



Vortex: Plastic in the Ocean

This lesson explores Vortex, a radical art installation by Douglas Coupland at the Vancouver Aquarium. Vortex is in an imaginative journey to the Great Pacific Garbage Patch and immerses visitors in the ocean plastic pollution crisis. Coupland's exhibit invites students to think about plastic in a relevant, contemplative and transformative way. In this lesson students will look at various plastic objects found in the exhibit and consider the level of necessity of the items, as well as possible non-plastic alternatives. As an extension activity, they will consider more deeply the impact that plastic objects have on marine animals.

- S**tudents will be able to:
- [1]** consider and discuss the necessity of plastic use
 - [2]** come up with alternatives to certain plastic items
 - [3]** think about explain how garbage in the ocean affects marine life

LEARNING ENVIRONMENT	Steps
<ul style="list-style-type: none">• Small groups and pairs	<p><i>This activity works best as a review of scientific concepts explored in class prior to a Vancouver Aquarium visit. Please see the section "Helpful Information" for details of pre-teaching material.</i></p>
MATERIALS	
<ul style="list-style-type: none">• Paper• Group activity sheets (included here)• Pencils	<p>1) Tour of the Vortex exhibit (20 minutes). If a tour of the Vortex fits with your schedule, it would be beneficial for the students because it gives a good introduction to all areas of the exhibit. If it is not possible for your class to take part in a tour, give them a brief explanation of the exhibit, then have them go around and read the plaques to learn more about it.</p>

2) Plastic Items Small Group Activity (15 minutes). Split the students into groups of four. Have them look at the “Treasure Wall” of items found on the shore and the garbage in the water surrounding the boat. Have students compose a list of the plastic items they find using the table provided (more rows can be added if you would like the students to come up with more than 5). They will then fill out the rest of the table on the activity sheet provided. This includes writing down what the item is used for, whether the students in the group use the item, and possible alternatives to the item. Alternatives can include non-plastic versions of the same item, or a different item entirely. This allows students to show their creativity while problem solving.

3) Group Discussion (15 minutes). Gather the students where there is space (just outside of the Vortex exhibit will likely be a good spot). Have each group share at least one plastic item they found and one alternative they came up with. Guide a discussion by asking students questions about plastic use, such as what items they use and if they think they could reduce their plastic use. This will create a personal connection between the students and the exhibit.

4) Creating an Ad (20 minutes). In the same groups the students will split into pairs and select one alternative item they came up with. They will create an ad for the item which shows why people should use it instead of the plastic item they found in the exhibit. A simple example would be a reusable metal water bottle instead of a single-use plastic water bottle. They can create a draft of the ad at the aquarium and finish it at school (see Extension Activities below). The ad should include a title, a catchy slogan, a short paragraph explaining the importance of reducing plastic use, and images

Helpful Information

Aquarium Meeting Spot: The Vancouver Aquarium can be a busy place so locating a pre-arranged meeting space for your class is essential to reinforce learning during your visit. Some spots to consider include the Underwater Dolphin and Arctic Galleries, the Exploration Gallery, and outdoors, weather permitting.

Using Cameras at the Aquarium: If using a camera, please ensure you are doing so carefully around animal habitats. Use camera straps to avoid dropping devices into the water/habitats. When photographing in dark galleries, avoid use of the camera flash to avoid reflection and ensure good quality results. Consider taking photos on an angle (as opposed to directly facing glass habitats) even in well-lit galleries.

Teacher Resources: On the Ocean Wise Education Self-Directed visits page you will find additional resources and links that can help deepen or continue the conversation with students. (<https://education.ocean.org/selfdirected/resources/>).

The Vancouver Aquarium recommends pre-teaching relevant content as a means of making your class visit a more meaningful learning experience. It would be beneficial to the students if they learn about ocean pollution and the Great Pacific Garbage Patch before coming to the *Vortex* exhibit, so they have some background knowledge. Some information about the exhibit can be found on the Vancouver Aquarium website (<http://www.vanagua.org/experience/feature/vortex>) which includes some short videos that could be shown to students before a visit. Students will learn more about the exhibit during the tour if your class is able to take part in that.

Extension Activities

Visual Communication: Students can make a good copy of their ads at school, including illustrations and colour. Each pair could then present their ad in front of the class and they could be hung in the hallway to inform other students in the school of the importance of reducing plastic use.

Poem: To connect plastic pollution to animals in the ocean, you can have the students individually write a poem about one of the objects on the wall in the Vortex exhibit and how it could affect a marine animal of their choice. This is a creative writing activity, but it should include factual information about the effects that garbage in the ocean has on marine life. Students can use any format to write their poem, unless the students have been working on styles of poetry and the teacher wants them to use a specific style. This activity can be framed as an inquiry research assignment about how the animal functions and what it needs to survive, in order to connect to Science Curriculum Big Ideas about organ systems and how they interact with the environment.

Reflection: A visit to this exhibit could be followed by a written reflection upon return to school. Students could reflect upon the perspectives of the four characters in the boat, shared during their visit, or they could be asked to consider alternate perspectives, such as those of animals living in the ocean. For example, “What does an oceanic trash vortex look like to aquatic life? What would it feel like to be in one?”

