



# The nappy challenge



## About this topic

Curriculum link: Year 3, Cross-curricular

### SUMMARY:

This topic looks at disposable nappies and provides opportunities for children to ask their own questions and make decisions on how to answer their questions using different scientific enquiry activities.

### UNITS:

6.1: Test centre

6.2: Environmental effects

### ACTIVITY RESOURCES:

- 6.1: Graph outline
- 6.2: Disposable nappy facts

### ONLINE RESOURCES:

- Teaching slides (PowerPoint): The nappy challenge
- Interactive activity: The nappy challenge
- CPD: The nappy challenge
- Pupil video: The nappy challenge
- Word mat: The nappy challenge
- Editable planning: The nappy challenge
- Topic Test: The nappy challenge

## Working scientifically skills

This topic develops the following working scientifically skills:

- o Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment including thermometers and data loggers.
- o Gather, record, classify and present data in a variety of ways to help in answering questions.
- o Ask relevant questions and use different types of scientific enquiries to answer them.
- o Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- o Set up simple practical enquiries, comparative and fair tests.
- o Use straightforward scientific evidence to answer questions or to support their findings.



## CROSS-CURRICULAR LINKS

This topic offers the following cross-curricular opportunities:

### English

- o Use non-fiction to research Marion Donovan who developed the disposable nappy; write a fact card and role play her story.
- o Use a dictionary to check the meaning and spelling of words, e.g. absorbent.
- o Ask questions about nappies and decide how to answer them.
- o Organise paragraphs when writing in science.
- o Use headings and sub-headings in writing.
- o Annotate deconstructed nappies.
- o Research reusable nappies and use persuasive writing to encourage parents and carers to change from using disposable to reusable nappies.
- o Participate in a debate: for and against disposable nappies.
- o Design and create an advertisement for a disposable or towelling nappy.

## Mathematics

- Compare sizes of different nappies.
- Measure absorbency.
- Measure strength and elasticity.
- Big sums: calculate nappies used per week, month, year.
- Write and carry out a survey, e.g. types of nappies used by parents and carers; record results using a database or tally chart.
- Present the results of the survey in a bar chart or graph.
- Work out the cost per nappy. Are they good value for money?
- Work out the cost differences between disposable and towelling or bamboo nappies.

## Computing / ICT

- Photograph the different components of a disposable nappy.
- Video interview with a parent.
- Blog about disposable versus fabric nappies: what do you think?
- Use video clips to explore polymer crystals.
- Internet research into the issues about disposable nappies and landfill.
- Internet research into who invented disposable nappies and bamboo nappies.

## Geography

- Disposable nappies into landfill: what are these and where are they in our local area?
- Where do the different components come from, e.g. are they wood pulp, cotton?

## Design / technology

- Design and make your own nappy.

## History

- Create a timeline to show what great great grandparents, great grandparents, grandparents and parents used as nappies.
- Research how people used to wash and clean towelling nappies; interview an older person.



## STEM (SCIENCE TECHNOLOGY ENGINEERING ART AND MATHS) OPPORTUNITIES

### Invite into class

- A scientist or anyone who works in product design or testing.
- A STEM Ambassador or local authority environmental office to explain the impact of nappies on the environment.
- Parents to interview about nappies and their use.
- Local authority environmental officer to talk about disposing of household waste.
- A newspaper / TV reporter to work with children on how to communicate their findings.

### Visit

- A local supermarket to find out about different nappies sold.



## TEACHER SUBJECT KNOWLEDGE

### What is inside a nappy?

When a disposable nappy is taken apart, it can be seen to consist of a shaped pad covered in a soft liner and enclosed in a waterproof outer layer. The centre layer of the nappy is made from a mixture of wood pulp and cotton; these materials are used because they soak up (absorb) the baby's urine and retain the moisture in this layer so that the baby stays dry. In the very centre of this there are some small crystals; if you rub the centre part of the nappy over some black sugar paper, you may find that powder or small crystals drop out (absorbent polymers). If you have ever made fake snow using a white powder, you will know that the tiny crystals absorb (soak up) and retain moisture. So that any urine or faeces do not leak out, parts around the legs are elastic and the waistband is designed to be adjustable: usually the 'tabs' are made from plastic and are like Velcro.

