Annex XVII One set of cards and two games: “BE-Match” and “SDG-Link”

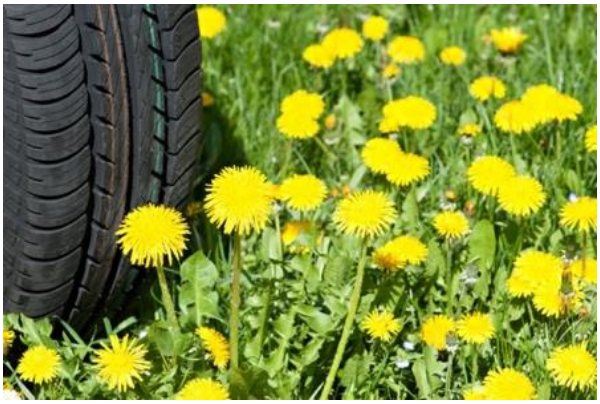
Two games were developed using the same cards to inspire participants about innovative products, already in the market, made of biological resources:

- **“BE-Match” Game**
- **“SDG-Link” Game**

These workshops or classroom activities were created to introduce various bioproducts, which can substitute traditional products in our daily life, and to inspire the limitless possibilities enabled by the bioeconomy industry. The activities also encourage discussion on the links of bioproducts to the UN Sustainable Development Goals (SDGs). Participants could play the “BE-Match” Game first, followed by the “SDG-Link” Game, either in the same day or in different days. Both games take about 15 minutes to 30 minutes and no prior knowledge on bioeconomy is required to play them.

In both games, cards have pictures and corresponding detailed text. The pictures show either biological raw materials used or final product or both. While the detailed text provides more information such as their benefits and properties.

The detailed text can also be a continuation of the text above the images – for example:

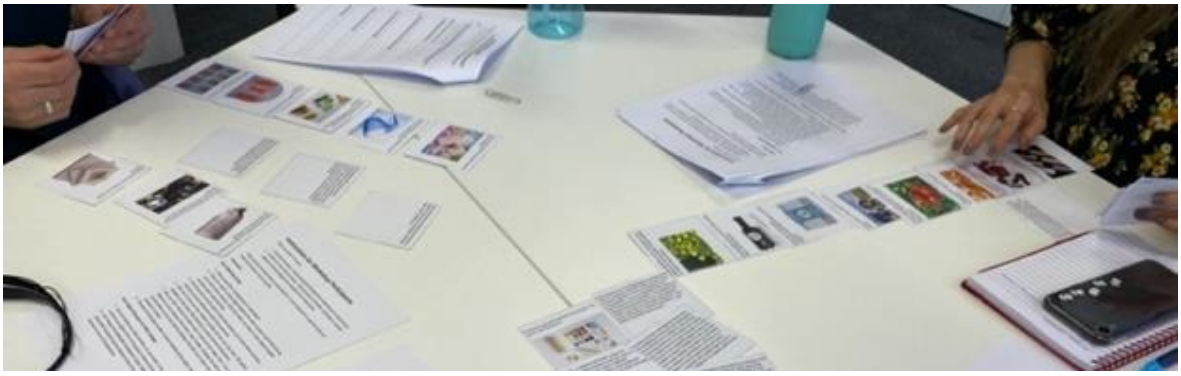
Russian dandelions can be considered a cost-effective and environmentally friendly substitute for natural rubber because 	the conventional subtropical rubber tree plantations in South East Asia which supplies 95% of global demand are under increased threat of devastating fungus, resulting in price volatility of rubber. Since Russian dandelions can grow in abundance in Central Europe, and even on soil not suitable for crop farming, it cuts down the reliance on natural rubber. Hence reducing the transport distance of raw materials and the corresponding carbon dioxide emissions.

Bend here for SDG-Link: Cut here too for BE-Match

In the case of the “BE-Match” Game, images and text should be cut separately to create 76 individual cards**.** While for the “SDG-Link Game”, 35 individual cards need to be cut (image and text need to be together and the last three fake products should not be used).

The aim of the BE-Match” Game is to match the image with the text. There are also three sets of cards with fake bioproducts - **Polystyrene, Synthetic fibres and Lipsticks** - which students need to identify. Ideally, there should be a workshop facilitator to help determine if the pairings done by participants are correct and confirm which are the fake bioproducts. If there is only a small number of participants, individuals can compete against each other. If there is a larger number of participants, then groups of 2 to 4 people can compete against other teams. Each game can be followed by more advanced discussion using the “Information for further study on the 35 resources and/or bioproducts”.

Instructions for the “BE-Match” Game



You have:

- **38 cards with pictures** – these describe or show the biological raw materials and/or bioproducts.
- **38 cards with the corresponding text** – these discuss the benefits, properties or special attributes of those biological raw materials and/or bioproducts shown in the cards with the pictures.
- **38 paper clips** to attach the cards with the pictures with the cards with the text.

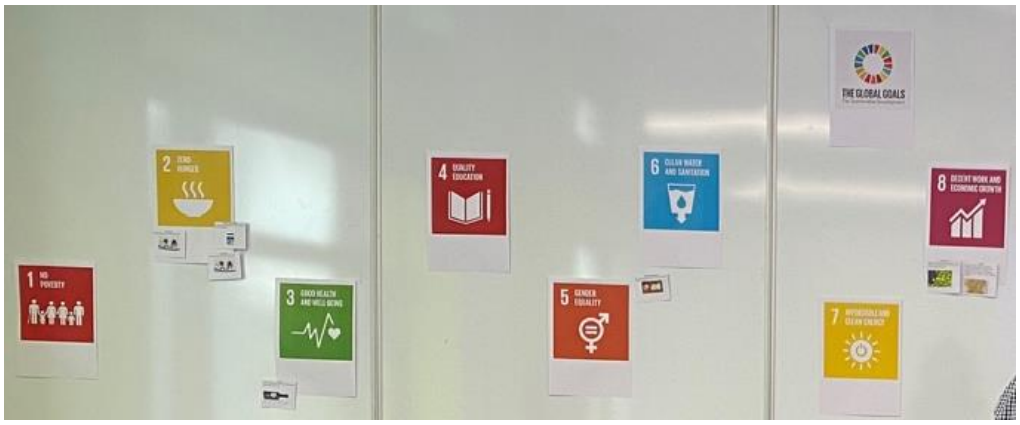
Aim of the game is to pair the two types of cards correctly, in the shortest time.

