Design E–Portfolio

Criteria A

Strand 1 (Explain and justify):

Tyres used to make the world go round and they still do, Unless you're a professional speed walker, your method of transportation probably involves tyres of some sort.

Tyres are made from synthetic rubber, natural rubber, fabric and wire, along with carbon black and other chemical compounds. The Application of Tyre is that it is the component that surrounds a wheel's rim which causes an oscillatory motion and a certain amount of distance. Is covered. There are various sizes for tyres that are the Light to Medium duty tyres which are used by passenger vehicles and the Heavy duty tyres which are used by the Trucks, Construction vehicles, agricultural and forestry equipment. But these tyres don't last forever.

Image from a Scrapyard near my Community Centre.

Whether it's an irreparable flat or loss of tread, eventually tyres need to be replaced. Used tyres are among the most problematic and challenging sources of solid waste[1]. Some tyres can be re-treaded for a second life. Because of this high availability, resilience, bulk and non-biodegradability, tyres are now a problem which people are trying to resolve by recycling. Tyres are not desired at landfills, due to their large volumes and 75% void space, which quickly consumes valuable space. Rubber tyres are likely to contain some traces of heavy metals or other serious pollutants, but these are tightly bonded within the actual rubber compound they are unlikely to be hazardous unless the tyre structure is seriously damaged by fire or strong chemicals[3]. The effect of Tyres can be seen everywhere including the scrapyard near my community centre which is filled with scrap tyres.

Tyre recycling, also known as rubber recycling, refers to the process of recycling used vehicle tyres that can no longer be used on the vehicles due to wear and tear or irreparable damage. Once tyres are discarded, they are considered scrap tyres. There are different methods of recycling tyres that are Tyre-Derived Fuel (TDF), ground rubber and civil engineering applications. Tyre-Derived Fuel (TDF) is an environmentally alternative energy source it stops the dumping of tyres in the landfills, it doesn't leave any amount of leftover components of the tyre that will be wasted or unusable, it produces high amount of energy because the type of fuel used has a high heat value and it also helps in the reducing the emissions of CO_2, Sulphur and Nitrogen. Ground Rubber is a product made from Tyre Recycling is used in playgrounds for shock absorption for the safety of the user and as a landscape cover that is an attractive alternative to a conventional mulch product. The Civil Engineering Applications are that the addition of tyre rubber as proven to be effective in protecting the environment and conserving natural resources include the production of cement mixtures, road construction and geotechnical works.

Another method of recycling tyres is by repurposing it which is done by many communities, by using it as the seats and the tables in the cafes, the base of a swing, the pot to hold plants, as a seesaw, as a garden pond and also to create a Seesaw. These different methods of repurposing tyres are done by cutting them and joining them together.

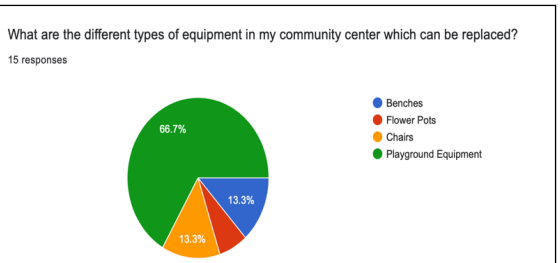


Image of Survey for the Target Audience – Parents and Community Centre members.

The 3 Rs of the environment—reduce, reuse, recycle—have been around for some time but many people have grown lax in following them. The 3. Rs are is one of the most common ideology about sustainable

To understand the behaviour I conducted a survey in my Community Centre there are many equipment for about what equipment can be replaced. From the Survey for the Target Audience (Parents and the Community Centre members) in my community centre, I can understand that the Playground Equipment are the equipment that need to be replaced.

With the help of the Survey and Research I gathered and also from the guidance of the key concept and the related concept Communities and Markets and Trends, I can state that creating a Playground equipment using tyres can cause an impact on the community centre as other people can become aware about it and try and reduce the number of tyres at landfills. These thoughts are also related to the SOI (Statement Of Inquiry) – Changing consumer behaviour at local community level is key to creating a global sustainable world as the Community Centre contains

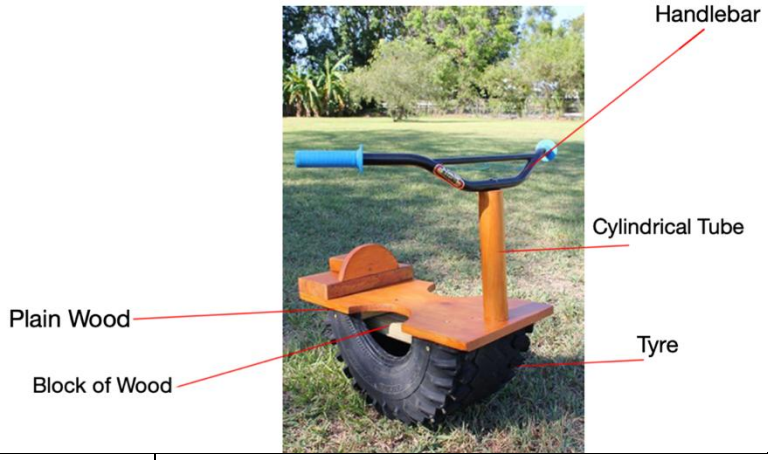
of all the parents and the community centre members who are affected by the Tyres and by creating a playground equipment out of tyres I can inspire them to recycle tyres.

Strand 2 (Identify and Prioritize Research):

Research Questions	Area of Research	Priority level	Sources of Information	Why is it important
What kind of equipment will attract kids of age 6-9?	Aesthetics	2	**Secondary** – I will conduct an analysis of the existing play areas, to gain knowledge about what kind of equipment will attract kids of age 6-9.	It will examine the existing Playground Equipment to better understand how and why they appeal to a wide variety of children so that I can develop an eye-catching Playground Equipment.
What are the different methods of reusing the tyres?	Function/ Environmental Issue/Material	6	**Secondary** – I will conduct an analysis of the existing product about the different methods of reusing the tyres.	This is a Key Factor since it provides more justification to my Aesthetics as I can understand how it looks like and also to the Environmental Issue related to it.
What equipment would be needed to reuse the tyres/upcycle them?	Materials/ Environmental Issue	7	**Primary** – I will go to the scrapyards to understand what equipment would be needed to reuse the tyres/upcycle them.	It helps by providing more justification as to what the means/equipment are would be needed to reuse the tyres/upcycle them.
How much space is available to make a play equipment in my community centre?	Size	5	**Primary** – I will measure the available area/space which can be used to make the play equipment in the community centre.	It will help me obtain the information about what size the play equipment should be so that it can fit in the community centre.
What are the safety features that need to be kept in mind while developing/designing the play equipment?	Safety	4	**Secondary** – I will research about the safety features about developing/designing the play equipment.	This is a Key Factor which is about the safety features that should be kept in mind while developing/ designing the play equipment.
What safety/environmental issues to be in mind for upgrading the tyres?	Safety/ Environmental Issue	8	**Secondary** – I will conduct a product analysis to know how safety/ environmental issues to be in mind for upgrading the tyres.	This is a Key Factor because it tells all the safety and environmental issues related to upgrading tyres.
Which Sustainable Development Goal (SDG) relates to tyre recycling?	Environmental Issue	9	**Secondary** – I will research about which Sustainable Development Goal (SDG) is related to Tyre Recycling.	It helps in understanding about what my Sustainable Development Goal (SDG) would Tyre Recycling relate to is Industry, Innovation and Infrastructure.
Does the different Playground Equipment in my community centre attract children?	Aesthetics	3	**Primary** – I will conduct a survey to identify if the playground equipment in my community centre attract children.	This will help me understand whether the current playground equipment in my community centre attract children to use it and also help in creating a cause for creating a playground equipment in my community centre.
What are the different equipment in my community centre which can be replaced by used tyres?	Material	1	**Primary** – I will conduct a survey of the Target Audience to identify the different equipment in my community centre which can be replaced by used tyres.	It will help me understand about the different playground equipment in my community centre and why the playground equipment aren't attracting children to use it.

Strand 3 (Analyze Existing Products):

Product 1 – Motorcycle Seesaw Made out of Tyre and Real Race Bike Handles:

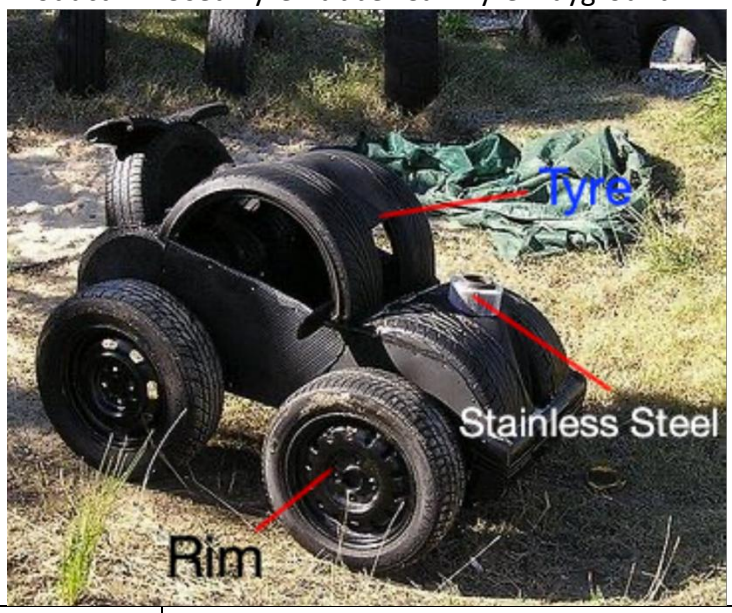


The Product is a Bike – Low Rider, that is made for children, they can use it to have the feel and understand what it is like to ride a bike by producing a back and forth motion because it is a rocking bike.

Key Takeaway Features:
The product looks very similar to a bike and it will give the feeling of riding a low rider because of its unique mechanism.

Name of Specifications	Description
Aesthetics	The Product looks attractive, because it is both rocking playground equipment and a Cycle combined. It has the Colours Brown, Black and Blue on its components. It's inspiration is its components – the cycle handlebar which gives the person on it a grip of the Playground equipment so that they don't fall when the tyre starts to make the equipment into a seesaw.
Cost	Since the tyre used is a big one is 10,000 Rupees this includes the plain wood which connects the tyre and the platform for the child to sit on, the Handlebar and the Cylindrical tube which holds it is 2,000 Rupees, while they wood which sticks the tyre and the Cylindrical tube that holds the Handlebar is 1,000 Rupees. Thus, in total the Product is 13,000 Rupees which is affordable and the product is value for its money.
Customer	The Customer for this Playground Equipment is the community centre who will buy it for their children, so that the children can use it as a Seesaw which is cycle.
Ergonomics	The product can be reused, recycled and repurpose able at the end of its life as the wooden platform may break since it holds the child sitting on it from falling on the tyre, the tyres. Won't break unless a huge body is kept on it. The Impact of the Product is that it gives the child using it a feeling as if he/she is riding a low rider. This is a Positive Impact as it can give the child some expertise of riding a bike.
Safety	The Product is safe since it won't fall back down or in front when a child is using it, because it is half a tyre it can easily move backward and forward.
Size	The Product can hold a child of the age 10 or below, because of its size. The Size of the Product: The Tyre is 25.4 cm for the Section Width and 73 cm for the Tyre Diameter. The handlebar is 85.6 cm for the width of the handlebar. The Wooden Plank is 81 cm for the length, 35 cm for the width, 6 cm for the height. The Cylindrical Cube is 72 cm.
Function	The Product is to give the child using it a feeling as if he/she is riding a low rider. The Product is both a Seesaw and a Cycle combined.
Material	The Material for creating the Product are the Tyre, a Cylindrical Tube, Wooden Platform and a Handlebar.

