

VOYAGES
ON THE...

M * I * C * R * O * S * U * B

DISCOVERY

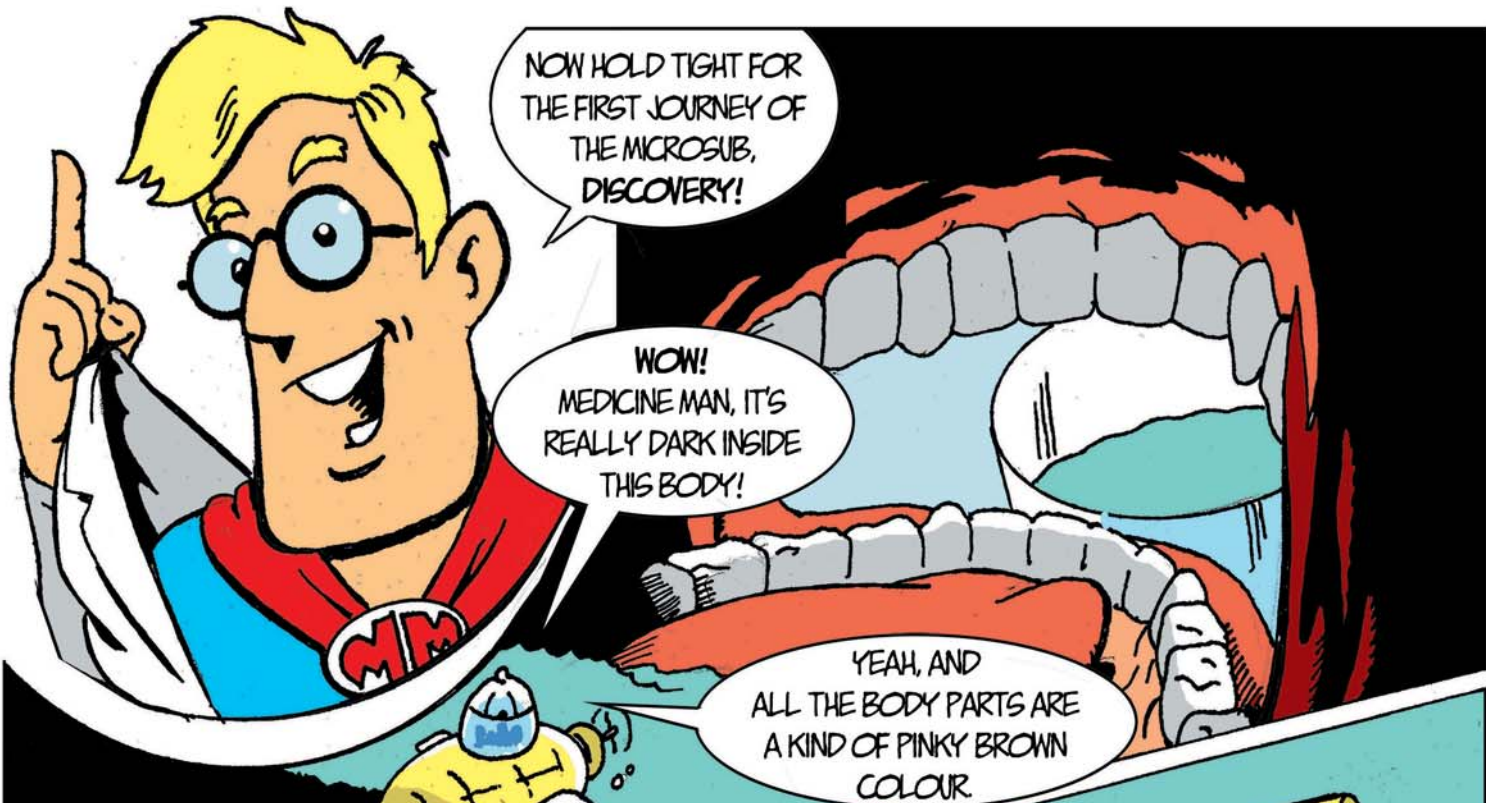
YOUR MISSION - TO EXPLORE THE FAR REACHES OF THE BODY!!

HI, I'M MEDICINE MAN. I'M GOING TO TAKE YOU ON
A SPECIAL JOURNEY AROUND YOUR BODY
WITH MY TWO FRIENDS
SOPHIE AND GARY.

WE'RE GOING TO CONCENTRATE
ON BLOOD BECAUSE BLOOD IS
THE BODY'S MAIN LIFE SUPPORT.
IT CARRIES OXYGEN BREATHED
IN THROUGH THE LUNGS TOGETHER WITH
FOOD TO NOURISH THE BODY.

DIVE!
DIVE!
DIVE!

10...9...8...7...6...5...4...3...2...1...

