



Thumbs Up
We were great at
the task
because...



Thumbs Sideways
We were good at
the task
because...



Thumbs Down
We were OK at the
task because...

we described and explained
what we thought about
different inventions, e.g....

we explained our thinking,
e.g....

we explored and discussed
different inventions, for
instance...

we explained how
inventions worked using
science, e.g....

we persuaded other people
by...

we...

Next time we will...





Smart Scientific Inventions

Communication: to justify opinions

Investigative skills: to use scientific language to communicate ideas



Generic task But why?



Learning Objective

Communication: to justify opinions

Introducing the task 5 minutes

Explain to the group that having ideas or opinions about things is great, but being able to say why you think so helps even more. It helps us persuade or convince other people by letting them understand our thinking. 'But why?' is often a question we ask other people so that we understand them better, but how often do we really ask it of ourselves?

There are many questions that we rarely ask 'why' about, for example 'Why is chocolate so tasty?' or 'Why do we have friends?'. This task encourages us to ask 'But why?' to things we've not really thought about much before.

Running the task 15 minutes

You need: a partner or group of friends.

- 1 Organise the children into teams of four.
- 2 In teams, encourage the children to ask each other intriguing questions. Use the But why? sheet as a stimulus. Emphasise that they should always ask 'why?' after each answer they receive, until they can suggest no more answers.
- 3 Make up reasonable sounding answers or research the question by asking other people, looking in books etc.

Helpful Hints

A But why? poster is provided for stimulus. If necessary run through an example for the class, such as:

- Why do we have friends?
...because we like to talk to other people and have things in common.
- Why do we like to talk to other people?
...because it helps us share our feelings and thoughts, and helps us learn.

Why do we need to learn anything anyway?

...because it helps us become more clever about things so that we can get a job and be proud of ourselves.

Why do we need to get a job?

...because we can't always live with our mums and dads, we have to be responsible and stand on our own two feet.

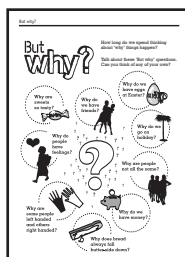
Why do we stand on two feet?

...because that's how many feet we have and we'd fall over if we only stood on one!

Encourage the children to come up with their own questions, or use the following suggestions to start things off.

If you want it to be general...	If you want it to be science-linked...
Why does bread always fall butter-side down?	Why does an apple a day keep the doctor away?
Why do we have friends?	Why are plants green?
Why do people have feelings?	Why are there more bees in summer?
Why are some people left handed and others right handed?	Why does the sun rise and set?
Why are sweets so tasty?	Why don't you get insects the size of elephants?
Why do we have eggs at Easter?	Why do I get thirsty and need water to drink?
	Why do we only see stars at night?

Resources





Science embedded task Smart Scientific Inventions



Learning Objective

National Curriculum

Breadth of Study: 2a

Scientific communication

to use appropriate scientific language to communicate ideas about living things, materials, phenomena and processes

Equipment

Information books, access to the internet would also be useful

Success Criteria

To be successful the children will:

- describe and explain what they think and why they think it
- persuade others by supporting opinions with information
- explore and discuss a variety of everyday inventions
- give simple scientific explanations, using appropriate scientific language, for how everyday inventions work.

Introducing the task 15 minutes

Involve the children in a discussion about the types of everyday objects that are scientific inventions, e.g. mobile phones, radios, televisions, fridges, computers etc. Explain that not all inventions are complex and even simple scientific inventions can be very important to people's lives, e.g. matches. Children would be interested to know that in the early 1900s workers making matches, mainly women, were poisoned by the chemicals they used. Their employer was taken to court and prosecuted for poisoning the workers – the first time this ever happened!

Brainstorm other examples and ask the children to talk with a partner to decide which of the suggestions they think was most important. If needed

give them the examples of mobile phones and asthma inhalers to decide upon.

In deciding on their choice they could consider:

- How has this invention affected people's lives today?
- How would this invention have affected people if it was developed 100 years ago?
- Is the invention important for lots of different people, or just a few?
- Does the invention have any dangers?
- What would people use if this invention didn't exist?

Ask volunteers to explain their choice and allow them to give a simple justification for their opinions. Gather all the class's opinions in a class vote.