Instructions:

1. Three people or three teams should compete to get the highest number of points. If working in teams, start by grouping yourself into three small teams.
2. Each person/team should get 11 pairs of cards of real bioproducts.
3. Each person/team should get 1 pair of fake bioproducts.
4. Make sure to shuffle the 12 pairs of cards before you start.
5. Two extra pairs of cards should be placed in the middle of the table.
6. Each person/team should start matching the 12 pairs of cards **at the same time**.
7. After finishing pairing the initial 12 sets of cards, each person/team can attempt to do the matching of the extra two sets of cards in the middle of the table for extra points. (Grabbing the extra cards in advance before you are done with the matching of the first 12 set of cards will result in a deduction of 2 points).
8. Each correct pair will earn one point.
9. But remember there are **fake bioproducts.** These must be identified. If you identify them correctly, you get two points. If you do not identify them correctly, you loose two points.
10. The quickest person/team earns a bonus of two points.
11. The person/team with the higher number of points overall wins.

Instructions can be given to participants or can be explained verbally by workshop leader. However, note that each set of 12 pairs of cards for each person/team should ideally be prepared in advance by the workshop leader, to make sure each set (12 pairs of cards, including 1 fake bioproduct) includes the correct pairs of cards.

Instructions for the “SDG-Link” Game



You have:

- **35 cards with pictures** and **extra text in the back.** The front with the image describes the biological raw materials and/or bioproducts and the reverse of the card discusses the benefits, properties or special attributes of those biological raw materials and/or bioproducts.
- **Large print outs of all 17 SDGs** (with respective targets written the back)
- **Blu Tack or tape**

The aim of the game is to link each card to a key SDG.

Instructions:

1. Place print outs of all 17 SDGs on a wall, on the floor or in separate tables.

2. Five people or five teams should each get seven cards of the real bioproducts.

3. Discuss in your groups which bio-product might contribute to each SDG. Note that each bioproduct may contribute to more than one SDG and each SDG may have a valid link to more than one bioproduct.

4. Place your bioproduct next to the key SDG that your product contributes but, for the game, **there is a maximum space of two bioproducts for each SDG**, and therefore one bioproduct will be “homeless” and one team has at least one card left in the hand.

5. Now the reasoning behind placing the bioproduct with each SDG needs to be explained by each team. If participants agree that the link is not valid, then that team needs to removed card.

6. The team with least amount of cards in the hand wins the game.

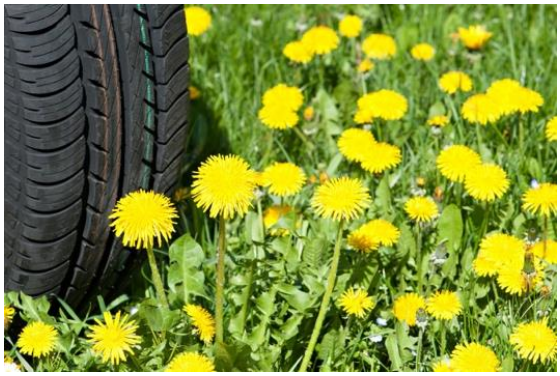
Instructions can be given to participants or can be explained verbally by workshop leader.

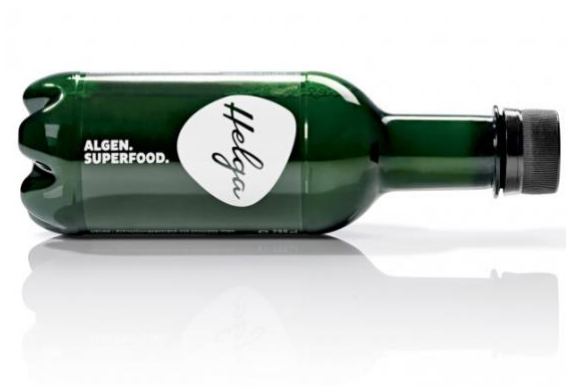
Playing Cards - print and cut along dotted lines to create either:

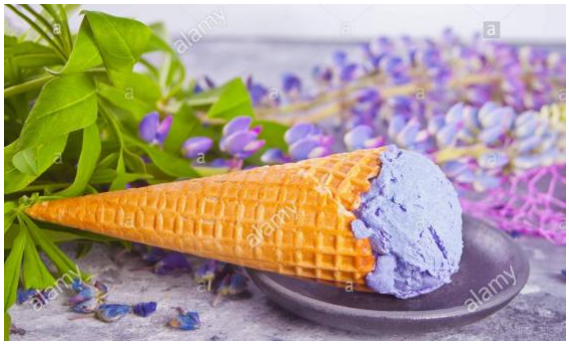
BE-Match - 76 individual cards – images and text should be cut separately

SDG-Link – 35 individual cards (image and text needed together; do not include last 3 fake products)

