LITTER LESS

Keep New Zealand Beautiful

Kiki Kiwi & Friends 'Litter Less'

FULL UNIT OF WORK

Released: April 2018

PROUDLY SUPPORTED BY:

KEEP NEW ZEALAND BEAUTIFUL

KESAB environmental solutions

Ministry for the Environment
Manatū Mō Te Taiao

MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

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KEEP NEW ZEALAND BEAUTIFUL

Full Unit of Work

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ABOUT THIS RESOURCE

This resource aims to provide students with authentic learning contexts in which to understand and respond to litter and littering issues. It is presented as six inquiry questions, which are separated into three interconnected themes and delivered over 12 lessons. The themes and inquiry questions are:

Theme 1: Defining

- Inquiry question 1: What is litter?
- Inquiry question 2: How and why do people litter?

Theme 2: Understanding

- Inquiry question 3: How does litter move, and where to?
- Inquiry question 4: How does litter break down?
- Inquiry question 5: What does litter look like in our school community?

Theme 3: Actioning

- Inquiry question 6: How do we create a litter-free school?

The learning intentions for each theme are based on Bloom's Taxonomy in order to promote higher-order thinking. The lessons aim to embrace local, national and global contexts, while considering the environmental, social and economic impacts of littering.

The resource is flexible enough to be taught as a complete unit of work or individual themes can be taught separately. The lessons and suggested lesson organisations are a guide only and can be changed to suit specific contexts.

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THEME 1 - DEFINING

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THEME 1: DEFINING

The 'defining' theme will lead students into understanding how litter moves and breaks down, in order to build an understanding of the litter issue in the local, national and global contexts. It will enable students to define litter and littering through a combination of individual work, group work and whole-class collaboration.

In this theme:

INQUIRY QUESTION 1: What is litter?

- Lesson 1a: Define litter and littering
- Lesson 1b: Where is litter found and where does it come from?
- Lesson 2: Litter hazards and impacts

INQUIRY QUESTION 2: How and why do people litter?

- Lesson 3: Types of 'litterbugs'

Theme 1 Student Learning Intentions

Students will:

- develop their understandings of litter in natural and built environments by completing sensory activities
- discuss where litter is commonly found, where it has come from and how it might end up in different places
- construct individual definitions of litter/littering
- identify the social, environmental and economic impacts and hazards of litter/littering
- examine the positive and negative effects of litter/littering
- select which impacts they believe to be the most important to address, and elaborate on their point of view
- identify the different ways in which people litter
- analyse the ways in which people litter and state their personal beliefs on littering, based on questions posed by the teacher
- draw their own conclusions on littering behaviour based on their developing personal beliefs.

THEME: Defining

INQUIRY QUESTION 1: What is litter?

Lesson 1a: Define litter and littering

Lesson 1b: Where is litter found and where does it come from?

Student Learning Intentions

- Understand and define the terms 'litter' and 'littering'
- Recognise where litter comes from
- Identify why people litter

Resources

- Litter in the real world cards
- Common litter items such as chip packets, lunch bags, plastic bottles etc. (optional)
- Littering videos on the internet (these are optional and can be found by searching for 'littering' or 'rubbish in creeks' etc.)
- Interactive whiteboard (IWB)
- Internet access

Teacher Background Information

Lesson 1a: Defining litter and littering

Lesson 1b: Where litter is found and where it comes from?

There are many definitions of litter and littering. A simple internet search will give you a number of different definitions; some more complex than others. Some definitions list certain items as litter (e.g. glass, paper, plastic), while others use technical/legal language to define littering (e.g. deposits rubbish without authorisation or a permit). For the purpose of this activity, litter is simply any item left lying in an open or public space. Littering is the verb, and is the act of dropping litter.

Litter is found everywhere; from shopping centre car parks to country roadsides. It can end up there in a number of direct and indirect ways. These will be elaborated on in subsequent lessons.

There is no absolute definition of litter and littering. This activity allows students to showcase their understanding of litter by creating their own definition, after considering the points covered in the lesson. You may wish to revisit the definition at the end of the unit to see if students would like to make any amendments.

Suggested Lesson Organisation

Lesson 1a: Define litter and littering

Lesson 1b: Where is litter found and where does it come from?

1. Before starting the lesson:
   - Prepare your classroom prior to the lesson by 'littering' it with common litter items (e.g. chip packets, takeaway food packaging, lunch bags etc.).
   - Locate a short video on the internet showing littering or a littered scene (try searching 'littering' or 'rubbish in creeks' etc.).
2. Begin the learning by discussing litter. Prompt this conversation by asking the following questions which consider all five senses (I see, I feel, I hear, I smell, I touch):
   - What can you see?
   - What is happening or what has happened?
   - How does this make you feel? Do you think it is okay?
   - Where has this happened or where could this happen?
   - Why has this happened?

   Students can respond to these questions as a whole class or in small groups.
3. Introduce the unit of work to the students. Ask the students for a definition of litter and to give an example. Then discuss why the class might be learning about litter, whether they think it is important and why.
4. Explain that litter can be found in a number of different places. Form small groups and provide each with a 'Litter in the real world' card (with the scenario removed or covered) to prompt thinking about where litter is found, and where it might have come from.

   Key questions to discuss could include:
   - What can you see?
   - Have you ever seen litter in the place in the picture?
   - Where have all these items come from?
   - How did they get there?
   - Why is the litter there?
   - Can you think of other places where you have seen litter?
   - Is there litter here at school? (Consider taking the students outside briefly.)
5. Allow the groups to report back to the class and record key words and phrases on the board. This could include the environment featured in the picture, any specific items they have identified, how they might have ended up there etc.

6. Review some of the key words/phrases written on the board. Explain that they are all important factors when considering litter and littering.
7. In the same small groups, ask the students to use some of the ideas from the whiteboard to form their own definition of litter and littering. For example, 'Litter is an item that is dropped in any environment and not in a bin' or 'Littering is when someone drops something in the environment without caring'. Using the students' definitions as a starting point, work together as a class to form an agreed definition of litter and littering.

Optional activities

- Students investigate the question 'Why is there a litter problem?' Students could focus on how packaging has evolved over the years (e.g. the evolution of plastic packaging) and how changes in packaging have contributed to the litter problem.
- Students to interview an older relative (e.g. grandparent) to understand how items were packaged in the past.
- Students to look at advertising of food items. Are the advertised items packaged? Does packaging help to sell products? Consider colour, characters, word choices etc.
- Students to draw a picture of a place where they have seen litter or littering.
- Ask the students to select one image and devise a 'litter story' to explain how the litter ended up in the place.
- Students to write a description piece or profile on a litter item using the five senses, and covering points such as: what does it look like, what does it feel like, what does it smell like?
- Recap/reflection
- What key words can we use to create a definition of litter/littering?

THEME: Defining

INQUIRY QUESTION 1: What is litter?

Lesson 2: Litter hazards and impacts

Student Learning Intentions

- Identify the hazards and impacts of littering
- Infer the environmental, social and economic impacts of littering
- Determine whether littering impacts are positive or negative

Resources

- Litter in the real world cards
- Litter scenario impacts and hazards chart
- Impacts of littering sheet
- Interactive whiteboard (IWB)

Teacher Background Information

Lesson 2: Litter hazards and impacts

Litter creates hazards which may impact on people, animals and the environment. A hazard is something that has the potential to harm. An impact is something that has an effect on someone or something. Hazards and impacts can generally be grouped into one of three categories:

1. Environmental (plants, animals, habitat, natural resources)
2. Social (people, and places)
3. Economic (money-related)

Environmental hazards and impacts include:

- Polluted waterways
- Litter entrapment
- Litter ingestion by animals
- Leaching toxins from litter (e.g. plastics)
- Injuries to animals caused by broken glass etc.

Social hazards and impacts include:

- Injuries to people caused by broken glass etc.
- Negative impact on aesthetics
- Inability to access facilities (e.g. swimming in polluted waterways).

