

# Thatha's Torch



It was a foggy night. Sooraj was sitting next to the campfire in the open lawn behind his Grandpa's house. "This is better than camping. We have thatha, paati and a campfire too," said Sooraj, smiling as wide as he can. "Yes, that's right. But, now it's time to get some sleep," said Sooraj's father as he got up. "WHAT, NOOO..." cried Sooraj along with his brother Prathik and sister Sharmi. "We are going home tomorrow. We want to stay a little longer here," they said. "And that is exactly why we have to sleep now. We have to get up early and you don't want to see your dad sleep while driving, right?" his father asked with a smile. Sooraj was restless. "Thatha, what is the time now? Is it late already?" Grandpa shook his head. "I would love to tell you, but my watch must have slipped somewhere here. If you can wait till morning, I will find it and tell you the correct time," he joked. All three children got up with a disappointed face and walked into the house. Sooraj's father put off the campfire and walked last into the house. "Hmmm, unusual silence," he wondered.



He peeped into the room. The children looked glum. "This is not how a vacation should end," he told himself. Breaking the silence in the room, he walked into the room with heavy steps grabbing the children's attention. "Did you know? Thatha lost his watch in the backyard today," he said. "Yeah, dad. He told us," all the three replied in chorus.

"So, who wants to come with me and find the watch for him? It is his favorite watch, right?" father asked. The children's face suddenly lit up."





"But," interrupted Sharmi. "You said we have to leave early tomorrow," she asked. "That is exactly why we have to find it for him now," her father replied with a wink.

With a joyous roar, all three children rushed outside. "But children," called father. "You have to take your torches. I have put out the campfire. So it is dark, smoky and foggy," he warned. "Of, course, dad. We will take them," replied the children as they ran towards their bags and pulled out the torches. But there were only two torches in the bag. Sooraj being the youngest of the three, reached last to the bag only to find that Prathik and Sharmi had taken the torches and left to the lawn. Disappointed, Sooraj turned back and walked with a long face into the room as he bumped into his grandpa.

"What is the matter, dear?," his Grandpa asked, caressing Sooraj's hair. "I want to go out with Prathik and Sharmi but I don't have a torch, thatha," Sooraj said with a weak voice. "Is that it? Come with me, I will give you a wonderful torch," Grandpa said as he held Sooraj by hand and walked towards his room. Filled with hope, Sooraj followed his Grandpa.



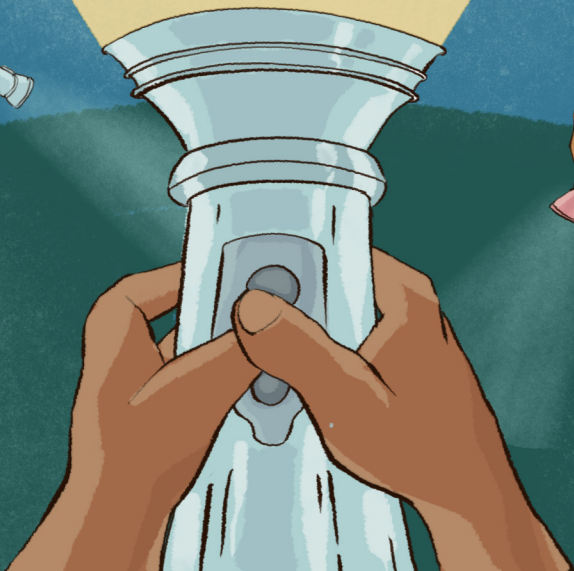
Grandpa bent down to pickup something. With a sigh turned towards Sooraj and sat down in his chair. "Here, take it," he said as he held a torch out. The happiness on Sooraj's face vanished in a moment. The torch was nothing like he wanted. It was rather huge, heavy and with a click, it gave a yellow light, which was even more disappointing to Sooraj. It was nothing like the torches his siblings had, which were small, stylish and gave a bright white light. "Thatha... But... Don't you have a different torch. Maybe something that gives a different color?" Sooraj asked with hesitation. "What are you talking about? This is a wonderful torch. I have been using it for 30 years now," his Grandpa said with pride. Sooraj had no other option but to take it.



