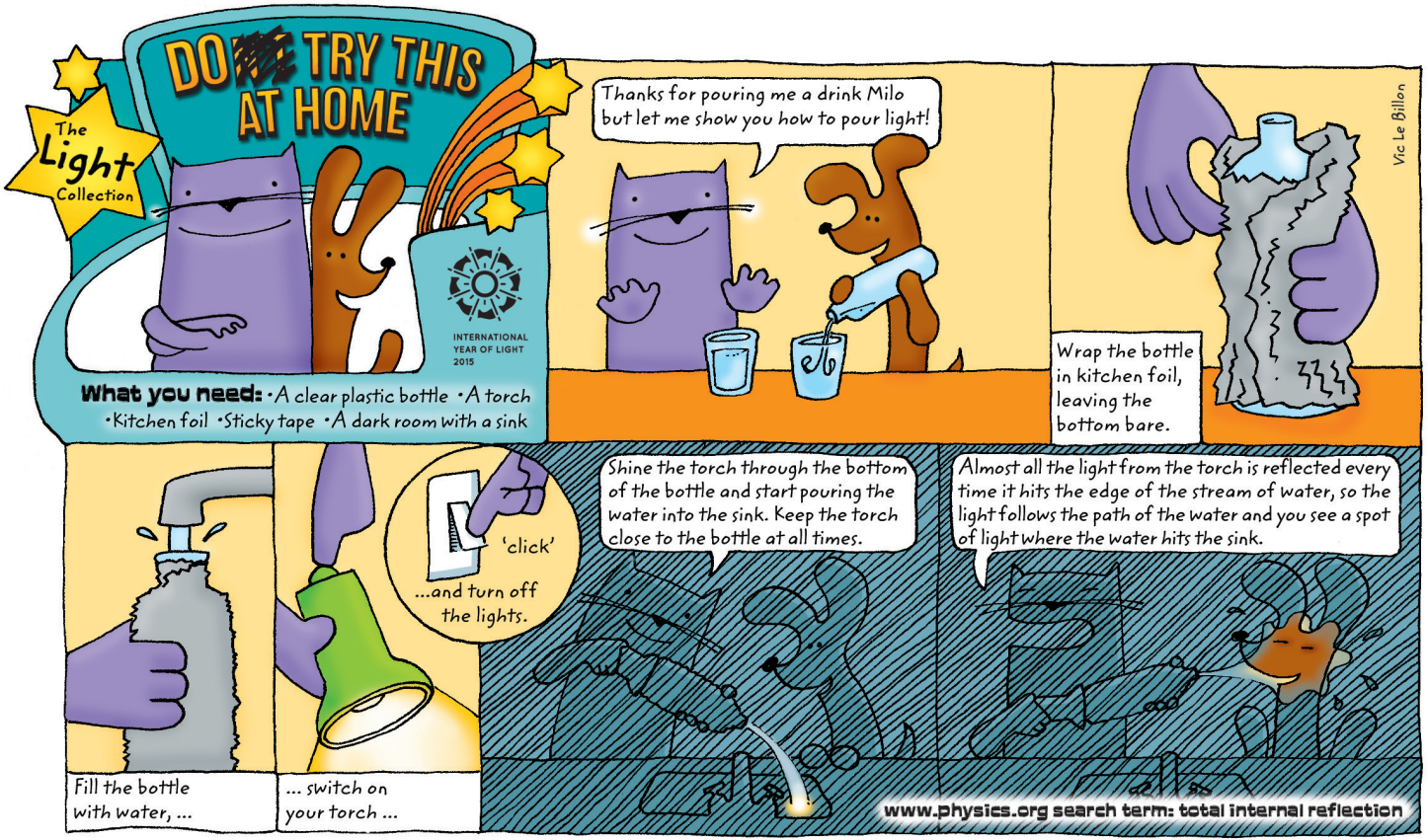
