

## LET US UPCYCLE (AGE 8 TO 10)

<b>Description:</b>	Learners will understand what upcycling means, and will upcycle 5 waste objects from their homes. They will then write the procedure to upcycle them as well and teach someone else to do the same.
<b>Leading question:</b>	How do I make the 'best' out of 'waste'?
<b>Age group:</b>	8 to 10
<b>Subjects:</b>	Literacy, Science, Mathematics, Art and Design
<b>Total time required:</b>	5 hours across 5 days
<b>Self-guided / Supervised activity:</b>	Supervised (Medium)
<b>Resources required:</b>	Plastic Bottle, Old newspapers, Old T-shirt, Straw, Shoebox lid (or any other type of lid), cardboard
<b>Previous Learning</b>	Basic number operations (+, -, /, x)
<b>Learning outcomes:</b>	<p><b>Literacy:</b> Use transition words and prepositions in sentences correctly. Create a manual with procedures on various topics. Give instructions to the audience for a given procedure. Write an empathetic response. Review and edit a written piece using a checklist.</p> <p><b>Science:</b> Explain the process of transforming fibre into fabric using common materials. Compare and contrast the use of plastic and paper.</p> <p><b>Math:</b> Calculate the area and perimeter of a rectangle.</p>

### Day 1 - T-Shirt to Grocery Bag

Time	Activity and Description																									
15 minutes	<p><b>Introduction to Upcycling</b> Ask learners: Do you like making new things? If there is one thing you would want to create today, what would it be and why?</p> <p>Learners will collect the following materials:</p> <p>An old t-shirt, a shoebox (or any type of box), a plastic bottle, and some old newspapers (or rough papers)</p> <table border="1" data-bbox="906 1667 1430 1892"> <thead> <tr> <th>Object</th> <th>Father</th> <th>Mother</th> <th>Sibling</th> <th>You</th> </tr> </thead> <tbody> <tr> <td>Old T-shirt</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Plastic bottle</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Old newspapers</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Shoebox Lid</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Object	Father	Mother	Sibling	You	Old T-shirt					Plastic bottle					Old newspapers					Shoebox Lid				
Object	Father	Mother	Sibling	You																						
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Learners have to ask members of their family on what they would do with these objects once they get old or have no use. Learners will note their responses in the following table:

Do all of them have the same ideas?

**Say:** Different people can look at the same object or situation in different ways.

Reflect: (based on the table)

1. Whose ideas do you like the most?
2. Whose ideas on these 'waste' materials are very different from yours?

**Say:** When we look at old objects, some people may see it as 'waste', and some may look at them as a way to make something new! There are 2 ways to reuse old things.

To **recycle** something means to completely break something down and make something new out of it. For example, this road in India is made from used plastics!



To upcycle means to use old things creatively and make something new out of them without changing its state too much.

For example, the plastic bottles in the image were upcycled to make toy cars.

Learners will look at the old t-shirt and write 2 new things they can create out of it. They will note their idea down.



10 minutes

### Fibre to Fabric

Learners will feel the t-shirt and think about the material it is made of. They will note down their thoughts in the following format:

- What do you see? (colour, print, texture of the material, etc.)
- What do you think about that?
- What does it make you wonder?

Then, they will ask their parents for the name of the material. Learners will discuss the following questions with their parents:

- What is the material used for?

- Collect some more different materials available at home. How are they different or similar to each other?
- Were these materials used in the past or are they more modern?

**Say:** There are different types of materials - cotton, wool, etc. How do t-shirts get made?

Learners will observe fibres in the t-shirt cloth. Fibers are thin threads from which the cloth is made. Learners will make a flowchart with their parents on how a cotton t-shirt is made.

Similarly, they can also make a flowchart on how silk or wool is made. Learners can stick pieces of fabric, or fibre to the chart with their drawings.