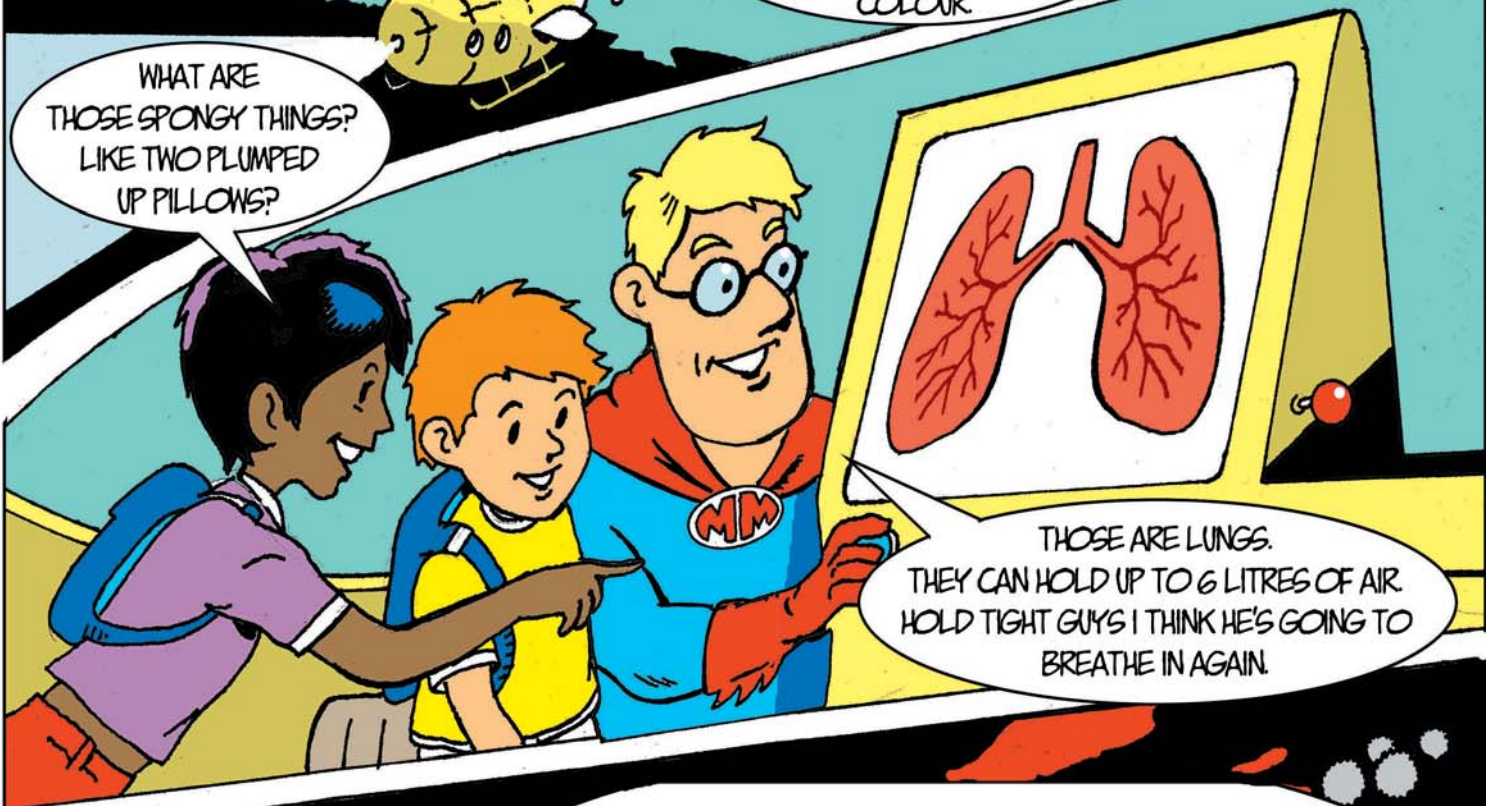


NOW HOLD TIGHT FOR
THE FIRST JOURNEY OF
THE MICROSUB,
DISCOVERY!

WOW!
MEDICINE MAN, IT'S
REALLY DARK INSIDE
THIS BODY!

YEAH, AND
ALL THE BODY PARTS ARE
A KIND OF PINKY BROWN
COLOUR.

WHAT ARE
THOSE SPONGY THINGS?
LIKE TWO PLUMPED
UP PILLOWS?



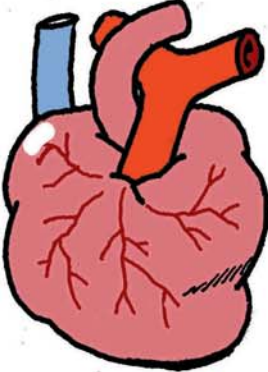
THOSE ARE LUNGS.
THEY CAN HOLD UP TO 6 LITRES OF AIR.
HOLD TIGHT GUYS I THINK HE'S GOING TO
BREATHE IN AGAIN.

WOOSH!

