



A Series of Impossible Questions

By Isabel Thom

If I Was Born in a Different Year, Would I Still Be Me?



No, because you would have a different genome AND a different environment.



Let's start with your genome. You get this instruction manual from your parents. But the information included isn't always copied across exactly – it's more like a pick 'n' mix, where each birth parent supplies roughly half of the sweets in the bag. The pick 'n' mix process is complicated (imagine a choice of 84,000 sweets but only 21,000 fit in the bag!).



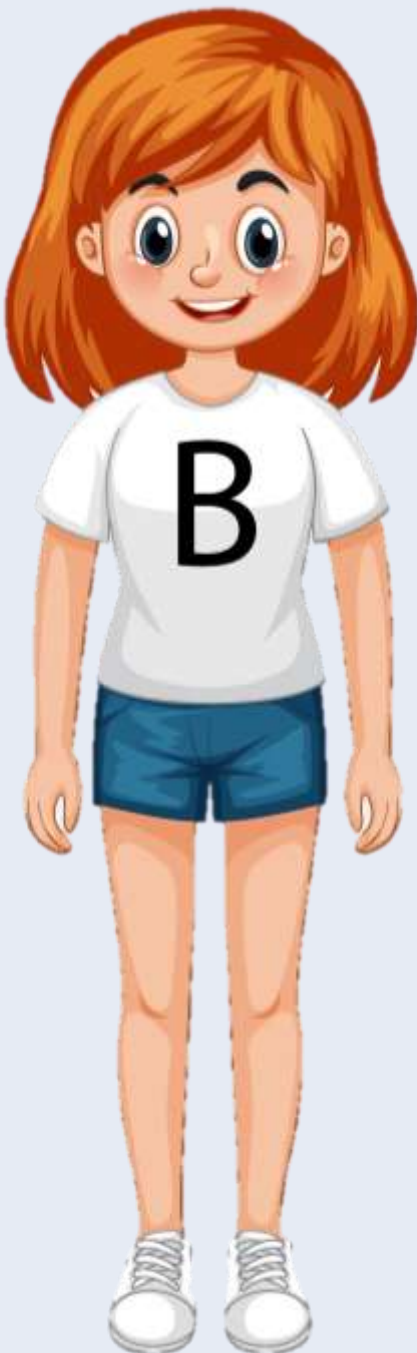
The chances of picking the exact same set of sweets twice are tiny. Even if it did happen, your environment would be different in thousands of ways if you were born in a different way.



Your parents would be different ages. You would meet different teachers and friends at school. You might eat different foods and form different opinions.



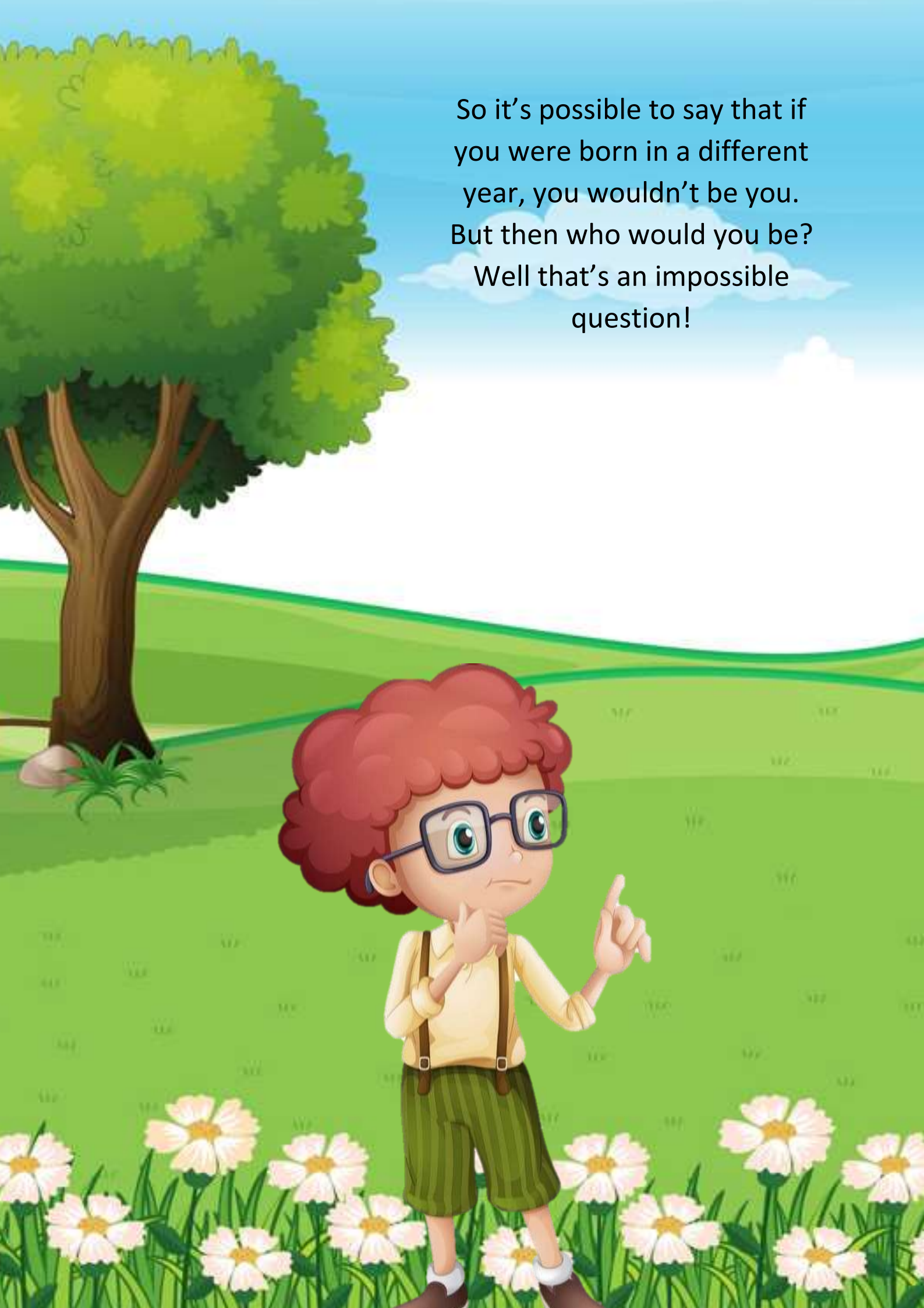
The only people who are born with identical genomes are identical twins. They often grow up in similar environments too.



