How Light Travels

A task setting Powerpoint Pack about how light travels

Learning Objective

- To understand that light cannot travel through some materials and that this creates a shadow.

Success Criteria

- To know that light travels from a source.
- To understand that objects let different amounts of light pass through them.
- To know different types of light sources.

Recap

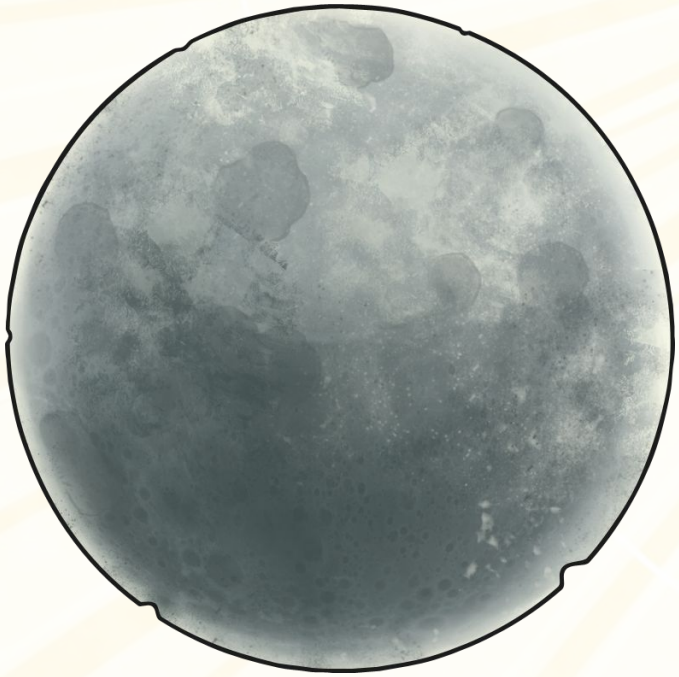
Light originates from light sources.
Can you sort these objects into light sources and non-light sources?

Mirror
Pencil
Candle (lit)
Television screen (turned on)
Stars
Moon
Earth
Sun

Light source	Non-light source

Recap

The moon is not a light source because it does not make its own light. Instead it reflects light from the sun, which is a light source.



Objects that reflect light from light sources are sometimes called secondary light sources.

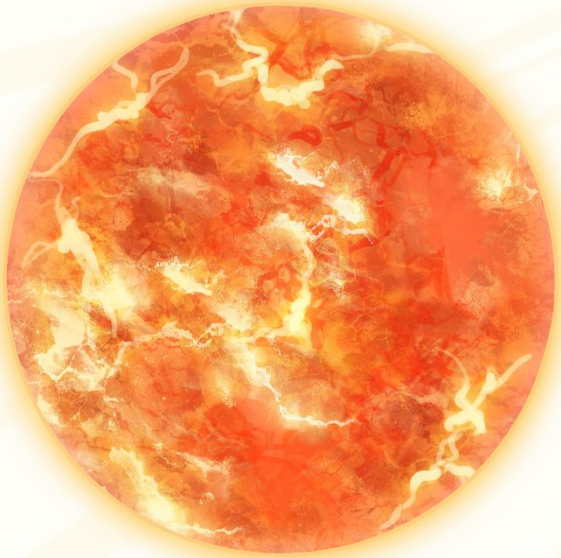
Recap

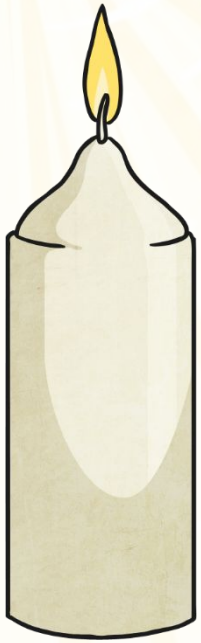
Light sources can be natural or man-made.
With a partner, can you make a list of natural light sources? Why do they produce light?

How Does Light Travel?

Here are some pictures of light sources.

Can you draw one of them and then draw a diagram to show how light travels from it?





How Does Light Travel?

Light travels in a straight line from a light source. We can see this if we shine a torch across a dark room.

The Peace Tower in Iceland sends a high powered beam of light into the night sky.

How Does Light Travel?

When an object passes in front of a beam of light, the light can be blocked, making a shadow.

- Opaque objects let no light through.
- Translucent objects let some light through.
- Transparent objects let all light through.

Investigate

We are going to find out more about light and shadow by using several different investigations. You will carry out these investigations in small groups.

We will investigate:

1. How does an object's distance from the light source affect its shadow?
2. How does the angle at which the light source shines on an object affect its shadow?
3. How does an object's distance from the wall affect its shadow?
4. How does the translucency of an object affect its shadow?

Investigate

Your investigation needs:

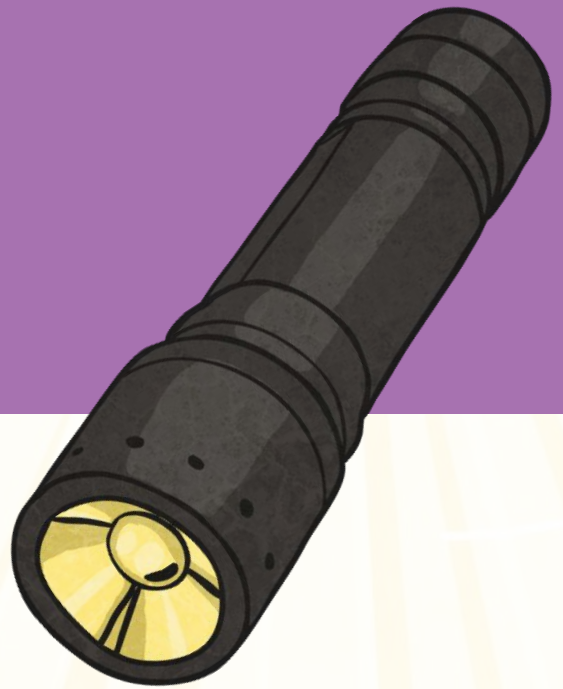
- Title
- Equipment list
- What you are going to change (a variable)
- What you are going to keep the same
- Prediction
- Results
- Conclusion