He carried it slowly with both his hands. In the lawn, Prathik and Sharmi were trying hard to find the watch. But their torches weren't good enough to see through the thick fog and smoke. "I thought my torch was the most powerful," Prathik said. "I thought mine was the most powerful," Sharmi replied. "Well, I know that mine is surely not powerful," interrupted Sooraj and held the torch forward. And with a click, a beautiful yellow light spread across the lawn cutting through the fog. Sooraj was as surprised as the other two.

"Wait, I see something," said Sooraj as he walked near a bush.

A piece of metal was dazzling. It was the watch.





Sooraj took the watch to his Grandpa. "Look what I found for you, thatha," he said as he showed the watch. "Oh my dear, thank you so much," his Grandpa hugged Sooraj. "And this is also yours," Sooraj extended the torch. "No, that is yours. A gift for finding my favorite watch," Grandpa said. Now Sooraj was really happy to have the torch for himself. "If you want, we can swap our torches," Prathik came with his torch. "No, thanks," Sooraj smiled. "I think I like my new torch more."





# In The News

## Police Urge Motorists To Use Fog Lights

On January 2022, heavy fog filled the streets of Chandigarh as winter peaked. During the darker and early hours of the day, visibility was severely affected and motorists found difficulty driving on the roads. The Chandigarh police instructed the city people to avoid driving on the streets when the visibility was poor. And the police urged people to use fog lights while driving to prevent accidents.

# So, How it works...

What difference does it make to have a yellow light and a white light? In Sooraj's case, it made all the difference. Prathik and Sharmi had new torches that gave a bright white light. But the white light couldn't penetrate far through the fog. But grandpa's yellow light cut through smoke and fog and helped Sooraj see easily across the lawn. Light travels in the form of waves and colors with shorter wavelengths (in our story, white light\*) get scattered when it hits denser particles in air like smoke and fog. Have you played carrom board? It happens just like how the striker hits a coin and starts moving in a different direction. But colors with longer wavelengths (like Sooraj's yellow torch) don't get scattered very easily. They muscle through the particles in air. Like how you squeeze through a heavily crowded street.

But to how much a lightray gets scattered can be determined by a law called the Rayleigh's scattering law. According to this law "The amount of scattering is inversely proportional to the fourth power of wavelength of light, when the size of the particles are smaller than the wavelength of light." Simply speaking, it again means that shorter wavelengths are scattered more, and longer wavelengths are scattered less. And it is for the same reason, fog lights in vehicles mostly use yellow beams instead of white. That way, drivers can be seen better through fog, thus preventing accidents.

\*White light consists of all colors, of which several have short wavelengths.

# TRY IT AT HOME

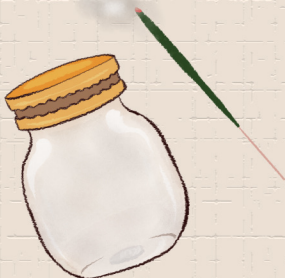
## Find the coin



Let us try to recreate a scene from the story "Thatha's Torch". The climax, where the backyard is filled with fog, should be good. But let us do it inside a small bottle instead.

1. Take a glass or any transparent plastic bottle.

2. Place a coin inside. Observe that the coin is easily visible through the bottle.



3. Now fill the bottle with smoke. How? Use an incense stick to create smoke inside the bottle and close the lid tightly.

4. Notice that the coin becomes almost invisible in the smoke.



5. Better done in a dark room, try to find the coin just like Sooraj did.



6. You can try flashing a phone's torch (white color) on the bottle and then light a candle (or use a yellow torch if your thatha has one.) and compare the changes yourself.

7. Now feel the magic just like Sooraj did.