**But identical twins are still
totally different people
because no set of experiences
is ever exactly the same.**



So it's possible to say that if you were born in a different year, you wouldn't be you. But then who would you be? Well that's an impossible question!





Why Can't I Remember Being a Baby?



Don't worry, you're not the only one! Most people can't remember anything about their first few years on the planet. At the moment it's hard to explain why we forget so much.





Our brains are good at remembering skills we learn as babies. We don't forget how to walk, talk or recognise families. Three-years-old can remember all kinds of things. But by the time we are seven, most events and experiences that happened before we three have been mysteriously wiped from our brains!



Scientists have come up with different theories to explain this. One idea is that we can't store memories until we learn enough language to turn them into 'stories'.



Another idea is that a child's brain grows and changes so quickly, that new brain cells and connections mess up the memories that are already there.



Even older children and adults seem to forget experiences quickly, unless they are very important or make us feel strong feelings.



What experiences do you remember from when you were very young? Why are they important to you? Why not draw or write them down, to help you remember them forever!



If you're younger than seven you will probably forget this page in the future, so be sure to come back and read it again!





Why Don't Caterpillars Get Stung by Nettles?



Ow! Plants might look pretty and peaceful from a distance, but some of them are packed with powerful poisons. They can't run away from enemies, so they have to rely on devious defences.



Nettles are covered in tiny, brittle hairs that break easily when we brush against them (they're actually made of the same stuff as glass). As the broken tip scratches our skin, chemicals rush up through the hollow hair and deliver a nasty sting.



It's a cunning defence that keeps away hungry herbivores, like sheep and deer.



So it's confusing that dozens of butterflies and moths love to lay their eggs on nettle plants.



When their caterpillars hatch, they happily tuck into leaves that would send a human running for the first aid kit.



So far it's been impossible to tell if these caterpillars are immune to the stings, or if they are simply putting up with the pain. Perhaps they're just really good at crawling past the hairs without breaking them (being small probably helps).



Whichever theory is correct, it seems that nettles have adapted to stop BIG herbivores from grazing but are happier to host smaller critters – including pollinators, and insects that provide food for birds and other animals.



So next time you get stung, don't take it out on the nettles. A friend to insects is also a friend to us!



Why Do Insects Have Six Legs?



How many different insects can you think of?
Enormous, multi-coloured moths. Slinky black beetles.
Strange-looking stick insects. Armies of ants.



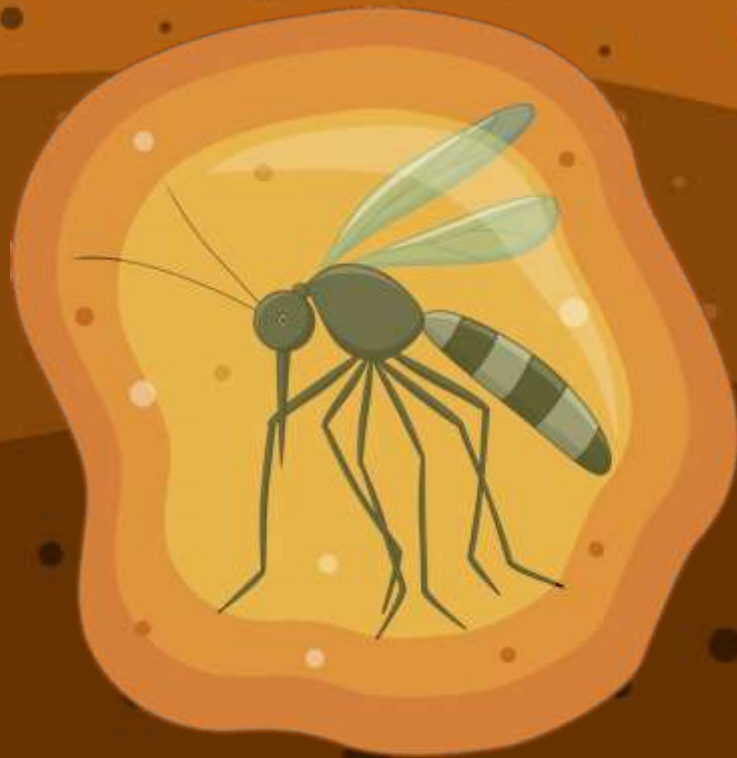
There are more than a million types of insect, and they are different from one another in so many ways. But they all have six legs. Why not two or four? Why not 100 or more?