Economic hazards and impacts include:

- Cost of clean-up
- Cost of litter disposal
- Loss of income to tourist locations (if affected by litter).

Each category is significant although some people may feel that certain categories are more important than others (e.g. some students might think that the cost of clean-up is more important than polluted waterways). By enabling the hazards and impacts to be ranked, an understanding of where the beliefs of the class lie can be established, and students can recognise their own values/beliefs. Depending on the individual class, the difference between hazards and impacts can be discussed, or students can complete an activity to identify a hazard and list its associated impacts.

Suggested Lesson Organisation

Lesson 2: Litter hazards and impacts

1. Recap on the previous lesson; where litter is found and where it might have come from. Explain that once litter is dropped, it can become a problem for people, animals and the environment.
2. Explain that litter can create hazards and impacts (explain the difference between the two).
3. Read out a scenario from one of the 'Litter in the real world' cards and ask the students to identify any hazards. List these on the board and then consider the flow on impacts (e.g. hazard: broken glass, impact: person could cut foot if they stood on it).
4. Explain that hazards and impacts can be grouped under three main headings: environmental, social and economic. Explain the difference between the three and place the previously listed hazards/impacts underneath one of the headings.
5. Provide each group with a 'Litter in the real world' card (either the same one as in step 3, or a different one) and a 'Litter scenario impacts and hazards' chart. Each group is to read through their scenario and list as many of the hazards and impacts on their chart as possible. There are some suggestions to guide students' thinking on the 'Impacts of littering' sheet.

   Things to consider include:

   - Health impacts to animals and people
   - Hazards
   - Pollution
   - Aesthetics
   - Cost of clean-up.
6. Allow the groups to report back to the class with their scenarios and ideas. Students can list additional hazards and impacts suggested by other groups on their chart, or a class copy of the 'Litter scenario impacts and hazards' can be completed on an IWB by the teacher.
7. Ask the students if they think the hazards and impacts are positive, negative or both. Then ask if they think that some of the hazards and impacts identified are worse than others.

8. Ask the students to rank the impacts from most damaging to least damaging, more severe to less severe and so on. This can be done by:
    - Having students nominate the three hazards or impacts they think are the most significant by placing sticky dots next to them. Collate this information, and share with the class; or
    - Naming a hazard or impact and allowing students to stand on a number continuum from 1-10, where 1 is not a concern and 10 is extremely concerning. 10.

    Finish by discussing the students' opinions regarding certain hazards and impacts. Encourage them to provide reasons or justification for their opinions.

Optional activities

- Graph the responses from students. Which category had the most votes: social, economic, or environmental?
- Encourage students to debate why they voted as they did.

Recap/reflection

- Name some of the hazards that can be caused by litter/littering.

THEME: Defining

INQUIRY QUESTION 2: How and why do people litter?

Lesson 3: Types of 'litterbugs'

Student Learning Intentions

- Identify ways in which people litter
- Propose why people litter
- Determine whether certain littering behaviours are worse than others

Resources

- Name the litterbug activity sheet
- Name the litterbug solutions
- Laminated 'What kind of litterbug?' matching cards (colour or black and white)
- Laminator
- Litterbug animations
- Litterbug poster (optional to print for your classroom wall)

Teacher Background Information

Lesson 3: Types of 'Litterbugs'

There are various ways of littering, and the associated behaviours can generate interesting discussion. Studies on littering behaviour by Community Change (2011)[1] identified, eight certain types of littering behaviours. These eight types of littering behaviours are relevant to school-aged children (one type of litterer which relates primarily to cigarette butts has been excluded in this activity). For the purpose of this activity, the people who demonstrate the types of littering behaviour will be referred to as 'litterbugs'.

The types of litterbugs are:

1. **Dirty Disguiser**

   People who bury their litter under sand, leaves etc.

2. **Foul Shooter**

   People who aim for, but miss, the bin and then leave the object on the ground.

3. **Almoster**

   People who put large items in the bin, but leave smaller, less obvious items behind.

4. **Clean Sweeper**

   People who sweep litter off tables and leave it on the ground.

5. **Cheeky Chucker**

   People who throw objects away without even trying to conceal their actions.

6. **Sneaky Creeper**

   People who check that they aren't being observed, then slowly inch away from their litter.

7. **Trash Stasher**

   People who push items into small places where they will not blow away (e.g. gaps in tables).

8. **Ledge Edger**

   People who put items on the edges of bins, rather than littering or placing them in the bin.

[1]. Names modified to fit New Zealand content. Community Change. (2011) Cartoons of Disposal Behaviour Types. Retrieved October 6, 2014, from http://www.communitychange.com.au/insights-and-tools/changing-littering-behaviour/28-cartoons-of-disposal-behaviourtypes.html

Some of these littering behaviours may seem worse than others, based on the way in which the litterbug litters (quite obviously or discreetly), what they are littering (large or small items, organic items or human-made items) and how much they are littering (all their items, or only some). In reality, all these 'litterbugs' are contributing to the litter problem. It is important for students to understand this and acknowledge the cumulative effects of littering.

Community Change (2011)[2] also identified a number of positive littering behaviours, including:

1. **Compacting**

   Stuffing materials into a full bin.

2. **Trail Blazing**

   Going out of your way to find a bin.

3. **Coaching**

   Prompting people to do the right thing with the disposal of their item.

4. **The Assist**

   A pick-up if a foul shooter misses.

5. **Marshalling**

   Coordinating a clean-up.

6. **Intervening**

   Suggesting others pick up litter they have dropped.

7. **Chasing**

   Running after litter that has blown away.

8. **Do-It-Yourself**

   Bringing your own containers to take your litter home for appropriate disposal.

9. **Volunteering**

   Cleaning up after others litter.

Students should spend some time considering strategies such as those listed above to curb negative litter behaviours in their school and community.

[2]. Community Change. (2011) Cartoons of Disposal Behaviour Types. Retrieved October 6, 2014, from http://www.communitychange.com.au/insights-and-tools/changing-littering-behaviour/28-cartoons-of-disposal-behaviourtypes.html

Suggested Lesson Organisation

Lesson 3: Types of 'Litterbugs'

1. Start a classroom conversation by asking the following questions:

   - Has anyone ever littered? Students will not get into trouble for being honest.
   - Why did you litter?
   - Has anyone seen someone littering? What did they do?
   - Why do you think they did this?
   - What did you do?

   Explain that people litter in many different ways. The class is going to explore the different ways in which people litter and why.

2. Arrange the students into small groups. Provide each group with a set of 'What kind of litterbug?' cards. Ask the groups to see if they can match each picture to the correct type of litterbug.

3. As a whole class, work through each image and ask the students to:

   1. Describe what is happening in the picture and why it might be happening.
   2. Indicate the name they gave to that litterbug.

   Discuss any unexpected or differing responses, ensuring students provide sufficient reasoning for their choices. Use the 'Litterbug animations' to provide further clarity if required.

   Provide each student with a copy of the 'Name the litterbug' activity sheet on which to record the information. This step is optional and the activity sheet can also be used as an assessment item.

4. Allocate a litterbug type to each small group. Each group must role-play the type of litterbug for the class to guess, then give a brief definition of the littering action occurring.

5. Once completed, have a class discussion, asking the following questions:

   - Why do you think each type of litterbug is littering?
   - Do you think some of the litterbugs are worse than others? Why?
   - What kind of litterbugs have you seen?
   - Do you think people are likely to litter with certain items more than others (e.g. small items or food scraps)? Why?
   - Can you think of any other types of litterbugs?

6. Ask the students to suggest some positive littering behaviours. Prompt this by encouraging them to think of ways in which the negative behaviours could be changed, or how litter could be dealt with.