WHEN YOU GO TO THE DOCTOR HE TELLS YOU TO
BREATHE IN AND OUT THEN PUTS A STETHOSCOPE ON YOUR CHEST
TO HEAR HOW WELL YOU ARE BREATHING. WHEN WE BREATHE IN OUR
LUNGS FILL UP WITH AIR WHICH CONTAINS SOMETHING VERY
IMPORTANT CALLED OXYGEN THAT WE NEED TO KEEP US ALIVE.
OXYGEN GOES INTO OUR BLOOD.

THE LUNGS ARE IN
YOUR CHEST AREN'T THEY
MEDICINE MAN? BUT WHAT'S THAT
RESTING IN THAT HOLLOW AGAINST
THE LEFT LUNG?

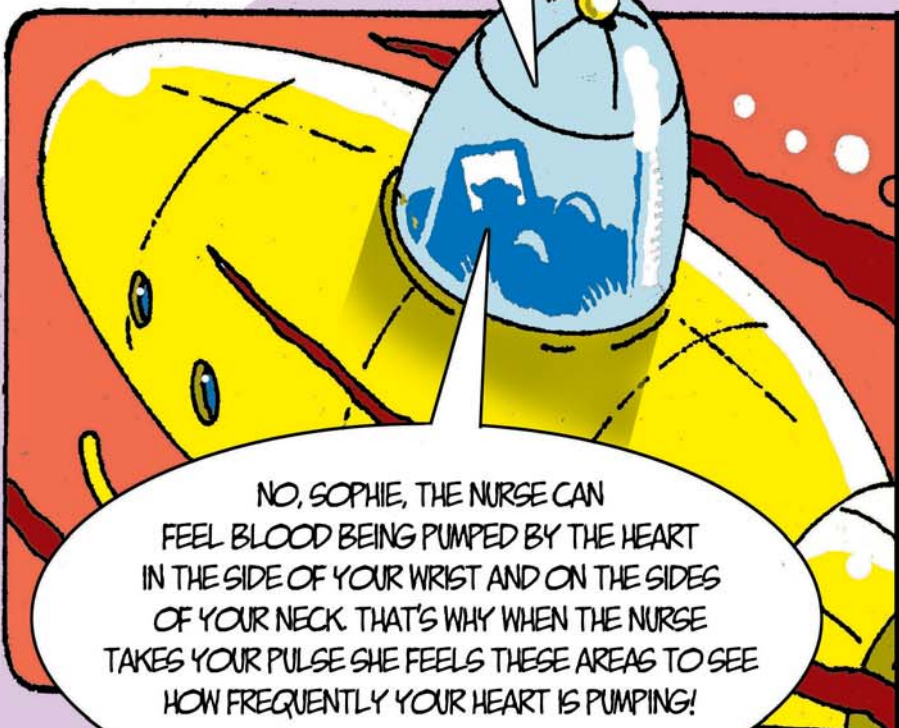
MICROSUB LOG- LUNG FACT
YOUR LUNGS HAVE 750 MILLION LITTLE
TUBES AND CAPSULES. IF THESE WERE
LAID OUT FLAT THEY WOULD COVER AN
ENTIRE TENNIS COURT



THAT BIG MUSCLE IS CALLED THE HEART AND IT PUMPS BLOOD AROUND THE BODY IN ONE MINUTE FLAT. IN YOUR LIFETIME IT BEATS 4 BILLION TIMES AND PUMPS OVER 300 MILLION LITRES OF BLOOD... ENOUGH TO FILL 5000 SWIMMING POOLS



I ALWAYS THOUGHT IT WAS HEART SHAPED



YOUR HEART ISN'T THE ONLY PART OF YOUR BODY THAT BEATS, IS IT MEDICINE MAN?



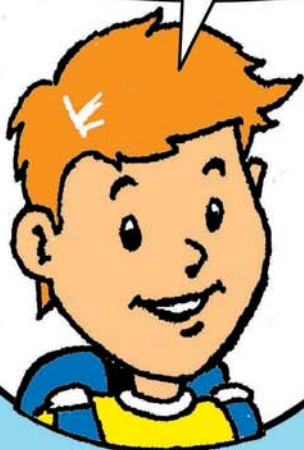
NO, IT'S ACTUALLY A SORT OF BLOB SHAPE WITH FOUR BIG BLOOD VESSELS HANGING OUT OF THE TOP AND IT NEVER STOPS BEATING, EVEN WHEN YOU'RE ASLEEP.

NO, SOPHIE, THE NURSE CAN FEEL BLOOD BEING PUMPED BY THE HEART IN THE SIDE OF YOUR WRIST AND ON THE SIDES OF YOUR NECK. THAT'S WHY WHEN THE NURSE TAKES YOUR PULSE SHE FEELS THESE AREAS TO SEE HOW FREQUENTLY YOUR HEART IS PUMPING!