Cotton Fabric



Cotton Fibre



Silk Fabric



Silk Fibre

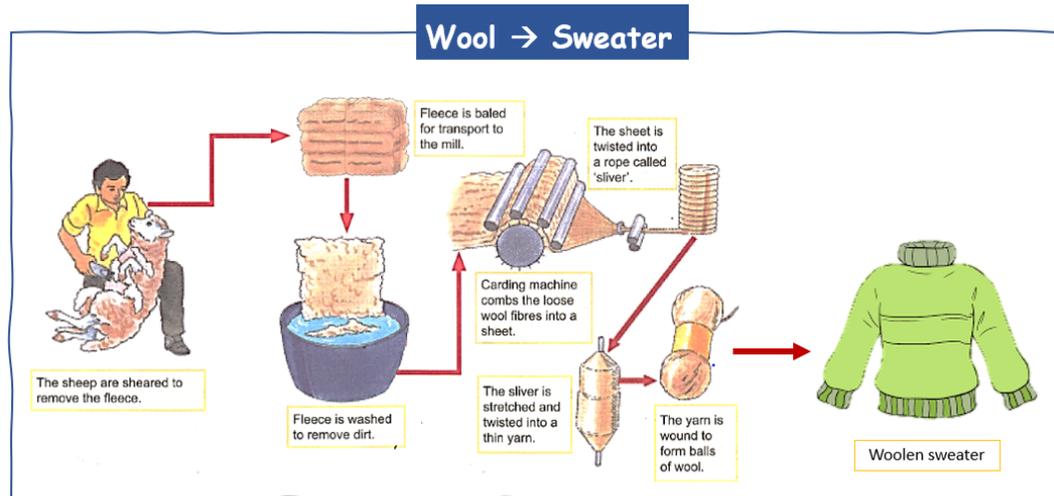
Below are some **guiding questions** to help the learners make the flow chart:

1. What is the material of the t-shirt?
2. What is the colour? How does it get its colour?
3. The t-shirt is made out of fabric. How is fabric made? Observe it closely. Can you see the cotton fibre?
4. How is the fibre made?
5. Where do we get cotton from?

Alternatively, draw each step on a piece of paper (the size of your palm) and get learners to arrange them in the correct order.

Below are some sample flowcharts for reference:





20 minutes

### Upcycling a T-shirt

Learners will upcycle the t-shirt using their own ideas. They can create any product they want using the t-shirt. Below is an example on how to upcycle a t-shirt.

Learners can follow these steps to change an old t-shirt into a grocery bag.

1. Cut the sleeves of the t-shirt off.
2. Cut the neckline area.
3. Find out how deep you want the bag to be and draw a line with a marker.
4. Cut fringes below the line using scissors.
5. Tie the fringes of the bag tightly together to make the base.
6. Your bag is ready!

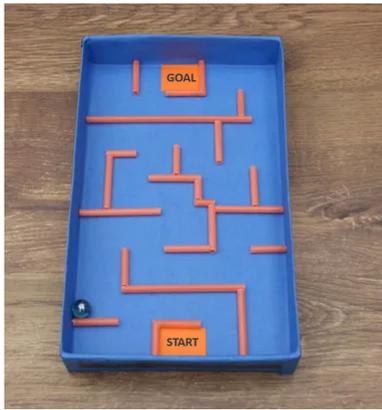
Below are the images for reference:

