**The Sensory Science HIV Capsid Couscous Project**

**Most viruses have hexagonal shapes that form their structure and make them strong enough to travel**

**The HIV capsid is the protein shell that contains viral RNA. It is capable of disassembling and then reassembling in the human immune cells, where it can then unpack its RNA**

**In this project we are using chicken wire which has a nice uniform hexagonal shape and is malleable enough to work with**

**You can get chicken wire of different sizes; in this project we chose a fairly small wire as the sculptures are small.**

**This project is an adaptation from the Protein Data Bank website, which contains a template for making a paper cut out of the Capsid**

[**https://pdb101.rcsb.org/learn/paper-models/hiv-capsid**](https://pdb101.rcsb.org/learn/paper-models/hiv-capsid)

**SAFETY FIRST:**

**Always wear protective safety glasses, gloves and use good lighting when working. Ask for assistance from a family member, friend or teacher if you need to**

**Get your materials ready**

1. **sheet of chicken wire**

**You can obtain lengths of chicken wire from most hardware stores**

**These come with different size hexagons in them**

**For this project, we chose chicken wire with smaller hexagonal shapes, as the sculptures are fairly small.**

**You will require either an A3 or A4 sized sheet (see sizes below)**

**A3** 297mm X 420mm

**or**

**A4** 210mm X 297mm

1. **A printout of the capsid template**

Choose from either A3 or A4 size, see PDF provided

When you cut out the wire to fit this shape there is no need to be exact. Use this template as a guide only, as the wire is very forgiving and malleable.

1. **rubber gloves**

Wire has sharp ends when cut. For this reason, always wear rubber gloves when working with this material.

Food handing gloves are strong enough and tight fitting to give you protection while also enabling sufficient movement with your fingers. Supermarkets also stock these gloves.

1. **Small wire cutters and pliers**

Hardware stores carry an inexpensive range of small cutters and pliers. Choose something comfortable and easy to work with**.**

1. **Good PVA glue**

Hardware stores and art shops carry a range of glues. Choose something thicker, as it needs to coat the thin wires adequately enough for a quantity of couscous to stick on to it.

1. **Couscous**

Couscous is readily available from supermarkets and specialty food stores. You will need one box for this project

You may wish to swap the couscous for black rice, semolina or other small food materials which can give a different effect

1. **Plastic plates, foil and a table to work on**

This project makes a bit of mess. Using plastic plates to pour your glue into and another for your couscous makes it easy to coat your chicken wire sculpture and throw the used materials in the bin. A big sheet of foil can make an excellent palette if you don’t have plastic plates

1. **Battery operated LED light, Christmas lights or elwire**

Major department stores, discount shops and electronic stores all carry a range of battery- operated LED lighting. Electronic stores carry battery operated elwire, which comes in a range of colours, and can be programmed to alternate colours at different tempos. Even small Christmas lights can be used for this project. It is recommended to use battery operated lighting as it is safer to use, comes in shorter lengths, and is easy to transport. The lights can be threaded into the cavity of the sculpture to mimic RNA strands.

**INSTRUCTIONS**

1. **Start with a sheet of chicken wire**

**Using your small wire cutters, carefully cut to the desired size using the provided templates as a rough guide.**

1. **With your gloves on, form the shape into a rough cylinder, from widest point to widest point.**

**Fold down the top and bottom pieces so they join the edges of the cylinder.**

**Start joining edges with you pliers.**

1. **When you are happy with the shape, roll it into a plate of PVA, then into a plate of couscous.**

**You can repeat the process for an extra thick coating**

1. **Once dry, insert a strand of LED lighting to represent the RNA of the HIV capsid**

**For this demonstration, I also cut open a portion of the chicken wire to represent the capsid breaking apart as it does when it enters the immune system**

**Use your creativity and imagination in this project, nothing has to be exact, and the wire is very forgiving. You can make all sorts of shapes and sizes to mimic the capsid, so long as it is relatively cone shaped. These sculptures are more than 1 million times magnification of the real thing, so have fun and get sensory**