Unit 1 – Pike Place Fish Market

Seattle is a large city in Washington state in the north-west of the USA. Today, it's probably most famous for its great coffee and its wet weather, but traditionally Seattle was a port town. At the turn of the 20th century, most people here made their money from the area's abundant natural resources, and the city's two biggest industries were logging and fishing.

Today, Seattle is home to some of the largest multinational companies in the world, so logging is not nearly as important as it once was. But fishing still plays a vital role in the local economy. It is estimated that the commercial fishing industry is worth around six billion dollars and employs more than 10,000 people.

One employer is the Pike Place Fish Market, which was founded in 1930. The open-air market was initially very successful, but business declined throughout the 20th century. Supermarkets became significantly more popular, and by 1986 the fish market was almost bankrupt.

Today, however, business is booming. At its busiest, the market attracts up to 10,000 customers every day. And they don't just come for the fish. The market has become one of the city's most popular tourist attractions. Visitors come to see the famous flying fish, and to enjoy the hustle and bustle of a typical market day. Most of all, they come to have fun. So, what's responsible for this change in fortunes?

The current owner, John Yokoyama, bought the fish market in 1965. For over twenty years, he worked tirelessly and demanded the same of his employees. He was quite strict and severe, but nothing seemed to work. The fishmongers weren't happy, and fewer people were coming to the market.

John decided to change his entire management style. He realized that in order to transform the business he needed to motivate the staff.

At that time I met Jim Bergquist, who brought this new philosophy into the market, and he enrolled me into taking that on. And he brought a new philosophy … and a philosophy of being. And since that time, the company has just grown hands over fist … no I mean, every year we break records …

He wanted everybody – from the manager to the market trader – to feel part of the business, so he created a shared goal and asked each member of staff to make it happen. The goal was simple – to make Pike Place Fish Market world-famous.

To do this, they decided they weren't just selling fish; they were selling a whole consumer experience. The fishmongers invented games, like 'catch the fish'. They played practical jokes and started shouting and repeating every customer's order.

The more fun the workers had, the more good it did the business. Soon the marketplace was buzzing with the sound of flying fish, laughing customers and the shouts of the market traders.

Before long, the team had achieved their ambition, and today Pike Place Fish Market is world-famous – both for its fresh fish and its positive management style. In 1998, the team were featured in a corporate video on teamwork and motivation. This has transformed workplaces across the globe and the market has been featured in all kinds of books and articles. In 2001, CNN names Pike Place Fish Market as the most fun place to work in the United States.

The Pike Place Fish Market has become well known for its vibrant atmosphere and playful staff, but behind the fun is a strong commitment to friendly service and quality products. And from wild Alaskan crab to sockeye salmon, the Pike Place Fish Market will be selling world-famous seafood for a long time to come.

Unit 2 – The Falkirk Wheel

Today, we take for granted how easy it is to transport goods across countries and around the world.

With highly-sophisticated and complex international ports that provide national road and railway systems with a constant supply of freight traffic, it's hard even to imagine how industries functioned before the internal combustion engine and the rail network.

Just as the primary method of moving goods around the world is still over water via container ships, water was also the key to the Industrial Revolution in the 18th and early 19th centuries. Carrying heavy or fragile goods on barges was cheap, safe and relatively quick.

So, historically, canals were critically important to the industrial development of the United Kingdom and many other countries. By the mid-19th century, a network of over 7,000 kilometres of waterways had been constructed, linking newly industrialized cities across the UK. The swift construction of these canals was one of the most impressive engineering feats of the Industrial Revolution.

But the United Kingdom isn't flat. And the hills and mountains created an enormous challenge when it came to building a network of canals that could cross the entire country. While multiple locks were used to gradually raise or lower a boat, the method was exceedingly slow. And, for the engineers of the time, finding a way around this issue proved impossible. As a result, and with the arrival of the steam train, the supremacy of the canal in the UK was short-lived.

So since the mid-20th century, people in the UK have been using canals mostly for leisure and recreation. Canal-side warehouses have been converted into highly-desirable apartments and, for many people, spending a week quietly cruising through the countryside on a houseboat is a perfect way to spend their holidays. But unfortunately, the canal network is fragmented, and in many regions waterways have fallen into disuse.

And for many years, this was the story of the historic Forth & Clyde and Union canals, between Edinburgh and Glasgow. Located in an area of Scotland renowned for its stunning lochs and mountains, the two canals were separated by a height difference of 35 metres. Since 1933, when a series of eleven locks at Falkirk were dismantled, there had been no way for a boat to cross Scotland from east to west on the canals.

That was until 1994, when engineers decided to tackle linking the canals once more, this time using modern technology. After years of research and development, engineers came up with a beautiful and radically-new solution to the age-old challenge.

This extraordinary structure is the Falkirk Wheel, a 35-metre-tall steel rotating boatlift, with two gondolas that can lift boats up and down between the two canals in just four minutes, using less power than it takes to boil eight kettles.

At a cost of over £17 million to construct, and using 1,200 tonnes of steel, the Wheel opened to the public in 2002. Today, it's a popular tourist attraction, with visitors, young and old, keen to experience the unique sensation of being in a boat and rising up through the air as if by magic.

