

Welcome to the first issue of *iBYTES*, your support update, providing useful and relevant information to our ICT centres and helping to support the OCR ICT community. We aim to highlight the developments that may be of interest to you in the teaching of our GCSE ICT qualifications.

## eRetailing

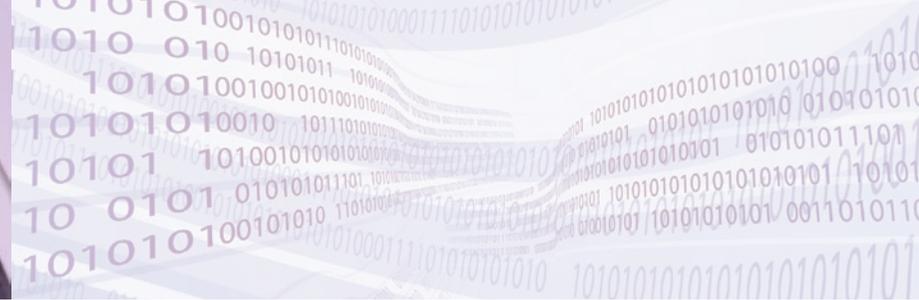
The quest to find and purchase a phone

## Nanotechnology

Good things in small packages

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-  Introducing Steve
-  Defining Steve's user requirements
-  Purchasing items online
-  Security of online retailers
-  Disposing of old technology
-  Quiz
-  Specification criteria map
-  Nanotechnology – the technology of the future
-  Introducing Adam Sweetener
-  How do we do the research?
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## eRetailing overview

Electronic Retailing (eRetailing) is the buying and selling of goods and services online. Customers access eRetailing websites using a device that connects to the internet, for example a computer or mobile phone. eRetailing websites allow you to browse for items on sale, add required goods to a shopping basket and pay electronically. Physical items purchased (e.g. a laptop) will be sent to the customer by post within a few days, while other items may be emailed (e.g. airline or concert tickets) to be printed out, or supplied as a hyperlink (e.g. computer software or eBooks) so the purchase can be downloaded.

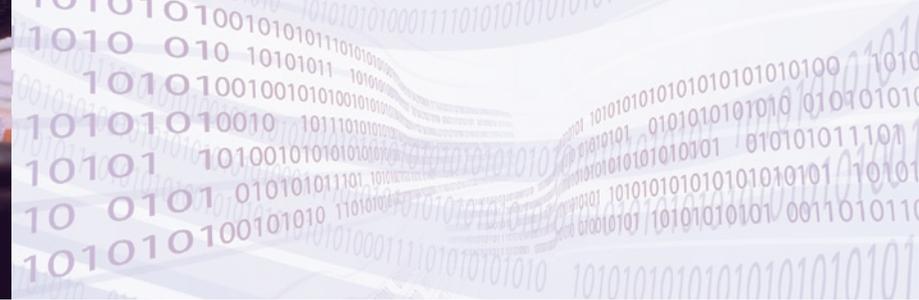
The advantage of eRetailing is that the virtual shops are open 24 hours a day 7 days a week so it is possible to buy items any time of day or night. You don't have to leave your home to buy items using eRetailing, which can save time and help the environment. Specialist items that may not be available locally will be online to purchase, which saves a potentially long journey to the nearest specialist shop.

The biggest draw to eRetail is the lower prices that are often associated with it. Retailers who trade on the internet have lower outgoings and these savings are then passed on to the customer. Shops in town centres are expensive to rent, maintain and staff – renting a large warehouse in an out-of-town location is a lot cheaper than the high street, and wages of staff packing goods into boxes for posting are typically lower. It has also been known for some eRetailers to set up their operations in countries outside the European Union (e.g. Jersey and Guernsey) as a tax loophole allows the supply of goods under £18 direct to customers without VAT having to be paid. This means even cheaper prices for CDs, DVDs and books.

