



Encouragement Award

Science Writing Year 7-8

Siming (Steve) Xin

St John's Grammar School -
Senior School



Johnno's Adventure in the City of Light

By Steve Xin

Johnno hated anything to do with light. In fact, he hated light so much that it seems to hate him back. His skin was so sensitive that he gets sunburnt every time he goes outside. He would accidentally look at the sun every time he looks up. He even got an F for his science exam on optics. z

One day, his Dad got sick of him complaining about the heat strokes he got from standing in the hot sun and got him a set of bright white clothes.

"Dad, why did you get white clothes?" Johnno asked. His overall Science grade wasn't that good either.

"Because the colour white reflects the most light. When we see the colour of something, we are actually seeing the colour it reflects. White light, the normal light, consists of 7 main colours: Red, Orange, Yellow, Green, Blue, Indigo, and Violet. For example, a green piece of paper reflects the green light and absorbs all other colours. The colour white reflects all the colours while black absorbs them. So the white clothes reflect more light, making it cooler to wear."

"Oh." Johnno didn't know that the colour of something affected how much heat it absorbs.

On a hot summer day, Johnno was sitting on his couch when he felt a sense of dizziness in his brain as sweat accumulated in his brows. He had a sudden urge to fall asleep and soon did such.

When he woke up again, there were blinding lights all around him. Johnno couldn't see anything because it hurt to just open his eyes by the slightest bit. A voice behind him said:

"Are you insane? Why are you lying around without sunglasses? Here, I brought a spare with me."

Johnno felt a pair of sunglasses being put around his head. Suddenly, the light wasn't so blinding anymore. He said:

"Thank you. Where am I?"

"You are in the City of Light. I say, are you new here?"

It took Johnno a moment to realize that he was speaking to a talking torch. He replied:

"Yeah, I suppose. How did I get here?"

“You must have ended up here by mistake. I’ll help get you back. But before you go, why don’t I give you a tour of this amazing place?” The torch replied.

“No thanks,” Johno replied. “Out of everything in the Universe, I hate light the most.”

The torch stared at him in astonishment.

“How could you possibly not love light! It has such fascinating properties and there are so many tricks you could do with them! They are also very important in your daily life. And yet you don’t like it? All the more reason for you to visit this place.”

It dragged Johno by the hand and took him through a shimmering gate with the words “City of Light” in big bold letters and surrounded by neon lights in rainbow colours. Inside, there were big buildings. Johno didn’t even get time to object before the torch took him into a dim room with nothing but a rectangular box on a table in the centre.

“By the way, my name is Flashy and I am the Mayor of this city.” It said. “Now, take a look inside that big box.”

Johno approached the box. It was separated by a thin plank in the middle. The side facing him was fitted with a glass pane so the inside of it could be seen. On the left side, there was an image of a flower with lots of light concentrated on it. On the right, there was the same flower except it was upside-down.

“Okay, what about it?” Johno asked. There was really nothing intriguing about the two pictures.

“Watch this.” Flashy said. He pulled an image of a tree from under the table. He opened a hatch on the box and replaced the flower with it. Miraculously, the picture on the right also changed to be an upside-down tree. He placed the flower picture back and the right side also changed back.

“It’s cool, isn’t it?” Flashy beamed. “And if I remove the plank in the middle...”

The other side turned into a blur of light.

“Wow! That’s so cool!” Johno exclaimed. “How did you do that?”

“It’s very simple.” Flashy replied. “look closer at this plank.”

Johno examined it carefully. He noticed a tiny hole in the centre of the plank.

“Is this how you projected an image on the other side of the box?” He asked.

“Bingo! You see, light always travel in a straight line. So, without any confinement,” Flashy gestured towards the box. “they will form nothing but blur.”

“But when you only allow light to pass through this little hole,” He said, placing the plank back in to form a clear picture again, “the light irradiated from the top of the image has to pass through the hole, ending up at the bottom on the other side. The light from the bottom of the image will end up at the top on the other side. Any light that doesn’t follow that rule would hit the plank and not be able to get through. This allows the light that does make it through to form a clear image. Because the light from the top of the image goes to the bottom on the other side and vis versa, the projection on the other side will be upside-down.”