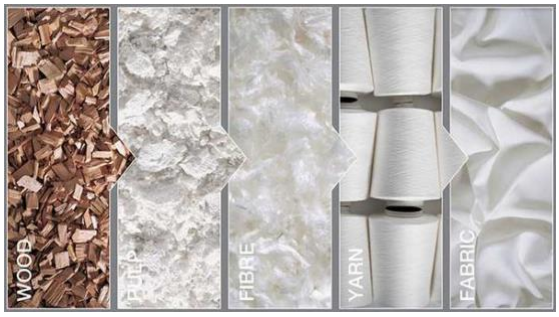
Bend here for SDG-Link; Cut here too for BE-Match

Curran, a material extracted using root vegetable waste streams such as carrot or sugar beets, can be used in different applications such as paper and cardboard packaging, paints, coatings, or even cosmetics because 	its strong and light nanocellulose fibres make the packaging stronger and more lightweight. It also enhances the consistency, anti-cracking and drying behaviour of the paints and coating and makes them last longer and easier to clean. The use of root vegetable wastes prevents the problem of direct competition for farm land with food crops. Less water and chemicals are needed to manufacture it, and there is no release of harmful gases during production. These properties and benefits make it a greener substitute for non-organic performance additives
Russian dandelions can be considered a cost-effective and environmentally friendly substitute for natural rubber because 	the conventional subtropical rubber tree plantations in South East Asia which supplies 95% of global demand are under increased threat of devastating fungus, resulting in price volatility of rubber. Since Russian dandelions can grow in abundance in Central Europe, even on soil not suitable for crop farming, it cuts down the reliance on natural rubber. Hence reducing the transport distance of raw materials and the corresponding carbon dioxide emissions.

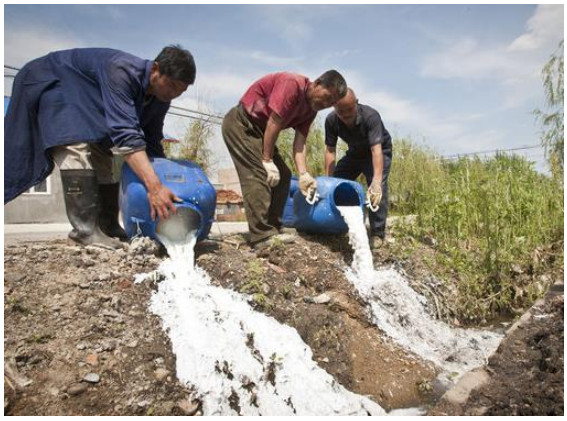
Insects, such as buffalo worms, can be used as a healthy and sustainable alternative to traditional beef patties because 	they have high protein content and unsaturated fats and they also consume significantly lower resources. They consume 10 times less feed than cows, and growing them produces 100 times less greenhouse gas emission than beef production.
	Chlorella algae can be used to produce healthy vegan soft drink because it contains vitamins such as B12, minerals and vegetable protein. One of the notable things about this chlorella algae is that it can grow 10 times faster than ordinary plants on land.
Cocoa shell wastes can be used to make sustainable and eco-friendly alternatives for ice cream spoons because 	it uses renewable resources by valorising the wastes and can replace conventional single-use plastic spoons which are thrown away after single use. Its fibres ensure the stability of the spoon and give a pleasant chocolate taste.

Blue sweet lupines can be used to make ice cream suitable for people with lactose intolerance because 	they make a dairy-free product, which does not contain lactose or gluten. Their protein-rich seeds are peeled and processed into paper-think flakes which are then de-oiled and undesired odour are removed to make this ice cream.
Bread waste, instead of being thrown into the bins, can be given a second life as 	beer, by replacing one-third of the malt required for brewing. Each bottle of beer contains an equivalent of one slice of this waste diverted from landfill where they are normally left to rot and emit methane. This also help free up part of the land used to grow barley, save energy and water, and avoid CO_2 from one-third of barley never grown.
Bacteria can be used to grow environmentally friendly bricks because 	they eliminate the firing process, hence eliminating CO_2 emissions. The bacteria Sporosarcina *pasteurii* is used to grow a durable cement. Sand is packed into rectangular moulds and bacteria are added, which wrap themselves around the grains of sand. Calcium carbonate crystals begin to form around the grains while an irrigation system feeds nutrient-rich water. The crystals grow larger and after 3-5 days these products are ready for use. Process was inspired by corals, which gro all kind of formations and can withstand water and erosion.

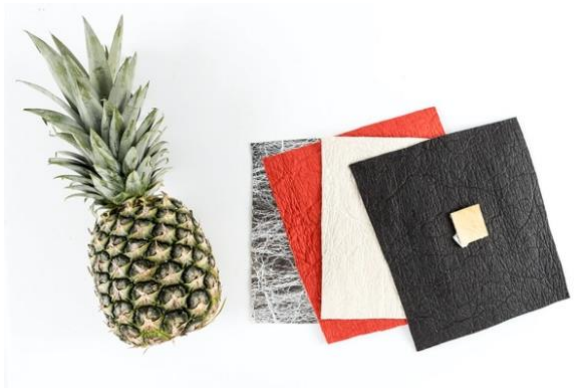
Enzymes have been used in cleaning products such as detergents because 	the biocatalysts accelerate biological processes and are active even at low temperatures. Some classes of enzymes remove dirt particles, while others work by preventing the fabrics from pilling. Less detergent and energy are required with the use of enzymes.
The advantages of using plant-derived Isosorbide, chemically produced from sugar, to make smartphone display are 	high transparency, excellent durability and higher resistance to impact, heat and weather than conventional plastics. This new bioplastic can be used in a variety of industrial applications such as automobile sunroofs, headlights, transparent highway noise barriers, and exteriors of electronics.
Orange and citrus waste can be given a second life as 	sustainable fabrics to make scarfs and shirts. Up to 700,000 tonnes of waste materials are produced from citrus production in Italy alone annually. These wastes could be valorised by extracting cellulose from the fibres, enriched with citrus fruit essential oil by using nanotechnology techniques.



