



DERREN BROWN'S
GHOST TRAIN



DESIGN
TECHNOLOGY KS4

GETTING SOME FEEDBACK

Understanding how feedback systems are used in a range of contexts.

Episode 1: The need for feedback

Systems often need to have feedback built in. This applies to natural systems as well as constructed ones. Think about being in a room which is rather warm. Fairly quickly you realise that if you don't do something, you're going to be uncomfortable and even become ill. You respond in one of a number of ways. You might:

- loosen your clothing
- have a drink
- open a window
- turn the heating off
- go outside

All of these are ways of responding to a situation to reduce the negative aspects. Your body has detected some feature and you respond to mitigate it, returning your body to a more comfortable condition.

1. If you went out into a cold night, how might you respond?
2. Experiencing hunger is also part of a feedback loop - suggest some others.



Episode 2: the system responds

Mechanical systems, such as fairground rides and theme park attractions also need feedback mechanisms. The train needs to go round at a safe speed, fast enough to be exciting, but not so fast that it is dangerous.

You might think that once the track is built and set along the track, the speed the train reaches at a certain point is always the same, but this isn't the case:

- The temperature makes a difference; the bearings on the wheels of the train run more freely when they're warm.
- The load also makes a difference; a train full of adults is heavier than a train half full of children.
- A heavier train will need a greater force to accelerate it to a certain speed – and more force to slow it down.
- The system needs to detect the differences in speed – and respond. Greater speed requires more braking. The braking system shown here can slow down a train as it goes past. They work like the brake callipers on a bicycle, but they are part of a system which has detected the speed and responded. The faster the ride car, the more the braking force they apply.



If you visit a theme park such as THORPE PARK Resort, look out for examples of feedback systems such as this. Some brakes will be high up on the track and harder to spot, but you may see some near the station. A mix of manual and automated systems can be used in a variety of contexts for example, automatic pilot in an aeroplane or cruise control in a car. For these examples, answer the following questions:

1. Why might automated be better?
2. What's the case for a person being in charge?
3. What do you think?

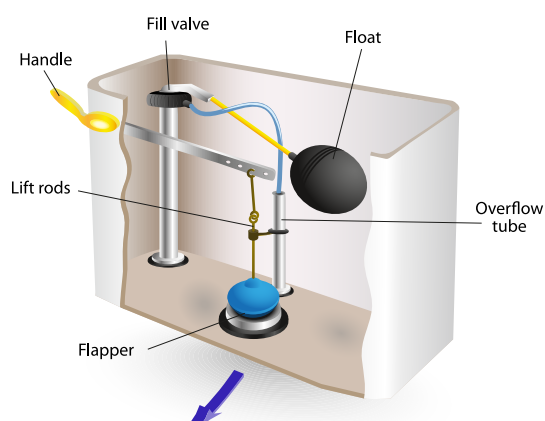


Episode 3: Design a feedback system for a water feature

Several of the attractions at THORPE PARK Resort have water features. It might be a lake or a small pond. In either case, it will need topping up. This is another example of a feedback system. The level of water is fed back to the valve that allows more water to be added. If the water level drops, the valve should be opened. Once the level is high enough, the valve is closed. It saves someone having to check regularly and then turn a tap on or off.



One way of doing this is to use a float valve. This uses the buoyancy of the float and a lever to control a valve. The diagram below shows how it works. The water supply is connected by a pipe to the fill valve (top left).



1. Explain how this would maintain a constant water level.
2. Why will the water level in the lake drop over time?
3. Where would you find this version of a float valve in your own home?



MAKING THINGS APPEAR... AND DISAPPEAR

Using theatrical techniques to produce visual effects.

Episode 1: When is a reflection not a reflection?

