TO WHAT DEGREE?
Telling Climate Change Stories Through Photos

A Lesson Plan for Grade 6 to 9
PART II
A picture tells a thousand stories

Suggested classes: Geography, English Language Arts

Length of time: 50-70 minutes

Objective
In this lesson, students will:

- Appraise photos to work in different settings and contexts to tell a different story
- Interpret images using prior knowledge on climate change and the environment
- Select effective words and phrases to describe a photo
- Design and create photo captions using background knowledge on climate change

Materials

- Environment Photos (one copy per group)
- Captioned To What Degree? sample images (to display digitally or print)
- Uncaptioned To What Degree? environment photos to sort, (one copy per group, printed)
- Pen and paper

Evaluation

- Captions and word clouds created for photo panels (Summative)
- Communication and work as a group (Formative)
REVIEW OF PART I

Begin by recalling the discussion in the previous class. Ask some questions and, if time allows, write down students’ answers on the board as a group brainstorming session. Some recommended questions include:

- What is the difference between adaptation and mitigation for climate change?
- What are some examples of actions we can take to adapt to climate change, and to mitigate (prevent/lessen) future climate change?
- What are some actions that both adapt to and mitigate climate change?

CATEGORIZING PHOTOS

Shift into today’s activities. Today students will be discussing the use of photos to tell a story, in particular about climate change and the environment. Ask the students to think about what their top five criteria would be for an effective photo.

Give them time to think individually, and then share with a partner, or a group next to them, for a few minutes and see if they can find a common agreement on good criteria.

After a few minutes, have each group share their criteria and note on the board, providing a checkmark or star if something is repeated. (Think-Pair-Share)

Explain to the students that they will be looking closely at photographs to tell an environment and climate change story. Brainstorm with the class:

- What kinds of images do you think would be good at representing climate change?
- What kinds of images come to mind when you think of climate change?
- What kinds of images have you seen on book covers, news articles, and television shows that talk about climate change?

Write down student suggestions and examples on the board for a few minutes, and then begin the activity.

Divide the class into groups of four to five students and have them sit together. Hand out a copy of the sample photos for each group, cut out beforehand. These photos were compiled from from websites and can be used and distributed for free for educational purposes.

In groups, ask the students to decide together a way they wish to sort their images. Give them five to 10 minutes to do so.
Alternatively, you may want the students to sort the photos in a particular way, or assign one group each to sort them differently. Examples include:

- By tone of the photo (is it more upbeat and positive, more sad and pensive, or somewhere in between?)
- By categories of image types (e.g. animals, energy, weather, actions, colours, quality)
- By most compelling/least compelling story
- By how well they connect to the local community or not

Review how students decided to sort their images and see how it differs between groups. As a final task for these photos, ask the students to choose their top five to 10 images. In choosing them, do they want to tell a particular story? Allow time for the class to share their top selections. You may want to let each group put them up on the board and discuss them, or use the digital document projected to display them for analysis.

**Access to photos**

We have included photo examples for you in the appendix attached. Our photos are from Pexels and Unsplash ([http://pexels.com](http://pexels.com); [unsplash.com](http://unsplash.com)), but you can also look for other photos across the internet. We used photos with Creative Commons Zero License, which allows the use of photos, images, audio, and video that the creators have licensed for certain uses (often non-profit and educational). If you choose to have your students look up their own examples of photos online—and they may be displayed outside of the classroom—teaching about Creative Commons licenses and citing work might be a useful tool. More info on the different types of Creative Commons licenses here: [https://creativecommons.org/](https://creativecommons.org/)

**CAPTIONING PHOTOS**

For the next part of this lesson, students will be looking at a series of images that were chosen for a photo exhibition on climate change adaptation and mitigation across Canada.