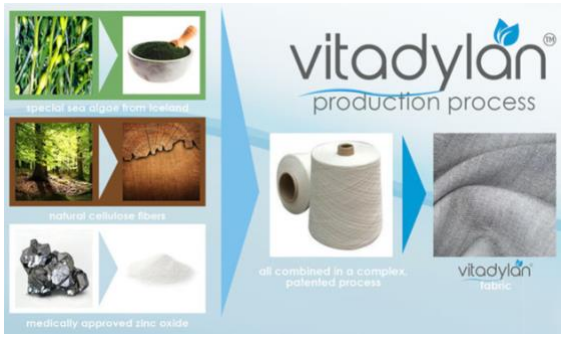
Textile fibres can be extracted from wood and they are called Tencel or lyocell fibres. Some of the benefits of using these fibres to make clothes are the use of renewable raw materials from sustainable forestry and plantations, the water absorption capacity of 50% higher than that of cotton, no harmful chemicals used during fibre manufacturing, its recyclability and biodegradability.

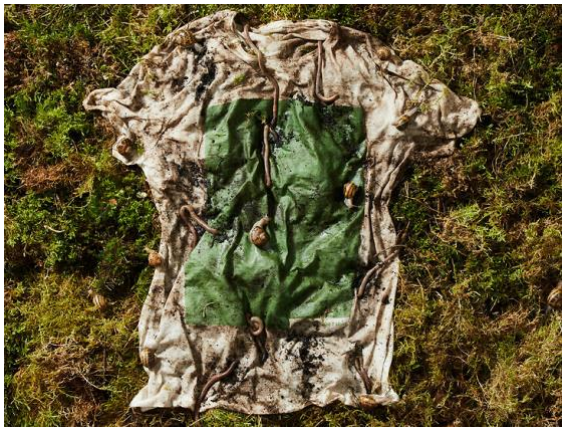


Casein protein in milk waste can be used to produce textile fibres to make clothing such as dresses or underwear, which are silky to the touch, naturally antibacterial and can be easily dyed. This milk waste to fibres process requires significantly fewer resources, and organic fibres have been produced in accordance with the Global Organic Textile standard.



Some of the advantages of using pineapple leaves waste as raw materials to make shoes are the valorisation of waste and leftovers from pineapple production process and the waterproof, anti-allergic, warm and breathable fibres.

	The use of algae biomass to make products such as bathing shoes can help solve the problem of a threat to sea ecosystems as the abundance of algae removes oxygen and blocks the sunlight to pass through for aquatic animals.
Olive leaves can be natural and environmentally friendly alternative tanning agents because 	they make the leather extremely skin-friendly. This process valorises these traditionally burned green leaves waste during harvest time in the Mediterranean. It also eliminates the use of toxic acids and heavy metal salts such as Chromium(III) sulphate during the procedures.
Natural fibres produced using the mixture of Icelandic seaweed, beechwood and medical zinc are more environmentally friendly than cotton products because 	its production uses 97% less water and emits 90% less CO_2 compared to cotton productions. These seaweed, only harvested every two years in crystal-clear waters of Iceland, is dried and finely ground with a special jet mil. The fine powder is then mixed with zinc powder and cellulose from beech, and weaved into the fibres using a patented procedure to retain all vitamins and minerals of high-quality Icelandic seaweed in the final fabric.



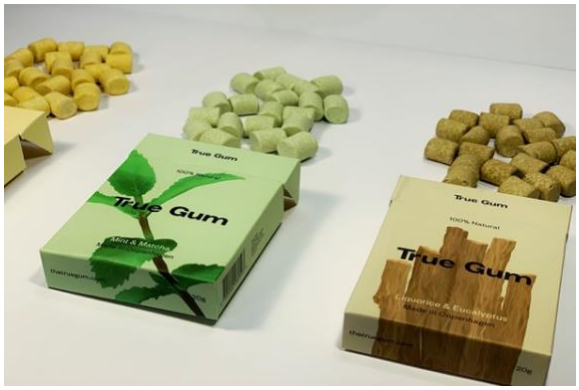
The t-shirt made from pulped eucalyptus, beech and algae can biodegrade in just 12 weeks and turn into food for all animals living in the soil. Hence, these old t-shirts can be disposed of just by either burying in the garden or putting out together with the compost.

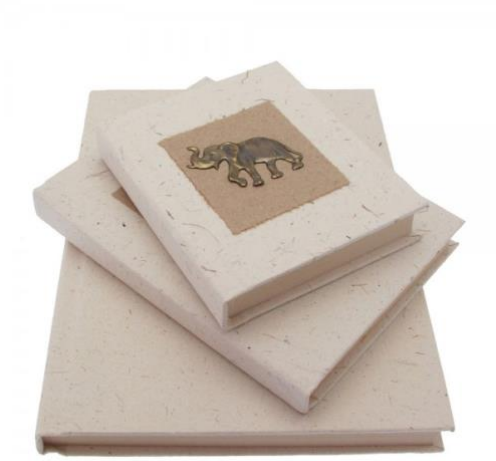
Tinder fungus can be used to produce a soft leather-like vegan product such as

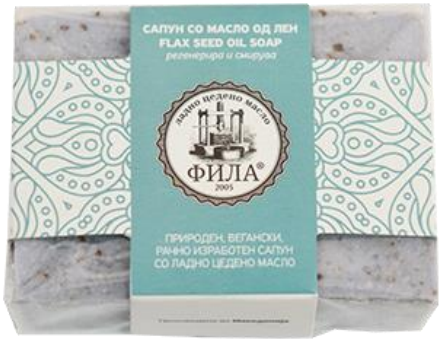
wallet, caps, watch straps, etc. These fungus are harvested naturally, dried for up to a year, peeled and then processed. The resulting leather is absorbent, antibacterial and antiseptic properties.