Over the last decade eRetailing has expanded rapidly with most of the UK's high street names having a presence on the World Wide Web – many with full eRetailing websites. There are also eRetail giants which have established themselves as internet-only retailers and have seen their businesses grow as the popularity of eRetailing has increased. In 2009, IMRG reported UK web sales of £50 billion, and 15% of all retail sales are now completed online. *Source: IMRG*

Just about every product or service is available to purchase online. However, the World Wide Web is not just used for making a final purchase, it can be used to help in all stages of buying an item. Shoppers can use information available to select the correct product, find the best price and even dispose of old unwanted items. In this article we will discuss the stages involved in selecting, purchasing and disposing of items electronically and the different tools and techniques that can be used.





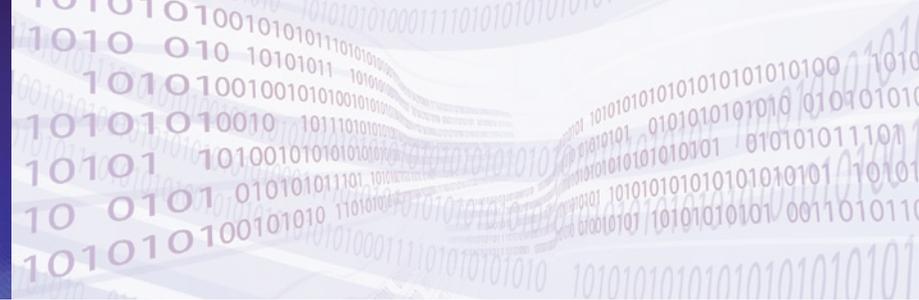
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## Introducing Steve...

Steve is a teenager attending sixth form who wants to purchase a new smartphone. He has decided that he will use the World Wide Web to help him select the correct phone, make the purchase and dispose of his old phone. Smartphones are mobile devices that are not just limited to making phone calls and sending text messages. They are like a computer that sits in your pocket, often with touch screens and small keyboards. Smartphones are capable of running software applications, playing music and videos, accessing the internet, acting as a personal organiser, making calls and sending text messages. Worldwide sales of smartphones increased in the first quarter of 2010 by 48.7% to 54.3 million units according to research company Gartner, Inc.

Source





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## Defining Steve's user requirements

### How do we analyse a problem?

**One of the most interesting changes in the new ICT specification has been the opening up of A Level ICT coursework to earlier historical topics.**

To analyse Steve's problem, about deciding which smartphone to buy, we need to speak to teenagers to find out what are the most important features they need and what features they would like their phones to include. A good starting place would be to do a comparison of smartphones available on the market.

We can carry out this research in different ways, including:

- Going into a range of different phone shops and looking at the phones on offer, their features and the prices
- Carrying out research on the internet
- Talking to teenagers about the features they think are most important on a phone.

Before deciding which phone Steve should purchase, we could produce a requirements specification to ensure that we don't miss out any important features or needs when recommending which phone Steve should buy. The requirements specification will list all the important phone features that the teenagers have highlighted as well as Steve's requirements, such as the maximum cost he wants to pay and whether he wants a contract or 'pay as you go' phone.



### Using price comparison websites

Many people nowadays use price comparison websites to make informed choices before they buy.

Price comparison websites list products offered for sale by different retailers to show the consumer the best price available for a particular product. Most sites will list the same products together on one page in order of the retail price. While price comparison websites are mostly unbiased, some do allow retailers to 'bid' for a position in the listings; however, the consumer can still re-sort the data on the page from highest price to lowest price. As one price comparison website may not list all the retailers that sell a particular item, it is a good idea to look at two or three different sites.

### How does a price comparison website work?

Price comparison websites either collect data about the products from the retailers or, more often, the data is collected through a data feed, which means the information is sent to the website electronically and it is imported to the website. Alternatively, the websites can 'crawl' the web for prices, which means they don't have to rely on retailers supplying them with data. Some price comparison websites also allow consumers to contribute pricing data.

A price comparison website won't usually charge consumers to use the site. It will receive money from retailers, either from a flat fee or, for example, by being paid a fee every time a visitor to the website clicks through to the retailer's website and then buys something or registers with the site.