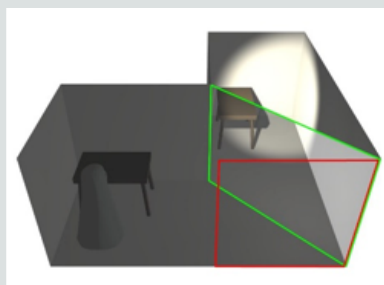
It's sometimes useful in entertainment to be able to make something appear to be somewhere it isn't. This might be because a 'ghostly apparition' is called for in a show or it might be simply to get something static to float in mid-air. If you're making a film it's relatively easy to superimpose one image on top of another.

The feature film 'Who Framed Roger Rabbit?' used both real actors and animations, as did 'Mary Poppins', but the idea of being able to produce images and add them to scenes has been around for much longer than that.

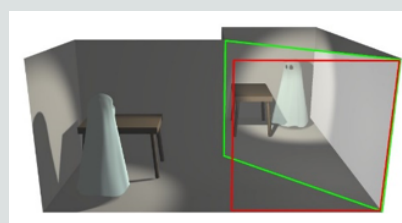
Some of the techniques used today were designed in Victorian times. One that the theatre industry used was an effect called 'Pepper's Ghost'; it made an object appear on stage.

How it works

1. In this diagram, the audience views the stage set through the red square. There is a sheet of glass or Perspex set across the stage diagonally but, the set is lit from above. The audience sees the table. To one side is a mirror image of the set, but in darkness.



2. The lights are now brought up over the second set, which has some other feature, such as a ghost, in it. What the audience sees is a reflection of the second set.

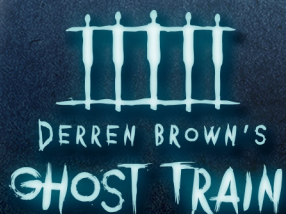


The effect uses the properties of transparent materials - they can both reflect light and allow light to pass through. The set needs to be carefully designed so that there are no reflections on the glass and that the edges are hidden, but if it's arranged well it can be very effective.

Although the effect was developed in the 19th century (and known about for longer ago than that) it is still used. A 21st century example is the 2014 Billboard Music Awards when Michael Jackson 'appeared', using the same effect. It has also been used at a variety of music festivals such as Glastonbury and Coachella.

1. Suggest instances in plays or shows where being able to make something appear might be effective.

2. Explain why getting the angle of the glass right on a teleprompter is critical.



Episode 2: Using it in a full size setting

How does it work in practice? Pepper's Ghost is used to good effect in a number of attractions though, like all good effects, you might not immediately realise it. Some examples are at the Wimbledon Lawn Tennis Museum, the Manchester United Museum and the York Dungeon.

If you can't get to see these, have a look at this YouTube video, which shows how a small ghost is made to dance across a table top: www.youtube.com/watch?v=Q8ZdYe2bIXU

Consider a visit to Derren Brown's Ghost Train and see if you can spot any techniques similar to this.

1. Research some other examples of the effect being used ... and why.
2. Look at examples – how well does it work?
3. What do the designers have to get right for it to work well?

Episode 3: Applying the idea to a wider setting

Being able to make something appear and disappear is a cool trick but how can we make it useful?

In this part, your challenge is to devise an application for this. The idea is to come up with a situation where making a figure or object appear could be useful for entertaining or thrilling an audience. Remember however, that it also has to be practical. There needs to be something to reflect the light and also has to be projected in some way.

Try to come up with something that is original. Here are some ideas to get you started:

- the figure of a security guard that appears on the (glass) door on the way into the security area of an airport, warning you about what you're not allowed to take onto an aircraft.
- a police officer projected onto the windscreen of a car to warn the driver that they are breaking the speed limit near a school

Now see what you can come up with. In your solution, make it clear:

1. Where the image is projected from
2. What it reflects off
3. What purpose it serves





DERREN BROWN'S
GHOST TRAIN



DESIGN
TECHNOLOGY KS4

IT'S ALL ABOUT THE BRAND

Exploring how brands can be used to communicate values.

Episode 1: What does a brand mean to you?

We're used to brand labels appearing on various products. Branding is a very useful way of getting us to recognise things as having been produced by a certain organisation. Well-known brands, such as Nike, HMV and Apple are well established.