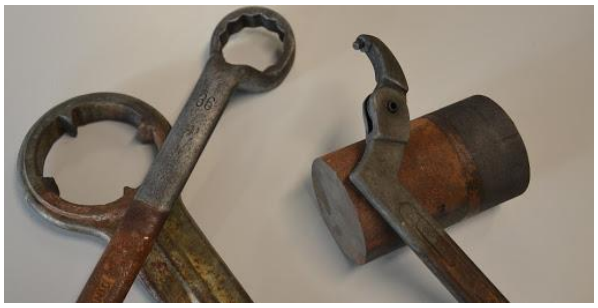
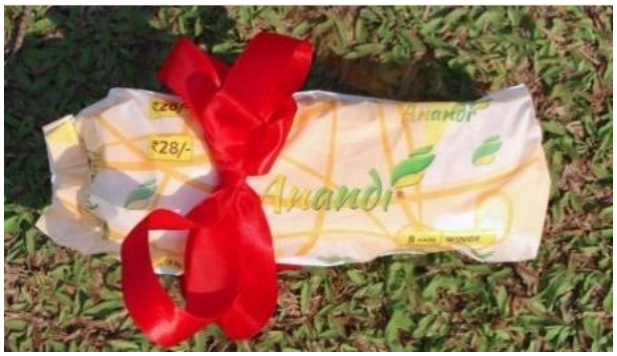
Wheat bran can be alternative raw materials to produce environmentally friendly and disposal tableware products because

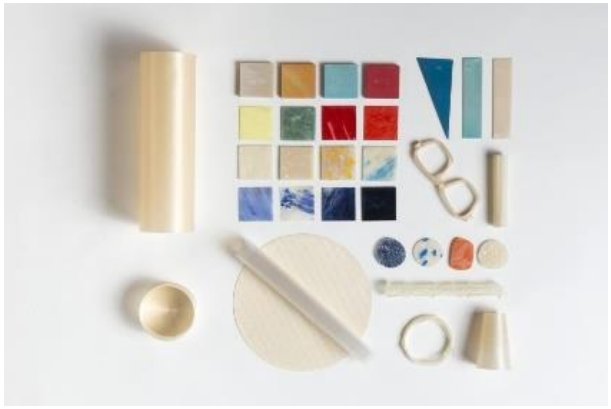
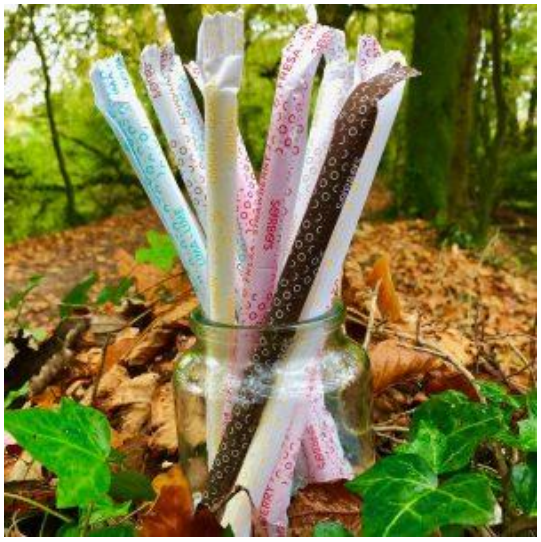
its production process does not require significant amount of water or mineral resources or chemical compounds. These products can biodegrade in 30 days.

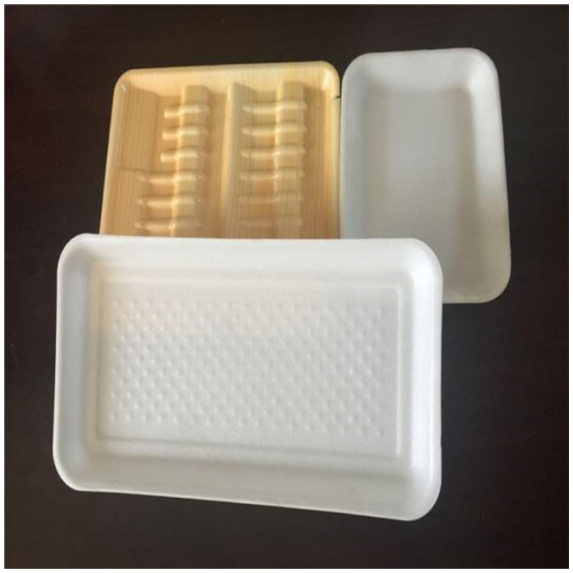
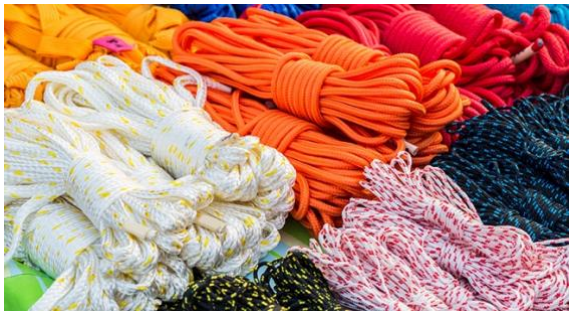
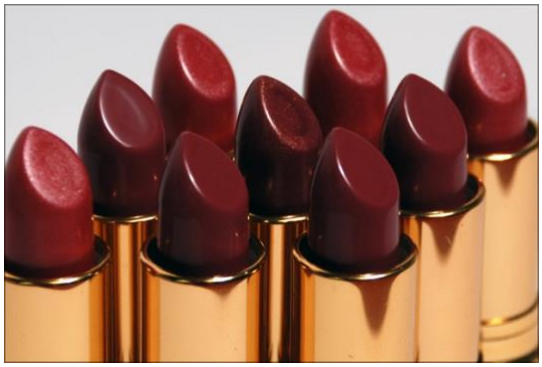
How can apple residues be valorised to make a vegan backpack? 	Apple skin can be dried, milled to fine powder and mixed with 50 percent polyurethane. The mixture is placed on a tear resistant roll of cotton fabric and then heated to produce a weather resistant and durable fabric.
How can the fish skins by-product of the fishing and food industry be valorised? 	By turning these by-products into the leather to make purses, handbags, backpacks, belts, shoes, clothing etc.
Juice of the sapodilla tree can be used to produce environmentally friendly chewing gums because 	the conventional products contain plastic-filled rubber base, which hardly rot on the streets, whereas these chewing gums are completely vegan and biodegradable alternatives.

