

ICS20 - Environmental Unit

Resource is completed and included here.

Resource is not yet completed. Please wait for further updates.

Curriculum Expectation	Timing (based on 75 min period)	Lesson Plan (Resources can be found in following appendices)
C2.1	<p>17 min</p> <p>20 min</p> <p>7 min</p> <p>10 min</p>	<p>Lesson 1</p> <p>Goal: Identify incorrect ways to dispose of e-Waste</p> <p>Watch PBS - Ghana: Digital Dumping Ground (2009) students follow along with w-enviro1-videos.doc</p> <p>Watch CBC - Electronic Waste in China (2008) students follow along with w-enviro2-videos.doc</p> <p><i>Above videos include public display rights and should be available through your librarian</i></p> <p>Watch Greenpeace - Scraplife: e-Waste in Pakistan (2009) available through greenpeace.org</p> <p>Class discussion: What are the toxins included in computers and example of why they are harmful 1b-w-enviro-e-waste.doc</p> <p>Resources 1-w-enviro-e-waste.doc - student worksheet for initial lesson 1b-w-enviro-e-waste.doc - teacher led discussion notes</p>
C2.1 C2.2	<p>5 min</p> <p>30-45 min</p> <p>25-35 min</p>	<p>Lesson 2</p> <p>Goal: Summarize what e-Waste is</p> <p>Introduction why e-waste is a global problem. 2a-w-enviro-teacher-notes.doc</p> <p>Watch the PBS.org Jim Puckett interview (10 parts)</p> <p>Short activity student pairs Students are assigned a clip from above interview. They have to put it into layman's terms what each clip means. Present to class. 2b-w-enviro-activity.doc</p>

		<p>Resources 2a-w-enviro-teacher-notes.doc 2b-w-enviro-activity.doc</p>
C2.2	20 min 20 min 30 min	<p>Lesson 3 Goal: Identify how consumers generate electronic waste</p> <p>Watch Annie Leonard's The Story of Stuff video available from storyofstuff.com</p> <p>Teacher led discussion regarding Provincial Legislation - electronics recycling fees Discussin notes 3-w-enviro-provincial-legislation.doc</p> <p>Watch Discovery Channel's: iPod History available through video.google.com <i>to be continued in following period</i></p> <p>Resources 3-w-enviro-provincial-legislation.doc</p>
C2.2	20 min 15 min 10 min 30 min	<p>Lesson 4 Goal: Identify ways to reduce consumer electronic waste</p> <p>Finish watching Discovery Channel's: iPod History</p> <p>Students complete the personal electronic inventory activity Lesson plan 4-w-enviro-inventory-lessonplan.doc (Sample electronic items are included but could be changed based on the list of WEEE items listed at: wdo.ca/)</p> <p>Class discussion regarding results</p> <p>Students complete the reflection activity. This activity would be best suited as an assessment of learning activity. 4-w-enviro-inventory-reflection.doc</p> <p>Resources 4-w-enviro-inventory-lessonplan.doc 4-w-enviro-inventory-reflection.doc</p>
		<p>Lesson 5 Goal: Identify ways to promote proper e-Waste recycling</p> <p>Students bring in e-Waste items from home. Use them to create their version of the weee man</p> <p>OR/ Create a bulletin board to build awareness in school</p>

		Resources 5-w-enviro-promotion.doc
C2.4	20 min 40 min	Lesson 6 Goal: Identify correct way to recycle e-Waste Watch Dirty Jobs S4 E11: e-Waste recycling Video follows Mike Rowe into the SIMS recycling plant. Can be purchased from iTunes for \$1.99 Students complete SIMS recycling investigation 6-w-enviro-sims-recycling.doc Resources 6-w-enviro-sims-recycling.doc
C2.2		Lesson 7 Goal: Identify corporate policies that reduce e-Waste Students complete Global Corporate Responsibility assignment This assignment is best suited as an evaluation of learning activity. Resources 7-a-global-analysis.doc - student assignment
		Lesson 8 Global Corporate Responsibility Assignment - work period
		Lesson 9 Global Corporate Responsibility Assignment - presentations
C2.3		Lesson 10 Goal: How computers are used to improve the environment

e-Waste ... what shouldn't happen

PBS - Ghana: Digital Dumping Ground (2009)

1. Explain 3 or more issues exposed in this video.
These issues could be environmental, societal, human health, justice.
 - a.
 - b.
 - c.

