



## **Litter Topic: A week of lesson plans (cross curricular)**

**Lesson 1 – An Introduction to litter and a Quiz**

**Lesson 2 – Litter art (Art)**

**Lesson 3 – Making potato plastic (Science)**

**Lesson 4 – The Water Cycle and Litter (Geography)**

**Lesson 5 – The Great Ocean Plastic Problem – new solutions (Science/Geography)**



## Lesson 1 – Introduction to litter

Subject: PSHE/Topic		Year: (Suitable for any KS2 class)	Class:
Date:		Day:	Time/session:
<b>Topic: Litter</b>		Links to National Curriculum: Y4 Science – environmental change and threats to living things	
<b>Learning objectives:</b> Introduction to litter – at the end of this lesson children will have explored what litter is and possible reasons why people litter.			
<b>Time</b>	<b>Lesson structure</b>	<b>Teacher notes/structure</b>	
	<b>Starter: What is litter?</b> Show Pictures of litter and animals trapped in litter. Discuss where litter comes from. Ask class to discuss what we could do in our local area to help. Likely ideas: not drop litter ourselves, ask people not to litter – draw a poster. Go on a litter pick around the school. Reduce amount of plastic we buy. Tell friends and family about problem/solutions	Paired talking: Teacher asks “What is litter?” Report back to class Questioning: How do these pictures make you feel? Have you seen anywhere around the school that looks like this? What can we do? What do you think causes litter in our area? Why is plastic a problem? Let’s come up with a plan... How do I know all students have made progress?	
	<b>Plenary:</b> Quiz Reminder of what we can do – pledge to reduce litter by using bins provided, educate friends and family and do a litter pick	Quiz at end of lesson (see separate Powerpoint)	
<b>Differentiation:</b> Be careful to warn sensitive children that the pictures are coming up and may upset them. Be sure to reassure children that these animals were rescued and lived long and happy lives after the photo. Be positive about the actions we can do to help.			
<b>Links to literacy/numeracy:</b> Class discussion. This could be written up in literacy books – report/debate on litter.		<b>Key words/terms:</b> Litter Marine litter Ocean plastics	
<b>Resources:</b> Pictures of litter Powerpoint Smartboard		<b>Homework:</b> Draw a poster to stop people dropping litter	
<b>Use of TA (or other adults):</b> Support any children with difficulty reading the board to help interpret slides.		<b>Evaluation:</b>	



## Lesson 2 – Litter Art

Subject: Art	Year: (Suitable for any KS2 class)	Class:
Date:	Day:	Time/session:

<b>Topic: Litter</b>	Links to National Curriculum Art & design: Improve mastery of art with different techniques and learn about some different artists.
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Learning objectives: To explore ways of turning litter into art
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Time	Lesson structure	Teacher notes/structure
	<b>Starter: Can litter be art?</b>	Paired talking: Teacher asks “Can litter become art?”  Report back to class
	Show Pictures of litter art  Plan art  Recap where litter comes from.  Collect resources.  Create art!	Questioning: How do these pictures make you feel?  Would you like to create some litter art of your own?  Let’s come up with a plan...give 5 minutes thinking/planning time.
	Plenary: Criticise your art – are you happy with it? What could have gone better? How would you improve it next time?	How do I know all students have made progress?  They have created and critiqued their own art by the end of the lesson

Differentiation: Make sure children can all access the art supplies and understand the task. Some children may need further guidance, especially those with processing difficulties or who are not confident/resilient.
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Links to literacy/numeracy:	Key words/terms: Litter Marine litter Ocean plastics
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Resources: Bag full of litter (rubbish – packaging, beachcombed materials, found objects) Powerpoint Smartboard Further info:	Homework: Make a note of any litter you see on the way home – what could you make from it?
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Use of TA (or other adults): Support any children who will have difficulty producing a work of art within the lesson time	Evaluation:
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## Lesson 3 – Making Potato Plastic

Subject: Science	Year: (Suitable for upper KS2)	Class:
Date:	Day:	Time/session:

