# How to make your own
Design Play Cards

1. Download this PDF (you're already 25% done!)

2. Print this PDF out at home, or take it down to your local print shop to tell them you'd like it printed on some reasonably sturdy cardstock (they'll know what that means - remember to request recycled paper too!)

3. Cut the sheets carefully along the dotted lines, separating the cards. You can use a scalpel and metal ruler, a guillotine or plain old scissors - as long as you are careful!

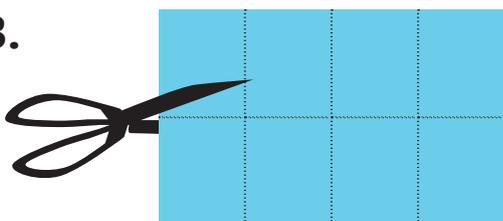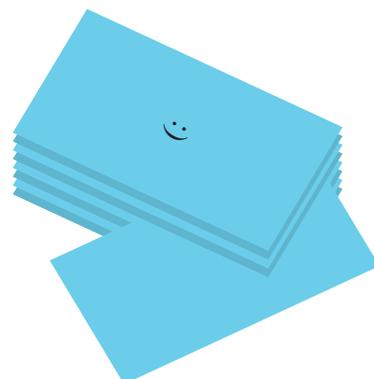4. Stack, store and enjoy your DIY **Design Play Cards**!

1.
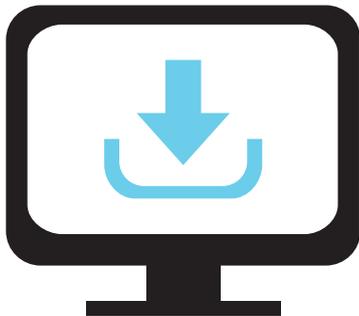
2.

3.

4.

Ways to play with your
Design Play Cards

Design Problem Solving
`(2—6 players)`
Give each group a design **problem** card and 1, 2 or 3 design **strategy** / solution cards. Give the groups 20 minutes to solve the **problem** using the **strategy** cards. The groups report back to the rest of the group and the best design is selected as a winner. This can also be played in rounds or heats with shorter designing times.

Design Competition
`(Groups of 2+ players)`
One **design problem card** is selected and the appropriate **design inspiration** and **strategy card** that accompanies it. The challenge is set to solve the problem in a set time (depending on how resolved the design outcome needs to be this will vary from half an hour to a full day). The group with the best resolved design solution wins.

Solutions Challenge
`(2—10 players)`
Divide the cards out evenly among the group. One person starts and plays any card into the centre. The person to their left has to then try and play a complimentary card (e.g a **problem card**: 'e-waste' gets solved by the **strategy card**: 'disassembly' or 'recyclability' or the **inspiration card**: "WEEE"). If no-one contests the card played then they get to collect the cards as one set – winning one point. If a card isn't successful then the next person to the left can try a play or pass - continuing until someone wins the point. Play resumes with a new card and continues clockwise until all the cards are gone or no more cards can be played. Highest points determine the winner.

Memory Match
`(2 — 8 players)`
Place all of the cards on a table, play side down. Take turns to turn over 2 cards and try and match the **problems** with appropriate solutions or match **strategies** with **inspiration** cards that relate to them. Whether or not the cards match is decided by the group. Play continues until all the cards have been matched up. The winner is whomever matches the most cards.

Design Inspiration: Changing Trends

Colours and design trends come in and out of fashion and so designers can create products that can change as the trends do. For example lounge chairs with different coloured fabric's that can be removed and changed or carpet tiles that can be easily replaced in sections rather than the entire room.

Design Inspiration: Co-Design

Co-design or collaborative design is when designers work directly with a community of stakeholders to collaboratively design a solution. Examples include designing new health services or products for people with disabilities whilst working with the people who will benefit directly from the design outcome.

Design Inspiration: Electronic Waste

E-waste or Waste Electronic and Electrical Equipment (WEEE) policies have been set up in countries around the world to encourage recycling and remanufacturing. Companies who make electronics have to take them back and recycle them when the customer is finished with it. This means the companies must design their goods for disassembly and ease of recycling.

