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Along Came a...

RAINBOW!



A whoppingly windy science story

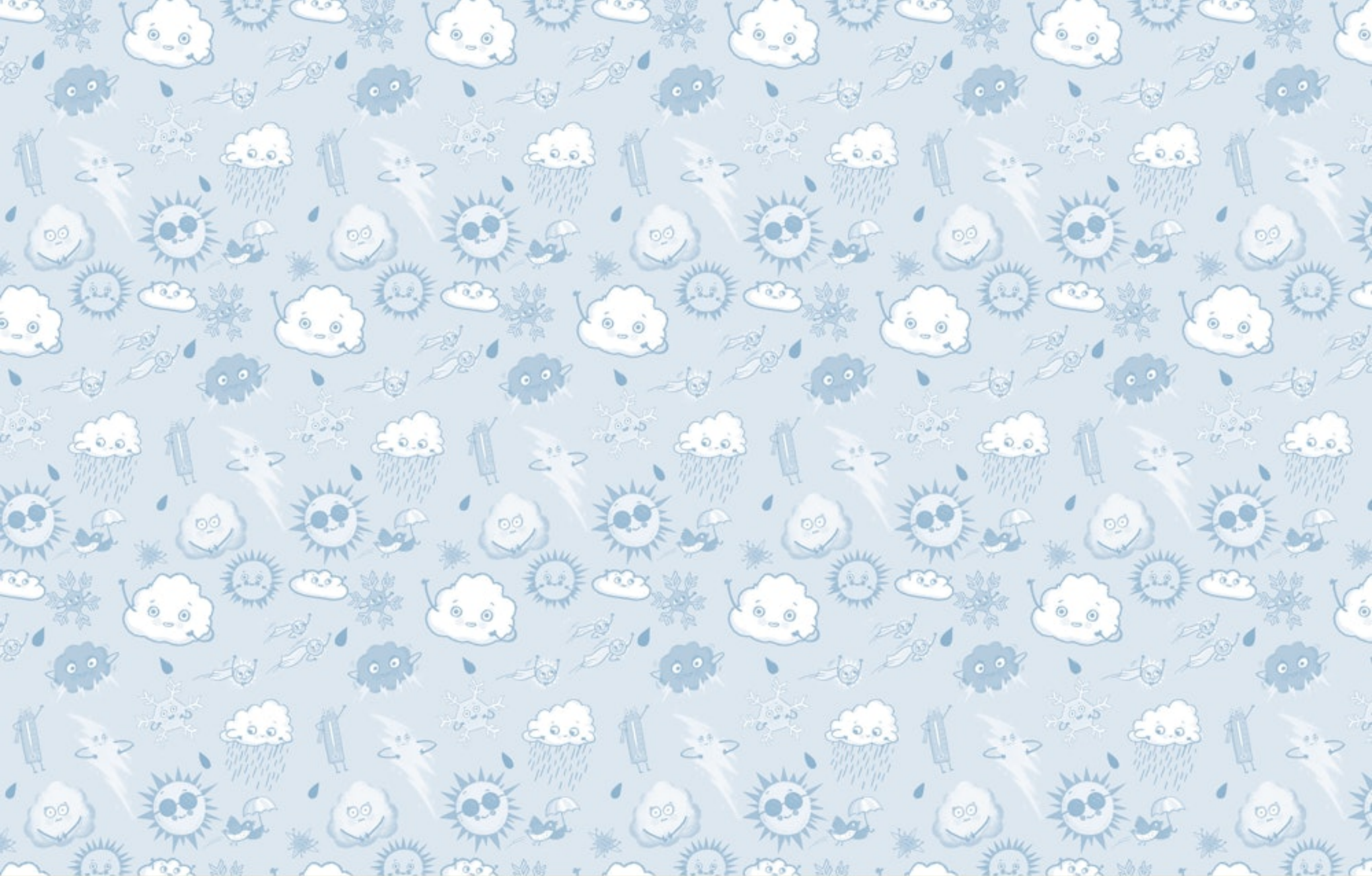
COVER NOT
FINAL



brilliant brolly
This ~~book~~ belongs to:

.....

.....



For Dash and all other
intrepid weather
explorers – S.G.

