

Light

What is light?

Lesson 1: Why can't we see when the lights go out?

Grammarsaurus

Scientific enquiry types and skills



Scientific enquiry types

- Testing
- Researching
- Observing
- Pattern seeking
- **Identifying & classifying** ✓
- Problem solving

Working scientifically skills

- Asking questions
- Making predictions
- Setting up tests
- **Observing & measuring** ✓
- **Recording data** ✓
- Interpreting & communicating results
- Evaluating

What is light?



Lesson 1: Why can't we see when the lights go out?

Lesson 2: Why do some objects look brighter than others?

Lesson 3: How can we protect ourselves from the Sun's light?

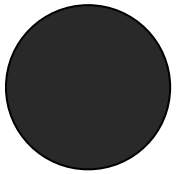
Lesson 4: What makes a shadow appear?

Lesson 5: What happens to a shadow when the light moves?

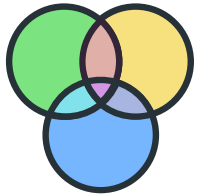
Lesson 6: How are mirrors used to help us see?



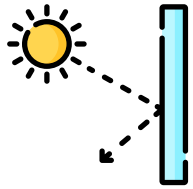
Key vocabulary for this lesson



dark – without light



light – a type of energy that allows us to see



reflect – to throw back light from a surface

Identifying and classifying



Hi, I'm Ciara. I'm a special effects engineer. I make actors appear and disappear on stage using **light**. Before I create any effect, I have to **identify** all the different light sources around me and **classify** which ones are bright, dim, coloured or moving. If I switch the wrong light off, the whole scene disappears! Today we're going to explore **how light helps us see things**… and **what happens when the light goes away**.



Let's discuss



When a stage is completely **dark** ●, even bright costumes disappear! Think about your bedroom at night… when you turn the lights out, **what can you still see? What disappears straight away?**

Discuss these questions with your learning partner. Be ready to **share your *feedback*** with the class.



If your classroom has blinds, you can try this out now. Let's make the room darker and observe which objects stay visible and which ones are harder to see!

Let's discuss



Now that our classroom is darker, **look around**. Some objects are harder to see! When this happens on stage, I decide what to do so everyone can see again.

What could we do right now to help us see the things in our classroom better?



Discuss the question with your **learning partner**.

Use the following sentence starters to help you:

"To help us see, we could…"

"If we… then…"

Let's investigate

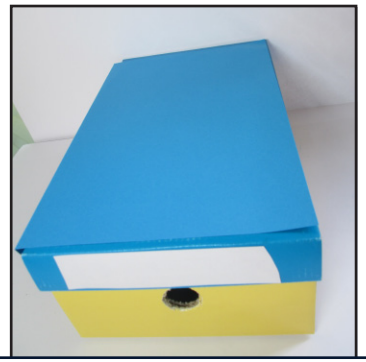


Now it's your turn to **investigate**. Put an object inside a box and close the lid. Any box is fine, as long as you seal it to make sure the **light** **can't get in**.

There should be just **one small viewing hole** in the end of the box. Look through the hole… **can you see the object**?



Put the object in the box…



place the lid on…



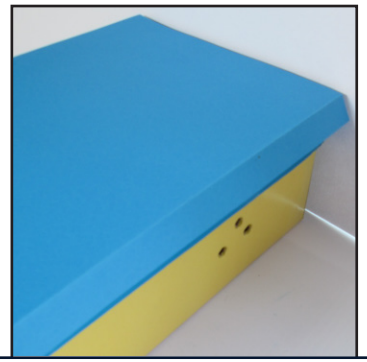
and look through the hole.

Let's investigate

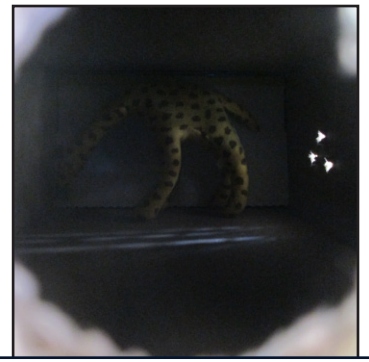
Next, **make a few small holes** in the side of your box. Look again through the hole in the end of the box.

Has anything changed? Discuss with your partner what you can see now.

You're observing how the **amount of light** affects what your **eyes can see**.



Make some holes…



and look again.