How can used coffee grounds be transformed into new products such as coffee cups and saucers? 	By mixing these waste coffee grounds with plant fibres, cellulose and a resin made of biopolymers and by using an injection moulding procedures during manufacturing to make stable, washable and reusable coffee cups and saucers.
Elephant dung can be turned into a paper because 	up to 50% to 60% of the dung is undigested fibres of grass, fruits and plants fibre cellulose. Hence, elephant manure can be washed and boiled to be sterilised. It could then be blended with other paper wastes into a pulp which is thereafter dried and treated in the same way as conventional paper.
	Shells from shellfish, the waste materials from the fisheries industry, can be valorised by upcycling it into the plastic packaging. This packaging material is compostable, anti-microbial and extends the shelf-life of fresh seafood.

	At least 4,000 tonnes/year of standard lacquer can be replaced with lacquer derived from tomato, by-products of industrial tomato processing (mainly skins). This would enable a reduction of CO_2-eq emissions of 2 tonnes/year. In Italy alone, 650,000 tonnes of metal packaging are used every year. The emissions reduction by replacement with tomato-peel based bio-lacquer for metal cans could be impressive i.e. some 1 million kg CO_2/year.
A spray produced using organic waste residues to make the food stay fresh for longer. 	This is an edible protective spray for sensitive fruits and vegetables. It is tasteless, low in calories and is obtained from the remains of food products such as pear stalks, fruit peels, seeds and much more. The main constituent of the edible coating are glycerol and phosphatides, which are involved in the formation of biomembranes in higher plants. Due to the molecular structure, the odourless and tasteless lipids are water-insoluble and offer permanent protection against moisture and gases.
	Cold pressed oil is a type of fresh juice squeezed from the seeds of particular plants, containing their natural nutrients. It is unrefined and rich in essential fatty acids, vitamins soluble in oil, lecithin, phytosterols and minerals valuable for people's health. The seeds are processed by using a technology for cold seed pressing which means that the oil is mechanically pressed on a low temperature. As a result of the essential fatty acids present in flax seed oil, the flax seed soap provides better skin care, regenerate and soothe.

	Insect protein feed could be produced using black soldier fly and this is a hypoallergenic alternative to conventional food for aquaculture or pets. These insects can convert 60% of organic waste into proteins, lipids and other useful substances by eating voraciously and becoming protein and lipid-rich body mass. These insect biomass are turned into animal feeds using an efficient and sustainable production system based on circular econo
Nutrients for biogas optimisation to a biological and non-polluting alternative to chemical de-rust processes. 	Rust is simply atoms of iron which have reacted with oxygen. There are some microorganisms, such as bacteria, that eat iron. In order to obtain this important element, the bacteria produce siderophores, protein molecules that can trap iron atoms and incorporate them into their structure. This is the reason why siderophores are used as biodegradable rust removers. In order to use siderophores to remove rust, ASA Spezialenzyme has developed a procedure that uses bacteria of the species Streptomyces *olivaceous*.
Agricultural wastes locally sourced in India to produce sanitary napkins. 	This product is fully compostable and aimed at solving rural and urban disposal issues while ensuring environmental sustainability. Disposal of this Anandi pad should be done by burying it in a pit for the compounds to de-compost. Composting is recommended due to its environmentally sustainable nature, compared to other methods of disposal.

Producing high-end products using sugar, corn starch, and cooking oil. 	These are fully biobased and biodegradable materials that can be competing standard polymers and other oil-based plastics in terms of properties and processability. It can be adjusted to the needs of each product and application. The material can withstand the temperatures of over 100 degrees Celsius and has an estimated lifespan of 1 - 50 years depending on blend composition, with stable properties while stored.
	These are edible straws made of sugar, water, maize starch, gelatine, flour and water. EcoStraws do not dissolve in the drinks and stay in their original form for up to 50 minutes. These straw act like a sponge and absorb the taste of the drink. So, the users can eat the tasty straw after they finish the drinks.
	Aquafaba could be used as a substitute for eggs to make smooth and creamy mayo that can be enjoyed by vegans. Aquafaba is the protein-rich water left over from cooking chickpeas which would normally be thrown away. Creating condiments using this is considered to be sustainable as it makes use of surplus ingredients.

