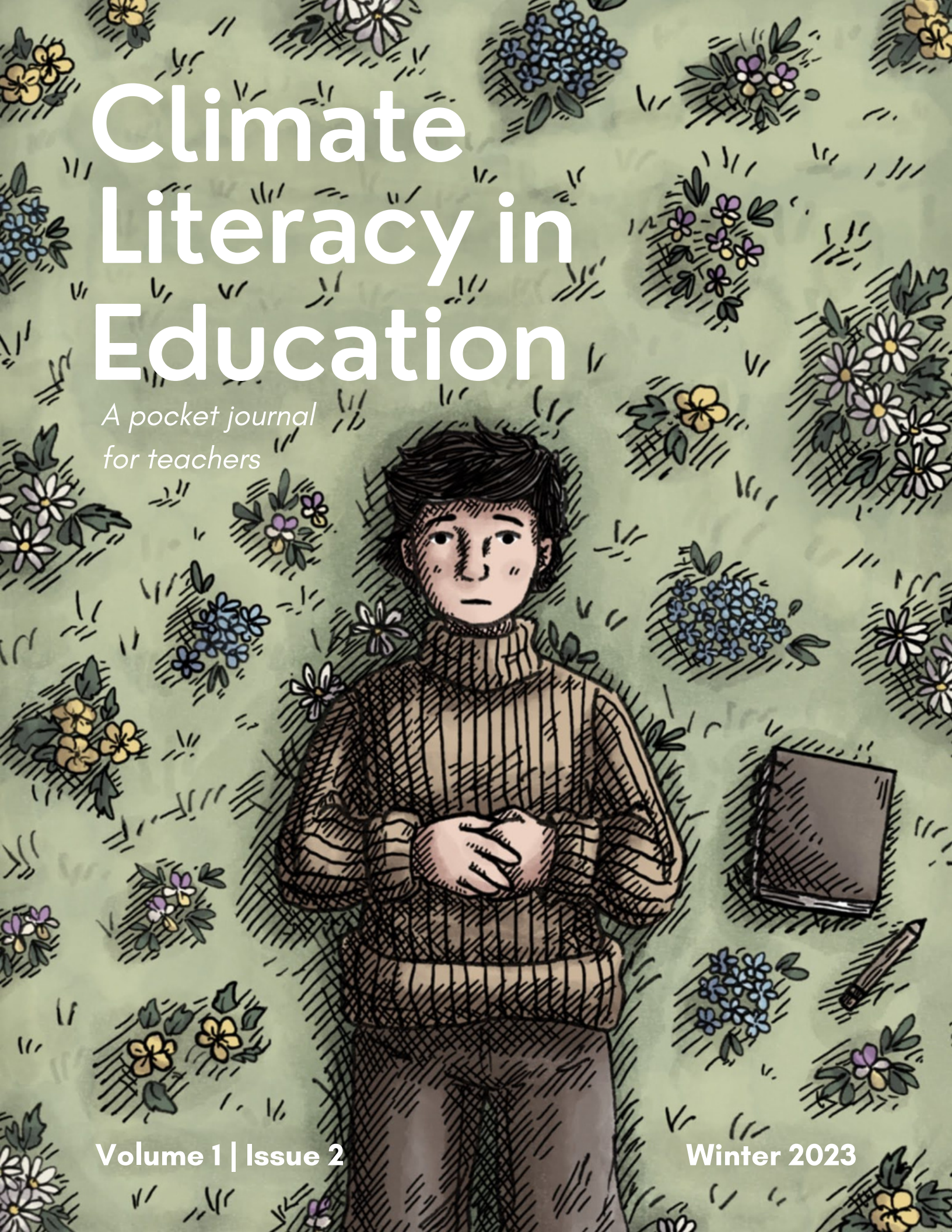
Climate Literacy in Education

A pocket journal for teachers



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About *CLE*

Climate Literacy in Education (*CLE*) is an open-access, double-blind, peer reviewed journal sponsored by the Center for Climate Literacy at the University of Minnesota and published through University of Minnesota Libraries. *CLE* publishes practical, teacher-oriented content on all aspects of climate literacy education at all grade levels and across all subject areas (primarily K-16, but including teacher education and professional development). We are a pocket journal focused on classroom practice which is why the articles we publish are short: 2000 words or less. Our content is written in jargon-free prose accessible to the general audience. All submissions are peer-reviewed by two anonymous readers. Authors can expect to hear results within two weeks after submission. We publish on a rolling basis.

We welcome submissions in the following categories: Curriculum, Reflections, Critical Essays, and Creative & Multimedia. For detailed submission criteria pertaining to each category, please visit our journal website.

We look forward to working with you!

Editorial Collective

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Climate Literacy in Education

Introduction:

Climate Literacy Work After COP28

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Abstract

In this Introduction, we review the key developments of 2023 when it comes to climate, including COP28. We reflect on what they mean for *CLE* and consider their implications for the urgent challenge of building a climate literate, ecological civilization.

Keywords

climate change, COP28, climate literacy education, ecological civilization

Welcome to the second issue of *Climate Literacy in Education*! We write these words a week after the end of COP28 in Dubai and at the close of 2023, which was not just the hottest year on record, but saw the hottest week ever (in 120,000 years) and the hottest day ever too: the hottest "in at least a hundred and twenty-five thousand years" (McKibben, 2023, n.p.). These numbers are not anomalies. They are indicators of a building momentum that comes from derailing of the planetary system caused by human-driven climate change, especially the burning of fossil fuels. These numbers also come at the tail end of the La Niña cold period, which had kept global temperatures lower for the last 18 months, and at the start of a strong El Niño event, which is expected to bring even more record-breaking temperatures through at least mid 2024 and will

accelerate the arrival of "unsurvivable heat extremes" in many parts of the world this very decade (Vanos et al., 2023, p. 9). The record numbers in temperatures also correlate with rapidly growing costs of climate disasters—2023 being another record-breaking year for billion-dollar disasters in the US—and, equally worryingly, with a rapidly growing number of armed conflicts, international tensions, and rising authoritarianisms all over the world. As if climate, temperatures, and resource scarcity had anything to do with authoritarianisms or wars.

There is another war that is being fought globally and is, increasingly, globally called out. It is a war against life on Earth, present and future, fought by Big Oil and their allies. In this war the stakes are power and corporate profit, even if just for a while longer, versus habitability of the planet for human and nonhuman beings—today and for generations ahead. "War against life" is not too strong a word either: its casualties have been 69% of wildlife populations (as compared to 1970 population levels), 49% of wild grassland and 20% of forests (since 1900), six out of nine planetary boundaries that define a safe operating space for humanity (since ever), over 2 million people dead as a direct result of extreme weather events (since the 1970s), with an additional 8+ million dying each year from CO2 emissions and air pollution—and about $4.3 trillion in economic damage worldwide (Associated Press, 2023). If this doesn't count as war, how else would you call it? And if it does—in scope, scale, and impacts—consider who has been winning in this war over the past four decades? And why?

It is not wrong to be impatient with the current system. Or with its key strategy of "addressing" climate change through negotiations at Conference of the Parties (COP) summits. COP28 in Dubai was unprecedented in revealing the shameless determination of Big Oil to question, disrupt, deflect, slow-walk, and flat-out refuse any meaningful change. Not only was this year's summit led by the CEO of the UAE's Adnoc—one of the major oil companies in the world (which used COP28 to strike new oil deals)—and by an oil executive who distinguished himself by being the first-ever COP President to declare that there is 'no science' behind demands for phase-out of fossil fuels. It also included in negotiations at least 2,456 fossil fuel lobbyists, "almost four times as many [as] the number registered for Cop27 in Sharm el-Sheikh—which itself was a record year" (Lakhani, 2023, n.p.). With so many high-level professionals pushing the fossil fuel interests, COP28 was largely—and more than ever before—a fossil fuel trade fair. In

particular, the final resolution—article 28, subsection d—replaced the call to *phase out* fossil fuels (see 2023 Global Stocktake Synthesis Report, p. 21) with a vapid call to *transition away* from fossil fuels, and specifically "in energy systems" rather than across all emission sectors and industries.

Yet what seems to be another victory for Big Oil (the final agreement) only accelerates their demise on other levels, especially though what happens in the sidelines. At least since COP21 in Paris (2015), COPs have increasingly become spaces where thousands of people, groups and organizations—including those from the Global South, BIPOC, Indigenous communities—come together to propose equitable and ecocentric ways to move forward. On these levels COPs increasingly succeed to unify global resistance against ecocide: this year Indigenous women leaders took center stage, detailed proposals for equitable phaseout of fossil fuel extraction were released, and a number of important declarations were announced (see the full list here and the UN list). Our favorites include COP28 Declaration on Sustainable Agriculture, the Freshwater Challenge initiative, and the long-awaited, albeit ridiculously underfunded Loss and Damage Fund. All these are important steps. Yet much more needs to be done, especially by the general public.

One consensus is this: we need pathways that are alternative or parallel to the COP process, pathways that accelerate the pace of change and public pressure for it. Rupert Read calls these initiatives "coalitions of the willing": collaborative efforts by groups and individuals who see opportunities for action in the present and are committed to do "what actually needs to be done, if we are to have a future" (2023, n.p.). Another climate action leader George Monbiot (2023) is calling for adoption of a different voting system that cannot be manipulated by Big Oil and a more localized system of creating regional treaties that can bypass the gridlocks of the UN general assembly approval system. Finally, the doyen of climate science James Hansen—acknowledging the continuing collusion of governments and financial interests to ignore the climate's delayed response—urges "anticipatory action" (Hansen et al., 2023, p. 2), especially with young people, in preparation for a period when "climate will become less tolerable to humanity, with greater climate extremes, before it is feasible to reverse the trends" and restore the climate to its Holocene levels (26).

At *CLE*, we believe in anticipatory action of universal climate literacy education. Ours is a coalition of the willing that can transform every classroom but requires the initial investment of research, design, curriculum development and training. This is not an easy work. About a year ago the Center for Climate Literacy was tapped by an organization in UAE that asked us for advice on preparing a climate curriculum for showcasing at COP28. Although they were eager for the final product, they had never considered details such as how many teachers would get trained, based on what materials, how many schools would participate, at what grade levels or for how long... Every new question we asked made it more clear that a climate curriculum can never merely be a product for display. It needs to be a lived reality embedded in classroom teaching, requiring broad cooperation, a support system, and a vision of change. Since none of those things are "showcasable," the request was dropped. We do not know what educational initiatives were eventually presented in Dubai. We do know, however, that even Big Oil recognizes the power of stories to shape young minds. If you attended COP28, you had a chance to receive a free copy of I Need to Know: An Introduction to the Oil Industry & OPEC, a children's informational book produced by the PR and Information Department of the Organization of the Petroleum Exporting Countries. Dedicated to children and young people all around the world, the book is a shameless piece of fossil fuel propaganda on how oil is necessary for the human civilization to survive and how OPEC has played a key role in advancing humanity's march toward prosperity and stability. And if this message strikes you as contrary to the very idea of COPs or climate action, it also suggests that a transformation toward an ecological civilization will first need to be achieved in the realm of stories: in words that recognize the truth of our predicament and help imagine the way forward.

Contributions in this issue of *Climate Literacy in Education* put forward tangible, practical, and necessary interventions in education. Articles in this issue's Curriculum Section offer critical frameworks for engaging students with multimodal texts. Nina Goga and Maria Pujol-Valls, along with students Rebecca Agostini, Debora Carolo, Giulia Nai, Ilaria Sardella, Giulia Silvestrini, discuss insights from the Green Dialogues project. They show how educating pre-service teachers to use picturebooks that "address both greed and insensibility and welcome young readers to collaborate and engage critically" (p. 7) can raise ecocritical consciousness in both pre-service educators and the students they

teach. Abby Hartzell shares complimentary insights from a secondary perspective, arguing that Oziewicz's CLICK Framework offered her ninth class a generative opportunity to reflect their relationship with the non-human world.

The Reflection Section includes two perspectives on and experiences in engaging with climate literacy. Neela Nandyal describes preliminary findings from her doctoral research in coastal Ecuador, noting that Ecuadorian youth are simultaneously acutely aware of climate destruction and hopeful about their own capacity to make positive change. Mary Woodbury, curator at Dragonfly.eco, shares her experiences curating one of the world's largest databases on eco-fiction resources. Woodbury's practical insights prove useful to anyone collaborating on digital platforms.

A robust set of critical essays offer readers several insights to think with. Marek Oziewicz outlines the CLICK Framework: a care-centric map for guiding students through climate literacy learning. Echoing Hartzell's observations, Oziewicz argues that the CLICK Framework allows students to both articulate relationships of care and understand their profound interconnectedness. Richard Beach and Blaine Smith discuss the range of skills and knowledges that young people are already leveraging in their creation of digital media. They offer a wide summary of examples of youth-created digital media that educators could use in their classrooms. Last, Lee Zimmerman responds to Kirsten's Hunt's article (see Issue One) on discussing Naomi Klein's *How to Change Everything* with pre-service educators. Julia Coltman argues that many of the stories in Shuan Tan's *Tales from the Inner City* demonstrate human arrogance and put forward more ecocentric alternatives. Marcus Axelsson and Charlotte Lindgren's reading of the *Pettson and Findus* series from Sven Nordqvist argues for leverage a "pre-ecocriticism" to engage in ecocritical dialogues with even the youngest readers. Last, Zimmerman suggests that blanket insistence on hope risks blunting the need for urgency and action, going on to join Donna Harroway's invective to "stay with the (climate) trouble."

Finally, Emma Ambrosi introduces us to Mr. Warbler: a pen-pushing clerk who, feeling work-weary, decides to go on a walk. Ambrosi's Gorey-inspired text and her illustrations (which also feature as this issue's cover) are a call for us all to, like Mr. Warbler, venture further afield than just a stone's throw.

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Climate Literacy in Education

Picturebook Dialogues About Environmental and Social (In)justice

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Maria Pujol-Valls, Universitat Internacional de Catalunya (UIC)

Infographics by students from the University of Padova (UNIPD): Rebecca Agostini, Debora Carolo, Giulia Nai, Ilaria Sardella, and Giulia Silvestrini

Abstract

Climate curriculums and reading practices are urgently needed both in school and higher education. The mobility project Green Dialogues is focused on enhancing the quality of teacher education by strengthening student teachers' and staff's ecocritical thinking and collaboration competency. As part of the project the students developed experience-based teaching plans for primary education on how to connect literature activities with reflections on and dialogues about environmental and social (in)justice. This article presents five of these teaching plan infographics and explains their educational context.

Keywords

Ecocritical dialogue, children's literature, infographics, UN Agenda 2030, teacher education

A student mobility project focusing on ecocritical thinking and collaboration

The five infographics were created by student teachers involved in the mobility project *Green Dialogues*, a collaboration between Western Norway University of Applied Sciences (HVL, Bergen, Norway), the University of Padova (UNIPD, Padova, Italy), and

the Universitat Internacional de Catalunya (UIC, Barcelona, Spain). Green Dialogues is a four-year mobility project (2022–2025) aimed at enhancing the quality of teacher education by strengthening student teachers' and staff's ecocritical thinking and collaboration competency through dialogue and intercultural exchange. The students and staff involved in the project participate in five-year MA programmes in teacher education with an orientation in language and literature. To enhance the quality of education, the project builds on dialogic teaching (Bakhtin, 1986; Alexander, 2020). It seeks to develop and apply theoretical and ecodidactic perspectives on environmental children's literature, primarily addressing children aged 6 to 12.

