

THE SECRET AGENT

Purpose Of The Activity:

To classify surrounding light sources as natural and artificial light sources. To explore the interaction of light with matter through camouflage writing.

Theme Beyond Disciplinaries:

Ways of Self-Expression



TUNING IN

Let's arouse curiosity!



FINDING OUT

What Should Future Science People Discover?



TAKING ACTION

Question Of The Day?



QUESTIONING CYCLE

SORTING OUT

Let's Start Discovering!, Scientific Explanation For The Curious, Video



MAKING CONCLUSIONS

Activity Pages, Exit Card



GOING FURTHER

What else can we do? ?



THE SECRET AGENT

Secret Path

Let's Arouse Curiosity



Students are directed the following questions:

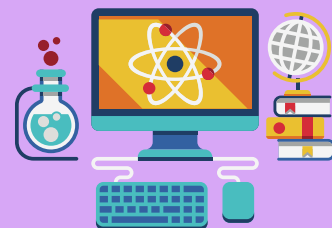
- Is sunlight a natural source of light?
- What are the light sources around us?

"Let's think about natural lights. The brightest and most mesmerizing light source is the Sun! The Sun illuminates the sky throughout the day and paints a colorful picture. The sun rising in the mornings blankets nature with rosy tones; while the setting sun paints the sky with orange and pink hues in the evenings. The lamps, flashlights, and light-up toys around us, on the other hand, are examples of artificial lights. The lamps in our homes help us read books, play games at night, and add color to our rooms. Flashlights guide us in dark nights and are perfect companions for stargazing in the park. Some animals and even some objects can perfectly camouflage themselves using the light around them. Now, are you ready for a very fun activity considering all of these?" is asked. After receiving answers, the activity materials are brought out and examined.

Let's Start Discovering!

The activity video is watched by pausing. The content of the set is checked before proceeding with the activity. All the lid and package opening steps are done simultaneously with the students.

Watch The Video By Pausing!



Content Of The Set

- | | |
|--|---|
| <input type="checkbox"/> Research file | <input type="checkbox"/> Double-sided tape or adhesive (not |
| <input type="checkbox"/> Magnifying glass template | <input type="checkbox"/> included in the set contents) |
| <input type="checkbox"/> Red acetate | <input type="checkbox"/> Pen (not included in the set contents) |
| <input type="checkbox"/> Hidden label | <input type="checkbox"/> "Light Sources" activity page |

How Do We Do It?

1. Double-sided tape is applied to one of the magnifying glass models. The tapes are opened, and the acetate is placed in the middle gap. It is then stuck onto the second piece.
2. First, the codes corresponding to the letters are deciphered to find the first code (**Code1**).
3. To solve the second code, what the picture is about is written down (**Code2**).
4. The scratch-off area is scratched, and the codes found are written in the parts labeled "code 1" and "code 2".
5. An attempt is made to find the answer. **Answer:** Journey at the Speed of Light

What Should Future Science People Discover?

Students are directed the following questions:

- Have you ever seen grasshoppers hidden among plants before?
- Why couldn't we read the writing with our naked eyes?

We see many lights around us. These lights have sources. Objects that emit light and illuminate their surroundings are light sources. The biggest light source on our planet is the Sun. Light sources are divided into two groups: **natural light sources** and **artificial light sources**.

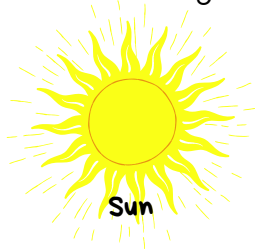


Star

Natural light sources are objects that emit light spontaneously to their surroundings. The Sun, fireflies, stars, and lightning are examples of natural light sources. Some living organisms can produce their own light. Fireflies, jellyfish, squid, and some mushrooms are natural light sources that can emit light.



Jellyfish



Sun



Firefly



Lightning

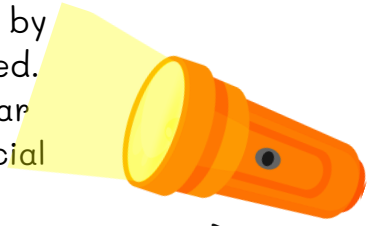


Ink snapper



Lightbulb

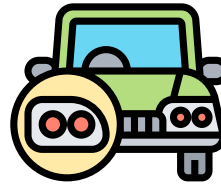
Artificial light sources are made by humans and emit light when ignited. Bulbs, flashlights, candles, and car headlights are examples of artificial light sources.



Torch



Candle



Car Headlight

Some objects reflect light even though they are not light sources. The moon, mirrors, phosphorescent traffic signs, or phosphorescent clothing reflect light like a light source, although they are not light sources themselves.

The light rays from the Sun are considered white. The red "SCIENCE" text on a white balloon can be easily read. If red light is reflected intensively on a white balloon, this text becomes camouflaged. We can see many examples of camouflage around us. For example, soldiers wear green clothes to camouflage with the green color of the forest in wooded areas, while in snowy regions, they wear white to camouflage. In the animal kingdom, the chameleon changes its color with various environmental factors or to protect itself from enemies. Like the chameleon, many animals have the ability to camouflage. Various butterflies, insects, marine creatures... camouflage themselves and protect themselves from their enemies.

How Do We See the Hidden Message with Acetate?