## Design Inspiration: Multifunctional
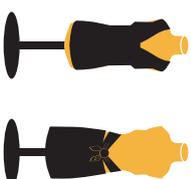
Finding ways of making special occasion garments (like a wedding dress) turn into a different item of clothing is a way that designers can increase the number of functions that a garment has. A dress that can then be turned into a skirt or even can be worn in several different ways increases its use.

Design Inspiration: Changing Behaviour

To help save wasted energy from over-filling electric kettles, a new design encourages the user to only boil exactly what they need by having two different filling chambers. One that holds the water in reserve and the other that actually boils it. A button has to be held down to fill the boiling chamber from the reserved water this saves energy as only what is needed is actually boiled.

## Design Inspiration: Closing the Loop
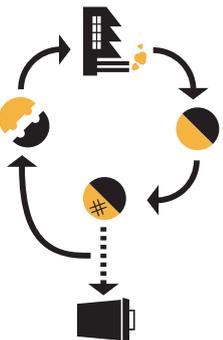
Some products are designed to be 100% recycled so that all of the embodied materials can be recaptured and reused. This is closed loop or cradle to cradle design and helps keep materials in use and out of landfills.

Design Inspiration: Easy Disassembly
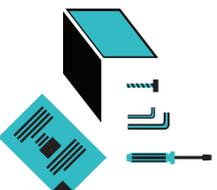
Laptop computers can be easily designed to be disassembled into different parts and components as to increase the likelihood of repair and recycling. Including disassembly instructions, having universal screws and making sure each material is clearly labelled makes it much easier for disassembly and recycling.
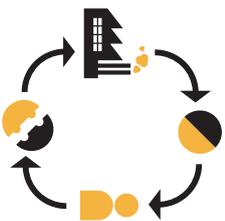
Design Inspiration: Light-weighting
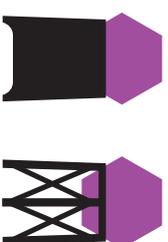
Products designed with a reduced number of materials and parts are cheaper to create, and easier to recycle. Products such as disposable water bottles with externally thin plastic means less raw materials need to be used in production. Manufactured wood products with honeycomb shaped walls drastically reduce the weight but keep the material strength.
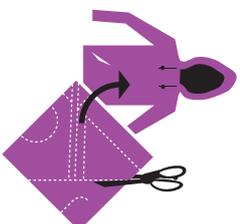
Design Inspiration: No Toxic Materials

The European Union introduced a policy called the Restriction of Hazardous Substances (RoHS) which bans the use of several known toxic substances such as lead-based solder from the design of electronic items. The RoHS policy requires manufacturers to reduce the amount of these toxic materials used in manufacturing and ending up in landfills at the end of life.

Design Inspiration: New Eco Materials

There are new materials made from waste products, material fibres, food crops and some that have been designed to be lighter in weight with 'honeycomb' internal structures. When exploring new material options make sure it suits the products needs and requirements – there is no point picking an 'eco' material if it reduces the life of the product!

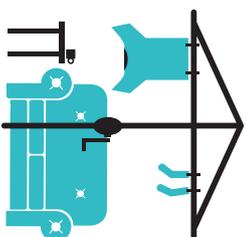## Design Inspiration: Product Service Systems

Manufacturers of large photocopy machines design their products to be taken back, disassembled and re-manufactured. The customer leases the photocopier so, when it is no longer needed, the owner can return it for recycling and remanufacturing by the company. This reduces the need for raw materials and results in a much higher level of recycling.

Design Inspiration: Packaging Re-used

Packaging is often thrown out right after the product is purchased, but multifunctional boxes and packaging can be designed so that it becomes part of the product or made into something else. A jam jar can turn into a water glass, a shoe box can be the carry bag or a laptop box could be the computer stand.

Design Inspiration: Zero Waste

Fashion designers are creating zero waste patterns for their garments. The patterns are designed so that each cut is the edge of two different pattern parts which means you have no waste in-between the fabric parts. This is a more efficient use of materials and saves costs as well. Try and create a garment pattern that uses zero waste design.