Ecocritical thinking and collaboration through dialogue

Climate literacy implies knowledge about the drivers of climate emergencies and about transformative responses needed "to stand up for everyone's biospheric inheritance" (Oziewicz, 2023, p. 34). Taking human greed and environmental insensibility as one cause of the climate emergency, in the Green Dialogues Project students selected picturebooks that address both greed and insensibility and welcomed young readers to collaborate and engage critically with the books to gain knowledge and understanding required to develop "ecocentric ways of thinking" (Oziewicz, p. 35). The Green Dialogues project considers collaboration and the development of dialogic skills as key actions to establish viable and democratic long-term solutions to the climate crisis. Following Goga et al. (2023), ecocritical dialogues "combine theoretical concepts from ecocriticism and dialogic teaching" (p. 3) to encourage teaching practices that open participants to "critical, relational, and collaborative encounters and entanglements with multiple environments, materials, and matter" (p. 9). This conception of ecocritical dialogues is based, among other things, on previous experiences with ecocritical dialogues and picturebooks (Goga & Pujol-Valls, 2020; Campagnaro & Goga, 2022). To enable educators to systematically consider the key principles of ecocritical dialogues and to develop their repertoire of techniques, Goga et al. (2023, p. 8-9) propose a framework for setting up ecocritical dialogues. This framework, which guides the five teaching plans presented here, calls for attention to the location, participants, approach, and subject matter of the ecocritical dialogue.

The educational context of the infographics

The infographics by Debora Carolo, Giulia Nai, Ilaria Sardella, and Giulia Silvestrini were created within the educational context of a 15 ECTs (about 8 US credits) course on "Sustainable literacy and environmental children's literature." The course combines advanced knowledge about literacy and children's literature with current themes in sustainable development and lifelong learning needed to meet the goals of the UN's Agenda 2030. The literary corpus consisted mainly of contemporary children's literature with an emphasis on environmental connectedness, climate change, and social and environmental (in)justice. Dialogic teaching and the didactic tools related to ecocritical dialogues were applied, tested, and further developed throughout the course. The course included an assignment in which students created an infographic based on their classroom experience with children aged 9–10. The infographic applies ecocritical and educational approaches to a selected corpus of picturebooks that thematize environmental connectedness and social and environmental (in)justice.

The educational context of Rebecca Agostini's infographic was a 16 ECTs course on "Environmental children's literature and teaching English as a foreign language." The course included extensive reading, storytelling, and literary circles as TEFL methodologies, complemented with ecocritical, literary theory, social science, and pedagogical components for education in democratic citizenship. One of the competencies developed in this course was how to combine storytelling, picturebooks, and dialogue—grounded in ecocritical and social approaches—when teaching English as a foreign language. One assignment consisted in designing a teaching proposal that involves storytelling with a picturebook. The selected book had to lend itself to developing pre-reading, during-reading, and post-reading activities that foster dialoguing and critical thinking on sustainability and social (in)justice.

The format of the infographics

Students were asked to create infographic posters or booklets to help primary school teachers design lesson plans related to children's literature, environmental issues, and child-oriented learning activities that stimulate affective, critical, and collaborative ways of thinking. The infographics were designed as a step-by-step guide on how to carry out activities and to provide teachers with educational justifications for each step. In line with

the Green Dialogues project parameters, these justifications link up with key ideas in dialogic teaching, environmental literacy, performative and aesthetical picturebook mediation.

A few final notes: except for *Forêt des frères* by Yukiko Noritake, all picturebooks are available in English. Noritake's book is available in the original French, as well as in Italian, Spanish, and Catalan translations. All five lesson plans are designed to be carried out within the frame of one to four lessons/class periods, approximately 45–60 minutes each. They are designed for groups of 15 to 30 primary school students, preferably with two teachers in the classroom.

The five infographics

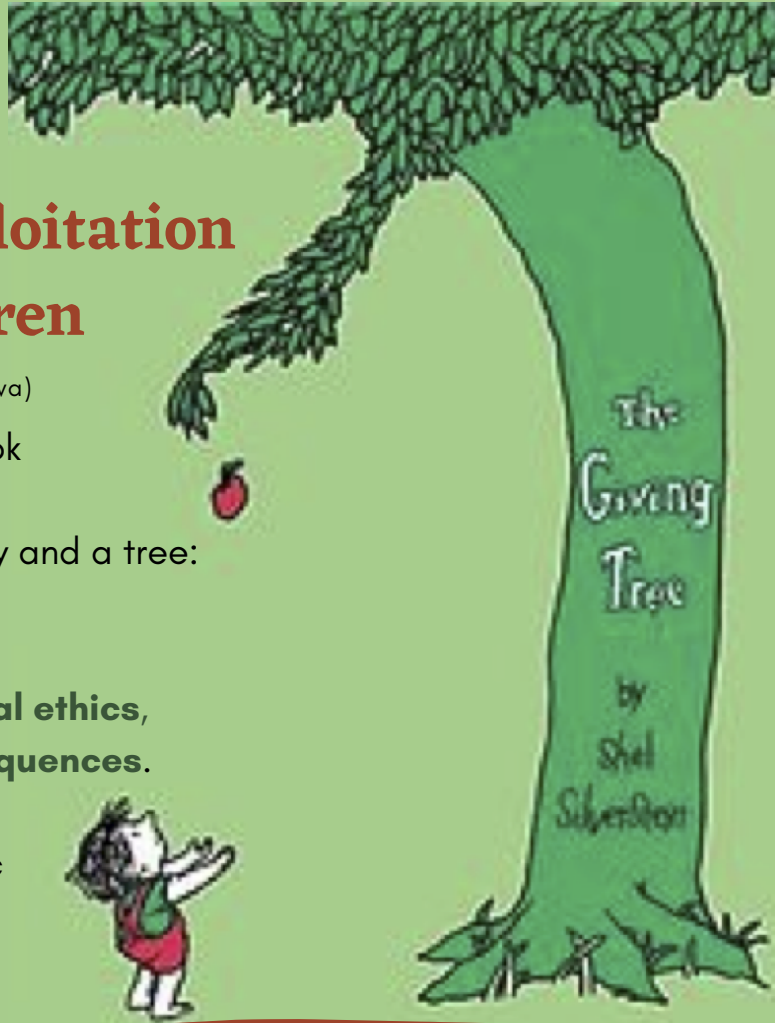
The first two infographics (figures 1 and 2) address one of UN's most disputed Sustainable Development Goals—SDG 8, decent work and economic growth—by displaying how economic growth and humanity's greed for natural resources have caused today's climate crisis. Both infographics suggest ecocritical reading activities to enable primary school students' transformative responses to the picturebook by imagining alternatives.

Title	*How to Talk About the Exploitation of Nature with Children*
Unit Time	*2-3 hours*
Grade Level(s)	*Students age 9-10 years*
Core Text	*The Giving Tree* (1964) by Shel Silverstein
Supporting Texts	United Nations SDG 8 and 15
Climate Literacy Terms	Anthropocene, Capitalocene, Greed
Objectives	*At the end of the lesson students will have shared and discussed their thoughts on humanity's greed and its consequences. They will have had the opportunity to express their own suggestions on how humans can respond or take action in more generous and sustainable ways.*
Materials and Resources	Figure 1, paper, coloured pencils (leporello)

Figure 1 (below). Infographic by Giulia Nai on Shel Silverstein's *The Giving Tree*

How to talk about the exploitation of nature with children

By Giulia Nai (Università Degli Studi di Padova)



The Giving Tree (1964) is a children's picturebook by Shel Silverstein.
The story is about the relationship between a boy and a tree: The boy asks and pretends, and nature gives.

Children (9-10 years) can focus on **environmental ethics**, **nature-human** connections and **actions-consequences**. They have an important role in building a better future for our planet, and talking about this topic at school is a good beginning.
The suggested activities take 2-3 hours.

1. Brainstorming on the cover

The teacher asks the children what they see and what they think the book is about. They can write down their ideas on a post-it note and stick it near an image of the cover; at the end, the teacher reads all the notes.

Children can find out a lot of information about the story just by looking at the cover. They are active participants and not only passive listeners of the story.

2. Book reading

The teacher reads aloud the story and shows the pictures to the children.

The text is short and with pictures it is easy to understand.
The repetitions in the book are engaging and they push the reader to turn the page and find out what happens next.

3. Discussion about the message of the story

Together the class discusses : "How did the boy treat the tree? How did the tree treat the boy? Do you think that humans take good care of nature? Why?"

Conversation about the characters and their actions is necessary in order to reflect on the message of this story. Keep in mind that it is important to listen to what children think without judgment.

4. Brainstorming about emotions

Children can share emotions and feelings: "How does the boy feel?
How does the tree feel?
And how do you, as a reader, feel about this story?"

It's important to try to identify with each character and imagine why this character did a certain thing instead of another. Talking about feelings and emotions is challenging but necessary to develop empathy. We may have different opinions, but it is important to accept them, so this is why the dialogic part is so relevant.

5. Leporello: The Giving Tree VS The Giving Human

Everyone creates a Leporello, a small double-sided book with two stories: One story is about the book they read with the title "The Giving Tree", and the students are encouraged to draw the main scenes on the pages.
In the second story, children have the possibility to tell an alternative story with the title "The Giving Human". Students can reflect on these guiding questions: "What can we do for nature? What can we give?" and they can draw some ideas on the other pages.
At the end, children show their Leporello and share what they have done.
Children have to think of some solutions in order to improve the world and prevent exploitation. It is necessary to think differently to find alternatives and solutions to problems.

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Title	*Forêt des frères* by Yukiko Noritake
Unit Time	2-3 hours
Grade Level(s)	students age 9-10 years
Core Text	*Forêt des frères* (2020) by Yukiko Noritake
Supporting Texts	United Nations SDG 8 and 15
Climate Literacy Terms	Anthropocene, Coastal erosion, Human expansionism, Individual action, Wilderness, Capitalocene, Greed
Objectives	*At the end of the lesson students will have shared and discussed their thoughts on sustainable ways of living. They will have had the opportunity to imagine human or other earthlings' responses and perspectives on the various choices and changes of life represented in the picturebook.*
Materials and Resources	*Figure 2, pen and paper*

Figure 2 (below). Infographic by Giulia Silvestrini on Yukiko Noritake's *Forêt des Frères*.

Literary activity by Giulia Silvestrini (Università degli Studi di Padova)

FORÊT DES FRÈRES

by Yukiko Noritake

The book presents the parallel stories of two brothers, who each inherit half of the same forest. They both decide to settle down there, but from the beginning, they take two different roads...

The literary activity is designed for **9-10 year old** students and it is connected to the 15th SDG ***Life on Land***. The entire activity takes **two/three hours** to complete.

READING

Following a discussion about the cover, the teacher reads and shows everyone the picturebook.

Teaching tips: the teacher should read using expressive techniques to keep the students' interest and attention high. *Each page has only a few words, so the book can be explored as a wordless picturebook.*

DIALOGUE

The teacher asks questions or replies to answers strictly regarding the storyline, without going into the reflective part.

Teaching tips: the teacher can also let the students create questions and share them with the class. In this way, the students will be more interested and will improve their dialogical skills.

INDIVIDUAL REFLECTION

Each student should write which story they prefer and why. Then, the teacher collects the replies, reads them to the class and starts to discuss them, respecting everyone's opinions.

Teaching tips: the teacher should ensure that everyone works on their own, because the students can sometimes be too influenced by one another, risking that they always share the same ideas and forget to reflect on their own.

GALLERY WALK

The students, divided into small groups, should write answers to specific questions, focusing more on the details of the story, and should read what other groups have already said.

Teaching tips: the teacher should organise the gallery walk with the doublespreads and, at the end, discuss the replies with the class. This activity helps the students to improve their communication skills and their imaginative dimension.

WRITING

Each small group has to write the story from the point of view of one character (be it one of the brothers, another human, or an animal or plant).

Teaching tips: the teacher can make this activity more challenging, making the students choose a character from the story that they don't like. In this way, they can improve their narrative skills, walking in the shoes of someone else.

LIFE ON LAND

The teacher asks each student to choose one picture from the story that, in their opinion, can represent the *Life on Land* Goal.

Teaching tips: the teacher should let everyone go through the pages individually and reflect. This activity helps the students to connect the picture book with the 15th SDG.

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The third infographic (figure 3) revolves around the sustainability of natural resources used by humans. It engages with SDG 6 (clean water and sanitation) and SDG 14 (life below water) through its focus on the discovery, availability, and sustainable use of water. The picturebook and the activities developed for classroom use help encourage children to read the story ecocritically and to develop deeper awareness about water as a resource at risk.

Title	*The Meaning of Water*
Unit Time	*4-5 hours*
Grade Level(s)	*students age 7-8 years*
Core Text	*On a magical do-nothing day* (2016) by Beatrice Alemagna
Supporting Texts	United Nations SDG 6 and 14
Climate Literacy Terms	Ecological civilisation, Nearby nature, Planetarianism, Wilderness
Objectives	*At the end of the lesson students will have learnt, thought, written and painted about the meaning of water, both in class and outdoors. They will have considered the meaning of water and the use that humans should and should not make of it.*
Materials and Resources	*Figure 3, paper, pens, watercolours, sticky notes*

Figure 3 (below). Infographic by Debora Carolo on Beatrice Alemagna's *On a magical do-nothing day*.

Debora Carolo - Università degli Studi di Padova

The meaning of water

The project

This project includes all the following activities, based on the reading out loud of the picturebook *On a magical do-nothing day* by Beatrice Alemagna.
SDGs: 6:Clean water and sanitation, 14:Life below water
Time: 4-5 hours
Age: 7-8 years old

1. Intro to SDGs and WATER

The teacher and the pupils should watch a video together about SDGs and then go through the goals, focusing on the ones linked to water.

2. Reading of the book

After a short introduction of some key-words relevant to the story, the teacher reads aloud the picturebook *On a magical do-nothing day* by Beatrice Alemagna. The teacher should stop and show the picturebook to the children every second page.

3. Outdoor exploration time

During a break or a walk outside, the children should be encouraged to look for things with water and keep them in mind for later.

4. Watercolor time

When the children come back from the outdoor exploration, the teacher asks them to do some watercolor painting, underlining why they are using water for it.
The teacher asks them to paint what they have seen or experienced with water.

5. Gallery walk

The teacher hangs up the watercolor paintings of the children in their classroom and asks them to walk through, watch, and think. They should focus on what the meaning of water is to them and write a few key-words on a post-it.

6. Writing

Thinking about all the work done about water, the children should be encouraged to write:

- to water
- for water
- about water

It can be a letter, a poem, or whatever they feel to be appropriate.

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In climate literacy education it is important "to foster an appreciation of *the interconnectedness of social and environmental justice*, encouraging more contemplative behaviour toward each other, other species, and the environment" (Young, 2018, p. 6, our italics). Whereas the first three infographics are more related to the environmental component of the interconnectedness mentioned by Young, the fourth and fifth infographics focus on the social side of the spectrum. Addressing the SDG 10 (reduced inequalities), these infographics intend to develop children's ecocritical thinking through reflection about the many people who need to migrate, the reasons for migrations, the risks migrants encounter, and their feelings.

