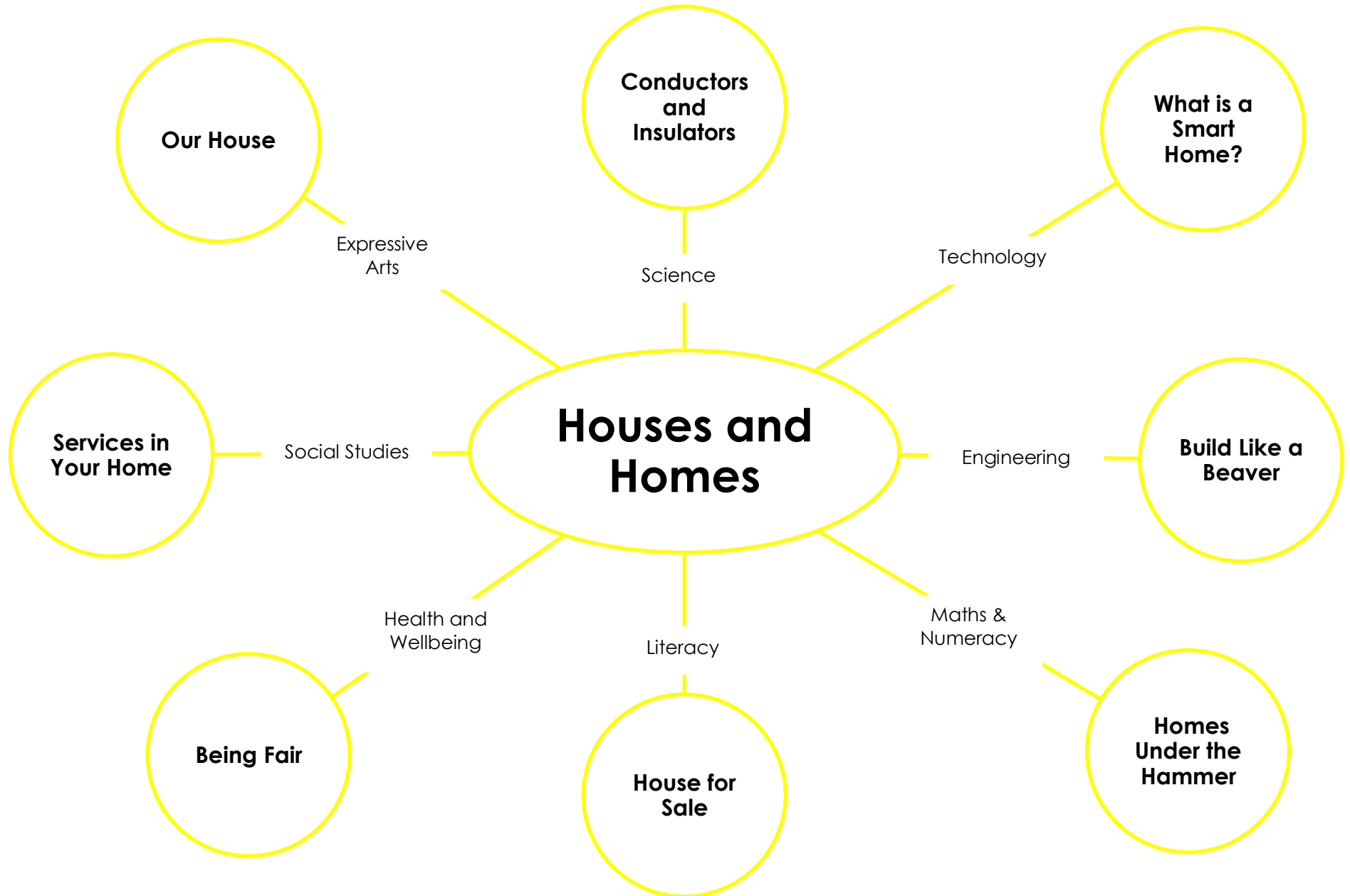


# Learning from Home



# Science Challenge



## Conductors and Insulators

We use electricity as a form of energy to power gadgets in our homes. Some items need to be plugged in to get them to work and others use stored energy in the form of a battery (or batteries).

**Learn more about conductors and insulators here:**

<https://www.youtube.com/watch?v=a8zryOJOvcc>

**Task:** Using the information learned from the video try to sort the items in the grid below into **conductor** or **insulator**.

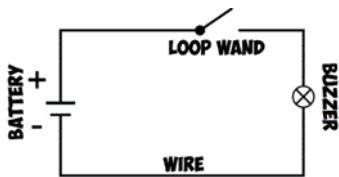
Draw a table like the one below and put the objects into the correct column.