MICROSUB LOG- BLOOD FACT

ONE TINY DROP OF BLOOD CONTAINS THREE SUPER HEROES... 7000 WHITE CELLS THAT FIGHT OFF ANY GERMS THAT GET INSIDE YOUR BODY... 50,000 PLATELETS- LIKE LITTLE ELVES WHO STOP BLEEDING BY LOCKING THEIR ARMS TOGETHER TO PLUG THE HOLES IN YOUR BLOOD VESSELS, AND 5 MILLION RED BLOOD CELLS THAT CARRY OXYGEN AROUND YOUR BODY

MY DAD SAYS THAT
BLOOD FLOWING ROUND THE BODY IS
CALLED CIRCULATION...



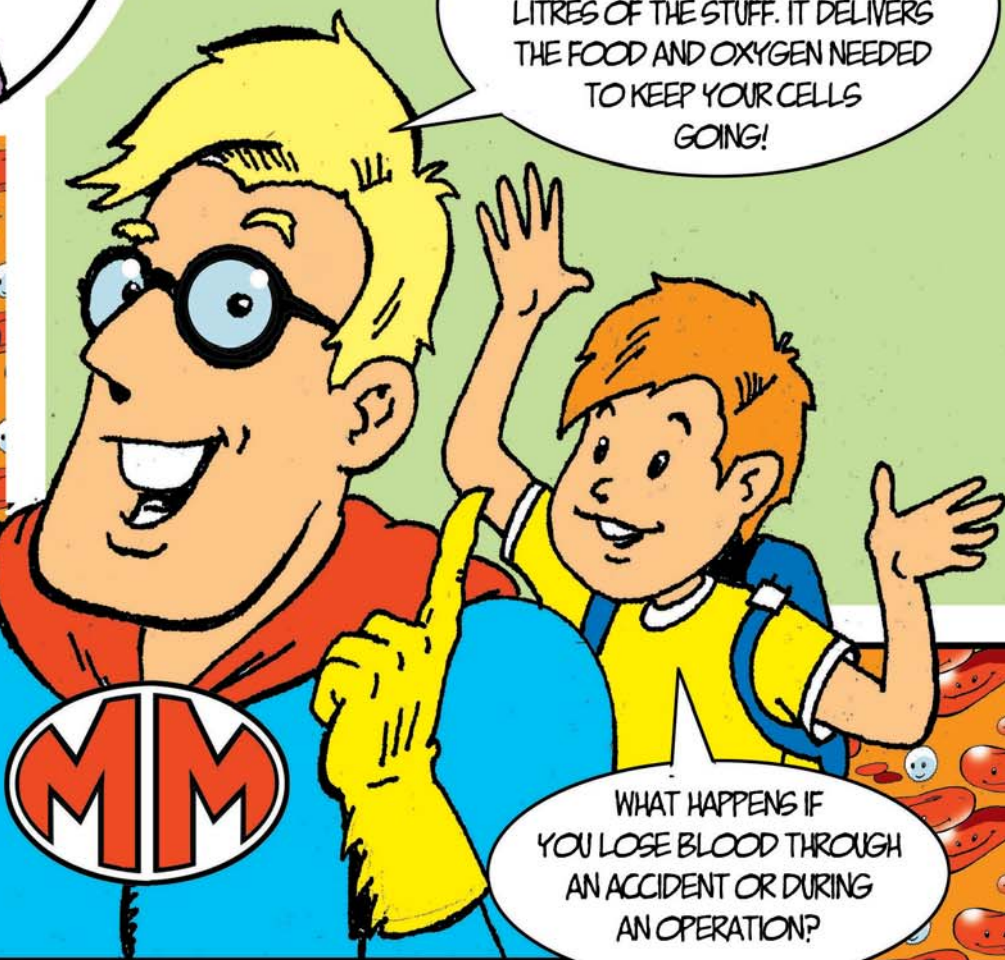
HE'S RIGHT GARY... THERE ARE TWO
MAIN KINDS OF BLOOD VESSEL... ARTERIES
THAT CARRY BLOOD FILLED WITH OXYGEN,
AND VEINS THAT CARRY BLOOD FILLED
WITH CARBON DIOXIDE AND OTHER
WASTE MATERIAL



TELL US
MORE ABOUT BLOOD,
MEDICINE MAN



BLOOD IS VITAL
IN ORDER FOR YOU TO LIVE
AND YOUR BODY CONTAINS FIVE
LITRES OF THE STUFF. IT DELIVERS
THE FOOD AND OXYGEN NEEDED
TO KEEP YOUR CELLS
GOING!



WHAT HAPPENS IF
YOU LOSE BLOOD THROUGH
AN ACCIDENT OR DURING
AN OPERATION?

YOU CAN LOSE ONE THIRD OF YOUR BLOOD WITHOUT HARM BUT IF YOU LOSE HALF OF YOUR BLOOD YOU'D BE VERY ILL

BLOOD ISN'T REALLY RED, IT'S YELLOW WITH RED BITS FLOATING IN IT. THE YELLOW STUFF IS CALLED PLASMA AND IS 90% WATER AND 10% CHEMICALS SUCH AS MOLECULES AND MINERALS THAT YOUR CELLS REQUIRE IN ORDER TO STAY HEALTHY

WHAT ARE THOSE RED AND WHITE THINGS OVER THERE MEDICINE MAN?