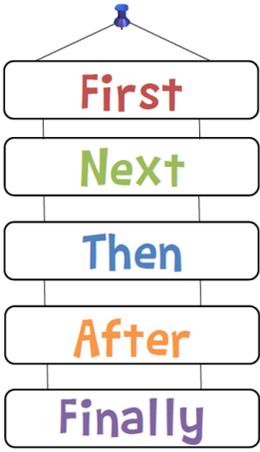


15 minutes	<p><b>Making a Manual (Procedural Writing)</b></p> <p>Ask:</p> <ul style="list-style-type: none"> <li>- List some manuals you have seen. (Ex: Instruction manuals, recipe books, etc.) <i>If learners have not seen any manuals, explain to them what they mean by taking a recipe book as an example.</i></li> <li>- How are manuals helpful?</li> <li>- If you want to explain to someone the steps to upcycle something, how would you do it?</li> <li>- If you have to create a manual with the various procedures to upcycle something, who would be reading it and why?</li> </ul> <p>Learners will make their 'Upcycling Manual' over the course of the project and beyond. In this manual, they will write the procedure to upcycle any item in the following format.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">                 Goal: _____                  Materials Needed: _____                  Steps:                  1. _____                  2. _____                  3. _____                  4. _____                  Use: _____             </td> <td style="padding: 5px; background-color: #fff9c4;">                 Cut    Stick                  Take   Pour                  Tie    Place                  Find   Fold                  Mark   Mix                  Measure   Put                  Add   Decorate             </td> </tr> </table> <p>In the 'Use' section, they can add a closing note and write how the new product can be used. Instruct the learners to use the verbs provided.</p> <p><b>Ask:</b> Where do you see procedures being written? (Recipe books, instruction manuals, etc.) How are procedures useful? (They give clear instructions on how to achieve something.)</p> <p>Learners can stick pictures or draw each step for the reader to understand the step clearly.</p>	Goal: _____ Materials Needed: _____ Steps: 1. _____ 2. _____ 3. _____ 4. _____ Use: _____	Cut    Stick Take   Pour Tie    Place Find   Fold Mark   Mix Measure   Put Add   Decorate
Goal: _____ Materials Needed: _____ Steps: 1. _____ 2. _____ 3. _____ 4. _____ Use: _____	Cut    Stick Take   Pour Tie    Place Find   Fold Mark   Mix Measure   Put Add   Decorate		

## Day 2 - Shoebox Lid to Toy Maze

Time	Activity and Description
20 minutes	<p><b>Perimeter and Area of a Rectangle</b></p> <p>Say: We will be creating a toy out of this shoebox! You can create more toys by upcycling waste materials and distributing it to children in your community.</p> <p>Learners will note down 2 ways they can upcycle a shoebox in their notebook. Learners can do the upcycling in their free time.</p>

	<p>Learners will take a shoebox lid and cover its inner part with colour paper through the following steps:</p> <ol style="list-style-type: none"> <li>1. Measure the sides of the base of the lid using a ruler. The unit used to measure is 'centimeters' (cm) Are the opposite sides equal to each other? This shape is called a 'rectangle'. The longer side is called the <b>length</b>. The shorter side is called the <b>breadth or width</b>. If all four sides are equal to each other, the shape is called a 'square'.</li> <li>2. To find how much area the shaper covers, multiply the length and breadth. <b>Area = Length x Breadth or width</b>. The unit of area is cm<sup>2</sup>.</li> <li>3. Draw the shape using the length and breadth on the coloured paper, using a ruler.</li> <li>4. Place the coloured paper on the base of the box and glue it down. Are the areas equal? If they are not equal, calculate the difference between the two areas.</li> <li>5. You can decorate the borders using a ribbon, coloured sheets, string, etc. The total length of the border is called the 'perimeter' of the shape. We simply add the sides to find this. Perimeter = Length + Breadth + Length + Breadth Since the length and breadth is added twice, we can also multiply them by 2. <b>Perimeter = 2 x (Length + Breadth)</b> The perimeter is expressed as a cm value, for example, 10 cm.</li> <li>6. Cover the rest of the inner part of the lid in the same way.</li> </ol>
20 minutes	<p><b>Upcycling a Shoebox</b></p> <p>Now that we have covered the shoebox lid, let us make the maze! Learners will follow these steps:</p> <ol style="list-style-type: none"> <li>1. On any edge of the lid, stick a small piece of square paper. Write 'GOAL' on it.</li> <li>2. On the opposite edge, stick a small piece of square paper. Write 'START' on it.</li> <li>3. Draw the maze with a pencil and ruler. Follow the example below or create your own maze.</li> <li>4. Cut pieces of straw by measuring the length of the lines with a ruler and paste them on the lines.</li> <li>5. Use a marble to play the game. The player must take the marble from 'START' to 'GOAL' only by moving the shoebox lid to get the marble rolling.</li> </ol> <p>Below is a sample:</p> 