Optional activities

- Students draw a comic strip of their small group role-play.
- Students give their litterbug role-play an alternate ending, showing a possible option instead of littering (e.g. they find a bin, a friend reminds them not to litter, they put litter back in their bag etc.).
- Students draw a picture of a positive littering behaviour.
- Students design posters for a particular litterbug to try and discourage people from littering. Place the posters around the school.
- Extend students' understanding by showing what happens when litter is dropped by one person or by multiple people (the cumulative effect of littering). Drop one piece of litter on the floor, then ask:
  - Does one piece of litter matter?
  - How would the school look if every student dropped litter?
- Instruct all students to drop a piece of litter, and then ask the first question again. Discuss the effect on the school and surrounding community if everyone dropped their litter.
- Students to create their own names for each of the litterbug characters.
- Students to suggest new litterbug characters and describe their action.

Recap/reflection

- Think about the many ways in which people litter and why.

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THEME 2 - UNDERSTANDING

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THEME 2: UNDERSTANDING

The 'Understanding' theme is designed to enable students to understand litter and littering through a combination of individual work, group work and whole-class collaboration.

In this theme:

INQUIRY QUESTION 3: How does litter move and where to?

- Lesson 4: Litter movement in a local context
- Lesson 5: Litter movement in a national context
- Lesson 6: Litter movement in a global context

INQUIRY QUESTION 4: How does litter break down?

- Lesson 7: Litter break down

INQUIRY QUESTION 5: What does litter look like in our school community?

- Lesson 8: Litter survey
- Lesson 9: Litter audit

Theme 2 Student Learning Intentions

Students will:

- identify ways in which litter moves through the environment
- summarise how and where litter can move in your local context
- discuss if and how litter stops moving
- list and explain the impacts of litter in a local context, with a focus on the schoolyard and surrounding areas
- list and explain the impacts of litter in a national context, with a focus on coastlines and national ocean currents
- list and explain the impacts of litter in a global context, with a focus on the ocean garbage patches and/or litter in Asia
- develop an awareness of the links between national and global ocean currents to understand how local litter can become a global issue
- predict and discuss the cumulative effects of individual pieces of litter, with reference to the global garbage patches
- identify and investigate breakdown periods for common litter items
- design and conduct a school community survey to gauge attitudes towards littering and associated behaviours
- create and conduct a litter audit in the school to determine common litter items and identify litter hotspots.

THEME: Understanding

INQUIRY QUESTION 3: How does litter move and where to?

Lesson 4: Litter movement in a local context

Student Learning Intentions

- Identify various ways in which litter can move in your local context
- Identify reasons why litter might stop moving
- Identify the possible impacts of litter in your local context

Resources

- Kiki Kiwi & Friends - The Travelling Trash (story)
- Copies of a map of your local area (hard copy or online)
- Computers
- Cameras (optional)

Teacher Background Information

Lesson 4: Litter movement in a local context

Quite often, individuals do not consider the impacts of their littering. The concept that an item is no longer an individual's responsibility once it has been dropped (out of sight and out of mind) is one that needs to be changed.

More often than not, litter moves after it has been dropped. Litter can move via:

- Wind – sea breezes, windy weather
- Water – creeks, rivers, drains, ocean currents
- Traffic – vehicles
- Animals – carrying litter (e.g. birds).

These 'modes of transport' can take litter far away from its original location. Litter can continue to move unless acted on by something or someone. Litter movement can 'stop' when it:

- catches on something (e.g. fence, bush or tree)
- flows into and is collected in a gross pollutant trap (stormwater drain)
- is picked up and placed in a bin by someone
- is ingested by an animal
- is cleaned up by a machine (e.g. street sweeper).

As litter moves, and even when it stops moving, it can still create environmental, social and economic hazards/impacts (as discussed in previous lessons).

This lesson considers the local impacts of litter. It focuses on identifying local 'litter hotspots' in the school and community and how litter can move from place to place. Students are encouraged to explore the school grounds, and perhaps beyond (depending on your circumstances), to see litter issues first-hand.

Suggested Lesson Organisation

Lesson 4: Litter movement in a local context

1. Ask the class if they think that litter stays where it is dropped. As a class, or in groups, brainstorm the ways in which litter moves.
2. Read/listen to 'Chapter 1: Local' of Kiki Kiwi and Friends - The Travelling Trash. Ask the students to take note of any key events.
3. At the end of the chapter, ask students to reflect on the key events. Use the following prompting questions:
   - How did the blue plastic bag become litter?
   - Where did the blue plastic bag start and end up?
   - How did the blue plastic bag travel there?
   - What other litter is mentioned in the story?
   - What environmental impact could that litter have made if it hadn't been picked up?
   - What environmental impact did the blue plastic bag have as it travelled?
   - What other impacts could the blue plastic bag have had?
   - What social/environmental impacts concerning litter did Kiki Kiwi and his friends have?
4. Ask students if they have ever seen litter in the schoolyard, and whether they think that piece of litter could go on a journey like the blue plastic bag.
5. Take the class outside to see if they can find any litter. Discuss where it is located and why. If there is no litter, ask students to imagine they have found some. Ask students to recall ways in which the blue plastic bag was transported through the environment (a good example is via wind into the stormwater drain). See if you can find any drains in the school that litter could enter. Then ask students where the litter could go from there, bearing your local surroundings in mind.
6. Return to the classroom. As a whole class or in groups, look up the school and surrounding area on a map (you may be able to get stormwater drainage maps from your local council). Use the map to identify possible pathways (e.g. creeks, roads etc.) from the school grounds to the ocean. Ask students to consider the local environment along the way by using the following prompting statements and questions:

- Litter may not continuously move once dropped; it can accumulate along fence lines or become caught in vegetation. What are the hazards/impacts to people/animals/environment in this instance?
- What is the most realistic way in which you think litter could move in your local context (e.g. wind, stormwater drains etc.)?
- What might make a piece of litter stop moving? Do any of these suggestions result in litter no longer being an issue (e.g. if it is picked up and put in a bin vs if it temporarily stops along a fence line)?

7. Students now select one or more commonly littered items (based on litter they have seen) to create a story of litter movement. Encourage the students to refer to their local context as much as possible (e.g. there may not be creeks close by, but the area could be particularly windy). Stories can be created as a narrative, comic strip, interpretive dance, drama, digital media, or picture book.

Optional activities

- Look up the prevailing wind direction in your area and, based on this information, discuss where litter could go.
- Check the weather forecast. Is any rain or wind forecasted? How would rain/wind impact the movement of litter?
- Take cameras out into the surrounding streets/suburbs and find litter hotspots. Photograph these and discuss how the litter got there and where it could potentially end up.
- Look at a map that includes the location of your school and the nearest coastline. Trace the path that litter could take from your school to the ocean. Use the map scale to calculate the distance travelled.
- Ask students to pay attention to the surrounding environment as they leave school. Did they see any litter? Where was it? How much? What type of material was it?

Recap/reflection

- What influences the movement of litter?
- What waterways could litter move into?
- What/who could the litter impact in your local context

Share your stories with Keep New Zealand Beautiful by emailing info@knzb.org.nz

THEME: Understanding

INQUIRY QUESTION 3: How does litter move, and where to?

Lesson 5: Litter movement in a national context

Student Learning Intentions

- Identify various ways in which litter can move in a national context
- Outline how litter can have impacts beyond the local area
- Apply mapping skills to determine where litter might end up

Resources

- Kiki Kiwi & Friends - The Travelling Trash (Story)
- New Zealand Ocean Currents interactive map
- Litter scavenger hunt information and solutions
- Litter scavenger hunt activity sheet
- Computers with internet access
- Atlases (print or online)

Teacher Background Information

Lesson 5: Litter movement in a national context

As mentioned in the previous lesson, litter rarely stays where it is originally dropped.

Litter, if it reaches the ocean, has the potential to travel vast distances due to the ocean currents around New Zealand.

Currents are moving waters influenced by a number of factors including temperature, salinity, the rotation of the Earth (the Coriolis Effect), waves, wind, tides, shorelines and depth contours.

Ocean currents can move litter from one place to another. This activity will allow students to understand that litter can move faster and further once it reaches the ocean, as well as how it is moved and how far it can travel.

There are eight ocean currents near/around New Zealand[3]:

1. East Auckland Current
2. East Cape Current
3. Wairarapa Coastal Current
4. West Auckland Current
5. D'Urville Current
6. Southland Current
7. Westland Current
8. Antarctic Circumpolar Current.