2. How can we reduce the impact on the environment as we use computers?

CBC – Electronic Waste in China (2008)

1. What industry did Guiyu's economy depend on 20 years ago?
2. What group does most of the 'dirty work' in Guiyu?
3. What percentage of the children in Guiyu have high levels of lead in their bodies?
4. Why are illegal recycling methods permitted in Guiyu?

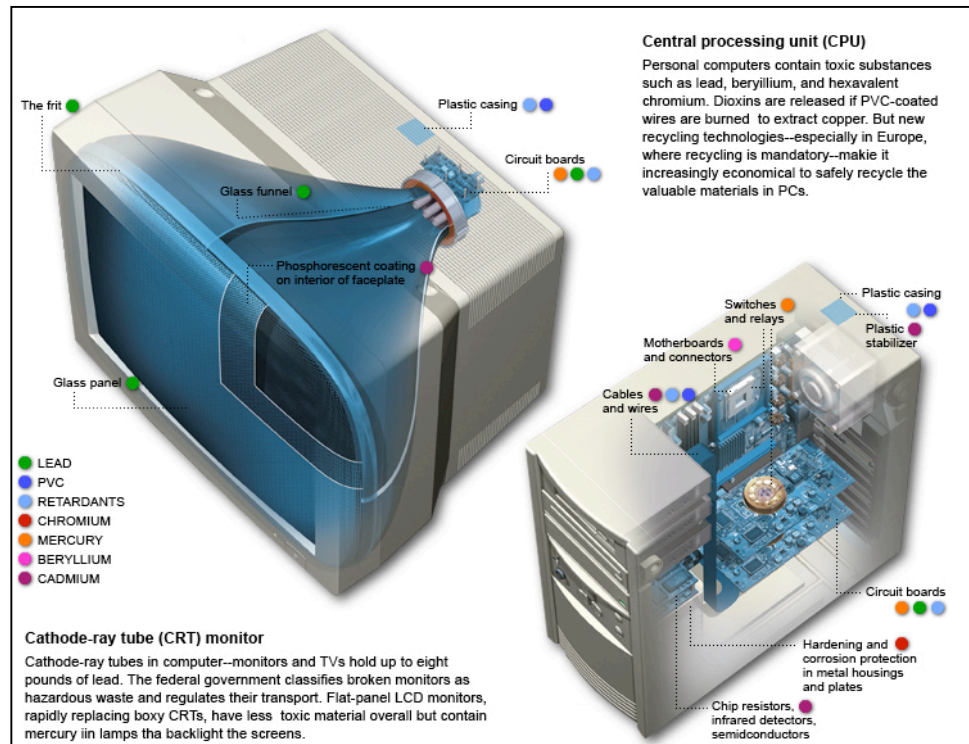
5. Where does most of the e-waste enter China?
6. How much e-waste is shipped annually to Mainland China?
7. Where is most of Canada's e-waste shipped (as of 2008)?
8. How many companies did Environment Canada and Canada Customs inspect in 2006?

9. What was the fine each of these companies incurred?

Toxins in Computers

Information from the National Geographic Feature article - High Tech Trash
<http://ngm.nationalgeographic.com/2008/01/high-tech-trash/computer-interactive>

Below is a screen shot of an interactive website that details where toxins exist in the computer and the effects they can have on the human system.