For Aija – P.B.

A TEMPLAR BOOK

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Along Came a... **RAINBOW!**



There I was, watching a worm and wondering if it would
EVER stop raining, when ALL of a sudden with a...

DRIP!

DROP!

BEAM!

Along came a...
rainbow!



Everyone knows there is treasure at the end of a rainbow, so off I went to look for it.



I checked every corner of the garden.



I climbed the TALLEST tree that I could see.



I even dug a HUGE hole, but the end of the rainbow was nowhere to be found.

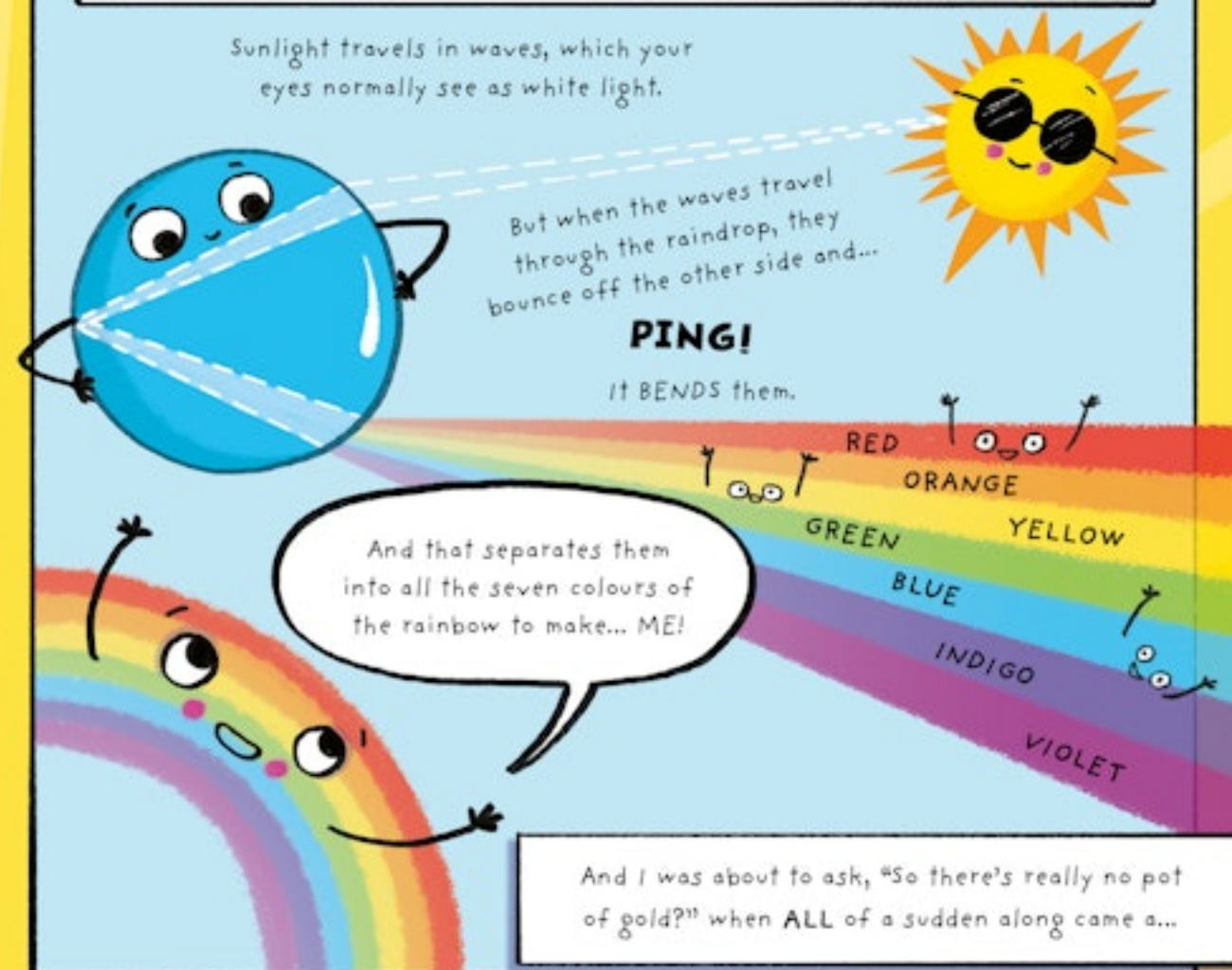
So I asked the rainbow...