Obviously it's not magic that drives the Wheel. In fact, it's ten hydraulic motors and a series of linked cogs that turn the massive arms that support a water- and boat-filled gondola at each end. All of this is made possible by clever engineering and the application of Archimedes' principle of displacement. This basic principle of physics guarantees that the weight of any boat in a gondola will displace an exactly proportional volume of water so the final 'boat plus water' will always remain the same. It's this precise balance that means a minimal amount of energy is required to rotate the gondolas from top to bottom around the massive central spine.

The giant mechanisms controlled by computer and constantly monitored to guarantee the safety of everyone using the Wheel. All the moving parts are regularly checked, and the operators are careful to ensure that the Wheel rotates an equal number of times clockwise and anti-clockwise to reduce stress on the structure.

The Falkirk Wheel was built more than two hundred years after the golden age of the canal in the 18th century, but its proof that technology and innovation can breathe new life into old ways of doing things. And who knows – a hundred years from now, if we haven't managed to find alternative fuels to address problems with current energy supplies, maybe well have returned to using canals for transport. And maybe we'll have more magnificent boatlifts like the Falkirk Wheel, providing an elegantly engineered and energy-efficient solution to an old problem.

Unit 3 – The Tall Ships race

On a beautiful August afternoon, dozens of tall ships of various shapes and sizes, accompanied by hundreds of smaller boats, formed the largest flotilla in living memory as it left the small town of Falmouth in the south-west of England. These magnificent ships were all heading for the start of a race to Greenwich, over 200 miles away in London.

On board these ships were over 800 trainee crew members, many of whom had never been to sea or even been sailing before. These trainees had been recruited to support the professional sailors, and given the chance to experience life as part of a tall ship crew. The professional sailors had high expectations of their trainees, as the race would be a physical and emotional challenge, and a life-changing experience for many of them.

This Tall Ships Race was organized by Sail Training International, a charity dedicated to the development and education of young people through sailing experiences. Over half of the trainees were under twenty-five years old, and many had difficult backgrounds to overcome. But there was no room on board for troublemakers. If the crew was going to make it, all the trainees needed to be open to new ideas and willing to get their hands dirty The trip would take them far away from their creature comforts, and force them to work together as a team.

It's a huge challenge because one of the great powers of Sail Training is that it goes out of range of the mobile phone. And everybody can see, it's very obvious, why everybody has to work together. The sails don't go up unless you all pull together. Somebody has to steer the boat, has to cook, has to wash up ... and all the other tasks on board. And even people who have no idea about boats at all very soon understand why it's necessary to work together. And it has a terrific effect on the crew. So right now, at the beginning of this race, we've got a lot of very anxious young people climbing the masts for the first time in port, pretty worried, white knuckled. But once they get to Greenwich at the other end next weekend, they'll be confident, working together, and they'll remember it for the rest of their lives.

For some of the trainees, this is not their first time on board, and they're eager to spend more time at sea.

I started off not liking sailing at all. I was scared of boats, and, um, now you … I'd happily live on one. I think it's made me more confident as … for meeting new people, um, and kind of making the most of it, like the time you've got because, if you've only got a week on a boat, you kind of don't want to hang around and be like not doing much at the start. So I think it's just kind of taking things as soon as you can and making the most of it while you can.

Jack now helps first-timers on board find their sea legs.

I think probably the biggest thing is, um, I mean sometimes, when it's really rough, it's a bit uneasy, but you just get on with it. And as soon as you've been off for a couple of days, you forget that you even felt slightly ill in the first place.

And what's the biggest challenge when a new crew arrives?

I think it's just getting to know new people, really. I mean, obviously you're always going to find people that you don't get on with quite as well, but, um, it's just learning to kind of get round things and make the best of what you've got.

But it isn't just young people who have the opportunity to experience life as part of a tall ship crew. The most remarkable ship in the flotilla is, without a doubt, the *Tenacious*. Launched in the year 2000, the ship is fully accessible for disabled crew, giving people of all abilities and all ages the same opportunities as their able-bodied crewmates.

My name is Helen Leehy, and I'm sailing here as voyage crew on Tenacious, and this is my tenth voyage on Tenacious, which is one of the two ships owned by the Jubilee Sailing Trust, which specializes in access for disabled people as well as able-bodied sailors, um, on this wonderful three-masted ship. So every single detail is as ,er, accessible as possible for the widest number of people.

So for example, you might be surprised to know that somebody who's blind can actually steer the ship, because the compass has a speaking compass, so they can hear where they're going even if they can't see where they're going.

But for me, I think, as a disabled person in particular, it's about meeting other people who have different sorts of disabilities, working together with people as a crew. And when you come on board, you really don't know who your fellow crew members are going to be. They can be all ages, you know, all shapes, sizes, colours, creeds, and that's fantastic. So it becomes a community of people who really become one, as it were, become as the crew and work together, and live together in a fairly confined space for a week or so. And that's a very special experience, and I don't think it's an experience that you can have on land very easily.

The beautiful sunshine and the enthusiastic support of the crowds were a real morale boost for the crews as they embarked on their sailing adventure. And if they could all work together and support each other, there's little doubt that their efforts would pay off with a triumphant arrival into Greenwich.

