Name ……

Class ……

Date ……..

Real-Life Research

THE UNIVERSITY of EDINBURGH
Easter Bush
Science Outreach Centre

Get hands-on with real-life science

ELISA MASTERCLASS: FLU FIGHTERS

We hope you enjoyed our **ELISA Masterclass: Flu Fighters workshop** and that it helped you understand the concepts you have been learning in class! This workbook will build on the foundation of the experiments you carried out and will give you some more practical experience of interpreting real data. The key concepts included in this workbook are:

Metabolism and survival

- Genetic control of metabolism

Sustainability and interdependence

- Plant and animal breeding
- Animal welfare

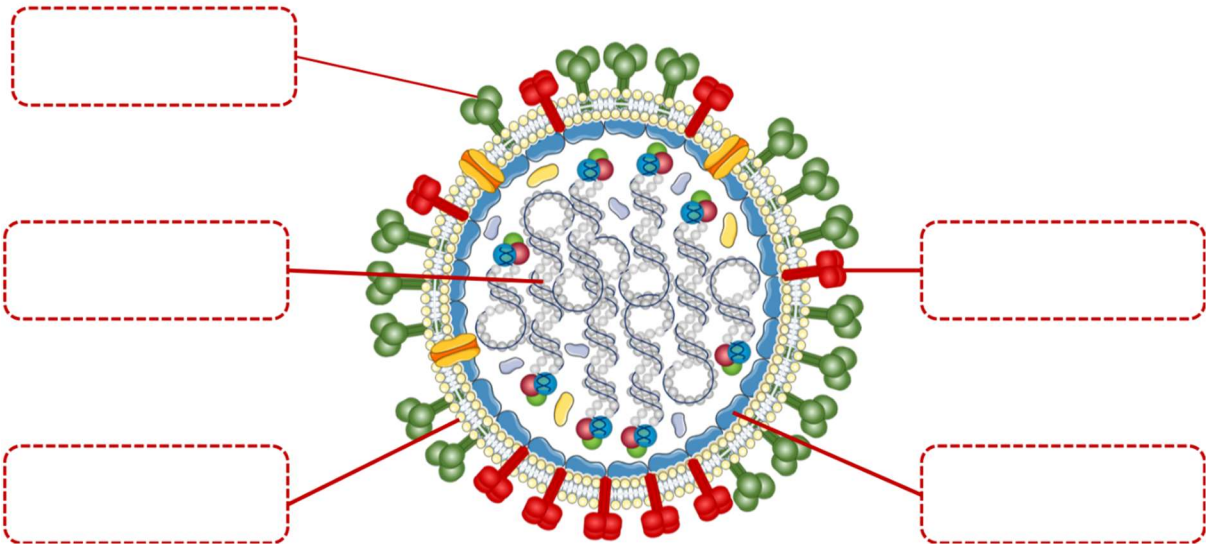
This workbook is also a good exercise if you are preparing for exams!

Viruses

1. What illness does influenza virus cause?

2. Label this influenza virus

nucleic acid (RNA) - protein coat - phospholipid bilayer (envelope) - antigen haemagglutinin (HA) - antigen neuraminidase (NA)



Lab Techniques

3. Centrifugation is a technique used to separate the components of blood. What are the three main components of blood? What do they do?

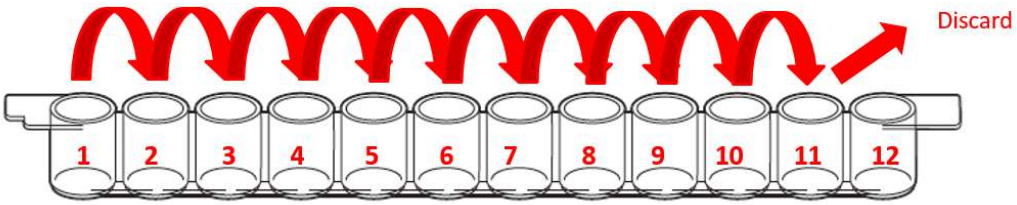
4. How does the ELISA technique work in a **sandwich ELISA** (the type of ELISA carried out in the workshop)?

5. How many antibodies did we need to use in this experiment?

6. What is an antigen?

7. Why did we add acid?

8. In the workshop you did serial dilutions to prepare your standard curve. You added 50µl of PBS to the wells #2-#12. You then added 100µl of antigen to well #1 and carried out a serial dilution from well #2-#11.



The initial concentration of antigen in well 1 is 1000ng/ml, what is the final concentration of the antigen in well #4?

9. We used PBS in this experiment. PBS is a very common salt solution used in labs. It stands for phosphate buffered saline. Usually, stock solutions are prepared at x10 and diluted to x1.

A. Complete the table below with the correct weights of the components for x10 PBS

Component	**Percentage**	**Weight**
Di-sodium hydrogen phosphate anhydrous (Na2HPO4)	50%	
Sodium dihydrogen orthophosphate monohydrate (NaH2PO4*H2O)	12%	
Sodium Chloride (NaCl)	37%	85g

B. Complete the table below to make up different concentrations of PBS using the stock solution. The first one is done for you.

PBS Concentration	**x10 PBS**	**Water**
x1	100ml	900ml
x0.25		
x0.1		