Explain to the students they will be using source material from a climate change photo exhibition, *To What Degree? Canada in a changing climate*, from the Canada Science and Technology Museum. Over the next few classes, they will be exploring how stories can be curated for the public to tell a story on climate change and the environment. Taking on similar roles of museum exhibitors, curators, and interpreters, they will be asked to look at different visual representations to tell a story, delve deeper into some specific stories, and finally curate their own.
Exhibit planning for public spaces such as museums can be a challenge. Some important things the creators of this photo exhibit discussed were:

- Having photos that bring up a number of emotions and feelings at once
- Choosing photos that tell more than one story (i.e. cows in a field with wind turbines behind tells a story of methane and energy used by agriculture, but also renewable energy)
- Photos that reflect stories from throughout Canada that inform but also connect them to different regions (“I’ve been somewhere like that before!” or “This looks a lot like home.”)

In groups of two to three students, give out one of the 10 uncaptioned photo panels from the uncaptioned To What Degree? sample images. You can either give these out at random, or have each group pick one.

Ask the students to take out a piece of paper and brainstorm as a group. Work through the following steps:

1- Take five minutes to mind map (in the form of a word cloud, for example) words and phrases you think of when you look at the photo. Knowing that the photos are from a climate change adaptation and mitigation exhibition, ask the students to try and think about other words and phrases they may have been introduced to last class—with the button Venn diagram activity—that may also apply. It may be helpful to have the button Venn diagram activity posted somewhere in the room to refer to, or on a digital screen.

2- After they have written some words down, give the students another 10-15 minutes to craft a made-up caption that captures what messages the image might be trying to convey. The group can decide what kind of tone they want to take with their caption (serious, goofy, educational, instructive, sombre, optimistic, etc.), but should keep it short and concise.

**CLIMATE CAPTION WORDS**

A team at the Canada Science and Technology Museum prepared the text and photo selections for the exhibition, To What Degree?. The following word clouds were created by the interpretive planner and writer of the captions, after asking people to brainstorm words they thought of when looking at the images. You may want to project these word clouds on a screen in the classroom. How many words do your students have in common?

<p>| Cool roofs | boring, innovation, light reflection, urbanization, green, cooling heat, rooftop, clean, overcrowding, hot, surprising, cooling, empty, living roof, cool roof, light, heat cool, community, innovative |</p>
<table>
<thead>
<tr>
<th>Topic</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban forests</td>
<td>average, solitary, fall, greenspace, open, park, trees, peaceful, landscaping, tranquil, urban, open space, dead, path, urban forests, calm, sad</td>
</tr>
<tr>
<td>Wildland fire: friend and foe</td>
<td>teamwork, containment, wildfires, invasive species, firefighting strategies, wildfire, tragic, hot, controlled burn, destruction, control, controlled burning regeneration, destruction, disaster, determination, urgent, dangerous</td>
</tr>
<tr>
<td>What's the beef?</td>
<td>landscape, spring, arid, melting, warming, change, unpredictable weather, arctic, brisk, Canada, warmth, peaceful, north, prairie desert bare, vast</td>
</tr>
<tr>
<td>Spreading tick habitat</td>
<td>microscopic, yuck Lyme, tick Lyme, disgusting, bedbug, yikes, terror, bedbug, ew, yuck, gross, tick gross Lyme disease, eerie, pests, tick, scary</td>
</tr>
<tr>
<td>Electric vehicles</td>
<td>eco, futuristic, clean, renewable, energy efficient, rural and modern, eco vehicle, progressive, awesome, electric, adaptive, clean technology, change, future, electric, energy, modern, travelling</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Heavy-duty aerodynamics</td>
<td>what is this, research, innovation, reduce, air resistance energy, testing facility, funny, testing, wind tunnel, awesome, unusual, testing research wind tunnel, trucking, research, museum, technology</td>
</tr>
<tr>
<td>All-season Arctic highway</td>
<td>construction, dry, industry, develop, pipeline infrastructure permafrost, construction, bare, barren, desolate, contrasting, transport, dig, permafrost, vast, digging, exploration, new, desert</td>
</tr>
<tr>
<td>Preparing for climate-driven health impacts</td>
<td>Hands, investigate, explore, scientist, researcher, bacteria, sample, glass Petri dish, disease, observe, growth, gross, spreading</td>
</tr>
</tbody>
</table>
If time allows, have each group share their caption with the class. Then, end the class by revealing the real captions. Have students discuss how accurate they were in their own messaging versus the real messaging. Inform the students that for the next class, they will be digging deeper into the climate change story behind the image. You may wish to ask them to think about choosing a few of the images that stood out for them – as they will be choosing one for their research project next class.