The text in the hidden message is camouflaged. To reveal the text that cannot be seen with the naked eye on the front of the card, acetate paper of the same color as the pattern on the card is used.

The acetate paper filters the front surface of the card, making the previously invisible written message appear more pronounced and easily readable.

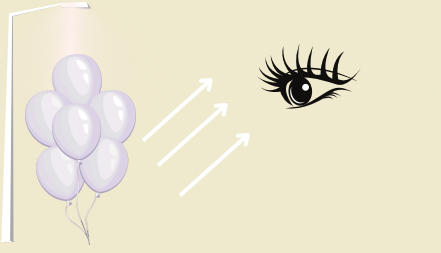
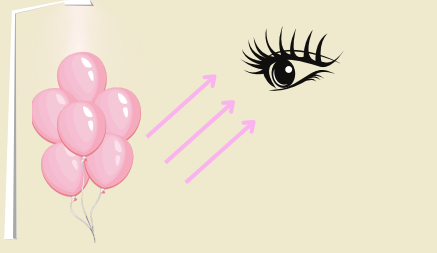

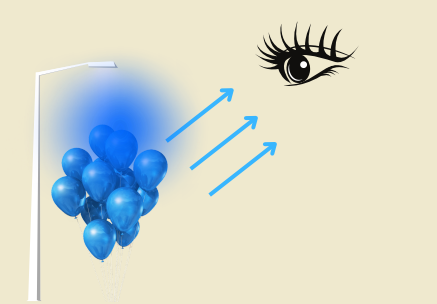
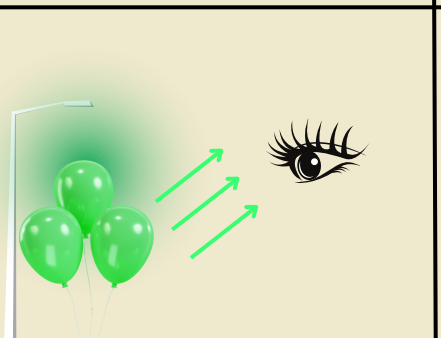
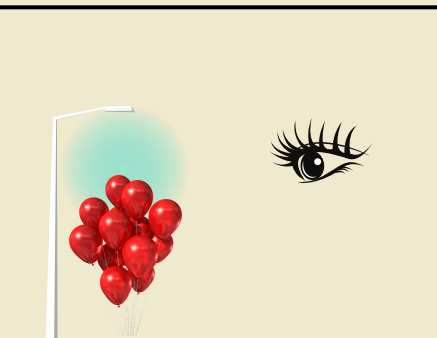


Scientific Explanation For The Curious

Students are directed the following questions:

- What color clothes do you wear in summer?
- So, what color clothes do you wear in winter?

Light is a type of energy and radiates in all directions linearly. The absorption of light by objects is called absorption. Sunlight is considered white in color. Dark-colored objects absorb much of the light, while light-colored objects reflect much of the light. The reason why objects appear black, white, or colored under white light is related to whether they reflect or absorb light.

 <p>Objects that reflect all of the incident white light appear white.</p>	 <p>Objects that reflect one color of white light and absorb the others appear in the reflected color.</p>
<p>So how do we see objects under light of different colors rather than white light? Objects appear differently under red, blue, or green light.</p>	
 <p>Objects that absorb all of the incident white light appear black.</p>	 <p>The blue balloon appears blue because it reflects blue light.</p>
 <p>The green balloon appears green because it reflects green light.</p>	 <p>The red balloon absorbs all the blue light falling on it. Since no light is reflected, the balloon appears black.</p>

What Else Can We Do?

Dear Teacher,

You conducted observations with future scientists to find camouflage writing.

We can organize exciting activities to discover how light is refracted between different materials!

Surprising Water



Materials;

Transparent small bag or transparent acetate, two small pieces of paper, CD marker, deep bowl, water

Experiment 1:

- Fill the bowl with water
- Draw the letter "L" on a piece of paper and place it behind the bowl filled with water
- Look at the letter "L" through the water-filled bowl in a way that it will be right in the middle
- Discuss what changes you observe

Experiment 2:

- Write "128√eg80" on a piece of paper with a CD marker, sized to fit in the bowl
 - Wrap the paper in a small transparent bag or acetate
 - Write "iloveyou" on the lower half of the visible "128√eg80" in the transparent bag
 - Fill the bowl with water
 - Submerge the transparent bag into the bowl and look at it from above
- The "128√eg80" will disappear, and the "iloveyou" will become visible (This experiment is entirely about refraction, so the viewing angle is crucial. Make sure to look from above, and the sealed bag should be placed as vertically as possible. From other angles, only the "iloveyou" will be visible)

What Happened?

When we look at the water from the top of the glass bowl, there will be total reflection, so the light coming from the drawing on the paper will not enter our eyes. Therefore, while the part written on the sealed bag cannot be seen, the part written on the sealed bag can still be seen because it is not completely refracted.



What Did We Discover?/Exit Card



Today, we discovered camouflage writing using our red magnifier. We completed the writing like secret agents by finding the codes. We explored what light sources are and how light is reflected on objects. The "Light Sources" activity page is provided.

Question Of The Day



Can we travel at the speed of light?



Write, how you felt in this activity!

CURIOUS BOX



miniskop

www.curiousbox.co