Design Inspiration: Public Interest Design

Public interest design seeks to address and solve social issues ranging from low cost reading glasses to water transporting devices in emerging economies. It's about design that is focused on benefiting people rather than profit focused.
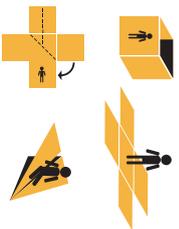
Design Problem: Clothes Drying

Drying clothes in an electric clothes dryer wastes lots of energy compared to a washing line but it's hard to dry items in small apartments. How can you design a clothes drying system that allows for air drying in small spaces conveniently?

Design Problem: Burnt Toast

Toasters often burn toast, which means a lot of toast gets thrown out. How can you design a toaster that prevents toast from burning and therefore reduces food waste?

Many food items such as chips and chocolate bars are packaged in single-use thin plastic packaging which is non-recyclable and often blown from bins into the environment. How can you design a food packaging solution that addresses these problems?

Bananas easily bruise when transported and are often thrown away uneaten. One solution is to package them. How can you design an environmentally responsible banana packaging solution?
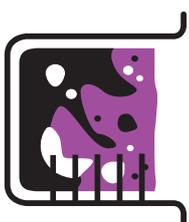
50 million tonnes of electronic waste (e-waste) is generated each year. Select an electronic item and re-design it so it can be recycled or remanufactured at end of life.

Billions of single-use disposable water bottles are thrown away every year. How can you design a product and/or service that reduces the use of disposable water bottles?
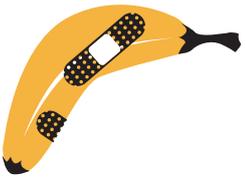
More than one third of all food produced worldwide is wasted – most of it fresh produce, and often because it goes rotten in the fridge. How could you design a fridge that encourages people to change their behaviour and reduces food waste?

People often fill their kettles with more water than needed. Over-filling means energy is wasted when boiling the excess water. How can a kettle be designed to reduce excess water boiling?
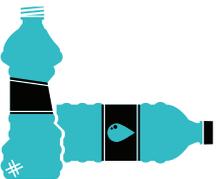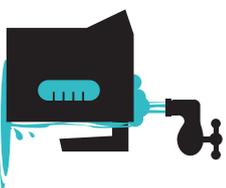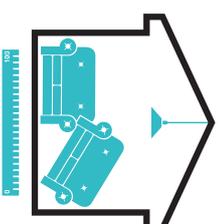
Some plastic toys include up to 20 different types of plastics, making them hard to recycle. How can you design a complex toy using a limited number of recyclable plastics so that it is easy to disassemble for recycling?

Furniture items are often thrown away when people move house, particularly if those items don't fit into the new house. How can you design modular furniture that caters for different spaces and situations?
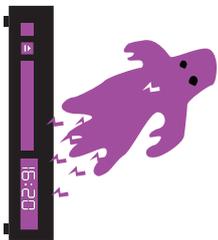
The average home has over 60 electronic goods, many of which sit idle. How can you design a solution or system that encourages sharing and reduces the number of electronic items owned per household?
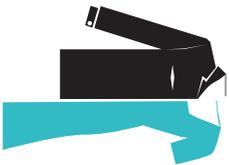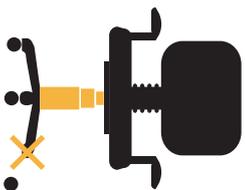
Dresses and suits for special occasions are often worn once and then stored away. How can a wearable item be designed to increase its use and functionality and therefore be used more?

Laptop computers are often replaced when a single part (such as the battery) wears out or breaks. What type of design changes could be made to improve repair and re-use in laptops?

The average mobile phone is only used for 15 months before being replaced. How can you design a phone that lasts much longer and promotes longer use to the owner?
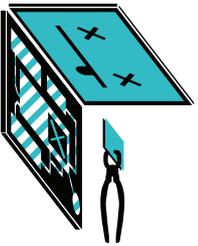
2013–2014

Some electrical items such as DVD players and microwaves waste energy when not in use. How can you reduce the wasted stand-by or 'Phantom' power in these products?