MORE RESOURCES

- Check out Everyday Climate Change on Instagram for a global collection of photographers documenting climate change, or a summary piece by the Guardian here: https://www.theguardian.com/environment/gallery/2015/jan/20/everyday-climate-change-in-pictures
- Similarly, check out CNN’s photo gallery This is What Climate Change Looks Like: https://www.cnn.com/2016/11/16/world/gallery/cop22-photo-award/index.html
To What Degree?

Environment Photos

Vlad Tchompalov- Unsplash

Pixabay- Pexels

Guido Klinge- Pexels

Priscilla Du Preez- Unsplash

Pexels

Pixabay- Pexels
What’s the beef?

Black Angus beef cattle graze in a field with wind turbines in Rosenhof, Saskatchewan.

Climate change is a threat to cattle farming and meat production because it impacts the quality of food crops and animal feed, and contributes to water shortage and livestock disease. Livestock, especially cattle, also contribute to climate change. In terms of reducing the carbon footprint, switching from beef to vegetables just one day per week is like driving 1860 km LESS per year.

L’effet du changement climatique sur l’élevage bovin

Des vaches Black Angus mangent de l’herbe dans un champ à Rosenhof en Saskatchewan.

Le changement climatique est une menace pour l’élevage bovin et la production de viande, car il a un effet néfaste sur la qualité des cultures alimentaires et des aliments pour animaux et contribue aux pénuries d’eau et aux maladies du bétail. Le bétail, notamment les bovins, contribue également au changement climatique. Pour réduire l’empreinte de carbone, il suffirait de ne consommer que des légumes un seul jour par semaine, ce qui équivaudrait à une réduction d’émission carbone égale à l’émission carbone d’une voiture roulant 1860 km par an.
Top predators adapt

A group of killer whales is spotted in Nunavut’s Admiralty Inlet in the Canadian Arctic.

With ice melting earlier in the year, killer whales are expanding their hunting range, and competing with polar bears as the top Arctic predator. They target narwhals, beluga, and bowhead whales during the summer, which are traditional Inuit hunting prey. Interviews with Inuit community members have revealed important Arctic changes including this story about more predatory killer whales in the region.

Les grands prédateurs s’adaptent

Un groupe d’épaulards (orques) dans l’anse de l’Amirauté du Nunavut dans l’Arctique canadien.

La saison de fonte des glaces arrive plus tôt dans l’année qu’au précédent, et en conséquence, les orques bénéficient d’une période de chasse allongée et sont désormais en concurrence avec les ours blancs pour le titre du plus grand prédateur de la zone Arctique. Ils chassent les narvals, bélagas et baleines boréales durant l’été, mammifères marins qui entrent aussi dans la chasse traditionnelle inuit. Des entretiens avec des membres de la communauté inuit ont révélé d’importantes changements dans la zone arctique comme le prolongement de la période de chasse des épaulards dans cette zone.
Heavy-duty aerodynamics

Researchers in Ottawa test a 39% scale model of a transport truck in the National Research Council Canada’s 9-metre wind tunnel, for a Transport Canada project to assess aerodynamic retrofits for trucks and trailers.

While cars are getting more fuel efficient, emissions of heat-trapping carbon dioxide from heavy-duty trucks are growing rapidly because of the increase in the movement of goods. Electric trucks might be the future, but equipping trucks with aerodynamic technologies, such as side skirts, boat-tails, and gap and roof fairings, can help reduce emissions today.

Transport aérodynamique

Des chercheurs d'Ottawa testent une maquette à échelle 39% d'un camion de transport dans la soufflerie de 9 mètres du Conseil national de recherches du Canada, pour un projet de Transports Canada visant à améliorer l'aérodynamique des camions et remorques.