Product 2 – Used Tyre Rubber Car: Tyre Playground:



This looks like a rallycross car made out of tyre, there were many equipment and technical skills needed to make this car from 6 tyres. The Door is cut in a manner that when it opens it is not blocked by the wheels. The Stainless Steel adds the feeling to the child as if he is driving a muscle car.

Key Takeaway Features:
The Car is only made out of tyres and looks similar to the cars used in Rallycross.

Name of Specifications	Description
Aesthetics	The Product looks attractive, because it is a Car made out of a tyre. It has the Colours Black on all of its components. It's inspiration is its components – the car used in Rallycross and gives the child a feeling of being in a car.
Cost	Since the tyre used are small and approximately 6 which costs 20,000 Rupees, thus the total cost of the product is 20,000 Rupees.
Customer	The Customer for this Playground Equipment is the community centre who will buy it for the children, so that the children can use it as a car.
Ergonomics	The product can be reused, recycled and repurpose able at the end of its life, since only the tyres are used in making the tyres and they can. Be reused later. Impact of the Product is that it gives the child using it a feeling as if he/she is riding a Rallycross Diver. This is a Positive Impact as it can give the child some expertise of driving a car.
Safety	The Product is safe since a child is covered in all sides by the product.
Size	The Product can hold a child of the age 10 or below, because of its size. The Size of the Product: The diameter of the tyre for car is 30.48 cm. The Height of the Car including the tyres is 68.96 cm. The Length of the Car is 172.4 cm.
Function	The Product is to give the child using it a feeling as if he/she is driving a Rallycross Car.
Material	The Material for creating the Product are the 6 Tyres in which 4 of them are complete with their rims.

Product 3 – Cute Ways To Reuse Old Tyres:

The Swing looks like a Horse made from tyre. Even Children of age 3 can use it, there were different steps needed to create this Swing. Making the face of the Horse needs precision and a high level of skills.

Key Takeaway Features:
The Swings are made from only tyres as the Metal Strings a component from a tyre.

Name of Specifications	Description
Aesthetics	The Product looks attractive, because it is both Swing and a Cycle combined. It has the Colours Black on its components, since only tyres are used. It's inspiration is its components – the swings are created with the inspiration of animals as the cycle and the children sit on it and swing.
Cost	Since the tyre used are small ones which costs 5,000 Rupees this includes the 4 tyres. Thus, in total the Product is 5,000 Rupees which is affordable and the product is value for its money.
Customer	The Customer for this Playground Equipment is community centre who will buy it for the children, so that the children can use it as a Swing which is cycle.
Ergonomics	The product cannot be reused, recycled and repurpose able at the end of its life as all of the tyres used are cut and made for this purpose only.
Safety	The Product is safe since it break, when a child is sitting on it as it won't break.
Size	The Product can hold a child of the age 10 or below, because of its size. The Size of the Product: The Height of the Swing is 304.8 cm and the Length of the Swing is 381 cm. The Diameter of the Tyre used is 17.78 cm.
Function	The Product is to give the child using it a feeling as if he/she is riding a cycle. The Product is both a swing and a Cycle combined.
Material	The Material for creating the Product are the 4 Tyres.

Product 4 – Tokyo Tyre Playground:

The product is from the Tokyo Tyre Playground and it looks attractive for a playground equipment. The product looks like a giant robot made of tyres. It was made from the different sizes of used/scrap tyres and also using multiple steel rod to hold the Product is place and not fall over. Children will like to climb onto this product so that they feeling of going to heights.

Key Takeaway Features:
The product looks really good because of the different tyres used in creating it and making it attractive and also that it is safe to climb the product as all the tyres are being held by a steel rod that can handle big tyres.

Name of Specifications	Description
Aesthetics	The Product looks attractive, because it looks like the Pokémon Dusclops but it looks magnetic. It has the Colours Black on its components. It's inspiration/it's idea is that it looks like a figure of a magnetic person.
Cost	Since the tyre used is are big ones and small ones, also there are more than 20 used which costs 50,000 Rupees this includes the paint for the hands that is red and it will cost 200 Rupees.
Customer	The Customer for this Playground Equipment is the community centre who will buy it for the children, so that the children can use it as something to climb onto.
Ergonomics	The product can be reused, recycled and repurpose able at the end of its life as the tyres used are highly durable and can be used for other purposes.
Safety	The Product is safe, because if a child falls. Down he will fall on the tyres which is soft and it won't hurt.
Size	The Product can hold a child of the age 10 or below, because of its size. The Size of the Product: The Diameter of the Tyres used are – 80.19 cm, 63.87 cm, 46.9 cm and 25.92 cm. The Length of the Steel Rod is 85. cm and the Diameter for the Circle is 17.54 cm.
Function	The Product is to climb on it and it is also for it looks as a show-off product on the Playground.
Material	The Material for creating the Product are the more than 20 Tyres.

Strand 4 (Develop Design Brief):

According to my Research I have understood the impact of used tyres which are that the most problematic and challenging sources of solid waste and the high availability, resilience, bulk and non-biodegradability and they also consume a high amount of space. Rubber tyres are likely to contain some traces of heavy metals or other serious pollutants, but these are tightly bonded within the actual rubber compound they are unlikely to be hazardous unless the tyre structure is seriously damaged by fire or strong chemicals.

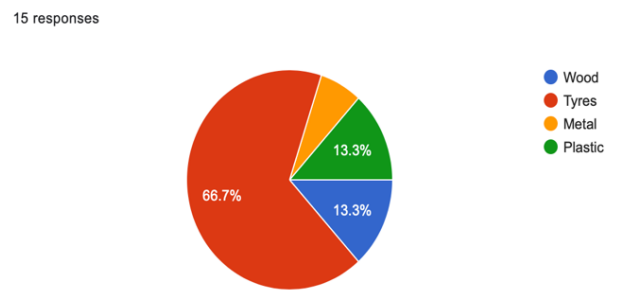


Image from the Survey of Target Audience which shows the Response for a Question – What type of material can be used to make the equipment?

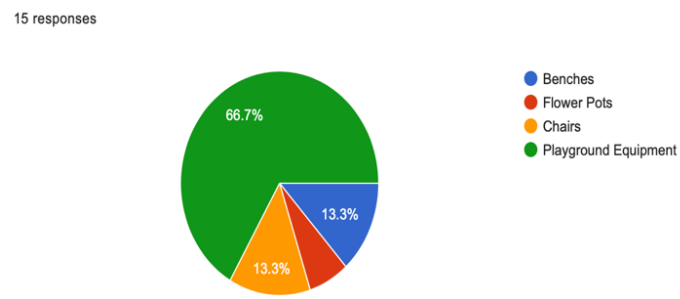


Image from the Survey of Target Audience which shows the Response for a Question – What are the different types of equipment in my community centre which can be replaced?

From the Survey that I conducted for the Target Audience which are the Parents and the members of the Community Centre, I understood about the which is the equipment in my community centre that should be replaced which was Playground Equipment (66.7% that is 10 people) and for the type of material to make the equipment which needs to be replaced is Tyres (66.7% that is 10 people). This gives a justification that the playground equipment needs to be changed and that tyres need to be used in creating the equipment for recycle purpose.

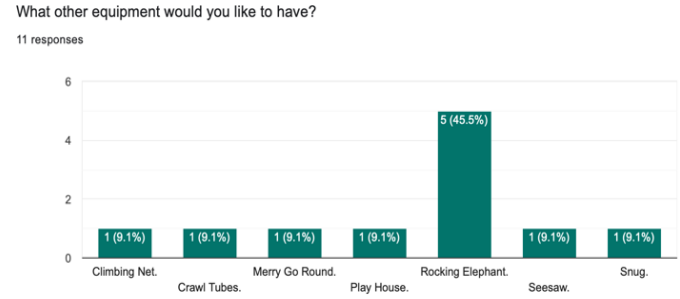


Image from the Survey of the User which shows the Response for a Question – What other equipment would you like to have?

From the Survey that I conducted for the User which are the children, I understood about which is the equipment that the children would like to have so that I can create the Playground Material made from the Tyres. The highest is the Rocking Elephant which has (45.5% that is 5 children) means that the need from the children is that they require a Rocking Elephant as the new Playground Material.

I had conducted an analysis of the existing play areas to find out about which Playground Equipment attracts kids of the age 6-9 because It will examine the existing Playground Equipment to better understand how and why they appeal to a wide variety of children so that I can develop an eye-catching Playground Equipment, and the subsequent result was that the Playground Equipment made from the inspiration of tyres are attractive for kids of the age 6-9.

I conducted an existing product analysis to know about the different methods for Reusing Tyres because this provides more justification to my Aesthetics as I can understand how it looks like and also to the Environmental Issue related to it. The subsequent result is There are different methods of recycling tyres that are Tyre-Derived Fuel (TDF), ground rubber and civil engineering applications. Tyre-Derived Fuel (TDF) is an environmentally alternative energy source it stops the dumping of tyres in the landfills, it doesn't leave any amount of leftover components of the tyre that will be wasted or unusable, it produces high amount of energy because the type of fuel used has a high heat value and it also helps in the reducing the emissions of CO2, Sulphur and Nitrogen. Ground Rubber is a product made from Tyre Recycling is used in playgrounds for shock absorption for the safety of the user and as a landscape cover that is an attractive alternative to a conventional mulch product. The Civil Engineering Applications are that the addition of tyre rubber as proven to be effective in protecting the environment and conserving natural resources include the production of cement mixtures, road construction and geotechnical works.
Another method of recycling tyres is by repurposing it which is done by many communities, by using it as the base of a swing, the pot to hold plants, as a seesaw, as a garden pond and also to create a Seesaw. These different methods of repurposing tyres are done by cutting them and joining them together. After going to the Scrapyard to have more justification as to what the means/equipment are would be needed to reuse the tyres/upcycle them. I found that the equipment that is needed to Recycle Tyres are Tyre Shredder, Tyre Crusher and Hand Grinder.
After measuring the amount of space in my community centre I found that the space available to make a play equipment in my community centre is 100 square meters.
The Safety Features that need to be kept in mind while developing/designing the play equipment are that it should withstand multiple children sitting/standing on it and it should have enough space to carry/contain multiple children.

From the Survey of the Users – the Children, I understand whether the current playground equipment in my community centre attract children to use it and also help in creating a cause for creating a playground equipment in my community centre. I can conclude that the different Playground Equipment in my community centre don't attract their children and the different Playground Equipment made from Tyre will attract their children to use it. Also I can also conclude that the other type of playground equipment in my community centre that children want are Rocking Elephant.
From the existing products I understood about the size of what my Product should be as the Product 1 is similar to my Product and its size measurements are The Tyre is 25.4 cm for the Section Width and 73 cm for the Tyre Diameter. The handlebar is 85.6 cm for the width of the handlebar. The Wooden Plank is 81 cm for the length, 35 cm for the width, 6 cm for the height. The Cylindrical Cube is 72 cm. The cost of Product 2 is Rs. 20,000 which helps in identifying the cost of the Rocking Elephant as Rs. 6,000. Because of the number of tyres used in creating the Product.

According to a psychological report about '**Social Psychology and the Stimulation of Recycling Behaviours'** from Shawn M. Burn, most residents do not live by the landfill which ultimately houses their solid waste. Furthermore, personal responsibility is reduced because individuals feel that "nobody else is performing the behaviour either" and that they have no choice but to perform the environmentally irresponsible act. Awareness that neighbours are recycling may not only suggest that an action is more likely to make a difference (since others are presumably performing it also), but may lead to performance due to a desire for social approval. Thus if I start creating playground

equipment from tyres for the community centre I can inspire the parents and members of my community centre to do the same.