Shoreline Cleanup: Provide the students with a leadership opportunity and citizen science experience by registering for a Shoreline Cleanup in your local area. Have the students take charge in organizing, communicating and facilitating the cleanup for the community, either a whole class or in smaller teams. Data collected from Shoreline Cleanups goes directly to the International Coastal Cleanup database (ICC). <https://www.vanaqua.org/learn/educational-resources>

Dive Deeper: have the students partake in a research project to further investigate single use plastics and the microplastics that they produce in the ocean. Students may communicate their research through their choice of media or method, to align with the theme of Douglas Coupland’s exhibit that art is a powerful medium to communicate science.

Map it Out: Learn more about the Great Pacific Garbage Patch: it’s size, the fact that garbage travels via ocean currents from all over the world to become a part of it, etc. Students might even think about mapping the origins of garbage, for example, the boat featured in Vortex which travelled from Japan to Haida Gwaii after the tsunami in 2011. We all share the same ocean and our choices therefore have global impacts.

British Columbia – Curricular Connections for Visit and Extension Activities

Grade 4

Science

Big Idea: All living things sense and respond to their environment

Curricular Competencies:

- Demonstrate curiosity about the natural world
- Make simple inferences based on their results and prior knowledge
- Demonstrate an understanding and appreciation of evidence
- Identify some simple environmental implications of their and others’ actions
- Generate and introduce new or refined ideas when problem solving

English Language Arts

Big Idea: Questioning what we hear, read, and view contributes to our ability to be educated and engaged citizens

Curricular Competencies:

- Access and integrate information and ideas from a variety of sources and from prior knowledge to build understanding
- Exchange ideas and perspectives to build shared understanding
- Use personal experience and knowledge to connect to text and deepen understanding of self, community, and world
- Use writing and design processes to plan, develop, and create texts for a variety of purposes and audiences

Grade 5

Science

Big Idea: Multicellular organisms have organ systems that enable them to survive and interact within their environment.

Curricular Competencies:

- Demonstrate a sustained curiosity about a scientific topic or problem of personal interest
- Demonstrate an openness to new ideas and consideration of alternatives
- Demonstrate an understanding and appreciation of evidence
- Identify some of the social, ethical, and environmental implications of the findings from their own and others' investigations
- Generate and introduce new or refined ideas when problem solving

English Language Arts

Big Idea: Questioning what we hear, read, and view contributes to our ability to be educated and engaged citizens

Curricular Competencies:

- Access information and ideas from a variety of sources and from prior knowledge to build understanding
- Apply a variety of thinking skills to gain meaning from texts
- Use personal experience and knowledge to connect to text and develop understanding of self, community, and world
- Respond to text in personal and creative ways
- Exchange ideas and perspectives to build shared understanding
- Use writing and design processes to plan, develop, and create texts for a variety of purposes and audiences

Grade 6

Science

Big Idea: Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment.

Curricular Competencies:

- Demonstrate a sustained curiosity about a scientific topic or problem of personal interest
- Identify questions to answer or problems to solve through scientific inquiry
- Demonstrate an openness to new ideas and consideration of alternatives
- Demonstrate an understanding and appreciation of evidence
- Identify some of the social, ethical, and environmental implications of the findings from their own and others' investigations
- Generate and introduce new or refined ideas when problem solving

English Language Arts

Big Ideas:

- Questioning what we hear, read, and view contributes to our ability to be educated and engaged citizens
- Exploring and sharing multiple perspectives extends our thinking

Curricular Competencies:

- Synthesize ideas from a variety of sources to build understanding
- Construct meaningful personal connections between self, text, and world
- Respond to text in personal, creative and critical ways
- Exchange ideas and viewpoints to build shared understanding and extend thinking
- Use writing and design processes to plan, develop, and create engaging and meaningful literary and informational texts for a variety of purposes and audiences
- Transform ideas and information to create original texts

Grade 7

Science

Curricular Competencies:

- Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest
- Identify a question to answer or a problem to solve through scientific inquiry
- Use scientific understandings to identify relationships and draw conclusions
- Demonstrate an understanding and appreciation of evidence (qualitative and quantitative)
- Consider social, ethical, and environmental implications of the findings from their own and others' investigations
- Generate and introduce new or refined ideas when problem solving

English Language Arts

Big Ideas:

- Exploring and sharing multiple perspectives extends our thinking
- Questioning what we hear, read, and view contributes to our ability to be educated and engaged citizens

Curricular Competencies:

- Synthesize ideas from a variety of sources to build understanding
- Construct meaningful personal connections between self, text, and world
- Respond to text in personal, creative, and critical ways
- Exchange ideas and viewpoints to build shared understanding and extend thinking
- Use writing and design processes to plan, develop, and create engaging and meaningful literary and informational texts for a variety of purposes and audiences
- Transform ideas and information to create original texts

Plastic Items

Item	What is it used for?	Do you use it?	Possible alternatives