Running the task 1 hour

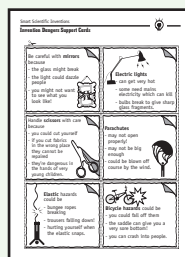
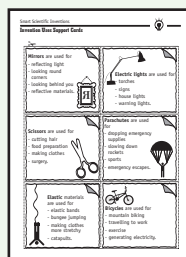
- 1 Divide the class into six teams.
- 2 Read aloud or hand out Smart Inventions.
- 3 Tell the children that each team must prepare an information poster to present their thinking on how the invention works and why it is important to us. They must justify their thoughts and opinions using scientific knowledge and by considering the pros and cons. Use Invention Uses and Invention Dangers Support Cards as appropriate.

- 4 When the posters are complete give each team time to make their presentation and answer questions (2 to 5 minutes is suggested).
- 5 Ask the children to consider if the invention is as important for different groups of people, e.g. the elderly, babies and toddlers, men or women etc., and then to vote for the invention they consider is the most important in their lives.

Reviewing the task 15 minutes

Discuss some of the ways and reasons they used to justify their opinions and how they tried to persuade people to vote for their inventions. Which reasons were effective and why? Involve the children in reviewing their work and making an overall judgement about how well they communicated and justified their opinions. Use the assessment for learning Smart Grid (see back cover).

Resources



But why?

How long do we spend thinking about 'why' things happen?

Talk about these 'But why' questions. Can you think of any of your own?

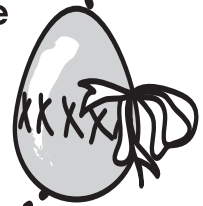
Why are sweets so tasty?



Why do we have friends?



Why do we have eggs at Easter?



Why do we go on holiday?



Why do people have feelings?



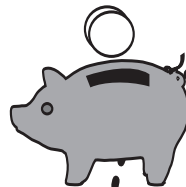
Why are people not all the same?



Why are some people left handed and others right handed?

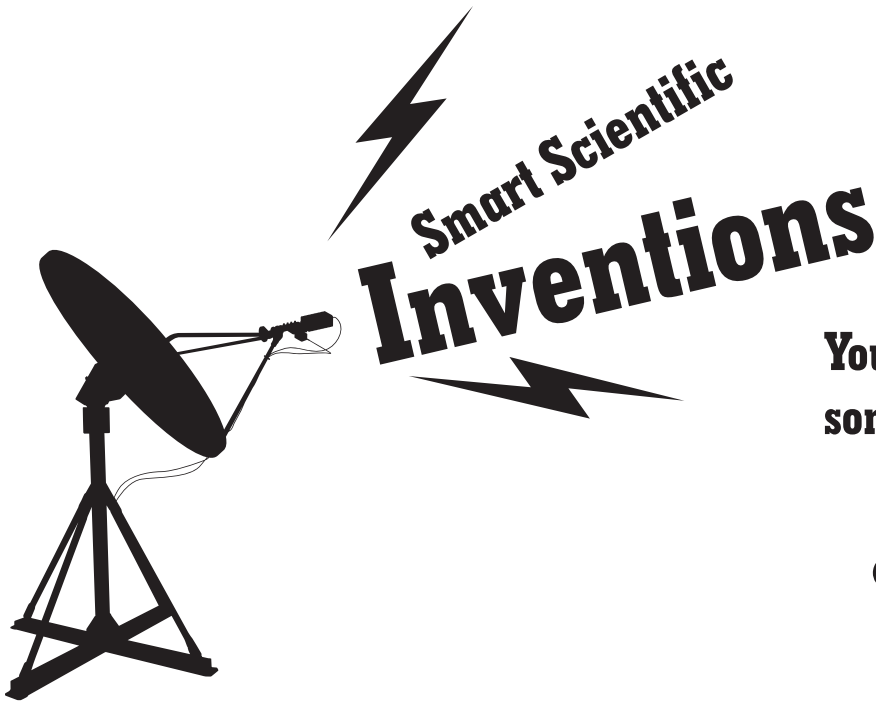


Why do we have money?



Why does bread always fall butter-side down?