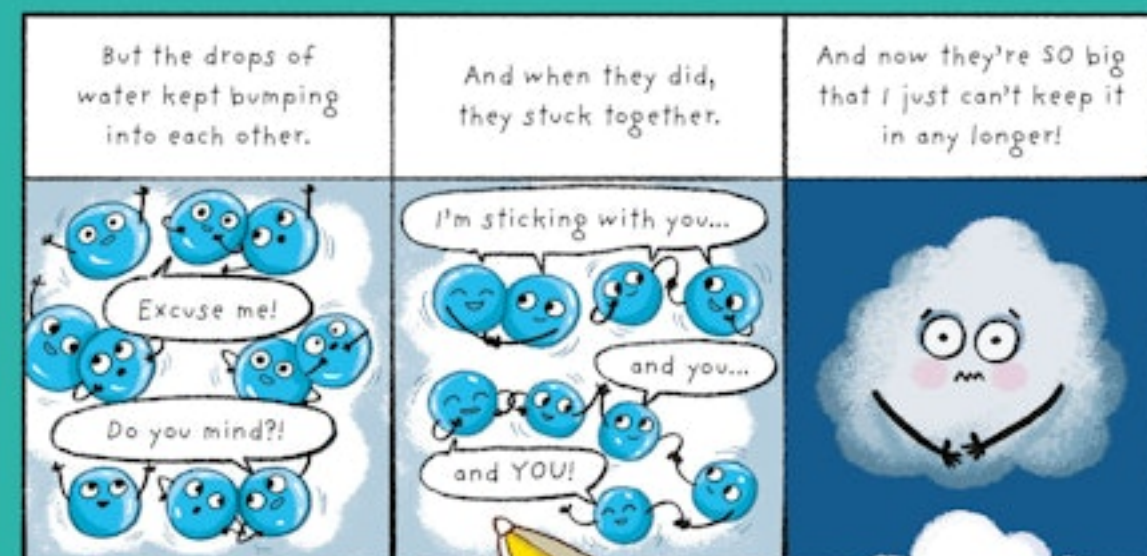
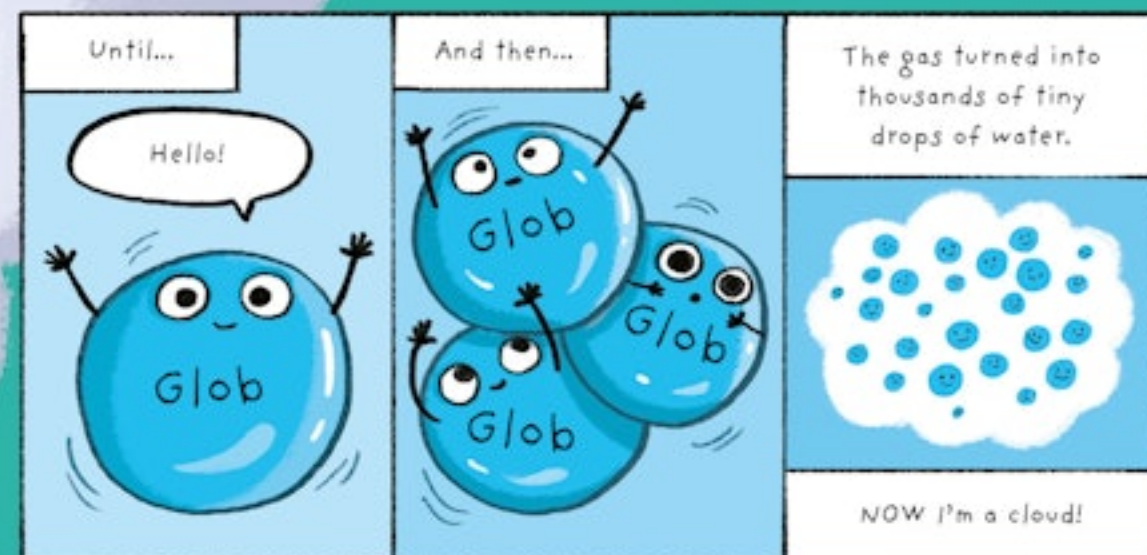
Where is your end, please?