	Polystyrene is widely used as packaging materials due to its several benefits. It is lightweight, water resistant and also resistant to bacterial growth. It has excellent insulation property and shock absorption quality. It can be moulded into customised shape and size. These advantages combined with economical production cost make it an ideal product for packaging to transport goods.
	The benefits of synthetic fibres have enabled it to be one of popular materials to make clothes. It is stain resistant and does not wrinkle easily. These make it ideal for regular wash and daily wear. Its waterproof and durable properties also makes it popular to be used in outdoor and rain gears. It is also elastic and strong to handle heavy loads without breaking. On top of all these great benefits, it is a lot cheaper compared to alternatives raw materials to make clothes.
	Cosmetics including lipsticks can be traced back to ancient civilisations. Many improvements have been made to make lipsticks as time passes. Basic ingredients are wax, oil, alcohol, pigment, antioxidant and emollients. Wax provides the structure to solid lipstick. Many modern-days lipsticks use paraffin wax, derived from petroleum. The pigment that is used for colours also comes from a variety of organic or inorganic materials.

Information for further study on the 35 resources and/or bioproducts, used in the two games

Biological resources (and/or new bioproducts)	Sources/ Links for Images used in 'Match the Cards' game	Sources/ Links for further information
Curran in coatings, packaging, cosmetics	http://products.bio-step.eu/fileadmin/Other_FP7/Paint_procedure.jpg	• http://products.bio-step.eu • https://www.cellucomp.com/blog/article/curran-a-microfibrillated-cellulose-mfc-wonder-product-1 • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Russian dandelion to substitute natural rubber	https://www.uni-muenster.de/news/data/img/2015/04/7635-9g7sOM50-previewL.jpg	• http://products.bio-step.eu • https://phys.org/news/2015-06-natural-rubber-dandelions.html • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Insects as alternatives to traditional beef patties	https://icdn5.digitaltrends.com/image/digitaltrends/bug-burger-space10-ikea-test-kitchen.jpg	• https://bugfoundation.com/our-burger.html • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Chlorella Algae vegan soft drink	https://lifestyle-drinks.online/media/image/85/d3/d9/helga-algen-drink-chlorella-algen-0-29l-24-pet-flaschen-10922459d51b148dd88.jpg	• https://lifestyle-drinks.online/en/products-on-request/helga-pure-alga-drink/ • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Cocoa shell waste ice cream spoon	https://en.reset.org/files/imagecache/sc_832x468/2019/04/01/spoontaible-loeffel-aus-kakao2.jpg	• https://en.reset.org/blog/spoontainable-making-summer-more-sustainable-edible-cocoa-ice-cream-spoons-04062019 • http://engnews24h.com/breakthrough-2020-award-spoontainable/ • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Blue sweet lupines ice cream	https://c8.alamy.com/comp/W1X936/waffle-cone-with-purple-lilac-ice-cream-on-the-dark-gray-background-decorating-lupines-W1X936.jpg	• http://www.bio-step.eu/fileadmin/BioSTEP/Bio_documents/BioSTEP_Bioeconomy-in-everyday-life_Glasgow_Exhibition-Guide.pdf • https://biooekonomie.de/en/lupin-ice-cream-sustainable-dessert • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Leftover bread to beer	https://www.iamrenew.com/wp-content/uploads/2019/07/Toast-Ale-Banner.jpg	• https://www.toastale.com/impact/ • https://edition.cnn.com/2017/11/14/world/toast-ale/index.html • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Bricks grown from bacteria	https://i0.wp.com/biomason.com/wp-content/uploads/2014/04/6bricks-4-960x525_c.jpg	• http://products.bio-step.eu • https://www.inc.com/kevin-j-ryan/best-industries-2016-sustainable-building-materials.html • https://goexplorer.org/growing-bricks-with-bacteria/ • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Enzymes detergent	https://5.imimg.com/data5/VD/LH/MY-13547509/detergent-enzymes-500x500.jpg	https://ec.europa.eu/research/bioeconomy/pdf/eu_bioecnomoy_apartment_katalog.pdf
Plant-based isosorbide/ bio-based polycarbonate resin	http://web.tradekorea.com/upload_file2/product/758/P00295758/cbe9caa5_214d3947_c68b_429e_b8d7_7e12988512f9.jpg	• https://bioplasticsnews.com/2019/10/29/south-korea-japan-bio-polycarbonate/ • https://www.m-chemical.co.jp/en/products/departments/mcc/sustainable/product/1201026_7964.html • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Orange and citrus waste to sustainable fabric	https://y6auj24xr4y3qq95tz7io6uu-wpengine.netdna-ssl.com/wp-content/uploads/2017/09/Orange-Peels-Banners_Zatevakhin-900x600.jpg	• http://orangefiber.it/en/how-to-turn-citrus-waste-into-a-sustainable-fabric/ • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Tencel or lyocell fibres from wood	https://ecotouch.com.au/wp-content/uploads/2018/08/tencel-eucalyptus_grande.jpg	• Hutten, I. M. (2016) Handbook of Nonwoven Filter Media.(https://www.sciencedirect.com/topics/engineering/lyocell) • https://www.lenzing.com/sustainability/production • https://spinnova.com/our-method/fibre/ • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf