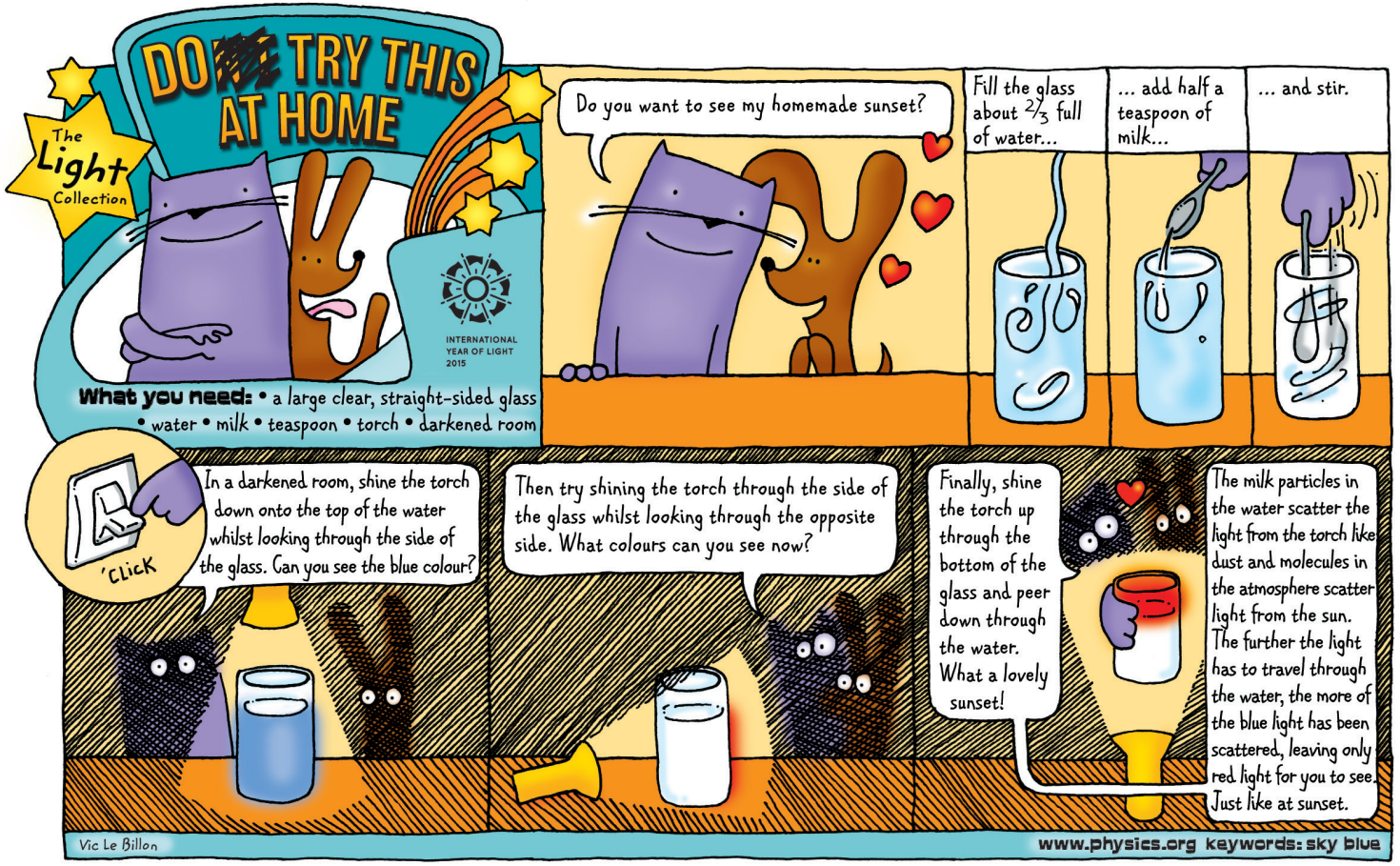