Sunlight travels in waves, which your eyes normally see as white light.



...cloud!



I was about to ask, "Keep what in?" when ALL of a sudden from out of the cloud along came a...

...raindrop!

"Why are you SO round?" I asked the raindrop. "Aren't raindrops supposed to be shaped like a tear?"

Oh no, we don't really look like that unless we're sliding down a window. We're actually super cool shape changers. Look!

When I fell out of that cloud, at first, I was shaped like a circle.

Then like a hamburger!

Then like a pair of headphones!

THEN I broke in two and I landed on your head.

And guess what? Because a drop of water is recycled over hundreds of millions of years, a dinosaur probably weed out all the rain that falls today. That means you've probably got ancient dino wee on your head right now!

And I was about to say, "No way! You mean it's raining T Rex wee?" When ALL of a sudden the air warmed up, the sky turned grey and along came the...

...fog?

A fog so thick I could barely see!
"Cloud! Where did you go?" I called.

"I'm all around you," boomed the cloud.
"I AM the fog. Now if we fast forward
to nighttime and head out to sea..."

Excuse me!
That's a lot
of effort.

Well, there's no way around it,
as the **BEST** way to make fog
is overnight.



First LOTS of water
vapour rises into
the air.



The salt in the air from
the ocean mixes with the
water vapour. Then...



They whisk up over
a cool surface and
become fog. Perfecto!

Oh, and you better watch out if that water vapour
hits something icy cold like a mountain top,
because you get...

FREEZING FOG!



You don't need the salty
ocean to make fog either. If the
ground is cold and wet and the air
has dust in it, the water in the air
will stick to it to make... you
guessed it... fog!



And I was about to say, "Err, how will I get down?"
when ALL of a sudden along came the...

...snow!

Beautiful flakes of tiny, shiny snow.
The kind of snow that is perfect
for making a snowman!

Did you come
from a cloud too?

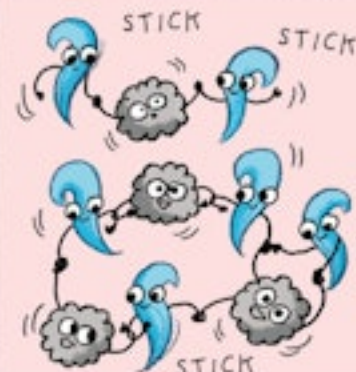
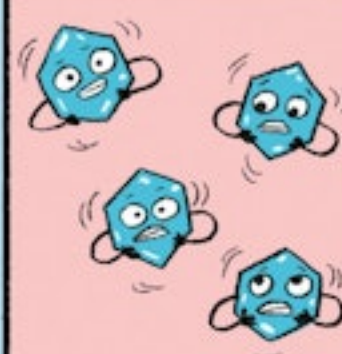
Yes! The very same
cloud that made the rain.

When it gets really cold
outside, the cloud gets
colder and colder and
COLDER too.

It gets SO cold that
some water vapour
turns to ice!

Other bits of water
vapour stick to bits of
dust, and together...

the ice and dust grow
bigger and BIGGER until
they turn into...
ice crystals!



But these are just the beginnings
of snowflakes – like little
snowflake babies.

When they are big
enough to leave
the cloud...



...the ice crystals fall through the sky and even more water vapour
sticks to them. Then the cold makes everything freeze and turns the
ice crystals into one of ME. Beautiful six-sided shapes called...

SNOWFLAKES – YAY!
Just like you, every single
one of us is different too!



BUT the air has to be the right
temperature. If it's too warm on
the way down then along comes the...

...freezing rain!



But when it's cold enough
the whole way down, we get...

...sleet.



THEN if the air goes from warm to cold
AGAIN on the way down, along comes the...

SNOW – HOORAY!



And I was having SO much fun sledding and sliding and making snow
angels that I didn't even notice something BIG and DARK and a little
bit cross-looking filled the sky and along came a...

...storm cloud!



Who are YOU?