Title	*A silent book about courage, loss and hope*
Unit Time	*1 hour*
Grade Level(s)	*students age 8-9 years*
Core Text	*Migrants* (2020) by Issa Watanabe
Supporting Texts	United Nations SDG 10
Climate Literacy Terms	Collective Action, Social Justice, Migrants
Objectives	*At the end of the lesson students will have been able to reflect about the social and environmental inequalities experienced by migrants. Through drawing, speaking, or writing, students learn about the potential of wordless picturebooks to expose and overcome linguistic inequalities.*
Materials and Resources	*Figure 3, paper, pens, watercolours, sticky notes*

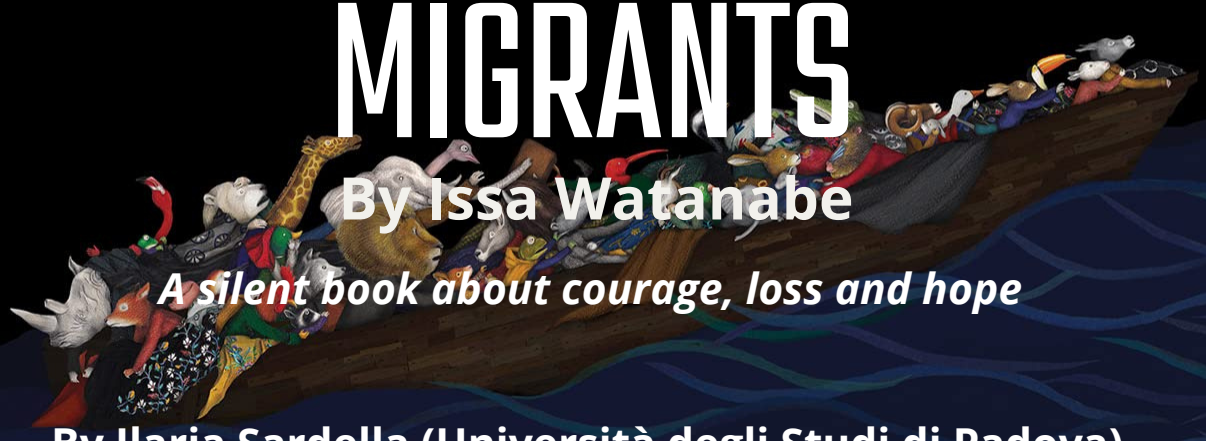
Figure 4 (below). Infographic by Ilaria Sardella on Issa Watanabe's *Migrants*.

Children age 8-9. A one-hour lesson

MIGRANTS

By Issa Watanabe

A silent book about courage, loss and hope



By Ilaria Sardella (Università degli Studi di Padova)

1 READ

This is a Silent Book so it's important to know how to read it.

There are many ways, but I suggest stopping on every page and asking the children what they see and what they think about it.

Starting from the cover.

Teacher tips

This book can be used to talk about the 10th goal of SDG (Reduce Inequalities). You can talk about inequalities during the reading, but also about this kind of book, which everyone can understand (Silent Book). In this case the teacher has to be a scaffolding for her students, in order to create an interactive and inclusive activity.

2 RECONSTRUCTION

After the reading, you can propose to the children that they reconstruct the story with copies of some of the characters from the book.
In this way you can see what they have understood and what impressed them the most.

Teacher tips

In a Silent Book every child can see different things according to their interpretations. Seeing their stories can be really interesting, but it's not an evaluation of the children. You have to consider this reading as an aesthetic work. Let the children work on their interpretations and meaning-making.

3 WRITE

You should subsequently ask the children to write down the story.

In this way everyone can express their opinion and their meaning of the story.

They can also look at the book or at their story and write it down.

Teacher tips

In able to offer the children different possibilities, you should propose different options with different forms of expression (drawing, speaking, writing).
In this way you can meet all the children's needs and offer them possibilities to express themselves.

4 INVENT

To go deeper into their learning you can ask the children to invent a personal new story about migration.

They have to draw it without using words.
If they need it, they can use the previous works to get inspiration.

Teacher tips

This is another way to give the children a chance to express themselves.
In this way they can be involved and be active participants in their own learning.

Important: there's not a right way and a wrong way.

5 BUILD A BOOK

For the last step you can build a book with the stories of all the children in the class.
You can choose the title together and write down all the authors' names.
You can then read it together with all the children, each one explaining his or her work.

Teacher tips

During all these activities it is really important to have a meaningful dialogue with the children. In this way they can share and build their ideas together.
For this activity it is fundamental that everyone has a chance to share their story with the whole class and be active participants in the lesson.

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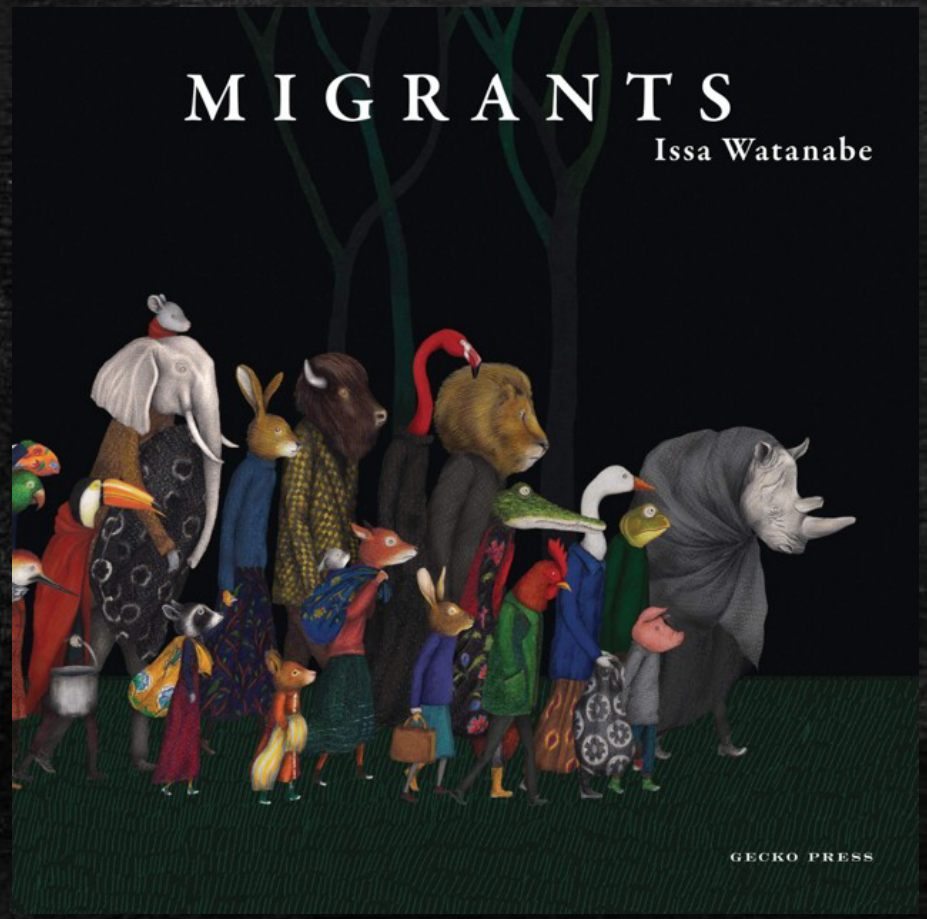
Title	*Literature Conversation for a Selected Book*
Unit Time	*1 hour*
Grade Level(s)	*students age 9-10 years*
Core Text	*Migrants* (2020) by Issa Watanabe
Supporting Texts	United Nations SDG 10
Climate Literacy Terms	Collective Action, Social justice, Migrants
Objectives	*At the end of the lesson students will have increased their awareness of migration, environmental and social injustices. Thanks to reading the book and discussing it with the classmates, they will be able to question the knowledge and opinion regarding migrants that they had before the session.*
Materials and Resources	*Figure 5, paper, pens, watercolours, sticky notes*

Figure 5 (below). Infographic by Rebecca Agostini on Issa Watanabe's *Migrants*.

Literature conversation for a selected book

Rebecca Agostini
A Focus on Literature When Teaching English as a Foreign Language
2022/2023



Organization of the project

CLASS:
4th primary school
(9-10 years)

TIME:
1 class
(45 minutes)

OBJECTIVES:
- Dialogue and discuss important and current issues with an eco-critical approach
- Raise children's awareness of migration through children's literature

Choice of the picturebook

- It tells the **migration path** of a group of animals, with difficulties and obstacles

  → the ending is open but suggests a positive outcome with a little bit of hope
- A **heterogeneous group of animals** as protagonists keeps the story in balance between fantasy and reality

  → children can identify with the characters
- A **silent book** has a lot of potential

  → its universality makes it very useful for including all pupils and breaking down language or other barriers
- Children's literature can help to educate about **environmental and social sustainability**

  → an effective tool to develop greater **awareness** of social issues such as migration

Pre-reading activities (7 min)

- Initial **brainstoring based on questions** (presented again at the end to see how children's ideas have changed)
  - *Who do you think migrants are?*
  - *Why do they flee from their own country? What leads them to emigrate?*
  - *How do you think they feel? What emotions and feelings do they experience?*
  - *Do you think that migrants are people who want to travel and enjoy changing countries? Or do you think that migrants are poor people who are running away from difficult situations and have to face terrible journeys?*

During-reading activities (30 min)

1. **First moment**

- silence while the teacher slowly flips through the pages of the book
- musical background of the stormy sea is played, in order to allow children to have a 360-degree experience, combining the sense of listening with that of sight

2. **Second reading**

- children are able to speak by raising their hands, discussing, asking questions and making contributions, highlighting what they observe and asking for clarifications
- the teacher guides the discussion with stimulating questions:
    - *What do you notice here?*
    - *What has changed from this page to this page?*
    - *What is the plot of the story?*
    - *What happened in this scene?*
    - *What is the global message?*

During-reading activities (30 min)

A focus on the different **symbols**

sea	an enemy-friend, as the only escape route undertaken with hope, which however irremediably brings danger and death with it
boundaries	barriers, frontiers, walls and obstacles to overcome; geographical, physical and imaginary ones built by people who exclude
colors	The dress worn by death and the trees varies according to the situation: • when the animals are traveling, the plants are without leaves and flowers are colored in black and white → feeling of despondency • at the end, the plants return full of colorful leaves and flowers → a feeling of hope and trust towards a new life
death	spiritual and physical, represented as in the book *The Duck, Death and the Tulip* by Wolf Erlbruch
suitcase	past memories, place of origin
ibis	link between life and death, connection between past and present

Post-reading activities (7 min)

- **Final brainstorming based on questions** (to compare with the initial ones)
  - *Who do you think migrants are?*
  - *Why do they flee from their own country? What leads them to emigrate?*
  - *How do you think they feel? What emotions and feelings do they experience?*
  - *Do you think that migrants are people who want to travel and enjoy changing countries? Or do you think that migrants are poor people who are running away from difficult situations and have to face terrible journeys?*

Theoretical framework

- **Picture-book selected for storytelling**

"[It] needs to meet a range of criteria, such as its suitability and interest in terms of content, linguistic, conceptual and cultural accessibility and appropriacy, aesthetic appeal and its educational affordances for a particular group of children"

(Ellis, G., & Mourão, S. (2021) *Demystifying the read-aloud: Gail Ellis and Sandie Mourão discuss the role of reading picturebooks in early English language learning.* Teaching Young Learners)

- **Structure of the activities**

Subdivision of the work and organization of the times, project in 3 parts, albeit connected: Pre-reading activities, During-reading activities and Post-reading activities.

(Graves, F. M., & Fitzgerald, J. *Chapter 5. Scaffolding Reading Experiences for Multilingual Classrooms*)

→ Pre-reading activities

Methods that activate the knowledge background, that introduce the topic, that motivate the students for the subsequent activities and that direct attention to the main theme through stimulating questions.

→ During-reading activities

Methods such as silent reading and guided reading, two opposing techniques but useful for different purposes and for carefully studying the book.

→ Post-reading activities

Methods such as discussion, dialogue and questioning to broaden children's knowledge and make them think about what they have just read.

Continuing the dialogue

We hope to have clarified the framework of the five infographics and aroused your curiosity either as a primary school teacher, a student teacher, or a teacher educator. To continue the process of self-examination and project improvement, we warmly welcome your comments and feedback. We can be reached at Nina.Goga@hvl.no.

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Climate Literacy in Education

9th Grade Language & Literature Unit: Critical Literacy and Climate Action

Abby Hartzell, Fridley Community Schools, Minneapolis, MN, USA

Abstract

This 9th grade, 8-lesson Language & Literature unit centers on Critical Literacy and Climate Action by exposing students to climate-related texts from diverse genres. The goal is to foster critical literacy skills and build students' baseline understanding of the climate crisis and its solutions. The unit covers several Common Core standards related to media literacy, research, and inquiry-based writing. It culminates in a student-choice driven climate action research project through which students demonstrate their ability to apply climate literacy concepts to a specific climate solution.

Keywords

International Baccalaureate, critical literacy, collective action, CLICK framework

I designed and taught this climate change unit to three sections of International Baccalaureate (IB) Middle Years Programme (MYP) 9th grade Language and Literature at a Title 1 public high school in the suburbs of Minneapolis. I completed much of my idea generation and lesson planning while I participated in a teacher fellow program through the Center for Climate Literacy. My fellow cohort members supported each other's unit planning processes through collaborative discussions and workshops. The support I received from this interdisciplinary group of teachers was invaluable.

For the backbone of this 9th grade unit, I used the framework that I developed for my 11th grade Critical Literacy and Climate Literacy unit in 2022: 1) start by determining what students already know and what they're curious about; 2) teach key climate

concepts through vocabulary terms; 3) invite students to apply their knowledge through critical analysis of climate-related texts from a wide range of genres. However, I made a few key changes and additions too, based on my own reflections from the 11th grade unit and feedback from others.

Of these additions, I am most proud of the Climate Action Project (CAP) assignment which helped my students gain a deeper understanding of the complexities of climate action. Since I started teaching climate literacy, I have noticed that students often fixate on individual actions, like buying an electric car, as the main solutions to climate change. Despite leading conversations about the importance of collective action, I hadn't found a way to instill a more nuanced understanding of this concept until I devised the CAP. As part of CAP, students researched a climate solution of their choice from an online database of climate solutions called "Nexus" developed by Project ReGeneration. Each database entry lists the actions that must be taken by "individuals," "groups," and "governance." Students then produced a mini collage about their chosen solution with a catchy slogan that encouraged a certain type of action, whether individual or collective. The CAP gallery walk on the last day of the unit was a joy to watch. Students appreciated their peers' collages and each student acted as the "classroom expert" about the solution they researched.

Narrative framing for climate literacy unit

This 8-lesson unit began with a "four corners" activity where students shared their agree/disagree responses to a series of prompts about the unit's key terms: climate change, biodiversity, anthropocentrism/ecocentrism, and environmental justice (see climate literacy term definitions in "Curriculum at a Glance" below). The following three lessons built on this activity, with one lesson dedicated to each term. Each term, in turn, was paired with a few related multi-genre texts, including picturebooks, news articles, videos, etc. (linked in "Curriculum at a Glance" below). Students were introduced to the four care domains of climate literacy from the CLICK framework—species care, kinship care, systems care, and people care—and they completed a critical analysis chart by recording which domain(s) of care they noticed each text advocates. The unit culminated in a Climate Action Project where students researched a climate solution of their choice from the "Nexus" database and created a mini collage with a catchy slogan to promote the solution.