There are also mobile comparison sites and applications, including SMS-based interaction and bar code scanning applications that are available on the iPhone.





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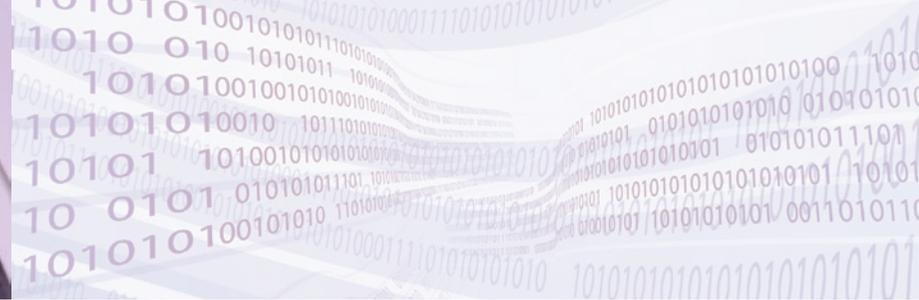
### How did we compare prices between retailers before the advent of price comparison websites?

Another method of comparing prices between retailers is independent product-testing publications and magazines that publish their own reviews of similar products and compare features and prices. We could also visit shops in person and speak to a sales assistant to find out about products that they sell. Word-of-mouth (speaking in person to people we know who have bought similar products) is also a method we could use to compare products and prices.

### What other internet-based applications can we use to make an informed choice before buying?

As well as using price comparison websites on the internet, we can find out the opinions of others who have already bought the product. Many shopping websites nowadays have areas where customers can review a purchase and rate it. There are also consumer forums and blogs where potential customers can discuss items bought by other consumers.





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## Purchasing items online

The next stage of Steve's journey, once he has used comparison websites and other means to find the smartphone that best suits his needs, is to make the purchase. There are different types of eRetailer that he can use: auction sites, online-only stores and high street stores with an online presence.

Auction sites are popular with sellers who run small businesses and people who want to dispose of unwanted items, because of the large number of potential customers, ease of use and low fees charged. It isn't just used items that are listed on auction sites. You can also find lots of new items for sale at fixed prices. The disadvantage of using auction sites is that people are occasionally dishonest. If Steve chooses to use an auction site for his purchase, he needs to read item descriptions very carefully and check the seller's feedback to ensure that only positive comments have been left.

Most high street stores have websites from which you can buy goods. The benefit of choosing a high street eRetailer is that they are established and if you have a problem you can go into store and speak to somebody face to face.

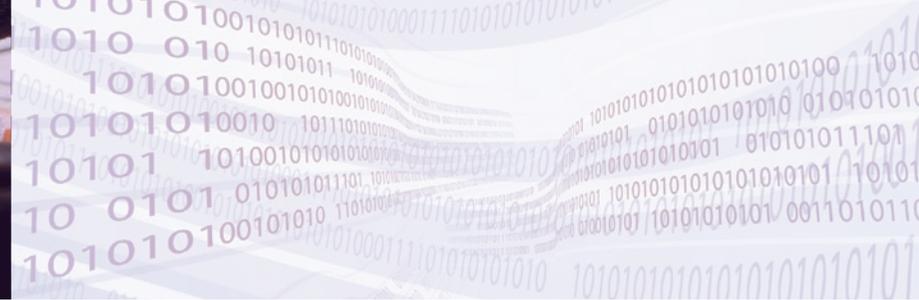
Online-only stores have been around since the mid 1990s and offer cheaper prices because their overheads are lower. Some online-only stores have been criticised about their level of customer service because phone lines are often very busy, which sometimes results in a long wait for attention. To find out about the performance of a retailer, Steve could do a quick search of its name in a search engine. A range of consumer discussion websites will appear, allowing him to survey the business's performance. These forums will feature discussions about many companies and although they can be quite useful, there is a temptation for people to criticise rather than give constructive and balanced feedback.