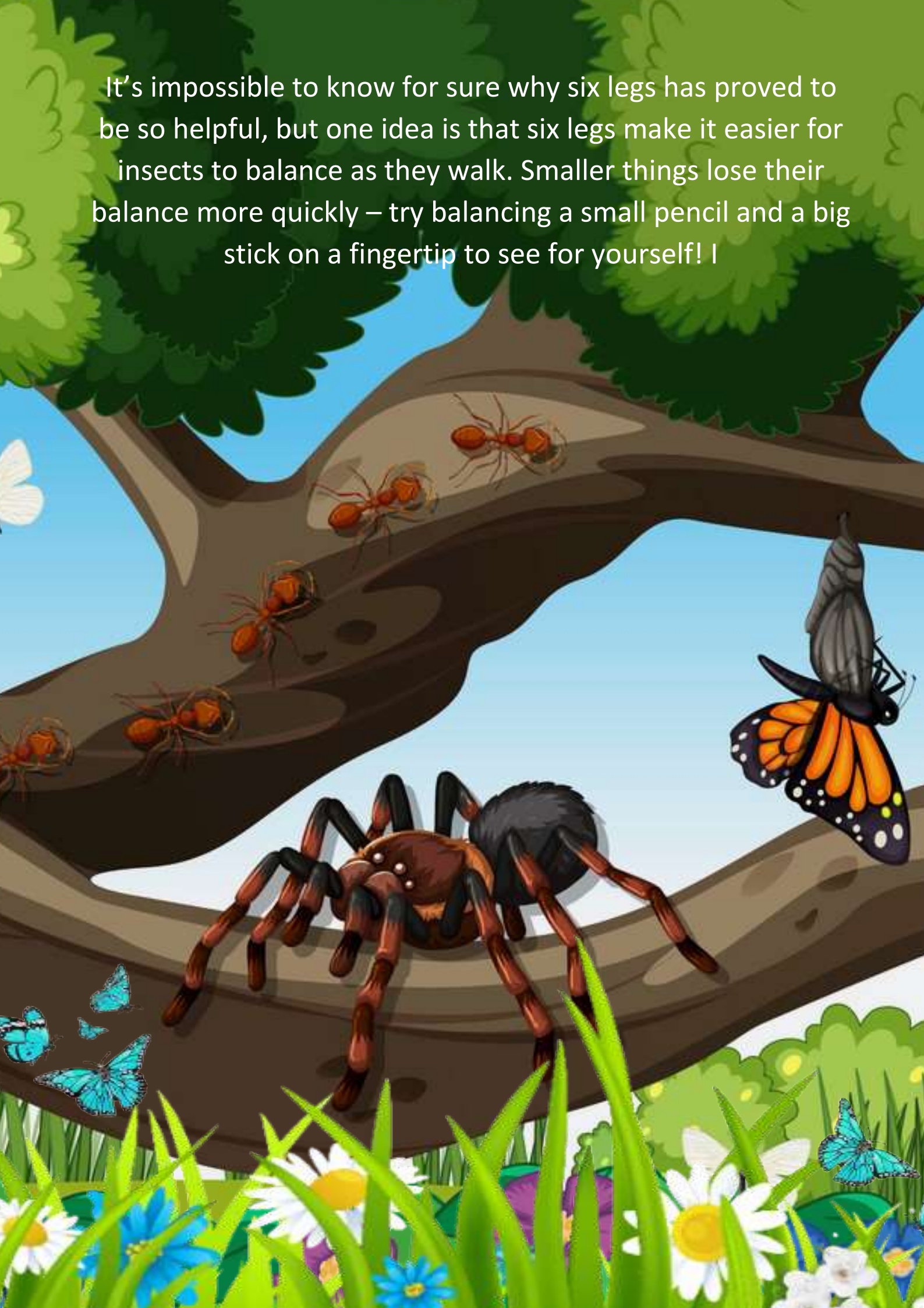
Fossils show us that the ancestors of insects have had six legs for about 400 million years! This tells us that being a hexapod (a six-legged creature) must be very helpful to insects.