Title	*9th Grade Language & Literature Unit:* *Critical Literacy and Climate Action*
Unit Time	*Eight Lessons* *Schedule: Daily 48 minute class periods*
Grade Level(s)	*Grade 9*
Core Text	*Students used the website ReGeneration Nexus to research climate solutions for this unit's final assessment project.*
Supporting Texts	Various
Climate Literacy Terms	• Short Film Ice Merchants by João Gonzalez • Video What is Climate change? Produced by Al Jazeera • Picturebook The Fate of Fausto by Oliver Jeffers • Image "Thanksgiving Address" from Braiding Sweetgrass (YA) by Robin Wall Kimmerer • Video What is biodiversity? By David Attenborough • News article Food system biodiversity published by The Guardian • Picturebook by *Over and Under the Pond* by Kate Messner and illustrated by Christopher Silas Neal • Picturebook *We Are Water Protectors* by Carole Lindstrom and Michaela Goade • Climate justice tweets by Vanessa Nakate, Urban Air Quality, Mark Ruffalo, and Climate Justice Alliance
Objectives	By the end of the unit, students will be able to define and discuss vocabulary terms. They will be able to answer the unit's essential question: How can literature help us understand the diverse impacts of climate change? Through engaging in research about climate solutions and completing a climate action project, students will gain specific knowledge about a climate solution of their choice and develop communication skills by drafting a slogan and creating a collage.
Materials and Resources	Unit Calendar with links to resources Climate Action Project research and planning guide

Climate Action Project, Unit Culmination, and Going Forward

For the final three days of the unit, students worked on their CAPs. The CAP research and planning guide (linked in "Curriculum at a Glance" above) encouraged students to break down the action required by their chosen solution into categories: "individuals" "groups" and "governance." This complicated many students' preconceived understanding of climate action as a solely individual pursuit. Additionally, these projects allowed students to demonstrate the critical analysis skills they developed throughout the unit by requiring students to apply the care domains from the CLICK framework to their own collage. Each student wrote an artist statement that referenced the specific domain(s) of care their CAP promoted.

On the second to last day of the unit students voted on which collages and slogans were most inspiring. They also filled out a feedback survey about the unit as a whole. I enjoyed reading their answers that afternoon, especially for the question, "What is one thing you wish all adults knew about climate change?" Most called for adults to take action and to remember that younger generations are counting on them. A of my few favorite answers included unique insights: "PROFIT DOESN'T REALLY MATTER IF WE ARE ALL GONNA BURN IN 30 YEARS 🤓🤓;" "be more reasonable" and "Buying a Tesla doesn't make you better than everybody else."

The final day of the unit was a celebration. I handed out eco-themed prizes to the contest winners and gave each student a blue marble to remind them to take care of our planet. Students enjoyed the celebration, but it was also the last day of school. I kept them engaged by promising that they could go play outside for the last 20 minutes of class. When the time came, they eagerly packed away their papers and we headed outside to enjoy the sun. The weather was unseasonably warm, and a thin haze of Canadian wildfire smoke made the sky white. I wondered if any students would apply their new climate literacy skills and identify the connection between our curriculum and the weather. If they did, they didn't voice it. Instead, they teased each other as they played foursquare, gleefully discussed summer plans, and made daisy chains in the grass.

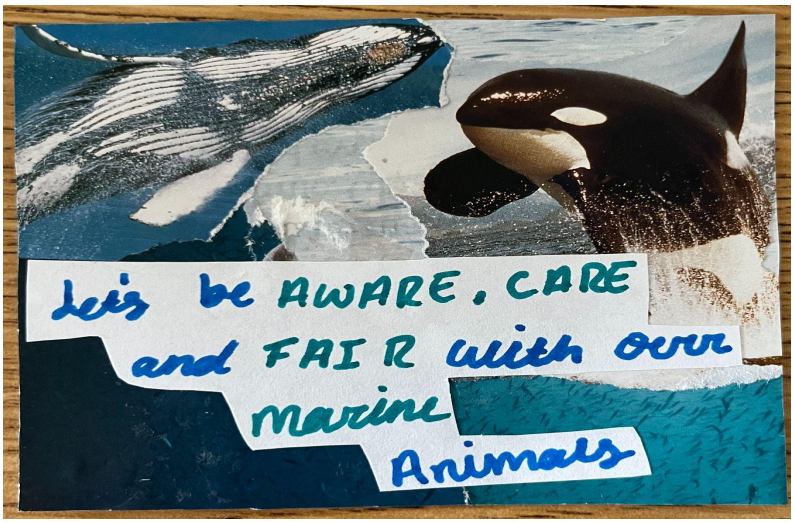
As with most of my climate change related thoughts, I felt a mix of despair and hope as I watched my students. I felt anxious looking at the sky, thinking of the climate

solutions students had just spent days researching, but knowing that time for implementation is running out. Yet the human joy, creativity, and connection I witnessed that day was also a reminder of what fuels my work. Humans will always seek connection with the outdoors, even in the face of the climate crisis. We must continue to educate our youth about climate change, both as a threat *and* a call to action. Teaching climate literacy units is my small act of radical hope.

Kayda M., 9th Grade

Aiyanna S., 9th Grade

Nex N., 9th Grade



Fernanda A., 9th Grade

Gabby B., 9th Grade

Brianna E., 9th Grade

"It Was Beautiful Here, and Then the Pollution Came":

Researching Youth Climate Emotions in Coastal Ecuador

Neela Nandyal, University of Minnesota-Twin Cities, Minneapolis, MN, USA

Abstract

In this reflection I share findings from researching youth climate hope and future outlooks in a fishing community in coastal Ecuador. I discuss how teens in this community experience both climate despair and climate hope and look to nearby nature to inform their thoughts on climate change.

Keywords

climate emotions, climate hope, climate despair, solastalgia, climate literacy, El Niño, Latin America, nearby nature, pollution, Ecuador,

Acknowledgements

The fieldwork discussed in this paper was funded in part by the University of Minnesota CEHD Graduate Global Grant and the Graduate School Thesis Research Travel Grant. The author is grateful to Mayi Quimis Pincay and Carlos Gutierrez for their expert assistance.

Introduction

In summer 2022, I traveled to Ecuador to conduct a pilot study on the attitudes, values, and practices shaping environmental education in the coastal province of Manabí. Although I had some prior experience of living in South America and had taken

numerous classes on the region's history and geography, I had never been to Ecuador before. It turned out to be a marvelous trip. I met many educators and professionals working to protect nature through local government, nonprofit organizations, and schools. Through my interviews with community members, I learned that pollution and contamination of the ocean were among the top environmental concerns, and people worried about the effects on human health. I also found that many people had observed *positive* changes in the local environment in their lifetime – these were typically people in their 40s and 50s who could remember when the beaches were more polluted and littering went unchecked. For them, the recent adoption of environmental regulations in Ecuador had begun to rein in pollution, which many of my participants pointed to as a sign of progress. All of this led me to wonder, how did the younger generation feel about the future of the environment in Manabí? What did youth think about local sustainability efforts and climate change more broadly? In summer 2023, I returned to Ecuador to explore these questions in more detail. My key takeaways from this period of field research are below.

Between Hope and Despair: Climate Emotion and Future Outlooks

To better understand youth climate emotion and future outlooks on the environment in coastal Ecuador, I conducted a mixed methods study that involved a 35-question survey of 193 secondary school students and semi-structured interviews with 17 of the student participants. What the study revealed was that students had the capacity to experience a multitude of climate emotions (including climate despair and climate hope) simultaneously. In the survey, for example, just over two thirds of participants reported that they were "worried" or "very worried" about climate change. Yet in interviews, worry over the environment did not seem to affect the day-to-day life nor long term plans of participants, a common indicator in measuring eco-anxiety (Hickman et al., 2021). Rather, I perceived my participants' worry over climate change as a sort of climate despair or solastalgia. Students lamented how "through social media you learn a lot about different places and how we are polluting" and "you can see garbage everywhere" (Student participants, 2023). While many students blamed their peers and fellow townspeople for local environmental pollution, others were more specific – linking contamination and loss of wildlife to the local fishmeal plant. As one student explained, "I can tell you that since

the factory started the pollution, nature has never been as beautiful as it was before, because before here…there were deer…there are no more because of the pollution and the smoke from the factory. That's why we must clean up the beach: because it was beautiful here, and then the pollution came" (Student participant, 2023).

Additionally, the survey[1] revealed the students to be fairly hopeful about their own role in mitigating the climate crisis. 74% of youth participants agreed or strongly agreed with the statement "I think that the actions of individuals like me have a role to play in mitigating the negative effects of climate change" and 67.4% of the students agreed or strongly agreed that "I am optimistic that the effects of climate change will be reversed, because there are several actions that individuals like me can take to improve the problem of climate change". As one student reasoned "...if we stop polluting and we listen…and make less garbage, it can be better" (Student participant, 2023). For these participants, hope over mitigating climate change and environmental degradation was hinged on both personal and community agency.

Nearby Nature and the Specter of El Niño

Interviews with students also highlighted the ways that youth turn to nearby nature to notice changes in the natural world and connect these changes to ideas about climate change. Most of the participants came from fishing or farming families and spent their free time on the beach. Summer 2023 was an El Niño year for Ecuador, which meant that the Pacific experienced unusually warm temperatures, with serious implications for marine life (including depleted fisheries), vulnerability to flooding, and decreased tourism from the highlands. While I had not anticipated including the topic of El Niño in my interviews with students, it soon emerged as a common theme in many of my conversations with local youth. In interviews, students often discussed El Niño in conjunction with their thoughts about climate change, environmental risk and natural disaster. As one student observed, "El Niño is coming and now there are many dead birds around the beach…they have died because of the scarcity of fish" (Student

[1] The survey design and content drew heavily from recent studies on youth climate hope. The questions examples in this reflection are modeled on questionnaires by Finnegan (2022), Li and Monroe (2018), and Ojala (2012).

participant, 2023). Other students dwelled on anticipated floods and family hardship, one youth warned "we have to be prepared with supplies, food, medicines and everything necessary because they say it is going to be long, prices are going to rise …and we will not be able to work because of the heavy rains" (Student participant, 2023). The interviews revealed how these students' thoughts and feelings about climate change are profoundly shaped by the local environmental conditions they experience.

Concluding Thoughts

While this study centers on the climate emotions of youth from a rural community in coastal Ecuador, it has broad implications for environmental and climate literacy education as it speaks to the experiences of young people everywhere. . In making space for discussing climate emotion in classrooms, teachers can support students in developing climate literacy, especially climate hope and envisioning alternative, low-carbon futures. Moreover, teachers can draw on students' own lived experiences and local environs in talking about climate change, emphasizing how climate literacy can be fostered through the love of nearby nature. Finally, teachers should consider the role of environmental risk and local climate histories in their students' perceptions of climate change.

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Building a Database and Website for Eco-fiction Resources

Mary Woodbury, curator at Dragonfly.eco: Exploring World Eco-fiction

Abstract

This essay offers an overview of Dragonfly.eco—a collaborative project for exploring eco-fiction—and its evolution over the period of the last ten years. Following a tour of the content—reviews, author interviews, music, games, films, and a database of more than 1,000 books—the article reflects on how children's fiction and climate literacy fits into Dragonfly and provides a site road map for finding teacher's resources.

Keywords

Eco-fiction, climate change, climate literacy

Dragonfly.eco is a volunteer project that curates meaningful stories about the natural world and humanity's connection with it. The site explores the breathtaking literary scope of eco-fiction: a diverse field of stories which includes environmental and nature themes in Black and Indigenous fiction, literary fiction, science fiction, fantasy, solarpunk, and more. Diversity and inclusion are central to eco-fiction, and the goal of this article is to introduce the site to climate literacy educators. While Dragonfly is a resource for all readers, it also features reviews and other materials for K-12 teachers.

Since I began the site more than ten years ago, it has been important to me to offer content freely, promote authors with no charge, and share news about narratives dealing with climate change, biodiversity, conservation, extinction, pollution, the state of our waters, diaspora, colonialism, and more. Such narratives raise awareness of climate and ecological concerns while also offering inspiration and courage to face these challenges. Dragonfly is evolving and has grown considerably since I first launched it in 2013. With a database of more than 1,000 books, more than 150 author interviews, and over 100 excerpts of works, the site has remained highly collaborative in nature. Together, we are able to do more to protect our planet's ecosystems and share climate literacy lessons through stories. Such education starts with young children, which is why Dragonfly includes recourses helpful to parents and teachers alike.

How to use Dragonfly

Dragonfly offers plenty of content for people of all ages curious about eco-fiction and its cultural work. Readers can search for books in two ways: the **Search For** widget on the top-right menu or the Book database. Readers can also use pull-down menus in the top menu bar to find more information. Because so much data has accumulated throughout the years, readers can find a Tour Guide in the About section, which acts as a road map to the major sections at the website:

- Book database: Every book post added to the site is auto-added to the database via advanced fields, such as book title, author name, publication date, type of book, category, and genre. Categories include audience types, such as all, YA, teen, and children's stories. The database has filterable headings, but readers can only sort by one heading at a time. Click **Show entries** at the top of the database and select **All** to view all entries at once. With over 1,000 book posts so far, the database is a work in progress. It isn't exhaustive, but aims to include as many pieces of eco-fiction that time allows.
- Book posts: Most of the 1,000+ books auto-added to the database are generated from plug-ins to show a short description, book cover, and ordering information. Occasionally, authors provide the information directly. For many years, Dragonfly used Goodreads to generate book information. Currently we use a plugin by Booknet.ca's BiblioShare, which pulls data from LibraryThing, WorldCat, and

BookFinder. Readers can search through the database to select a book title, author, publication date, type of book, audience, or genre to find what you are looking for.

- Book and film reviews: Dragonfly publishes book reviews written by contributing authors. To read a few book and film reviews, click here.
- Author interviews and spotlights: Dragonfly features many authors, all with free promotion. The Dragonfly Library is no longer accepting submissions but has over 100 book excerpts shared by authors. The World Eco-fiction Series: Climate Change and Beyond features notable novels and anthologies from authors writing in various genres and styles on topics such as science, climate change, ecological studies, animals, water, and much more. Featuring authors from around the world, this spotlight series is designed to be inclusive, allowing audiences to virtually visit different places, ideas, and learn about other cultures. Many spotlights come from children's book authors. The Indie Corner spotlights new authors who either self-publish or publish with small literary presses.
- Links and Resources: For readers wanting to branch out away from the site, this link provides a list of publishers, journals, projects, and bloggers with similar themes.
- Film and Video: Since early 2015, Dragonfly has added a song of the week to a YouTube environmental playlist, Since 2014, we have maintained a list of films related to climate awareness and ecology.
- Games: A new list of eco-games joins Dragonfly!
- Turning the Tide: A list of resources for children, teen, and YA audiences.

Resources for Teachers

What Is Eco-fiction?

Our definition of eco-fiction builds on the criteria proposed by Jim Dwyer in *Where the Wild Books Are: A Field Guide to Ecofiction* (2010). According to Dwyer, ecofiction includes narratives in which:

- The nonhuman environment is present not merely as a framing device but as a presence that begins to suggest that human history is implicated in natural history.
- The human history is not understood to be the only legitimate interest.
- Human accountability to the environment is part of the text's ethical orientation.
- Some sense of the environment as a process rather than as a constant or a given is at least implicit in the text. (Buell qtd. in Dwyer, 2010, p. viii)

Today's eco-fiction is a sprawling category that spans over twenty distinct genres (see this short guide), each of which brings its own tools for using fiction to raise climate and ecological concerns.

Dragonfly.eco offers teachers a background into eco-fiction across a range of formats, from books and films, to songs, games, and other media. In all eco-fiction works, the ecological elements are deeply integral to the story, even if used as symbols or metaphor. Some writers refer to these strategies of foregrounding nature in stories as the project of *rewilding* the novel, framing eco-fiction as, to use Dwyer's term "wild books."

Turning the Tide

From the beginning, Dragonfly.eco included stories for younger audiences. About midway into the life of the site, I began the Turning the Tide section. It was inspired by a conversation with author Edan Lepucki about her short story "There's No Place Like Home." In the story, youth are represented as a *stuck generation*, because the environmental climate and catastrophe made it impossible for them to grow and live the full lifespan of a human life. They remain children until they die. In the story, youth are also called the *youngest generation*. Lepucki's haunting idea has its equivalent in the real world too. Youth activists like Vanessa Nakate, Greta Thunberg, Xiuhtezcatl Martinez, Bana Alabed, Emma Gonzales, David Hogg, Mari Copeney, Payla Jangid, and hundreds of thousands more are today's "youngest generation" of leaders who mobilize others to stand up for social and climate justice.

