**Light and Surfaces - Demonstration**

Question

What happens to light when you shine it through different surfaces (water, milky water, and a solid cup)?

Hypothesis - make a hypothesis about the following:

* I think that in the water the light will . . .
* I think that in the milky water the light will . . .
* I think that in the solid cup the light will . . .

Materials

* clear container
* water
* flashlight
* milk
* solid cup
* dark colored surface (notebook or binder)

Procedure

1. First, stand the dark colored surface up on one side of the clear container containing water and shine the flashlight through the side of the cup so that the beam would hit the binder. Record your observations.
2. Next, add a small amount of milk to the water and shine the flashlight through the side of the cup so that the beam would hit the binder. Record your observations.
3. Now, stand the dark colored surface up on one side of the solid cup (you do not need to put any liquid in the solid cup) and shine the flashlight through the side of the cup so that the beam would hit the binder. Record your observations.

Conclusion

1. When light passes through an object we say that it is *transparent*. Which of the cups was transparent?
2. When only some light can pass through an object we say that it is *translucent*. Which of the cups was translucent?

When all light is blocked we say the object is *opaque*. Which of the cups was opaque?

How you see colour

White Light

White light is composed of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The colours are:

* This was discovered by Sir Isaac Newton 1672. He used a glass prism to separate and study light.

Colour of Objects

The colour of an object depends on two things:

1.

|  |  |
| --- | --- |
| Transparent |  |
| Translucent |  |
| Opaque |  |

2.

1. Opaque Objects & Reflection

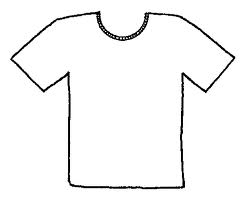
The colour of an opaque object, that is not emitting its own light, is the colour of the light that is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. All of the other colours are being \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Example:**

Given the objects below; state which colours are being **REFLECTED** and which are being **ABSORBED**.

|  |  |  |
| --- | --- | --- |
| Objects Colour | Colour Reflected | Colours Absorbed |
| Red Book |  |  |
| Green Pants |  |  |
| White Hat |  |  |

**Reflection:** Draw a diagram for a Blue Shirt.



**BLACK VS WHITE**

On the hottest day of the summer you and a friend are going to Canada’s wonderland. You wear a black shirt and he wears a white shirt. Who’s shirt will be hotter by noon?

Transparent and Translucent Objects & Transmission

The colour of a **transparent or translucent object** or **filter** is the colour of the light it is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (allows through). All of the other colours are being \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Example:**

Given the objects below; state which colours are being **TRANSMITTED** and which are being **ABSORBED**.

|  |  |  |
| --- | --- | --- |
| Transparent Objects Colour | Colour TRANSMITTED | Colours ABSORBED |
| RED filter |  |  |
| GREEN filter |  |  |
| BLUE filter |  |  |
| MAGENTA filter |  |  |

**Transmission:** Draw a diagram for a CYAN piece of glass.

Cyan piece of glass (side view)

•Filters can be used to “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” out different colours of light, since the colour of the filter only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that colour or the primary colours of light that make that colour.

2. Colours of Objects in **Different Colours of Light**

|  |  |  |
| --- | --- | --- |
| Object | Colour of light | Colour object seems to be |
| Red socks | Red | Red |
| Blue | Black |
| Green | Black |
| Blue teddy | Red | Black |
| Blue |  |
| Green |  |
| Green camel | Red |  |
| Blue |  |
| Green |  |
| Magenta book | Red |  |
| Blue |  |
| Green |  |