Currents

North Island currents

The East Auckland Current flows south-east along the north-east coast of the North Island. The current travels at speeds up to 50 centimetres per second. The origins of these waters are tropical; occasionally tropical-reef fish are found at the Poor Knights Islands. Typical surface temperatures at the current's northern reaches are 20–22°C in summer, and 15–16°C in winter.

Part of the East Auckland Current continues south, where it becomes the East Cape Current.

[3]. Craig Stevens and Stephen Chiswell, 'Ocean currents and tides - Currents', Te Ara - the Encyclopedia of New Zealand, http://www.TeAra.govt.nz/en/ocean-currents-and-tides/page-1 (accessed 11 January 2018)

When this current encounters the Chatham Rise, it is forced offshore and flows eastwards along the rise. Inshore, the Wairarapa Coastal Current flows north-east along the Wairarapa coast, bringing relatively cool water to the region. As this water moves up the coast, some gets pulled into the East Cape Current, so that the Wairarapa Coastal Current probably does not extend north of Māhia Peninsula. Temperatures in the Wairarapa Coastal Current are 1–2°C cooler than in the East Cape Current.

Currents to the west of New Zealand are weaker and more variable than those along the east. The West Auckland Current flows southwards along the west coast of the North Island from North Cape to Raglan, where it is met by north-flowing currents in the North Taranaki Bight. In the South Taranaki Bight, the D'Urville Current flows south-east and through Cook Strait.

South Island currents

The Southland Current is the main current along the east of the South Island. It flows north-eastwards past Stewart Island and along the Otago coast, reaching speeds of 25 centimetres per second, and extending 130 kilometres offshore. At the Chatham Rise, it veers east to become part of the subtropical gyre (giant circular current on the surface of the ocean).

On the South Island's West Coast, the Westland Current flows north until it reaches the south Taranaki Bight, where it contributes to the D'Urville Current.

Southern currents

South of New Zealand, the Southern Ocean's westerly winds drive the Antarctic Circumpolar Current, which flows continuously around the globe. This is the world's strongest ocean current, reaching down 4 kilometres to the ocean floor and transporting about 100 times the volume of water of all the world's rivers. The current does not directly affect New Zealand's main islands. However, the Campbell Plateau to the south deflects the current south and channels it north past the Antipodes Islands before the flow resumes its eastward course. Further south, cold, downward-moving winds, known as katabatic winds, flow off Antarctica. These winds drive a westward current and form a clockwise gyre in the Ross Sea.

Suggested Lesson Organisation

Lesson 5: Litter movement in a national context

1. Begin the lesson by recapping the previous lesson. In Chapter 1 of Kiki Kiwi and Friends - The Travelling Trash, the blue plastic bag began his journey in the shop near the school and ended up making his way to the coast. Ask the students if they think the blue plastic bag's story ends there, or whether it would could continue its journey.
2. Read/listen to 'Chapter 2: National' of Kiki Kiwi and Friends - The Travelling Trash. Ask students to listen to the story and take note of any key events.
3. Reflect on the key events using the following prompting questions:
   - What happened to the blue plastic bag?
   - Where did the blue plastic bag end up?
   - How did it manage to move away from the beach?
   - What environmental/social/economic impacts did or could the blue plastic bag have?
4. Use the 'New Zealand Ocean Currents' interactive map to show the surrounding currents. Discuss the following points:
   - Describe where the individual currents flow.
   - In theory, is it possible for litter to move between the coasts of different towns and cities?
   - If litter is dropped along your closest coastline where could the currents take it?
   - What are the potential impacts of litter on New Zealand marine environments and animals?
   - Could this litter wash up on a beach? What impact could it have in this environment? Whose responsibility is it to clean up coastline litter?
5. In pairs or small groups, complete the 'Litter scavenger hunt' activity sheet, while using the 'New Zealand Ocean Currents' interactive map, an online map and/or New Zealand atlas.
6. Review the answers as a whole class, using the 'New Zealand Ocean Currents' interactive map and the 'Litter scavenger hunt information and solutions', or alternatively collect the papers as an assessment piece.

Optional activities

- Students to research New Zealand marine debris information and organisations, and then produce some 'fast fact' cards on marine debris in New Zealand.
- Litter counts, referred to as the 'National Litter Index' are conducted regularly across New Zealand. The counts collect data on litter types and littering behaviours. Litter is counted in a number of locations, including beaches, car parks, highways, industrial areas, recreational parks, residential areas, and shopping precincts. Students to create an information piece or poster referring to one specific location and the possible impacts litter could have in that place.

Recap/reflection

- How is it possible for litter to move from one town or city to another?

THEME: Understanding

INQUIRY QUESTION 3: How does litter move, and where to?

Lesson 6: Litter movement in a global context

Student Learning Intentions

- Identify ways in which litter can move in a global context
- Outline how litter can have impacts beyond the local and national contexts
- Research and present information on the Great Pacific Ocean Garbage Patch
- Explain the cumulative effects of litter

Resources

- Kiki Kiwi & Friends - The Travelling Trash (Story)
- Global Ocean Currents interactive
- Great Pacific Ocean Garbage Patch activity sheet (optional)
- Computers with internet access (you will need access to YouTube)

Teacher Background Information

Lesson 6: Litter movement in a global context

This lesson is designed to lead into a research topic which can be completed over several lessons. Alternatively, the research topic could be altered to be a one-lesson class discussion.

It is up to the teacher to decide the best way to deliver the content in this lesson.

Ocean currents across the world flow together to form global ocean currents. These play an important role in determining the climate of different parts of the world, but can also dictate where litter in the ocean ends up. It is essential that students make local, national and global connections when it comes to litter by understanding how ocean currents can contribute to a global litter issue.

During 1992, a cargo ship spilled 28,000 bath toys, primarily yellow rubber ducks, into the Pacific Ocean. These rubber ducks have helped scientists understand the workings of the global ocean currents, but have also highlighted the issues of marine debris. Many of these ducks became caught in what is known as the North Pacific Gyre, which is essentially a 'vortex' of ocean currents. The North Pacific Gyre is more often referred to as the Great Pacific Ocean Garbage Patch due to the enormous 'island-like' amount of floating debris caught in it.

Although the Great Pacific Ocean Garbage Patch is the most documented, it is not the only marine garbage patch in the world. There are at least five gyres, all of which have their own garbage patches forming. These are:

- Indian Ocean Gyre
- North Atlantic Gyre
- North Pacific Gyre
- South Atlantic Gyre
- South Pacific Gyre

The debris in these gyres has come from a range of sources, including littered items from the land. As these littered items (which are mainly plastic) make their way to the coast and float through the ocean, they start to degrade. The smaller items pose the greatest environmental threat. The marine debris (particularly plastics) can be ingested by birds and other marine life, causing them to choke or starve. Other floating debris, such as nets, can trap animals. The garbage patches show the result of litter accumulation in a marine environment, as well as the impacts of litter degradation.

In order to understand why littering is such a problem, students must understand the impacts of these garbage patches. There are many useful articles and videos about the garbage patches. For more information, conduct an internet search using the terms '5 Gyres' or 'Garbage Patches', or for information on the rubber duck story, search 'Rubber ducks global ocean currents'. This lesson requires some additional research to source more specific information on the issue.