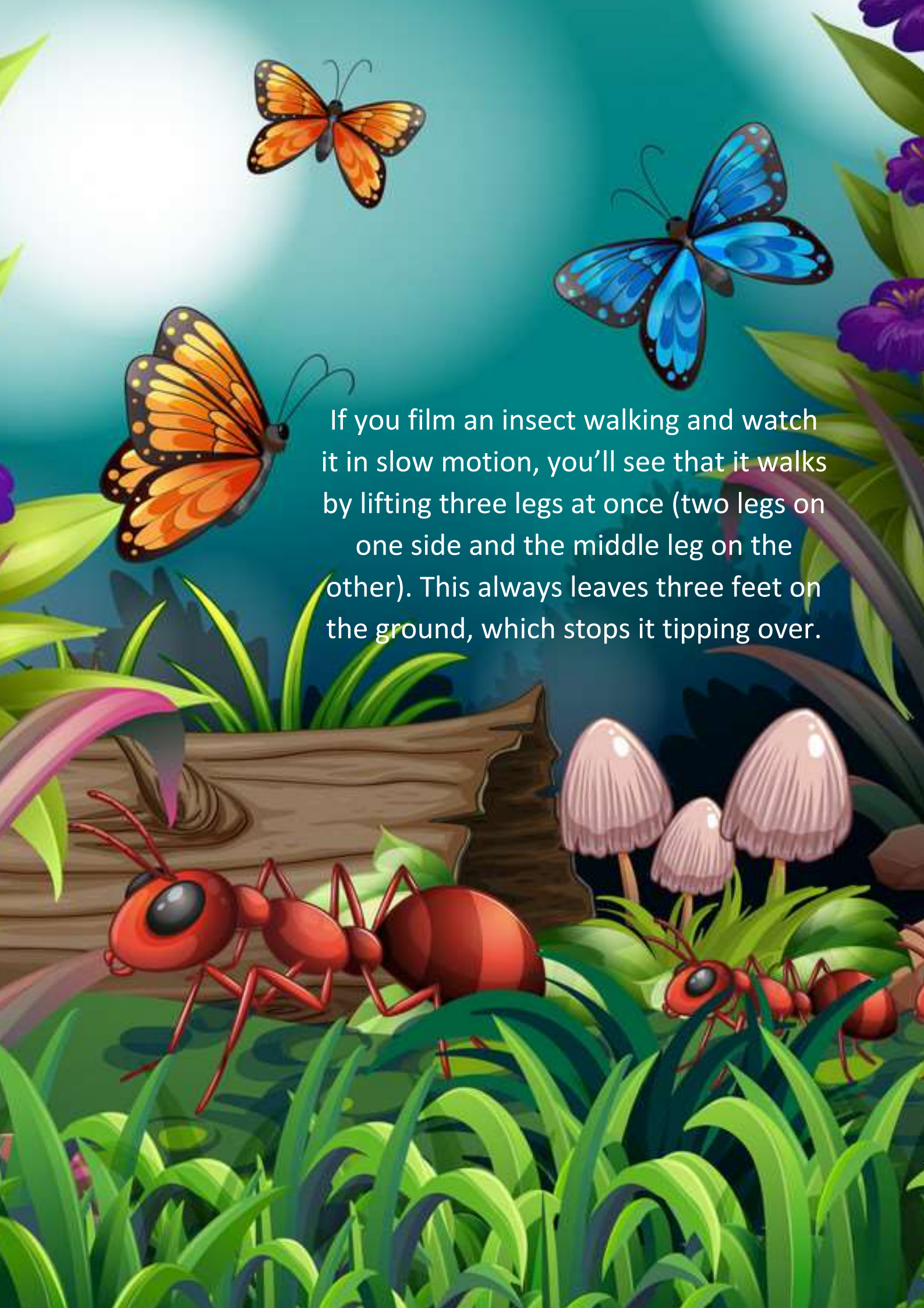


If a feature is not helpful, it tends to disappear over time – for example, fish and other animals that spend their entire lives in pitch-black caves have adapted by not bothering to grow eyes.



It's impossible to know for sure why six legs has proved to be so helpful, but one idea is that six legs make it easier for insects to balance as they walk. Smaller things lose their balance more quickly – try balancing a small pencil and a big stick on a fingertip to see for yourself! I





If you film an insect walking and watch it in slow motion, you'll see that it walks by lifting three legs at once (two legs on one side and the middle leg on the other). This always leaves three feet on the ground, which stops it tipping over.

Scientists are even copying these hexapods to design robots that can cross rough ground without falling over. These robo-animals could soon be carrying out daring rescues on Earth, or even exploring other worlds.



Why are Bubbles Round?