No matter which type of online shop Steve chooses, all have a number of common features. They should have a facility to locate and browse for products and arrange goods into categories which are navigable using menus. There should be a search facility where keywords can be entered to find products quickly. When goods are displayed on a webpage, there should be a facility to change the category by which they are displayed – eg sort by price or popularity. There may also be links to customer reviews of the product so Steve can be sure it's the correct product for him.

Once he has chosen a product he will add it to his virtual shopping basket. Virtual shopping baskets are similar to real ones where products can be placed 'in' and 'out'. Once Steve has finished shopping he will need to go to the virtual till or 'checkout'. Here Steve will enter his delivery address, contact and payment details. Payment is made using a debit card, credit card or a form of ePayment. Not all goods will be delivered to the customer's home – products such as MP3 files and computer software will be available for instant download after purchase. Other goods will be emailed to the customer. Many high street shops have the option to pick the goods up in store – this is particularly useful for busy people who may not be at home during the day and miss the post.

Some sites will require Steve to create an account, allowing much quicker payment the next time he visits to do more shopping. He can just log in with his username and password and all his personal details will appear. All that is needed is to press 'ok' and the transaction will be completed. When setting up an account, Steve will need to be careful about the password he chooses so nobody can access his account and steal his personal details. Often sites will have a password policy to prevent people from using weak passwords. Typically his password will need a minimum length and must be a mix of letters and numbers.





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## How do online shopping sites work?

Ever thought about how online stores work? They are simply a website attached to a database. The database holds all of the information about the products on sale and can be changed easily and quickly. When a customer performs a search for products, a query is run and the results are displayed as a webpage. Goods added to the virtual checkout are stored temporarily on the shopper's computer until the transaction is complete. On completion of the checkout process, the whole order will be written to the online shop's order table(s) in its database.

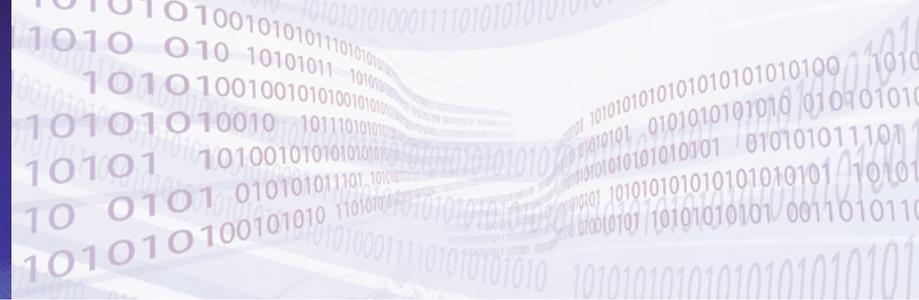


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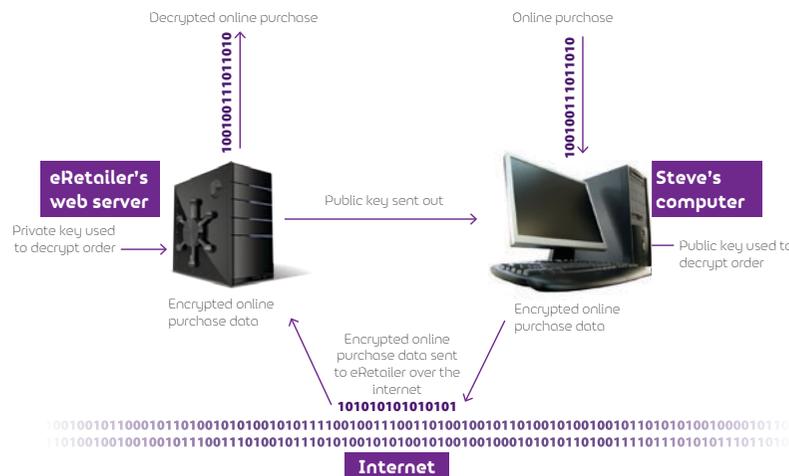