MICROSUB LOG - BLOOD FACT
YOUR BODY CONTAINS ABOUT 100,000 KILOMETRES OF BLOOD VESSELS. IF YOU LAID THEM END TO END THEY WOULD CIRCLE THE EARTH TWICE!

OH, THEY'RE TWO SUPERHEROES THAT YOUR BODY CAN'T DO WITHOUT. THE RED BLOOD CELLS CARRY OXYGEN AND GIVE THE BLOOD ITS RED COLOUR AND THE WHITE CELLS HELP TO DEFEND YOUR BODY AGAINST GERMS

MICROSUB LOG BLOOD FACT
IN ONE DAY YOUR HEART PUMPS ENOUGH BLOOD TO FILL A 10,000 LITRE TANKER!

I THINK WE'RE UNDER ATTACK... SOMETHING IS ATTACKING THE BODY!!

I'M SCARED!

DON'T WORRY ABOUT THEM... THAT'S BARON BACTERIA, VERY VICIOUS VIRUS AND THE GRUESOME GERMS. THEY'RE TRYING TO GIVE THE BODY AN INFECTION BUT THERE'S PLENTY OF WHITE CELLS BETWEEN HIM AND THE VIRUS TO HELP FIGHT THEM OFF!

LOOK SOPHIE...

MICROSUB LOG BLOOD FACT

BLOOD IS FOUR TIMES THICKER THAN WATER!!!



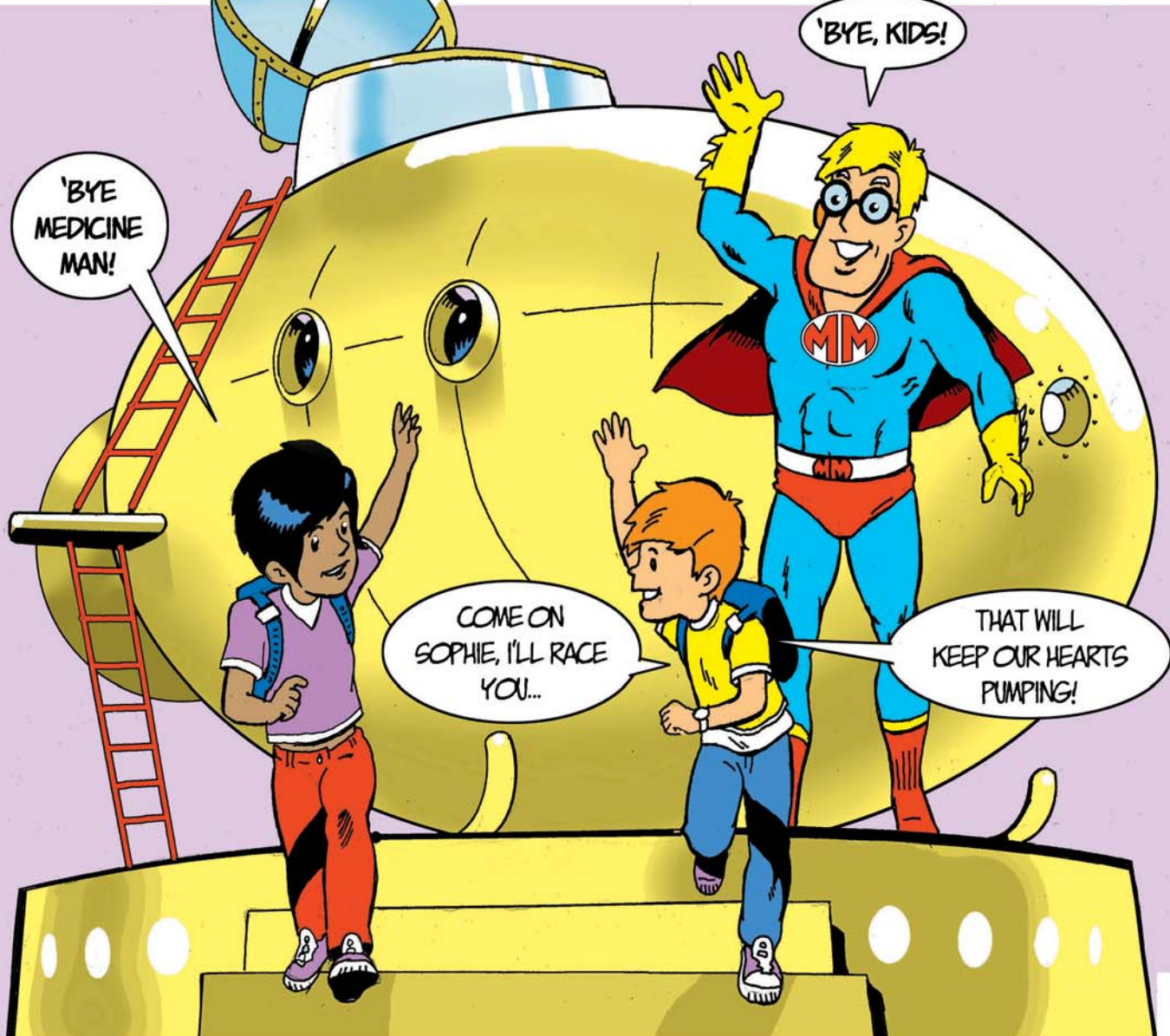
LOOK... THE WHITE CELL IS STICKING TO BARON BACTERIA AND SURROUNDING HIM AND THE VIRUS AND ALL THE GERMS HAVE BEEN SWALLOWED UP!

