



Lesson 6: Our light bulb family

In this activity, pupils are asked to find out about the different light bulbs, their main features and functions and use these ideas to create their own family of light bulb characters.

PREPARATION

Photocopy the activity sheet *Our light bulb family* for each pupil. Download *Light bulb types* whiteboard presentation.

LESSON

Explain to pupils that there are lots of different kinds of light bulbs and that they all work in similar but different ways and, consequently, they can be useful for different tasks in different devices. Show pupils the *Light bulb types* whiteboard presentation.

Explain to pupils that they are going to use what they have learned about different light bulbs to create some characters in a light bulb family. Each family member will be created from a different kind of light bulb and this choice will help to form part of their character's traits. For example, an energy efficient bulb might be very organised and helps to promote recycling. Whereas, an old style light bulb would be an older character who perhaps need to find lots of energy to do things and tires very easily.

Give pupils the activity sheet *Our light bulb family* and ask them to begin creating their characters. When they have finished their drawings, ask pupils to write a character portrait or create a cartoon strip about the family they have created.

PLENARY

Ask pupils to choose their favourite character from their Light Bulb Family and introduce them to the rest of the class. What is their name? What makes them unique? What do they like to do? Where would they be found?

LEARNING OUTCOMES

- To show how important it is to save energy
- To encourage pupils to think of design as an important communications tool

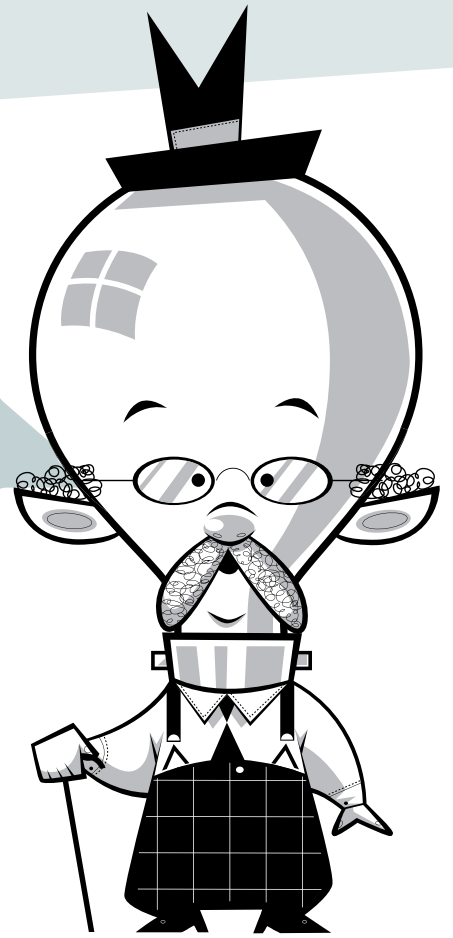
Curriculum links

PSHE, English, Art

Our light bulb family



“I’ve been around a very long time and I’m proud to watch my family grow. Look at them all. Can you create some characters for my light bulb family? They all work so much better than me you know, it takes so much energy for me to give out a warm glow these days.”





Lesson 7 : Design a light

In this activity, pupils have an opportunity to explore the way lighting designs have developed and create their own designer light feature to celebrate the importance of light.

PREPARATION

Photocopy the activity sheet *Design a light* for each pupil. Collect a range of old magazines and catalogues showing lighting. Collect simple materials for making small scale versions of pupils' designs.

LESSON

Ask pupils to look through the magazines and collect pictures of lighting designs they like and think about what it is they like about them. What makes them appealing? Would these designs work if we didn't have light bulbs to put in them?

Tell pupils that they are going to design their own light feature and ask them what they think will be important. Will their design be pretty, practical or both? Will it hang on a wall or be free standing? One important feature of the design should be that it must use low energy bulbs. Ask them to think about other ways their designs could help to improve the environment.

Give out the activity sheet *Design a light* and ask pupils to start planning their design. They may find it useful to discuss their ideas with a partner before committing them to paper. Once they have a design, provide materials for them to create a small scale model of their design while they consider which aspects of their design work well and which need to be changed.

PLENARY

Ask pupils to present their designs to the class, explaining what have they learned during the design process and what they might do differently if they had another chance. Consider how their designs celebrate the importance of the light bulb.

