

A bloody investigation - make your own blood!

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Year group

I initially did this with a year 6 class as a reminder and recap on the circulatory system. It could be done as a standalone or a focus on keeping healthy and ensuring you keep your body in a fit state to maintain the health of blood and ensure it does the required job. It can be used as an assessment activity or a group work activity.

Cross curricular links

- Maths: Measuring out the required ingredients.
- English (follow up activity): Write a report of the investigation using relevant scientific vocabulary.
- ICT (follow up activity): produce a presentation of the investigation.

Learning objective

Year 6: Animals including humans- "Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood." (National curriculum.)

Resources

- **Newspaper** to cover the desks as red food colouring often stains.
- **Plastic protective gloves** for the children.
- **Small plastic bottles**, if children are making one themselves or working in a pair.
- **Larger bottles** if needed if working in a group of 4 or more.
- **Measuring jugs or measuring cylinders.**
- **Pipettes.**
- **Pictures of main components of blood**, labelled if need to differentiate, description of the function of the main components of blood and the percentage of these in the blood, again, differentiated by leaving some words out or writing a full description. These can be a mixture if your children are working in mixed ability group.
- **Water.**
- **Yellow food colouring** to create the colour of plasma. It is worth investing in school catalogue food colouring as supermarket ones can be weaker.
- **Bottle of red food colouring.**
- **A pinch of salt**, this represents the minerals and chemicals present in the blood. (For an extension the high ability child could research what chemicals these are.) Pinch of salt can be changed to an identified weight, reinforcing the link between maths and science.
- **Small white marshmallows** - available from most supermarkets and used to represent the white blood cells, approx. 10 each bottle.
- **Small purple pompoms** - to act as platelets -See above for quantity.
- **Cheerio type cereals**, about a bowl full,
- **Large strong zip plastic bag.**
- **Sticky labels** for use when blood is complete in the plastic bottles. (optional)

Working scientifically (from national curriculum statutory requirements)

- Planning different types of scientific enquiries to answer questions, including recognising variables where necessary.
- Taking measurements, using scientific equipment, with increasing accuracy and precision, taking repeat readings where necessary (for example calculating the percentage of materials needed using the information cards to be matched)
- Using test results to make predictions to set up further comparative and fair tests.
- Reporting and presenting findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
- Identifying scientific evidence that has been used to support or refute ideas or arguments.

Length of activity

This is a session that can take as long or as short as you want. You can leave out the matching activity for another session to shorten the investigation. When I completed it, it took approximately 90 minutes.

Questions for children

- What is the role and function of all the components of the blood?
- What role does the blood have in the circulatory system?
- Why has the plasma changed colour and what does this tell us about red blood cells?
- How does blood contribute to a healthy lifestyle?
- What percentage of each component is in blood? (Emphasise cross-curricular link to Maths)
- What are the chemicals and minerals found in the blood?

Expected outcomes

- Children will recognise and understand the role of blood and its various components in relation to the human circulatory system.
- Children will be able to name and recognise the function of red and white blood cells, plasma, minerals and platelets.
- Children will recognise the role of blood in the heart and blood vessels.
- Children will understand the importance of blood in keeping healthy and maintaining a healthy lifestyle and how drugs and medication can have an impact on blood carrying out its function.

Possible misconceptions

- All the components of blood are equal in their quantity in blood.
- Plasma is red.
- Red and white blood cells do the same job.
- Underestimating the role of blood in the functioning of the circulatory system.
- That diet, drugs, medication and leading a healthy lifestyle is irrelevant in maintaining healthy blood

Step by step instructions

Step One

It is recommended that you go through this yourself first, assessing what maths you will use and any extensions you will ask your children to do. It is a good opportunity to test the strength of the food colouring for example, when I did my run through, I found I needed more drops of food colouring. The children do the matching activity in their book or floor book. Working as a mixed ability group is a productive way to get the children discussing. If this is done on large sheets of paper it can be used as a display afterwards.

Step Two

Ensure tables or work surfaces are covered with newspaper or protective material and measure out the appropriate water for the bottle-different amounts for different sized bottles. Each bottle should be one third full. If you have chosen to work out the amount using percentages, this can be done here.

Step Three

Add the yellow food colouring using the pipettes. Add the salt. If you have chosen to undertake the extension activity, the group should report back to the class about what chemicals and minerals the salt represents.

Step Four

Recap the role and function of plasma in the blood.

Step Five

Pour the cereal into the large plastic bag and add the whole bottle of red food colouring, ensuring the pupils are wearing protective gloves and the tables are covered. Ask the pupils to recap over the role and amount of red blood cells in blood, again using any maths you have calculated.

Step Six

Add the red blood cells into the bottle. Have a discussion about why the plasma has changed colour?

Step Seven

Add the white marshmallows and purple pompoms using any calculations made that show the ratio of white cells in the blood. The children should be discussing the number of white cells and platelets in blood compared to the amount of red blood cells. This is a good time to embed the role and function of white blood cells and platelets in the blood.

Step Eight

Allow pupils to mix the components up. Pupils should label the components of the blood and display on the bottle.