- X LEAD** – Can be found in the Cathode Ray Tube, the glass of the monitor and the solder in the circuit board of the CPU. A CRT monitor can have up to 2.2kg of lead based on the glass used.
Lead poisoning can happen through fumes, food contamination, skin absorption. Lead is particularly harmful to children because it interferes with development of the nervous system.
- X MERCURY** – Can be found in the circuit boards and internal switches.
Mercury poisoning can include symptoms itching/burning skin, skin discoloration, shedding of the skin.
- X CADMIUM** – Can be found in a coating on monitor glass, batteries, chip resistors and cables/wires.
Cadmium can cause flu-like symptoms, respiratory problems, liver and kidney damage.

Waste is a problem?

Event descriptions taken from Basal Action Network website
http://www.ban.org/about_basel_ban/chronology.html

Electronic waste is now synonymous with computers, cell phones and old televisions. However, electronic waste falls under the broader scope of toxic waste. While disposing of toxic waste locally is a constant challenge, the global need to control the shipment of toxic chemicals overseas has developed over the last 25 years. These are a few events that increased global awareness of what companies were doing to get rid of toxic waste.

August, 1986 - Voyage of the Khian Sea

Cargo Vessel Khian Sea departs Philadelphia, USA loaded with 14,000 tons of toxic incinerator ash. The ship travels to Haiti and dumps some of it's load on Gonaives beach. After leaving Haiti (it's unclear if they left of their own will) the ship embarks on an infamous voyage. They sail the waters of 5 continents for over 2 years changing the ship's name several times to avoid being detected. The purpose of roaming around the ocean was to find another port where they could dump the balance of their toxic load. Greenpeace alerts all likely ports and ship is repeatedly turned away. They are suspected of finally dumping remainder of cargo in Indian Ocean. Waste still lies on Haitian beach.

November 1986 - Sandoz/Ciba-Geigy Chemical Spill

The Ciba-Geigy factory in Basel Switzerland produced synthetic dyes. There was a leak which later led to a fire at the Sandoz chemical factory where pesticides were produced. The fire caused a major flow of more than 30 tonnes of highly toxic waste to enter the waters of the Rhine.

March, 1987 - New York Garbage Barge

A barge named Mobro is towed from Islip, New York carrying 3,186 tons of solid waste. The garbage cruise becomes a sad international joke as it attempts to unload its cargo in 6 U.S. states. After each attempt failed the Mobro continues south and is barred from the waters of Mexico, Belize, and the Bahamas. On September 1, 1987 after a 6,000 mile, 162 day voyage, the barge returns the garbage to its point of origin, New York City.

August, 1987 - May 1988 -- Italian Chemical Wastes Poison Koko Beach, Nigeria

An Italian businessman sends 8,000 drums of hazardous chemical waste to small port town in Nigeria. The drums are labeled "relating to the building trade, and "residual and allied chemicals." It is believed that the Italian businessman paid \$100 monthly rent to store these barrels on his farmland. Nigerian workers eventually remove the waste for export back to Italy. Many are hospitalized for severe chemical burns, nausea, vomiting blood, and partial paralysis. In response to the dumping, Nigeria recalls its ambassador to Italy and then seized an Italian freighter in order to pressure Italy to remove the wastes. Subsequently the ships Karin B and Deepsea Carrier were employed to return the wastes to Europe where they were met with massive protests.

1992 - U.S. Company Sends Toxic Waste to Bangladesh Labeled as Fertilizer

Bangladesh government purchases more than 3,000 tons of lead and cadmium contaminated fertilizer from a South Carolina company. Toxic fertilizer is sold throughout Bangladesh and spread on farms.

Personal Inventory Tracking

Goal is for students to tally and reflect on how much consumer electronic waste they have generated in the last 4-5 years.

