LEAVING SOME OF THE CIRCLE OPEN. Make this opening large enough for the knitted sperm to be able to enter.

### **Sperm**

#### **You will need:**

5mm needles

Double knit wool, white, two different colours

Stuffing

3.50mm crochet hook

#### **Instructions**

Make 2

With the white wool cast on 4sts

Knitting in stst inc each end on every K row until you have 22 sts

Continuing in stst inc each end of every other K row until you have 30sts, ending with a P row

Next row k2tog across the row

P the next row

Repeat the last 2 rows once

P 1 row

K 4 rows

Cast off

With one of the chosen other colours cast on 2sts

K1 row

P1 row

Continue in stst

Cast on 1 st at each end of the K rows until you have 10sts

Cast off

With the 3.50mm crochet hook and the second chosen colour make 3 loops

Make 6 loops in the first loop

Make 2 loops in each of the loops

Make 2 loops in each loop, mark the last loop with a safety pin

Make 6 rounds as follows:

1<sup>st</sup> round crochet loop in second loop make 2 loops, continue this sequence until you reach the safety pin

2<sup>nd</sup> round crochet 2 loops and in the 3<sup>rd</sup> loop make 2 loops, continue this sequence until you have reached the safety pin

3<sup>rd</sup> round crochet 3 loops and in the 4<sup>th</sup> loop make 2 loops, continue this sequence until you reach the safety pin

Repeat this pattern for the next round 5 and 6 increasing 2 loops in the 5<sup>th</sup> and 6<sup>th</sup> loops

Bind off

Using the white wool cast on 4sts and knitting in stst K 50cms ending with a P row

Next row dec 1<sup>st</sup> at each end of the row

P1 row

Repeat the last 2 rows until you have 1 st left

Bind off

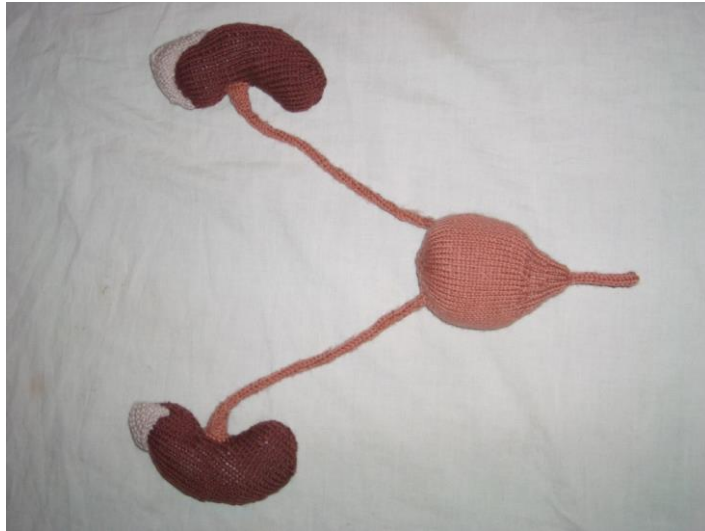
Sew pieces

2 options: you can choose to keep the head and the tail separate or sew them together. Option 1 is so that the tail can be taken off when used with the kitted ovum. With option 1 attach Velcro to the 2 separate parts so they can start off as one piece.

Embroider the sheath down the tail. Make French knots for the mitochondria. You can choose to use sequences for the centrioles or using a different colour thread from the mitochondria make 2 French knots.

Sew triangle and circle to the head.





## **Kidneys**

Make 2

Cast on 4 stitches.

Increase 1 stitch at beginning and end of each row to 14 stitches.

Stocking stitch 5 rows.

Make 1, K to last 2 stitches, K2 tog.

P one row.

Make 1, K to last 2 stitches, K2 tog.

P2 tog, p to end.

K to last 2 stitches, K2 tog.

Stocking stitch 2 rows.

M1, P to end.

K to end M1.

P to end.

K to end, K2 tog

P to end

\*\* K2 tog, K to end, M1

M1 P to end

K to end, M1

M1, p to end \*

Repeat from \*\* to \*

K2 tog, K to end

Stocking stitch 3 rows

K2 tog, K to end

P2 tog, P to last 2 stitches, P2 tog

K2 tog, K to end

P to last 2 stitches, P2 tog

Decrease 1 stitch at beginning and end of next 4 rows.

Cast off.

## **Ureters**

Make 2

Using 4 double pointed needles or French knitting make a tube of 4 stitches round for 20 centimetres.

Increase in each stitch to 8 stitches.