I am a storm cloud.

Enormous. Gigantic. The Queen of Clouds.
Bursting with energy from my flat bottom
to my cauliflower head.

Where I'm from, it's wet and hot...
SO hot that water vapour shoots up
SUPER fast and creates a colossal tower.

"So how did you get here?" I asked.

"Well," the storm cloud said, "it all happened when along came the..."

...wind!

Wind?
But I can't see
any wind...

That's because wind
is just air that's moving.

Air is everywhere. And
when air moves it's called
wind. You can't see it.
You can only feel it.

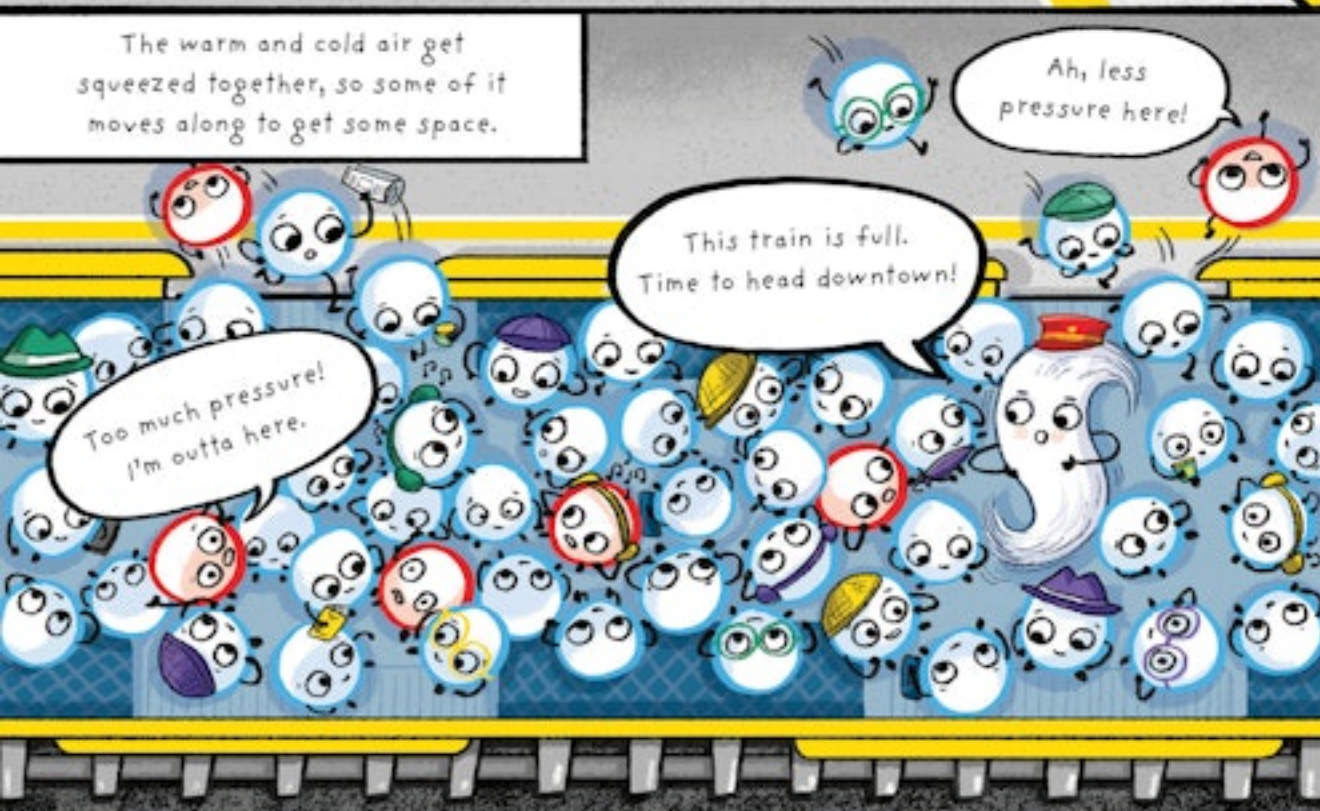
AHEM. I can tell my own
story, thank you. I'm surprised you
haven't noticed me as I'm here, there
and EVERYWHERE! But I can think of a
couple of places where you'll see me
pop up very soon...