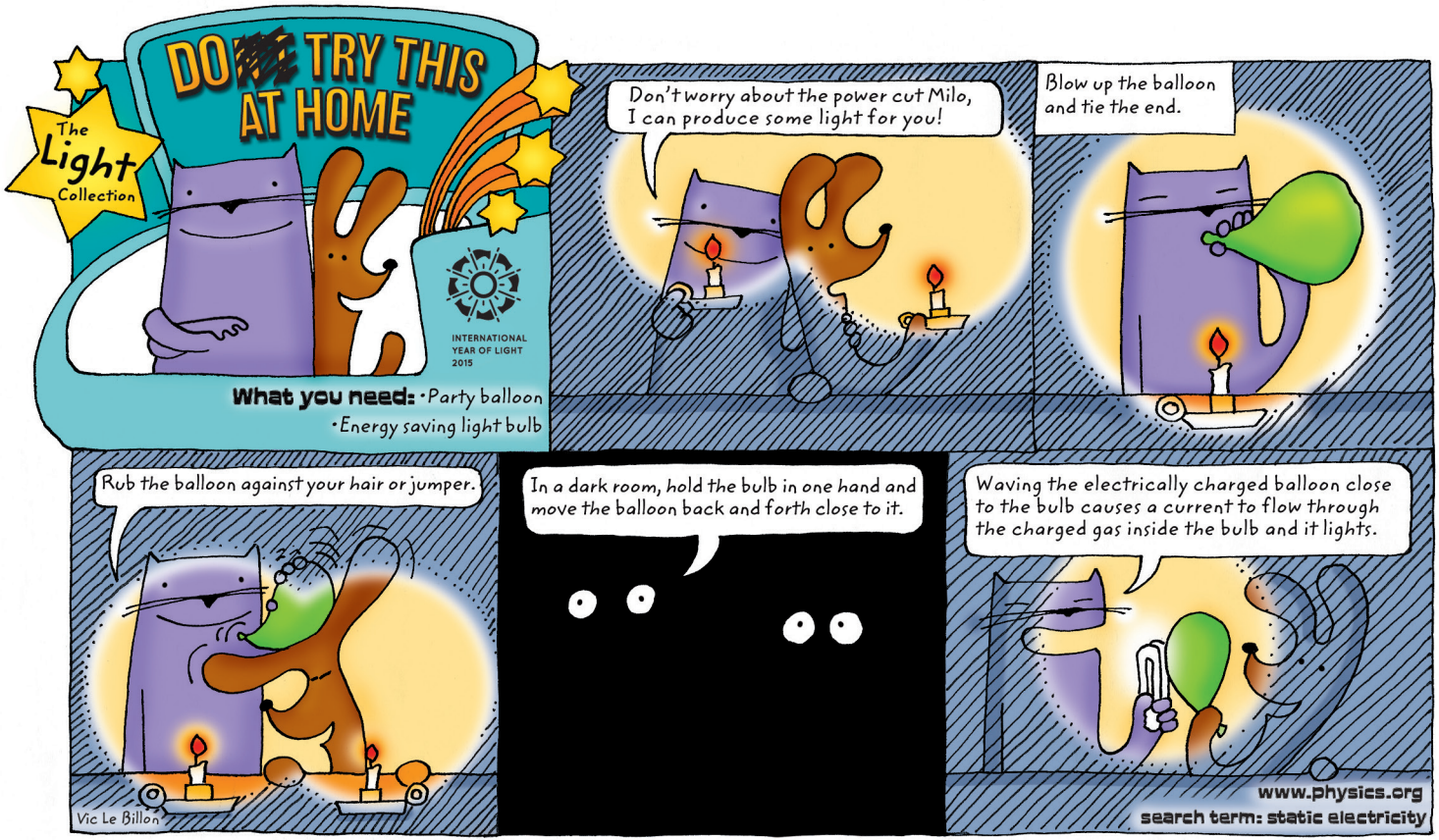