Stocking stitch 3 rows

K2 M1 to end (12 stitches)

Stocking stitch 3 rows

Cast off

## **Urethra and Bladder**

Make tube of 4 stitches as above for 5centimetres.

Increase in each stitch to 8 stitches

P one row

K2 M1 to end (12 stitches)

Stocking stitch 7 rows

Increase in each stitch (24 stitches)

Stocking stitch 7 rows

Increase in each stitch (48 stitches)

Stocking stitch until knitting measures 12 centimetres from beginning of increasing

K2 tog to end (24 st)

P one row

K 2 tog to end (12 st)

P one row

K 2 tog to end (6 st)

P one row

K2 tog to end (3 st)

Thread wool through these three stitches, pull up tight and fasten off.

## **Adrenal Glands**

Make 2

Cast on 4 Stitches

Work in garter stitch throughout

Increase one stitch at the beginning of each row to 24 stitches

K2 tog at beginning of each row to 4 st.

Fasten off

Fold one in half lengthways, join edges, stuff lightly and sew onto left kidney along the top outer edge.

Fold the other in half widthways, join edges, stuff lightly and sew onto right kidney across top edge.

## **CLEAPSS draft knitting pattern:**

### **Uterus, placenta, umbilical cord and baby**



The baby in the uterus



The baby emerging (via caesarean section!)



Uterus, baby, placenta and umbilical cord

### **You will need**

3.25mm knitting needles

Dark red/burgundy, pink double knit wool

Stuffing

3.5mm crochet hook

### **Abbreviations**

Sts- stitches

K-knit

P- purl

Inc- increase

Dec- decrease

Stst- stocking stitch

Beg-beginning

Ch – chain

Dc – double crochet

### **Instructions**

## **Uterus**

Cast on 24sts

Work 12 rows in K1 P1 rib

Next row inc in every 2<sup>nd</sup> stitch to last stitch, K1 (35 stitches)

P1 row

Repeat the last 2 rows until you have 64sts

Continue in stst until you have 16cms from the beg

Next row k2tog to the end of the row

P1 row

Repeat the last 2 rows until you have 16sts left on your needle

Measure off 50cs of the yarn and break off the yarn, thread this through the remaining 16sts, pull yarn tight and fasten knitting off

Sew the bottom of the uterus tog but leave the side opening

## **Baby**

The legs, body and head are knitted together. Make 2 pieces (front and back).

## **Legs**

Make 2, keeping the first leg on a needle till the second leg is complete and ready to be joined.

Using pink cast on 4 sts.

K1 row

P1 row

Next row inc 1 st at each end

P1 row

Repeat the last 2 rows (8 sts)

Stst for 3cms

Next row inc 1 st at each end (10 sts)

P1 row

### **Body**

Align and knit across the two legs (20 sts)

Stst 5cms

Next row k2tog K to end k2tog

P1 row

K2tog K to end k2tog (16 sts)

P1 row

### **Head**

Cast on 10sts

Stst 4 rows

Next k row inc 1 st at each end

P1 row

Repeat the last 2 rows until you have 16sts

Continue in stst for the next 6 rows

K2tog knit to the end k2tog

P1 row repeat the last 2 rows twice more

Break off yarn, thread through the stitches, pull thread tight and fasten off.

### **Arms**

Make 2

With pink wool cast on 10sts

Stst for 4cms

K2tog K to the end k2tog

P1 row

Repeat the last 2 rows

Break off about 10cms of yarn and thread through the stitches

Pull yarn and fasten off

### **Placenta**

With the red wool and a 3.5mm crochet hook make 3 loops and pull tight.

Next round: dc into the centre of the loops to complete the round.

Next round: 1ch, 2dc into next dc. Continue to the end of the round, adjusting the number of sts to keep the shape roughly flat.

Continue making rounds until the placenta measures roughly 10 cm across. Fasten off.

### **Umbilical cord**

Using a 'knitting dolly', make a cord 20 cm long. Break off yarn and fasten off.

### **To assemble the model:**

Sew round the edges of the baby's body and legs, leaving a gap to fill with stuffing before completing. Sew the long seams of the arms, add stuffing and attach in place.

Attach one end of the umbilical cord to the baby's navel and the other to the centre of the placenta.

Sew the loose edges of the uterus. You can leave a gap to allow the baby to be inserted (and be born by Caesarian section if wished, though it should be possible to simulate a normal birth via the cervix). See photos.

Adapted from Maggy Fillery's design.