As a matter of fact, I'm TERRIBLY
busy. Walk with me fast while
I tell you about air!





You see... warm air goes up,
and cold air goes down.
Now, here's how I come about.
As the warm air goes up, the
cold air rushes in...



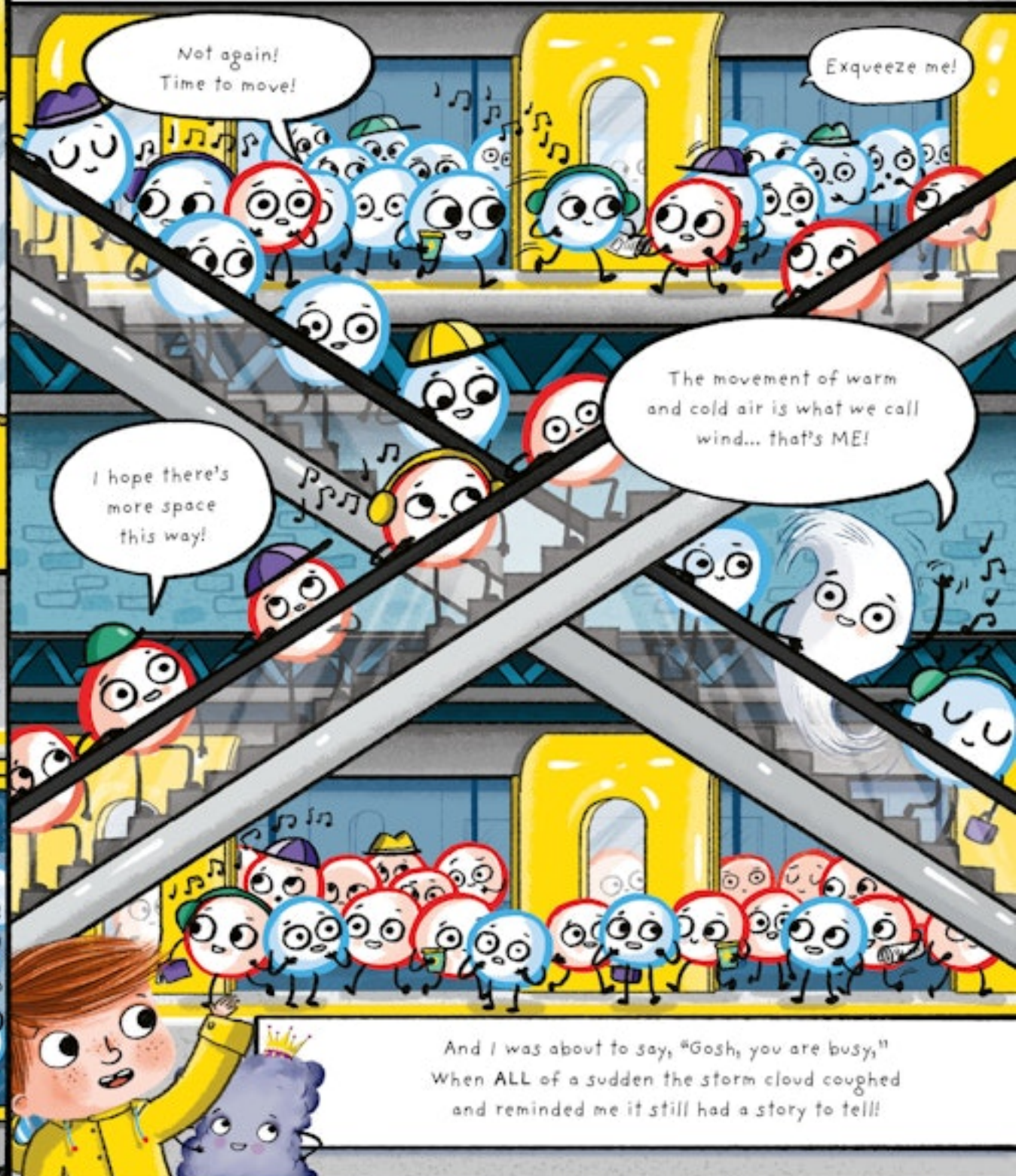
The warm and cold air get
squeezed together, so some of it
moves along to get some space.