Suggested Lesson Organisation

Lesson 6: Litter movement in a global context

1. Recap on previous lesson: litter in the ocean can become very mobile due to the ocean currents. Ask the students if they can remember what any of the ocean currents are called.
2. Recall what has happened to Kiki Kiwi and Friends - The Travelling Trash in Chapters 1 and 2 of the story. Read/listen to 'Chapter 3: Global' of Kiki Kiwi and Friends - The Travelling Trash. Ask students to listen and take note of any key events and reflect on these at the end of the story. Use the following prompting questions:
   - What happened to the blue plastic bag?
   - Where did the blue plastic bag end up?
   - How did it manage to move away from New Zealand?
   - What happened to the blue plastic bag and the other trash in the Gyre/'Plastic City' over time?
   - List all the times in the story the bag could have been rescued and disposed of correctly.
3. Explain to your students that the ocean currents around New Zealand link up with other ocean currents to form global ocean currents.
4. Share the story of the rubber duck spillage to explain how global ocean currents and gyres are now better understood. Explain that the ducks which ended up in the gyres also highlighted the issue of other litter items becoming caught there.
5. Ask the students what happened to the blue plastic bag when it became caught in the gyre, and whether they think that is actually possible.
6. Ask the students if they have ever heard of or seen anything about garbage patches in the ocean. Ask them to share what they know.
7. Explain to students that just like the blue plastic bag, litter can accumulate in the gyres to form 'garbage patches'. Explain that the garbage patches are made up of all sorts of litter, (mainly plastics) and pose a threat to marine life. Ask students to identify some of the hazards they believe the garbage patches could cause to marine life.
8. Locate a video or images of the Pacific Garbage Patch, or other ocean garbage patches, to show the class what they look like (there are numerous videos on YouTube). Ask students to discuss what they can see and how large they think the garbage patches are.

   Explain that there are five gyres where it is possible for litter to accumulate to form garbage patches. Use the 'Global Ocean Currents' interactive to show where they are located. Discuss which gyre/s litter from New Zealand could end up in.

9. Great Pacific Ocean Garbage Patch research topic (for assessment or computer lessons). Students should research the most documented garbage patch; the Great Pacific Ocean Garbage Patch, and present their findings (oral report, digital media, visual, poster, interview with 'scientist', documentary, news article etc.). You may wish to provide your students with a copy of the 'Great Pacific Ocean Garbage Patch' activity sheet, which contains prompting questions, or students can brainstorm their own research focus.

Optional activities

- Litter in Asia research topic: Students to investigate litter in an Asian country and if/how it contributes to global garbage patches. Consider how the litter impacts the chosen country in terms of economic, social and environmental factors. Students may also want to investigate the ocean currents which operate around their chosen country. What are the current solutions/strategies to deal with litter issues in Asia? How do these compare with New Zealand's litter issues and solutions?
- Based on their research, students to write a piece on the garbage patches, using the headings 'I see', 'I feel', 'I think'.

Recap/reflection

- Reflect on the stages of litter movement in the local, national, and global contexts.
- Reflect on the hazards and impacts of the garbage patches.

THEME: Understanding

INQUIRY QUESTION 4: How does litter break down?

Lesson 7: Litter break down

Student Learning Intentions

- Understand that plastics break down over time in the environment
- Investigate the breakdown rates of different materials
- Organise common litter items in order of breakdown time

Resources

- Litter break down cards (printed, laminated and cut out). There are colour and black and white versions
- Litter break down interactive game
- Water break down experiment sheet (this sheet has a list of the resources required for this experiment)
- Water break down observations activity sheet
- Laminator
- Interactive whiteboard (IWB)
- Computers

Teacher Background Information

Lesson 7: Litter break down

As previously mentioned, there are many items in the ocean garbage patches that will remain in the environment for years. The biggest issue is plastic. This is because plastics break down into smaller pieces as a result of being exposed to the elements (e.g. water and sunlight). As plastic degrades (or breaks down into smaller pieces), marine creatures often mistake it for food. This reinforces the issue of how long litter items can remain in the environment, and the hazards they may create. The breakdown time for some common litter items are:

- Banana skin: 3 - 4 weeks.
- Paper bag: 1 month.
- Apple core: 1 - 2 months.
- Cardboard: 2 months.
- Plastic bag*: Up to 20 years.
- Plastic bottle*: 450 years.
- Aluminium can: More than 1 million years.
- Glass: 1-2 million years.

*Petrochemical products never truly break down and will remain in the environment forever.

List sourced from Keep Australia Beautiful WA (n.d.)[4]

The amount of time that some of these items remain in the environment is significant. The longer these items remain, the longer they pose a threat. The breakdown time is based on a number of factors, including whether the item is organic (e.g. food) or inorganic (e.g. plastic) and the conditions in which it is left to break down (e.g. water, sunlight).

[4]. Keep Australia Beautiful WA. (n.d.) Litter- How Long Does it Take to Breakdown? Retrieved July 10, 2014, from http://www.kabc.wa.gov.au/library/file/Fact%20sheets/How%20long%20Fact%20sheet%20KAB.pdf

Suggested Lesson Organisation

Lesson 7: Litter break down

1. Reflect on the previous lesson, focusing on the items, particularly plastic, that float in the garbage patches of the world. Plastic in the ocean is a major issue. Discuss:
   - Does anyone know how/why the plastics are in smaller pieces in the garbage patches?
   - Is it better, worse, or no different when the plastic items become smaller?
2. Explain that the litter that makes its way to garbage patches can include a variety of materials. Brainstorm, and list the types of materials that constitute litter.
3. Explain that the properties of each material influence how long it will stay in the environment (both on land and in the ocean) before it breaks down.
4. Ask students if they know what is meant by the term 'break down'. Explain that the word describes how long it takes for something to 'disappear' into the environment.
5. Ask students why they think it is important to know how long it takes for something to break down.
6. As a whole class, in small groups, or individually, use the 'Litter break down' cards to match common litter items with their breakdown times. Once the cards have been matched order the items from shortest breakdown time to longest breakdown time. At this point discuss the order and make any revisions or adjustments. If the activity is being completed individually or in small groups, students should report back to the whole class, providing reasons for their choices.
7. Work together to create a class-agreed sequence then use the 'Litter break down' interactive to check the answers. Once the correct order has been established, discuss the findings as a class. Prompt students by asking them to consider what each item is made from, whether it is an organic item (i.e. living and growing or comes from something that was once living or growing) or not, and whether this impacts on breakdown time.
8. In order to show students what happens to items that end up in waterways, use the experiment on the 'Water break down experiment' sheet. This involves placing various items in containers of water and observing them over time. The experiment can be repeated using soil to demonstrate land breakdown times. Students should record weekly observations on the 'Water break down observations' activity sheet. Consider making predictions prior to the experiment and producing a report following it.

Optional activities

- Create a timeline (using an appropriate scale) to show how long it takes for the items to break down. Consider researching the average adult lifespan in New Zealand and work out how many 'lives' it would take for each item to break down.
- Make a 'break down information card' for some common litter items, detailing:
  - what it is
  - what it is made from
  - how it is formed
  - how long it takes to break down
  - any issues caused by that item if it becomes litter.

Recap/reflection

- Reflect on breakdown times.
- Discuss why certain items take longer than others to break down.

THEME: Understanding

INQUIRY QUESTION 5: What does litter look like in our school community?

Lesson 8: Litter survey

Student Learning Intentions

- Design and conduct litter surveys
- Interpret information on the attitudes and behaviours of the school community with regards to litter/littering
- Report and discuss research and investigation methods and findings

Resources

- Litter survey template
- Computers (optional)

Teacher Background Information

Lesson 8: Litter survey

Lessons 1 to 7 have assisted in strengthening students' understanding of why litter prevention is important. To connect the learning to a relevant local context, students will now investigate litter in their school community.

Collecting litter and littering data from the local community can highlight key issues, concerns and general attitudes. The information gathered can also help direct and shape a 'litter-free' education campaign. Data can be collected by conducting a qualitative survey (to gauge attitudes and behaviours) and a quantitative litter audit (to gather numerical data on what is happening in the school).

Conducting a survey enables baseline data to be collected and can help decision-making relevant to litter issues. A 'Litter survey template' has been provided for use, or you can create your own. If you are designing your own survey, it is important to write questions that will enable the data to be collated easily. For example:

- Using tick boxes with fixed responses (e.g. Yes, No, Maybe).
- Being able to group written responses (e.g. how far are you willing to walk to a bin (0m, 1-3m, 3-5m, 5-10m, 10+m etc.).