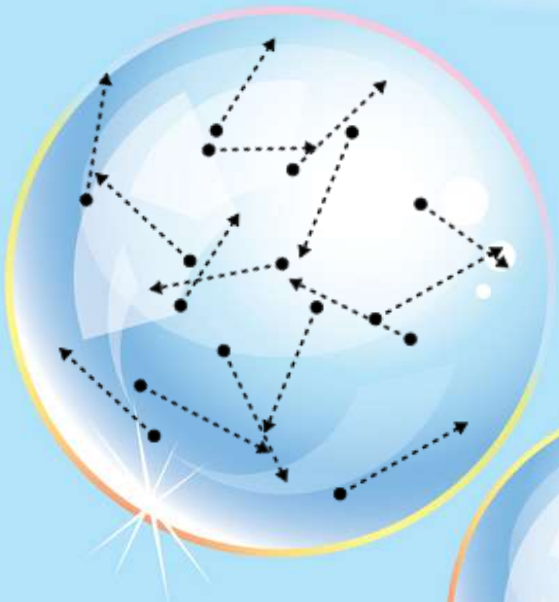




You can use a bubble wand shaped like a heart, square or star, but the bubbles always end up ball-shaped.

Even if you blow a gigantic,
wonky bubble, it will wobble
and wobble as it tries to
reshape itself into a sphere.
You're actually watching an
epic battle of different forces.





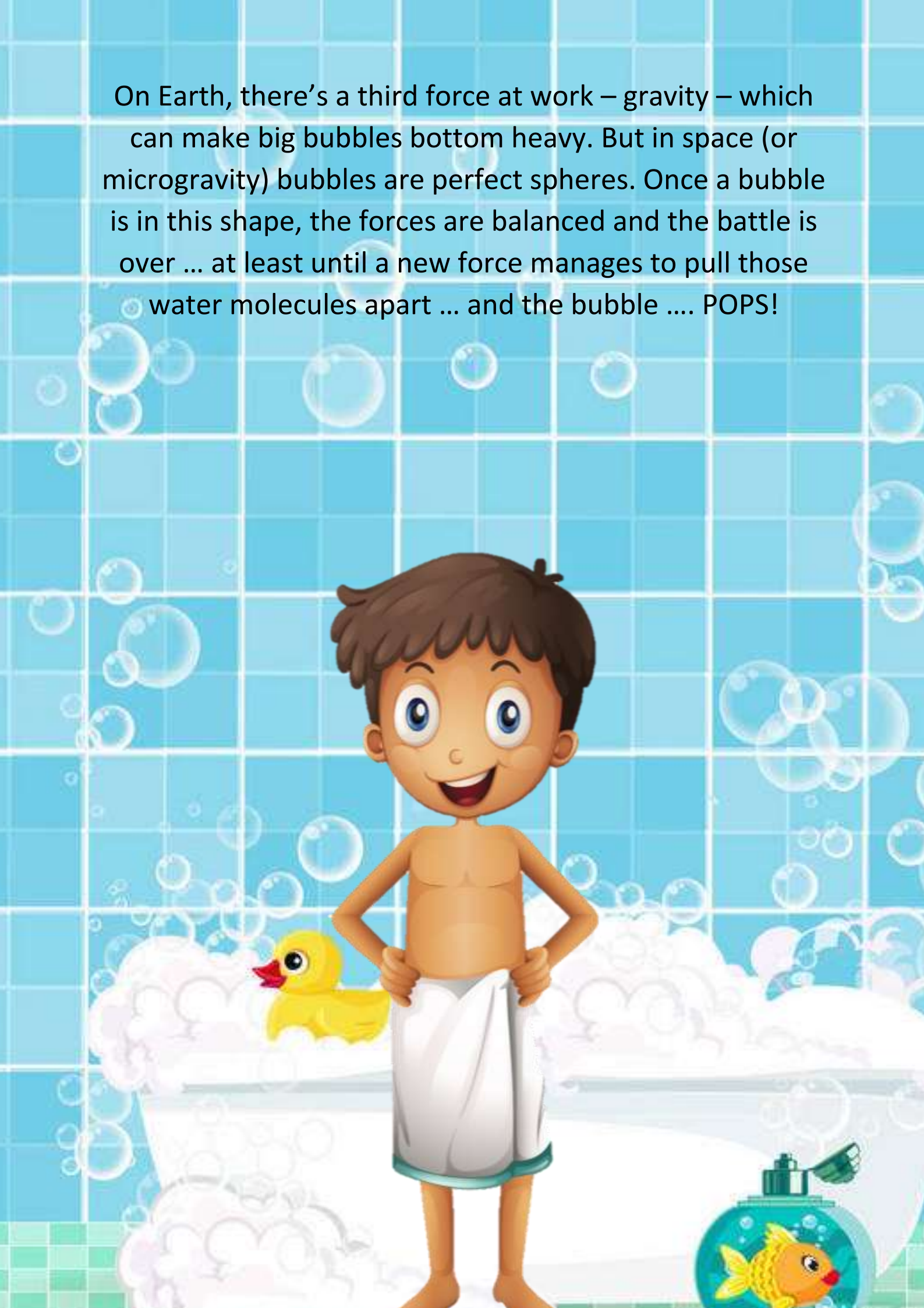
The air trapped inside the bubble is made of molecules too, but they don't cling together like molecules of water. In fact, they try to move apart!

They push against the inside of the bubble's soapy wall, trying to break the water molecules apart. But the molecules of soapy water refuse to be separated! They cling to each other, pushing back on the air.