This train is full.
Time to head downtown!

Ah, less
pressure here!

Too much pressure!
I'm outta here.

But that space gets filled quickly and becomes a squeeze TOO! As you can see,
warm and cold air is always moving around looking for some space.



Not again!
Time to move!

Exsqueeze me!

The movement of warm
and cold air is what we call
wind... that's ME!

I hope there's
more space
this way!

And I was about to say, "Gosh, you are busy,"
When ALL of a sudden the storm cloud coughed
and reminded me it still had a story to tell!



"Back to me," said the cloud. "The wind whips **MIGHTILY** through my middle and makes me **BIG** and **TALL**..."



It carries water vapour too! They tickle inside me and become water drops...
Upwards!



When the water drops hit the cold air at my top, they turn to bits of ice! Down they go as the cold air sinks, then up they go as they're lifted by the wind again. Up and down they go like a **ROARING** roller coaster!



And I was about to ask, "How wild?" when **ALL** of a sudden along came the...

...hail!

Great lolloping lumps of ice that bashed and smashed to the ground. "We're coming down!" said the hail.



"We can be as big as peas..."

...or as colossal as kiwis...

...or as massive as mangoes!"

Well, everyone knows you don't want to be outside in a hailstorm, so I rushed back indoors and just when I thought I'd seen it all...

The wind grew **WILDER**...

Watch it,
there!

You can't
stop me!

Then the sky began changing,
the wind was getting faster...

...and the cloud
started to spin.

"What's happening?" I called
to the storm cloud.

"It's the wind again!" the storm
cloud replied. "It's making the warm
and cold air roll around inside me!"

The storm cloud whipped and
whirled until it reached all the way
to the ground – a twisty, twirly
tube of wind, water and dust until
ALL of a sudden along came a...

...tornado!

It twisted and twirled
and whipped and whirled,
and the wind went
SUPER ULTRA fast
(as winds in tornadoes can
blow at speeds up to
480 kilometres per hour!).

STOP!

You're going to wreck everything!
Don't you know tornadoes are
DANGEROUS? They can rip up
whole houses! They can throw
around trees!

Sorry!

"I'm all tired out now," said the storm cloud.
"I can show you some flashier weather in a moment,
if I can just find some energy..."

And I was about to say, "that's okay, thanks," when **ALL** of
a sudden the cloud whipped back up and along came a...

...lightning bolt!

Woah!

That came out
of nowhere!

I took you by surprise.
I'm super speedy, don't you know?
One giant FLASH of energy!

I am faster than a cheetah...



I am faster than a dino who needs
a wee on a Wednesday and...



I am faster than a racing car...



I'm EVEN faster than a ROCKET. Why, it would
take me less than an hour to get to the Moon!



Listen up! When a storm cloud becomes **SUPER STORMY** (but not so twisty) the ice crystals inside of it crash together to make electricity!



They keep on crashing into each other which keeps on creating electricity until...



Eventually the bottom of the cloud becomes **SO** negative that **ALL** that negative energy has to go somewhere.



The negative charges go down, hitting the positive charges from the ground who rise up to meet them and **FLASH!** Here I am!



...thunder!

"You're LATE!" I said
to the thunder.
"The lightning's been
and gone already."



That's rude! I think you'll find I'm
perfectly on time. I am the noise made
by lightning! But noise reaches
your ears more slowly.

When lightning leaps through
the air, it heats it up.



So the air moves away from it FAST!



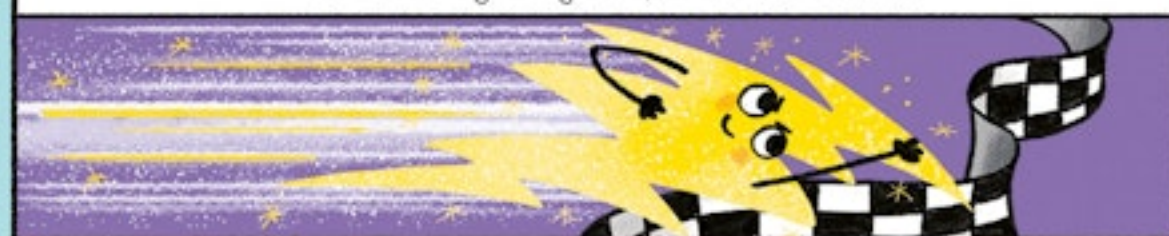
Relax, will you.
I can't set air
on fire.