Consider designing the survey on a platform that fits in with the resources/learning direction of the school (e.g. create an online survey for students who have access to the internet, incorporate ICT skills into learning, or conduct face-to-face surveys on paper or a tablet to increase communication skills). The survey results can be collated and analysed as a graphing and reporting assessment. The lesson should be adapted to suit the needs of the class and the learning context.

Suggested Lesson Organisation

Lesson 8: Litter survey

1. Recap on previous lesson(s): the links from local through to national and global impacts of litter, and the issues litter can cause at all these levels. Explain that it is important to understand littering behaviours and attitudes in the local school community to help determine the best way to address local littering issues.
2. Ask the students to brainstorm questions that could be asked in a littering survey for students and staff (to help understand behaviours) or information that might need to be found out during the survey. Provide prompts from questions on the 'Litter survey template'. This can be done in small groups or as a whole class. Points to consider include:
   - People's understanding of what litter is.
   - Whether or not people feel that there is a litter problem at the school.
   - What/who are the biggest contributors to the litter problem (e.g. particular age group/s, lack of bins etc.)?
3. Decide on what type of survey should be used and how it will be administered (i.e. face-to-face, handed out or emailed). If a hardcopy survey is being used, ensure you have enough copies. If you have designed an online survey, ensure students have access to devices to conduct the survey, or written permission if it is being emailed to participants.
4. Conduct the surveys. It is up to the class to decide the best way to do this.
5. Once the data are collected, students can create graphs and reports to present their findings. Prompt students to discuss or report on:
   - Which results stand out the most?
   - Are there any unusual findings?
   - Are the results what you expected?
   - If you were to do this activity again, would you make any changes to the survey or the way it was conducted?

Optional activities

- Students can reflect on the survey process. What did they enjoy about conducting the survey? What did they find challenging? What could they have done differently? Are there any questions that weren't asked and could be included next time?

Recap/reflection

- Reflect on the key findings.

THEME: Understanding

INQUIRY QUESTION 5: What does litter look like in our school community?

Lesson 9: Litter audit

Student Learning Intentions

- Gather litter data by conducting a litter audit
- Interpret litter data
- Report and discuss on research and investigation methods and findings

Resources

- Litter audit information sheet
- Litter audit template
- Map of school grounds
- Cameras
- Measuring equipment (e.g. measuring wheels or tapes)
- Gloves (if students will be touching bins or litter)

Share your results with Keep New Zealand Beautiful by emailing info@knzb.org.nz

Teacher Background Information

Lesson 9: Litter audit

By completing a litter audit, comparisons between data collected during the surveys (e.g. perceived most commonly littered item) and what is learned during the audit can be made. The audit will also provide additional information on behaviours in the school and potentially suggest why littering behaviours are occurring. The audit can help assess:

- The type of litter at the school
- Where litter is located, including litter hotspots
- Bin locations and their location in relation to litter (e.g. how many bins and are they close to eating areas?)
- Bin design (e.g. height, lid type, capacity etc.)
- Condition of bins (e.g. are they always full or overflowing, are they sticky or dirty?).

This information will assist in developing litter-reducing actions within the school. The audit can be conducted with notepads and recording sheets, or could incorporate digital technologies (cameras, tablets etc.). Data can be collated as a class, or individual groups can present their findings to the rest of the class as an assessment piece.

If there is not a litter problem in the school, consider investigating why. Conducting surveys is still relevant here, or assess/audit your school yard (looking at bin types, placement, where students eat etc.)

Lesson 9 may require several lessons to complete.

Suggested Lesson Organisation

Lesson 9: Litter audit

1. Recap on the litter survey findings (from Lesson 8) and explain that the information collected from the surveys has helped establish people's perceptions of litter in the school. Explain to the students that they still need to collect some factual, numerical data on what is happening in the schoolyard. This can be done by completing a litter audit. Explain what an audit is and ask what information could be gained from completing an audit.
2. Using a map of the school, divide the school into areas (e.g. basketball court, field, 'Year 5 hangout' etc.) for groups of students to investigate litter issues. The whole class should be involved in deciding on the areas.
3. Ask students to read the 'Litter audit information sheet'. Provide pairs or small groups with a copy of the 'Litter audit template' and a school map and then have them complete the following steps to conduct a litter audit:
   - Measure out their litter audit area and mark it on the school map.
   - Mark bins, drains and water pipes on the school map.
   - Locate litter and tally the items found (on the template).
   - Mark on the school map where litter was found.
   - Highlight, or make note of, areas that were litter heavy, or appeared to be catchment areas.
   - Record additional comments such as 'bin is broken', 'bin is full', 'no bins', 'bins located in poor spot', 'lots of litter on edge of sports field' etc.
   - Decide if each area is considered as having heavy, medium or light traffic during play times (e.g. basketball court may have heavy traffic, but breezeway does not).

   Students are encouraged to photograph their site if possible.

   Please note: The class should be made aware of Health and Safety guidelines prior to conducting the audit.
4. Students to complete one of the following:
   - Return to class to review data and work in their groups to develop a short presentation detailing their findings.
   - Collect and graph information relating to types of litter and location/s where it was found. The information can then be presented and discussed as a whole class.
   - Collate individual group data to create a whole-class litter audit report/picture/story.

5. As a whole class, discuss the findings:
    - Were any areas more littered than others? Why might this be the case?
    - What were the main litter items found? What were the top three? Why might this be the case?
    - How many bins (on average) were there per area?
    - Were all bins accessible/usable?
    - Did any areas have no bins?
    - Were there any common litter traps or catchment areas?

Optional activities

- In their groups, students compare and discuss whether the participants' responses from the litter survey coincide with litter results found at the school (e.g. the survey indicated that people do not think there is a litter problem, but the audit data revealed a lot of litter).
- Students to measure out their audit space and use the audit data to work out how many pieces of litter there were per square metre (based on an average). Students can then compare different areas.
- Refer back to learning from Lesson 7, review or assess the breakdown process of the different materials.

Recap/reflection

- Reflect on results.

Share your results with Keep New Zealand Beautiful by emailing info@knzb.org.nz

LITTER LESS

Keep New Zealand Beautiful

Kiki Kiwi & Friends 'Litter Less'

THEME 3 - ACTIONING

Full Unit Of Work

Released: April 2018

PROUDLY SUPPORTED BY:

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TE TĀHUHU O TE MĀTAURANGA

THEME 3: ACTIONING

Theme 3 'Actioning' is designed to enable students to take action in their school community to reduce and prevent litter and littering through a combination of individual work, group work, whole-class collaboration and whole-of-school engagement.

In this theme:

INQUIRY QUESTION 6: How do we create a litter-free school?

- Lesson 10: Litter-free education
- Lesson 11: Creating litter-free lunches
- Lesson 12: Evaluating litter-free education

Theme 3 Student Learning Intentions

Students will:

- create a vision/goal for how they want their school and wider local environment to be
- reflect on and draw conclusions from the survey and litter audit data
- develop and design education tools based on the data collected
- implement whole-of-school strategies to promote and create a litter-free environment
- compare common 'packaged' lunches and 'nude food' lunches
- construct or analyse a nude food lunch
- evaluate the success of their education tools by conducting further surveys and audits
- use the findings of the evaluation to redesign the education process, if required
- design a process of re-evaluation for continuous improvement.

THEME: Actioning

INQUIRY QUESTION 6: How do we create a 'litter-free' school?

Lesson 10: Litter-free education

Student Learning Intentions

- Discuss and develop a school vision or goal
- Develop an education campaign based on litter survey/audit findings
- Design education tools aimed at creating a litter-free school

Resources

- Sensory chart activity sheet
- Visioning – for teachers
- Visioning – for students
- Action table
- Survey and audit results from Lessons 8 and 9
- Interactive whiteboard (IWB)

Teacher Background Information

Lesson 10: Litter-free education

It is important for students to remember that, although litter is a global problem, they shouldn't feel overwhelmed by the big issue but should focus on what they can control (e.g. preventing litter in their local context and educating local people).

With the baseline data now collected, students will be able to direct their education campaign based on the findings.

