

BUILD-A-PHAGE

Structural biology is the study of the shape of biological things. This is a very important aspect of understanding how different things work and what role they play.

Scientists have researched the structure and function of the different parts of phages in a lot of detail. Use the instructions below to build a phage using the 5mm foam sheet, scissors and glue and learn about the function of each of the parts as you go along.

This project is part of *The Phage Collection Project* - to find out more about how you can get involved; scan the QR code >>>>>



YOU WILL NEED: The Build-A-Phage template sheet, a polystyrene sheet (2.5cm) PVA Glue, Craft Scissors, Straws or Pipecleaners

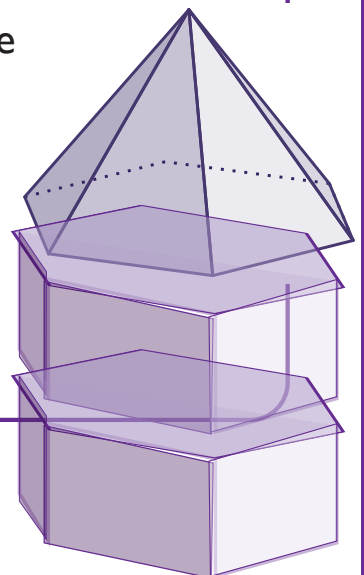
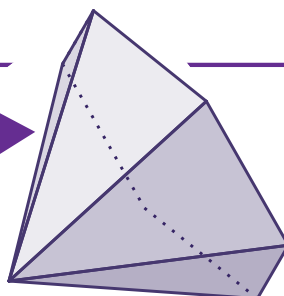
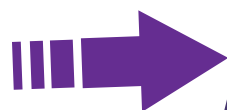
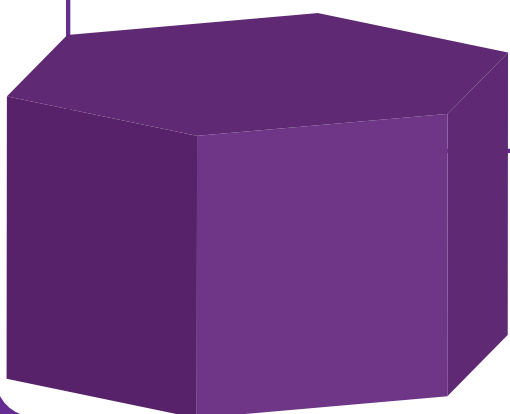
1

Use the template sheet to cut the polystyrene sheet into the shapes A-F

Glue two shape A's together

Then cut 2 Shape A's at each rectangular face to form a pyramid with a hexagonal base. This will form the top and bottom of **the capsid**

Glue the tip and bottom of the capsids to the middle section to form the capsid. The capsid stores all the genetic information needed to make new phages in the bacterial host. This partly explains why it's such a big portion of the phage structure.