Let's investigate



Now **increase the size** of the holes. Look carefully inside the box and think about these questions:

- **What happens as more light enters?**
- **Does the object become easier to see?**
- **What happens if you shine a bright light from a torch through the holes in the side of the box?**

You're discovering how our eyes need enough light to make objects appear!



How do we see things?

We can only see an object when **light** shines on it.

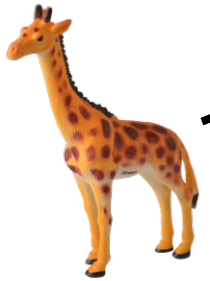
The light **reflects** or bounces off its surface into our eyes.

When there was **no light** reaching the object in the box, **you couldn't see anything**. When you added holes, light reached the object and it bounced off towards you. That means you could **see it again**.



The torch is a **light source**, so it creates light.

When the light hits an object, it **reflects** or bounces off.





We can see the object because the **light** from the object **enters our eye**.

Let's recap

Discuss the following questions with your learning partner, using the **sentence starters** to help you.

What happens to objects when there is no light at all?

"When there is no light…"

Why can we still see things in a dark classroom?

"We can still see things because…"

How does increasing the amount of light change what you can see?

"Increasing the amount of light…"



Now decide which statement is true and which is false.

A. I can see things clearly when I look harder.

B. I can see things clearly when there is more light.

Use this sentence starter to help you:

"Statement ____ is true/false because…"

Be ready to **share your feedback** with the class before the **answers** are revealed.

Let's recap

answers

What happens to objects when there is no light at all?

When there is no light at all, we are not able to see anything.

Why can we still see things in a dark classroom?

We can still see things because there might be a small amount of light coming from outside or from light sources in the room.

How does increasing the amount of light change what you can see?

Increasing the amount of light makes the object look brighter and shows more colour.

Which statement is true and which is false?

False – I can see things clearly when I look harder.

True – I can see things clearly when there is more light.

Let's watch



We've discovered that our **eyes need light to see**. Now let's look at things that give off their own light. Some objects shine by themselves, and some don't. Let's watch this short clip to help us spot which things make light and which things don't.



https://www.youtube.com/watch?v=4Ni6TuB-21o

New word alert!

light source – something that makes its own light

Activity

Identifying & classifying

Recording data

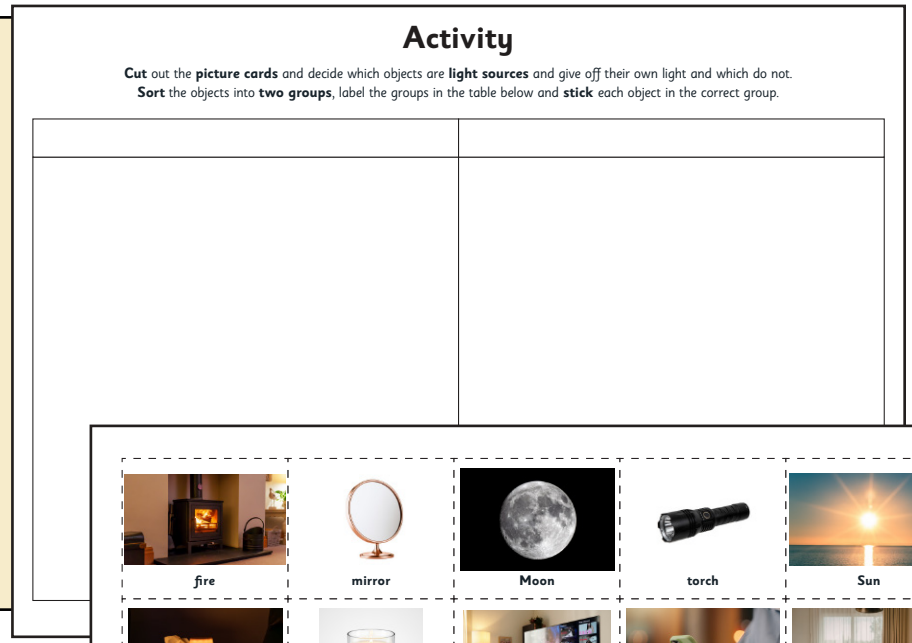


Look at the objects on the picture cards. Decide if each object **makes its own light** or **not**.

Cut out and **sort** the objects into **two groups**. Choose your own group names. **Stick** them into the table on your **activity worksheet**.