Conductor	Insulator

pencil	10p coin	2p coin
piece of wood	toy car	ruler
plastic spoon	metal spoon	piece of paper
key	tin foil	piece of card
drawing pin	piece of string	nail

**The Science:** When gadgets are plugged in, or batteries switched on, an electrical circuit is completed, powering the device with energy and allowing it to work. When electric charge moves, we call it an electric current. Current is a flow of charge (or electrons) around a circuit. Materials that allow current through them are called electrical **conductors**. Materials that do not allow current through them are called electrical **insulators**.

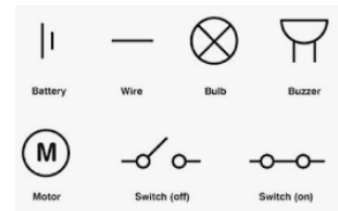
A big part of carrying out a science investigation is called the 'write up' or 'report' and this is where you basically describe the materials you used, what you did, and what the result was. Writing the report will often involve drawing pictures and diagrams. Here is a circuit diagram for the Buzz Off game. Note that it uses symbols to represent the different elements of the electrical circuit. The loop wand completes the circuit when it touches an electrical conductor (the metal buzz wire) causing the buzzer to activate.



Buzz Off game circuit diagram

Here are some commonly used symbols used when drawing electrical circuits.

**Note:** Electricity can be incredibly dangerous – never tamper with electrical devices!



Click here for a video about the symbols: <https://www.bbc.co.uk/bitesize/topics/zc16yrd/articles/z7rbcqt>

If you have the **Buzz Off** or **Operation** game (or a variation of them) at home, you can investigate circuits further. Note, that if the metal loop or tweezer tips touch plastic or wood, there will be no response as these materials are both insulators. When they come into contact with metal however, the buzzer or light will activate. This is because metal is a conductor, the circuit is now complete, and electricity is flowing.

# Technology Challenge



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## What is a Smart Home?

Smart homes incorporate technology and automation (things happening automatically) allowing homeowners to monitor and control energy use in the home. This can include lighting, heating, hot water, electricity and security. Smart homes are constantly evolving as technology advances, you may already have technology that makes your home smart.

**Task 1:** Talk to an adult at home about technology you might already be using in your home.

**Smart speakers:** These include Alexa, Siri, Google Home and many more. These tiny virtual assistants can tell us what the weather is going to be and play music, but did you know if you have the correct equipment, they can also turn on and off lights and close blinds?



**Household goods:** Even everyday household items can be smart. You can brew coffee from your phone, access the internet from our TV's and clean the house with app-controlled robot vacuum cleaners!

**Smart blinds and curtains:** Closing blinds and curtains can help to keep heat in the home, stopping heat escaping through windows. The ability to control them from anywhere can also make your home more secure.

**Smart lighting:** Can be turned on and off remotely, be put on timers and sensors and even change colour. This avoids having lights on for longer than you need and can help to keep your home secure.

**Security:** Devices such as lights, cameras, gates and alarms can all be virtually monitored and controlled, allowing us to keep our homes secure, even when we are not there.



**Heating and gas:** Many smart home utilities allow you to turn the heating and gas on/off and control the temperature from anywhere. Turning these off when you're not home can save hundreds of pounds each year!

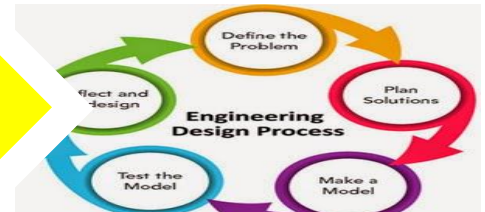
**Task 2:** Talk to an adult about other ways people may be able to reduce these costs? (Think about renewables!)

**Smart Meters:** What is a smart meter? A smart meter is a two-way digital communication device located in homes and businesses that measures the amount of electricity and gas used. Energy companies provide an in-home display (IHD), a small energy monitor that displays energy readings, this is different from the actual smart meter itself, just acting as the display. The actual smart meter looks a lot like standard gas and electricity meters that you may already have in your home.

**Task 3:** Think about how you would design your own smart house. What features would you install and how could they save energy?

Information and images from: [www.cgi.com/](http://www.cgi.com/)

# Engineering Challenge



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## Build Like a Beaver

### Adult Support Required

Beavers are large rodents which live in slow moving water, like rivers. They build their homes, called **lodges**, by building **dams** using tree branches, vegetation, rocks and mud. They use their large strong teeth to chew down trees for building material. The dams trap the water, and the lodges serve as shelters and homes.