While Dragonfly is not an exhaustive resource on children and teen fiction, it is a stepping-off point for teachers wanting to find more information. While a lot more work needs to be done, Turning the Tide links to:

- Resources and links: The main section includes links to articles and resources about climate literacy and climate lit for kids.
- Children's bookshelf: a list of children's book posts at Dragonfly. The website's focus is on adult fiction, but about 70 books are currently featured for children up through middle-grade.
- YA/teen bookshelf: a list of teen and YA fiction at the site. 165 books currently fall into the YA/teen category.
- Book reviews for younger readers: thanks to Kimberly Christensen, who reviews most of the younger reader books, Dragonfly currently houses about 30 reviews for fiction aimed toward younger audiences.
- Games: a growing list of eco-games, whether video or tabletop, with highlights for children-appropriate games, including age guidelines.
- Films: a list of movies, television shows, and documentaries relating to environment and nature. Highlights indicate children's shows and age levels recommended by movie rating or Common Sense Media.
- Spotlights (interviews and features): includes reviews of, or interviews with, the following authors, arranged chronologically, most recent to earliest:
    - Arlene Mark: *The Year Without a Summer*
    - Jewell Parker Rhodes, *Paradise on Fire*
    - Todd Mitchell, *The Last Panther*
    - Cynthia Zhang, *After the Dragons*
    - Sonia Meyers, *We Have Something to Say!*
    - Jennifer Harrington, *The Spirit Bear*
    - Bijal Vachharajani, *A Cloud Called Bhura*
    - Emma Reynolds, *Amara and the Bats*
    - Ryan Mizzen, *Hedgey-A and the Honey Bees*
    - Clete Barrett Smith and Dave Matthews, *If We Were Giants*
    - Sita Bramachari, *Where the River Runs Gold*
    - D.G. Diver, *Juniper Sawfeather* collection
    - Ned Tillman, *The Big Melt*
    - James Bradley, *The Buried Ark*
    - Jennifer Dance, *White Feather* collection
    - Edan Lepucki, "There's No Place Like Home"
    - Marissa Slaven, *Code Blue*

- John KixMiller and team, *Protectors of the Wood* series
- Jo Marshall, *Leaf* series
- Gary Robson, *Who Pooped in the Park* series
- Austin Aslan, *The Islands at the End of the World*
- Sarah Holding, *SeaBean* trilogy

Looking ahead, I am inspired to add more climate literacy materials at Dragonfly by increasing the content at Turning the Tide. The opportunity to partner with the Center for Climate Literacy is a thrill as well because I am getting older and I understand my privilege in growing up in a world where scientific reality and literacy were a given. Looking back, I realize that reading books, walking through forests to learn the names of trees by their leaf types, and always learning more about the world's environmental complexity made me the person I am today. Today's children need climate literacy education more than any other generation before them. I am inspired that this work is accelerating everywhere, including at the University of Minnesota's Center for Climate Literacy, and I look forward to extending some of my time toward building children's climate literacy.

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Climate Literacy in Education

The CLICK Framework:

A Care-Centric Conceptual Map for Organizing Climate Literacy Pedagogy

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Abstract

This article outlines the **C**limate **Li**teracy **C**apabilities and **K**nowledges (or CLICK) framework for climate literacy pedagogy. The framework includes four domains—Earth Care, Kinship Care, People Care, and Systems Care—and is modeled on the care-centric thinking central to the Indigenous Worldview and to other Earth stewardship efforts emerging today. The purpose of this article is to introduce CLICK as a conceptual tool to guide classroom practice.

Keywords

climate literacy pedagogy, CLICK, climate literacy capabilities, climate literacy knowledges, Indigenous worldview, Indigenous knowledge(s)

There are many ways to teach climate literacy. Given the urgency of the climate emergency—and the urgency to design climate literacy education pedagogies that speak to age-specific audiences, place-specific challenges, and discipline-specific forms of knowing—the best strategy is to be creative. That said, designing conceptual frameworks for climate literacy education (yes, we need many and diverse frameworks!) can help articulate foundational principles, goals, and questions to guide practice and inspire pedagogical innovation. The framework described in this article—**C**limate **Li**teracy **C**apabilities and **K**nowledges (or CLICK)—was originally drafted for the 2022

"Schools for the Planet" summer institute. I have since expanded it, based on my research and classroom practice. CLICK is a practical tool, whose uses I intend to unpack in future essays. Here, the goal is to outline the framework as a theoretical model intended to help us think about ways to scaffold climate literacy capabilities and knowledges across K-12 education.

The CLICK framework builds on three core notions: climate literacy (described in this article), capabilities, and knowledges.

"Capabilities" is a notion introduced by Nobel laureate economist Amartya Sen—later modified by moral philosopher Martha Nussbaum to include "the capabilities of nonhuman animals as well as human beings" (Nussbaum, 2011, p. 18)—to refer to actual (in contrast to theoretical) things we can do or become, if we so choose (The Capability Approach). For example, my ability to read is a capability I can use to read *The Climate Book*; reading this book becomes a realized capability, or "functioning," that informs my other functionings, say as a teacher. Sen refers to capabilities as "substantive freedoms" to achieve what we value, stressing that thinking in terms of capabilities "makes us accountable for what we do" (Sen, 2009, p. 19). Applying capabilities to climate literacy allows us to distinguish—on individual and community levels—between ways of doing or living that we can actually achieve and those we cannot (yet). Say, eliminating or reducing meat from my diet is a functioning I can achieve. Stopping industrial carbon emissions is not, at least not in the current system. The notion of "climate literacy capabilities" will thus refer to functionings—practical ways of being and doing—we can achieve to live as climate literate Earthlings.

The plural term "knowledges" is a notion derived from Indigenous theory and scholarship, which rejects the post-Enlightenment monolithic idea of "knowledge" in favor of braided, evolving, place- and experience-based knowledges—the plural acknowledging "both the shared commonalities and the diversity of many Indigenous ways of knowing" (Kovach 2021, p. 19). Collectively referred to as **Indigenous Knowledge**—also "Indigenous perspectives and thought processes," "Indigenous pattern thinking," and "Indigenous Knowledge Systems" (Yunkaporta, 2020, p. 17)—these ways of knowing combine values, technologies, and culture. Accordingly, "climate literacy knowledges" (in the plural) is proposed to refer to a vast body of practical and philosophical knowing—often fragmentary and/or intuitive—that transcends

conventional disciplinary boundaries, is grounded in "resident relationships" with our environments (Topa & Narvaez, 2019, p. 3), and helps us learn how to live at the time of the climate emergency.

So what are these capabilities and knowledges? Given that climate literacy is about "developing values, attitudes, and behavioral change aligned with how we should live to safeguard the Earth's integrity in the present and for future generations" (Oziewicz, 2023, p. 34), I have followed a line of thought about knowledge as care that has been a trickle in mainstream (Western) scholarship and is best articulated by proponents of Indigenous Knowledge and Indigenous Worldview (Topa & Narvaez, 2019). This line of thought affirms that human beings *are* nature: not *apart from*, but *part of* a complex living system that sustains us all. Its precepts find expression in statements like Robin Wall Kimmerer's "Know the ways of the ones who take care of you, so that you may take care of them" (Kimmerer, 2022, p. 89). They can also be heard in arguments like James Lovelock's insistence that "we need to love and respect the Earth with the same intensity that we give to our families and our tribe" (Lovelock, 2000, p. viii).

Unpacking the Kimmerer and Lovelock statements, I propose that values and attitudes that inform our relations with "the ones who take care of us" can be thought of as falling into four domains: relations *with the planet*, especially its geophysical processes that enable all life; relations *with nonhuman people/beings*, especially plants and animals, with whom we share the Earth; relations *with human people*, including strangers, ancestors, and future generations; and relations *with human-created systems* in which we participate, such as education, economy, etc. The CLICK framework emerges when we map values and attitudes onto a conceptual diagram of these four core domains of care.

Important caveat: although the four vectors of care are explored here as separate domains, they are *not separate* at all. I am inspired by Indigenous thinkers to believe that withholding, refusing, or limiting care in any one domain degrades our capacity to care in other domains too. I thus chose to represent these values within the Native American Medicine Wheel which symbolizes balance, interconnection, and interdependence of these values. The CLICK framework thus includes four equally important core domains in which climate literacy values and practice are realized.

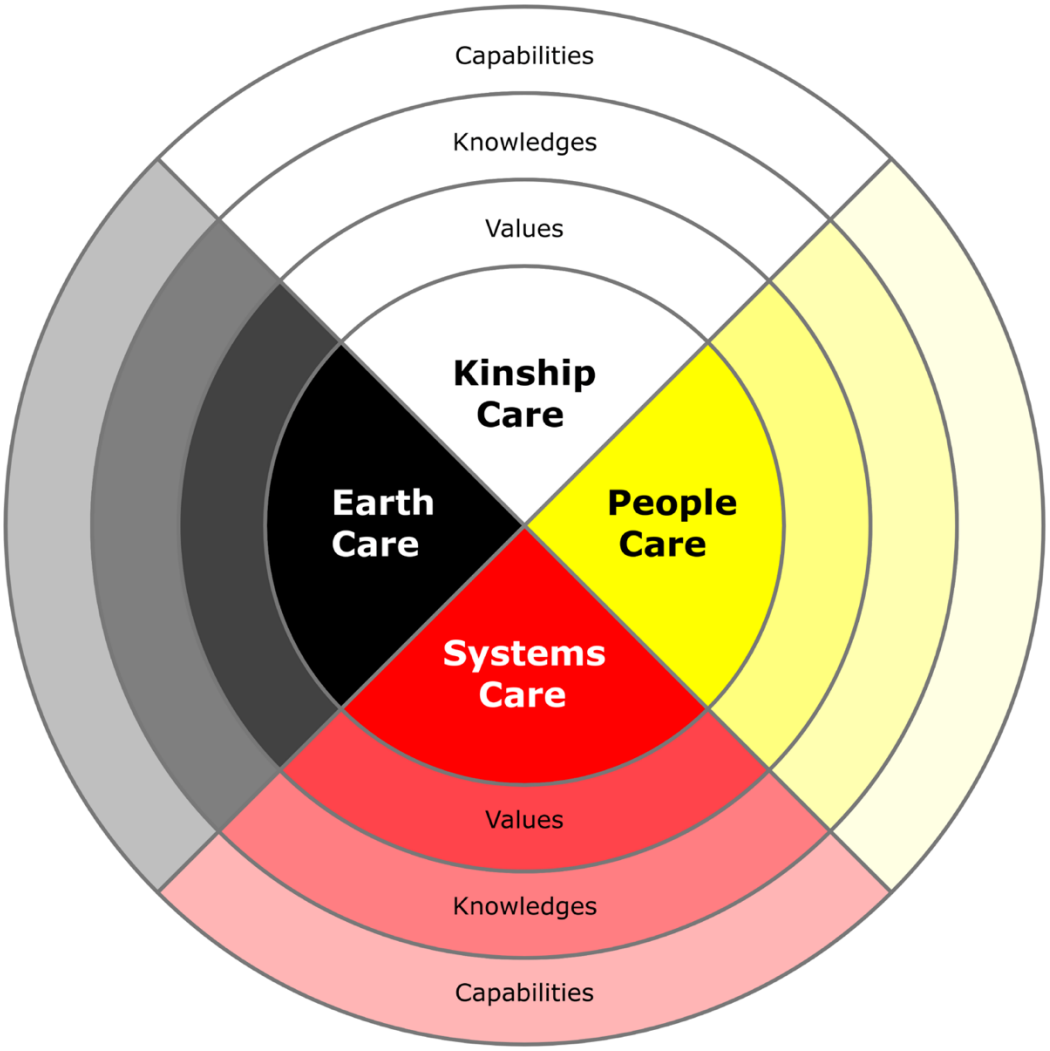

Figure 1. The CLICK framework, domains & rings structure.

Earth Care: How do we care for the planet, its ecosystems, bioregions, water, air, soil, and geochemical processes—tightly integrated on organic and inorganic levels—whose complex interactions enable life to exist? How do we actively defend, restore, and steward the planet's wellbeing and the health of planetary-scale elements that support the web of life? This domain requires we actively confront questions about threats to a living Earth, say, pollution or global warming, but also that we actively seek to experience the wonder of a living Earth and develop a love-care relationship with the land, waters, sky, ecosystems, and the planet. The notion of Nature Rights; the fight for clean air, water, and soil; all initiatives to curb, eliminate, or clean industrial pollution; recycling; rewilding; conservation; organic farming; Leave no Trace ethic; the notions of ecological and energy footprints; and a number of other concepts and initiatives are all part of the Earth Care domain.

Kinship Care: How do we care for nonhuman persons/beings: animals, plants, insects, and all other life forms? What values and forms of relating do we cultivate, and how, versus what types of relationships with the nonhuman should be discouraged or avoided, and how? This domain includes all aspects of human-animal and human-plant relationships, including what we eat, respect for habitats, how we engage with the outdoors, attention to and things we can do for local species. The Kinship Care domain invites conversations about animal and plant rights; wildlife corridors, sanctuaries, and refuges; protection of endangered species; expanding habitats and supporting nonhuman life even in human-dominated spaces; conservation initiatives such as Half-Earth, Homegrown National Park, We Are the ARK movements; and other initiatives to curb human expansionism in general.

People Care: How do we care for other humans, those we know and those we don't, near and far, living today and those yet to be born? How to address historic injustices of settler colonialism, slavery, violence, and exploitation that continue to expose BIPOC, poor, and Global South communities today to higher risks of climate change-related threats, from floods, droughts, and rising sea levels to food insecurity, energy shortages, pollution, and resource depletion? Climate migrations; climate, environmental, social, and racial justice; Indigenous land rights; poverty, exclusion, and wealth inequality; access to education and healthcare; human rights and freedoms, democracy vs authoritarianism; opportunities for building communities and supporting communities where relations are local, grounded, and based on recognition of collective responsibility to each other are some of the key issues in the People Care domain.

Systems Care: How do we (re)organize our communities, countries, and the global civilization to practice the ethics of care across the board? How do we redesign human-created systems like politics, education, media, finance, economy, healthcare, transportation, housing, food, and others to at least stop eroding the planet's capacity to sustain life? Better yet, how do we reimagine these systems so that they become accelerators for creating a sustainable, clean, just, inclusive, and biodiversity-rich planet that supports thriving human and nonhuman lives? Energy transition; circular economy; green technologies; universal basic income; farm-to-table and other local production-consumption networks; energy and food sovereignty; zero waste economy; system change not climate change; the Green New Deal; initiatives like a Fossil Fuel Non-Proliferation Treaty, Project Drawdown, and other systemic solutions—all these belong in the Systems Care domain.

The goal of using the CLICK framework in classroom activities is to help students 1) learn to think about the workings of the world in terms of these four domains, 2) develop an understanding of their role as agents of care and change in a complex living system, and 3) identify, name, and build students' climate literacy capabilities and knowledges for each of the four domains. Using stories—fiction and nonfiction alike—is a practice in which students are prompted to explore questions and issues in the story as they relate to each domain. The story serves as a springboard for considering these issues not just in that single narrative but in other stories and in real life too. The exploration, which the students can scale up or down depending on the project's scope, becomes an inquiry into each domain which also demonstrates how the four domains are inherently interrelated.

