LITTER LESS

Keep New Zealand Beautiful

Kiki Kiwi & Friends 'Litter Less'

THEME 2 - UNDERSTANDING

Full Unit Of Work

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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