15 minutes	<p><b>Procedural Writing Using Transition Words</b>  <b>Ask:</b> How would you help someone go to the market from your house? (By giving directions)</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">  </div> <div> <p><b>Say:</b> In the same way, through writing, we can help the reader go from one idea to another by using some words that will direct them. These are known as 'transition words'.</p> <p>The learners can make this transition words poster using a string and paper or draw it on a chart.</p> <p>We add these words at the beginning of a step while we write a procedure and can even use these words in stories to tell the reader what happens first, next, and at the end.</p> <p>Learners will write the procedure of upcycling a shoebox lid in their manual using the transition words for each step.</p> </div> </div>												
5 minutes	<p><b>Self-Review Checklist</b>  Learners will use the checklist given below to review their procedural writing piece. (A parent can assist the learner in reviewing their work.)</p> <table border="1" data-bbox="365 1003 1442 1402"> <thead> <tr> <th style="background-color: #fff9c4;">Question</th> <th style="background-color: #fff9c4;">Yes/No</th> </tr> </thead> <tbody> <tr> <td>Have I followed the format? (Goal, Materials, Steps, and Use)</td> <td></td> </tr> <tr> <td>Have I started every sentence with a capital letter?</td> <td></td> </tr> <tr> <td>Have I used the correct spellings?</td> <td></td> </tr> <tr> <td>Have I added a full stop after each sentence?</td> <td></td> </tr> <tr> <td>Have I used transition words correctly? Underline three.</td> <td></td> </tr> </tbody> </table> <p>Learners will correct the errors based on the checklist.  Get the learners to reflect on the following question:  - What have I learned about my strengths and what areas are in need of improvement today?</p>	Question	Yes/No	Have I followed the format? (Goal, Materials, Steps, and Use)		Have I started every sentence with a capital letter?		Have I used the correct spellings?		Have I added a full stop after each sentence?		Have I used transition words correctly? Underline three.	
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### Day 3 - Plastic Bottle to Piggy Bank

Time	Activity and Description
5 minutes	<p><b>The Impact of Plastic</b>  <b>Ask:</b> What is your weight? (Learner answers in kgs)  We normally use kilograms to express weights of big things, such as ourselves!</p>

	<p>A 1000 kgs is called a 'Tonne'/ton. Let us find out how many of you will be needed to make 1 tonne! Use this formula → <math>1000 / \text{Your weight}</math>.</p> <p>Can you guess how many tonnes of plastic we throw in our oceans each year? Learners will note down their guess. We produce about <b>11,000,000 tonnes</b> of plastic every year!</p> <p>Many materials that come from animals or nature, such as cotton, silk, or wool are <b>biodegradable</b>, which means that they can break-down and go back into our soil. But plastic is made from chemicals and it stays on Earth forever. Over 1 million animals in the ocean are killed because of plastic each year - plastic that floats on the sea blocks sunlight, it has harmful chemicals, and strangles animals too.</p>
10 minutes	<p><b>Speech Writing</b> Get the learners to observe the following images:</p> <div data-bbox="402 814 927 1213"> </div> <p>Imagine you are an animal living in the ocean.</p> <p>Write a speech, addressed to the ones responsible for causing you and your friends harm, expressing how much damage they are causing to the oceans and your lives.</p> <p>Learners can use the sentence starters and format given below:</p>

Hello world!  
I hope all of you are enjoying your morning. However, we do not get to.  
The plastic you use kills millions of us everyday. It \_\_\_\_\_,  
\_\_\_\_\_, and \_\_\_\_\_.  
My question for you is this: \_\_\_\_\_.  
I feel that \_\_\_\_\_.  
We all share our planet Earth and we all deserve to live. So, I urge you to  
think about \_\_\_\_\_.  
Let us discuss some actions we can take towards this.  
Firstly, \_\_\_\_\_  
Next, \_\_\_\_\_  
Lastly, \_\_\_\_\_  
Let us hope for a brighter future for my friends in the ocean and for  
you.