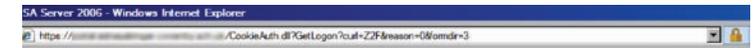
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## Security of online retailers

One of the biggest worries when shopping online is that somebody could steal our bank details or other personal information. When you send information over the internet it's like sending a letter through the post in a transparent envelope – anybody can intercept it, read it and use the content. To prevent this interception sites where visitors have to submit personal data use encryption, provided by secure socket layer (SSL) certificates. Encryption is the scrambling of data so that if it gets intercepted it can't be understood without a key to decipher it. SSL uses two different keys – a public key and a private key. When Steve is at the checkout, his computer will have received a public key from the eRetailer. This public key scrambles his personal and credit card details before they are transmitted over the internet. When the order is received by the eRetailer, a private key is then used to unscramble the data so the order is processed. Each eRetailer needs their own SSL certificate and the issuing of them is governed by the Electronic Communications Act 2000.



Whenever you are sending personal information over the internet you need to check that SSL is being used – you can tell this because a padlock appears in the browser and the web address begins with https instead of http.

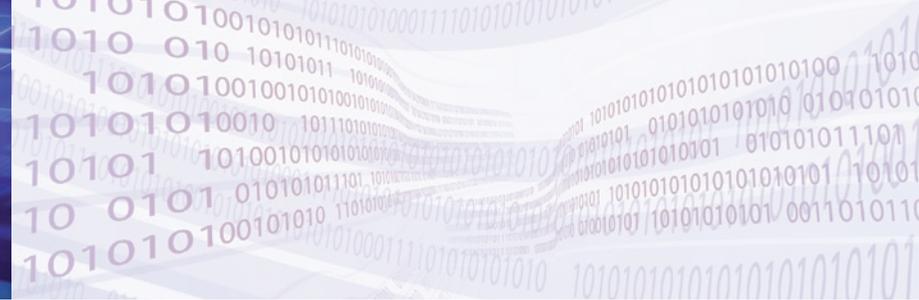


Another concern is that when you set up an account with an eRetailer they store personal details on their server. There is no need to worry, however, because how this data is obtained and kept is protected under the Data Protection Act 1998. The Act lays out eight Data Protection Principles that companies storing data must adhere to; otherwise they can face prosecution. Under the Act, data must be:

- Fairly and lawfully processed
- Processed for specified purposes
- Adequate, relevant and not excessive
- Accurate and, where necessary, kept up to date
- Not kept for longer than is necessary
- Processed in line with the rights of the individual
- Kept secure, and
- Not transferred to countries outside the European Economic Area unless the information is adequately protected.

Source





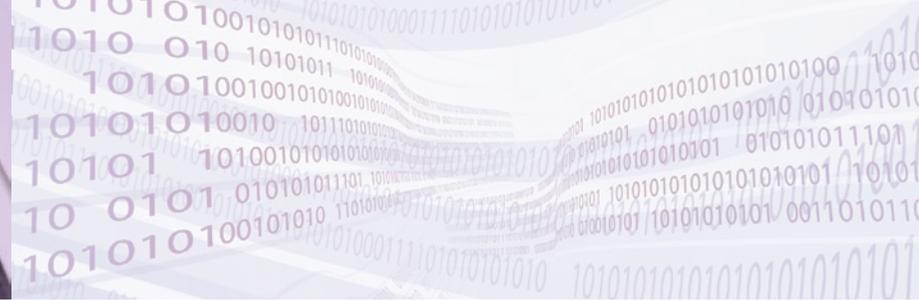
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## Disposing of old technology

Steve should not dispose of his old phone in the bin because of the adverse environmental effects this would have. He could also make some money from disposing of his old phone. Instead of just throwing it away, there are a number of actions Steve could take to minimise the environmental impact of redundant technology:

- Steve could use an online company that buys old phones and refurbishes them for re-sale
- He could send his phone to a company that breaks down and recycles old phones that can't be refurbished
- Steve could give his phone away to somebody else
- He could even sell the phone on an auction website.