Criteria B

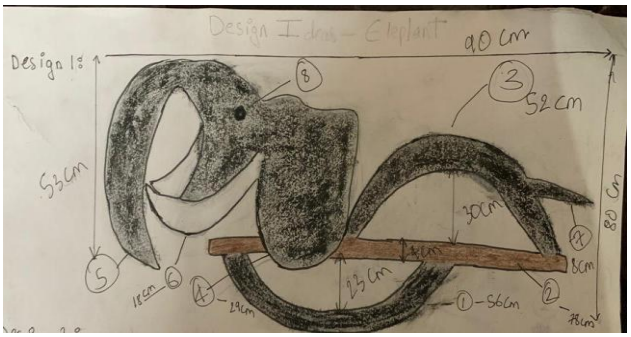
Strand 1 (Design Specifications):

Specification	Description	Limited (1 – 3)	Satisfactory (4 – 6)	Excellent (7 – 9)
Aesthetics	The Product will look like an Elephant or Parrot, which is made of 3 tyres, the Elephant will have the colors like Black, Brown and White. These colors are used to enlighten its appearance.	The Product doesn't look like an Elephant or Parrot and it doesn't use any colors to enlighten its appearance.	The Products look like an Elephant or Parrot but doesn't use any colors to enlighten its appearance.	The Products look like an Elephant or Parrot will use colors like Black, Brown and White to enlighten its appearance.
Cost	The Cost of the Elephant or Parrot Product will be approximately 7,283 Rupees, including all accessories and manufacturing cost.	The Product might costs more than 10,000 Rupees and it is expensive as a product.	The Cost of the Elephant or Parrot product should be between 7,500 – 10,000 Rupees but it is expensive and it as a recyclable product.	The Cost of the Elephant or Parrot Product will below 7,500 Rupees and it includes the accessories and manufacturing cost.
Customer/Target Audience	The Customer for the Product are the Children below the Age of 9 in my community centre.	There is no Customer for the Product.	The Customer for my Product is the children and the teenagers of the community centre. The Target Audience caters to different people excluding the children of the community centre. Which is informed by the opinions of the Target Audience.	The Product seems appropriate for the community centre that is the children of the Age 9 which is validated accurately by the opinions of the Target Audience.
Environmental Impact	The Product will not harm the environment. It will follow the principles of recyclability, reusability and sustainable design.	It is not Environmentally Friendly and it is not a sustainable design,	The Product is Environmentally Friendly but it is not a sustainable design.	The Product is Environmentally Friendly and it accepts and follows the principles of recyclability, reusability and sustainable design.
Function	The Function of the Product will be suitable for children of age 9 to sit on it and to use it.	A child of age 9 can sit on it, but he/she can't use it.	A child of average weight can sit on it, but he/she can't use it effectively.	Multiple children of average weight can sit on it and use the product effectively.
Manufacturing	The Manufacturing process will include a process which is precise and it uses environmentally friendly methods. There is no pollution or extra waste generated during manufacturing.	The Manufacturing process is not precise and it doesn't use any Environmentally friendly methods. There is extra waste and pollution generated during manufacturing.	The Manufacturing process is precise and it uses Environmentally friendly methods. However, there is extra waste that Is generated.	The Manufacturing process will include a process which is precise and it uses environmentally friendly methods. There is no pollution or extra waste generated during manufacturing.
Materials	The Resources which will be used for the Creation of the Product is • Tyres. • Block of Pine Wood. • The Cutting Tools Processes which are Box Cutter, Hand Grinder,	There are many recommended processes/resources which will be used for the Creation of the Product.	For the creation of the product only a few tools are used and multiple processes.	The Resources which will be used for the Creation of the Product is • Tyres. • Block of Pine Wood. • The Cutting Tools Processes which are Box Cutter, Hand Grinder,

	Wood Cutting Wheel, Metal Cutting Wheel, Drill Machine, Mitre Saw, Saw, Bench Wise, Welding Goggles and Welding Gloves. • Joining Tools which are Bolts & Nuts, Screws, Screwdriver and Wrench.			Wood Cutting Wheel, Metal Cutting Wheel, Drill Machine, Mitre Saw, Saw, Bench Wise, Welding Goggles and Welding Gloves. • Joining Tools which are Bolts & Nuts, Screws, Screwdriver and Wrench.
Safety	The Tyre shouldn't break when a child sits on it and the supporting materials should be strong enough to hold the Tyre. It should not contain sharp edges which can hurt the child only smooth edges.	The Product doesn't have any safety measures and the product is not strong enough to hold the tyre.	The Tyre shouldn't break when a child sits on it and the supporting materials should be strong enough to hold the Tyre. But there are some sharp edges which can hurt the child.	The Tyre shouldn't break when a child sits on it and the supporting materials should be strong enough to hold the Tyre. It should not contain sharp edges which can hurt the child only smooth edges.
Size	The product in length is of 90 cm and in height it is of 80 cm. The Length of the Tusks are 20 cm and the length of the ears are 30 cm. The Length of the bottom Half tyre is 60 cm and the Height of the bottom Half tyre is 27 cm. The Length of the upper Half tyre is 56 cm and the Height of the upper Half tyre is 30 cm. The Length of the Block of Wood is 83 cm and the Height of the Block of Wood is 7 cm. The Length of the Tail is 12 cm.	The product in length is more than 160 cm and in height it is more than 130 cm. The Length of the Tusks are more than 40 cm and the length of the ears are more than 50 cm. The Length of the bottom Half tyre is more than 80 cm and the Height of the bottom Half tyre is more than 45 cm. The Length of the upper Half tyre is more than 70 cm and the Height of the upper Half tyre is more than 50 cm. The Length of the Block of Wood is more than 99 cm and the Height of the Block of Wood is more than 30 cm. The Length of the Tail is 40 cm.	The product in length is more than 120 cm and in height it is more than 100 cm. The Length of the Tusks are more than 25 cm and the length of the ears are more than 35 cm. The Length of the bottom Half tyre is more than 67 cm and the Height of the bottom Half tyre is more than 32 cm. The Length of the upper Half tyre is more than 60 cm and the Height of the upper Half tyre is more than 35 cm. The Length of the Block of Wood is more than 87 cm and the Height of the Block of Wood is more than 16 cm. The Length of the Tail is 20 cm.	The product in length is of 90 cm and in height it is of 80 cm. The Length of the Tusks are 18 cm and the length of the ears are 29 cm. The Length of the bottom Half tyre is 56 cm and the Height of the bottom Half tyre is 23 cm. The Length of the upper Half tyre is 56 cm and the Height of the upper Half tyre is 30 cm. The Length of the Block of Wood is 78 cm and the Height of the Block of Wood is 4 cm. The Length of the Tail is 8 cm.
Potential to Change Consumer Behavior	The Product should be such that the target audience understands the value of recyclability and it changes the mindset or inspires them to use recyclable materials.	The Product doesn't make the target audience understands the value of recyclability. Neither, does it change the mindset or inspires them to use recyclable materials.	The Product makes the target audience understands the value of recyclability. However, it doesn't change the mindset or inspires them to use recyclable materials.	The Product should be such that the target audience understands the value of recyclability and it changes the mindset or inspires them to use recyclable materials.
Follows the correct trends	The Product follows the current trends of sitting structures made sustainably in the market by using recyclable materials.	The Product doesn't follow the current trends of sitting structures made sustainably in the market by using recyclable materials.	The Product follows the current trends of sitting structures made sustainably in the market but not by using recyclable materials.	The Product follows the current trends of sitting structures made sustainably in the market by using recyclable materials.

Strand 2 (Design Ideas):

Design 1 (D1):

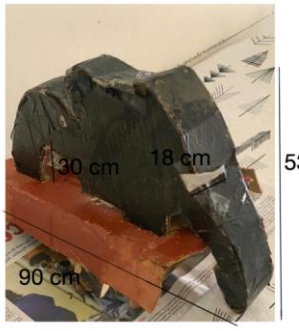


Back View:

Angled View:

Side View:

Angled View:



Description:

This design has the looks of an Elephant. It looks like it has a Wooden Plank which separates the Elephant and the Bottom Tyre which is used as a Seesaw to Rock. The Elephant, the Bottom Tyre and the Wooden Plank combined it shows as if the Elephant is of the size of a three-year-old child. The colours used are Black, Brown and White because it relates with the Product. The Elephant will be made out of tyres and placed on the ground for the Children to sit on it. In the Design Hatchback Tyres are used for its Creation. Overall, this design satisfies every criterion to a high extent and is in the Excellent Band.

Opinion from User:

This Design looks like an Elephant and also it looks fun because it is a combination of an Elephant and a Seesaw.

Components in the Design	Function of the Design
1	Its use is to be a platform between the Elephant and the Grass/Surface.
2	It connects the Platform (1) to the Elephant, to make sure the Elephant doesn't fall down from the Platform as a Safety Measure.
3	It is the Back/Body of the Elephant; it is where the child will be sitting on.
4	This is the Ear of the Elephant and it can be used for the Child to hold onto the Elephant when he is sitting on it.
5	This is the Trunk of the Elephant which is for the look of the Elephant.
6	This is the Tusks of the Elephant which is for the look of the Elephant.
7	This is the Tail of the Elephant which is for the look of the Elephant.
8	This is the Eye of the Elephant which is

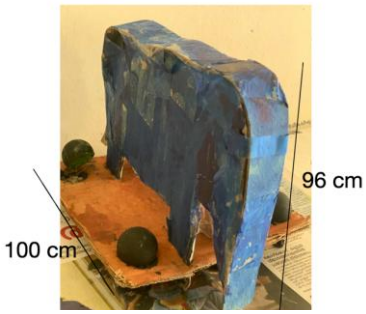
Design 2 (D2):

Design:

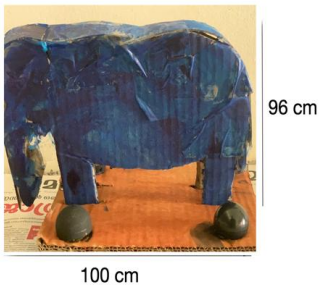
Back View:

Side View:

Angled View:



Side View



Description:

This design has the looks of a small Elephant. It has a vivid scheme with the colours that will be used are Black, Blue & White and it is slightly pleasing to the eye and might have a positive effect on the children. The Elephant will be made out of tyres, Wooden Plank and Spring which will be fixed into the ground for the Children to sit on it. In the Design Sedan Tyres are used for its Creation. Overall, this design satisfies every criterion to a slightly high extent and it is in the Satisfactory Band.

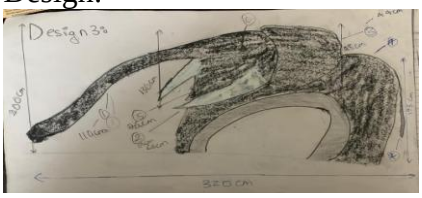
Opinion from User:

The Design looks like an Elephant which can move around its place because of its Spring which looks fun, but it is risky because the child can fall of easily.

Components in the Design	Function of the Design
1	This is the Tusks of the Elephant which is for the look of the Elephant.
2	This is the Trunk of the Elephant which is for the look of the Elephant.
3	This is the Ear of the Elephant and it can be used for the Child to hold onto the Elephant when he is sitting on it.
4	It is the Back/Body of the Elephant for giving the look of an Elephant.
5	This is the Tail of the Elephant which is for the look of the Elephant.
6	This is the Eye of the Elephant which is for the look of the Elephant.
7	This is the Spring which makes the Elephant move around its place when a child is sitting on it.
8	This is the Wooden Board which connects the Spring (7) and the

Design 3 (D3):

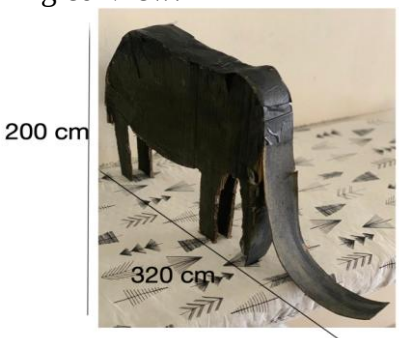
Design:



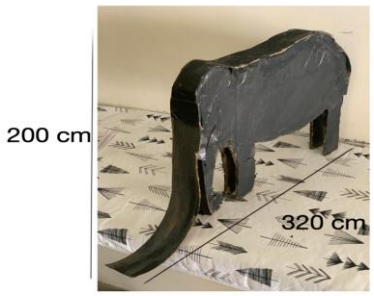
Top View:

Side View:

Angled View:



Angled View



Description:

This design has the looks somewhat like an Elephant. It uses the colours like Black & White and it is pleasing to the eye and will have a positive effect on the children. The Elephant will be made out of tyres and placed on the ground for the Children to climb on and play with. But it is dangerous since the Elephant is really tall and high up for a child to climb onto. In the Design SUV Tyres are used for its Creation. Overall, this design satisfies every criterion to a slightly high extent and it reaches the Satisfactory Band.