LEARNING OUTCOMES

- To identify features of lighting design
- To design a light feature celebrating the importance of the light bulb

Curriculum links

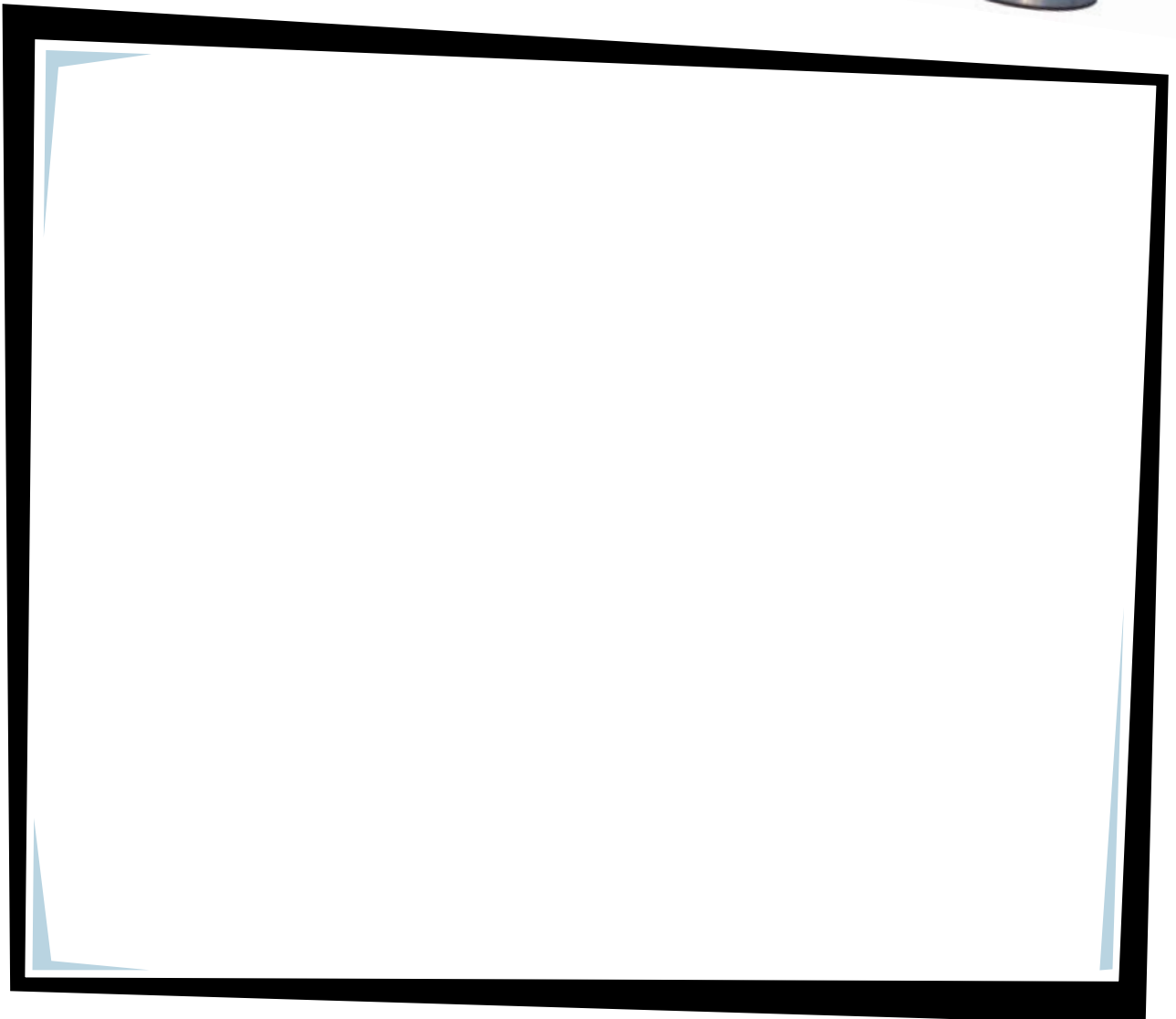
Design & Technology, Art

Design a light



Lighting has come a long way since the light bulb was first invented and it has since become a practical and affordable feature of every home. There are now thousands of designs for lighting features and lamps. One of the strangest inventions has to be the Lava Lamp which was first sold in 1963. It became a huge craze and many families had to have one. Designs have come a long way since then and are much more modern. They can also be themed around favourite characters or modern art.