<b>Topic: Litter</b>	Links to National Curriculum: Working scientifically – following instructions to conduct a practical experiment.
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<p>Learning objectives: To make plastic from potatoes</p> <p>NOTE: This lesson could be extended into a series of experiments to investigate how different proportions of glycerine affect the properties of the plastic produced.</p>
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Time	Lesson structure	Teacher notes/structure
	<p><b>Starter: The problem with plastics</b></p> <p>Video: <a href="https://youtu.be/73sGgmZoMBQ">https://youtu.be/73sGgmZoMBQ</a> (up to 5:35, as figures out of date) Link: <a href="http://www.bbc.co.uk/news/science-environment-42264788">http://www.bbc.co.uk/news/science-environment-42264788</a></p> <p><u>Extracting the starch from the potatoes</u></p> <ol style="list-style-type: none"> <li>1) Wash and peel the potato</li> <li>2) Cut the potato up into cubes about 1cm<sup>2</sup></li> <li>3) Add about 250ml of water and the cubes to the blender, and turn it on high for a minute or two.</li> <li>4) Strain off the cloudy water using a coffee filter or jelly bag.</li> <li>5) If storing to make later, spread out on some greaseproof paper and leave to dry. This step can be omitted if using straight away.</li> </ol> <p><u>Making the resin</u></p> <ol style="list-style-type: none"> <li>1) Measure out 60ml (4 tbsp) of cold water and pour it into the beaker.</li> <li>2) Measure out 10g (or about 1 tbsp) of starch from the potato and add that to the water.</li> <li>3) Add 5 ml (about 1tsp) of vinegar to the mixture.</li> <li>4) Add 5ml (about 1tsp) of glycerin to the mixture, more glycerin will make it softer and more flexible, less will make it harder and stiffer but more brittle.</li> <li>5) If a coloured plastic is desired, add about 5 drops of the food coloring now.</li> <li>6) Turn the burner on low and constantly stir the mixture. When it starts to thicken up turn the heat up to medium and stir even more. When it starts to boil, keep boiling it for 5 minutes. It should be clear and sticky.</li> </ol>	<p>Paired talking: Teacher asks “Why is plastic a problem?”</p> <p>In explanation be sure to mention:</p> <ul style="list-style-type: none"> <li>- Plastic is made from oil which is dug out of the ground and is non-renewable;</li> <li>- Plastic takes a very long time to break down, hundreds of years for one plastic bottle;</li> <li>- Because of this it remains in our oceans, where sealife mistakes it for food and swallows it.</li> <li>- We need to find alternatives – one of these is biodegradable plastic made from plant material, bioplastics.</li> <li>- Today we will make a starch based plastic from potato starch!</li> </ul>

	<p>7) Pour the "goeey" substance into a mold, or pour it onto a sheet of aluminum foil or a silicone sheet to dry.</p> <p>8) Depending on humidity, it should take about 1 day to dry in a sunny place. You can dry it faster by putting it in an oven set to 90°C for 1-2 hours.</p> <p>So by now you should have a glob of messy starch plastic resin that is ready to be molded, injected, shaped, and formed into anything you want. A major advantage to this plastic, besides the fact that it does not use petroleum, is that it is also 100% biodegradable! That means in the right conditions, it will decompose in months instead of thousands of years.</p>	
	<p><b>Plenary:</b>  <b>What could we use this substance for?</b>  <b>Possibilities include:</b>          -Plates and dinnerware          -Plastic bags          -Cups          -Bowls          -Pens          And whatever else you can imagine...</p>	
<p><b>Differentiation:</b>  <b>Make sure they are working in multi ability partners</b></p>		
<p><b>Links to literacy/numeracy:</b>          How can we use this – write a passage out to explain some of your ideas. Write up as a report.          How can we scale this up? Imagine trying to make a ton of plastic.</p>		<p><b>Key words/terms:</b>          Non-renewable resource          Renewable          Biodegradable          Compostable</p>
<p><b>Ingredients:</b>          2 White skinned potatoes          Water          100% Vegetable Liquid          Glycerin          White Vinegar          Food Coloring</p>	<p><b>Tools / Supplies:</b>          Non-stick pan          Spatula          Stove Top or Hot Plate          Knife or guillotine          Blender          Peeler          Coffee filter and stand</p>	<p><b>Homework:</b>          What would you use it for?</p>
<p><b>Use of TA (or other adults):</b></p>		<p><b>Evaluation:</b></p>