In the opening of the last section of *The Climate Book*—entitled "The most effective way out of this mess is to educate ourselves"—Greta Thunberg introduces the Swedish word *folkbildning*, which stands for "broad, free, voluntary public education" (325). She notes that Fridays for Future was not originally intended as a protest movement but as a *folkbildning* project: to educate everyone about the climate emergency. The irony, Greta says, is that she had to skip school to find climate education. The time is now to bring the *folkbildning* of climate literacy education front and center in all schools everywhere. The CLICK framework is one conceptual model that can help make it happen. It can serve as a cornerstone for considering climate literacy capabilities and knowledges. It can act as a springboard for a broad range of pedagogical strategies, inquiries, and action. Most of all, it can inspire teachers and students everywhere to discuss what we can do, and how, to restore ecosystems and build an ecological civilization.

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Climate Literacy in Education

Youth Production of Digital Media to Address the Climate Crisis

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Abstract

This article describes the value of having youth produce digital media—videos, social media, digital images/art, digital stories, and online writing to address the climate crisis. While students are engaged with and producing media on their own, teachers and project coordinators can support students by drawing on examples noted in this article to provide students with technical support and examples for producing different types of digital media.

Keywords

digital media, ecomedia, social media, climate activism, youth climate activism

Youth are highly concerned about the need to address the climate crisis. In one survey, 59% of youth worldwide note that they are extremely or very worried, and 84% are moderately worried about climate change impacts (Hickman et al., 2021). Given these concerns, 45% experience anxiety related to how climate change is impacting their lives.

Youth Uses of Digital Media to Communicate About the Climate Crisis

To share their concerns about climate change impacts, youth are turning to digital media: their default platform to communicate with others. 13-to 18-year-olds engage in about

an average of eight-and-a-half hours of screen media daily, with YouTube, Snapchat, and TikTok being the most popular platforms (Common Sense Media, 2022). 56% of American youth are frequently referencing climate change topics online and 45% are posting messages about climate change through use of media (Tyson, 2021). For example, Greta Thunberg's Instagram post about the School Strike for Climate in 2018 lead to worldwide youth participation on the Fridays for Future strikes platform *fridaysforfuture.org* (Hawley, 2022). Other youth employ YouTube, TikTok, Instagram, and Twitter to communicate the need for collective action (Sorce & Dumitrica, 2021).

Youth employ a range of types of digital media—videos, blogs, podcasts, digital art/music, or online writing—to portray climate change impacts and connect with local/global audiences (Beach & Smith, in press). To successfully mobilize climate action, young people need to know how to effectively employ different media tools and how to effectively communicate the need for change. They need to be able to employ these tools to assume activist roles and inspire their audiences to activism too.

"For the vanguards of the present dreaming up new ways to fight global warming…this is an essential point: that the shape and extent of the change they seek depend as much on the tools they use as it does on their own will and hunger" (Beckerman, 2022, p. 2). This suggests the need for engaging youth in projects or classroom instruction that provide technology support and training but also supports students to assume activist roles as change agents when they experience positive uptake from their audiences.

This article summarizes youth use of media to address climate change in our forthcoming book, *Youth Media Creation on the Climate Crisis: Hear Our Voices* (Beach & Smith, in press). The book includes chapters on youth producing videos, digital images/art, social media, digital stories, and online writing media production. Here, we describe examples of the authors' own media projects from selected chapters, as well as related research on producing these different types of media. You can access chapter summaries and related links, activities, and readings on the use of media for communicating about climate change on the book's website.

In the introductory chapter, Marek Oziewicz and Scott Spicer posit the importance of engaging youth in media production related to addressing climate change. Given that media is central to how youth communicate and interact with others in their lives outside

of schools, they argue that teachers or project coordinators need to draw on and transfer these experiences for engaging school and project contexts. This can be done by providing technical training as described in Spicer's (2022) book, as well as by creating venues for students to share their media productions—say, a video critiquing the "fast fashion" clothing industry—with the general public. One example of such a venue is the University of Minnesota's *Student Produced Sustainability Project Gallery*.

Oziewicz and Spicer also note the importance of producing media based on cultural perspectives related to moral and ethical concerns about the future of the planet. Portraying and critiquing how the "stories-we-live-by" have shaped our actions—for example, narratives of domination and conquest of nature—can lead to imagining alternative, novel narratives for a sustainable human interaction with the environment.

Video

Youth produce videos to visually portray climate change impacts, record examples of people engaged in protests, enacting adaptation, or mitigation solutions to climate change. In his chapter, Steve Goodman describes how in the Education Video Center project, youth produce documentary videos about environmental justice issues that adversely impact low-income neighborhoods. For example, *Shame on You! That Can Be Reused!* confronts the adverse health effects of pollution from trucks on people living in South Bronx neighborhoods (Goodman, 2020). In another project, the Climate Change Initiative at the University of Massachusetts, Lowell, youth generate PSA videos with a more global framing, focusing on the need for understanding climate change as a global phenomenon, as evident in the Your Voice video.

Youth may also frame their videos to portray local versus global climate change impacts. As part of the Lens on Climate change (LOCC) project at the University of Colorado, youth-produced videos spotlight local climate change impact (Littrell, 2022), including the effects of droughts in students' Colorado communities. An analysis of youth participation in the LOCC project found that their participation in the project enhanced students' *re-seeing* (through their visual portrayals of climate change impacts), as well as their *re-enactment* (by shaping their thinking around how they could help their communities) that translates into direct action or continued communication with family

or community members about climate change and other environmental challenges after the program (Littrell et al., 2022, p. 18).

Digital Images/Art/Music

A number of chapters in the book describe youth's production of digital images/art related to climate change. In their chapter, Michelle Jordan, Catherine Lockmiller, and Steven Zuiker describe a project in which high school students participate in a summer solar engineering project related to enhancing the understanding of and the need to use media to promote the use of solar energy. Students then created multimodal slide presentations to portray what they learned about use of media for promoting solar energy. Youth participated in the "Polar Army" artwork project Madder, 2017) and the Art for Adaptation project, using art in ways that change their perceptions of climate change (Bentz, 2020). In their chapter, "Addressing Climate Change and Sustainable Energy Futures Through Creative Music Engagement," Evan Tobias, Kyle Bartlett, Michelle Jordan, and Steven Zuiker, describe how students produced music related to the use of solar energy.

Social Media

Youth frequently employ social media to post about climate change (Tyson, 2021). They use hashtags such as #climatecrisis #climatechange or #FridaysForFuture to interact with others and organize protests such as the School Strike 4 Climate (Boulianne et al., 2020). As Claire Napawan, Brett Snyder, and Beth Ferguson note in their chapter, youth use social media to communicate with followers in ways that build community and enhance their sense of being climate activists. In her chapter, Natallia Goshylyk provides examples of how youth insert emojis and images in their posts to enhance audience engagment. In their chapter, David Rousell, Amy Cutter-Mackenzie-Knowles, and Thilinika Wijesinghe, describes the creation of the Climate Action Adventure! app as a game-like, social media space for students to share their responses to images and artwork about climate change.

Digital Storytelling

Youth also create digital stories to portray perspectives on climate change. In their chapter, Shiyan Jiang, Blaine Smith, and Ji Shen describe how middle school students adopt the roles of writer, producer, director, cameraperson, or/and editor to create digital stories on sustainability issues, particularly in the Miami area (Smith et al., 2019). In her chapter, Linda Buturian describes how her students create digital stories about climate change impacts. By responding to novels, graphic stories, and poems in her course Creating Identities, Learning in and Through the Arts, students create digital stories—many of which are included in her book (Buturian, 2022)—to portray, for example, the adverse effects of flooding or waste deposits on the Mississippi River.

Writing for Planning Media Productions and for Communicating on Media Outlets

It is also important to recognize the value of using writing for planning media productions and communicating on media outlets. In his chapter, Antonio Lopez describes the importance of creating scripts and storyboards to plan for the production of videos or podcasts. Youth are also producing writing to share on media outlets such as the Youth Voices climate change page. In their contribution, Liane Xu, Julian Arenas, and Ardra Charath, youth editors on the Youth Think Climate (YTC) Magazine, sponsored by the Action for Climate Emergency, describe how they solicit and publish essays, narratives, poetry, art, and music by and for young people. Emily Polk's chapter, in turn, describes having students in her Stanford University composition courses investigate local climate justice issues to then write about them by creating podcasts, blog posts, or submissions to magazine/news outlets.

Teacher Support for Media Production

In conclusion, while students are actively engaged in using media to communicate about climate change outside the classroom, teachers and project coordinators can certainly provide support for engaging students in media productions as part of the schoolwork. In doing so, they need to consider the digital divide related to variations in students' access to digital tools as well as differences in their previous experience in employ these

tools. Within school contexts, teachers may want to draw on assistance from school technology support staff. Within university contexts, teachers may consider interacting with faculty associated with units, centers, or departments focused on climate change or environmental studies. Teachers can support students' media production by:

- having students acquire scientific information about climate change to produce valid information about climate change
- having students clarify their purposes for producing media
- providing instruction on production techniques, for example, how to employ visual images or graphics (Bryne, 2022)
- giving students options for use of different media types (Bernier, 2020).
- creating organizations or clubs within school to support collaborative media production.
- providing relevant feedback to enhance student development in media productions
- having student share media productions through youth-oriented projects such as Action for the Climate Emergency, Young People's Trust for the Environment, The UK Youth Climate Coalition, Climate Change Education, Youth4Climate, Young Voices for the Planet, Our Climate Our Futures, Connect4Climate, and the Climate Reality Project
- having students employ digital visualization tools for acquiring data or images about climate change impacts in certain regions or communities using tools, such as Climate Interactive, Community Viz, National Climate Assessment, Visualizing Change Toolkit, or Visualizing Change.

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Climate Literacy in Education

Staying with the Climate Trouble:
On (Not) Containing the Crisis in the Classroom

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Abstract

Trying to introduce the climate crisis into the classroom *as* a crisis presents us with a pedagogical challenge: how to contain the crisis without foreclosing it? Focusing on Naomi Klein's *How to Change Everything*, I suggest that attempts to contain eco-anxiety mainly by stressing "what students can do" risk foreclosing the crisis by obscuring its real urgency. Rather than offering what Jenny Offill ironically calls an "obligatory note of hope," we might consider that our deepest obligation isn't to alleviating eco-anxiety but to helping students listen to and be guided by it: to help students, as Donna Haraway puts it, "stay with the trouble."

Keywords

climate pedagogy, climate change, climate crisis, eco-anxiety, *How to Change Everything*, "staying with the trouble," hope

In recent years, I've framed most of my literature classes in relation to the climate crisis. The premises of such an approach are that "climate change is not a STEM issue," but, rather, "a worldview issue, entangled with our values, perceptions, beliefs, and lifestyles" (Oziewicz, 2023, p. 36), and that—because worldviews are established, maintained, normalized, and, perhaps, challenged and changed by stories a culture tells about itself and the world—one important way of studying the climate crisis is studying literature. The first challenge, though, is to establish the crisis *as* a crisis, to draw on the basic science to justify a melodramatic but apt picture of our deranged present moment:

our planetary house is burning down; the time left to save part of it is running out; but we keep adding more fuel to fire.

In a culture where the dominant discourses of climate change domesticate its urgent and existential threat by casting it as a (pretty low priority) political "issue," it's hard to make that issue present in the classroom as a truly existential crisis. Indeed, even the term crisis can be seen to keep the most disruptive meanings of climate change at a distance, lumped together with other crises, like the "debt crisis." Insofar as the continued burning of fossil fuel in the global north has already been responsible for the death of millions of people, mainly in the global south, and guarantees the death of hundreds of millions, or probably billions, of people in the future, it might be better to replace crisis with terms such as "climate homicide" or "atrocity in process." For that reason, teaching literature in the context of the climate crisis presents pedagogical challenges akin to those involved in attempts to confront historical atrocities like the Holocaust.

Shoshana Felman's "Education and Crisis, or the Vicissitudes of Teaching" (1992) offers a revealing account of some of those challenges. When she taught videotaped testimonies of Holocaust survivors, her students felt "at a loss, disoriented, and uprooted" (p. 48). Reflecting on that dynamic, Felman comes see that her job as a teacher necessarily involves "creating in the class the highest state of crisis that it could withstand," but doing so without "driving the students crazy" (p. 53). The central pedagogical question thus becomes "on the one hand, how to access, how *not to foreclose* the crisis, and, on the other hand, how to *contain it*?" (p. 54).

That's a compelling way to describe the challenge of teaching about climate change. But there's also a significant difference between containing the secondary trauma of *an historical* event and containing the traumatic response to becoming aware one is living in the middle of an atrocity *in process*. For Felman, "it is the teacher's task to recontextualize the crisis and to put it back into perspective, to relate the present to the past and to the future and to thus reintegrate the crisis in a *transformed* frame of meaning" (p. 54) so that the students' then "contained" knowledge can be "*put to use*" (p. 53). But the crisis of the climate is precisely that the future *cannot* function as a stabilizing point of reference. It is that future that is itself *at stake*, dependent on how knowledge of that crisis can sufficiently be "*put to use*."

How *can* it be put to use? Discussions of how to bring the climate crisis into the classroom often propose "containing" the crisis by answering that question and thereby offering the students some hope. Kirsten Hunt (2023), for example, responds to her students' "palpable anxiety about the future of the planet" by stressing that essential to teaching the class "what climate change is" is teaching "what they *can do about it*" (p. 24). But knowing *that* students need to hear what they can do isn't the same thing as knowing *what* to tell them. For this, Hunt turns to Naomi Klein's *How to Change Everything* (2021). Where she sees that work as providing "actionable tools" and thus offering "a sense of hope for the future," however, I want to suggest that Klein's book offers less a clear basis for hope than a demonstration of how efforts to "contain" the crisis often function as ways of foreclosing it.

The book begins with what are meant to be inspiring stories of young people taking action, sketching the story of Greta Thunberg, the student strikes she inspired worldwide, and a lawsuit that "sixteen kids from twelve countries" have filed against five countries. These are, indeed, "examples of activism that have been *successful to counter climate change inaction* on a sociopolitical level" (Hunt, p. 25, my italics). However, the difficult truth is that they haven't (yet?) *countered climate change itself*—a state of affairs that Klein quietly acknowledges by noting that "Greta's speeches brought no dramatic action from world leaders" (p. 23).

Elaborating on how she sees Klein's forestalling "anxiety about the fate of our planet" by offering stories to inspire hope, Hunt turns to Klein's evocation of "The Green New Deal," presented as "achievable" in light of the precedents of the New Deal and the Marshall Plan—cases where the U.S. has successfully "dealt with crises in the past." As with stories of student activism, though, Klein's models of the New Deal and the Marshall Plan can offer substantial hope only if you don't look at them too closely. As one historian of the period has observed, "The New Deal made America safe for capitalism," while "the Marshall Plan would do the same for Europe" (Kunz, 1997, p. 164). Yet, as Klein herself as argued extensively in *This Changes Everything*—with its pointed subtitle *Capitalism vs. the Climate* (2021)—the climate crisis is fundamentally *a problem of capitalism itself*. While "what the climate needs to avoid collapse is a contraction in humanity's use of resources," Klein writes, "what our economic model demands to avoid collapse is unfettered expansion" (p. 21). As precedents for

responding to a climate crisis rooted in our economic model, then, evoking programs like the New Deal and the Marshall Plan seems more desperate than it does inspirational.

Specifically, in Klein's chapter, the "sweeping change" the historical precedents are meant to inspire in the present is the passage of the version of a Green New Deal (GND) introduced to the U.S Congress in 2019. Once more, however, it's hard to see how that bill actually responds to the *urgency* of the present crisis. Where the legislation effecting the original New Deal and the Marshall Plan mandated specific programs and massive spending—passing those bills was *taking action*—the 2019 GND bill asked the House merely to declare its "sense" that "it is the duty of the Federal Government to create a Green New Deal" and its "sense" of what the GND's goals should be. This GND sets out goals, that is, but itself takes no action. It expresses a sense of things but mandates nothing. As our planetary house burns down, students are asked to find hope in the prospect that, if their activism is successful, those in power, rather than taking adequate action, would express a sense that they should make a plan to take such action—kicking the climate action can down the road yet again.