They can do this more easily if they arrange themselves into the smallest possible shape. This is a sphere, or ball shape, where each water molecule clings to its neighbours with the same force.



On Earth, there's a third force at work – gravity – which can make big bubbles bottom heavy. But in space (or microgravity) bubbles are perfect spheres. Once a bubble is in this shape, the forces are balanced and the battle is over ... at least until a new force manages to pull those water molecules apart ... and the bubble POPS!





Why do Children Have to go to Bed so Early



Sleep is mysterious.

We don't know exactly why we need to sleep, but we do know it's very important for survival.



In fact, it's so important that EVERY OTHER ANIMAL sleeps too. Even jellyfish try to catch up on any sleep they miss. This tells us that the benefits of sleep are worth the risk of being less alert to sharks creeping up on you.



Sleep is a special kind of rest, when our bodies are less active than usual. Our eyelids close and almost all our muscles go floppy. Some parts of our brain get a break – we stop seeing, hearing and smelling things, so we don't have to think about them.



But, for some reason, other parts of our brain seem to work even harder than usual. We still don't know exactly what's going on in there – human brains are the most complicated things in the universe to understand! But scientists think our sleeping brains could be hard at work making new brain cells, storing memories, practising new skills we have learned and even giving themselves a good clean!

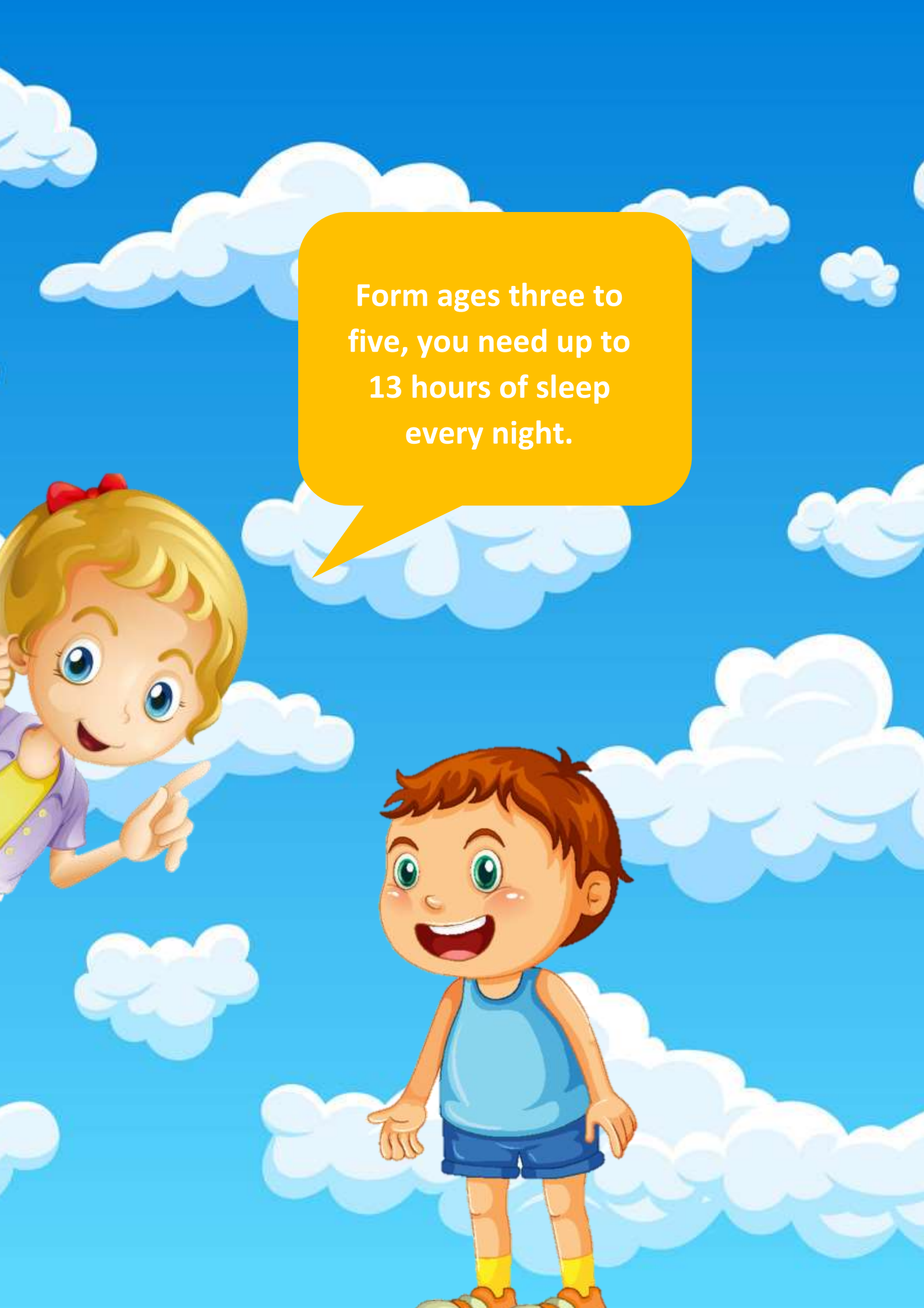


The amount of time your
★ brain needs to get all
these jobs done changes
as you get older.