Before the students can do this, it is important for them to create a vision or set a goal which will help keep them on track and ensure their progress can be measured.

In creating a vision/goal, students should consider what their 'perfect' school environment would be. In order to do this effectively, students should use all five senses (i.e. what would it look like, feel like, smell like, taste like, sound like).

Once an initial vision/goal has been created, students should consider how littering/litter-free environments fit into this, and whether their vision/goal complements their school motto/values (if applicable). Once the vision/goal has been created, students should consider the data previously collected and prioritise the issues which they believe need to be addressed. In order for the education campaigns to be successful, it is important to develop a working document. The vision/goal is the overall end point (where you want to be at the very end), the baseline data is where you began, and the issues to be addressed and how they are addressed are the pieces in-between. A good idea is to list the major issues, discuss why they might be an issue, suggest ways in which they can be addressed, identify who will address them, and allocate a timeframe. This will ensure everyone is aware of the plan and progress can be tracked.

Students can then develop education tools, based on their own creative ideas. The possibilities of education tools are endless and only limited by your imagination. However, they should be aimed at increasing students' understanding of the:

- current litter issue (through showing litter audit results)
- causes of litter (through survey responses and audit results)
- fact that fines for littering publically can be hundreds of dollars - you may come up with a school fine system
- hazards and impacts of litter
- movement of litter (local, national, global) and associated impacts/hazards.

Each group could be assigned a different way to create their aspect of litter education (e.g. one group may do an assembly presentation on global impacts, one group may design posters, one group may write a letter to the principal about moving bins to high-litter areas etc.).

Students may also consider implementing a school space ownership program (if litter is an issue in the playground). Students can care for an area and help with education and reporting on that area's cleanliness and how its users dispose of their rubbish. Zones can be given to a student leadership group, individual classes, year levels etc. To engage students, a 'cleanest area' competition could be run between the areas.

Additional Opportunities:

- Sign up for Clean Up Week or hold a local community clean up event. Keep New Zealand Beautiful will provide all the resources needed for a successful event (no charge). This includes rubbish bags, recycling bags, gloves, health & safety guides, certificates and more. Email cleanup@knzb.org.nz for more information.
- If your school teaches year 7-13, consider introducing Keep New Zealand Beautiful's Young Reporters for the Environment (YRE) "Litter Less" Campaign. YRE enables young people to become part of the solution by producing creative and engaging environmental journalism. For more information see www.yre.org.nz or email education@knzb.org.nz

Suggested Lesson Organisation

Lesson 10: 'Litter-free' education

1. Explain to the students that the data collected has helped to develop a 'picture' of the litter issues in the school, and can be used to take action to improve the school environment. Explain that a vision or goal must be created before any action is taken as this will help to maintain focus.
2. Ask the students to think about how they want their school to be. Ask them to consider their senses in this process by using the 'Sensory chart' activity sheet. This can be done in small groups, pairs or individually.
3. Ask the students to share their ideas. Display a 'Sensory chart' on an IWB and collate the students' ideas.
4. Provide small groups of students with the 'Visioning – for students' document which will help them understand the process of creating a vision. Each small group should create a basic vision.
5. As a class discuss the groups' visions and work together to create a class vision. Ask the students to identify ways in which their vision/goal addresses or encompasses a litter-free environment. Also consider asking the students if they know what the school motto/ values is/are and whether litter issues fit into it/them.
6. After establishing the general links to the vision, review the major findings from the survey and audit again. Display the 'Action table' on an IWB and list the major findings in the first column. Discuss how these align or conflict with the class vision/goal.
7. Ask students to comment on the major findings and add comments in the other column:
   - Why is it an issue (e.g. no bins near the playground)?
   - What can we do (e.g. try and get bins out on the field and provide info on new bins)?
   - How can we do it (e.g. speak to principal/ground staff, speak at assembly)?
   - Who will do it (e.g. who in the class will take this project on)?
   - How will we know when we have 'fixed' the issue?
   - Other comments/thoughts (e.g. could make students who play on the playground responsible for bringing bins into the school grounds at the end of the day).

8. Use the above conclusions to direct the development of educational tools for the school community on the litter issue and findings. The class can create a range of educational materials including:
    - Newsletter articles
    - Posters
    - Small group or whole-class presentations for an assembly
    - Photographic pieces
    - Storyboards of litter journey
    - Student-led lessons in younger classes

    Students can work on these projects over a number of lessons.

Optional activities

- If your site does not have a litter issue, you may wish to consider tackling the litter issue beyond the school context. If the students have noticed litter outside the school, consider writing a letter to council, or your local MP, drawing on all the knowledge gained in previous lessons.
- Once the vision has been created, you may wish to get students to draw their interpretation of it. Students could also pick key words from the vision to create posters for the classroom.

Recap/reflection

- Reflect on the vision/goal and associated plan/s to address litter issues.

THEME: Actioning

INQUIRY QUESTION 6: How do we create a 'litter-free' school?

Lesson 11: Creating 'litter-free' lunches

Student Learning Intentions

- Explore the concept of 'nude food'
- Identify lunchbox sources of litter
- Analyse lunchbox items and categorise items as 'nude' or 'packaged' food
- Design a nude food lunch

Resources

- Lunchbox images
- Teacher lunchbox information
- Lunch items chart activity sheet
- Audit data from Lesson 9
- Items to pack in a healthy, litter-free lunch (optional)

Teacher Background Information

Lesson 11: Creating 'litter-free' lunches

Another way to reduce litter in the school is to reduce the amount of potential litter items. Many food items brought to school are heavily packaged, and this packaging often contributes to litter found in school yards.

Food and drink packaging often make up a significant percentage of bin materials in schools. This shows that there is a significant amount of material that could become litter if incorrectly disposed of. Students should assess the audit data to identify which of the litter items could have potentially been brought in from home/canteen etc.

The term 'nude food' is becoming very popular in schools. It simply means food that has no packaging or comes in its own packaging (e.g. a banana). Not only is nude food great for reducing litter, it also benefits the environment by producing less waste. Good examples of nude food include healthy food options such as apples, bananas and mandarins, buying food in bulk packs and placing a small amount in reusable containers and bringing a reusable bottle.

Much of the challenge is in changing the purchasing habits of parents and caregivers. Encourage students to take ownership of their lunchboxes, first by reviewing their lunchbox items and then designing a lunchbox which has no packaging. This could complement a letter written by the class/individuals about nude food and why it is important. The whole school should also consider having a 'nude food day' once a week, with education and promotion designed using this resource. An audit on nude food days could also be conducted to see how many packaged items still came to school that day.

Suggested Lesson Organisation

Lesson 11: Creating 'litter-free' lunches

1. Explain to the students that one way to reduce litter/littering is to reduce the amount of items brought to school, or bought at school, that could become litter.
2. In groups, or as a class, use the audit data (collected in Lesson 9) to determine which of the litter items could have come from home or the canteen. Consider listing the litter items underneath 'home' or 'canteen'.
3. Have a class discussion as to whether these items could be brought to school differently so that they don't become a litter item. Discuss whether the canteen could sell different items, or package them differently, to reduce litter. Record the brainstormed ideas.
4. Explore the concept of 'nude food'. Ask students if they have heard of the term and if they know what it means. Ask the students if they think it can help reduce litter and how.
5. Allow the students to investigate nude food by completing one or all of the following activities:
   - Examining and analysing their own lunchboxes.
   - Analysing one or more of the 'Lunchbox' images (in small groups or as a whole class).
   - Observing their teacher pack a lunchbox (using the 'Teacher lunchboxes' document).

   During the chosen activity, ask the students to complete the 'Lunch items chart' activity sheet.
6. As a whole class, discuss the findings, using the following prompting questions:
   - What were the most common items in people's lunchboxes?
   - Were these items packaged? If so, how?
   - Is the packaging recyclable?
   - Do these items require packaging? Why?
   - Could these items be purchased differently? How?
   - Could these items be brought to school differently? How?
7. Ask the students to redesign their lunchbox to make it a litter-free/nude food lunch by:
   - redrawing it
   - writing a piece describing the old lunchbox and the new lunchbox
   - redesigning a 'typical' lunchbox using one of the 'Lunchbox' images provided.