Recognizing that the New Deal in fact exacerbated racial inequality, the GND does stress social and economic justice. But when it comes to the most immediate cause of the crisis, the hoped-for plan calls for eliminating greenhouse gas emissions *not* fast and fully enough to probably prevent the most apocalyptic scenarios but only "*as much as technologically feasible*" (my emphasis)—as if the problem was essentially one of as insufficiently developed technology, rather than what Klein pithily calls an economy "at war with many forms of life on earth" (2014, p. 21).

Ultimately, as we bring the more than inconvenient truth of the climate crisis into the classroom, much of what students are told "they can do about it" seems to shy away from another inconvenient truth: despite many local victories, the fight against climate change hasn't slowed, much less begun to reverse, the steady rise in greenhouse gas emissions. It has often been pointed out that making profound changes takes time—that though the arc of the moral universe is long it bends toward justice. But if the arc of the moral universe is long, in a house on fire time is short. Any real hope we might stir in our students must be premised on confronting this urgency. In other words, responding to the students' "palpable anxiety" by teaching "what they can do" carries its own danger:

the danger that, in purporting to already *know* what they can do, one will err on the side of foreclosing the crisis, of minimizing its actual urgency.

In lieu of focusing on what students can do, I've found it helpful to address *what needs to be done*—cutting greenhouse emissions fast and fully enough, as defined by the IPCC. I especially stress the following:

a) though time is short, it is (as I write this in late 2023) probably *not yet too late to do that;*[2]
b) the impediment to doing that is not technical but, rather, political;
c) unlike the geophysical laws of nature, political realities are always subject to further negotiation.

At least until the house burns down.

While I think some students have been stirred by this approach, I don't suppose it can provide what Hunt finds in Klein's book: a way of offering students "fewer moments of eco-anxiety and more moments of hope" (p. 26). Perhaps, though, the point isn't to alleviate anxiety but, rather, to listen to it, to live through it, and to be guided by it. Perhaps, as teachers, we might focus less on offering what Jenny Offill calls an "obligatory note of hope" (p. 67) than on the value, even the necessity, of what Donna Haraway describes as "staying with the trouble." If the point is to help students confront the reality of the climate crisis *as an existential threat*, that is, perhaps our deepest obligation is not to hope but to attending to the trouble itself. We can't know in advance precisely what that might mean, or whether it will help the process of what Hunt calls "finding a way through." But we can invite students into our own state of not-knowing and thus into the process of finding out (which I hope to describe in a follow up article). And we can hope that in that joint process students might yet help find a way both to stay with the trouble and to arrive at their own sense of "what they can do" to help put the fire out while we still can.

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[2] In a 2018 report, the IPCC finds that limiting warming to 1.5°C would require greenhouse emissions to be about halved by 2030 (relative to 2018 levels) and brought to "net zero" by about 2050.

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Climate Literacy in Education

Sven Nordqvist's *Pettson and Findus* Series and Children's Education:

Ecocritical Dialogues in Preschool

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Abstract

This article explores how Sven Nordqvist's books about Pettson and Findus may be used to initiate dialogues in preschool on the relationship between humans and nature. We argue that Nordqvist's books are especially fitting for ecocritical dialogues on three levels, on which they depart from today's ecocentric aspirations. These levels include (1) the main characters' view of nature as a resource, (2) the untraditional representation of plants, and (3) the characters' assumptions of control and superiority over nature, especially over (other) animals. Another implication of the article is that pre-ecocriticism children's books, and books that are not climate fiction can be useful in preschool discussions thematizing the relationship between humans and nature.

Keywords

Sven Nordqvist, ecocritical dialogues, preschool, human–nature relationship

Introduction

It is a truth universally acknowledged that literature can change people's way of viewing the world (Felski, 2018; Langer, 2011; Nussbaum, 2016; von Mossner, 2017, pp. 6–7). In

recent years, a plethora of climate fiction (cli-fi) literature for children has sprung out of the woodwork. Children can read about endangered nature (Tucker & Persico, 2019), oil disasters (Lillegraven, 2020), and climate activism (Camerini, 2020; Winter, 2020). We argue that children's books without an explicit eco-activist agenda and books written before questions of sustainability made their way into curricula and other documents regulating school systems can serve an important function by influencing children to reflect on questions of sustainability and, in the long run, to become eco-citizens. One example is Sven Nordqvist's picturebook series about Pettson and his cat Findus. The countryside is a constant backdrop across the series, depicted as a pastoral idyll, rich in flora and fauna. In addition, the characters' close connection to nature is central. These factors make Nordqvist's books especially fitting for prompting ecocritical dialogues with preschool children. We highlight three characteristics from the books that support this argument.

Our theoretical point of departure is Garrard's (2012, p. 5) definition of ecocriticism as an investigation of the relationship between humans and nature in literature. The concept of ecocritical dialogues, defined by Goga et al. (2023) as dialogues whose goal is to make children reflect on humans' contact with nature, is central to our study. According to Goga et al. (2023, p. 20), a central question in ecocritical dialogues is whether nature is understood from an anthropocentric or an ecocentric perspective.

Nature as a Resource

The often-recurring depictions of Pettson and Findus' use of nature as a resource are apt incentives to embark on ecocritical dialogues with children. In the series, several illustrations show how Pettson and Findus use nature as a resource to obtain food (growing vegetables, picking berries, fishing, keeping poultry, etc.). The images are rich in details and tell parallel stories to the textual one (Nikolajeva, 2000, p. 226). Tracing these stories can be detective work to activate the attentive reader. In *A Ruckus in the Garden* (2018), the reader may notice that Findus is planting a meatball in the vegetable garden. It is interesting to hear the children's ideas on whether the meatball will grow. These reflections may, in turn, lead to discussions on the differences between plants and

animals. Here, the preschool teacher may ask, "Where do vegetables come from?" "Do we buy them at the store?" "Where do Pettson and Findus get their vegetables from?"

In addition to using nature as a resource for food, the protagonists use it as a source of recreation and happiness. In *Festus and Mercury: Wishing to Go Fishing* (2016), Pettson (here translated as "Festus") suffers from depression, and to address this ailment, he and Findus (Mercury) go fishing. The book features illustrations of Pettson's mental state before and after spending time in nature. His depression is accompanied by rain and gray colors and his recovery is represented by sunshine afterward. These illustrations offer another opportunity for preschool teachers to prompt children's reflection about connections between the character's emotions and nature.

When we discussed Nordqvist's books with a preschool teacher, she mentioned that she was especially fond of the so-called mumbles—the magical creatures in the Pettson books. She argued that these creatures are closely related to nature and hypothesized that they need it to survive. This, in turn, made her reason about the everyday activities in preschool, which often include excursions to the forest. She suggested that "maybe we are not supposed to bring sticks and leaves and other things from the forest back to kindergarten to keep them or create something of them. Then we see nature as a resource and take things that the mumbles and the creatures living in the forest need." She argued that, together with the children, we should look beyond those resource aspects and teach the children that nature has a value on its own. As we can see, the teacher questions the idea of nature as a resource for humans and puts this critical approach into practice when making field trips into nature with the children.

The Depiction of Nature

Another opportunity for ecological dialogues arises from the fact that Nordqvist's depiction of nature is not always mimetically accurate. Plants are often oversized or out of season. Nordqvist experiments with perspective and size, and this stylistic device often makes the plants especially visible to the reader. The so-called plant blindness (Wandersee & Schussler, 1999), where readers tend to ignore plants and merely treat them as background elements—a view that is often associated with an anthropocentric view of nature—is clearly not an issue in the Pettson and Findus series. Oversized dandelions and daffodils are also accompanied by the mixing of seasons. Attentive

readers may notice that spring flowers and summer berries appear simultaneously. Although Nordqvist uses these mixings to enhance the magic of his fictional world, the illustrations may lead to discussions regarding what plants are and in what season they grow.

Findus, who is not an ordinary car, is related to Nordqvist's often non-mimetic representation of nature. Anthropomorphizing animals is a common strategy in children's literature (Birkeland, 2016, pp. 1–3), but what is unique about Nordqvist's books is Findus' liminal position on a human–animal axis. He wears clothes and always walks on two feet; he could hence be interpreted as a child rather than a cat (Lindgren, 2015). At the same time, he is an animal, because he never speaks to anyone except Pettson, signaling that he only exists as a human within Pettson's (and the readers') head(s). Findus' double status as both an animal and a human relates to Goga et al.'s (2023) argument about anthropocentric and ecocentric perspectives on nature and animals. One may, for example, discuss with the children if cats have clothes, if they can talk, and what are typical characteristics of a cat.

Impact on Nature

The third reason that makes the series fitting for ecocritical dialogues centers on the protagonists' anthropocentric view of nature. In Nordqvist's works Pettson, Findus, and other characters often assume they have the right to control nature or other animals. In *Findus Rules the Roost* (2017), for example, Findus is inconvenienced by the rooster's crowing and forbids him from uttering any sound. The rooster's misery is vividly depicted in several illustrations, where the children can see how unhappy and frustrated he is. Another way in which the main characters impact nature is when Findus, in the same book, tries to make a hen fly by using a seesaw-like construction. This is not to help the hen but simply for his own entertainment. These and similar examples of anthropocentric perspectives are opportunities for the teacher to discuss with children questions about nature rights, especially the rights of domesticated animals and plants.

Another example is related to the threatening of a traditional, anthropocentric, lifestyle. It is rare that the series deals with the killing of animals, but in one episode in *The Fox Chase* (2015), Pettson and Findus' neighbor, Gustavsson, is experiencing problems with a fox who threatens his hens, and he ventures to kill it. Pettson and Findus

are also troubled by the fox, but their approach to the situation is different as they lure the fox away from the farm. Their strategy is less anthropocentric than Gustavsson's, who sees it as his right to kill the fox. Themes that are interesting to bring up for discussion regarding the reasoning above are whether animals have feelings and how humans treat animals. This could, in turn, lead to a discussion of how animals' feelings are represented and rendered in the book.

Concluding Discussion

Judith Langer (2011) argues that literature has the potential to position child readers within an imaginary story world but also that children may step out of this world and reflect upon what role the story may have in the real world in their own lives. It is in the latter case where Nordqvist's books, in combination with ecocritical dialogues, are especially powerful. As we suggested earlier, books written without an ecocritical agenda can be just as important as cli-fi when questioning anthropocentric world views and the human–nature divide. We have shared examples of why Nordqvist's Pettson and Findus picturebooks are especially fitting for initiating ecocritical dialogues with preschool children. With their traditional view of nature as a resource for food and entertainment, the Pettson and Findus series are far from "perfect" from an ecocritical point of view. However, these "imperfections" are valuable points of departure for questioning and discussing how humans treat nature. The teacher may ask the children: "Is one allowed to try to make a hen fly, like Findus did?" "Are we allowed to take what we want from the forest in the shape of sticks, fruits, berries, etc.?" For whom do animals and plant exist?" All this, however, cannot be accomplished without knowledgeable preschool teachers who are aware of the resources for ecocritical dialogues that are hidden in this kind of literature.

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Climate Literacy in Education

Humanity's Reliance on the More-Than-Human in Shaun Tan's *Tales from the Inner City*

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Abstract

Various aspects of human life—including art, media, and culture—are becoming increasingly informed by the climate and environmental crises. Shaun Tan's *Tales from the Inner City* illustrate and respond to this emergency, rising questions about the consequences of humanity's disconnect from the nonhuman world. Tan's message is wistful but not hopeless: although reestablishing balance with nature will not be easy, it is the only goal that matters.

Keywords

climate literacy, anthropocentrism, empathy, ecocentrism, nonhuman persons

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Understanding the complex relationship between the health of our climate and the well-being of living creatures is important more than ever before. This understanding, an

individual's ability to critically consider both the impact that the climate crisis has on human wellness and the consequences that the demands of human life have on our environment, is a key component of "climate literacy," especially in the domains of Earth Care and Kinship Care. It involves more than the necessary understanding that we, humans, should be doing better for our planet: it also implies a realization that when we actively choose against doing better to preserve our Earth, the consequences are fatal. Our culture is becoming increasingly informed by climate literacy concerns, and the rising climate and environmental sensitivity lies at the heart of much storytelling today. Shaun Tan's *Tales from the Inner City*, a collection of elaborately illustrated, ecocentric short stories and poems offer a fresh perspective on why fostering healthy mutual connections between ourselves, other living beings, and our environment is of vital importance for today's society. It stands as a compelling illustration of the power literature holds for climate literacy education to create a more climate literate culture.

Many works in the environmental and climate literature genres are often melancholic; in part, Tan's collection is no exception. However, *Tales from the Inner City* also includes stories that share a lot of hope. Not only do they communicate how much we long to move away from environmentally abusive lifestyles, but they actively encourage our ability to do so. Tan's illustrations convey the way this longing is spurred by the haunting, ever-present if somewhat suppressed awareness of *what once was*. Accompanying these illustrations are short narratives which suggest that the echoes of the past are still accessible to us, especially if we set aside our anthropocentric conceit and open our ears to them. Tan's collection communicates that, with enough effort, we may achieve a better state of balance with Nature. His tales each do so, uniquely, often by finding refreshing ways of expressing an equality or partnership between humanity and the world's nonhuman beings. Each of the tales speaks to different aspects (and species) of this longing—as do, for example, the stories called "Sheep," "Pig," and "Fox." However, when taken as a collection, they present a powerful, unified ecocentric voice that challenges us to reconsider and redefine our relations with animals and the natural world.

Many of the stories in *Tales from the Inner City* suggest that humanity's arrogance and capriciousness is one of our greatest downfalls. The idea that human intelligence and consciousness are superior to those of all other species—animal or plant—keeps us

from understanding how much we gain from taking a step back from ourselves and respecting nonhuman lives as equal to our own—even instead as more-than-human. The tale "Sheep," for example, takes place in a classroom: the teacher is attempting to convince the students of the importance of respecting the sacrifices animals and other living beings make (often by our demands) to help us live well. The teacher's lessons do not fall on completely deaf ears: the students understand and take to heart the way that the sheep's life and sacrifices are "something much bigger than any lesson" (Tan, 2018, p. 135). However, they still struggle to let go of the comforting idea of human supremacy. Their awe and respect for the sheep is thrown off by the "rank breeze that roll[s] in from the…livestock ship" (p. 135), reminding them of their belief in the greater sophistication and refinement of human intelligence and sentience. The students bustle out of the classroom before their guilt can counteract their ego and self-importance. While doing so, however, they have to "tr[y] hard to think of something else" (p. 135), which suggests that they will not be able to unsee the respect for nonhuman lives they were just allowed to glimpse. Stepping away from human arrogance and self-importance takes a conscious effort: an effort we are each capable of enacting, with enough determination.

Many of Tan's tales speak to concerns surrounding human/nonhuman interaction. Peppered throughout the book are passages and single-line phrases, which make us realize just how far humanity has become removed from understanding what our more-than-human counterparts need from us. In fact, Tan suggests, we have become *so* far removed that we are hardly even aware that there is an alternative to human selfishness and self-importance. In the story "Pig," the narrator wonders: "[T]he pig doesn't cry or make much noise. But maybe pigs suffer in a way we can't know. Who can say for sure what another animal is feeling?" (p. 86). The story concludes with the narrator—presumably a child disobeying their parents' rules—setting the pig free. In doing so, the child is actively choosing to counter human superiority, the supposed "natural" order of things. The tale further suggests that treating all living beings with the same respect we would offer to our fellow humans is maybe not such a strange obligation after all.