25 minutes

### Upcycling a Plastic Bottle

Given all the dangers plastic causes, we have to reuse items like plastic bags and bottles, recycle plastic items by throwing them in a recycling bin in the area, and upcycle plastic as much as possible.

Learners will write how they would upcycle a plastic bottle. They can upcycle their bottle based on their idea in their free time.

Learners can then follow these steps to make a piggy bank out of plastic bottles.

1. Clean and dry the bottle.
2. On the side of the bottle, cut a slot big enough to send a coin through.
3. Seal the edges with glued paper or tape to prevent any tearing.
4. Cover the rest of the bottle with the paper and paint it or make patterns.
5. You can even make it look like a pig with some basic paper sticking.
6. Your money bank is ready!

Below are some images for reference:



#### Ask:

Did you have a similar idea on upcycling a plastic bottle?

How can you use this piggy bank?

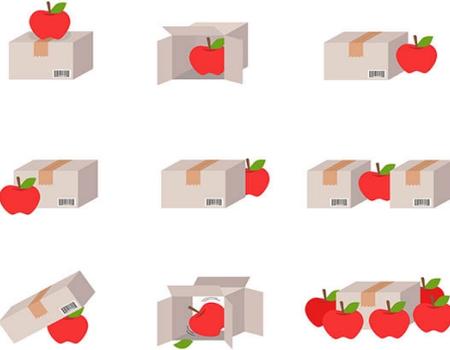
How much money will you save every day?

Discuss with your parents why it is important to save money and come up with a saving goal for every month. Discuss what you would do with the money you have saved.

15 minutes

### Using Prepositions

When we write or speak about something, we often talk about time, place and locations. Prepositions are words that show us time, place or movement. For example, in, on, at, above, under, over, etc.



For learners who are not familiar with prepositions, conduct the following activity:

Show/draw this visual and get learners to write sentences using the following prepositions for each image.

Beside	Under
On	In front of
In	Through
Between	Around

Refer to the answers below:

The apple is <b>on</b> the box.	The apple is <b>in</b> the box.	The apple is <b>beside</b> the box.
The apple is <b>in front of</b> the box.	The apple is <b>behind</b> the box.	The apple is <b>between</b> the boxes.
The apple is <b>under</b> the box.	The apple moves <b>through</b> the box.	The apples are <b>around</b> the box.

Alternatively, for older learners, get them to **write their own sentences** using these prepositions.

Learners will write the procedure to upcycle a plastic bottle in their manual using appropriate transition words and prepositions.

5 minutes

### Self-Review Checklist

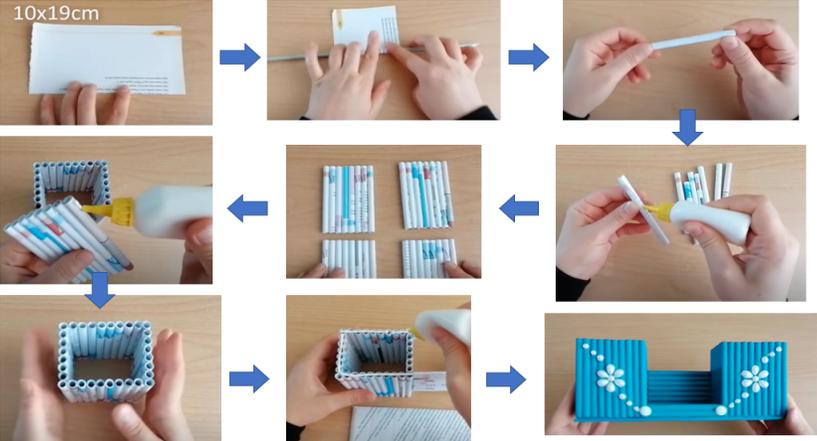
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Have I started every sentence with a capital letter?	
Have I used the correct spellings?	
Have I added a full stop after each sentence?	