When you are young,
you are growing and
learning very quickly, so
you need more sleep.



A cartoon illustration of a young girl with blonde hair and a red bow, wearing a purple shirt, pointing towards a boy. The boy has brown hair and is wearing a blue tank top and shorts. They are standing on a small patch of ground against a bright blue sky filled with white, fluffy clouds. A yellow speech bubble is positioned above the boy, containing text.

From ages three to five, you need up to 13 hours of sleep every night.

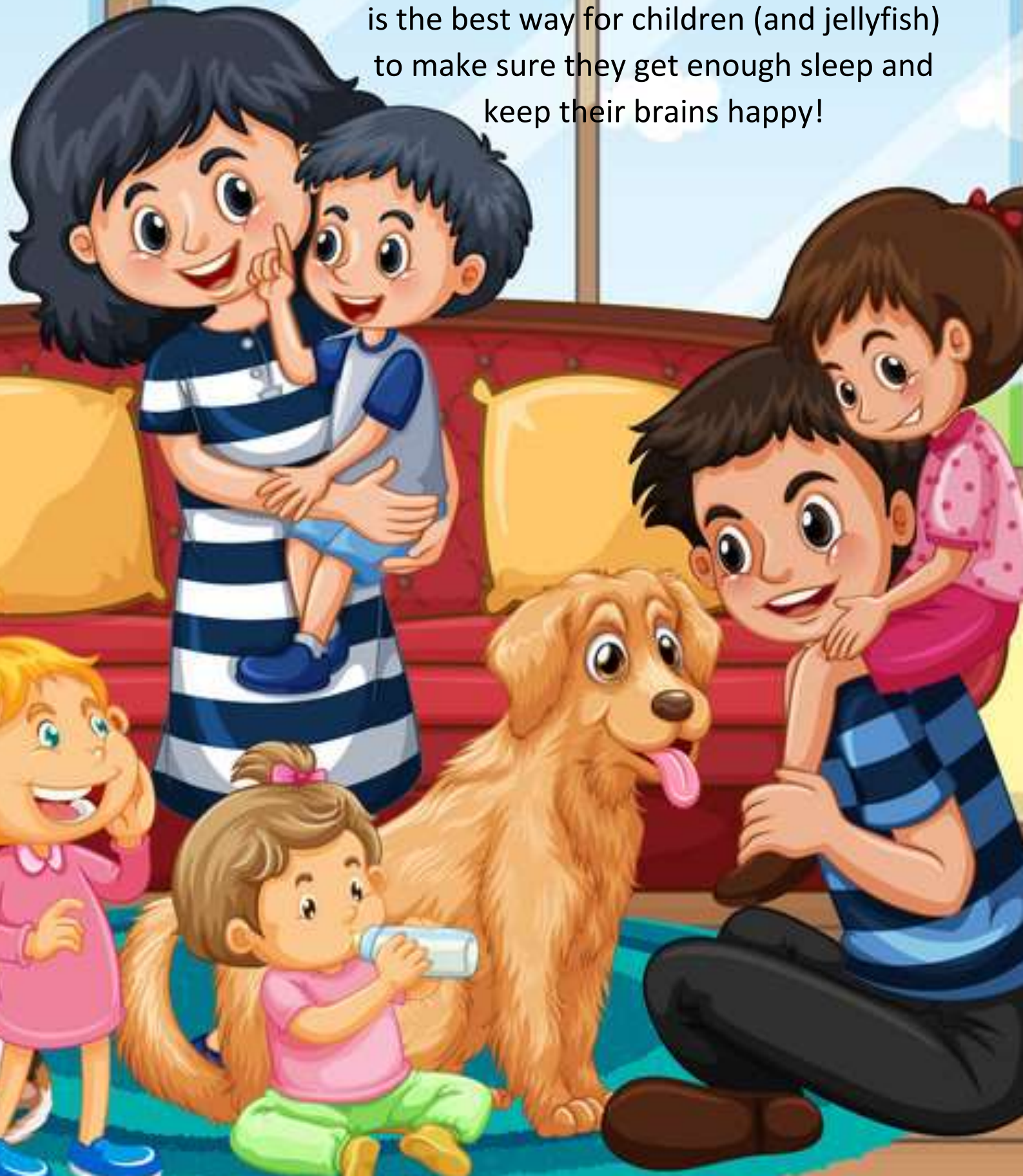
School-age children need up to 11 hours of sleep. If you get enough sleep you will feel alert the next day. If you miss out on sleep, your brain might find it hard to concentrate, solve problems and make decisions. It just wants to catch up on sleep. This can make you feel very moody.



Teenagers need a little less sleep than younger children and adults only need 7 to 9 hours each night.



In a family, often everyone needs to wake up at the same time, to go to work and school. So going to bed earlier than adults is the best way for children (and jellyfish) to make sure they get enough sleep and keep their brains happy!