Design a modern lighting feature which could be displayed in your school. Think about whether or not it will hang on a wall or stand alone. One very important feature of the design must be that it will use low-energy light bulbs. Also try to think of other ways your design could help to improve the environment.





Lesson 8: Saving the planet starts at home

In this activity, pupils are reminded of the importance of recycling and how they can do their bit from home.

PREPARATION

Photocopy the activity sheet *Saving the planet starts at home* for each pupil. Download *Saving the planet* whiteboard presentation.

LESSON

Ask your class to get into groups to compile a list of things that can be recycled and how they can be recycled. Ask each group to give some examples from their list and consider whether or not they recycle those things at home. Discuss why children think recycling is important.

Hand out the activity sheet. Do they know how to recycle the list of items? If they do not know, they should consider how they could find out by searching on the internet or nominating a spokesperson to call the local council or they may have their own ideas. Show the class the *Saving the planet* whiteboard presentation.

Ask pupils to complete the activity sheet *Saving the planet starts at home*, thinking carefully about whether they would have known the answers before completing the activity. They should be encouraged, also, to think carefully about what the activity has taught them and how it is going to affect the way they recycle things in the future.

PLENARY

Ask pupils what they have learned about recycling from completing the task and what they think are the most important points. Try to establish whether or not the activity has raised their awareness of the issues and what they think would be a good way of raising awareness in others.

LEARNING OUTCOMES

- To understand the importance of recycling
- To understand the ways which everyone can contribute and help to save our planet

Curriculum links

PSHE



Saving the planet starts at home

There are lots of things in our homes that we can recycle to save energy and help prevent unnecessary waste. Look at the list below and see if you can find out how to recycle everything.

ITEM	HOW DO WE RECYCLE IT?	DID YOU KNOW THAT?
Plastic bottle		
Paper		
Ink cartridge		
Vegetable peelings		
Low energy light bulbs		
Glass		
Batteries		
Fridges		
Cardboard		
Batteries		

Add any other items to this list.

ITEM	HOW DO WE RECYCLE IT?	DID YOU KNOW THAT?

Saving the planet starts at home



What have you learned about recycling? _____

Which items surprise you the most? _____

How can you improve recycling in your home? _____



Lesson 9: LIGHT BULB

In this activity, pupils are asked to write a poetic tribute to the light bulb, in the style of an acrostic poem.

PREPARATION

Photocopy the activity sheet *LIGHT BULB* for each pupil.

LESSON

Ask pupils to think about all the things they now know about low-energy light bulbs and the need to recycle them. Bring together the class ideas on the board. Explain that they are going to create a poem that helps people to remember that low-energy light bulbs may last a long time, but they need to be treated with special attention when they are thrown away. They must use these ideas in a poem.

Write the word *LIGHT BULB* on the board and collect ideas for the first word of each line. Consider how many different alternatives they think of and note what important things they would like to say.

Hand out the activity sheet *LIGHT BULB* and ask pupils to write their own light bulb acrostic poem which highlights the importance of recycling low-energy light bulbs. Encourage them to use as many adjectives as they can to make their writing as interesting as possible.

PLENARY

Ask pupils to take turns reading out their poems and note what other words have been chosen to use as the framework for a poem and why these words are relevant. Examine how their poems highlight the importance of the invention of the light bulb.

LEARNING OUTCOMES

- To understand the importance of recycling
- To understand the ways which everyone can contribute and help to save our planet

Curriculum links

English



LIGHT BULB

Using what you have learned about light bulbs, write an acrostic poem paying tribute to the humble light bulb.

L _____

I _____

G _____

H _____

T _____

B _____

U _____

L _____

B _____

Try choosing some other words and writing an acrostic poem on a light bulb theme. Try Edison, filament or watt.

ACROSTIC POEMS

An acrostic poem uses a word for its subject. Then each line of the poem begins with a letter from the subject word. They are also known as 'name poems', this type of poetry doesn't have a rhyme.



Lesson 10: Make a light bulb

In this activity, pupils can find out more about how a light bulb works by trying to make their own light bulb from simple materials.

