



## Primary Activities Booklet

## Components of the blood

### Challenge

Today's challenge is to research the different components of the blood (red blood cells, white blood cells, platelets and plasma). You will also create a model of the blood.

### Resources needed

To research the various components of the blood

- Books /Computer
- Blood components template sheet

To make the model of the blood

- Clear sealable bag
- Marshmallows (White blood cells)
- Small red jellies (Red blood cells)
- Sprinkles (Platelets)
- Syrup (Plasma)

Note: The model can be easily made with anything you find in your house, the above resources are just an idea 😊

### Background

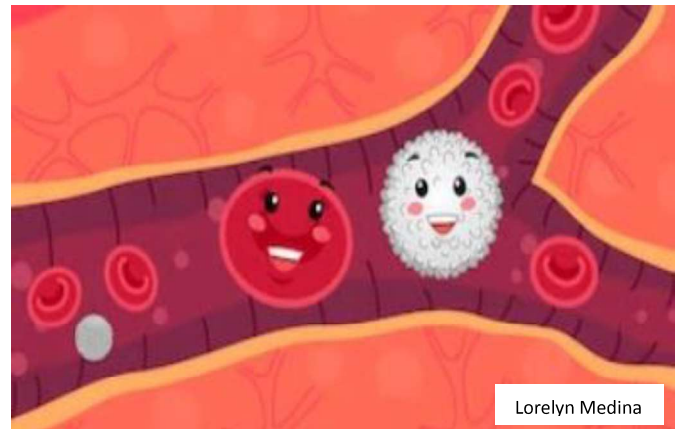
The blood is made up of four main parts

Red Blood cells- carry oxygen and carbon dioxide around the body

White blood cells- help fight diseases

Platelets- Helps the blood to clot and to repair cuts

Plasma-This is the liquid part of the blood



Lorelyn Medina

### Method

#### For research

- Research what each component of the blood looks like
- Draw each on the template provided.
- Write a little bio for each of the parts, explaining what they do and why they're so important to the body.
- Find out what % the cells make up and what % the plasma makes up. This will help you with making your model.

#### For the model

- Place the red blood cells, platelets, and white blood cells in the clear bag. Once the cells are added, place in the plasma. From your research, you should now know the % of each that should be added. Seal the bag and squish it around 😊

## Components of the blood

In the boxes draw a picture of each component. Write a bio of each part including any interesting facts that you find.

**Red Blood Cell**

**White Blood cell**

**Platelets**

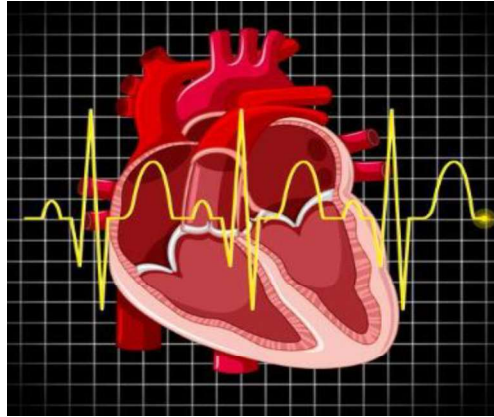
**Plasma**

## Heart Rate activity

### Challenge

Did you know that your heart beats about 115,000 times each day! And the heart pumps about 7,600 litres of blood per day! This is vital so that all your organs get the oxygen they need to work 😊

In this challenge you will be measuring your own heart rate during rest, light activity and intense activity.



<https://www.vecteezy.com/vector-art/432012-human-heart-and-graph-show-heartbeats>

### Resources needed

- Stopwatch
- Crayons/ pencil
- Ruler
- Paper

### Method

To check your pulse, place your first two fingers either gently on your wrist or below your jaw. If you cannot locate your pulse, ask a grown up to help you.

1. Sitting still, count the number of pulses for 1 minute. The stopwatch can be used to record the time. Note the number of pulses per minute on the table provided.
2. Walk around your house or garden for 1 minute. Immediately after this count the number of pulses again per minute. Note this down on the table.
3. Next, run in the same place for 1 minute. Immediately after this count the number of pulses again per minute. Note this down on the table.
4. With your data collected, draw a bar chart to show the difference in beats per minute. Use different colours for each of the bars (sitting, walking and running)