## Lesson Plan – Litter and the water cycle

Subject: Geography	Year: (Suitable for any KS2 class)	Class:
Date:	Day:	Time/session:

<b>Topic: Litter</b>	<b>Links to Assessment Objectives/Levels/Specification:</b> Yr 4 Science: States of matter (evaporation and condensation) KS2 Geography: Describe and understand key aspects of physical geography including the water cycle and rivers.
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**Learning objectives:**  
 To learn why litter is a problem related to the water cycle – everything ends out at sea

Time	Lesson structure	Teacher notes/structure
	<b>Starter: Hangman using waste words, eg. Reduce, Reuse, Recycle, landfill, energy from waste, ocean plastics, litter, composting.</b>  Show picture of water cycle. Explain water cycle. Put litter in the picture – if left near a water source, or on the road, washed into storm drains and into the rivers, down to the sea.  <b>Activity: In groups of 5-6 can you tell the story of the water cycle. Each person should represent a part of the story/cycle. How will you represent the litter?</b>  <b>Plenary:</b> Recap water cycle and litter What can we do?	Name some sources of water.  What do we know about the water cycle?

**Differentiation:**  
 Make sure groups are multi-ability and don't force children to perform if they have issues with standing in front of the class.

<b>Links to literacy/numeracy:</b> Retelling a story/acting	<b>Key words/terms:</b> Litter Marine litter Ocean plastics
<b>Resources:</b> Powerpoint Video links	<b>Homework:</b> Finish off water cycle in books/sheet
<b>Use of TA (or other adults):</b>	<b>Evaluation:</b>



## Lesson Plan – The Great Ocean Plastic Problem

Subject: Geography/Science	Year: (Suitable for any KS2 class)	Class:
Date:	Day:	Time/session:

<b>Topic: Litter</b>	<b>Links to National Curriculum:</b> KS1: Geography – continents and oceans (should be revision) KS2: Geography – identifying key aspects of physical geography, using maps Yr4 Science: environmental change
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**Learning objectives:**  
 To understand and explore solutions to the great ocean plastic problem

Time	Lesson structure	Teacher notes/structure
	<b>Starter:</b> Take the children outside – to recreate a map of the world.	Can they remember where the continents and oceans are?
	<b>Lesson:</b> Learn about ocean gyres and why plastic is collecting in them <b>Microplastics in our food chains</b> Some of the things happening to clean up our oceans – see videos on Great Ocean Cleanup, #2minutebeachclean, plastic solar ovens What can we do?	The Ocean Gyres could be drawn out into a science or geography book. Worksheets are available as part of this pack.  Be positive – your students can be the change – some of them may have ideas that can change the world.  Take their ideas – something that sounds crazy now may be the solution in the future...
	<b>Plenary:</b> Take the children outside – to recreate a map of the world with the ocean gyres in the right places between the continents. Maybe they could play ring-a-ring-a-roses with some new ocean relevant words...	

**Differentiation:**  
 Use different versions of the worksheet for different ability groups.  
 Use a Word Bank for less able groups.

<b>Links to literacy/numeracy:</b> Understanding large numbers – revise hundreds, thousands, millions, billions Can they work out how much plastic their family uses? Talking and listening	<b>Key words/terms:</b> Litter; Marine litter; Gyres; Circulation; Currents; Ocean plastics
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<b>Resources:</b> Powerpoint Worksheet	<b>Homework:</b> Worksheet completion for homework. Implementing change in their own homes
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