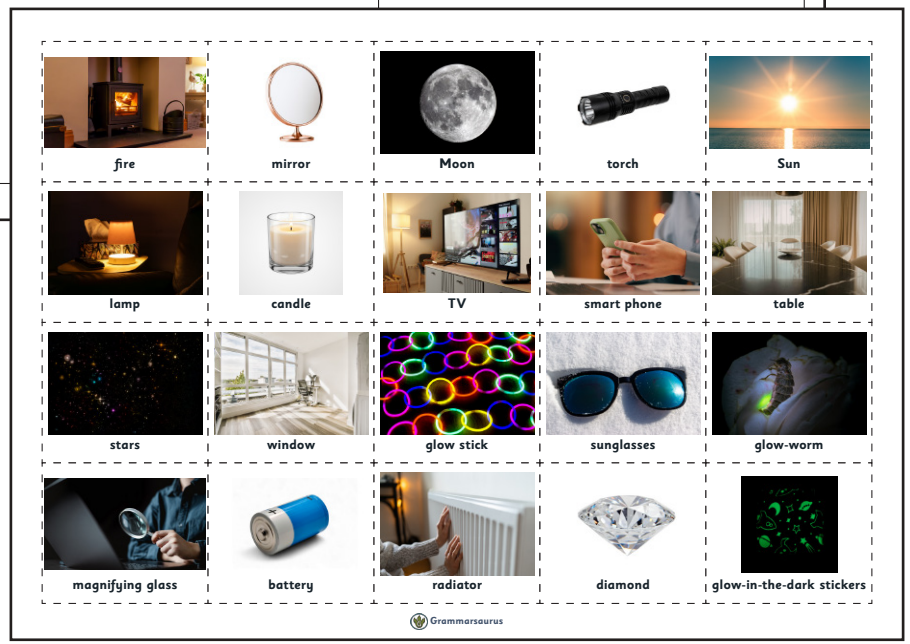
If there are any you are unsure about, place them to one side and we can discuss them together.

Be ready to **share your feedback** with the class before the **answers** are revealed.



Activity

Cut out the **picture cards** and decide which objects are **light sources** and give off their own light and which do not.
Sort the objects into **two groups**, label the groups in the table below and **stick** each object in the correct group.



Activity

answers

Sources of light	Not sources of light
fire	mirror
torch	the Moon
the Sun	window
lamp	table
candle	sunglasses
TV	battery
smart phone	radiator
stars	diamond
glowstick	magnifying glass
glow-worm	glow-in-the-dark stickers

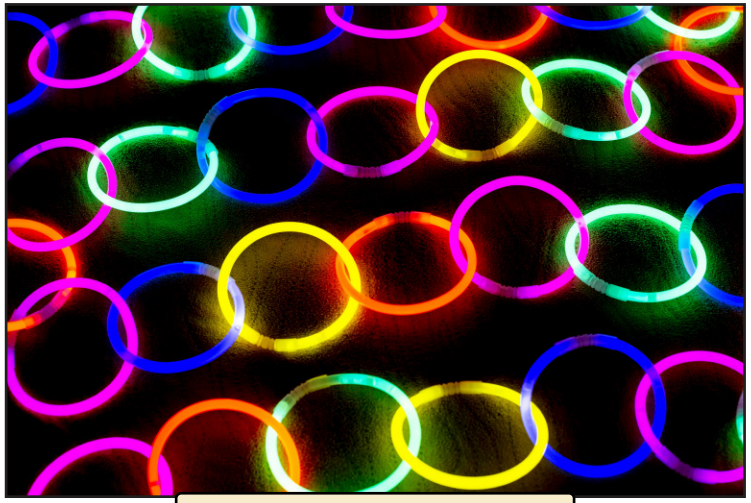
Activity

answers

How did you sort these objects?



the Moon



glowsticks



glow-in-the-dark stickers

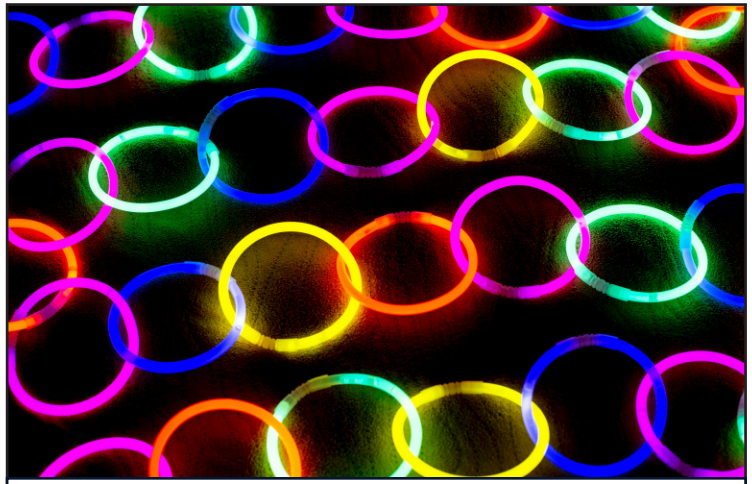
Share your *feedback* with the class.