NEVER FEAR... THE WHITE CELLS ARE HERE. DURING AN INFECTION, SPECIAL WHITE BLOOD CELLS KILL GERMS BY PRODUCING LITTLE HELPERS CALLED ANTIBODIES...

ANTIBODIES REMEMBER ALL THE DIRTY TRICKS THAT THE GERMS PLAYED ON YOUR BODY IN THE PAST AND THEY STAY IN YOUR BODY TO STOP THE SAME GERMS FROM ATTACKING AGAIN!!

PHEW, THAT WAS CLOSE... I ALSO LEARNED AT SCHOOL THAT PLENTY OF EXERCISE, SLEEP AND HEALTHY EATING CAN HELP FIGHT BACTERIA AS WELL...

ABSOLUTELY RIGHT! TALKING OF SLEEP AND REST... OUR JOURNEY THROUGH THE BODY IS ALMOST OVER. THANKS FOR COMING ABOARD MICROSUB DISCOVERY...



RECEIVING A **BLOOD TRANSFUSION**



HI. I'M
NURSE
NICKY!

THERE ARE LOTS OF REASONS WHY CHILDREN JUST LIKE YOU NEED EXTRA BLOOD. YOUR BODY IS FILLED FROM TOP TO TOE WITH BLOOD BUT FOR DIFFERENT REASONS YOU MAY NEED A TOP UP. THIS TOP UP IS CALLED A **BLOOD TRANSFUSION** ...AND NOW MEET TWO OF MY BRAVE FRIENDS WHO NEEDED A BLOOD TRANSFUSION.

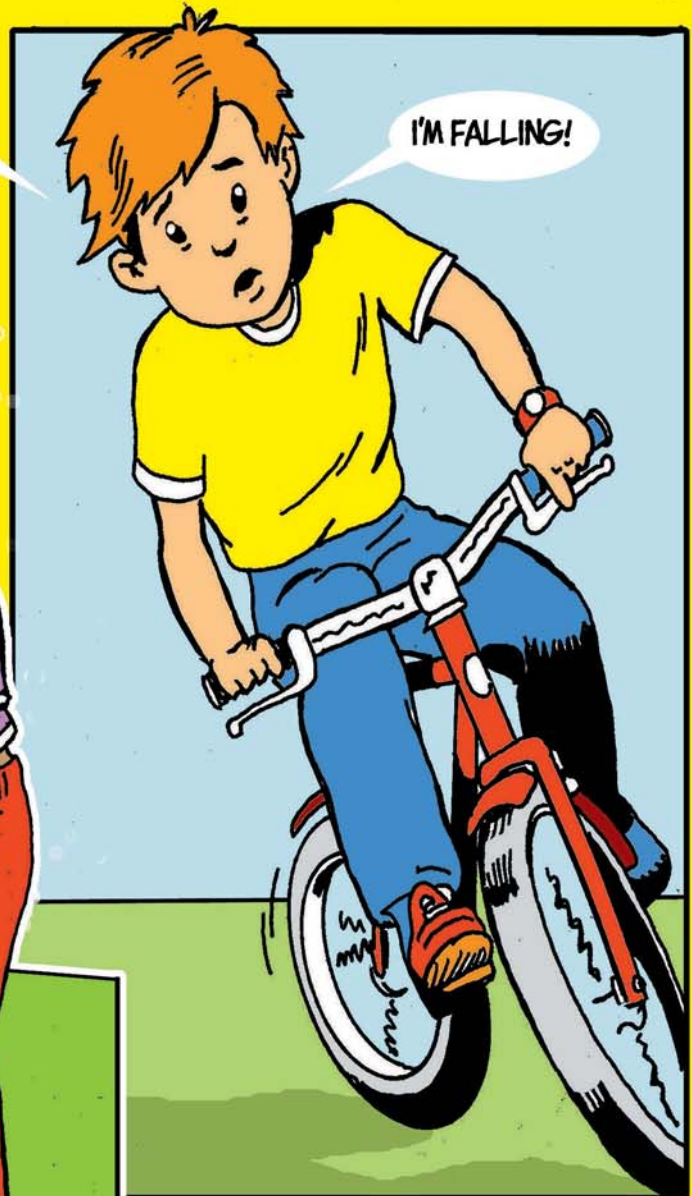
REMEMBER GARY? HE LOVES RIDING HIS BIKE, PLAYING IN THE PARK AND COMPUTERS. HIS FAVOURITE FOOD IS SAUSAGES AND MASH WITH TOMATO SAUCE. GARY FELL OFF HIS BIKE AND LOST A LOT OF BLOOD. THE BLOOD WAS REPLACED BY GIVING HIM A BLOOD TRANSFUSION.