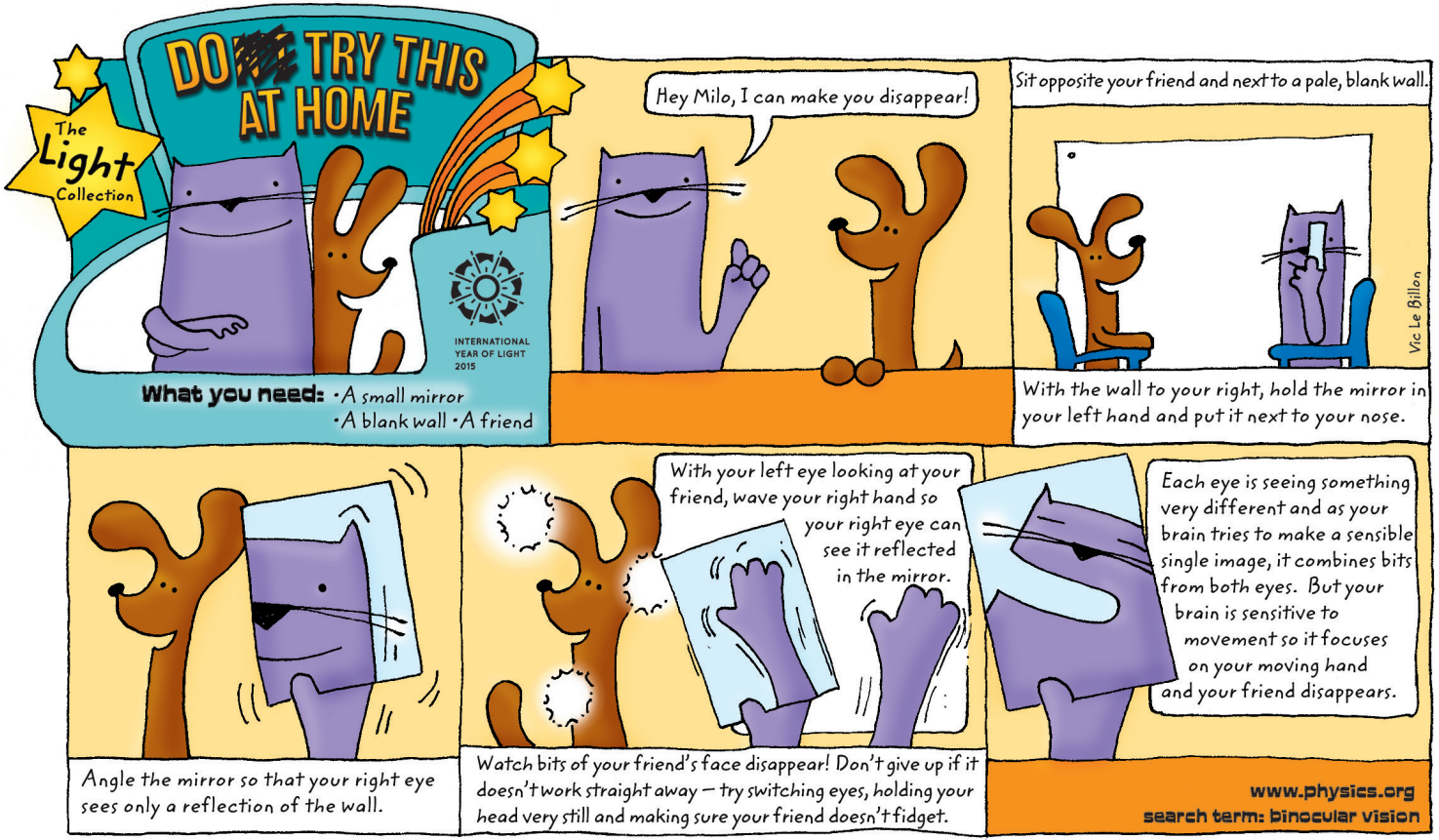