Alors que les voitures sont de plus en plus efficaces en consommation de carburant, les émissions de dioxyde de carbone retenant la chaleur et provenant des poids lourds augmentent rapidement en raison de l'augmentation du transport de marchandises. Les camions électriques pourraient être développés à l'avenir, mais l'amélioration de la technologie aérodynamique dans les camions, tels que des jupes latérales, rétrects et carénages, permettrait de réduire les émissions dès maintenant.
**All-season Arctic highway**

Completed in November 2017, the 137 km long Inuvik-Tuktoyaktuk Highway winds through the tundra of the Northwest Territories.

Ice roads are winter lifelines that move goods and people in Canada’s North. Climate change is thawing the ice and permafrost, making these roads less reliable and more costly to build and maintain. A new all-season Arctic highway now snakes from Inuvik to Tuktoyaktuk in the Northwest Territories. Its design and engineering help protect the permafrost and give the road additional strength.

**Route arctique en toutes saisons**

Achivée en novembre 2017, la route Inuvik-Tuktoyaktuk de 137 km de long traverse la toundra dans les Territoires du Nord-Ouest.

Les routes de glace sont vitales en hiver, car elles permettent le transport des biens et des personnes dans le Nord canadien. Le changement climatique fait fondre la glace et le pergélisol, ce qui rend ces routes moins fiables et plus coûteuses à construire et à entretenir. Une nouvelle route arctique toutes saisons relie désormais Inuvik à Tuktoyaktuk dans les Territoires du Nord-Ouest. Sa conception et sa construction aident à la protéger du pergélisol et renforcent la route.
Preparing for climate-driven health impacts

A scientist examines E. coli growing in a petri dish. Counting these colonies tells us about how much bacteria is present in the originating sample, of sewage overflow for example.

More intense weather like heavy rainfall and extreme temperatures put our health and well-being at risk. Weather like this may spread diseases, pollute our waterways, and impact our environment and ecosystems. Canadian scientists are preparing for these changes by making advances through research, laboratory work, technology and monitoring that will help us address climate change impacts.

Préparation pour les effets sur la santé du climat

Une scientifique examine des bactéries E. coli qui poussent dans une boîte de Pétri. Le comptage de ces colonies permet de dénombrer les bactéries dans l’écantillon d’origine, comme celui provenant du débordement des eaux usées par exemple.

Les événements météorologiques plus extrêmes, comme les fortes pluies et températures extrêmes peuvent mettre en péril notre santé et notre bien-être. Ces phénomènes météorologiques peuvent propager des maladies, polluer nos cours d’eau et modifier notre environnement et nos écosystèmes. Des scientifiques canadiens se préparent à ces changements en faisant avancer les recherches, les travaux de laboratoire, la technologie et la surveillance qui nous aideront à faire face aux effets du changement climatique.
Wildland fire: friend and foe

Life returns to a valley as charred trees are covered over by wildflowers, in the Sawback Range, Alberta.

Climate change is already causing more severe and catastrophic wildland fires. With the expansion of communities into forested areas, fires are more frequently threatening homes and livelihoods. Wildland fire is a natural part of forest ecosystems and important for forest health. Fire smart education, outreach and vegetation management are valuable wildfire prevention tools to protect homes and communities.

Feux de forêt : amis et ennemis

La vie reprend dans une vallée où des arbres carbonisés sont recouverts de fleurs sauvages, dans la chaîne Sawback en Alberta.

Le changement climatique est déjà à l’origine des feux de forêt plus graves et catastrophiques. Avec l’expansion des villes dans les zones forestières, les incendies menacent plus fréquemment les habitations et moyens de subsistance. Les feux de forêt sont un élément naturel des écosystèmes forestiers et sont importants pour la santé des forêts. La sensibilisation sur les feux et la gestion de la forêt sont d’importants outils de prévention de feux pour protéger les habitations et les villes.
Cool roofs

A six acre green roof extends on top of the west building of the Vancouver Convention Centre.

Built surfaces like roofs, paved roads, and parking lots absorb heat from the sun, making cities hotter than surrounding greener areas. One way to cool down cities and the people in them, is to create reflective or vegetative surfaces. Many cities across North America like the city of Vancouver now encourage the installation of cool roofs (reflective white roofs or vegetative green roofs) when replacing existing roofs or constructing new buildings.