THIS IS SOPHIE. SHE LOVES POP MUSIC, DANCING, WATCHING CARTOONS AND NETBALL. SOPHIE HAD SOMETHING CALLED **ANAEMIA** WHICH MEANS HER BODY DIDN'T HAVE ENOUGH RED BLOOD CELLS TO CARRY OXYGEN TO HER BODY TISSUES TO KEEP THEM HEALTHY. BECAUSE OF THIS SHE FELT TIRED AND BREATHLESS. A BLOOD TRANSFUSION MADE HER FEEL MUCH BETTER.

GASP!
CAN'T BREATHE
PROPERLY...



OOOER!



I'M FALLING!



BEFORE YOU ARE GIVEN A BLOOD TRANSFUSION, A SMALL SAMPLE OF BLOOD WILL BE TAKEN FROM A VEIN IN YOUR ARM. THIS IS TO FIND OUT WHAT BLOOD GROUP YOU ARE. ONCE THEY KNOW YOUR BLOOD GROUP, THEY ARE READY TO GIVE YOU A TRANSFUSION.



MANY OTHER CHILDREN WHO ARE RECOVERING FROM ILLNESS, ACCIDENT OR INJURY MAY ALSO NEED BLOOD TRANSFUSIONS.



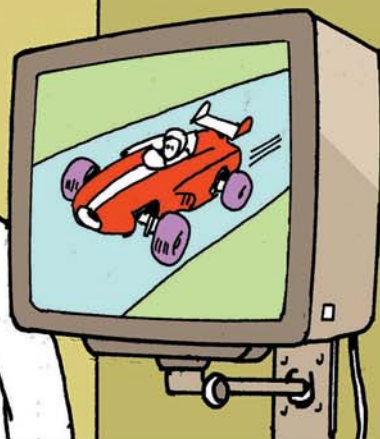
THERE ARE MANY DIFFERENT BLOOD GROUPS. THE MAIN ONES ARE A, B, AB & O AND EACH ONE OF THESE IS EITHER RH POSITIVE OR NEGATIVE. SO THAT'S EIGHT IN TOTAL.



EVERY TIME YOU NEED BLOOD THE NURSE OR DOCTOR WILL ASK YOU YOUR NAME AND BIRTHDAY SO THEY CAN CROSS CHECK YOUR ANSWER WITH YOUR WRIST BAND AND THE LABEL ON THE BLOOD YOU ARE TO RECEIVE. THIS MIGHT SEEM SILLY IF THEY ALREADY KNOW YOU BUT THEY ARE TRAINED TO DO IT THIS WAY TO ENSURE THAT YOU GET THE RIGHT BLOOD. YOU CAN HELP BY REMINDING THEM TO ASK IF THEY FORGET.



THE NURSE WILL THEN ATTACH A PLASTIC TUBE TO THE BAG OF BLOOD AND THEN FIX THIS INTO A TUBE IN YOUR ARM. AT FIRST THE BLOOD MAY FEEL A BIT COLD AS IT DRIPS INTO YOUR ARM. YOU MAY BE ATTACHED TO THIS TUBING FOR A FEW HOURS, BUT DON'T WORRY YOU'LL STILL BE ABLE TO DO THINGS.



A NURSE LIKE ME WILL BE AROUND AT ALL TIMES TO KEEP AN EYE ON THINGS. SOMETIMES YOU MAY FEEL HOT OR ITCHY OR UNWELL DURING YOUR TRANSFUSION. IF THIS HAPPENS TELL US STRAIGHT AWAY SO WE CAN MAKE YOU FEEL BETTER.

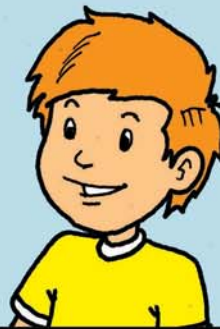


SO WHERE DOES THE BLOOD COME FROM?

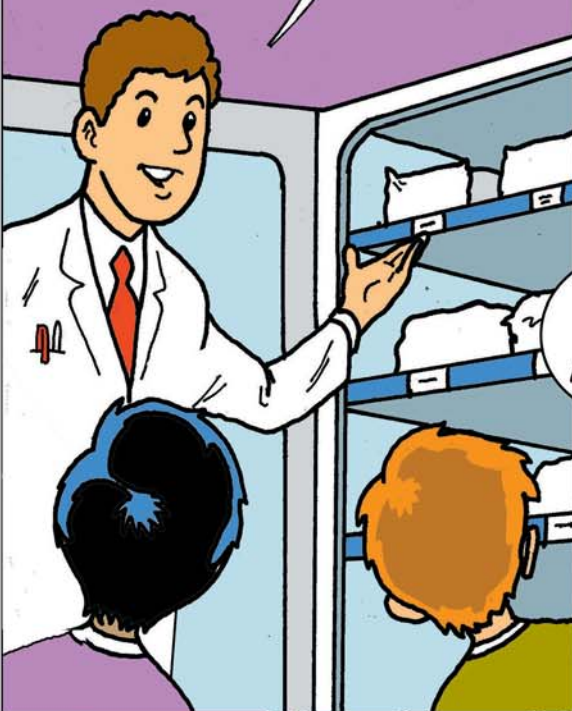
BLOOD FOR TRANSFUSIONS COME FROM VERY KIND PEOPLE. THESE PEOPLE, WHO GIVE THEIR BLOOD FOR FREE, ARE KNOWN AS BLOOD DONORS.