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## Quiz

- What is the difference between primary research and secondary research?
- What does the term 'blog' stand for?
- What was special about the entry of the BlackBerry into the smartphone market in 2002?
- In what year was the iPhone introduced?
- State three toxic heavy metals found in mobile phones that can damage our health and the environment if old phones aren't disposed of properly.

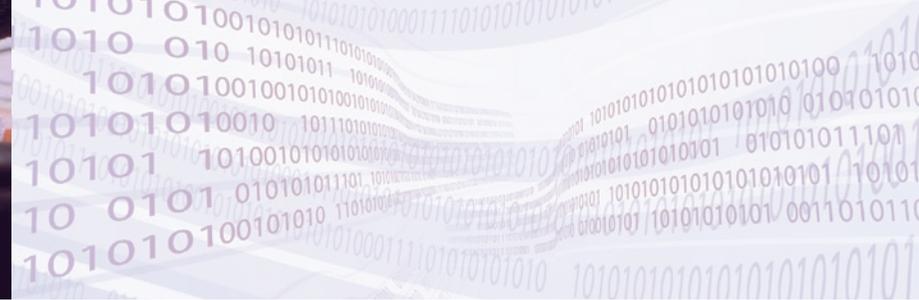
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S	C	N	N	D	F	M	I	K	Q	Z	G	F	P	L	M	G	S	E	A



## Word search clues

- The Act that governs how data should be stored and prevents its misuse
- A method of scrambling data so it can't be read
- A collection of files that can be searched or processed into different outputs
- Allows users to interact with a computer system and give instructions
- Protocol for transmitting data wirelessly over short distances
- Term used to describe wireless technology
- Software used to view webpages
- Property of a data field which could be text, number or Boolean
- A single item of data
- A collection of fields that describes one thing
- Unique ID used to log into an eRetailer's website
- Rules defining how passwords should be
- Reusing old items rather than placing them in the bin
- A global network of computers
- Powerful computer used to host webpages
- List of things that a system should be capable of doing



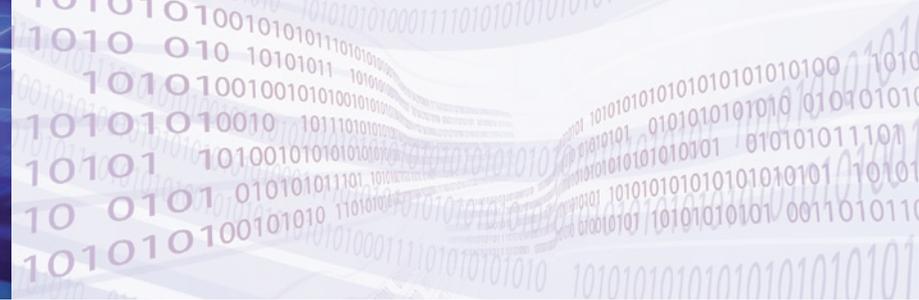


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## Specification criteria map

	Content specification	Page number in specification
Definition of a smartphone	2.1.2, 2.1.9, 2.3.1	8, 11, 14
Defining user requirements	2.2.1	12
Use of the internet to make an informed choice	2.1.1, 2.1.2, 2.2.1	7, 8, 12
Purchasing items online	2.1.2, 2.1.4, 2.1.5, 2.1.9, 2.2.3	8, 9, 10, 11, 13
Creating a database	2.1.1, 2.1.4, 2.3.7	7, 9, 16
Security of online retailers	2.1.5, 2.2.2, 2.3.9	10, 12, 17
Disposing of old technology	2.1.6, 2.3.8	10, 16





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## Nanotechnology – the technology of the future