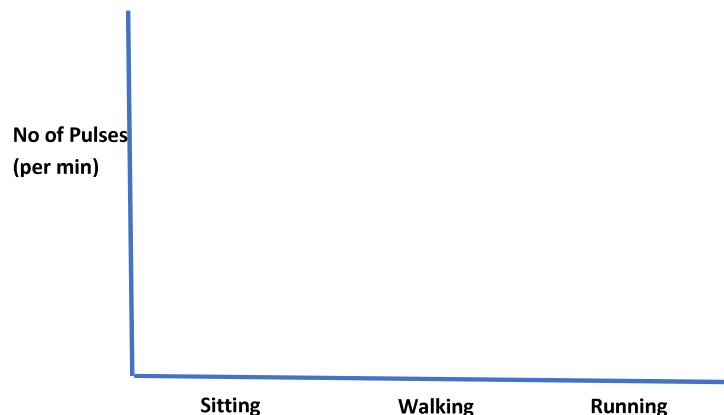
### Extension

Why do you think your heart rate increased during exercise compared to when you were at rest?

- When you have your heart rate recorded, why not try to record each of your family's heart rate!
- Make a new table and graph to represent you and your families heart rate.
- Did the heart rate differ? Can you work out the % difference? Why do you think there was such a difference?

### Results

Exercise	No. Of pulses (per min)
Sitting Still	
Walking	
Running	



## Lemon Volcano

### Background

Acids and bases are found everywhere in our daily lives. You may even drink these acids such as lemon juice or orange juice! Acids will have a sour taste. There are very strong acids that you can find in the laboratory such as hydrochloric acid. This acid is also found in your stomach!

Everyday bases include baking soda and soap, and they have a bitter taste (although I don't advise that you try tasting them!).

When an acid and base are combined, they undergo a chemical reaction.

### Resources needed

- Lemon
- Baking Soda
- Food colours
- Washing up Liquid
- Baking tray
- Spoon

### The Science behind the reaction

The lemon contains citric acid, which is a weak acid. The baking soda is a base. When the two are brought together it forms a chemical reaction. The lemon juice reacts with the baking soda to form a gas called carbon dioxide. It's this fizzing carbon dioxide that allows the bubbles that you see to form, mixing the food colours together. The washing up liquid helps to create even bigger bubbles.

### Method

(Make sure an adult is present when carrying out the experiment. No part of this experiment is meant to be edible)

1. Cut the lemon in half. Use the spoon to place deep dents in the cut lemon (this will help the reaction progress.)
2. Add some of the food colouring to the lemon. To make a colourful reaction add more than one colour.
3. Add some washing up liquid to the lemon
4. Finally place a good helping of baking soda onto the lemon

Tip: Use the juice from the other half of the lemon for a bigger reaction.

### Extension

Why not try this experiment with several other citrus fruits to see if there is a more reactive fruit 😊

You can create a table to compare how the various fruits differ in the amount of fizz and bubbles they make.



## Cabbage pH Indicator

### Why Red Cabbage

Red cabbage contains a water-soluble pigment called anthocyanin that changes colour when it is mixed with an acid or a base.



### Resources needed

- Lemon
- Baking Soda
- Red Cabbage
- Small containers/ glasses

### Extension

Research what the pH scale is. Make your own drawing of the pH scale. Add in various items on the scale that are either acidic or basic.

### Method

Make sure an adult is present when carrying out the experiment. No part of this experiment is meant to be edible

#### Making the indicator

1. Cut the red cabbage into small pieces.
2. Place the small pieces into a pot, add some water and boil for 5 minutes. After 5 mins of boiling, cover the pot and leave it rest for 30-40 mins.
3. Place the cooled indicator liquid into the small containers

#### To test

1. Cut the lemon in half. Squeeze the lemon juice into the container. Note what colour it changes in the table below.
2. To another container add some baking soda. Note what colour it changes in the table below
3. Why not try other items to test whether their acidic or basic (hint: look up the pH scale to get some ideas on what to test)

### Results

Item	Colour Change	Acid or Base

What was the strongest acid and strongest base?



## Mover Challenge

### Challenge

Today you will work with a marble and various other resources. Your challenge is to get the marble from one part of the room to the next with the following rules

1. The marble cannot touch the ground
2. The marble cannot be moved across the room by a person (i.e. throwing)
3. You can only use the materials supplied

### Resources needed

- Sheet of cardboard
- 1 marble
- Masking tape
- String
- Balloons
- Large/small rubber bands
- 2 paper clips
- Scissors
- Piece of cloth
- 2 straws

### Method

Create a plan that would allow the marble to be moved across the room.

Try to be as creative as possible and use all of the resources.

If your first attempt does not work out, revisit your plan and see what you could improve.



<https://webstockreview.net/explore/marbles-clipart-cartoon/>

### Results

- What worked well in the challenge?
  
- How could you potentially upscale this? What materials would you use?