DO TRY THIS AT HOME
The Light Collection
INTERNATIONAL YEAR OF LIGHT 2015
What you need: •A clear plastic bottle •A torch •Kitchen foil •Sticky tape •A dark room with a sink
Thanks for pouring me a drink Milo but let me show you how to pour light!
Wrap the bottle in kitchen foil, leaving the bottom bare.
Vic Le Billon
Fill the bottle with water, ...
... switch on your torch ...
'click'
...and turn off the lights.
Shine the torch through the bottom of the bottle and start pouring the water into the sink. Keep the torch close to the bottle at all times.
Almost all the light from the torch is reflected every time it hits the edge of the stream of water, so the light follows the path of the water and you see a spot of light where the water hits the sink.
www.physics.org search term: total internal reflection

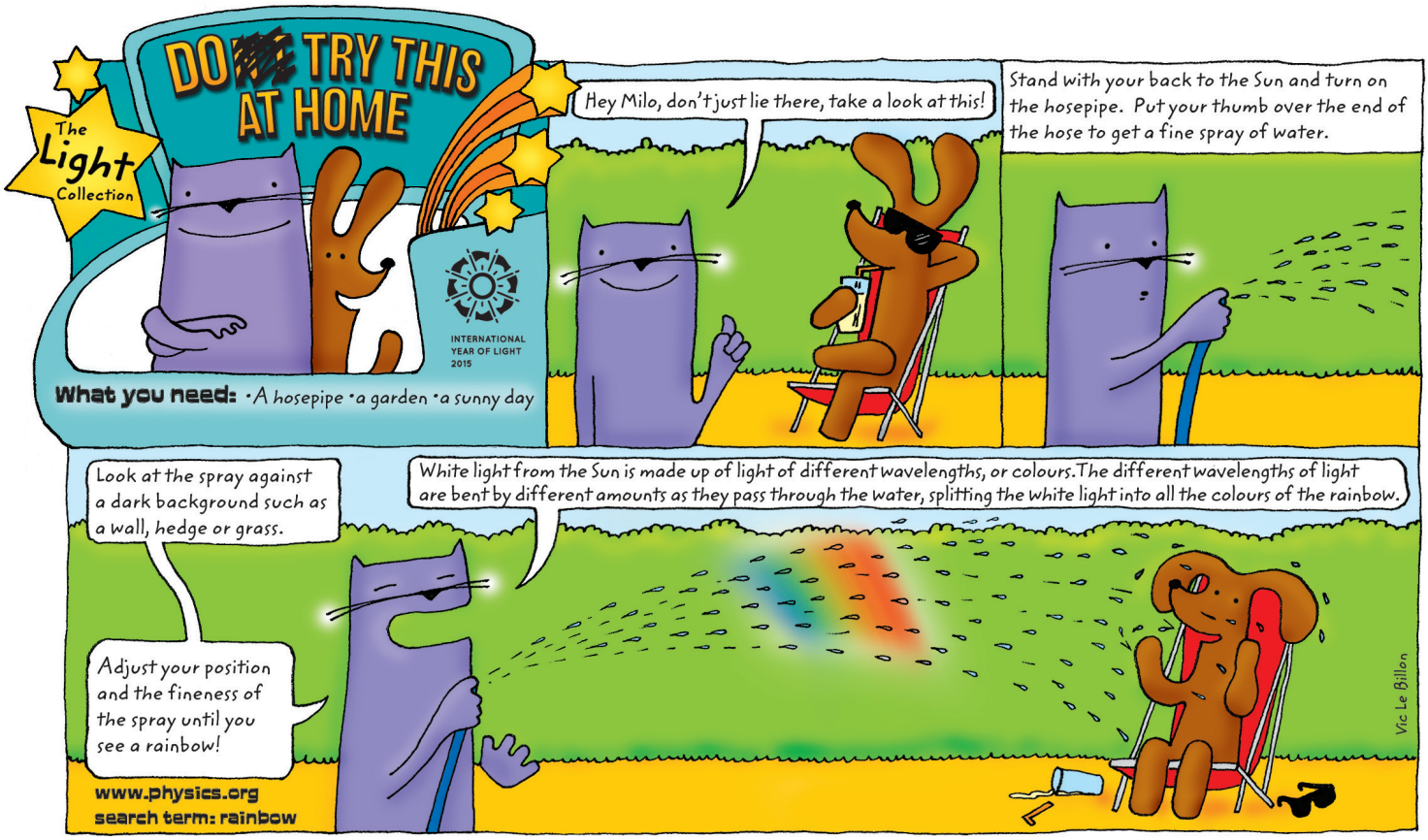

DO TRY THIS AT HOME
The Light Collection
INTERNATIONAL YEAR OF LIGHT 2015
What you need: • a glass of water • a piece of paper • a marker pen
This is my reversing machine.
Draw a column of short arrows.
Hold the paper a little way behind the glass.
The water acts like a glass lens, bending the rays of light and reversing the image of the arrows.
Stoopid person
Vic Le Billon
www.physics.org keyword: lens