You may think of others, but some important inventions are:



Mirrors



Electric lights



Scissors



Parachutes

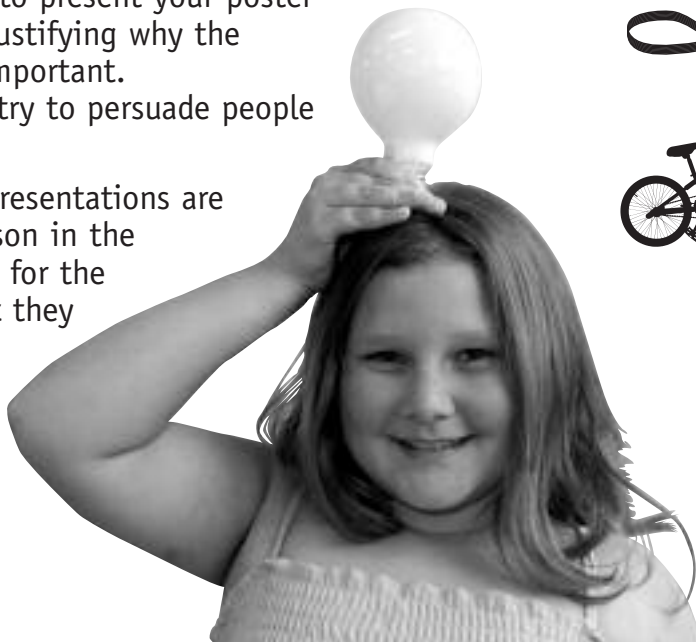


Elastic



Bicycles

- 1 Working in your team produce an information poster for one of the inventions which should show:
 - what the invention does and how it works
 - how the invention improves our lives (the pros)
 - possible dangers the invention might have (the cons).
- 2 Use what you know already and try to link some scientific information to help explain the invention.
- 3 You will need to present your poster to the class, justifying why the invention is important. The aim is to try to persuade people to vote for it.
- 4 After all the presentations are over each person in the class will vote for the invention that they think is the most important.





Invention Uses Support Cards



Mirrors are used for

- reflecting light
- looking round corners
- looking behind you
- reflective materials.



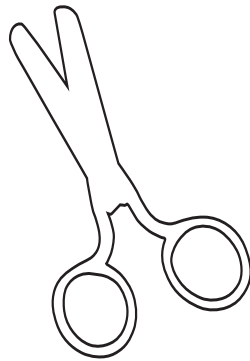
Electric lights are used for

- torches
- signs
- house lights
- warning lights.



Scissors are used for

- cutting hair
- food preparation
- making clothes
- surgery.



Parachutes are used for

- dropping emergency supplies
- slowing down rockets
- sports
- emergency escapes.



Elastic materials are used for

- elastic bands
- bungee jumping
- making clothes more stretchy
- catapults.



Bicycles are used for

- mountain biking
- travelling to work
- exercise
- generating electricity.

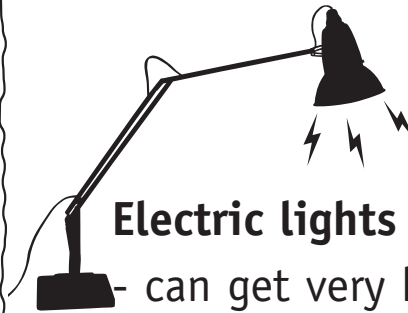
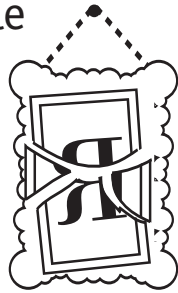


Invention Dangers Support Cards



Be careful with **mirrors** because

- the glass might break
- the light could dazzle people
- you might not want to see what you look like!

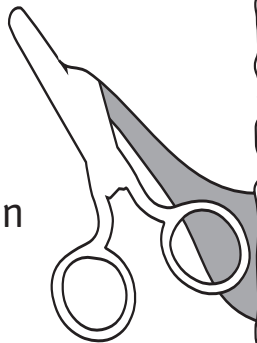


Electric lights

- can get very hot
- some need mains electricity which can kill
- bulbs break to give sharp glass fragments.

Handle **scissors** with care because

- you could cut yourself
- if you cut fabrics in the wrong place they cannot be repaired
- they're dangerous in the hands of very young children.



Parachutes

- may not open properly!
- may not be big enough
- could be blown off course by the wind.



Elastic hazards could be

- bungee ropes breaking
- trousers falling down!
- hurting yourself when the elastic snaps.



Bicycle hazards could be

- you could fall off them
- the saddle can give you a very sore bottom!
- you can crash into people.