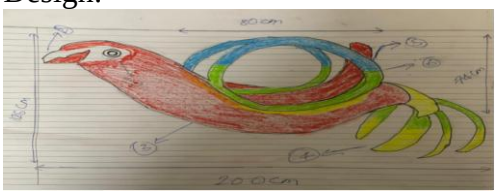
Opinion from User:

This looks a little bit like an Elephant and also it is very risky because the Elephant is really high up and dangerous to climb on and slide down the Trunk.

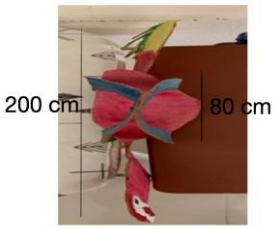
Components in the Design	Function of the Design
1	Trunk – The Trunk is the Slide where the child will go down from the Elephant and also for the Looks of the Elephant.
2	Tusk – The Tusk is only for its looks so that it looks like and Elephant.
3	Ear – The Ear is for its looks so that it looks like an Elephant and it is giving the child sitting on it can hold the Ears for Grip.
4	Tail – The Tail is only for its looks so that it looks like and Elephant.
5	Mouth – The Mouth is only for its looks so that it looks like and Elephant.
6	Eye – The Eye of the Elephant is made for the look of the Elephant.
7	Back – The Back is where the Child will climb to get on top of the Elephant.

Design 4 (D4):

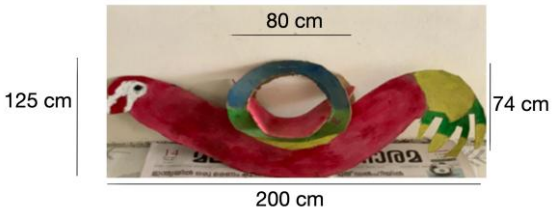
Design:



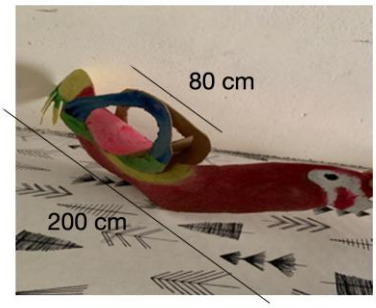
Top View:



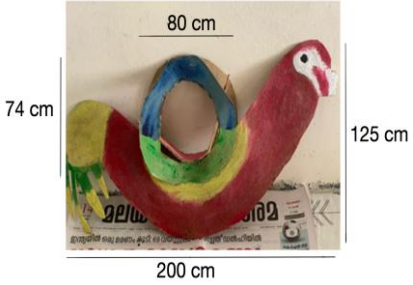
Side View:



Angled View:



Side View



Description:

This design uses and has the looks of a Parrot because of the structure of the Parrot which is the body. Also, its Beak, Eyes and Tail add gives the design the look of a Parrot. There is a vivid colour scheme which consists of Red, Green, Blue, Yellow, White and Black. For creating this Parrot 1 tyre would be needed. The cage gives the child sitting inside the Parrot something to hold onto while swinging. But it is not safe for the child to get onto the swing as there is nothing which can support the child while climbing. Overall, this design satisfies every criterion to a slightly high extent and it reaches the Satisfactory Band.

This looks very similar to a Parrot and also it is very risky because the Parrot doesn't have any support handles for the child to climb onto the Parrot and for getting out of the Parrot.

Components in the Design	Function of the Design
1	Eye – The Eye of the Parrot is made for the look of the Parrot.
2	Beak – The Beak of the Parrot is made for the look of the Parrot.
3	Body – The Body is for its looks so that it looks like a Parrot.
4	Tail – The Tail is for its looks so that it looks like a Parrot.
5	Cage – The Cage is made for giving the child something to hold on when the Parrot is swinging.
6	Seat – The Seat is made for letting the Child sit on the Parrot when Swinging.

Chosen Product – Rocking Elephant

Strand 3 (Chosen Design):

Designs	Opinion
Design 1 (11/11)	This is the best sketched design because it resembles a elephant and it would encourage the user to use the Rocking Elephant which has 2 Safety Measures which are; the User can use the Ears as handles to hold onto the Elephant while it is rocking and the User can keep his feet on the Block of Wood as a footrest or for support. The Cost of the Elephant Product is less than 7,500 Rupees. There are 3 colors used in this sketched design which are Black, Brown and White. There are certain number of materials used to create the Product. It achieves its function of Multiple children of average weight able to sit on it and use the product effectively. The Product can change that the target audience understands the value of recyclability and it changes the mindset or inspires them to use recyclable materials. The Product follows the current trends of sitting structures made sustainably in the market by using recyclable materials.
Design 2 (4/11)	I didn't like this design, even though it looks like an Elephant and it uses 3 Colours – Black, Blue and White because It is overpowered by the problematic size since the Elephant is too small for a child of the age 6-9 to use it. It also has no Safety Measure. For creating the Product there is no environmentally friendly process as the process used harms the environment. The Cost of the Elephant Product is more than 10,000 Rupees. There are many materials used in creation of the product, however it achieves its function of Multiple children of average weight able to sit on it and use the product effectively. The Product can change that the target audience understands the value of recyclability and it changes the mindset or inspires them to use recyclable materials. The Product follows the current trends of sitting structures made sustainably in the market by using recyclable materials. It functions as a Elephant with a Trunk that is a slide.
Design 3 (5/11)	The Design looks like an Elephant, but it doesn't use a wide variety of colours. The colours it uses are Black and White. It uses the Appropriate Size as Required. The Cost is appropriate as the cost including the accessories and manufacturing cost is less than 7,500 Rupees. The Manufacturing process includes a process which is precise and it uses environmentally friendly methods. There is no pollution or extra waste generated during manufacturing. It uses the appropriate amount of materials and it can be used by multiple child of children of average weight and of the age 6-9 but it is dangerous for a child to climb that high on an elephant and come down a slide. The Product

Final Design:
Design 1 (D1)

Chosen Product – Rocking Elephant

Testing against Passing Criteria

Sr. No.	Design 1	Design 2	Design 3	Design 4
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
Sum	11/11	4/11	5/11	7/11

Green = Pass & Red = Fail

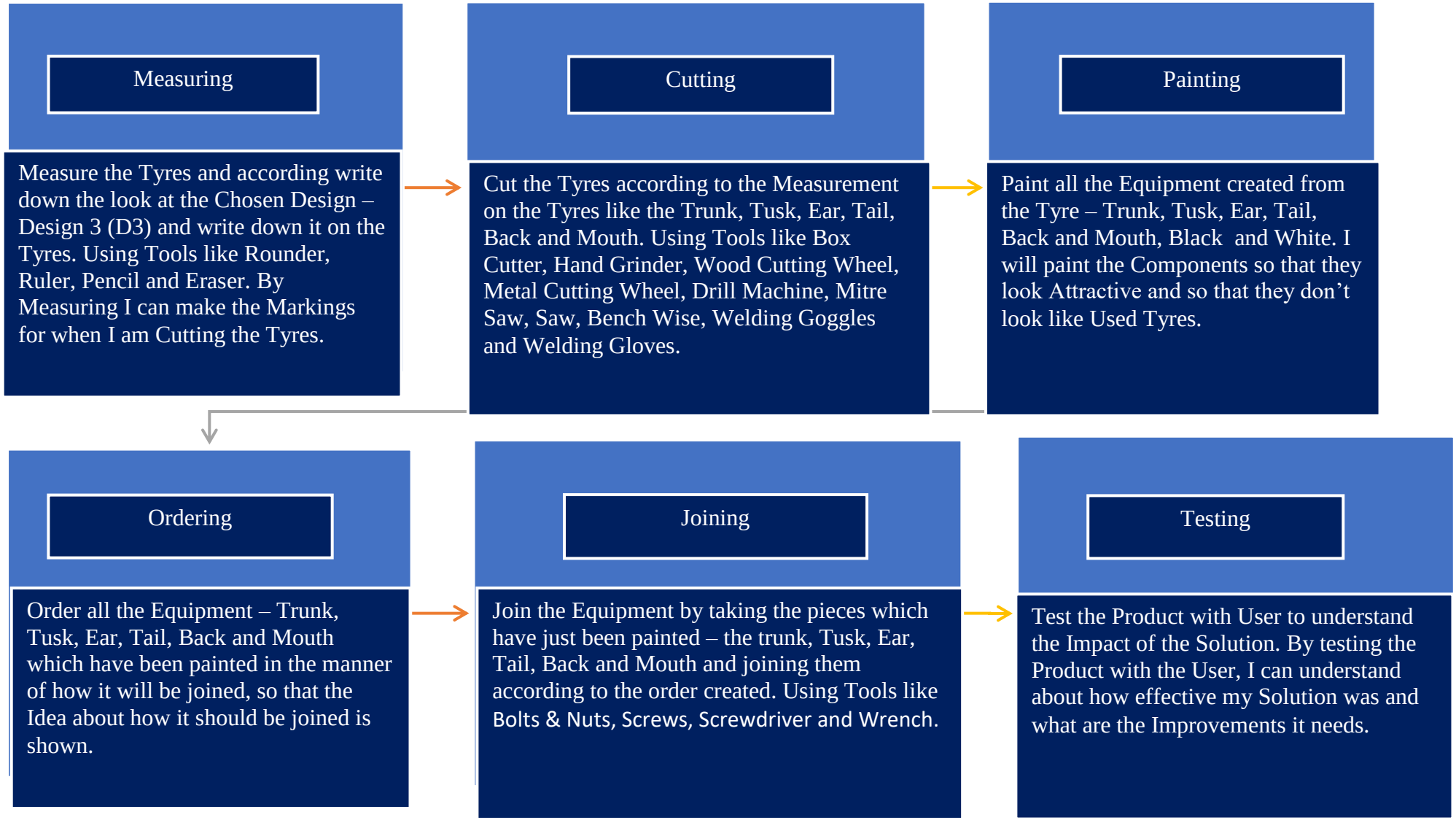
	doesn’t change the target audience and it doesn’t understand the value of recyclability and it doesn’t change the mindset or inspires them to use recyclable materials. The Product won’t follow the current trends of sitting structures made sustainably in the market by using recyclable materials.
Design 4 (7/11)	This is a highly aesthetically pleasing design as it looks like a Parrot and it uses a variety of colors – Red, Green, Blue, Yellow, White and Black. The Product costs below 7,500 Rupees. It functions as aa Parrot that is a swing. However, its safety is a concern as there is only 1 safety measure which is that there is a Cage that is covering the user but there is no safety measure for the child to get onto the Parrot or get out of the Parrot. In the Manufacturing process extra waste is produced there is an environmental impact as it doesn’t follow the principles of recyclability, reusability and sustainable design. But there are certain number of resources used for the Creation of the Product. The Size is appropriate as children can use it. The Product can change that the target audience understands the value of recyclability and it changes the mindset or inspires them to use recyclable materials. The Product follows the current trends of sitting structures made sustainably in the market by using recyclable materials.