Biological resources (and/or new bioproducts)	Sources/ Links for Images used in 'Match the Cards' game	Sources/ Links for further information
Milk waste to fabric	https://www.chinadaily.com.cn/photo/images/attachement/jpg/site1/20110616/002170196e1c0f63adc404.jpg	• https://ec.europa.eu/research/bioeconomy/pdf/eu_bioecnomoy_apartment_katalog.pdf • https://cordis.europa.eu/article/id/135536-making-clothes-from-milk • https://sewport.com/fabrics-directory/milk-fabric • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Pineapple leaves waste fibre shoes	https://danandmez.com/content/uploads/2019/05/ananas-anam-pinatex-ona691-1.jpg	• https://skizoshoes.com/material-v2/ • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Algae biomass bathing shoes	https://media.treehugger.com/assets/images/2017/05/4464986156_ec0c4e9784_b.jpg.860x0_q70_crop-scale.jpg	• https://mashable.com/article/kanye-west-yeezy-algae-shoes-sustainable/?europe=true • https://www.vivobarefoot.com/uk/blog/may-2017/vivobarefootxbloom • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Olive leaves tanning agent	https://www.herbal-supplement-resource.com/wp-content/uploads/2019/07/OliveLeaves2.jpeg	• https://ec.europa.eu/research/bioeconomy/pdf/eu_bioecnomoy_apartment_katalog.pdf • https://internationalleathermaker.com/news/fullstory.php/aid/3841/Olive_leaf_tanning_specialist_to_speak_at_Automotive_Conference.html • https://www.ackermann-leather.com/en/online-shop/collections/eco/ • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Icelandic algae, beechwood, medical zinc fibre	https://cdn2.f-cdn.com/contestentries/1229468/32420038/5a5fd2d8e4e7b_thumb900.jpg	• https://www.vitadylan.com • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
T-shirt made from pulped eucalyptus, beech and algae	https://dyk8bhziazfed.cloudfront.net/wp-content/uploads/2019/08/plant-and-algaet-300-1376-1376x776.jpg	• https://www.vollebak.com/product/plant-and-algae-t-shirt/ • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Tinder fugus leather	https://c8.alamy.com/comp/BXBETH/tinder-bracket-fungus-hoof-fungus-tinder-polypore-horses-hoof-fomes-BXBETH.jpg	• https://fashionunited.uk/news/business/sustainable-textile-innovations-mushroom-leather/2018051429598 • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Wheat bran dishware	https://industryeurope.com/downloads/4481/download/biotrem1.jpg?cb=493b12efb431dff28baf3fa3af9563a0&w=640	• https://biotrem.pl/en/ • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Apple residues backpack	https://i0.wp.com/stylewithasmile.co/wp-content/uploads/2019/04/IMG_8336.jpg?w=3420&ssl=1	• https://www.nuuwai.com/pages/materials • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Salmon fish skin leather	https://img4.mashed.com/img/gallery/8-mistakes-everyone-makes-when-cooking-salmon/removing-the-skin.jpg	• https://www.salmo-leather.de/en/ • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Sapodilla tree chewing gum	https://cdn.shopify.com/s/files/1/0076/0522/3537/products/True-Gum-3-flavours-biodegradable-gum-no-plastic-angle-Marvels.jpg?v=1550970461	• https://www.truegum.com/ingredients/ • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Coffee cups and saucers using coffee ground	https://www.designboom.com/wp-content/uploads/2018/07/kaffeeform-reusable-coffee-cups-made-old-recyclable-coffee-grounds-designboom-1200.jpg	• http://www.bio-step.eu/fileadmin/BioSTEP/Bio_documents/BioSTEP_Bioeconomy-in-everyday-life_Glasgow_Exhibition-Guide.pdf • https://www.kaffeeform.com/en/story/ • https://be-rural.eu/wp-content/uploads/2020/05/BE_Rural_Latvia_Brochure_ENGL.pdf
Elephant poo paper	https://www.paperhigh.com/media/catalog/product/cache/1/thumbnail/600x600/9df78eab33525d08d6e5fb8d27136e95/e/l/ele-dung-group-note-books-_9.jpg	• https://www.bbc.co.uk/news/business-36162953 • https://thekidshouldseethis.com/post/84437356027 • http://www.ecomaximus.com • https://mrelliepooh.com
Shells from shellfish into plastic packaging.	https://www.cuantec.com/	https://www.cuantec.com/
Tomato-peel based bio-lacquer for metal cans	https://www.tomapaint.com/	https://www.tomapaint.com/

Biological resources (and/or new bioproducts)	Sources/ Links for Images used in 'Match the Cards' game	Sources/ Links for further information
Organic waste residues spray	https://apeelsciences.com/	https://apeelsciences.com/
Soaps from cold pressed flaxseed/ pumpkin/ sesame/ black cumin/ chia seeds oil	http://e-shop.filla.com.mk/product-category/%d1%81%d0%b0%d0%bf%d1%83%d0%bd%d0%b8/	http://e-shop.filla.com.mk/product-category/%d1%81%d0%b0%d0%bf%d1%83%d0%bd%d0%b8/
Organic food waste to make protein feed	https://nasekomo.life/	https://nasekomo.life/
Alternative to chemical de-rust processes	http://asa-enzyme.com/	http://asa-enzyme.com/
Agri wastes to sanitary napkins	https://aakarinnovations.com/	https://aakarinnovations.com/
Producing high-end products using sugar, corn starch and cooking oil	https://www.craftingplastics.com/nuatan	https://www.craftingplastics.com/nuatan
Edible straws using sugar, water, maize starch and gelatin; flour and water, and pasta.	https://ecostraws.ie/	https://ecostraws.ie/
Using surplus ingredients to create condiments that are sustainable	https://rubiesintherubble.com/	https://rubiesintherubble.com/

Polystyrene	https://sc01.alicdn.com/kf/H3576e43f177b468d8d6240aac5f0b52fx/223439956/H3576e43f177b468d8d6240aac5f0b52fx.jpg	NA – This is a fake bioproduct
Synthetic Fibres	https://www.songwon.com/assets/files/content/textile_content.png	NA – This is a fake bioproduct
Lipsticks	https://www.kcet.org/sites/kl/files/thumbnails/image/earth-focus_petroleum-products_lipstick.jpg	NA – This is a fake bioproduct