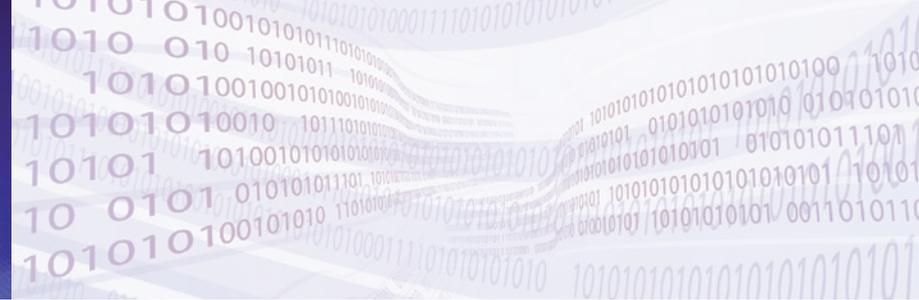
Nanotechnology is the study of molecules and atoms at a microscopic level. Scientists can now affect materials and compounds at a 'nano' level. So what does that mean? It means that by using specialist tools and equipment, scientists can both see and move nano-particles around which can actually change the properties of materials and even form new types of material. Imagine a super-strength tape that sticks to surfaces with the power of a gecko's feet, or tiny medical devices that detect diseases in seconds – this is what nanotechnology can offer. Nanotechnology is being used in a number of different industries such as in medical research, computers, handheld devices and cosmetics. Soon nanotechnology could be used in every product imaginable!

So what is a 'nano'? As we measure our world in terms of metres and kilometres it is sometimes hard for us to imagine a world that is too small to see. If you ever see incredible photographs of tiny bugs which have been taken using electron microscopes, these are taken by machines that take images of things that are 'microscopic' (on a scale of millionths of a metre across). 'Nanoscopic' indicates a scale of 'billionths' of a metre, so a 'nanometre' is a billionth of a metre. Another way of looking at it is that the nanoscopic scale is one thousand times smaller than the microscopic scale and a billion times smaller than the world of metres in which we live.



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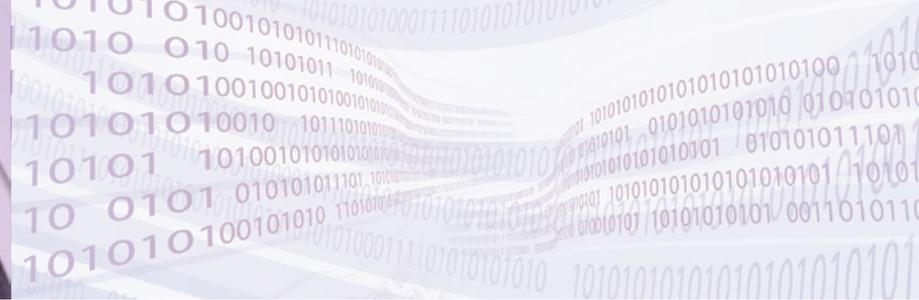
## Introducing Adam Sweetener . . .

Adam Sweetener is an entrepreneur, a businessman who is always on the lookout for new projects or ventures in which to invest his money.

His management team has told him about nanotechnology and the fact that they believe there is money to be made out of it! As this is a new technology, Adam considers it a bit of a risk and therefore, at present, is only willing to invest in one area.

He therefore wants a number of teams to investigate a range of different applications for nanotechnology and, using a presentation, convince him why he should invest in that particular area.





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## How do we research?

We can carry out the research in a number of different ways using a range of sources, including the following:

- Look in newspapers or magazines
- Browse websites (have a look at the list of links on the right)
- If your school has access to Youtube or iTunesU or something similar, investigate whether any relevant videos are available
- Search for associated podcasts (there are websites containing searchable podcast libraries)
- There are also television programmes you could search for (use BBC's iPlayer or ITV player)
- Again, if your school allows, you could also search social media to investigate whether there are any 'blogs', 'wikis' or forums devoted to the subject area.