“Wow. I didn’t know there was so much science behind all this!” Johno was fascinated by this amazing trick.

“Why do you hate light so much?” Flashy asked as they left that room.

Johno told him about all the troubles he had with light.

“Oh. That is a bit unfortunate.” Flashy said. “Well, perhaps today would change your mind. Have a look around you.”

Johno looked up from the ground. Even with the sunglasses on, his eyes still took some time to adjust to the brightness of his surroundings. However, when he saw the beautiful scene, he decided all that pain was worth it. The sky was radiating a warm glow of yellow. Along a glorious pathway lit by beautifully decorated street lamps were trees and plants of the wildest kind, each shimmering with a dim green glow. Johno stood up swiftly and dashed down the path. He stopped when a yellow river flowed in his path. Johno could see that there were more cool things on the other side but he couldn’t get there! A few minutes later, Flashy caught up with him and said:

“Aha! Perfect. It’s time I showed you another trick!” He stuck his foot out onto the water and placed his weight on it. Instead of sinking, the water held his weight. Flashy smiled as he saw Johno’s impression.

“Come on,” He said. “Try it yourself! Step where I stepped.”

Johno walked slowly and carefully towards him. To his surprise, he did not fall into the weird-looking water but was standing on it instead. He carefully dipped a finger into the water and realised it was vegetable oil! He then felt the ground he was standing on. It was glass!

“Do you want to know how that works?” Flashy asked. Johno nodded earnestly.

“The human eye can see glass because it both refracts and reflects light. When light transfers from air to glass, it’s bent and refracted due to the change. The severity and degree to which the light is refracted is determined by the object’s index of refraction. If the index of refraction of two object is similar or the same, one can’t be seen through the other, therefore making it invisible. In this case, vegetable oil has an index of refraction very similar to that of glass, so when glass is placed in vegetable oil it would

be invisible.” Flashy snapped his fingers and the water level dropped a few centimetres, revealing the glass path they just walked on to make the point.

“Awesome! This is just like magic!” Johno gasped. “I didn’t know that light had so many interesting features to it!”

He looked up and noticed a glimmering giant clock in the air and asked:

“Is that the real time? Oh no! My parents will be home soon! This has been a wonderful adventure, but if I don’t get home soon they will be worried sick!”

“Not a problem!” Flashy said with a smile. He clapped his hands and Johno was instantly surrounded by a clear white beam. Johno felt the same dizziness he felt before and became unconscious once more.

Johno sat up, startled. He was back in his house and his mother just woke him up.

“You must have dozed off while you were on the couch!” She said. So it was all just a dream and light was not so fascinating after all.

As he got up, he noticed that there was something in his right hand. It was a pair of sunglasses with a note tucked neatly underneath:

“For you. ;)”

Johno smiled.

Word Count: 1499

Reference:

Britannica.com: Understand how a pinhole focuses light and why lenses are better than pinholes.

<https://www.britannica.com/video/185495/pinhole-light-advantages-pinholes-lenses>

Exploratorium.edu: Disappearing Glass Rods.

<https://www.exploratorium.edu/snacks/disappearing-glass-rods>

Sciencing.com: What Colors Absorb More Heat?

<https://sciencing.com/colors-absorb-heat-8456008.html>

ScienceStruck.com: Colors of the Rainbow in Order.

<https://sciencestruck.com/colors-of-rainbow-in-order#:~:text=Colors%20of%20the%20Rainbow%20and%20their%20Meaning%201,Blue.%20...%206%20Indigo.%20...%207%20Violet.%20>

Physicsabout.com: What are 7 Basic Properties of Light?

<https://physicsabout.com/light/>

letstalkscience.ca: Light and Its Properties.

<https://letstalkscience.ca/educational-resources/backgrounders/light-and-its-properties>

Tulane.edu: Properties of light.

<https://www.tulane.edu/~sanelson/eens211/proplight.htm>