Specification	Rating (1 – 9)	Chosen Design according to Design Specification
Aesthetics	9	The Design looks like an Elephant and it uses colors like Black, Brown and White to enlighten its appearance. Therefore, I have graded it 9.
Cost	9	The Cost of the Elephant Product will below 7,500 Rupees and it includes the accessories and manufacturing cost. Therefore, I have graded it 9.
Customer/Target Audience	9	The Product seems appropriate for the community centre that is the children of the Age 9 which is validated accurately by the opinions of the Target Audience. Therefore, I have graded it 9.
Environmental Impact	8	The Product is Environmentally Friendly and it accepts and follows the principles of recyclability, reusability and sustainable design. Therefore, I have graded it 8.
Function	8	Multiple children of average weight can sit on it and use the product effectively. Therefore, I have graded it 8.
Manufacturing	7	The Manufacturing process includes a process which is precise and it uses environmentally friendly methods. There is no pollution or extra waste generated during manufacturing. Therefore, I have graded it 7.
Materials	9	The Resources which will be used for the Creation of the Product is • Tyres. • Block of Pine Wood. • The Cutting Tools Processes which are Box Cutter, Hand Grinder, Wood Cutting Wheel, Metal Cutting Wheel, Drill Machine, Mitre Saw, Saw, Bench Wise, Welding Goggles and Welding Gloves. • Joining Tools which are Bolts & Nuts, Screws, Screwdriver and Wrench. Therefore I have graded it 9.
Safety	8	The Tyre won't break when a child sits on it and the supporting materials are strong enough to hold the Tyre. It doesn't not contain sharp edges which can hurt the child only smooth edges. Therefore, I have graded it 8.
Size	9	The product in length is of 90 cm and in height it is of 80 cm. The Length of the Tusks are 18 cm and the length of the ears are 29 cm. The Length of the bottom Half tyre is 56 cm and the Height of the bottom Half tyre is 23 cm. The Length of the upper Half tyre is 56 cm and the Height of the upper Half tyre is 30 cm. The Length of the Block of Wood is 78 cm and the Height of the Block of Wood is 4 cm. The Length of the Tail is 8 cm. Therefore, I have graded it 9.
Potential to Change Consumer Behavior	8	The Product can change that the target audience understands the value of recyclability and it changes the mindset or inspires them to use recyclable materials. Therefore, I have graded it 8.
Follows the correct trends	9	The Product follows the current trends of sitting structures made sustainably in the market by using recyclable materials. Therefore, I have graded it 9.

Strand 4 (Planning Diagrams):

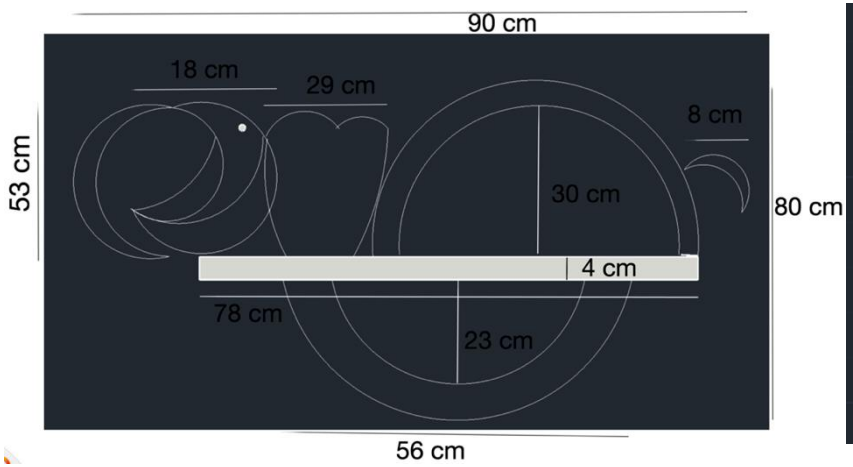
Material List:

Item	Quantity	Price/Cost
Tyre	3	₹ 2,000
Block of Pine Wood	1	₹ 500
Paint (Black)	2	₹ 200
Paint (White)	1	₹ 100
Box Cutter	1	₹ 260
Bolts and Nuts	20	₹ 60
Hand Grinder	1	₹ 400
Wood Cutting Wheel	1	₹ 25
Metal Cutting Wheel	1	₹ 25
Drill Machine	1	₹ 500
Screws	10	₹ 20
Mitre Saw	1	₹ 600
Wrench	1	₹ 200
Saw	1	₹ 700
Screwdriver	1	₹ 225
Bench Wise	1	₹ 1,000
Welding Goggle	1	₹ 192
Welding Glove	1 Pair	₹ 142
Cardboard	6	₹ 150
Rounder	1	₹ 20
Ruler	3	₹ 30
Pencils	6	₹ 18
Eraser	4	₹ 16
Blade	1	₹ 100
Total Price	₹ 7,283	

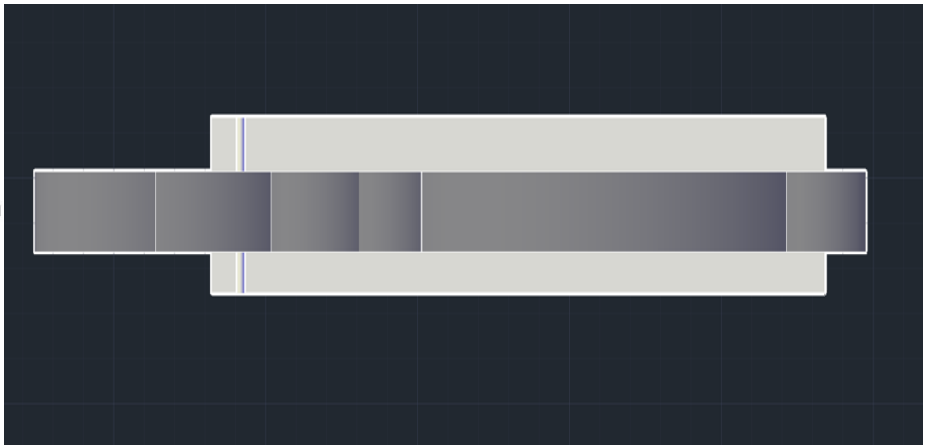

Measuring
Measure the Tyres and according write down the look at the Chosen Design – Design 3 (D3) and write down it on the Tyres. Using Tools like Rounder, Ruler, Pencil and Eraser. By Measuring I can make the Markings for when I am Cutting the Tyres.
Cutting
Cut the Tyres according to the Measurement on the Tyres like the Trunk, Tusk, Ear, Tail, Back and Mouth. Using Tools like Box Cutter, Hand Grinder, Wood Cutting Wheel, Metal Cutting Wheel, Drill Machine, Mitre Saw, Saw, Bench Wise, Welding Goggles and Welding Gloves.
Painting
Paint all the Equipment created from the Tyre – Trunk, Tusk, Ear, Tail, Back and Mouth, Black and White. I will paint the Components so that they look Attractive and so that they don't look like Used Tyres.
Ordering
Order all the Equipment – Trunk, Tusk, Ear, Tail, Back and Mouth which have been painted in the manner of how it will be joined, so that the Idea about how it should be joined is shown.
Joining
Join the Equipment by taking the pieces which have just been painted – the trunk, Tusk, Ear, Tail, Back and Mouth and joining them according to the order created. Using Tools like Bolts & Nuts, Screws, Screwdriver and Wrench.
Testing
Test the Product with User to understand the Impact of the Solution. By testing the Product with the User, I can understand about how effective my Solution was and what are the Improvements it needs.

Chosen Design on Auto Cad 2020

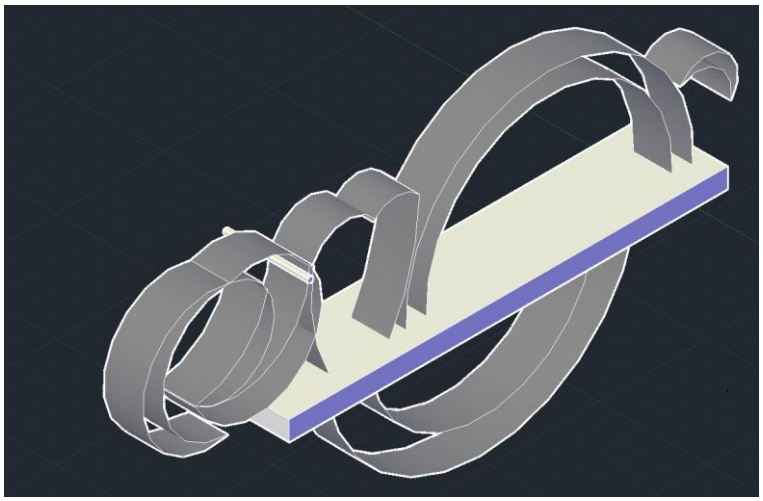
Side View:



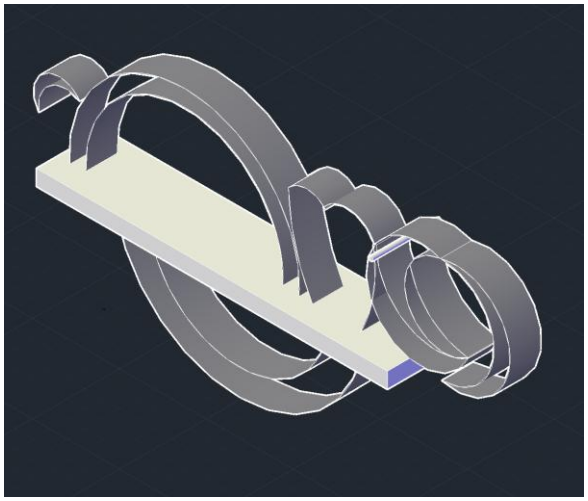
Top View:



Angled View:



Angled View:



Criteria C

Strand 1(Logical plan):