	Have I used transition words correctly? Underline three.
	Have I used prepositions correctly? Underline three.
Learners will correct the errors based on the checklist. Get the learners to reflect: How did my mindset affect how I approached my work?	

### Day 4 - Newspaper to Pencil Stand

Time	Activity and Description
15 minutes	<p><b>Ask:</b></p> <ul style="list-style-type: none"> <li>- If a piece of paper and plastic were kept in soil, what would you observe after a few weeks? (<i>Paper will decompose, which means they can break down into smaller substances and go back into the soil. But the plastic stays as is.</i>)</li> <li>- How long do you think it will take for plastic to decompose? (<i>It can't decompose.</i>)</li> <li>- Take any plastic material in your house, such as a bottle, packet, toothbrush, etc. What happens to it after you use and throw it? Will it stay on Earth forever?</li> <li>- What do you predict will happen to our planet if we keep using and polluting it with plastic?</li> </ul> <p><b>Say:</b> While plastic stays on earth forever and cannot go back into the soil, paper can. Paper is made from wood, while plastic is made using only chemicals.</p> <p>Learners find out how paper is made by discussing it with their parents. The image below can be used for reference:</p> <div style="text-align: center;"> </div> <p><b>Ask:</b></p> <ol style="list-style-type: none"> <li>1. What is more harmful for the Earth - plastic or paper?</li> <li>2. Observe some objects in your home that are made of plastic. What will happen if paper is used instead of plastic to make it?</li> </ol>

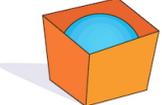
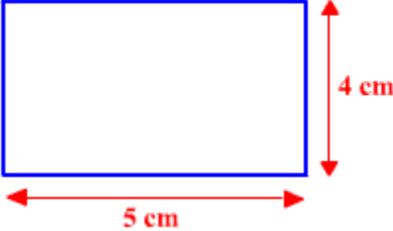
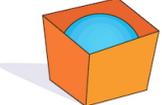
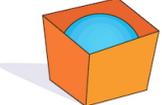
	<p>3. What are some things that can be made from paper instead of plastic?</p>
<p>30 minutes</p>	<p><b>Upcycling Old Newspapers</b> Learners will note down ways they can upcycle old newspapers. They can proceed to collecting materials and upcycling the newspaper <b>based on their own ideas</b>.</p> <p>Below is an example of how to upcycle old newspapers into a pen-stand. Learners will follow these steps to make a pencil stand out of newspapers:</p> <ol style="list-style-type: none"> <li>1. Cut old newspapers into 20 parts with 19 cm length and 10 cm breadth each.</li> <li>2. Use a straw or a toothpick to roll each newspaper cut out around it. Close the edge of the paper with glue so that you form a pipe. Do this for all 20 parts.</li> <li>3. Stick the edge of 6 pipes together using glue. Do the same for another 6 pipes.</li> <li>4. Stick the edge of 4 more pipes together using glue. Do the same for another 4.</li> <li>5. Stick the bunch of pipes together to form a pencil stand.</li> <li>6. Measure the length and breadth of base of the stand. Cut the same size on a cardboard and glue the pencil stand on it.</li> <li>7. You can paint your pencil stand or decorate it using beads and coloured papers!</li> </ol> <p>Use the image below for reference:</p> 
<p>10 minutes</p>	<p><b>Create Your Own Material</b> Say: We have learnt about different materials - cotton, paper, plastic, silk, etc. Now let us create our own!</p> <p>The learners will imagine they are scientists and create their own material by answering the following questions:</p> <ol style="list-style-type: none"> <li>1. How does it look? (colour, texture)</li> <li>2. How does it feel?</li> <li>3. Does it sink or float in water?</li> <li>4. What are some other properties it has?</li> <li>5. How can it be used?</li> <li>6. Does it help the Earth? why?</li> </ol> <p>Draw the material in your notebook!</p>