Unit 4 – An international aid worker

Christa Hook is a retired doctor. She spent the first half of her career working in general medicine and community medicine in the UK. But shortly before her 50th birthday she trained in tropical medicine, then began working in overseas relief work with the international organization, Médecins Sans Frontières.

Why did you move into overseas relief work?

I always wanted to work overseas from the time I was very small. When you're aware of all the problems overseas , for some people it's so much easier to simply say, 'There's something I can do about that. I can go and work overseas' and actually do something to help the situation.

So, why did you choose to work with MSF in particular?

Well, Médecins sans Frontières is an organization; it is an international and private organization which works mainly in conflict and with major epidemics and with people who are excluded from healthcare in their own countries. It focuses very much on quality medical care. There is no place for poor medicine for poor people. It appealed to me because I had worked in situations where health care was a poor relation in, in, in that sometimes less good medicines and less, um, innovative work was done because people could not afford it or it was never done that way before. For me it is important that the innovative and the good treatment is done for everybody, whether or not they can afford it. And this is what M … MSF has specialized in over the years.

Was it an advantage or a disadvantage to get into overseas work at an older age?

Well, it's certainly true that, um, most overseas work is done by younger people. However, when you're older and your family don't need you around anymore, it's often useful to be able to offer the experience and the life experience as well as the work experience, and the fact that you've often worked in a team and you can understand team dynamics, and also that you can, uh, understand and respect the people that you're working with. Younger people have the energy and the drive and it's great to have them; but a mixed team is probably best.

Tell us about some of the projects you've worked on.

The first time I worked with Médecins sans Frontières was in Zaire, which is now known as the Democratic Republic of Congo. I went there to work in North Kivu province on a project which involved epidemic preparedness in a very remote area of North Kivu. While I was there, the huge problem of a refugee crisis started with people coming over, escaping after the massacre and genocide in Rwanda. And in the course of four days, 800,000 people came across from the northern provinces of Rwanda in, into, into North Kivu province. There was very little there for them. It's a very poor country. They landed on an area which, in which there was very little water; and the water there was in the lake was contaminated with cholera. So, the cholera epidemic

started within a few days and swept through these thousands of people, with a very, very high death rate in spite of all the efforts of both MSF and many other international organizations.
I've also worked in Uzbekistan and some of the other Central Asian republics where there is a very big problem of drug-resistant tuberculosis, which is spreading rapidly. Latterly I was working much more with malaria. Malaria is still a huge problem worldwide. There are millions of cases every year. And there are hundreds of thousands of young children, especially children under the age of five, who die every year from malaria.
What challenges did you encounter?
There are a lot of challenges working with MSF. For example, when I was working in Congo during the cholera epidemic we would leave our team house in the morning, having hopefully had enough to drink, but not be able to put your hands anywhere near your mouth for the whole of the day because of the risk of catching cholera from your contaminated fingers. There were not enough gloves; there was nowhere to wash during the day. So, that was always a real risk. Other risks we face are from physical danger in conflict situations. There is a risk of being caught in crossfire; and I have lost friends and colleagues in this way.
Can you describe a typical MSF project team?
Yeah. Uh, a typical team involves some doctors and nurses, but a lot more people who are giving them all the backup that they need, especially logisticians and people who are involved with the, the transport and with the bringing in of the drugs from other countries, and looking after the finances. And while the majority of the work in the field is done by staff who are recruited in the region, we also find it important to have staff coming, international staff, because of their objectivity and neutrality in the political situation where the conflict arises.
Give us your happiest memories from your work.
Some of the happiest times were seeing children recovering from severe malnutrition. Uh, these children can come into a feeding centre really utterly miserable with this … their hair falling out, very pot-bellied, skinny arms, skinny legs. And within a few weeks, they can be properly nourished, happy – that's the great thing: they get happy again – and they are able to walk and to walk off home with their families.
Do you have any regrets?
About my work, no. Um, I always wanted to be a doctor; I always wanted to work overseas. Uh, I have been one of these very fortunate people who have never regretted my decision and have never regretted being a doctor.

Unit 5 – The power of the sun

The sun gives us light, heat and energy. In short, it gives us life. Mankind has always been aware of the sun's importance. Ancient civilizations worshipped it as the giver of life, and it has been a powerful symbol for cultures across the world for thousands of years. But until recently, we knew very little about it.

The discovery that the Earth revolves around the sun – rather than the other way around – was a turning point in our understanding of the universe.

Since then, many people have worked tirelessly to find out more. Today, we know that the sun, which is around 150 million kilometres from the Earth, is a massive ball of gas around which the rest of the solar system orbits. It is made of 92.1% hydrogen and 7.8% helium, and burns at around 15 million degrees Celsius at its core.

For millennia, people have harnessed this extraordinary energy. Early societies built their homes to maximize light and heat, and even the earliest farmers knew the extent to which crops and livestock depended on the sun.

But more recently, we have developed a different use for solar energy – to produce electricity.

For over a century, we have produced most of our electricity using fossil fuels, and today traditional sources such as coal, oil and gas provide 86% of the world's energy. It's a huge industry, and each year we produce 7.6 billion tonnes of coal and over 34 billion barrels of oil every year.

But this supply is about to peak and will soon decline. At the same time, demand for energy is increasing, especially in emerging economies like China and India. In order to meet this growing demand, companies across the world are looking for new energy sources, one of which is the sun.