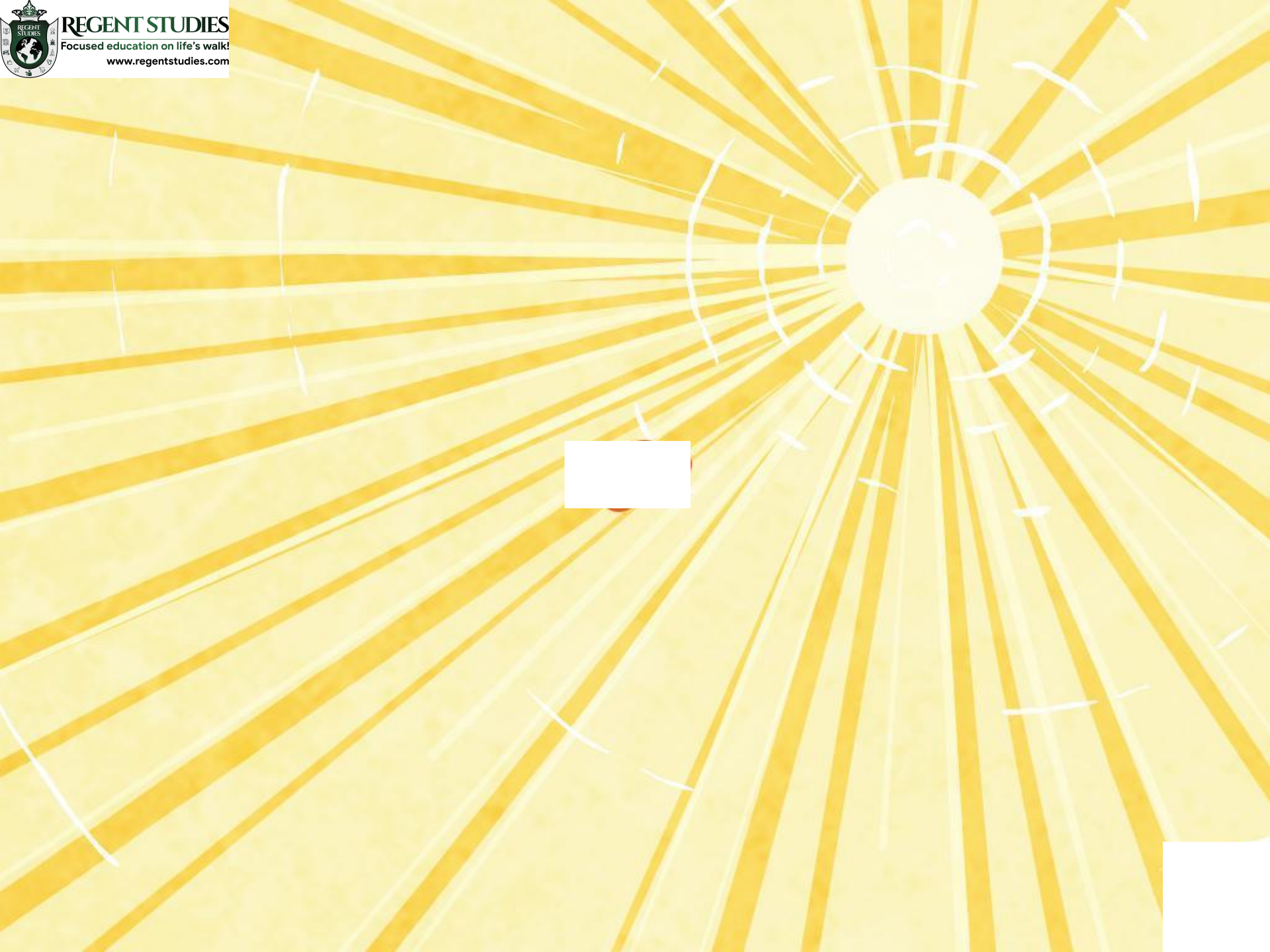
Plenary

It is important for scientists to share their findings so that people can learn from their experiments.

Things to share are….

- What your group were investigating.
- What you predicted would happen.
- What you found out.





How Light Travels – Teacher Notes

LO: To understand that light cannot travel through some materials and that this creates a shadow.

To know that light travels from a source.

To understand that objects let different amounts of light pass through them.

To know different types of light sources.

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Activity:

The main activity is broken down into 4 mini-experiments, designed to be carried out in small groups.

When differentiating, bear in mind that the distance variables (distance from light source and wall) are less scientifically and technically demanding than the angle and translucency variables.

Equipment:

- Tables set up against a blank wall
- A dimly lit working environment
- Torches
- Objects to cast shadows
- Translucent gels
- Rulers
- Light meters
- Large protractors
- Worksheets and results tables

Specialist Equipment:

Please note that a large protractor (or scaled-up image of one) is necessary for investigating the angle of the light source. A light meter (often found on data loggers) is also required to read levels of light in the translucency experiment.