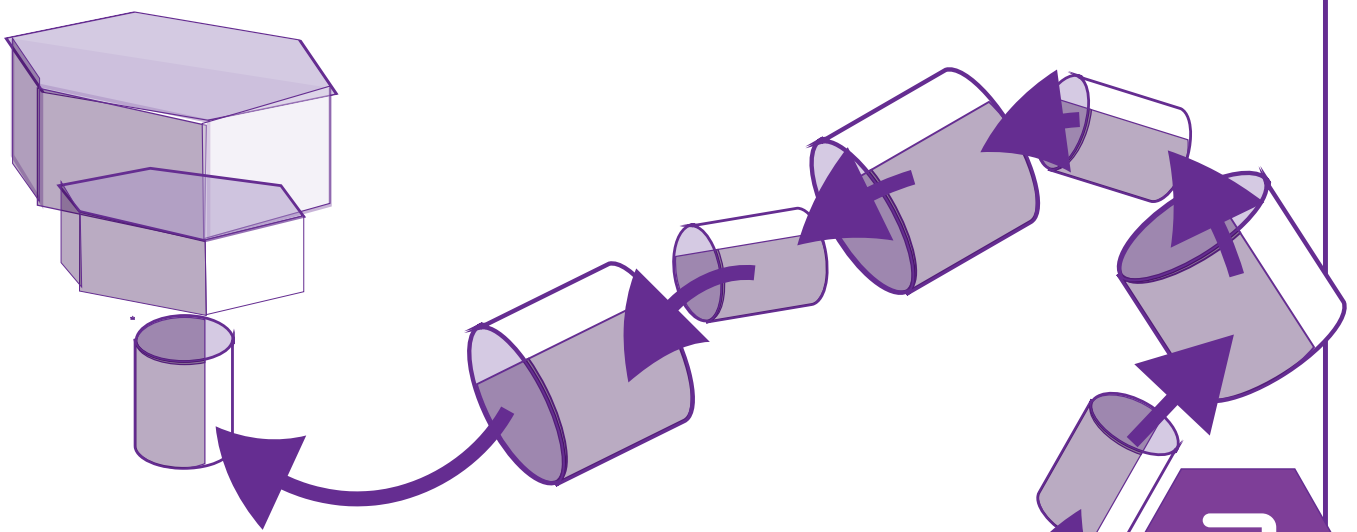


2

Cut Shapes B and C in half depthway to make 1.25cm thick hexagons. *This might be tricky! so ask an adult for help.* Keep the other half of Shape B - you'll need it for later

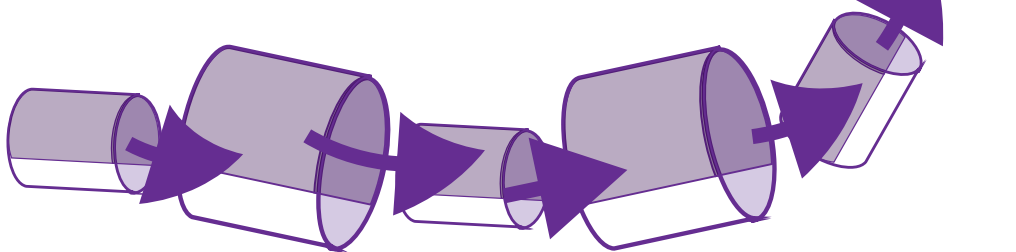
Glue one of the Shape B's to one of the Shape C's, and attach one shape D to the base of Shape C <<< This forms **the Collar**

The collar senses environmental conditions allowing the phage to only infect a bacterial cell in favourable conditions.

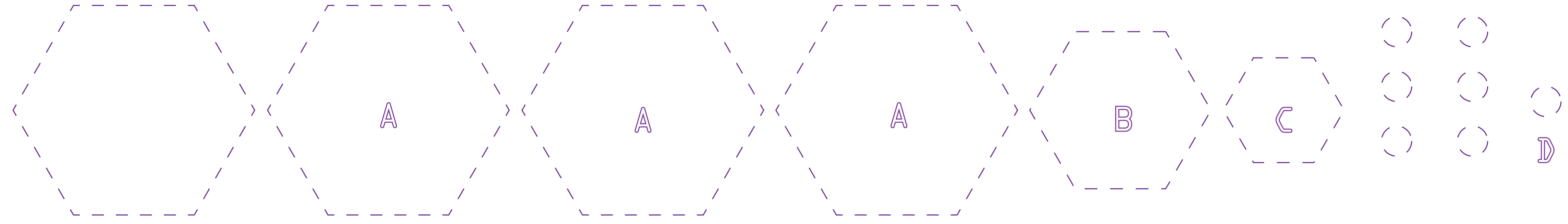


3

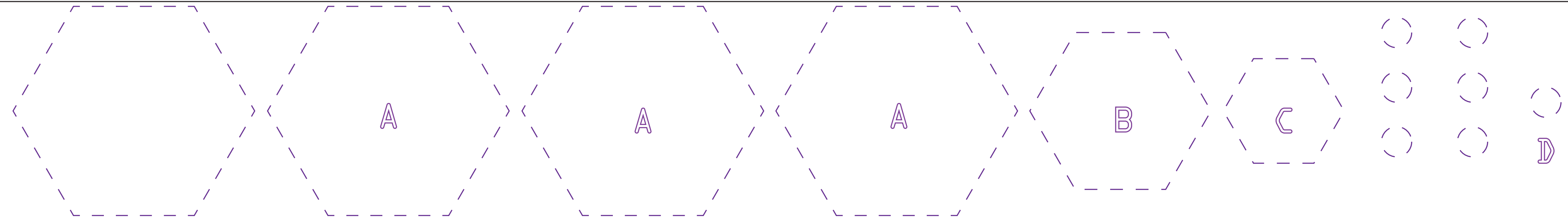
Cut shapes E and F in half depthways making 6 cylinders of big and small size- *again you might need help here!*