Avra Valley is a large solar farm in Arizona, It stretches across 300 acres of desert and produces 25 megawatts of electricity. At full capacity, Avra Valley can serve more than 20,000 homes, and over the next twenty-five years, it is hoped the electricity being produced here will offset around 51,500metric tonnes of carbon dioxide, which is the equivalent of taking 10,700 cars off the road every year. But how exactly does it work?

Avra Valley consists of hundreds of these photovoltaic solar panels. Photovoltaics is the most common way to convert solar energy into electricity. It was first discovered by the French scientist Alexandre-Edmond Becquerel when he was just nineteen, and today's panels are still based on the same fundamental principle.

The panels soak up the sun through these silicon sheets, and this creates an electric charge which is then channelled through these metal conductors. This method is clean and green, but there are some issues – the greatest of which is cost.

Harvesting solar energy in this way is very inefficient. Only around 23% of the sun's energy is converted into electricity. By the time it reaches the electricity grid, this will have reduced to a mere 15%, meaning that 85% of the sun's energy is wasted. These panels are also very expensive to produce and maintain, meaning that at the moment, solar-generated electricity is much more expensive than that produced by coal, oil or gas.

But things are changing. Over the last few years, the cost of solar panels has reduced by around 70%, and it is due to fall even further in the future. Huge solar plants like Avra Valley can also produce cheaper solar energy thanks to their larger economies of scale, making it much more economically viable for energy companies to buy and sell solar-produced electricity.

The sun is by far the greatest source of energy on Earth, but scientists are still working on unlocking its full potential for electricity production. Avra Valley is at the heart of this mission. The workers here hope that if they can produce enough affordable electricity, they can make solar energy a realistic alternative to fossil fuels, helping to create a brighter, cleaner future that we can all enjoy.

Unit 6 – Leisure through the ages

In today's fast-paced society, free time is a precious commodity. Many of us feel we spend far more time stressing out than chilling out, and if we had the choice, many of us would work less and play more. But our modern concept of leisure is a relatively recent phenomenon.

Our ancestors would never have imagined that we'd have so much free time and so many different things to do – but of course they did play. Relics unearthed from ancient civilizations across the world show people taking part in all kinds of games and activities. However, this kind of leisurely fun was largely limited to the upper classes who didn't work at all. For the majority of people, work and life were intertwined and leisure time didn't exist – until Ancient Greece.

The Ancient Greeks took great interest in the arts and sport. The success of their civilization meant their basic needs were met so they could pursue other interests. The wealthy elite, who had the luxury of leisure time, would spend it listening to storytellers, watching plays and enjoying early examples of modern games like draughts, dice and marbles.

The rest – who couldn't afford such frivolous games – played sport. This was an essential part of Greek society and was often central to religious festivals, including the very first Olympic Games. Here, in the Olympia valley, athletes would take part in events like wrestling, long jump, javelin and the discus, while thousands of their countrymen looked on. They would have travelled across the country to watch and experts estimate that a single event could attract more than 50,000 spectators.

As the Greeks gave way to the Romans, the role of ritualized sport changed. They also used it to worship their gods, but it was viewed less as entertainment and more as a training ground for future soldiers.

However, as the Empire grew in both size and wealth, many Romans had more time on their hands. They demanded to be entertained and thousands of people would pay to watch acrobats, musicians, and, of course, gladiators in amphitheatres across the empire, the most famous of which was the Coliseum.

These large-scale spectacles disappeared with the decline of the Roman Empire. Over the next 2,000 years few people had the time or the money to do much other than work. Of course people played games and had fun, and if you were to look at most civilizations during this time, you would find early versions of most modern sports. But these activities were ill-defined and differed from place to place. It wasn't until the Industrial Revolution that leisure once again became organized.

This was an era of great change. People moved from rural villages to big cities and worked in factories rather than farms. While people had always rested on Sunday, some now had Saturday afternoon off too. With this new-found time and hard-earned cash, people started to enjoy

themselves. During the day, they played newly-codified sports like football, rugby, or basketball, and improvements to transport infrastructure meant people could also travel to support their local team. In the evenings, they went to the theatre or to dance halls.

The impact of this leisure revolution can still be seen today. Many of our modern leisure activities have their origins in the 19th century and the attitude toward free time changed dramatically. In 1800, it was still seen as the preserve of the rich, but by the middle of the 20th century it was viewed as a right rather than a privilege.

By the 1960s people were spending more money on leisure than ever before. New employment laws recognized people's right to free time outside of work, and increased income meant they had more money to spend. The era of popular culture had arrived and people started to take their free time activities as seriously as their work time.

Today most of us fill our free time with a wide range of hobbies and interests, but it seems another revolution is underway. The Industrial Revolution created a routine that clearly divided our work time from our free time, but this is changing. Some of the biggest companies in the world pride themselves on offering fun activities in the office, while many of us find ourselves working in the evenings and at weekends. So we play during work time, and work during play time. This is redefining our concept of leisure time and who knows how it will change in the future?

Unit 7 – Decisions, decisions

Dr. Mike Browning is a psychiatrist and researcher at the University of Oxford. His research interests include a focus on finding new treatments for people who suffer from anxiety and depression.

So Dr. Browning, can you tell us what your research is about?