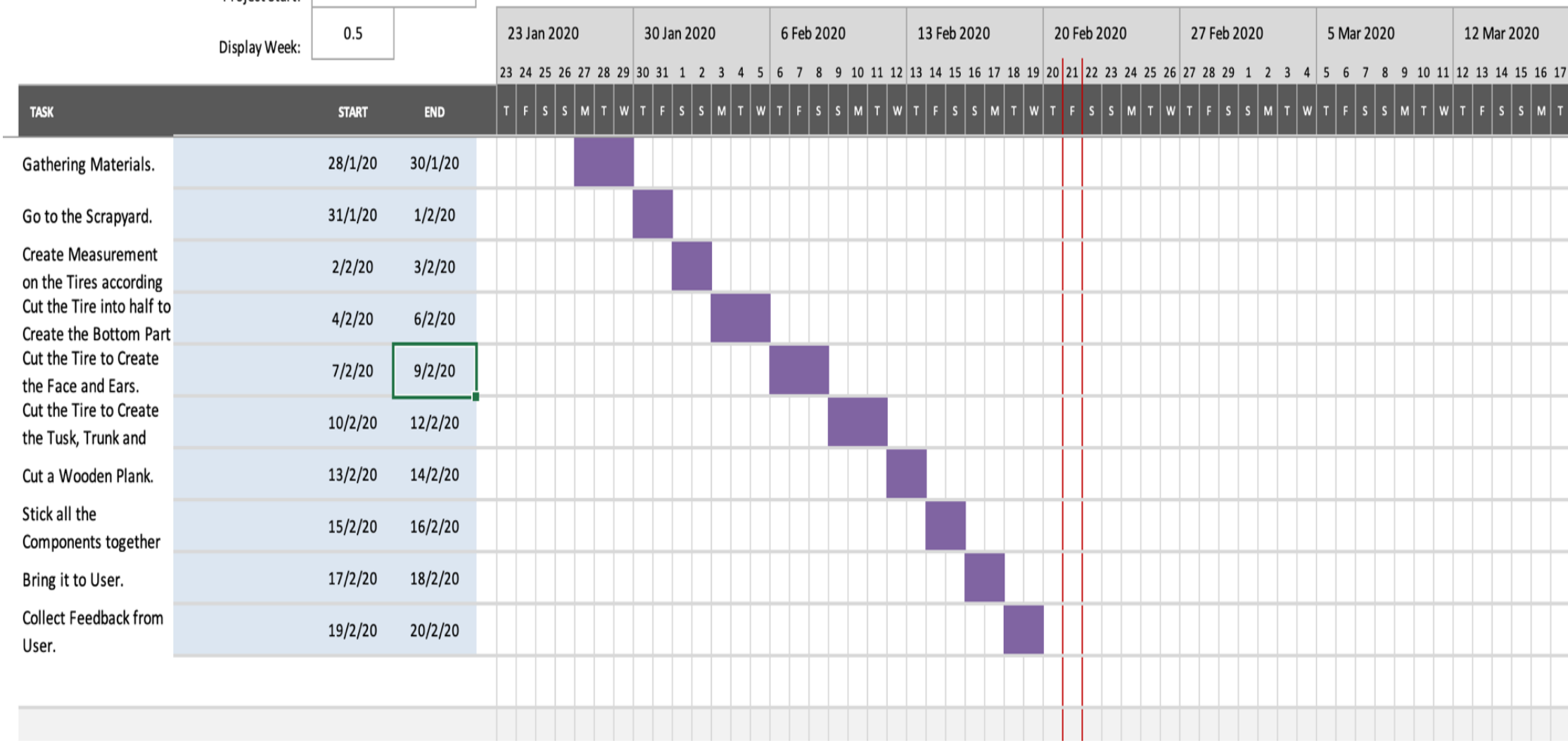
Steps	Descriptions	Resources	Material	Time Taken	Risk Assessment	Quality Checks
Gathering Materials.	This needs to be done first because it is about getting the materials for creating the product.	Stationary Store, Money and Transport.	–	2 days	–	Make Sure the Materials gathered are working and are according to the Material List.
Go to the Scrapyard.	This must be done to be able to get the most important Material for the Project – Tyres.	Money and Transport.	–	1 day	–	The Tyres must be Second Hand but not broken. It should be Sturdy and there are 3 Tyres of Medium Size.
Create Measurement on the Tyres according to the Chosen Design.	Do this to get the measurements by Cutting the Tyres to make an Elephant.	–	Pencil, Scale, Eraser and Measuring Tape.	1 day	Make Appropriate Measurements.	–
Cut the Tyre into half to Create the Bottom Part of the Chosen Design.	The needs to be done so that the bottom part of the Chosen Design is needed since it makes the Product into a Rocking Elephant.	–	Hand Grinder, Wood Cutting Wheel, Metal Cutting Wheel, Miter Saw, Box Cutter and Saw.	2 days	Use Sharp Tools with Care.	Drop Test.
Cut the Tyre to Create the Face and Ears.	This had to be done for creating the Face and Ears of an Elephant that is time consuming and it creates the Component with care, since it should be of Appropriate Size.	–	Hand Grinder, Wood Cutting Wheel, Metal Cutting Wheel, Miter Saw, Box Cutter and Saw.	2 days	Use Sharp Tools with Care.	Drop Test.
Cut the Tyre to Create the Tusk, Trunk and Tail as Extra Details.	Conduct this Process of creating the Extra Details to the Product to Show that the Product is an Elephant is time consuming. The Component also needs to be create with care, since it should be of Appropriate	–	Hand Grinder, Wood Cutting Wheel, Metal Cutting Wheel, Miter Saw, Bench Wise, Box	2 days	Use Sharp Tools with Care.	Drop Test.

	Size.		Cutter and Saw.			
Cut a Wooden Plank.	This needs to be done because the Wooden Plank is needed as it is a connection between all the Components of the Elephant.	–	Hand Grinder, Wood Cutting Wheel, Metal Cutting Wheel and Saw.	1 day	Use Sharp Tools with Care.	Drop Test.
Stick all the Components together according to the Design.	The components need to be connected together to create the Elephant that is showcased in the Design.	–	Drill Machine, Bolts, Nuts, Hammer, Screwdriver and Wrench.	1 day	Use Sharp Tools with Care.	–
Bring it to User.	Do this by transporting the Elephant to the User to collect the Feedback from the User.	Transport.	–	1 day	–	Bring the Product carefully.
Collect Feedback from User.	This needs to be done to collect feedback about the Elephant to understand about any improvements which are needed to be made.	–	–	1 day	–	–

Gantt Chart:

Project Start: Tue, 28/1/2020

Display Week: 0.5



TASK	START	END
Gathering Materials.	28/1/20	30/1/20
Go to the Scrapyard.	31/1/20	1/2/20
Create Measurement on the Tires according	2/2/20	3/2/20
Cut the Tire into half to Create the Bottom Part	4/2/20	6/2/20
Cut the Tire to Create the Face and Ears.	7/2/20	9/2/20
Cut the Tire to Create the Tusk, Trunk and	10/2/20	12/2/20
Cut a Wooden Plank.	13/2/20	14/2/20
Stick all the Components together	15/2/20	16/2/20
Bring it to User.	17/2/20	18/2/20
Collect Feedback from User.	19/2/20	20/2/20

Strand 2(Demonstrate Technical Skills):

Cutting the Tyre

I am demonstrating Technical Skills by Cutting a Tyre using Hand Grinder and the Wood Cutting Wheel to make the Elephant's Trunk. I am making this on 10th to 12th Feb.

Inserting Bolts and Nuts

I am demonstrating Technical Skills by Inserting Bolts and Nuts into the Head and Ears for joining them. I am making this on 15th and 16th Feb

Joining the Head and Ears to the Body of the Elephant

I am demonstrating Technical Skills by joining the Head and Ears of the Elephant to the Body. I am using Bolts and Nuts using a Wrench in this Process of creating the Product. I am making this on 15th and 16th Feb.

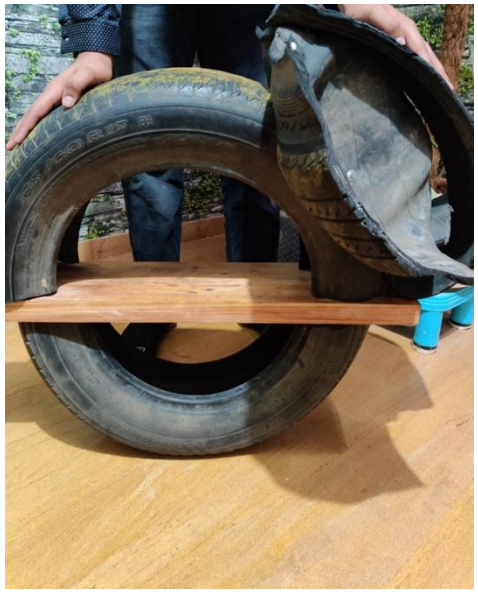
Strand 3(Follow the Plan to Create the Solution):

Cutting Tyre	Cutting Tyre	Joining parts
This is for Elephant's Trunk. Small tyre and splitted into two parts.	This is for Elephant's body. Chosen bigger tyre for this.	Joining Elephant's parts Trunk, Upper body and Ears.

Top View
This is the Top View of the Elephant which shows the Trunk, Ears and the Body (where the child will sit on the Elephant.

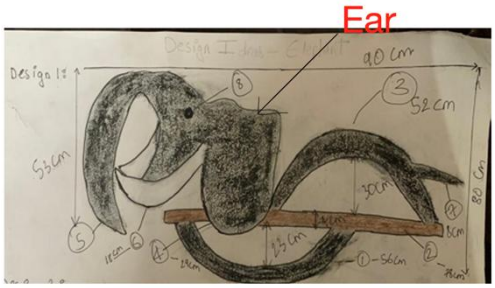
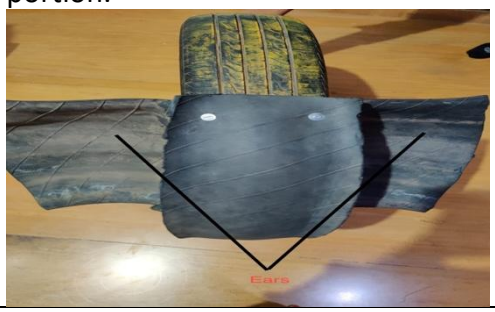
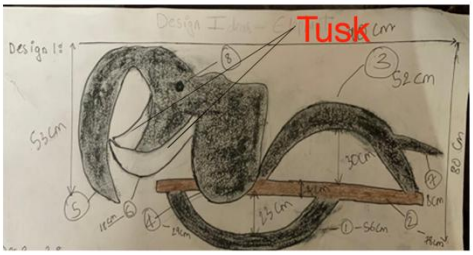
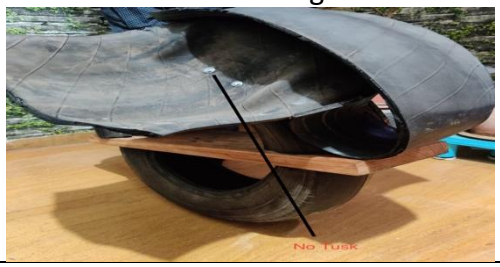
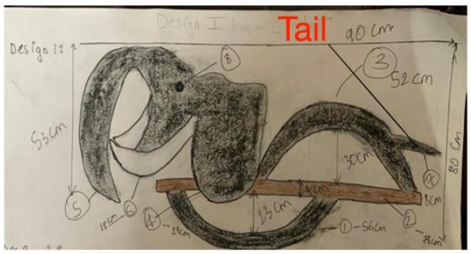
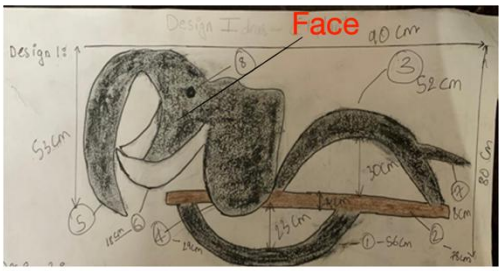
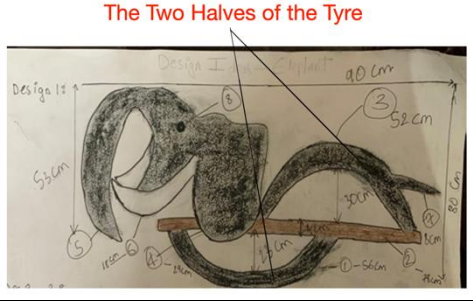
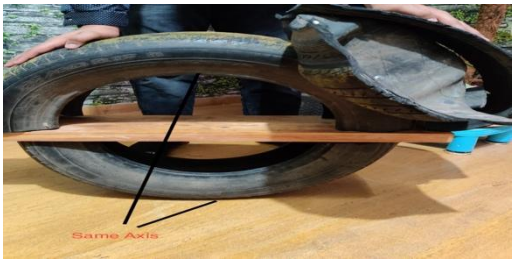
Angle View
This is the Elephant from an Angle, as it shows the Ears, the Trunk, the Wooden Plank and the bottom Tyre whose Function is to make the Elephant rock.

Back View
This is the Elephant from the Back, which shows mainly the Width of the Tyre where the Child will sit on.



Side View
This is the Elephant from the Side, that shows the Bottom Tyre, Wooden Plank, the Tyre where the Child will be sitting, the Trunk and the Ears of the Elephant.

Strand 4(Changes Made to the Design):

Sr No.	Design	Final Product
1	The original plan was to have the elephant ears hanging from the sides of the tyre. 	I made the ears stick with the face portion. 
2	The original plan was to fix a tusk protruding from the face/tyre. 	I could not make it fixed on the face and hence I decided to go without it. 
3	The plan was to have a tail sticking out at the backside of the tyre. 	I was unable to fix this and hence did not have this portion. 
4	The plan was to have the face of elephant in a concave design. 	I have made the phase with a convex model. 
5	The original design was to have two halves of the tyre placed on the plank NOT at the same axis. 	I have fixed the both portions of tyre on the wooden plank on the same axis. 