ALL THE BLOOD THAT DONORS GIVE IS CHECKED VERY CAREFULLY TO MAKE SURE IT IS AS SAFE AS POSSIBLE. BLOOD THAT FAILS THE TEST IS NOT USED.



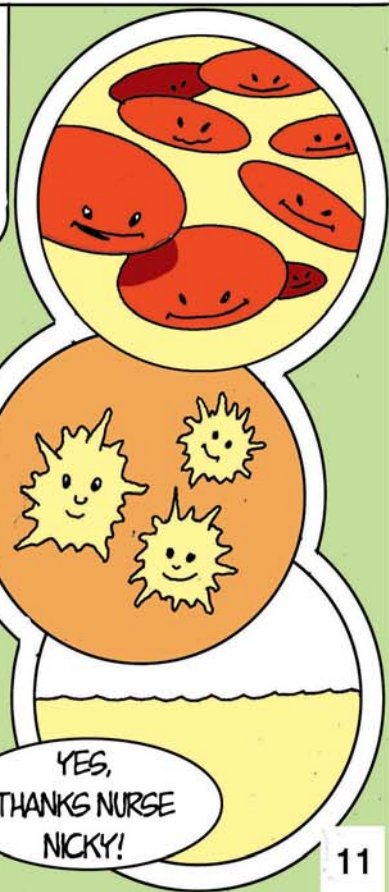
WHILE IT IS WAITING TO BE DELIVERED TO HOSPITAL IT IS STORED IN LARGE FRIDGES IN A BLOOD BANK.



MOST BLOOD COLLECTED FOR TRANSFUSIONS IS SEPARATED INTO RED CELLS, PLATELETS AND PLASMA SO YOU WILL ONLY BE GIVEN THE PART OF THE BLOOD YOU REALLY NEED.



WOW! THAT'S AMAZING.



YES, THANKS NURSE NICKY!

SEE HOW MANY OF THE WORDS LISTED BELOW YOU CAN FIND IN THIS WORDSEARCH.
THEY ARE ALL LINKED TO THE VOYAGE ON THE MICROSUB DISCOVERY.

R	O	N	O	D	D	O	O	L	B	N
S	L	L	E	C	D	E	R	W	S	O
E	S	I	C	R	E	X	E	H	T	I
E	A	N	T	I	B	O	D	I	E	S
A	I	R	E	T	C	A	B	T	L	U
M	L	A	T	V	N	P	S	E	E	F
P	U	L	S	E	D	E	O	C	T	S
U	N	M	G	I	R	O	O	E	A	N
M	I	Y	N	N	T	I	O	L	L	A
P	X	D	U	S	L	L	E	L	P	R
O	S	P	L	A	S	M	A	S	B	T

- ANTIBODIES
- ARTERIES
- BACTERIA
- BLOOD
- BLOOD DONOR
- EXERCISE
- LUNGS
- OXYGEN
- PLASMA
- PLATELETS
- PULSE
- PUMP
- RED CELLS
- REST
- TRANSFUSION
- WHITE CELLS
- VEINS



IF YOU KNOW A GROWN UP WHO WANTS TO BECOME A BLOOD DONOR,
OR WANTS MORE INFORMATION ON GIVING BLOOD, PLEASE CALL:

AUSTRALIAN RED CROSS BLOOD SERVICE (ARCBS):
13 14 95 OR VISIT WWW.DONATEBLOOD.COM.AU

NEW ZEALAND BLOOD SERVICE (NZBS):
0800GIVEBLOOD (0800 448 325) OR VISIT WWW.NZBLOOD.CO.NZ

Voyages on the Microsub Discovery has been developed by NHS Blood and Transplant, a Special Health Authority within the UK National Health Service. The **BloodSafe** Program, funded by the South Australian Department of Health, along with Australian Red Cross Blood Service (ARCBS) and New Zealand Blood Service (NZBS) are over the moon to be given permission to take you down under on a Microsub Discovery Voyage exploring the far reaches of the body. Thank-you to the Australian and New Zealand Society of Blood Transfusion (ANZSBT) for their stamp of approval.

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Illustrated and designed by John Richardson (www.cartoonist-illustrator.com).

Check out the UK “Fun Zone” at www.blood.co.uk

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