

New Zealand Blood Service Teaching Units

Level 7 Science:
Graphic organisers



nzblood.co.nz

NZBLOOD
Te Rauanga Toto O Aotearoa

A: Glossary

You will add new words and definitions as you work through the unit.

Word	Definition
analyse	Recognise and describe biological features in information and identify the information as accurate/inaccurate and biased/unbiased. Identify the purpose of the information, for example, who produced it and who is the intended audience?
analyse in-depth	Consider: <ul style="list-style-type: none">• the accuracy and bias of each biological feature• the consequences and impacts of inaccuracies and bias for the public• how vested interest is conveyed in information
antibodies	
antigens	
bias	
biological validity	The scientific accuracy of information that is used in an unbiased way to convey a biological idea.
blood types	
comprehensively analyse	Prioritise, with reasons, aspects of the information in relation to their significance in the context. Evaluate the overall impact of the article or website on the public, based on the bias and the balance of accurate and inaccurate features.
haemovigilance	
plasma	
platelets	
red blood cells	
Rh typing (previously called rhesus typing)	
white blood cells	
valid	

B: Timeline Information

Date	Event	Why Important	Scientific/Social

C: Composition of blood

Blood component	Structure <i>For example, size, shape, what it is made of....</i>	Function	Percentage of whole blood
Red blood cells			
White blood cells			
Platelets			
Plasma			

D: Website reliability checklist

URL (website address):				
Date accessed:				
Validity:				
Is the personal author of the site identified? What are their credentials/qualifications?				
Is contact information provided? (The author should be accountable for her/his work.)				
Does the site allow messages and feedback to be posted?				
When was the site first created and last updated? (A site's longevity is a clue to its stability; a reliable site is frequently revised and improved.)				
Content:				
What is the depth and breadth of the information offered?				
Are there links to other useful and reliable sites?				
Does the advertising overpower the content?				
Has the author referenced the sources used?				
Purpose:				
What is the major domain of the URL? What could that imply? (.com = commercial/ .edu = education/ .org = non-profit organisation/ .gov(t) = government). Is this site trying to persuade you? Educate you? Market a product?				
Are there any biases (only one side of the argument) that might be being promoted, such as racial, gender, religious or other types?				

(Adapted from https://www.ercsd.org/cms/lib/NY02205564/Centricity/Domain/990/Website_Evaluation_Checklist.pdf)

E: Retrieval chart – Karl Landsteiner

Scientific information	Other information

F: Inheritance of blood types

Blood is made up of:	Diagram of Type A blood	Diagram of Type B blood	An allele is:
Antigens are: They are found:	Diagram of Type AB blood	Diagram of Type O blood	How many alleles code for enzymes that determine the ABO blood type?
Co-dominance means:	Draw a table showing blood types of children from parents	What happens when an incorrect blood type is given?	Explain why Type O-negative is the universal donor

G: Blood typing experiment results

Sample	Reaction with anti-A antibody	Reaction with anti-B antibody	Blood type
A			
B			
AB			
O			
Sample W			
Sample X			
Sample Y			
Sample Z			

Conclusion:

H: Four ways to donate blood

Type of donation	How it works	Advantages	Disadvantages	Used to treat	Other
1.					
2.					
3.					
4.					

I: Why people need blood

Disorder	How do blood transfusions help?	What other treatments are available?	How much blood is needed?	What percentage of NZ blood is used for this treatment?

J: Reasons people cannot give blood

Reasons not to give blood	Justification for reason
1.	
2.	
3.	
4.	
5.	
6.	

K: Adverse effects of transfusion

Adverse Effect	Frequency	Symptoms	Treatment – if applicable	What does NZBS do to avoid this complication?	When is risking this effect justified?

Teacher factsheet: Blood typing experiment

Aim: To identify unknown blood types using antisera (anti-A and anti-B antibody).

Give students four known “blood” samples (A, B, AB and O, created from the recipes below) and six unknown “blood” samples. Students are to use the known blood samples and their reactions with antisera to identify the unknown blood samples.

Recipes for the reagents in the blood typing experiment.

- **Blood group A** = 0.5M NaCl (2.9g/100mL) + red food colour
- **Blood group B** – 0.1M barium nitrate (2.6g/100mL water) + red food colour
- **Blood group AB** = equal amounts of above solutions
- **Blood group O** = water + red food colour
- **Antisera A** = 0.1M silver nitrate (1.7g/100mL water)
- **Antisera B** = 5% sodium silicate (5.0g/100mL water)

Put the fake blood in unlabelled beakers and label W, X, Y and Z. (Keep note of which beaker contains which type.)

Test the bloods with antisera A and B to find the blood type of each sample.

- The test result is positive if a solid forms when the antisera is mixed with the blood.
- The test result is negative if no solid forms when the antisera is mixed with the blood.

Method:

1. Put 1mL of the blood from blood group A into two test tubes.
2. Add 5 drops of antisera A to one test tube and observe what happens.
3. Add 5 drops of antisera B to the other test tube and observe what happens.
4. Write these results into your results table (graphic organiser G).
5. Repeat with the other known blood types so that you know what happens with each blood type.
6. Now repeat with the unknown blood samples (from beakers W, X, Y and Z) to identify the blood type of each sample.
7. Record the results on your results table (graphic organiser G).

Conclusion:

1. Identify what the unknown blood samples are.
2. Using your results, construct a table to illustrate which blood types can be successfully transfused into which blood types.
3. Use your table to explain why O is known as the universal donor.
4. Find out the meanings of antigen and antibody. Use this and what you have learned from the experiment to explain what happens when someone is given incompatible blood.