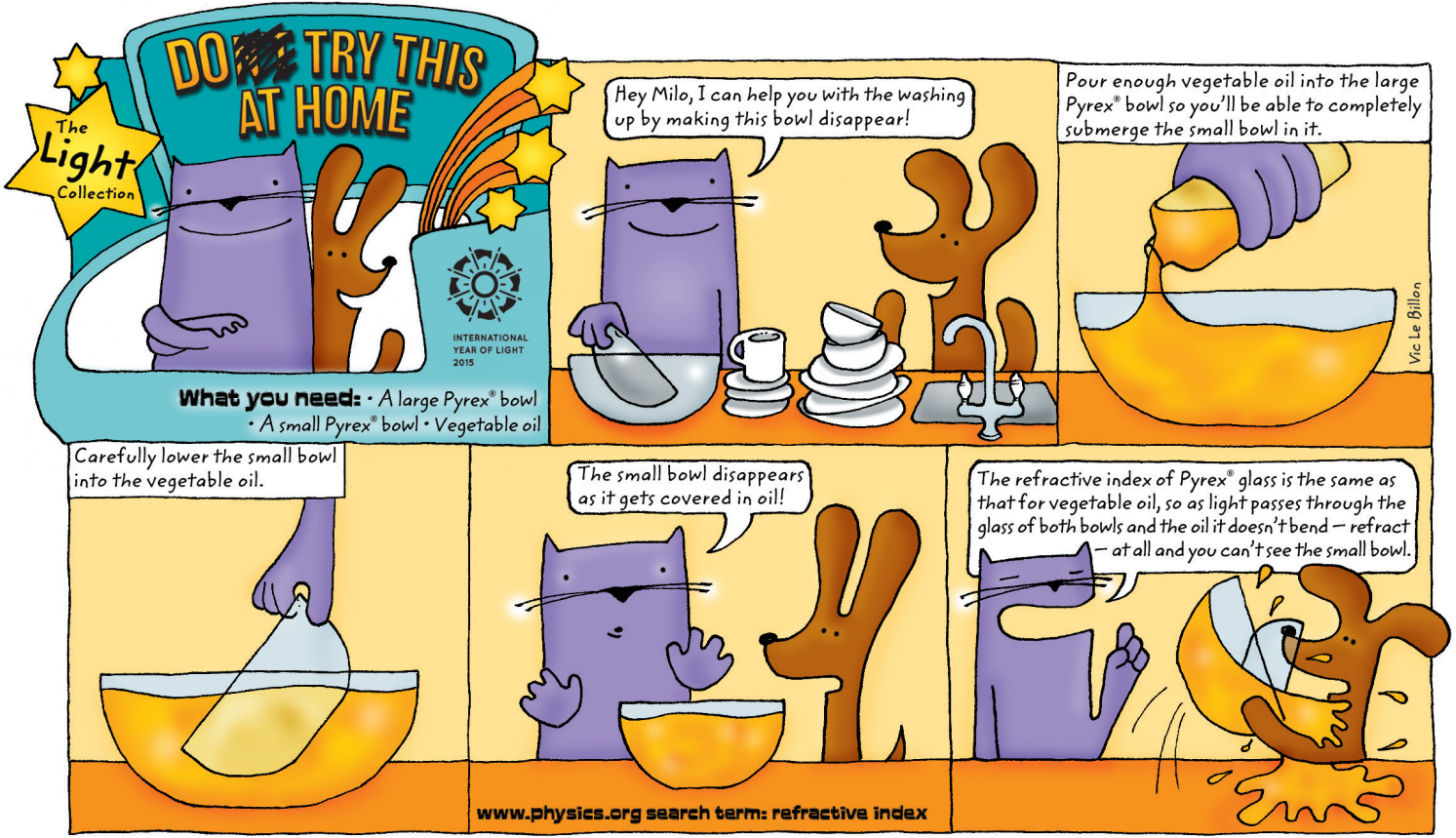

DON'T TRY THIS AT HOME
The Light Collection
INTERNATIONAL YEAR OF LIGHT 2015
What you need: • a large clear, straight-sided glass • water • milk • teaspoon • torch • darkened room
Do you want to see my homemade sunset?
Fill the glass about 2/3 full of water...
... add half a teaspoon of milk...
... and stir.
'CLICK
In a darkened room, shine the torch down onto the top of the water whilst looking through the side of the glass. Can you see the blue colour?
Then try shining the torch through the side of the glass whilst looking through the opposite side. What colours can you see now?
Finally, shine the torch up through the bottom of the glass and peer down through the water. What a lovely sunset!
The milk particles in the water scatter the light from the torch like dust and molecules in the atmosphere scatter light from the sun. The further the light has to travel through the water, the more of the blue light has been scattered, leaving only red light for you to see. Just like at sunset.
Vic Le Billon
www.physics.org keywords: sky blue