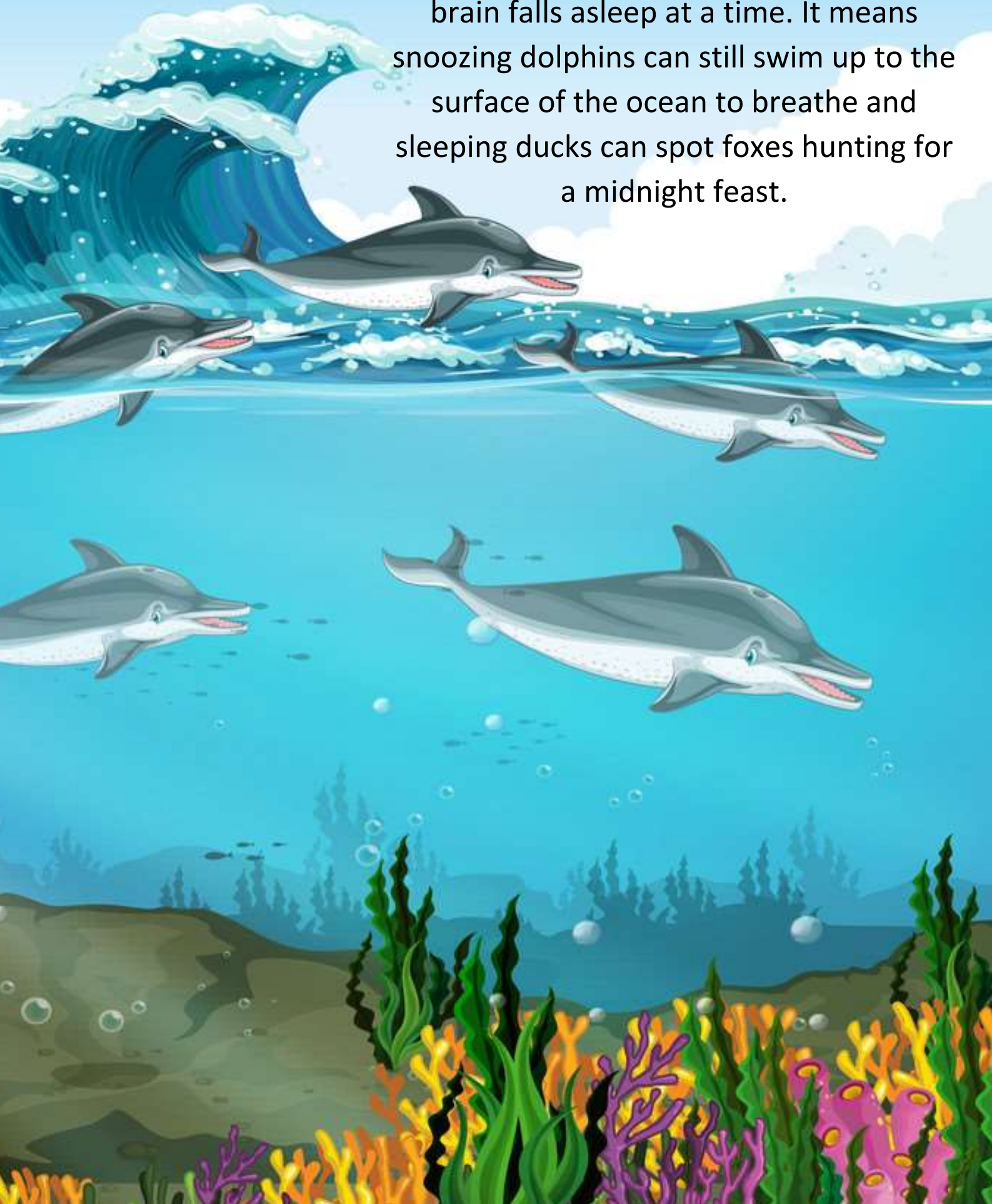
Can I Sleep With My Eyes open



If only Sleeping Beauty had fallen asleep for 100 years with her eyes wide open. She could have watched TV the ENTIRE time she was stuck in the castle! In real life, most of us sleep with our eyes tightly shut.



A few animals (such as ducks and dolphins) CAN sleep with one eye open. This is possible because just half of their brain falls asleep at a time. It means snoozing dolphins can still swim up to the surface of the ocean to breathe and sleeping ducks can spot foxes hunting for a midnight feast.



Some sea birds can even fly for miles while they doze.



But unless you happen to be a duck or a dolphin, you'll have to close your eyes to get to sleep. It might seem boring to spend so much time in the dark, but it keeps tears in and dust out, so your eyes stay healthy. It even gives your tears a chance to kill nasty germs overnight.



And it gives a big part of your brain a break, darkness is so good at helping our brains fall asleep, it's hard to stay awake when your eyes are closed.



Even when you blink, your brain takes a tiny nap – even though the darkness lasts less than a second. You blink at least 30,000 times every day, which is a lot of extra naps!



The real question is, is it possible to stay awake when my eyes are closed?





THINK

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