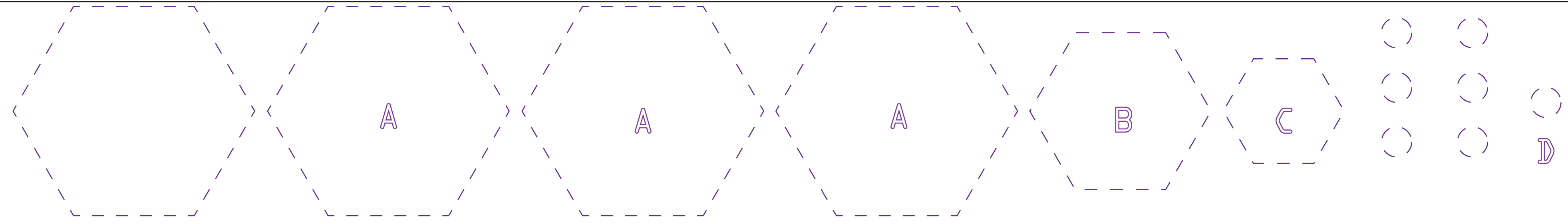
Glue shape E and F (6 of each) together in alternating order. This will form the **sheath** which acts as a passageway to allow DNA to travel from the capsid into the bacterial host.