Click here



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## Useful links

<http://quest.nasa.gov/projects/nanotechnology/resources.html>

[www.explainthatstuff.com/nanotechnologyforkids.html](http://www.explainthatstuff.com/nanotechnologyforkids.html)

[www.nano.gov/html/edu/educ12.html](http://www.nano.gov/html/edu/educ12.html)

[www.nanonet.go.jp/english/kids/](http://www.nanonet.go.jp/english/kids/)

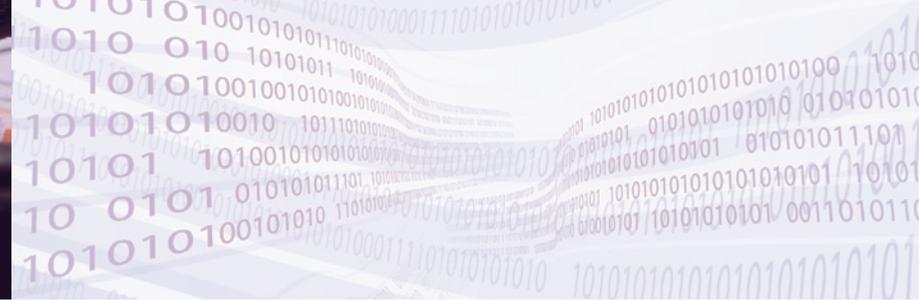
<http://nanozone.org/what.htm>

[www.nano.org.uk/whatis.htm](http://www.nano.org.uk/whatis.htm)

<http://cnse.albany.edu/>

[www.nanooze.org/](http://www.nanooze.org/)





- eRetailing overview
- Introducing Steve
- Defining Steve's user requirements
- Purchasing items online
- Security of online retailers
- Disposing of old technology
- Quiz
- Specification criteria map
- Nanotechnology – the technology of the future
- Introducing Adam Sweetener
- How do we do the research?
- Useful links
- Specification criteria map

## Specification criteria map

What is nanotechnology?

Where is nanotechnology being used?

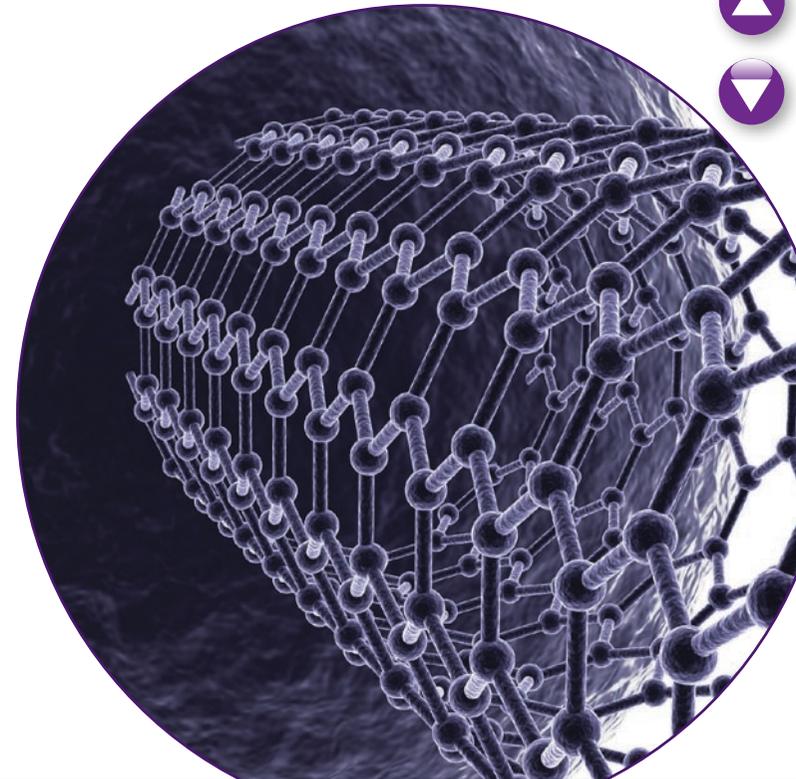
Selling nanotechnology to Mr Sweetener

### Content specification

**B063:** 2.3.1, 2.3.10

**B063:** 2.3.1, 2.3.10

**B063:** 2.3.10



# Do you have a **passion** for technology?

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Facsimile 01223 552627

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