So my research looks at why some people might develop illnesses such as anxiety and depression, and how those treatments for anxiety and depression might work.

And why did you become interested in this area?

So, um, I'm a psychiatrist – I treat patients with a range of disorders including anxiety and depression and one of the, um, realities of treating people with, with these difficulties is that the treatments that we have don't work as well as we'd like. So I, uh, do research to try and understand why people become anxious and depressed in the first place, and then I look to see if I can use that knowledge to improve the treatments for these patients so that in the future we'll have treatments that work a little bit better.

In your opinion, how much does emotion and gut reaction influence decisions in our daily lives?

OK. So I think probably the first thing to say is, is that almost all of the decisions that we actually make in our daily lives we're not consciously aware of making, we make them by habit. So if you think of the example of, of driving to work, for example, every drive you take involves making hundreds of decisions. So how fast to go, which pedal to press, whether I turn left or right. And you're not aware of making pretty much any of those decisions. They happen, by habit, and automatically. And so, as you can imagine, your emotions, or the way you feel, will influence a number of those decisions. So, for example, if you're feeling really happy and buoyant, you might drive a little bit faster. And if you're sad, you might drive a little bit slower. Uh, and the other, uh, thing I think influences us – those decisions is what you described as 'gut reaction'. So some of the complex decisions you make, for example, if you're thinking about driving to work. You might be at a junction and you might have to decide when it's safe to go. Now there's a couple of ways you can make that decision. One is to calculate exactly where every other car is, what speed it's going, where it's going to be in a few seconds, and decide whether it's safe for you. The other is just to look and just get the feel about when it's safe. And almost everyone does the second – uh, it's the second way of making decisions because that's much more efficient and much quicker. So those decisions are – are influenced by your gut reaction, rather than really thinking out each decision, uh, to its logical conclusion.

Do you think that going with our gut feelings and emotions leads us to make better decisions?

Yeah. So there's clear examples when emotions will be quite useful, ah, and help you to make a decision. Maybe a better decision or make the right decision more quickly. Ah, but there are other contexts where it's much better not to be driven by your emotions and where a more considered, thought out approach is probably the best approach. So, if we take, uh, an example – if you're walking down the street and a tiger jumps out in front of you, then you're likely to feel fear. And one of the reasons that, that people feel fear is that it gets you ready to run away or to fight, and scan your environment for threats, and all the things that are a really good thing to do if a tiger jumps out. So following your emotions when a tiger jumps out is a really good idea, whereas thinking it through too much would be a really bad idea. But there are other decisions, for example, as we mentioned before, buying a car, or, or something a bit less urgent and a bit less emotionally charged, where it's often better to make a more considered – a decision.

In general, are people who suffer from anxiety more likely to make decisions based on their emotions or are they more likely to think things over more carefully?

Um, I suppose it's quite a complex question, actually. They tend to make decisions in a different way to people who are less anxious. So whenever you make a decision, you'll often have to weigh up the pros and cons of the different options that you have available to, to you. And what you'll find with anxious people is they tend to be more adverse, or more worried about the bad things that might happen to them. And so that changes the decisions they make a little bit. So anxious people will tend to make decisions that, um, they think are less likely to put them in harm's way. So that can be a good thing. But the problem is, that sometimes that means that you'll miss out on something really good happening because you're not willing to take the risk that maybe it won't turn out well. So to give you a sort of real-world example of this – there's a couple of studies that have suggested that if you're anxious, particularly if you're male – if you're a man – you're less likely to be run over by a car in your twenties. And possibly because people who are anxious will look more assiduously both ways to see if a car is coming. However, to balance that out, once to you get up to your thirties and forties you're more likely to die of heart disease, so the worrying isn't all good. But there's obviously some benefit to being a little bit worried about the things in your environment that might harm you.

Unit 8 – Net value

Bags, bottles, food packaging ... plastic is everywhere in our modern world, and it quickly becomes rubbish. For example, in the USA alone, around 90% of plastic packaging is used only once; and around eight billion dollars' worth of the material is thrown away every year.

But plastic isn't biodegradable, and a lot of it ends up in our oceans. This is a huge threat. According to scientists, there are more than five trillion pieces of plastic in the ocean, weighing an astonishing 269,000 tonnes. This kills more than a million seabirds and 100,000 marine mammals every year.

All this plastic drifts along the oceans' currents, trapping other debris and eventually coming together to form into huge islands of waste. There are five such rubbish islands in the world today and, according to some experts, the largest – often referred to as the Great Pacific Garbage Patch – is twice the size of Texas.

Of course, we need to look at reducing the amount of plastic we produce, but it's also crucial we look at reusing and recycling the plastic that already exists.

Bureo is a small business that makes skateboards out of recycled plastic. It is based in Chile, and takes its name from the native Mapuche word for 'waves'.

The company's founders – Ben Kneppers, David Stover and Kevin Ahearn – are all keen environmentalists, and as surfers they spend a lot of time in the ocean, frequently encountering plastic waste, much of it from local fishing boats.

The fishing industry accounts for an estimated 10% of the oceans' plastic pollution. Fishing fleets across the world often discard used equipment such as lines and nets into the water. Over decades, this has had a devastating effect on both the ocean and its sea life. These nets are large and don't break down, so anything from small sea creatures to dolphins and whales can get caught up in them.