## Who invented disposable nappies?

An American woman named Marion Donovan is credited with inventing disposable nappies. She began designing in 1946 because she found the towelling nappies she used leaked through to her children's clothes. She began by using a shower curtain with a cloth nappy inside and used press studs to keep it together. Gradually she improved her design using paper that was strong and absorbent, but no one believed it was a good idea and it was not until 1961 that a man called Victor Mills used her idea to make Pampers.

Disposable nappies are convenient. Some though would argue that they harm the environment; they make up around 4% of UK waste that goes into landfill. Parents use about 4–5 disposable nappies every day.

## Other kinds of nappies

Other types of nappies are available such as cloth nappies and, more recently, bamboo nappies made from bamboo yarn that is said to be softer and more absorbent than a terry nappy. There are reusable nappies that have a throwaway liner inside a pair of waterproof baby pants that can be worn again.

## How are nappies tested?

Nappies are tested by the manufacturer, mums' groups and *Which?* Magazine. These are the sorts of things they test.

1. Absorption: the amount of urine (liquid) a nappy can hold.
2. Rewet: after 5 minutes, is the surface of the nappy dry or wet?
3. Leakage: if any urine or faeces leaks from the legs.
4. Strength of the Velcro: how much force it takes to open a nappy and how many times the Velcro can be opened and sealed.

## Who wears nappies?

Babies wear nappies, but so do astronauts (they are called 'Maximum Absorbency Garments'). Crew members on the Space Shuttle were given three disposable nappies because they would not be able to go to the toilet as the rocket was being launched or when it re-entered the Earth's atmosphere. They are also used when astronauts go outside on space walks.

Some children and adults with medical problems also need to wear disposable nappies in the form of disposable pants.

## Environmental impact

There are many arguments for and against both disposable and towelling nappies. One of the aims of primary science is to give children access to advantages and disadvantages so that they can engage in debate and understand that they have choices.

Disposable nappies	Towelling nappies
<ul style="list-style-type: none"> <li>end up in landfill and can contaminate ground water</li> <li>result in human faeces going into landfill</li> <li>use resources to make them, e.g. trees and water</li> <li>use energy in the manufacturing process</li> <li>take hundreds of years to degrade</li> <li>use chemicals that can be irritants</li> </ul>	<ul style="list-style-type: none"> <li>use cotton that has to be grown, which includes use of fertiliser and transport</li> <li>use energy in the industry that makes nappies</li> <li>have to be washed so they use electricity, water and detergents</li> </ul>

The arguments for and against are not straightforward since disposable nappies are very convenient for parents to use and the nappy industry is working to reduce the environmental impact of its products.



## CHILDREN'S MISCONCEPTIONS

### Children might think...

- o that only babies wear nappies.

### Children already know...

- o that babies wear nappies.
- o nappies need to be changed often.



## SCIENTIFIC VOCABULARY: THE NAPPY CHALLENGE

You can download a Word mat of essential vocabulary for this topic from *My Rising Stars*.

**absorb:** to soak up, e.g. liquid

**absorbent:** able to soak up, e.g. liquid

**bamboo:** a fast-growing grass that can be used to make cloth

**cloth:** a woven fabric made from, e.g. wool, cotton

**cotton:** a plant that is grown to make cotton thread and fabric

**disposable:** can be thrown away after it has been used

**elastic:** a material that can be stretched or compressed and will return to its original shape

**faeces:** waste from bodies from the process of digestion

**liquid:** a substance that can be poured and takes the shape of its container

**material:** anything from which an object can be made

**nappy:** absorbent material used to absorb and keep urine and faeces from a baby's skin

**plastic:** a synthetic material, or a material that when stretched does not return to its original shape

**properties:** a characteristic of something, e.g. waterproof, flexible

**urine:** a yellowish liquid containing waste from the body when a human urinates

**Velcro:** a fastener that uses hooks

**waterproof:** keeps out water

**wood pulp:** wood that has been ground to a fine pulp