However, brands do more than just gain recognition – they convey certain values. Companies work hard and spend lots of money to develop brands that you associate certain values with.

Sometimes this is supported by a logo, where the font, style and colour also indicate certain things.

For example, THORPE PARK Resort's logo is:

1. Why do you think:
 - The colours that have been used were chosen?
 - What does the font indicate?
 - What do you think the design behind it is intended to communicate?



2. Compare it with this version:

THORPE PARK

3. Why is this style much less successful?





DERREN BROWN'S
GHOST TRAIN



DESIGN
TECHNOLOGY KS4

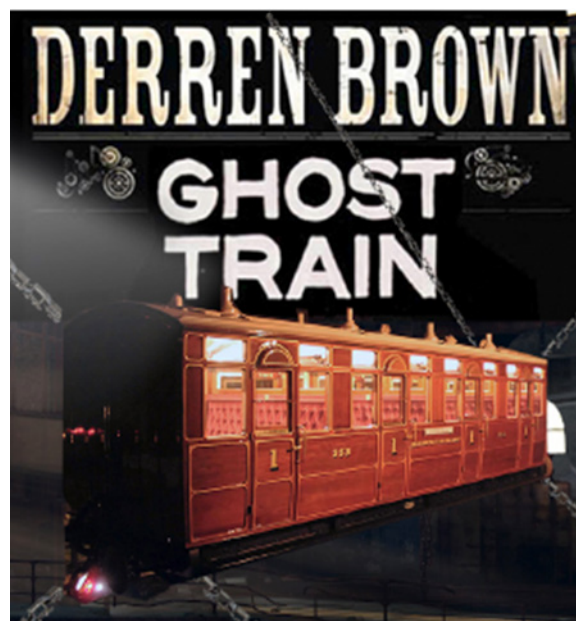
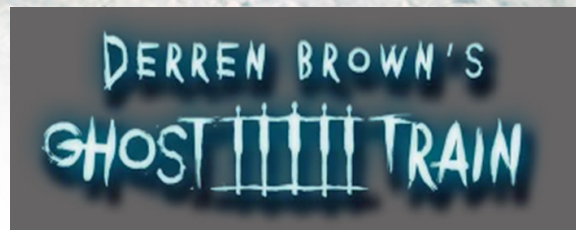
Sometimes within a brand, other 'sub brands' will need to be developed.

For example, Ford sell a wide range of cars. The brand is Ford and this is designed to convey values such as, reliability and good value for money. However, within this there is a range of models, such as Fiesta. These appeal to different customers.

At THORPE PARK Resort there are different rides and attractions. Sometimes these rides appeal to customers looking for the same type of experience.

Imagine you had been given the job of designing a logo for a new attraction, called Derren Brown's Ghost Train. This needs to look different to the other rides and have a distinctive appeal. Think about the colours, fonts and general design. Try to work up a few ideas. What impression does the phrase 'ghost train' convey to you?

Now look at two of the logos professionally designed for Derren Brown's Ghost Train.



4. Look at the way they have been designed. In particular, comment upon the:
 - colour
 - font
 - general design
5. What overall effect has the designer come up with?
6. Which of these do you think work better, and why?



Episode 2: How does it work in practice?

If you go to a place such as THORPE PARK Resort, look to see how the branding is applied. In particular, look out for:

- Where the signage appears
 - How it compares with the signage for other rides
 - How the branding carries through onto signage within the ride and merchandise
1. Take notes and produce a short report on how well you think the design works.

Episode 3: Design a refresh

Sometimes organisations keep the same branding for decades, but sometimes they go for a re-branding. It might be that the previous branding wasn't working well or was starting to look outdated.

Imagine that THORPE PARK Resort decided to refresh the rollercoaster Stealth and wanted a new design.

1. Come up with some ideas for a logo. Think about the colours to use, the typeface and the overall feel.
2. Mock up a couple of ideas and show other students. Which sort of idea seems to work well?
3. Could it be carried through to other aspects such as signage in the ride and merchandise?