16:20

Only 20% of clothing is recycled, while the rest goes to landfill. How can you design garments or a fashion business that reduces clothes ending up in landfill?

Broken office chairs are hard to repair and, as a result, are often thrown out. How can you design an office chair to repair, refurbish and recycle?
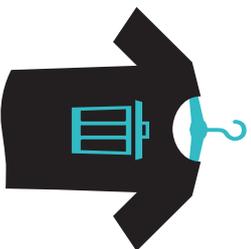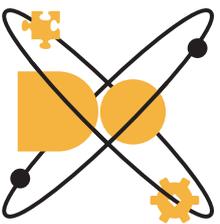
Televisions are very rarely recycled once they are no longer needed. How can you design a television to make sure that it will be recycled at end of life?

Millions of people live without access to clean drinking water and have to travel long distances to collect water. How can you design a water purifying or water carrying device that will improve access to clean drinking water?

Everything that is created has to exist in a world full of systems: human, product and eco systems. Therefore an important part of reducing the social and environmental impacts of a product is through identifying the way in which it will affect these systems. For example, a new household item has to be user friendly, but should also consider if it can be recycled within the system as well.

Design Strategy:
Systems Thinking

Design Strategy:
User Centred Design

Making the end user the focus for your design improves a product's functionality and effectiveness, and assists you in creating things that people will keep and care for in the long term. This is also a critical aspect of creating products and services for communities that are different to your own. Think of a person with different needs to you and try to design a product that assists their life.
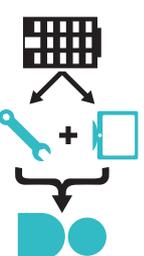
Reducing the overall size, weight and number of materials incorporated into a design is a simple way of keeping down the environmental impact. As a general rule, more materials result in greater impacts so it's important to use fewer types of materials and reduce the overall weight of the ones that you do use.

Design Strategy:
Dematerialisation

Design Strategy:
Product Stewardship

Product stewardship is about taking responsibility for a product across its entire life - from materials and manufacturing processes, to packaging, use and end of life. Companies design their products and develop 'take-back' systems so that their products can be returned at the end of life to be recycled and remanufactured. Around the world there are policies that require companies to take full responsibility of their products.

Making a recyclable product goes beyond simply selecting a material. One must consider the recyclability of all the materials, and ensure those can be disassembled easily for recycling at end of life. Another important consideration is whether there are systems in place whereby the producer will take back the product and recycle its materials at end of life.

Design Strategy:
Recyclability

Design Strategy:
Multifunctional

Making things multifunctional increases the use and value for the owner. How can your product be designed to serve different functions or tasks so that it can be transformed into something else? For example, packaging that is reusable as a different product. If a product has multiple functions, fewer products are needed. Consider how you can incorporate complimentary functions into your design.

An alternative to purchasable products is leasable products that exist as part of a company owned system or service. Leasing a product out - rather than selling it directly - allows the company to manage the product across its entire life cycle, while also reducing waste. Think about how your product could be part of a system and service.

Design Strategy:
Product Service Systems

Design Strategy: Low Impact Materials
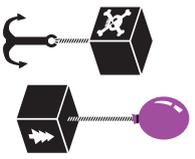
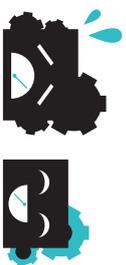Some materials are toxic or more environmentally damaging than others. But every material created has a Material Safety Datasheet (MSDS) online so that you can find out what it's made of. There are materials listed on the Restriction of Hazardous Substances (RoHS) list and ones that are known to be toxic when manufactured, used or discarded – so avoid these types of materials.

Design Strategy: Modularity

Products that can be moved and configured in different ways adapt to different spaces and uses, increasing their ability to function well. This is particularly the case with furniture so that they can be used in many different spaces and different configurations. How can your designs include modularity and transportability?