**You will need:** A long, clear open container like a deep edged tray, sand, gravel, plasticine or clay, ice lolly sticks, twigs, leaves etc. and a jug of water, any other materials you choose ...

**NB: It might be best to do this activity outside.**



### Build it:

1. Fill your container with materials to represent the bottom of the river and dig the course of a river through it.
2. Choose a good place for your dam and construct it using ice lolly sticks, twigs, leaves, clay, gravel and / or any other materials you choose.

**Test it:** **Slowly** empty a jug of water down your river. Your dam should still let a little bit of water through but not too much.

**Reflect:** How could you make your dam structure stronger? What shape do you think it should be? Did your dam hold back the water?

**Improve it:** Use your reflections to make your dam even better. Can you also build a lodge for a toy beaver family to live in?

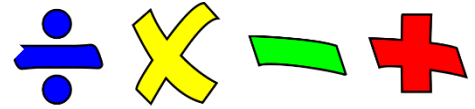


**Note:** There are many ways to improve the strength of your dam. One common type of dam is called an **arch dam**. This is a structure which has a curved surface which faces the water. When the water presses on the dam the arch strengthens the structure.

Click here to find out more: <https://www.youtube.com/watch?v=iyNA62FrKCE>

Activity from [www.stem.org.uk](http://www.stem.org.uk)  
Images from [www.clipart-library.com](http://www.clipart-library.com)

# Maths & Numeracy Challenge



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## Homes Under the Hammer

**Homes Under the Hammer** is a daytime television show, that follows what happens when people buy a property in an auction, do it up (renovate), then sell or rent it.

The hosts interview the buyers before and after the renovation and estate agents value the property before and after. There are three properties per episode and the aim is to make a profit!

**Task:** Have a look at each of these properties and work out whether the buyers make a profit or not. Have a go at working out the % profit or loss for each on.

### House 1

Before:



**Cost:**

- Auction - £35,000
- Labour - £6,500
- Kitchen - £2,500
- Bathroom - £3,000
- Flooring - £1,250
- Other - £750

After:



**Valued:**  
£55,000

Will they make a profit?

What percentage profit/loss have they made?

### House 2

Before:



**Cost:**

- Auction - £148,000
- Labour - £11,200
- Kitchen - £4,700
- Windows - £3,900
- Bathrooms - £5,630
- Carpets/Flooring - £5,350
- Other - £1,290

After:



**Valued:**  
£175,000

Will they make a profit?

What percentage profit/loss have they made?

### House 3

Before:



**Cost:**

- Auction - £173,250
- Labour - £15,530
- Kitchen - £4,215
- Bathroom - £3,420
- Carpets/Flooring - £3,140
- Garage - £12,060
- Garden - £3,125
- Other - £1,023

After:



**Valued:**  
£249,950

Will they make a profit?

What percentage profit/loss have they made?

**Example:**

A house costs £86,000. The renovations cost £14,000 bringing the total to £100,000

The house sells for £120,000

£100,000 = costs    £20,000 = profit

$$\frac{£20,000}{£100,000} \times \frac{100}{1} = 0.2 \times 100$$

0.2 x 100 = 20    So, the profit made is 20%

Activity and images from TES

# Literacy Challenge



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## House for Sale

Estate agents arrange the selling, renting, or management of properties and other buildings. When a buyer is looking for a house, they will often look at property specifications (specs) which describe the house and its features.

67 Woodgreen Drive Offers over £180,000



An immaculately presented, detached property situated on the outskirts of Dumfries. Gas central heating and double glazing throughout. The property has been well maintained and has been recently redecorated and recarpeted.

Ground floor accommodation provides a cosy sitting room at the front of the house with splendid views over green fields. There is also an inviting dining room and lovely airy kitchen.

First Floor accommodation comprises of 2 double sized bedrooms and a family bathroom.

Outside there is a good-sized garden with mature trees and shrubs. There is also a garden shed.

Early inspection recommended.

Contact Jim on 09675303021 for further details and to book a viewing.

**Your Task:** Create a property spec like this one, describing your own house or a made-up house. You can choose whether to complete the activity on paper or if you want to use a computer.

You should include: the address, the price, a picture of the house – you could use a photograph, or you can draw it, a general description of location and the utilities present. (Energy supply and energy saving measures), description of the rooms in the property and a review of the outside space. You should also include contact details for prospective buyers – e.g., phone number, email address etc.

To see more examples of property specs you could look in an estate agent's window if you are out on a walk, or you could find more information on an estate agent website. Try typing 'houses for sale in Dumfries' or whatever your hometown is.

**Remember**, you are trying to make the house sound appealing to prospective buyers so use positive words / phrases and avoid mentioning anything negative.

