opening extract from

The Icky, Sticky Snot and Blood Book

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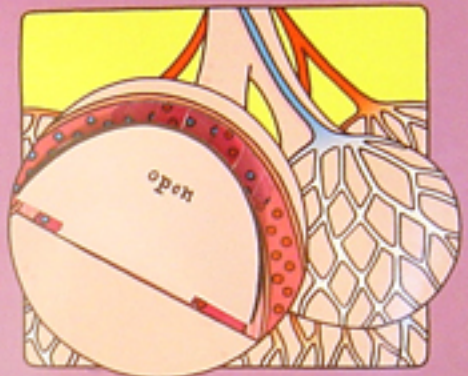
Breath-taking Mega-inflating Lungs!



Oxygen for Energy

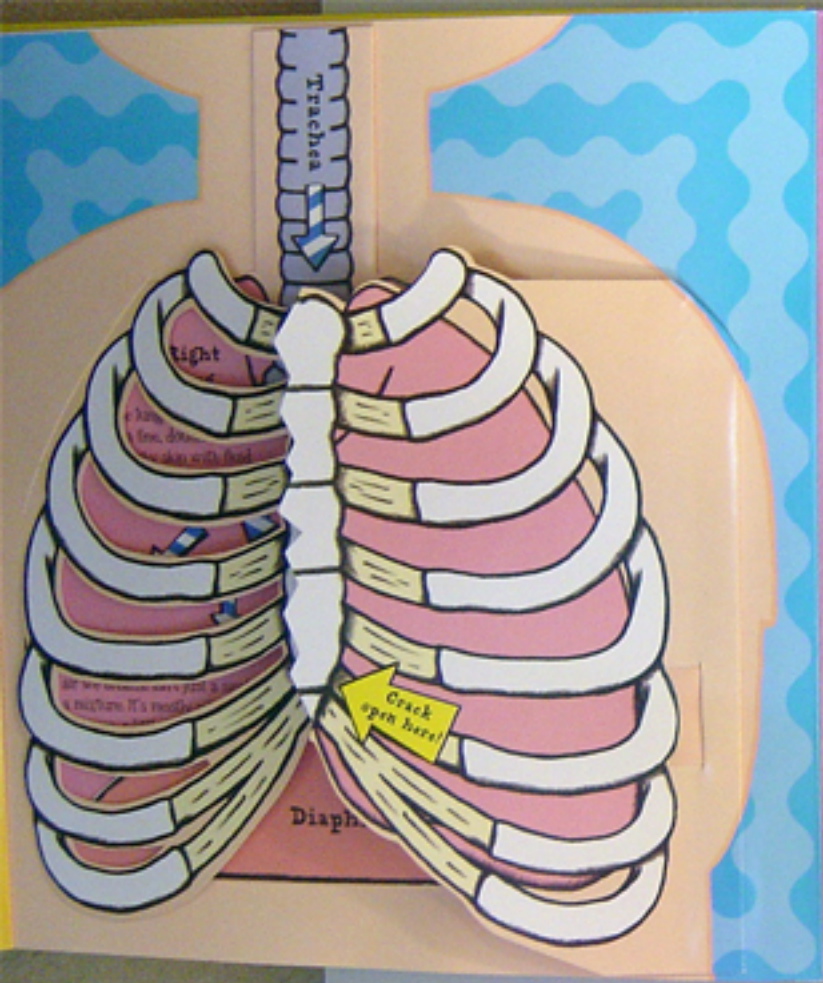
The air that has been warmed by your nose passes down your windpipe (**trachea**) and into your lungs. It spreads through all the branches of airways until it reaches the tiny bags (**alveoli**) at the ends. Here, the **oxygen** in the air dissolves in the thin layer of moisture that coats the inside of the alveoli. Once it is dissolved, it passes through the walls of the alveoli into the many tiny blood vessels on the other side. As oxygen moves one way, **carbon dioxide** moves from the blood into the alveoli – and out in your breath.

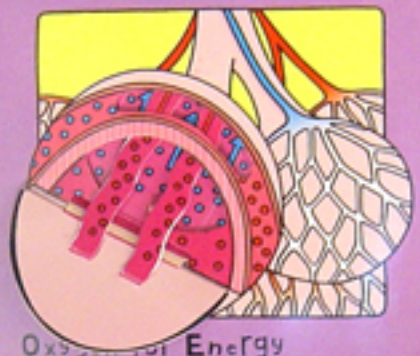
FOUL FACT
Cigarette smoke contains around 4000 different chemicals, 69 of which can cause cancer. Some of them are radioactive!

GUESS THE GROSS CLOSE-UP

Shout Aloud!