BUILD -A-PHAGE
The template sheet



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The template sheet

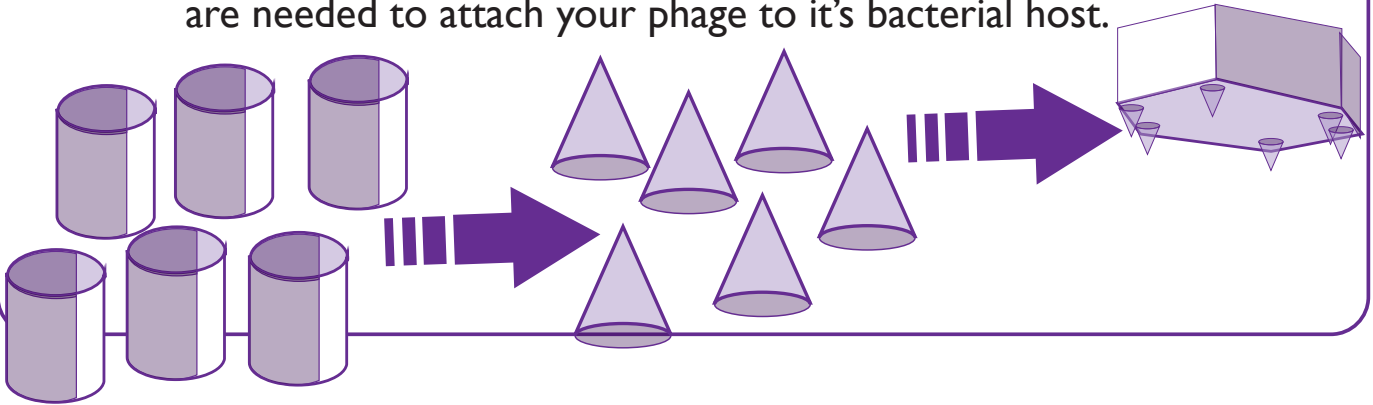


BUILD -A-PHAGE
The template sheet

4

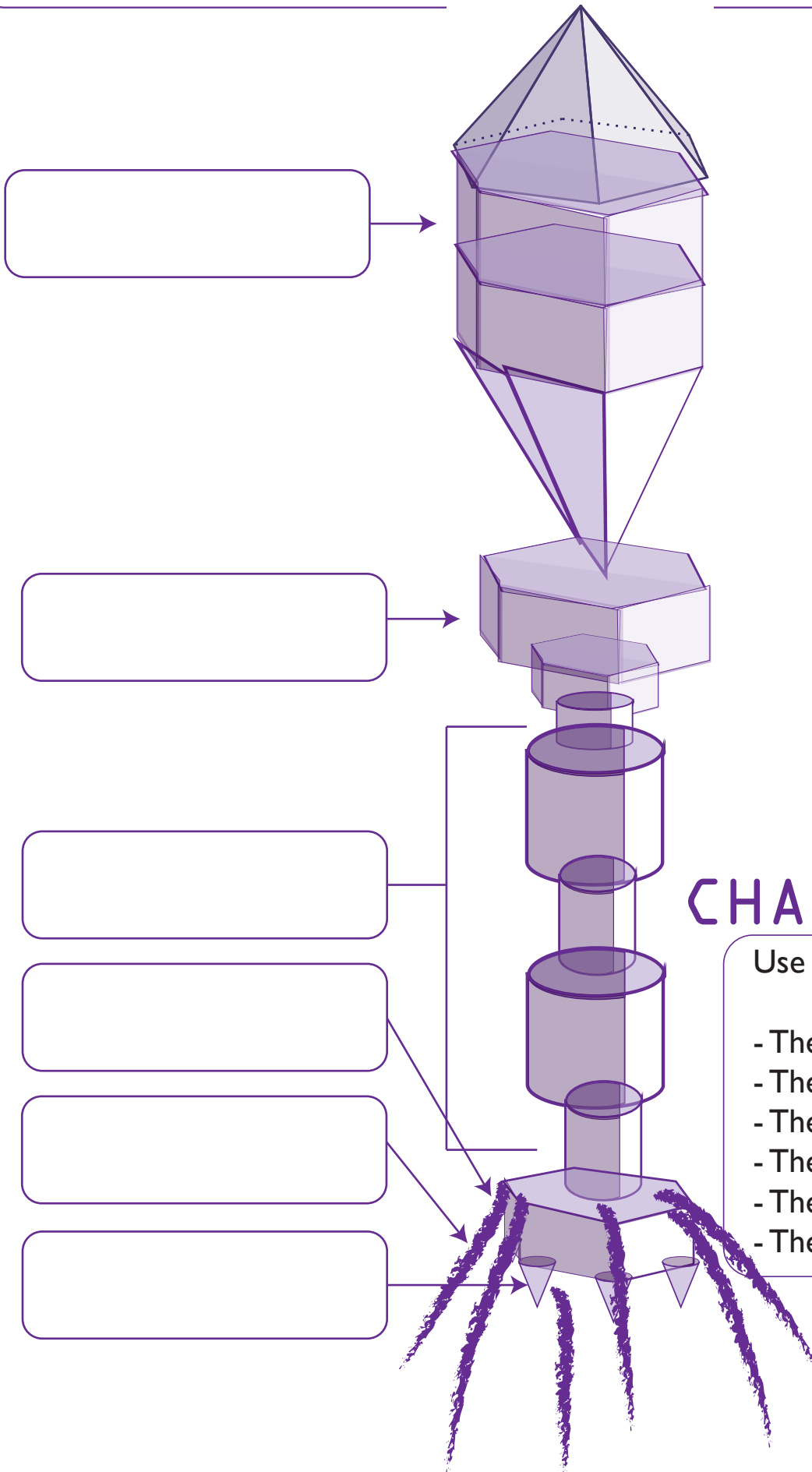
Take six Shape D's and cut them into cones. *This might be tricky - ask an adult to help you!*

Then attach each cone at each point of Shape B (the one you saved from step 2). This forms your **baseplate and spikes**, which are needed to attach your phage to its bacterial host.



5

Now Attach the Capsid, to the Collar, to the Sheath and to the Baseplate and Spikes (The phage below is shorter than yours), - attach six pipecleaners to the hexagon points between the baseplate and the sheath <<< these will form your **Tail Fibres**



CHALLENGE

Use a pen to label

- The Spikes
- The Capsid
- The Sheath
- The Collar
- The Baseplate
- The Tail Fibres

CONGRATULATIONS

..... *You have*

BUILT-A-PHAGE