Image from [www.clipart-library.com](https://www.clipart-library.com)



# Health & Wellbeing Challenge

## Being Fair

### Adult Support Required



Watch '**This House is Our House**' by Michael Rosen by clicking here:

[https://www.youtube.com/watch?v=wf\\_n6yjr9T0](https://www.youtube.com/watch?v=wf_n6yjr9T0)

On the surface, the story is about friendship and sharing but there are other messages present in the text. For example, at one point, George states that "This house isn't for girls!" how do you feel about that statement?

**Prejudice** comes from two words: '**judge**', which means to make a decision about what should be done, and '**pre**', which means 'before'. So, prejudice means when you make a decision about someone before you actually know them. Prejudice is not a good thing. Prejudice is often based on no real evidence at all. For example, some people are prejudiced against other people just because they look different, for example they wear glasses or have red hair, or because they speak differently. (E.g., Speak a different language, or with a different accent)

**Discrimination** is what happens because of prejudice. It means treating someone unfairly because you don't like something about them. Let's imagine a woman called Mary. Mary thinks that women are better than men. Mary has her own company that makes millions of pounds. She has to find people to work for her because her business is so big. So, Mary holds interviews for jobs in her company. Ten men and ten women apply for the jobs. The men and women are all as good as each other and they could all do the job very well. Mary gives all ten women a job and she doesn't give any men a job! She tells the men they were just unlucky but in her diary she writes: "Dear diary, today I hired ten women to my company. I didn't hire any men even though they were very good at the job. That's because I just think women are better! I can't wait to have all lovely women in the office and no stinky men!" Mary has shown prejudice by thinking all women are better than all men. She has shown discrimination by treating the men unfairly because of her negative beliefs.

**Task:** Speak to an adult about prejudice and discrimination. Can you think of any examples? Do you think there are any jobs or activities which women or men shouldn't be allowed to do? Can you explain why?

Activity adapted from TES

Image from [www.clipart-library.com](http://www.clipart-library.com)

# Social Studies Challenge



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## Services in Your Home

In the past, looking after a house would have been hard work and houses were not connected to utilities like we have today (Electricity, Gas, Water). Rugs would be taken outside for cleaning, and the dust beaten away, clothes and bedding would be washed by hand and all meals were made from scratch – there were no ready meals or takeaways!

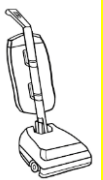
Today, people have very busy lives and many adults work, leaving them less time to carry out domestic chores at home. Our homes are filled with devices and gadgets to help us manage our daily lives.

Have a look at the items /gadgets below then sort them by whether they use electricity, gas or water. Some may use more than one utility.

- |            |               |                |                 |                 |      |      |          |
|------------|---------------|----------------|-----------------|-----------------|------|------|----------|
| toaster    | toilet        | microwave      | kettle          | TV              | oven | bath | computer |
| light      | blender       | sewing machine | shower          | central heating |      |      |          |
| hair dryer | music system  | radio          | washing machine | vacuum cleaner  |      |      |          |
| DVD player | clothes dryer | freezer        | printer         | telephone       |      |      |          |



Electricity	Gas	Water



Can you think of any other appliances you could add?



# Expressive Arts Challenge



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## Our House

We all need a home to live in, and each one of our homes can be very different, some noisy, some quiet, some busy and some not so busy.

**Your Task:** is to create a drama / dance routine that represents a day in your home.

**Click here to listen to Our House by Madness:** [https://www.youtube.com/watch?v=Kwle\\_sjKeAY](https://www.youtube.com/watch?v=Kwle_sjKeAY)



Before you make up a routine for your own day, try to act out the activities being sung about in the song. Watching the video as well as listening to the music will help with this.

**Now think about your own daily routine:** What happens next after you get up – do you have breakfast or get dressed? Do you have a wash? When do you brush your teeth? Do you help with the housework? Do you help by doing some gardening, do you watch TV, read a book, play a game? Etc.

**Write down:** a list of all the basic activities you might do during the day in the order that they might happen. Now think about the moves you could use to show them.

**Warm up:** Do some jogging on the spot to warm your body up before you begin.

**Your dance:** Listen to the music, your drama / dance routine should start with you waking up in bed, followed by you getting up out of bed and it should end with you going back to bed at the end of the day.

**Cool down:** When you have finished your routine, stretch up into a big star and gradually curl down to become a small, curved ball. Slowly stretch back out to a standing position and give your arms and legs a gently shake, being careful to bend your knees and elbows, avoiding keeping them totally straight.

Share your routine with someone at home. See if they can guess what activities you are showing? Ask them for some feedback. What did you do well, what could you improve?

Activity and image from TES