10 minutes	<p><b>Exhibition</b></p> <p>Learners will display their upcycled products and conduct an exhibition for their family. They will explain the following for each product:</p> <ol style="list-style-type: none"> <li>1. Why is upcycling this material important?</li> <li>2. What is the procedure? (The Upcycle Manual can be used to explain.)</li> <li>3. How can the product be used?</li> <li>4. What are other ways of upcycling the original product?</li> <li>5. Why is it important to upcycle this material?</li> </ol>
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<b>Additional enrichment activities:</b>	<ol style="list-style-type: none"> <li>1. Learners can upcycle more old or waste products in their homes and add their ideas in the manual. Below are some ideas for upcycling plastics: <a href="https://sheroes.com/articles/best-out-of-waste-ideas/NjkzNw==">https://sheroes.com/articles/best-out-of-waste-ideas/NjkzNw==</a></li> <li>2. Numeracy Extension: Learners can measure angles of a rectangle to arrive at the conclusion that all angles in a rectangle measure 90 degrees. They can do this by measuring the angles of a shoebox lid using a protractor.</li> <li>3. Learners can make their own paper at home: <a href="http://www.pennilessparenting.com/2012/05/making-homemade-paper-from-trash-no.html">http://www.pennilessparenting.com/2012/05/making-homemade-paper-from-trash-no.html</a></li> </ol>
<b>Modifications for simplification</b>	<ol style="list-style-type: none"> <li>1. Learners can choose any other product to upcycle in a simpler manner instead of the examples mentioned. For example, cutting a plastic bottle into halves to make a pencil stand.</li> <li>2. If learners do not know long division, they do not need to do the calculations related to it.</li> </ol>

## Assessment

<b>Knowledge</b>	<p>1. Fill in the blanks by choosing the correct preposition:</p> <table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">  </td> <td> <p>The boy is _____ the box.</p> <p>(behind / in front of)</p> </td> </tr> </table>		<p>The boy is _____ the box.</p> <p>(behind / in front of)</p>
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	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 30%;"></td> <td>The lion is _____ the bushes. (between / around)</td> </tr> <tr> <td style="text-align: center;"></td> <td>The ball is _____ the box. (in / under)</td> </tr> </table> <p>2. Fill in the blanks using the correct transition word from the box given below:</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="width: 33%;">Next</td> <td style="width: 33%;">First</td> <td style="width: 33%;">Finally</td> </tr> </table> <p style="text-align: center;"><b>How to make breakfast</b></p> <ol style="list-style-type: none"> <li>1. _____, take two slices of bread.</li> <li>2. _____, spread butter and jam on one side of each slice.</li> <li>3. _____, put the slices together and it is ready!</li> </ol> <p>3. Observe the shape given below:</p> <div style="text-align: center;">  </div> <ol style="list-style-type: none"> <li>(a) Which shape is it?</li> <li>(b) Find the perimeter of the shape.</li> <li>(c) Find the area covered by the shape.</li> </ol>		The lion is _____ the bushes. (between / around)		The ball is _____ the box. (in / under)	Next	First	Finally
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	The ball is _____ the box. (in / under)							
Next	First	Finally						
<p><b>Skill</b></p>	<ol style="list-style-type: none"> <li>1. How would you upcycle a plastic bottle? Write the procedure to do so. Draw images, if needed.</li> <li>2. Below are the steps done to make a cotton T-shirt. Arrange them in the correct order by writing the correct step number below each picture.</li> </ol>							
<p><b>Discover/ Conceptual</b></p>	<ol style="list-style-type: none"> <li>1. How is plastic more harmful to our Earth than paper?</li> <li>2. How will you reduce the use of plastic in your home?</li> </ol>							

<b>21st Century Skill</b>	<p><b>Communication:</b> Exhibiting the upcycled products to family members and delivering a presentation on the procedure.</p> <p><b>Creativity:</b> 1. Creating an 'Upcycle Manual' 2. Creating your 'own material' and explaining its properties. 3. Listing other ways to upcycle a waste product.</p> <p><b>Critical Thinking:</b> 1. Writing an empathetic response as an aquatic animal, highlighting how plastic pollution affects their lives. 2. Analysing different ideas on upcycling a waste product and its use.</p>
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