In Chile, fishing is a huge industry. It creates a lot of employment and is a major source of income for many people. But it's also caused a lot of damage to the country's stunning coastline. For local fishermen, disposing of worn fishing nets is expensive, so more often than not, they will simply throw their waste overboard, because it's quicker, easier, and much, much cheaper.

Bureo's first mission was to encourage these fishermen to stop doing this and to keep and collect their old nets instead. To do this, they distributed collection bags around three fishing villages on the Chilean coast. Convincing these fishermen to break the habit of a lifetime wasn't easy, but the locals soon saw the benefits to the ocean and to the local community. Within six months, Bureo had collected three tons of plastic – enough to start manufacturing the company's first product – the Minnow Cruiser.

Once they've been collected, the plastic nets are transported from these small fishing villages to Santiago, where Bureo has a recycling and manufacturing facility. Here they shred the nets and break them down into their original pellet form. This is then melted and injected into a mould, creating the deck of the skateboard. The wheels are added and the product is ready to be sold.
So far the business has been a huge success. The focus on sustainability meant the company initially attracted a lot of interest, quickly raising $64,000 through Kickstarter and obtaining a grant from the Chilean government. The boards are proving popular with customers, too, with their appropriately designed 'minnow' boards selling all over the world, but especially in California – the centre of the skate-boarding universe.
Over the next few months, Bureo hopes to extend its program, encouraging more fishermen to donate their used nets so that they can produce more skateboards. Ben, David and Kevin know their efforts are just a drop in the ocean. It'll take a lot more than one small start-up to stop the flow of cheap and disposable plastic into our seas and oceans. But Bureo's early success shows that there is a demand for eco-friendly products that actually make a difference. And if this trend continues, it could help to turn the tide on marine pollution.

Unit 9 – Academic excellence

For centuries, universities were almost exclusively for the wealthy and the privileged. They taught classical subjects such as philosophy, theology, Latin and Greek, and prepared students for a lifetime of learning rather than a lifetime of work.

But in the 19th century, the Industrial Revolution created a demand for people with practical knowledge. Suddenly the world wanted scientists and engineers rather than philosophers or theologians.

To meet this need, a new kind of institution emerged, known as a technical college. Here students could further their education while acquiring skills and technical knowledge relevant to their chosen career.

ETH Zurich, established in 1855, was the first such institution in Switzerland. Today, it has around 18,500 students from over 110 different countries. It is a leading centre of science and technology and is regularly rated as one of the top universities in the world. For over 160 years, it has linked academia with industry, a tradition that began at the height of the Industrial Revolution. Professor Nicholas Spencer, President of the ETH Research Commission, explains why.

There was a growing feeling in the country that there was a need for teaching engineering … the rest of Europe was building railways, and there was a danger they were going to build them around Switzerland. And if Switzerland wanted to be part of this developing movement, then Switzerland needed railways, they needed engineers, they needed tunnels – and the problem was there weren't any engineers. And the universities at that time said they weren't prepared to teach engineering, mostly for cost reasons, and they said the responsibility was with the federal government to found an engineering school – and that's what we became.

However, the university quickly grew. Today, it is spread across a number of campuses and offers a wide range of subjects across sixteen departments.

We have the full range of engineering subjects: mechanical engineering, electrical engineering, etc. … and civil engineering, of course. And then we have all the natural sciences: chemistry, physics, biology. And then we have sciences that are somewhere in between, like the earth sciences or material science, my own area. And then we do also have some, uh, support areas in the humanities. So we have full professorships in, in, in areas such as, um, literature, but these are really intended to be rounding out the education of the engineers and scientists rather than offering a full programme in those areas, which is what is done by the more classical universities in Switzerland.

Over the last 160 years, ETH Zurich has grown from a small specialist college to one of the most prestigious universities of science and technology in the world. It has produced an astonishing

twenty-one Nobel Prize winners, including the 20th century's most famous scientist – Albert Einstein. How does Professor Spencer account for this extraordinary success?

Well, I think there are three main reasons. Uh, one is that it's had the support of the federal government from the beginning, and it's still very well supported by the federal government – uh, to a level that most countries don't support their universities. So that's a very good starting point, but that's not enough. There are examples of universities that are well supported that don't have that reputation. Um, the other is, from the very beginning, it's been, it's been international. Even in the middle of the 19th century, there were many professors who weren't Swiss, and we now have 60% of our professors who are not Swiss. Uh, and I think this makes a big difference in outlook because we're always trying to recruit the best in the world in any subject …

I think the third reason is that professors are really given a very high degree of autonomy, which means they're given a good situation in terms of doing research … they have good students at their disposal and they're given complete freedom to work on whatever projects they think are right.

ETH Zurich has always been on the cutting edge of both science and technology, and this emphasis on innovation is reflected in its teaching.

We're looking at a lot of different new trends in, in education and trying some of them out in our, in our teaching offerings right now, and one I particularly like is the inverted classroom where the students arrive prepared for the lecture … um, so they're not arriving ready to learn, they're arriving already having started the learning process – for example, by watching videos or, or looking at material in books or on the Web the night before and asking questions in an online forum before they get to the class. And then the first thing that's done in the class is to discuss the questions they have on the material they've already learned. So we're doing that right now in an experimental class over this summer, and, uh, we have high hopes that that's going to be a new mode of teaching various techniques in material science in a hands-on way.