Criteria D

Strand 1(Design Testing Methods):

Specification	Testing method	Passing Criteria Measure the Success -> Success Criteria 4 – 5 -> Successful 2 – 3 -> Partially Successful 1 -> Not Successful
Does the Product look like an **Elephant** and does the colour (Black, Brown and White) enlighten its appearance.	User Trial	If the User gives the Result above 4 (out of 5) about whether if the Product looks like an Elephant and colour (Black, Brown and White) enlighten its appearance.
Is the **Cost** of 7,283 Rupees worth for the Elephant which includes the all accessories and manufacturing cost?	Marketing Expert (Mr. Harikrishnan)	If Mr. Harikrishnan approves the Cost of the Product which includes the all accessories and manufacturing cost used in Creating the Product is 7,283 Rupees.
Should the **Customer** for the Product be the Children below the Age of 9 in my community centre?	Marketing Expert (Mrs. Sreevidya)	If Mrs. Sreevidya approves that the Customer for the Elephant should be below the Age of 9 in my Community Centre.
Is the Product **Environmentally Friendly** and does it follow the principles of recyclability, reusability and sustainable design?	Marketing Expert (Mr. Harikrishnan)	If Mr. Harikrishnan agrees that the Product is Environmentally Friendly and it follows the principles of recyclability, reusability and sustainable design.
Does the Product **function** like a Elephant which will be suitable for children of age 9 to sit on it and to use it?	Performance Testing	If the Product functions like an Elephant which will be suitable for children of age 9 to sit on it and to use it.
Does the **manufacturing** of an Elephant include a process which is precise and it uses environmentally friendly methods?	Marketing Expert (Mrs. Sreevidya)	If Mrs. Sreevidya accepts that the process for manufacturing an Elephant is precise and it uses environmentally friendly methods.
Are the **Materials/Resources** Tyres, Block of Pine Wood, the Cutting Tools Processes which are Box Cutter, Hand Grinder, Wood Cutting Wheel, Metal Cutting Wheel, Drill Machine, Mitre Saw, Saw, Bench Wise, Welding Goggles and Welding Gloves and the Joining Tools which are Bolts & Nuts, Screws, Screwdriver and Wrench required to create the Elephant are Valid?	Marketing Expert (Mr. Harikrishnan)	If Mr. Harikrishnan approves that the Materials required to create the Elephant are Valid.
Does the Tyre break when a child sits on it and are the supporting materials strong enough to hold the Tyre. Does it contain sharp edges which can hurt the child or does it contain smooth edges which is **Safe** for the child.	User Trial	If the User gives the Result above 4 (out of 5) whether the Tyre won't break when a child sits on it and the supporting materials strong enough to hold the Tyre. Also does it contain sharp edges which can hurt the child or does it contain smooth edges which is **Safe** for the child.
Is the **Size** of the Elephant – length of the product	User Trial	If the User gives the Result above 4 (out of

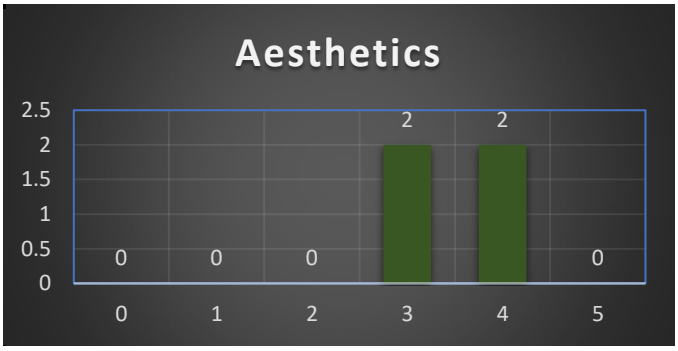
which is 90 cm and in height of the product which is 80 cm. The Length of the Tusks are 20 cm and the length of the ears are 30 cm. The Length of the bottom Half tyre is 60 cm and the Height of the bottom Half tyre is 27 cm. The Length of the upper Half tyre is 56 cm and the Height of the upper Half tyre is 30 cm. The Length of the Block of Wood is 83 cm and the Height of the Block of Wood is 7 cm. The Length of the Tail is 12 cm appropriate for a Child below the Age of 8 to use it?		5) about if the Elephant is of the appropriate Size for a Child below the Age of 8 to use it.
Does the target audience understand the value of recyclability and does it changes the mindset or inspires them to use recyclable materials?	Target Audience Observation	If the Target Audience gives the Result above 4 (out of 5) about whether the Product helps them understand the value of recyclability and it changes the mindset or inspires them to use recyclable materials.
Does the Product follow the current trends of sitting structures made sustainably in the market by using recyclable materials?	Expert Appraisal	If Mrs. Sreevidya agrees that the Product follows the current trends of sitting structures made sustainably in the market by using recyclable materials.

Strand 2(Evaluate Success of the Solution):

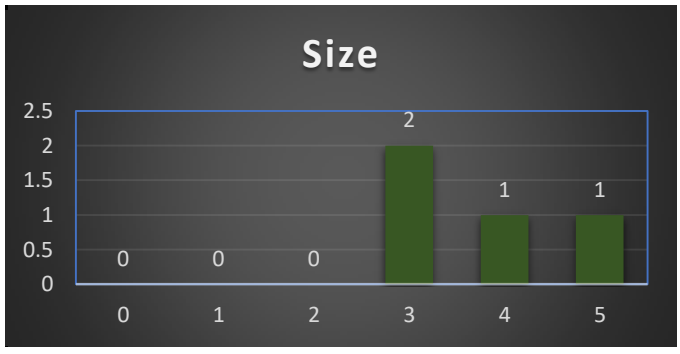
Specification	Outcome	Degree of Success
Does the Product look like an **Elephant** and does the colour (Black, Brown and White) enlighten its appearance?	50% of the Children who tried the Elephant rated it a 4 and 50% rated it 3. Which means that the Average Rating is 3.5.	Partially Successful
Is the **Cost** of 7,283 Rupees worth for the Elephant which includes the all accessories and manufacturing cost?	Mr. Harikrishnan says that he approves that the Cost for the Elephant as it includes all the accessories and manufacturing cost.	Successful
Should the **Customer** for the Product be the Children below the Age of 9 in my community centre?	Mrs. Sreevidya says that she approves that the Customer for the product is Children below the Age of 9 in my community centre, because of the Size of the Tyres being used to create the Elephant.	Successful
Is the Product **Environmentally Friendly** and does it follow the principles of recyclability, reusability and sustainable design?	Mr. Harikrishnan says the Tyres used aren't Environmentally Friendly but I am using it to stop it from Polluting the Environment and also it follows the principles of recyclability, reusability and sustainable design, thus he says he agrees.	Partially Successful
Does the Product **function** like a Product which will be suitable for children of age 9 to sit on it and to use it?	The Product functions like an Elephant which will be suitable for children of age 9 to sit on it and to use it.	Successful
Does the **manufacturing** of an Elephant include a process which is precise and it uses environmentally friendly methods?	Mrs. Sreevidya says that she accepts that the process for manufacturing an Elephant is precise and it uses environmentally friendly methods.	Successful
Are the **Materials/Resources** Tyres, Block of Pine Wood, the Cutting Tools Processes which are Box Cutter, Hand Grinder, Wood Cutting Wheel, Metal Cutting Wheel, Drill Machine, Mitre Saw, Saw, Bench Wise, Welding Goggles and Welding Gloves and the Joining Tools which are Bolts & Nuts, Screws, Screwdriver and Wrench required to create the Elephant are Valid?	Mr. Harikrishnan says that he approves that the Materials like Tyres, Block of Pine Wood, Mitre Saw, Bench Wise, Wrench and many more are required to create the Elephant are Valid.	Successful
Does the Tyre break when a child sits on it and are the supporting materials strong enough to hold the Tyre. Does it contain sharp edges which can hurt the child or does it contain smooth edges which is **Safe** for the child?	75% of the Children who tried the Elephant rated it a 5 and 25% rated it 3. Which means that the Average Rating is 4.5.	Successful

Is the **Size** of the Elephant – length of the product which is 90 cm and in height of the product which is 80 cm. The Length of the Tusks are 20 cm and the length of the ears are 30 cm. The Length of the bottom Half tyre is 60 cm and the Height of the bottom Half tyre is 27 cm. The Length of the upper Half tyre is 56 cm and the Height of the upper Half tyre is 30 cm. The Length of the Block of Wood is 83 cm and the Height of the Block of Wood is 7 cm. The Length of the Tail is 12 cm appropriate for a a Child below the Age of 8 to use it?	25% of the Children who tried the Elephant rated it a 5, 25% rated it 4 and 50% rated it 3. Which means that the Average Rating is 3.75.	Partially Successful
Does the target audience understand the value of recyclability and does it changes the mindset or inspires them to use recyclable materials?	60% of the Parents rated it a 5 and 40% rated it 4. Which means that the Average Rating is 4.6.	Successful
Does the Product follow the current trends of sitting structures made sustainably in the market by using recyclable materials?	Mrs. Sreevidya says that she agrees that the Product follows the current trends of sitting structures made sustainably in the market by using recyclable materials.	Successful

Rating whether the Product looks like an Elephant.



Rating whether the Size of the Product allows the Child to use the Elephant.



Rating whether it is Safe for a Child using the Elephant.

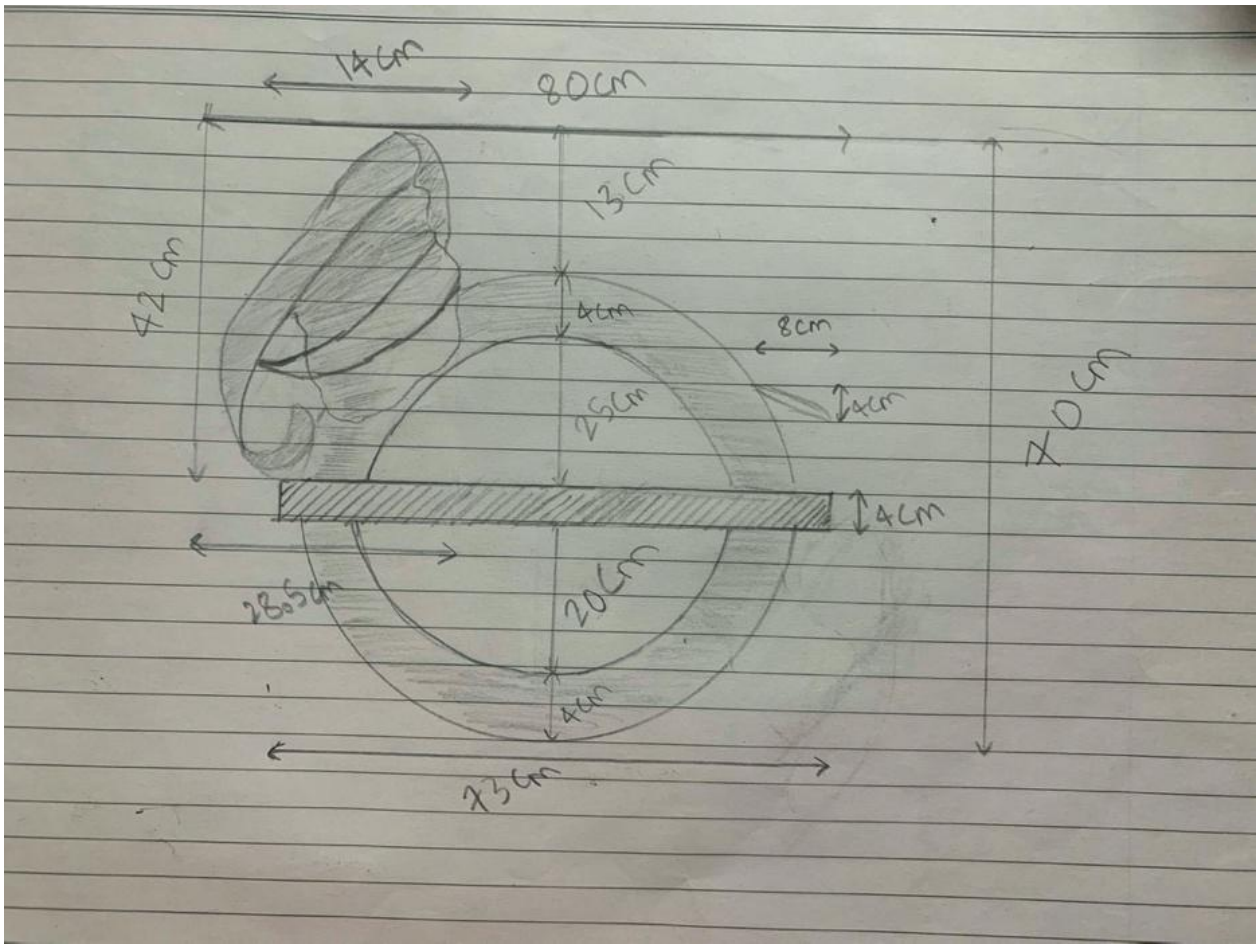
Rating whether the Product follows the current trends of sitting structures made sustainably in the market by using recyclable materials