DO TRY THIS AT HOME
The Light Collection
INTERNATIONAL YEAR OF LIGHT 2015
What you need: • Party balloon
• Energy saving light bulb
Don't worry about the power cut Milo, I can produce some light for you!
Blow up the balloon and tie the end.
Rub the balloon against your hair or jumper.
In a dark room, hold the bulb in one hand and move the balloon back and forth close to it.
Waving the electrically charged balloon close to the bulb causes a current to flow through the charged gas inside the bulb and it lights.
Vic Le Billon
www.physics.org
search term: static electricity


DO NOT TRY THIS AT HOME
The Light Collection
INTERNATIONAL YEAR OF LIGHT 2015
What you need: •Two clear glasses •Tap water •Tonic water • Dark paper
Hey Milo, I've got a cool trick for a sunny day!
Fill one glass with tap water...
... and the other with tonic water...
... and put them both in direct sunlight.
Holding the dark paper behind them, but not blocking the light, look across the surfaces of the water. The tonic water will be giving off an eerie blue glow!
Tonic water contains quinine. The quinine absorbs ultraviolet light from the Sun and re-emits it as visible blue light.
Vic Le Billon
www.physics.org search term: ultraviolet light


DO TRY THIS AT HOME
The Light Collection
INTERNATIONAL YEAR OF LIGHT 2015
What you need: •A small mirror •A blank wall •A friend
Hey Milo, I can make you disappear!
Sit opposite your friend and next to a pale, blank wall.
Vic Le Billon
With the wall to your right, hold the mirror in your left hand and put it next to your nose.
Angle the mirror so that your right eye sees only a reflection of the wall.
With your left eye looking at your friend, wave your right hand so your right eye can see it reflected in the mirror.
Watch bits of your friend's face disappear! Don't give up if it doesn't work straight away – try switching eyes, holding your head very still and making sure your friend doesn't fidget.
Each eye is seeing something very different and as your brain tries to make a sensible single image, it combines bits from both eyes. But your brain is sensitive to movement so it focuses on your moving hand and your friend disappears.
www.physics.org
search term: binocular vision


DO TRY THIS AT HOME
The Light Collection
INTERNATIONAL YEAR OF LIGHT 2015
What you need: •A hosepipe •a garden •a sunny day
Hey Milo, don't just lie there, take a look at this!
Stand with your back to the Sun and turn on the hosepipe. Put your thumb over the end of the hose to get a fine spray of water.
White light from the Sun is made up of light of different wavelengths, or colours. The different wavelengths of light are bent by different amounts as they pass through the water, splitting the white light into all the colours of the rainbow.
Look at the spray against a dark background such as a wall, hedge or grass.
Adjust your position and the fineness of the spray until you see a rainbow!
www.physics.org
search term: rainbow
Vic Le Billon


DON'T TRY THIS AT HOME
The Light Collection
INTERNATIONAL YEAR OF LIGHT 2015
What you need: • A large Pyrex® bowl • A small Pyrex® bowl • Vegetable oil
Hey Milo, I can help you with the washing up by making this bowl disappear!
Pour enough vegetable oil into the large Pyrex® bowl so you'll be able to completely submerge the small bowl in it.
Vic Le Billon
Carefully lower the small bowl into the vegetable oil.
The small bowl disappears as it gets covered in oil!
The refractive index of Pyrex® glass is the same as that for vegetable oil, so as light passes through the glass of both bowls and the oil it doesn't bend – refract – at all and you can't see the small bowl.
www.physics.org search term: refractive index

IOP Institute of Physics

To receive more of our great classroom resources, affiliate your school or college today. Visit **iop.org/affiliation** for details.

Running a science club? Download our STEM club activity pack for lots of physics ideas and experiments, including over 80 Marvin and Milo cartoons. Go to **iop.org/stemclubs** to download.

Contact us at **education@iop.org**.