Since it began, ETH Zurich has adapted to meet the challenges of the modern world. It has continued to develop and evolve in both its research and its teaching methods. This ability to change with the times has made it one of the leading science and technology universities in the world.

Unit 10 – A self-build community

Hello and welcome to the Yard, the centre-piece of a housing project just outside Bristol in the UK. But this isn't an ordinary property development. It's only two miles away from one of the UK's major cities, yet its beautiful location and strong community spirit make it feel more like a village than a suburb.

This is because it has been built and maintained by the people that live here. Thirty-two of these houses have been designed and developed by their owners. This row of terrace houses and this apartment block – home to six flats, the Wildgoose Space community centre and three offices – were planned by the Ashley Vale Action Group, the organization that runs the development. The neighbourhood has a private road, a play area and numerous community gardens.

But it wasn't always like this. Over twenty years ago this entire area was owned by a scaffolding company and consisted of little more than a couple of warehouses and a dilapidated office block. However, when the company tried to sell it to a property developer in the late 1990s a group of local residents decided to intervene.

They formed an action group and campaigned to buy the plot. They wanted to serve the local community rather than a wealthy property developer so they decided to focus on self-building – selling plots that people could build on. The idea quickly became popular and before long, the group had raised enough money to buy the site.

By the mid-noughties construction had begun. Although many of the people here didn't have a background in building, they quickly learned together – sharing skills, knowledge and resources. As well as construction tips, they pooled their knowledge on sustainability too. Many residents used natural materials like lime render and insulated their properties with recycled newspapers packed into the walls. All the windows were double-glazed to keep the heat in and some residents planted sedum grass on the roof. They also equipped each property with solar panels to generate both heat and electricity. By around 2009, the residents here had created one of the most distinctive residential areas in the country: a housing estate that each member of the community had helped to build.

This is at the heart of the philosophy here. In an age where properties are often seen as mere investments, this development offers people a personal connection to the home they live in. Because of this, people stay long-term and all the residents know each other. There's a strong sense of community here and residents share everything from sugar to lawnmowers to childcare. Today residents often get together to work on the site's common areas. They've even created a 'homezone' outside of the complex where green spaces help to control the traffic flow. But it isn't

all work. The Wildgoose Space often holds events for the local community, including film nights, workshops and pop-up restaurants.

Over the last fifteen years this area has transformed from a disused wasteland to a prize-winning development. But more importantly, it has become a community. The residents here have invested more than just money to create a place that feels like a real home.

This is increasingly rare in the modern world, but demand for places like this is soaring. A recent poll showed that one in seven British people want to build their own home, a 12% increase from the year before. Sadly, this won't be possible for everybody but the development here at Ashley Vale proves that it is possible to not just build a house, but to build a community, too.

Unit 11 – Chinese New Year

Chinese New Year is one of the world's biggest festivals, celebrated by around one sixth of the global population. The largest festivities take place in China's major cities, like Shanghai and Beijing. But there are parties wherever Chinese people live, so today Chinese New Year is a truly global phenomenon.

The start of this fifteen-day festival depends on the moon, but it's usually sometime between January 21st and February 19th.

Its origins lie in the fourteenth century BCE when the legendary Yellow Emperor, Huangdi, created the first Chinese calendar based on the movements of the moon.

Although China has used the western Gregorian calendar for over a century, it still celebrates the ancient lunar New Year.

Over the last three and a half thousand years, numerous traditions and customs have developed around the New Year. Many of these are still observed today and at the heart of these celebrations is the family.

In the lead-up to the festival, almost everybody tries to travel to the family home, no matter how far away they live.

Here several generations gather under one roof. They clean and decorate the house before they start preparing for the New Year's Eve meal.

Food plays an important role in Chinese culture and is central to the New Year celebrations. In traditional Chinese style, families gather to share different dishes and to chat about the year that has passed. The food is often symbolic, too.

These *jiaozi* dumplings, for example, are an important part of any New Year's meal. Their crescent shape, which is reminiscent of the gold ingots once used in ancient China, represents the wealth and prosperity of the family.

Steamed fish is also popular, because the sound of its Chinese character, *yu*, is a homophone of the Chinese word for 'abundance', so it represents good fortune in the year ahead. Whole roasted chickens or ducks stand for the unity of the family, noodles represent long life and special desserts symbolize the sweetness of reunion.

After the family meal, everybody stays up to observe *shousui,* which loosely translates as 'keeping watch over the year'. They talk and have fun, play games like Mahjong, an old and very popular Chinese game, or just watch television. Most people watch China Central Television's New Year's Gala, which runs from 8 p.m. to midnight, and is the most watched show on the planet, with an estimated 800 million viewers. Then, just as the clock strikes twelve, everyone rushes out to watch the fireworks.

Fireworks are an important part of Chinese culture. Gunpowder is said to have been invented here around 2,000 years ago, and today the country makes around 90% of the world's fireworks. Huge displays are now central to the New Year's celebrations, and almost everybody participates. Traditionally they were lit in order to scare away a mythical beast that terrified rural communities. But today most people come for the incredible spectacle, as millions take to the streets and fireworks light up the night sky.