Strand 3(Explain how the Solution can be Improved):

Sr No.	Weakness	Improvement	Justification
1	According to the Results, the Size of the Whole Elephant it **too big** which makes it very hard for the Child below the Age of 9 to sit on it.	The Aspect Ratio of the Elephant's Back Tyres should have been lower which could have made it easier for the child to get onto the Product. There should be Polished Stainless Steel on the side of the bottom tyres which can help the child to climb onto the Elephant. He can also use the support as a foot rest while on the Elephant. The Elephant could have been painted using aerosol spray and gel sponge. This Step can be done by spraying on the tyres after they all the fittings of the tyre is done.	This Error occurred because I used a bigger Tyre on top of the Wooden Plank for where the Child is sitting on. Due to this the Size of the Elephant was bigger than what was Anticipated. This occurred because I thought that I should use a Bigger Tyre on the Top of the Elephant so that this is not too small for a Child below the age of 9. Also I didn't know about the Measurement of the Tyre, as when I went to the Scrapyard the Person in Charge said that the Tyres are of the Same Measurement. Thus according to what was expected from my Project, I can state that this is a Weakness. The Elephant is not coloured and it of black colour only which is not appealing to the children, because finding the paint equipment, material and painting the Elephant was time consuming.
2	In the Product the ears aren't hanging from the Elephant.	The Trunk should have been made bulkier so that it could held the Ear and hanged from the Elephant.	The Ears weren't made hanging from the Elephant because it was hard to join the Ears to the Trunk as there was no thickness for the Trunk and it falling down and it wasn't safe.
3	In the Product the Tusks aren't there and they aren't protruding from the Face.	The Tusks could have been made from a swimming pool noodle which is cut in half, then cut in half in length wise, then a wire is added to bend it then shape it with duct tape after which add the plaster that covers the Tusk and makes it look like a tusk. This can be joined to the Face of the Elephant and then it will be protruding from the Face of the Elephant.	The Tusks couldn't have been created because I didn't have the proper material to create it. As using Aluminium Foil paper won't join to the Elephant and it will fall down and break easily.
4	In the Product there is no tail which is sticking out of the backside of the Upper Half Tyre.	The Tail could have been made from a swimming pool noodle which is cut in quarter and which is then covered by a Plaster. This can be joined to the back of the upper half tyre to. make a tail which is sticking from the back of the elephant.	The Tail couldn't have been created because I didn't have the proper material to create it. Because whichever material I used was breaking and falling from the Elephant.
5	In the Product the face of Elephant	The Face could have been joined to the Upper Half Tyre and the	The Face couldn't have been created because it was not joining to the Upper Half Tyre and it was

	is in a concave design and not a convex design.	Block of Pine Wood so that it doesn't fall off.	falling down.
6	In the Product the two halves of the tyre placed on the plank are placed at the same axis.	The bottom Half of Tyre could have been bigger so that even if the two halves of the tyre placed on the plank aren't placed at the same axis then the Elephant won't fall over and will remain at its position by maintaining its Balance.	The two halves of the tyre placed on the plank are placed at the same axis because the Elephant was falling over and I also wanted to keep its balance and make it remain at its position.

For this I have created a new Sketch which has all new Measurements according to the Feedback from the User.



Strand 4(Explain the Impact of the Solution):

The Aim of my Solution is to help the children under the Age of 9 by making an Elephant out of Tyre. The Rocking Elephant uses Used Materials in creating it, it uses Tyres which is the most Problematic and Challenging Sources of Solid Waste.
Tyres are very harmful when they are burned, they release Toxic Gases which affects all Living Beings at a severe Rate Tyres take up tremendous amount of Land Space which in turn creates Landfills that can lead to severe injury. Scrap Tyres can also cause a Pest Threat, because when the Water gets accumulated in the Tyres, they can be used by pests as Breeding Ground. These pests can also include Rodents, Cockroach and Wasp. By Reusing Tyres the Threat of Pest can reduce.
The Rocking Elephant made ingeniously from Scrap Tyres gives an Opportunity to Reuse Used Tyres. With a bit of Technical Labour, a couple of Used Tyres can be converted into very useful Playground Equipment. The Feedback I got from the Users (the kids in my Community Centre) who were under the Age of 9 was that the Product looks like an Elephant and the colour (Black, Brown and White) enlightens its appearance.

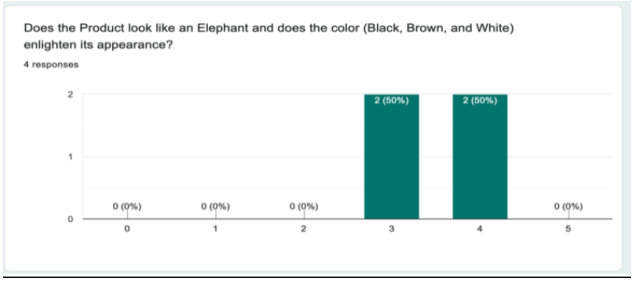


Image of the Feedback from User which shows the results for the Question – Does the Product look like an Elephant and does the colour (Black, Brown and White) enlighten its appearance?

I also received Feedback from the Target Audience (the parents in my Community Centre) which was the Product helps the Target Audience understand about the value of recyclability and it changes the mindset and inspires them to use recyclable materials.

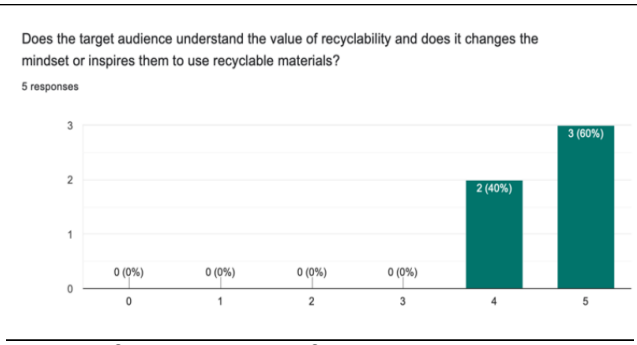


Image of the Feedback from Target Audience for the Question – Does the target audience understand the value of recyclability and does it changes the mindset or inspires them to use recyclable materials?

These Models if prepared in Large Scale can be placed in Corporations, Parks and Playgrounds. The Cost of Making the Rocking Elephant is relatively cheaper than buying the Readymade Playground Equipment. This can be implemented as a Small Scale Industry by Training the Technical Skills to Interested People. The Raw Materials are in Abundance because they are Used Tyres.
However a child below the Age of 4 should use my Solution only under Supervision because it can result in the kid losing Balance and Falling Down.
Another Negative Effect is that in creating the Rocking Elephant a Block of Pine Wood is used and if the Rocking Elephant is created at an Industrial Scale then a lot of Trees will be used in creating this Solution.

Impact through Global Context:-
The Solution helps to Reuse Unusable Tyres and thereby Reduce the Environmental Hazards. This can also result in the decreasing risk of filling Landfill Space.
My Solution also provides my User with a new playground equipment that encourages them to go to the playground and play with. As a Result, the Behavior of the Target Audience is changed as the Product made them understand about the value of recyclability and it changes the mindset and inspires them to use recyclable materials.

Bibilography

Budd, Christina. “Used Tire Rubber Car: Tire Playground.” *Pinterest*, Printerest, in.pinterest.com/pin/398146423281085038/.24 December 2019

“Choosing the Right Tire for Scrap Yards.” *Choosing the Right Tire for Scrap Yards*, Casmo, 24 Aug. 2015, camso.co/en/article/best-practices/choosing-the-right-tire-for-scrap-yards. 24 December 2019

“Cute Ways To Reuse Old Tires.” *Upcycle Art*, Upcycle Art, 19 Feb. 2020, www.upcycleart.info/diy-how-tos/cute-ways-to-reuse-old-tires/#1u9lqs3d.14250.pi. 25 December 2019

Frost, Joe, et al. “The Developmental Benefits of Playgrounds.” *Ooey Gooey, Inc.*, Ooey Gooey, Inc., www.ooeygooey.com/the-developmental-benefits-of-playgrounds/. 25 December 2019

Lundman, Susan. “What Are the Benefits of Installing Children's Playground Equipment?” *Healthfully*, 24 Dec. 2019, healthfully.com/239867-what-are-the-benefits-of-childrens-playground-equipment.html. 26 December 2019

“Natural Rubber Market Trends, Analysis, Size, Share, Forecast (2019-24).” *Market Research - Consulting, Reports, Advisory, Sizing*, Motor Intelligence, mordorintelligence.com/industry-reports/natural-rubber-market. 26 December 2019

“Need Expert Tire Recommendations? Buy Tires Online at RightTurn.” *Recycling Tire Facts - Recycling Tires*, RightTurn.com, www.rightturn.com/tire-guide/recycling-tires-facts/. 27 December 2019

ph1102. “Tokyo Tire Playground.” *Moolf*, Moolf, 13 Jan. 2017, www.moolf.com/interesting/tokyo-tire-playground.html. 29 December 2019

Pinas-Staff. “097 World's Biggest Tyre Graveyard: Kuwaiti Landfill Site That Is Home to SEVEN MILLION Wheels.” *Pinas Speech Material*, Pinas Speech Material, 5 Jan. 2014, material.pinasgroup.com/material_speech/?p=727. 29 December 2019

Roman, Betsy. “Motorcycle Seesaw Made out of Tire and Real Race Bike Handles. We Are Thinking about Adding Light in Front an...: Façons De Recycler, Vieux Pneus, Recycler Des Pneus.” *Pinterest*, Pinterest, in.pinterest.com/pin/398146423289729919/. 30 December 2019

taylor, Doug James. “World's Biggest Tire Graveyard: Incredible Images of Kuwaiti Landfill Site That Is Home to SEVEN MILLION Wheels and so Huge It Can Be Seen from Space.” *Doug Taylor's Blog*, Wordpress, 7 June 2013, 10:24 GMT, dougjtaylor.wordpress.com/2013/06/07/worlds-biggest-tyre-graveyard-incredible-images-of-kuwaiti-landfill-site-that-is-home-to-seven-million-wheels-and-so-huge-it-can-be-seen-from-space/. 30 December 2019

Trumino, Jessica. “Why Recycle Tyres.” *Oz Tyre Recyclers*, Oz Tyre Recyclers, www.oztyrerecyclers.com/why-recycle/.31 December 2019