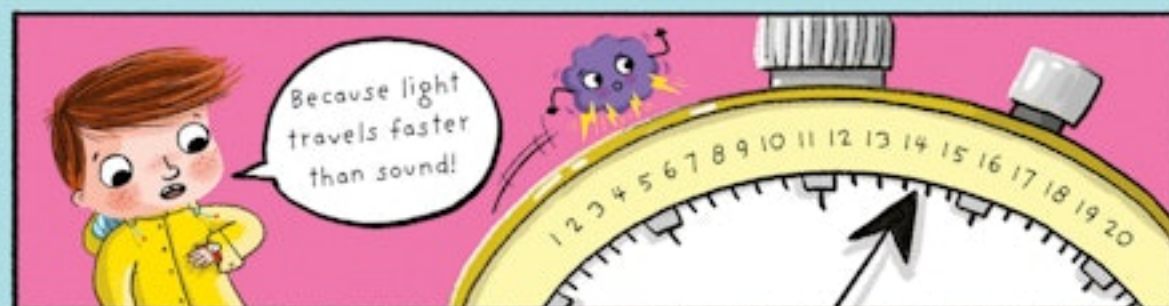
it makes a SUPER soundwave
(that's ME!).

The air cools down, but it cools
SO quickly that...

The reason lightning always wins the race is...



Because light
travels faster
than sound!



BOOM!

I'm here, everyone!



You always see lightning first.
But the closer the lightning is to YOU,
the quicker you'll hear ME!

Cracking! But I'm still
bamboozled. You're friends with
the cloud - do you know why
some of them look so similar?

Good question!
I think you need to go
to Cloud Town...



TO CLOUD TOWN



HIGH SKY

Hi! I'm Cirrostratus and I'm very long. I can go on for THOUSANDS of kilometres...

My name's Cirrocumulus and I come before stormy weather.

HORSE TAIL

I look like strands of hair. Check out my styles!

CONTRAIL

I'm Cirrus, a predictor of future weather!

FRINGE

Am I a bird?
Am I a flying saucer?
No, I'm Altostratus.
I can rain, but it won't reach the ground.

I'm Cumulonimbus. The wind can whip me up into a TORNADO!

The name's Cumulus. I can get SO windy (PARP - sorry!) and hot, I turn into Cumulonimbus.

WON'T MAKE IT DOWN

CAULIFLOWER HEAD

I'm the friend - Nimbostratus! Maker of rain and snow!

LOW SKY

I'm Stratus. I can be a bit drizzly and also make fog. I can also turn into...

...Stratocumulus, that's me! I also make fog, and very, VERY light rain.

And I was just about to open up my brilliant umbrella when ALL of a sudden along came the...

FLAT BOTTOM

LARGE AND LUMPY

FLAT
(like a sheet)

...sun!



Yay, you're back!

I've been here the whole time. Shining down on you ALL the way from SPACE nearly 150 million kilometres away. None of this weather could happen without me – I started it all.

Listen to my super star story, but never look at me directly – I can damage your eyes.

A gas called helium joined forces with another gas called hydrogen, and together they became... ENERGY!

Hydrogen

Helium

Energy raced right through me for... around 100,000 years actually, until it reached the edge.

Quick! To the edge!

THE EDGE

At the speed of light, it dashed towards Earth in eight-ish minutes...

That shield can't stop us!

Come in! I'm only keeping out those ones...

The shield pushed dangerous particles back into space. But the energy whizzed through the air on Earth to...

warm up the water and make the clouds...

light up the sky so you can see the COOL things around you...

and give everything the energy it needs to grow and thrive.



And I was just about to say a big thank you when ALL of a sudden along came a...

...puddle!

And everyone knows there is nothing more
fun than jumping in puddles so...



SPLA SH!



...I JUMPED
RIGHT IN.

The Water Cycle