You have two strong string-like pieces of skin at the base of your voice box (**larynx**). These are your **vocal cords** which allow you to make sounds. When you speak or make a noise you use the passing air to make them vibrate. The speed of vibration is changed if the cords are pulled or lengthened.





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The black holes are spots of pollution in a lung. The lungs have not been able to remove all the smoke and bad air that have been breathed in. This damage inside the lung is incurable.

Respiration

People often use the words **respiration** and **breathing** as if they mean the same thing. In fact, respiration is the name for the chemical reaction that turns the **glucose** from digested food and oxygen into **energy**. And breathing is, well, moving air in and out of your lungs!

It's a Wheeze!

Asthma is an allergic reaction to a of things – even exercise can be t 'trigger' that makes the airways tig and narrow. Their lining becomes in and swells. This makes it very diffic breathe but can be helped by inhali special medicines.

Hic!

The **diaphragm** flat muscle und lungs – sometim twitches. When happens, air rus your lungs, maki **epiglottis** plop That's a hiccup!

Bloody Bits!

...eady seen, your ... from your lungs ...oxy. And of your body, from your head to the tips of your toes. To get the oxygen-rich blood to these far-flung places you have a network of pipes – **blood vessels** – throughout your body. Some of these pipes – the **arteries** – deliver blood with oxygen from your lungs. Some of them – the **veins** – bring blood back for more oxygen. And the tiniest pipes – the **capillaries** – make sure it gets to every cell.

Uphill Struggle!

It's important that blood flows the right way – out to your organs when it is fresh and full of oxygen, then back to the lungs when it has done its job and needs to lose carbon dioxide. Gravity is trying to make it all run down to your feet, so to keep this circular, one-way system going, your blood vessels have **valves**. As long as blood is pumped the right way, the valves stay open. If it tries to flow the wrong way, the valves are forced shut.

FACT

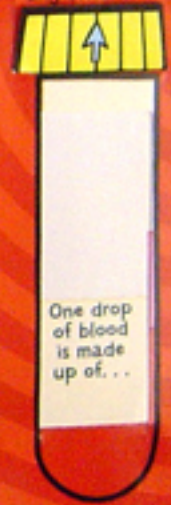
...lled all ...essels ...them ...hey ...h ...rld ...f

Blood and Bones!

The cells in your blood are made in your **bone marrow**. Marrow is the stuff that fills the spaces inside your bones. When you are young, almost every bone in your body makes blood cells. When you get older, it's made only in the long bones, like those in your legs. After about 120 days, your red blood cells get old and worn out. They have to be replaced by the new ones that are constantly being made.

Not My Type!

If you have a bad accident and lose lots of blood, somebody else's blood can be used to top you back up. This is called a **transfusion**. It's important to use the right type for you because your red blood cells recognize only the ones belonging to the same group and reject any other. There are four blood groups – A, B, AB and O. Do you know which one is your type?



Vile Blood!

Just over half (54%) of your blood is **plasma**. The rest is almost all red blood cells. White blood cells and **platelets**, although incredibly important, are much smaller and rarer, so take up hardly any space. Finally, there are also tiny amounts of protein, **fat** and **glucose**.

Bits!

...e already seen, you... ...oxygen from your... ...energy. And ...your body... ...r head to the tips o... ...s. To get the oxygen-r... ...od to those far-flung pl... ...u have a network of pipes — ...ood vessels — throughout your ...dy. Some of these pipes — the ...eries — deliver blood with ...ygen from your lungs. Some of ...m — the **veins** — bring blood ...ck for more oxygen. And the ...lest pipes — the **capillaries** — ...ke sure it gets to every cell.

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...OUL FACT
...ou pulled all ...lood vessels ...tied them ...ut, they ...stretch ...world ...half

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The orange splodge is a weakened bacterium from a vaccination that has been absorbed and killed by a white blood cell, here coloured pink so that you can see it! The immune system now knows to kill any similar bacteria.

Capillaries, the smallest blood vessels, are tiny and easily broken. If you get a bump, they can burst and release blood just under your skin.

This becomes a bruise. Chemicals are released to clear away the blood and they make the bruise go from purple through green to yellow.

...vent dirt and bugs ...getting through the ...hole in your skin. ...Antiseptic cream can ...kill any germs that ...do get in.

Here, Pus!

Blood might just look red and runny, b... actually a very clever mixture of ce... chemicals. The **red blood cells** give ... colour, but there are also a bunch o... hard-working cells. **White blood ce...** protect your body when things go w... There are several different types. ... clear away rubbish like dead or dam... cells and germs. Others, recognize t... things that shouldn't be in your body... bacteria and viruses. These white c... gather to destroy the invaders. Lo... dead white cells and bacteria toge... form a creamy goo called **pus**.