The following day – New Year's Day – is a time for reflection. Many families go to the local temple where they observe a variety of ancient customs. They burn incense in memory of their ancestors, pray for good luck in the year ahead and ring a small bell to ward off the evil spirits of the year gone by. Gift giving is also an important part of Chinese New Year, and again, luck is a central theme. People use red envelopes to exchange money with loved ones – especially children – and to give offerings to the temple. These gifts are called 'lucky money' because, according to ancient Chinese tradition, red is the colour of good fortune.

At over 3,500 years old, it is hardly surprising that Chinese New Year has changed a lot since it was first created. But wherever they are in the world, many Chinese people still observe the same ancient rituals, customs and traditions. People still wish for good luck and try to banish evil spirits. They stay up late to keep watch over the year, they light fireworks and give each other 'lucky' gifts. But most importantly of all, they still reunite with their families to remember the past and look forward to the future.

Unit 12 – How to train your memory

Michael Tipper is a consultant, teacher and public speaker. He specializes in memory and promotes techniques to improve it.

Can you tell us a little bit about yourself and what exactly you do?

Sure. Well, my interests at the moment … it's probably better if I describe who I am really. And I'm someone who has a balance of creativity and process. And that's come through my background as an engineer: I was in the military and the Royal Navy for sixteen years in the submarine service, doing systems and processes and managing teams. And then I developed an interest in learning how to think more effectively, which made me more creative. So, the blend of those two skills are the things that I use in the work that I do now. And that's ranged from teaching kids how to learn; um, helping people become better at their leadership; um, consulting; um, writing books and helping people use their minds more effectively.

Is it quite a common mistake among people to think that they've got a bad memory when it's actually something else?

Many people come to me and say, 'I've got a poor memory', and invariably what it is … it's very rare that there's a memory problem. Now, there are, there are problems with the brain and illnesses that can cause, um, shortfalls in the memory. But most challenges that people have are often circumstantial and the memory is blamed. To give you an example: a common problem is someone will come home and the keys go on the table, wherever they put their keys, and the following day they get up and they're going to work and they can't find their keys. 'Where are the keys? I can't find my keys? Um, I've forgotten where I put my keys. My memory must be going'. And they blame their memory. When in reality what's happened is that when they've come home from work they've been thinking about something else, they've put the keys down without consciously thinking about it. And so when they come to consciously think about where the keys are, they were never involved in that process in the first place. And so it's a concentration thing.

What sort of techniques do you use to help people to train their memory and develop better memory skills?

The techniques for remembering things vary depending on what you're actually remembering … want to remember. So, broadly speaking what you're looking to do is take something … and the principles of memory are: first of all you use your imagination; and then you use your imagination to create an image that is memorable; then you use association to link it to something that you already know. That broadly speaking is how memory works. So, if we take something as simple as a shopping list, for example: you can create a filing system in your mind. So, for example, there is one where we call it the number rhyme system. So, one, two, three, four to ten, we take a word

that rhymes with one: one sun; two shoe; three tree, so that your filing system for the third item would be an image of a tree. If on a shopping list item number three was some smoked salmon, for example, you might see your picture of the tree covered in smoked salmon. It's a bizarre image. It's unusual, particularly if it's big pieces of smoked salmon. So, those are the principles that you apply: the imagination and the association. And you make it outstanding, so you make this really weird image that's likely to, um, uh, be easier to recall. So, having created that image when you're in the shops and you go through: OK, I've got item number one – which was linked to your image of the sun; item number two – which was linked to the image of the shoe; oh, what was item number three? OK, oh it's a tree – smoked salmon. Get my smoked salmon. So, that in principle is how most of the techniques works. And there are a variety of ways to create that filing system. So, number rhyme I've just said. Number shape: so numbers, so two could look like a swan, um, four could look like the sails of a yacht; five could be a big hook; six could be the trunk of an elephant, for example. Then beyond that you get into more sophisticated systems that start playing around with um, uh, the, the number systems. You then start looking at things called, um, I mean, some of these techniques are very old. The Greek loci system or the Roman room system, they're the same system. So, the room that we're in, for example, now could be a filing system: so we have the, the sofa; we have the chair; we have the fireplace; we have the window; we have the door – those are fixed items. So, I could link something unusual to the chair; something unusual to the door. So, when I'm coming to recall I would go, 'What was on the door? Oh, oh yeah, there's that weird image that I created'. So, that's fundamentally how it works. Now, there are other variety of techniques as well. Mind mapping is a very powerful memory tool as well. So, if I gave you some information that was across several pages of text and then gave you the mind map, or, or said to you, 'Mind map that', the process of you doing that because you're analysing, because you're synthesizing, because you're summarizing, because you're organizing, will create a memory trace that is more than if you just copied. So, that will stick in your short-term memory, uh, much better than if you had just read it. Things like names and faces: the problem with … that most people have with names and faces is that they never get the name in the first place because of the introduction. So, the shaking of the hands; they're too busy saying their own name they never hear the other person's name, so they never remember it – but they blame their memory. So, just giving someone the process of how to introduce themselves and what to do, uh, is an example of another technique. And there are things like mnemonics as well. So, um, how do you remember the colours of a rainbow? Richard Of York Gave Battle In Vain is an example of that. And there's a variety … there are numerous examples of that.