Design Strategy: Life Cycle Thinking

Looking at all the life cycle stages that your product goes through will assist in identifying the areas where environmental impacts occur and reduce these through design. Map the life cycle through materials extraction and manufacturing, packaging, transportation, use and end of life. At each of these stages your product will require resources and create waste – identify these in your map and then find ways of reducing them through your design.

Design Strategy: Longevity

Longevity is about creating products that are aesthetically timeless, durable and will retain their value over time so people can resell them or pass them on. Products that last longer aren't replaced as frequently, and can be repaired or upgraded during their life. What design changes can you make to your product to increase its useful life?

Design Strategy: Efficiency

Designing an electronic product that requires much less energy use in its life than a standard alternative involves reducing 'standby' or phantom power by designing features that encourage unplugging, sleep modes and automatic switch offs. Products that remain on, like refrigerators can be made efficient through technology changes and through design features such as the size and sealing methods.

Design Strategy: Functionality

Breaking down a product into core and secondary functions, and creating new and different ways to deliver these functions can help generate innovative and diverse outcomes. List the primary and secondary functions of your product; what is it achieving and what alternatives are there? For example a kettle is needed to boil water and a bookshelf to hold up books. How can you do this differently?

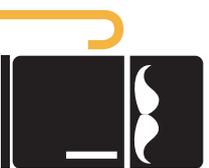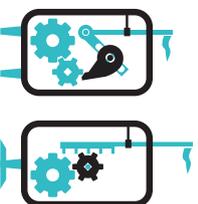# Design Strategy: Disassembly

Design for Disassembly requires a product to be designed so that it can be easily taken apart for recycling at the end of its life. How it is put together, the types of materials that are used and the connection methods all need to be designed to increase the speed and ease of taking it apart for recycling.

Design Strategy: Durability

The more durable a product is, the more likely it is to be re-used, repaired, resold or recycled. It follows that the longer a product lasts the less likely it is to be replaced, meaning that over time less materials are used. Think about the material types and combinations, as well as potential weak points which will eventually require repair.

DESIGN PLAY CARDS

designing for sustainability

The **Design Play Cards** have been created by Eco Innovators and includes a deck of **50** playing cards designed to **challenge**, **inspire**, and **inform** designers about sustainability opportunities in product development. There are a number of ways the cards can be used in group play and design challenges. We have provided a few options that we think really work, but try and find other ways to play!

The **Design Play Cards** are a FUN way to discover eco design!

Every part of this product is printed on 100% recycled paper

WAYS TO PLAY

Solutions Challenge
(2–10 players)
Divide the cards out evenly among the group. One person starts and plays any card into the centre. The person to their left has to then try and play a complimentary card (e.g a **problem card**: 'e-waste' gets solved by the **strategy card**: 'disassembly' or 'recyclability' or the **inspiration card**: "WEEE"). If no-one contests the card played then they get to collect the cards as one set – winning one point. If a card isn't successful then the next person to the left can try a play or pass - continuing until someone wins the point. Play resumes with a new card and continues clockwise until all the cards are gone or no more cards can be played. Highest points determine the winner.

Memory Match
(2 – 8 players)
Place all of the cards on a table, play side down. Take turns to turn over 2 cards and try and match the **problems** with appropriate solutions or match **strategies** with **inspiration** cards that relate to them. Whether or not the cards match is decided by the group. Play continues until all the cards have been matched up. The winner is whomever matches the most cards.

Design Problem Solving
(2–6 players)
Give each group a design **problem** card and 1, 2 or 3 design **strategy** / solution cards. Give the groups 20 minutes to solve the **problem** using the **strategy** cards. The groups report back to the rest of the group and the best design is selected as a winner. This can also be played in rounds or heats with shorter designing times.

Design Competition
(Groups of 2+ players)
One **design problem card** is selected and the appropriate **design inspiration** and **strategy card** that accompanies it. The challenge is set to solve the problem in a set time (depending on how resolved the design outcome needs to be this will vary from half an hour to a full day). The group with the best resolved design solution wins.