Setting up an online survey

- ▶ Open your docs.google.com account
- ▶ Click Create New > Form
- ▶ Give your form a title and description. Sample follows
- ▶ Create each question with a text question type. Sample follows
- ▶ When all your questions are created SAVE
- ▶ A hyperlink is provided at the bottom of the screen to add to your website so students can access the form to complete

Setting up the online viewable graph

- ▶ Open your docs.google.com account
- ▶ Click the form that you just created and a spreadsheet including the questions you created should appear
- ▶ In the first row create a sum of all the tallies that will appear in the column below. This row is used to create the bar graph.

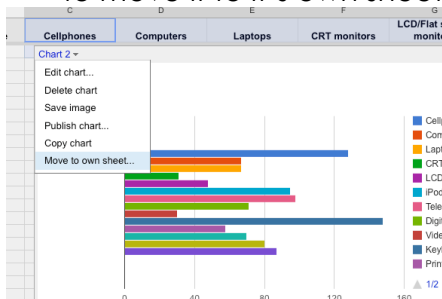
	A	B	C	D	E	F	G	H	I
1									
2	Timestamp	Initials/Name	Cellphones	Computers	Laptops	CRT monitors	LCD/Flat screen monitors	iPods/mp3 players	Televisions (tube or flatscreen)
3	TOTAL		128	67	67	31	48	95	98
4	5/15/2011 22:07:34	AQ	4	3	3	1	2	4	4

- ▶ Highlight rows 1 and 2 from the C column until the end of survey

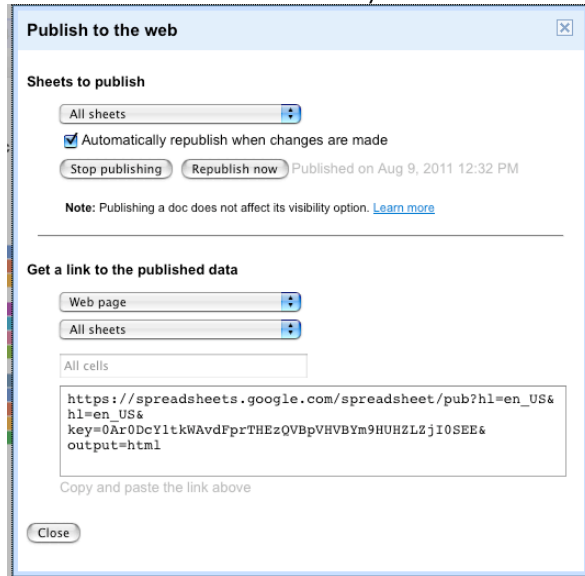


- ▶ Choose the horizontal bar graph > click insert

- ▶ Chart will appear on current sheet. Click the chart and use the menu to move it to it's own sheet.



- ▶ Go to the sheet that has your chart
- ▶ In the top right corner use the Share menu to Publish as a Webpage
- ▶ A hyperlink is provided to add to your webpage so students can view as each other's surveys are submitted



Sample Survey

How many ...

ICS201 - Measure the environmental impact of electronics

Complete the survey below to help us determine as a class how many of the following electronic devices can be found in our homes. Please include ALL electronic devices that you or your family has owned, even ones that have been disposed of. Time span should cover the last 4-5 years as you can remember them. Please only take the survey once.

- Initials/Name *
- Cellphones *
- Gaming consoles *
- Computers *
- Laptops *
- CRT monitors *
- LCD/Flat screen monitors *
- Keyboards, mice, input devices *
- Printers *
- Televisions (tube or flatscreen) *
- VCRs / DVD players *
- iPods/mp3 players *
- Stereos / radios *
- Digital cameras *
- Video recorders *

SIMS Recycling

Using the SIMS Recycling online interactive tool answer the following questions.
<http://simsrecycling.com/news-and-resources/audio-and-video>

Electronics Recycling

What happens in the picking shed?

What is the purpose of the hopper?

How many size reduction areas are there?

What are the processes to extract metals from non-metals?

CRT Recycling

What steps are the same in the CRT recycling process?

Why is it important to separate leaded from unleaded glass?