Activity

answers



While the Moon sometimes gives us light to see at night, it is **not a light source** as it doesn't make its own light – it is reflecting light from the Sun.



Glow sticks **make their own light**. Inside them, a tiny chemical reaction happens that makes the stick glow.



Glow-in-the-dark stickers look bright, but they **do not make their own light**. They only glow because they have stored light from somewhere else.

Let's recap



What have we learnt today?

- Our eyes need light to see.
- When there is no light, objects disappear.
- More light helps us see more clearly.
- Some objects make their own light.
- Some objects only look bright because they reflect or store light.

Challenge

Place knowledge

Discuss the following question with your **learning partner**.

On stage, if a bright light shines from behind a performer, their whole body can look dark. **Why does the person look dark even though the stage is full of light?**



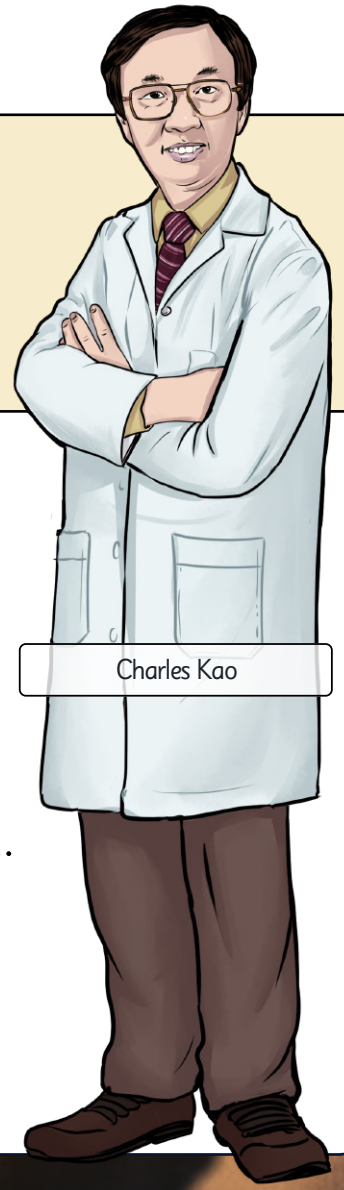
Be ready to **share your feedback** with the class before the **answers** are revealed.

Use the following sentence starters to help you:

"The person looks dark because…"

"The light is not…"



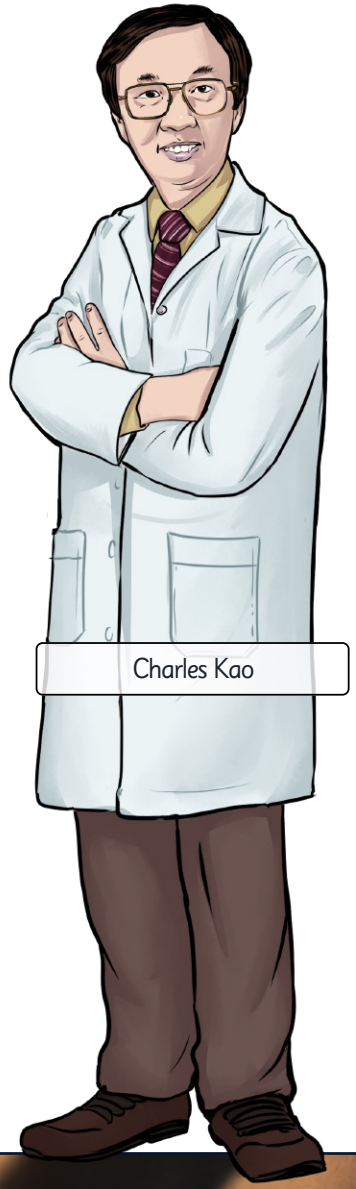


Challenge

answers







The person looks dark because the light is behind them.

The light is not shining on the front of their body, so our eyes can't see their face clearly.