   Whichever activity students choose to undertake, they should also consider healthy eating options.
8. Students to write a letter (including a picture example) to their parents detailing what nude food is and suggestions for packing nude food.

Optional activities

- Students can run this lesson with younger classes, and help them design their own nude food lunchboxes.
- Students can go home and try to repack their lunchboxes to contain only nude food.

Recap/reflection

- What is nude food?
- Identify nude food items.

THEME: Actioning

INQUIRY QUESTION 6: How do we create a 'litter-free' school?

Lesson 12: Evaluating 'litter-free' education

Student Learning Intentions

- Understand the importance of evaluation to measure the success of education tools
- Evaluate litter-free education tools
- Redesign and implement methods and tools to continue to encourage school-wide litter free education

Resources

- Completed 'Action table' from Lesson 10
- Completed 'Litter survey' from Lesson 8 (optional)
- Completed 'Litter audit' from Lesson 9 (optional)

Teacher Background Information

Lesson 12: Evaluating litter-free education

Evaluating the effectiveness of any project or campaign is important as it allows students to identify gaps in their education tools, and consider how they can be improved.

The major findings table created in Lesson 10 will allow students to keep track of what actions need to be completed, and make comments on how successful their actions have been. To determine how 'successful' an action has been, the students will need to conduct an evaluation. This can be done by conducting surveys and audits again, or by doing visual inspections of the school.

Once the students have conducted an evaluation process, they must put their findings into the 'Action table'. From here, they may need to redesign some of their initial strategies if areas have not improved, or are slow to improve. A continuous monitoring program must occur, even for areas in which litter has been eliminated completely. It is also important to share successes, as well as challenges, with the school community to ensure everyone is involved in the learning process.

Suggested Lesson Organisation

Lesson 12: Evaluating litter-free education

1. Start a discussion with students, asking whether they have made any observations of litter or littering in the school. Have they noticed changes in behaviour? Is there more/less litter present?
2. Explain to students that evaluating their education tools is a useful way to measure their success and there are several options for doing this:
   - repeat the litter audit and compare results
   - conduct a follow-up survey to gauge if there have been changes in people's attitudes and behaviours
   - check nude food on nude food days.

   Students may have other ideas to contribute.

   Enable students to choose and undertake evaluation projects. Once completed, they should present the information gathered. This can be done in a variety of ways (presentation, graphs, letter in newsletter etc.).
3. Ask students to comment on any recurring issues, or new issues that have arisen. If new issues have been identified, they should be added to the 'Action table'. If there have been any problems with management of previously identified issues, ask students what they think they could do differently. Prompt them by discussing what they did the first time, why they think it didn't work, and what they could try instead.
4. Finally, redesign and implement any education tools, based on the evaluation findings.

Optional activities

- Create a class video/scrapbook of the students' journey throughout the unit.
- Students to make a pledge of what they will do differently to help reduce litter.

Recap/reflection

- Discuss why evaluation is important.
- Complete a reflection on what has been learned in the unit. Have opinions changed since the beginning? What will you do differently?

LITTER LESS

Keep New Zealand Beautiful

Kiki Kiwi & Friends 'Litter Less'

CURRICULUM TABLES

Full Unit Of Work

Released: April 2018

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Ministry for the Environment
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MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

Level 1 - Curriculum Table

Learning Area	Achievement Objectives Level 1	Lesson											
		1	2	3	4	(5)	6	7	8	9	10	11	12
English- Ideas	Recognise and identify ideas within and across texts	✓	✓	✓	✓	This lesson would be better suited to Achievement Objectives at Levels 3 and 4.	✓	✓	✓	✓	✓	✓	✓
	Form and express ideas on a range of topics	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Language Features	Recognise and begin to understand how language features are used for effect within and across texts.			✓						✓	✓		
Health and PE- Healthy Communities and Environments	Community Resources Identify and discuss obvious hazards in their home, school and local environment and adopt simple safety practices.		✓	✓	✓								
	Rights, Responsibilities and Laws; People and the Environment Take individual and collective action to contribute to environments that can be enjoyed by all.			✓							✓		
Mathematics and Statistics - Statistics	Statistical Investigation Conduct investigations using the statistical enquiry cycle.								✓	✓			✓
Science- Living World	Life Processes Recognise that all living things have certain requirements so they can stay alive.		✓		✓		✓	✓					
Science- Material World	Properties and Changes of Matter Observe, describe and compare physical and chemical properties of common materials and changes that occur when materials are mixed, heated or cooled							✓					

Level 2 - Curriculum Table

Learning Area	Achievement Objectives Level 2	Lesson											
		1	2	3	4	(5)	6	7	8	9	10	11	12
English- Ideas	Show some understanding of ideas within, across and beyond texts	✓	✓	✓	✓	This lesson would be better suited to Achievement Objectives at Levels 3 and 4.	✓	✓	✓	✓	✓	✓	✓
	Select, form and express ideas on a range of topics	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Language Features	Show some understanding of how language features are used for effect within and across texts.			✓						✓	✓		
Health and PE- Healthy Communities and Environments	Societal attitudes and values Explore how people's attitudes, values and actions contribute to healthy physical and social environments.		✓	✓	✓								
Mathematics and Statistics- Statistics	Statistical Investigation Conduct investigations using the statistical enquiry cycle.								✓	✓			✓
Science- Living World	Life Processes Recognise that all living things have certain requirements so they can stay alive.		✓		✓		✓	✓					
Science- Material World	Properties and Changes of Matter Observe, describe and compare physical and chemical properties of common materials and changes that occur when materials are mixed, heated or cooled							✓					

Level 3 - Curriculum Table

Learning Area	Achievement Objectives Level 3	Lesson											
		1	2	3	4	5	6	7	8	9	10	11	12
English- Ideas	Show a developing understanding of ideas within, across and beyond texts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Select, form and communicate ideas on a range of topics	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Language Features	Show a developing understanding of how language features are used for effect within and across texts.			✓		✓		✓		✓	✓		
Health and PE- Healthy Communities and Environments	People and the Environment Plan and implement a programme to enhance an identified social or physical aspect of their classroom or school environment.			✓							✓	✓	✓
Mathematics and Statistics- Statistics	Statistical Investigation Conduct investigations using the statistical enquiry cycle.								✓	✓			✓
Mathematics and Statistics- Geometry and Measurement	Position and orientation Use a co-ordinate system or the language of direction and distance to specify locations and describe paths.					✓	✓						
Science- Living World	Ecology Explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human induced.		✓		✓		✓	✓					
Science- Material World	Properties and Changes of Matter Group materials in different ways, based on the observations and measurements of the characteristic chemical and physical properties of a range of different materials.							✓					

Level 4 - Curriculum Table

Learning Area	Achievement Objectives Level 4	Lesson											
		1	2	3	4	5	6	7	8	9	10	11	12
English- Ideas	Show an increasing understanding of ideas within, across and beyond texts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Select, develop and communicate ideas on a range of topics	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Language Features	Show an increasing understanding of how language features are used for effect within and across texts.			✓		✓		✓		✓	✓		
Health and PE- Healthy Communities and Environments	Rights, responsibilities, and laws: people and the environment Specify individual responsibilities and take collective action for the care and safety of other people in their school and in the wider community.			✓							✓	✓	✓
Mathematics and Statistics- Statistics	Statistical Investigation Conduct investigations using the statistical enquiry cycle.								✓	✓			✓
Mathematics and Statistics- Geometry and Measurement	Position and orientation Communicate and interpret locations and directions, using compass directions, distances and grid references.					✓	✓						
Science- Living World	Ecology Explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human induced.		✓		✓		✓	✓					
Science- Material World	Properties and Changes of Matter Group materials in different ways, based on the observations and measurements of the characteristic chemical and physical properties of a range of different materials.							✓					