Toits frais

Un toit vert de six acres sur le bâtiment ouest du Centre des congrès (Convention Centre) de Vancouver.

Les surfaces construites comme les toits, routes et parcs de stationnement absorbent la chaleur du soleil, ce qui rechauffe les villes par rapport aux régions rurales avoisinantes. Une façon de refroidir les villes et les gens dans les villes consiste à créer des surfaces réfléchissantes ou végétalisées. De nombreuses villes d'Amérique du Nord comme la ville de Vancouver encouragent l'installation de toits frais (toits blancs réfléchissants ou toits verts végétalisés) pour remplacer les toits existants ou pour les nouvelles constructions.
Spreading tick habitat

A close-up of a deer tick on human skin can help with identifying this kind of tick in the environment.

As our climate warms, ticks are spreading in Canada and may bring infectious diseases like Lyme disease. Adapt to our changing climate: stay healthy and enjoy the outdoors by taking steps to protect yourself, your family and your pets. Use insect repellent, wear long-sleeve shirts and pants, and be sure to check for ticks. If you find a tick, remove it immediately.

Agrandissement de la zone d’habitat des tiques

Un gros plan sur une tique à pattes noires posée sur la peau d’un humain peut aider à identifier ce type de tique dans la nature.

À mesure que notre climat se réchauffe, les tiques se propagent au Canada et peuvent transmettre des maladies infectieuses comme la borréliose (ou maladie de Lyme). Adaptez-vous au changement climatique : restez en bonne santé et profitez du plein air en prenant des mesures pour vous protéger, ainsi que votre famille et vos animaux de compagnie. Utilisez un insecticide, portez des pantalons longs et des chemises à manches longues et vérifiez que vous n’avez pas de tiques sur vous. Si vous trouvez une tique, enlevez-la immédiatement.
Urban forests

Evergreen Brick Works environmental centre situated within the Don Valley urban forest in Toronto.

In a changing climate, cities face higher temperatures and declining air quality. Trees help solve these problems and improve community well-being. Urban trees reduce heat by adding moisture to the air and creating shade. The soil they grow in absorbs storm water. Each year, urban trees absorb nearly 2.6 million metric tonnes of carbon dioxide – the weight of 21 CN Towers!

Forêts urbaines

Le centre de l’environnement Evergreen Brick Works situé dans la forêt urbaine de Don Valley à Toronto.

À cause du changement climatique, les villes font face à des températures plus élevées et à une qualité de l’air en déclin. Les arbres aident à atténuer ces problèmes et à améliorer le bien-être de la communauté. Les arbres urbains permettent de rafraîchir la température en humidifiant l’air et en créant de l’ombre. Le sol dans lequel ils poussent absorbe les eaux pluviales. Chaque année, les arbres urbains absorbent presque 2,5 millions de tonnes de dioxyde de carbone – le poids de 21 tours CN!
Electric vehicles
EV charging at a Fast Charger unit operated by Hydro-Québec’s Electric Circuit network in Lévis, Québec.

Using electricity to power your car produces zero tailpipe pollution or heat-trapping gases like carbon dioxide. With the increase in popularity of electric vehicles, one question arises: where can people charge their cars, especially in rural areas? Fast-charging stations are being built along highways across Canada to facilitate travelling from coast to coast.

Véhicules électriques
Recharge d’un véhicule électrique à une borne de recharge rapide opérée par le réseau Circuit électrique d’Hydro-Québec, à Lévis, Québec.

L’utilisation de l’électricité pour alimenter votre voiture ne produit aucune pollution atmosphérique ni de gaz qui retiennent le chaleur comme le dioxyde de carbone. Avec l’augmentation de la popularité des véhicules électriques, une question se pose : où peut-on charger son véhicule, en particulier en zones rurales ? Des stations de recharge rapide sont construites le long des autoroutes à travers le Canada pour faciliter les déplacements d’un océan à l’autre.