RESOURCES

- Light bulbs (both old style and the new low energy styles if possible)
- One small jar
- Cork stopper for a lid
- A 1-inch nail
- 1 metre of shielded copper wire
- One 6-volt battery — not a car battery!
- Thin iron wire (the best source for this is unravelled picture hanging wire)
- A watch with a second hand

PREPARATION

Photocopy the activity sheet *Make a light bulb* for each pupil.

Download *Make a light bulb* whiteboard presentation.

N.B. This activity might be best undertaken in small groups, each with a supervising adult, so it might be an idea to have one group work at a time or invite some parents or other volunteers to come along and help out.

LESSON

Show pupils the *Make a light bulb* whiteboard presentation. Discuss what they can see, what each part is called and how light bulbs work. Talk about the similarities and differences they can see between the different bulbs.

Explain that pupils are going to have a go at making their own light bulbs to find out more about how they work. Stress that they need to be very sensible and work safely at all times. Show pupils the activity sheet and talk about how they will make their own light bulb. You could also carry out a short demonstration if you feel this would be more appropriate.

Split the pupils into groups and ask them to carry out their investigation, recording their findings carefully. Pupils may find it useful to compare the results for each filament thickness before they draw their conclusion, as this will help to eliminate any anomalies from their results. Don't forget to recycle all the materials you have used in your investigation.

PLENARY

Ask pupils what they have learned about light bulbs, about which light bulbs work best, what happens if the filament is too thick or too thin and what other investigations could they carry out. Consider whether larger or smaller jars would make a difference and whether making the filament longer or shorter as opposed to thicker or thinner would make a difference. How could they investigate this fairly?

LEARNING OUTCOMES

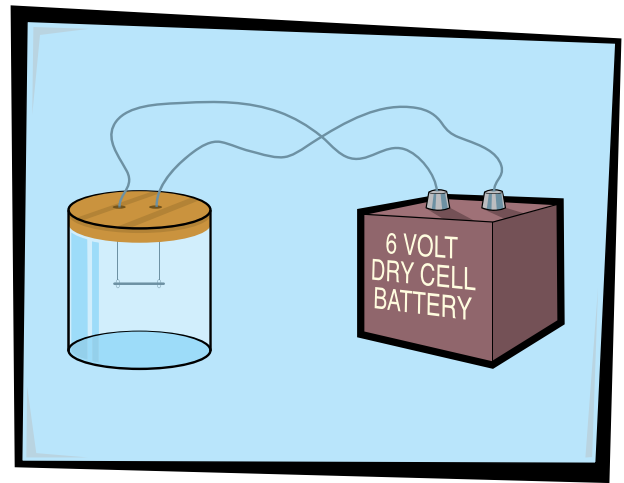
- To carry out a simple investigation
- To understand how a light bulb works
- To collect results and use these to draw a simple conclusion

Make a light bulb



You will need:

- One small jar
- Cork stopper for a lid
- A 1-inch nail
- 1 metre of shielded copper wire
- One 6-volt battery
- Thin iron wire
- A watch with a second hand



What to do:

1. First cut the copper wire into two lengths about 50cm. Cut off 3cm of the shielding (plastic coating) at each end of the strands.
2. With a nail, drill two holes into the cork. Push the wire through the holes in the cork so that about 5cm of the wire can be seen in the jar.
3. Make a hook at the end of the copper wires so that you can twist small strands of iron wire around them to make a filament.
4. Twist several strands of iron wire together and stretch them across the gap between the two copper hooks to form the filament.
5. Put cork stopper with filament inside the jar.
6. Carefully hook up both copper wire ends to the battery and watch your bulb light up. **BE CAREFUL, THE FILAMENT BECOMES VERY HOT. DO NOT TOUCH.**
7. Use the watch to time how long your filament glows. Keep a record of how long your filament lasts on the table.
8. Try the experiment again with a different number of iron wire strands twisted together. Record your results.

- 1: This experiment needs to be done with an adult present and supervising it!
- 2: **Always** wear safety glasses and gloves when doing experiments.
- 3: Be careful handling the filaments when they burn out – they will be **HOT**.
- 4: **Never** play with wall sockets or household electric currents.
- 5: **Don't try this at home.**

