(BB) - the “Bio Box”

I. Abstract

We want to make a biodegradable box for two reasons. First, non-biodegradable packaging often ends up in the ocean, killing animals like turtles, orcas, seals, fish and other animals. Second, when companies produce and use cardboard boxes, they have to harvest trees. Shrinking forests are a big problem because trees produce oxygen.

Our idea is to use a biodegradable plastic made out of called polylactic acid (PLA). We don’t want to use paperboard because it requires trees to produce, and we’re trying to save trees. Since plastic is clear, we will color the boxes so people can’t see through them and steal the contents. Each business will be able to customize their own boxes with the company's logo on the boxes. We will use a sponge made from polyurethane to cushion any breakable items in the boxes. That is our vision of how we will help the earth.

II.Description

1. Present Technology:

Right now, boxes are not good for the earth. They are killing trees and animals. They are wasteful. Some people think that in 2050 there will be more plastic waste in the ocean than fish. Boxes are the most common, fully recyclable and sustainable. We don't want to use transparent packaging because people could see through the packaging. If it's valuable then a person might steal it! We don't want to use aluminum packaging because you always see aluminum packaging on the street.

The authors of "Food Security and Justice" blog write that "The direct or indirect impacts of packaging on the environment include soil degradation, water pollution, and the sharp reduction of scarce resources such as forests, solid waste pollution and toxic chemical pollution. It seriously affected the sustainable development of resources and environment'' You can make biodegradable plastic out of corn. It's called polylactic acid or PLA.

2. History

The very first documented time that someone used a cardboard box was for a popular war strategy game in 1817 in Germany. Next the first foldable cardboard box was made in Germany in 1890, made by Robert Gair. In France they already had cardboard boxes in 1840. They were used for shipping special kinds of moths to make silk. The first "box" was invented in the 2nd century by the Han Dynasty. They used it to wrap food.

3. Future Technology

We want to make all boxes biodegradable so we don’t kill trees because we need clean oxygen to breathe. Many boxes ended up in the ocean. Another reason is so we don’t have a lot of big boxes laying around. We want to make biodegradable boxes to sell to companies that deliver products. That’s why we want to make biodegradable boxes.

We want to make packaging boxes biodegradable, so we don't kill animals like turtles, orcas, seals, fish, and other animals. We are going to make a biodegradable box because they don't biogradegrate and they can end up in the ocean and other places too and end up killing animals. We want to use algae ink for printing on the boxes. You can make biodegradable plastic out of corn called polylactic acid or PLA.

4. Breakthroughs

Our main goal is to create a packaging box with new technology using PLA as our base for a new packaging system with material that can dissolve in water. Compared to paper-based materials like cardboard, PLA is made from more easily renewable biological resources like corn. PLA is more easily composted and biodegrades more successfully in natural settings, such as when littered. PLA is already established and we are using it as part of this project to create a new kind of packaging system.

We want to integrate PLA and water soluble plastic to create the new box. Our main goal is to reduce all the waste that packaging causes. In this process we found out that packaging in general is a cause of big pollution and trees being cut down and that causes less oxygen. We are 9-10 year old kids that care about what the world is now and want a safe and better place

when we grow up. We will need a way to dispose of it, like a way to make it dissolve in water or some machine. Using dissolvable bags (water soluble plastic bags) we will save animals. The dissolvable bags can be used to replace the bubble wrap and the AIRplus plastic film (the big bubble wrap). Plastic often ends up going into the ocean and killing animals like turtles, so water soluble bags will reduce the impact. The water soluble plastic can dissolve in water, so less animals get killed. Even though the AIRplus is recyclable. If it is not recycled and instead is littered it can kill animals. To use water soluble bags in our process to make shipping boxes with PLA, we think it can be dissolved in water. PLA and water soluble plastic will be used to create the boxes. PLA is already used and is successful to make cups and other products. Why not incorporate those two inventions and revolutionize packaging systems? Water soluble plastic is also a working product.

5. Design Process

One idea that we had was HDPE. We didn't want to use HDPE because it is not biodegradable. Most water bottles are made out of HDPE. It's lightweight, yet super strong and recyclable but it ends up in the ocean. Another idea we had is polylactic acid. It is a plastic that is made out of corn and is biodegradable. We have so much corn in the US so we can waste some of it on our box. Farmers are using corn on really bad stuff like corn syrup, so it would be good to use corn to create our shipping box. It is biodegradable but the negative part is the PLA will take a super long time to biodegrade. However the box we are creating is compostable and better for the environment.

6. Consequences

I think the positive thing about biodegradable boxes is that we are using corn. Bio-plastics like PLA require less energy to produce than paper-based packaging. This means the carbon footprint of PLA is less than cardboard. We're helping the economy of rural communities through supporting corn production. The negative consequences are that it takes just as long or longer to decompose as another biodegradable box made from trees.

III. Bibliography

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IV. Sample Web Pages

Page 1.

Background of packaging - Bio Box

The first box was invented in the 2nd century by the Han dynasty. The very first time that someone used a cardboard box was in 1817 in Germany. The first foldable cardboard box was made in Germany in 1890, In France they already had cardboard boxes in 1840.

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Design Process- Bio Box

Home Background Future Technology Breakthroughs **Design Process** Sources

We are planning to use is polylactic acid to create a new and innovated packaging boxing system that will revolutionize the shipping and transportation. First, we want to use the corn (PLA) to make our box. The box is going to be clear so the company can design the color and logo. We will use corn starch because is biodegradable. This means the carbon footprint of PLA is less than cardboard. We're helping the economy of rural communities through supporting corn production.

Future Technology-Bio Box

Home Background **Future Technology** Breakthroughs Design Process Sources

We are using PLA [polylactic acid], an existing technology, to create a biodegradable box for packaging. PLA is made out of corn which grows quickly and can be harvested every year. Right now a lot of packaging is made from cardboard that uses trees that take years to grow. By saving trees we are also saving animal habitat and improving the environment.

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Bio Box Breakthroughs

Home Background Future Technology **Breakthroughs** Design process Sources

Our main goal is to create a packaging box with new technology using PLA as our base for our new packaging. Compared to paper-based materials like cardboard, PLA is made from more easily renewable biological resources like corn. We will make it dissolve in water by mixing it with water soluble plastic. We want to make an environmental impact with our new packaging system.

For this to be possible we need to add a way for it to dissolve in water or some machine. We will also need to mix it with water soluble plastic