In several other tales, Tan depicts the importance of fostering humanity's awareness of other creatures' dignity. "Fox" expresses the way that we, humans, often think of ourselves as being above the nonhuman, even though our very existence relies on the existence of the world's other creatures. We are, as if, haunted by the biological

truth we so much wish to suppress. With this idea in mind, the illustration accompanying the story depicts the pale, near-ghostly image of a person lying in their bed, while hovering above them is the figure of a bright, red-orange fox, in stark contrast against the dark neutrals of the background (pp.192-193). The fox, as the tale's narrator, explains that all of our decisions and actions in our world are always already informed by our suppressed memories of humanity being embedded in the same web of life as the nonhuman and more-than-human beings:

> *Don't you know that I am as old as the blood in your veins?... I know your every thought and feeling, more than you do yourself, every craving, every fear and dream and vice and embarrassing secret, I know them all. So please, pay me no mind as I ransack the bottom drawers of your subconscious. There's nothing here that I haven't already seen a thousand times before* (p. 191).

In this passage, Tan asserts that human lives are irreversibly intertwined with those of nonhumans, whether we recognize it or not. If we deny or reject the interconnectedness between nature, animals, and ourselves, we condemn ourselves to being instead haunted by that mutual need and reliance. As the fox questions: "where could we live if not in the bottomless den of each other's shadow?" (p. 191). The missing pieces to our self-awareness are provided by the bonds we form between ourselves and other living creatures, including between our wellbeing and the wellbeing of our environment. We would not be where we are, nor even *who* we are today, without the foundation that those relationships provide us with. The nonhuman gives shape and form to our homes and identities.

Taken together, these three tales illustrate that we have drifted away from a sense of being entangled with the nonhuman beings—a self-induced separation that is significant and undeniably harmful, yet not irreversible. The bonds between ourselves and the rest of the planet's lifeforms—those sentient or not—still hold great potential, if only we act on the call to reject our arrogant comforts and to redefine those relationships. It is vital today that we foster a culture informed by climate literacy, and one of the most powerful ways we can do this is through literature and other forms of popular media. Shaun Tan's *Tales from the Inner City* offers an invitation to a larger community of species

kinship. It exposes our despair and anxiety caused by separation, yet it affirms unrelenting hope that the human-nonhuman connection persists. The conclusion we may draw from the collection is that change is always possible as long as we commit to it.

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Climate Literacy in Education

A Stone's Throw and Ten Paces:

Or Mr. Warbler's Succinct and Useful Field Guide to Flora and Fauna of the Northern Forest

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Artist Statement

A Stone's Throw was created as a class project for an undergraduate first-year writing class and is partially based on my own experiences growing up close to a wooded trail in northern Minnesota. My intention for the story was to write and illustrate a simple narrative about the mental health benefits of nature exposure and based on both my personal experiences and the findings of several previously published research articles. The goal of the story is to introduce the reader to the concept of interacting with nature as a restorative experience and to portray experiencing nature as an accessible activity that requires no prior knowledge or particular skill set.

Ideas for reflection:

1. Nature can be present around you in many ways, from a state park to a garden to a simple potted plant. What types of nature do you notice around your neighborhood? What types of nature might your students notice?
2. In the narrative, nature journaling is portrayed as one form of interaction with nature. What other forms of interaction could you engage with and/or teach to your students?

Keywords

Nature immersion, embodiment, biodiversity, nearby nature, nature journaling

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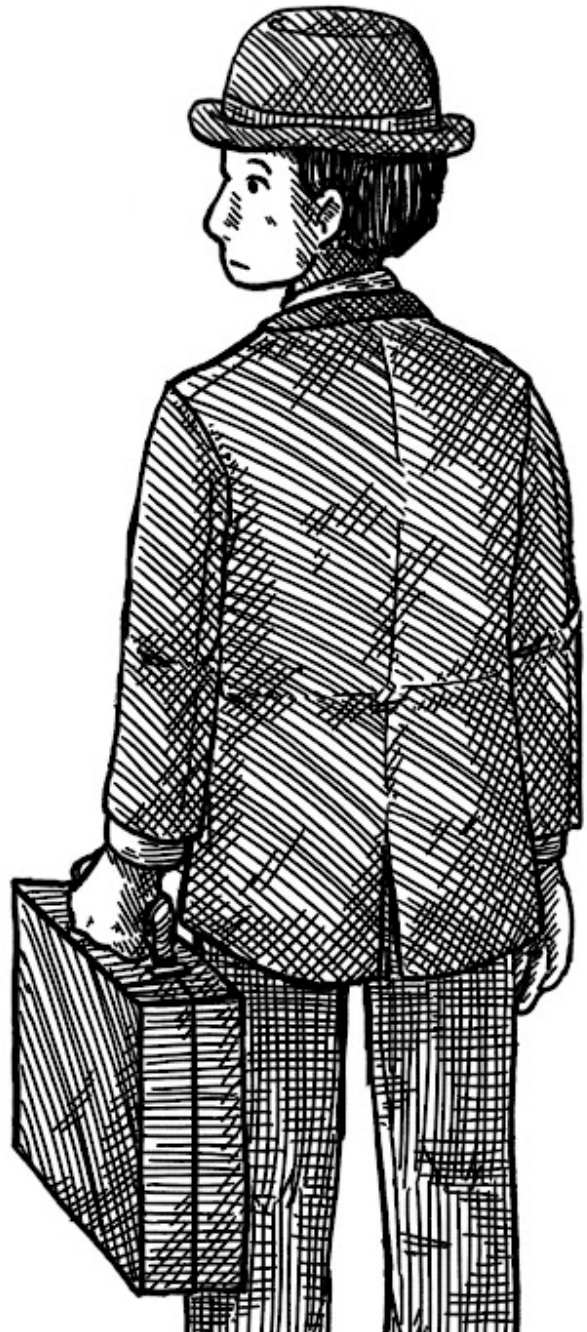

Written & Illustrated by Emma Ambrosi

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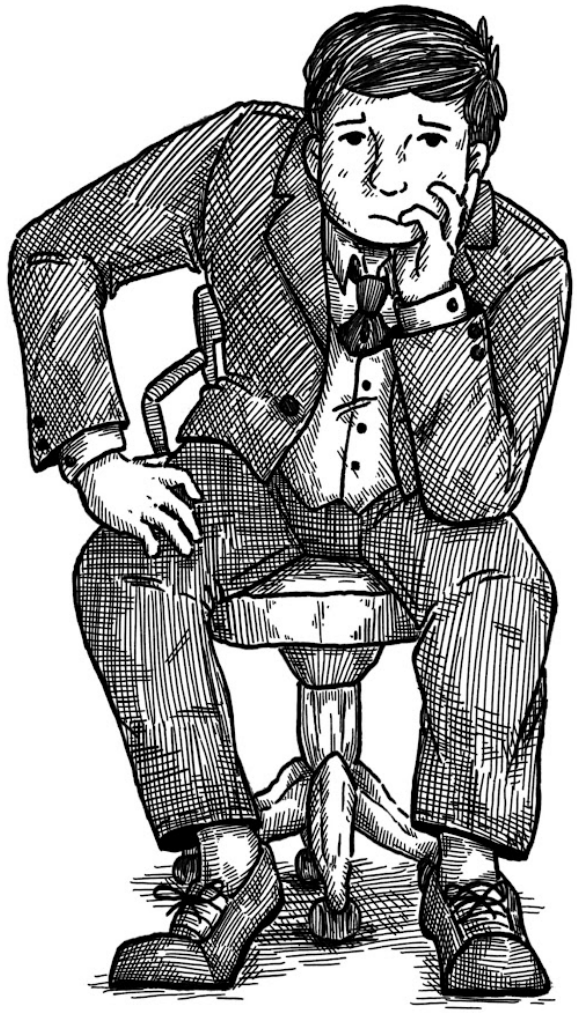
Mr. Henry Warbler is currently sitting at his office desk.

He has been trying for some time to formulate an ad campaign for a brand of toothpaste that comes packaged with cheap plastic figurines.

So far, his ideas are nil.

Through his splitting headache, he attempts to discern
which word would be better:
"incredible" or "delightful."



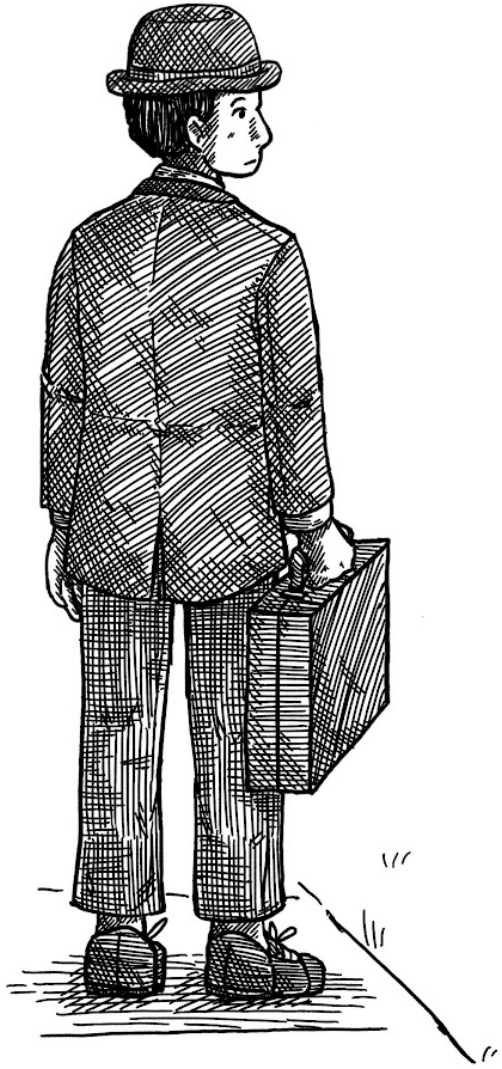
Perhaps the weekend will give him the respite he needs to make a decision -- but he is doubtful.

The Elysian prospects of the weekend never seem to live up to their potential.

Soon, his mind turns towards its daily ritual of retreading all of the minor faux pas and professional errors he has committed throughout the past decade.

Maybe he just isn't cut out for this.

To avoid aggravating his headache, Mr. Warbler charts a roundabout path home, along the edge of downtown.



During one stretch, he notices a patch of woods on the opposite side, with a trail leading through the trees.

At home, in front of the fire, Mr. Warbler is overcome by a deluge of thoughts.

He thinks about work.

He thinks about deadlines, and headaches, and suffocating waves of ennui.

He thinks about the babbling stream by his parent's house, where he played when he was a child.

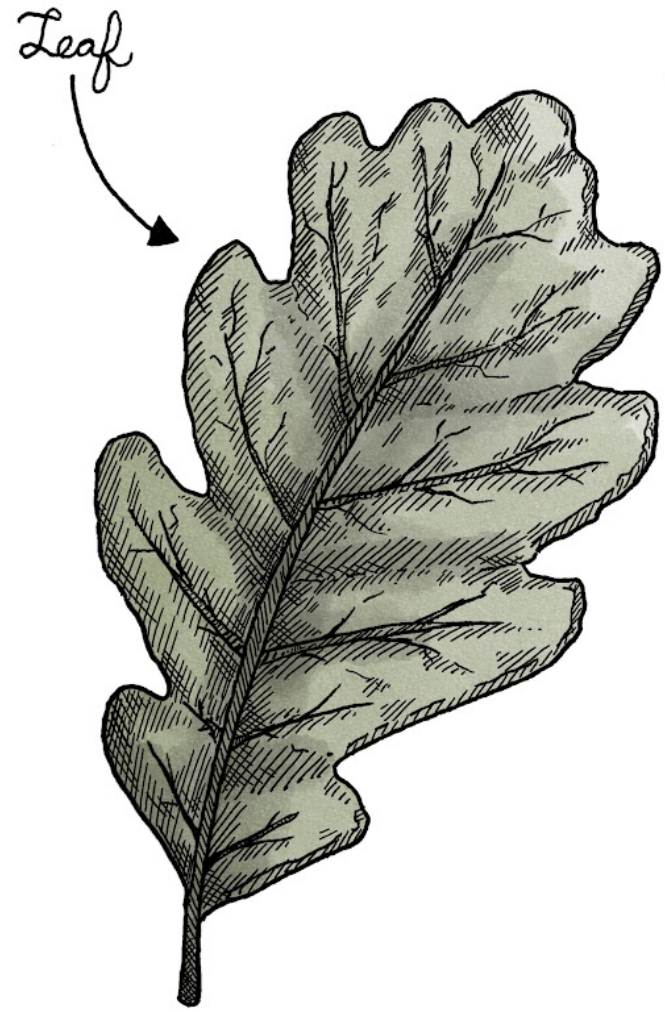
He thinks about that little patch of woods, a stone's throw away from the sidewalk.

By Sunday, Mr. Warbler has thought himself in
enough circles to come to a decision:
he will visit the trail.

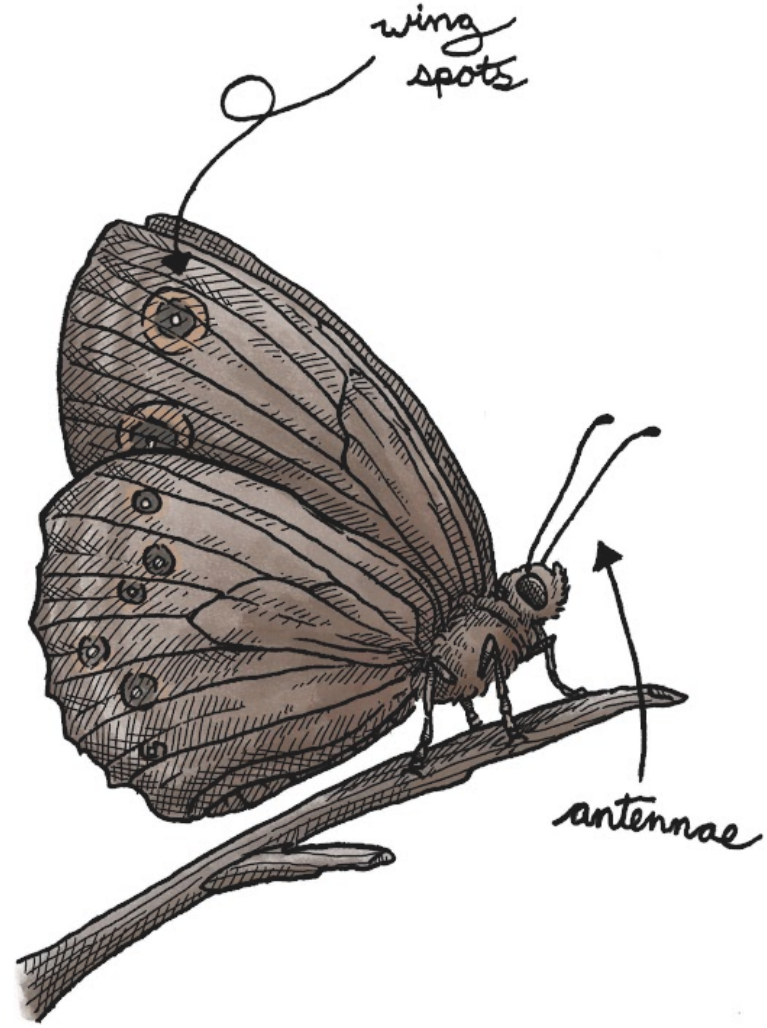
He dusts off a blank sketchbook (bought long ago
for the sake of since-forgotten pastimes), puts on
some suitable hiking attire, and strides with
purpose back to the patch of woods.

Not ten paces after stepping onto the trail, he finds a suitable subject for his sketchbook.

He diligently illustrates it, then labels it in as much detail as he can muster.

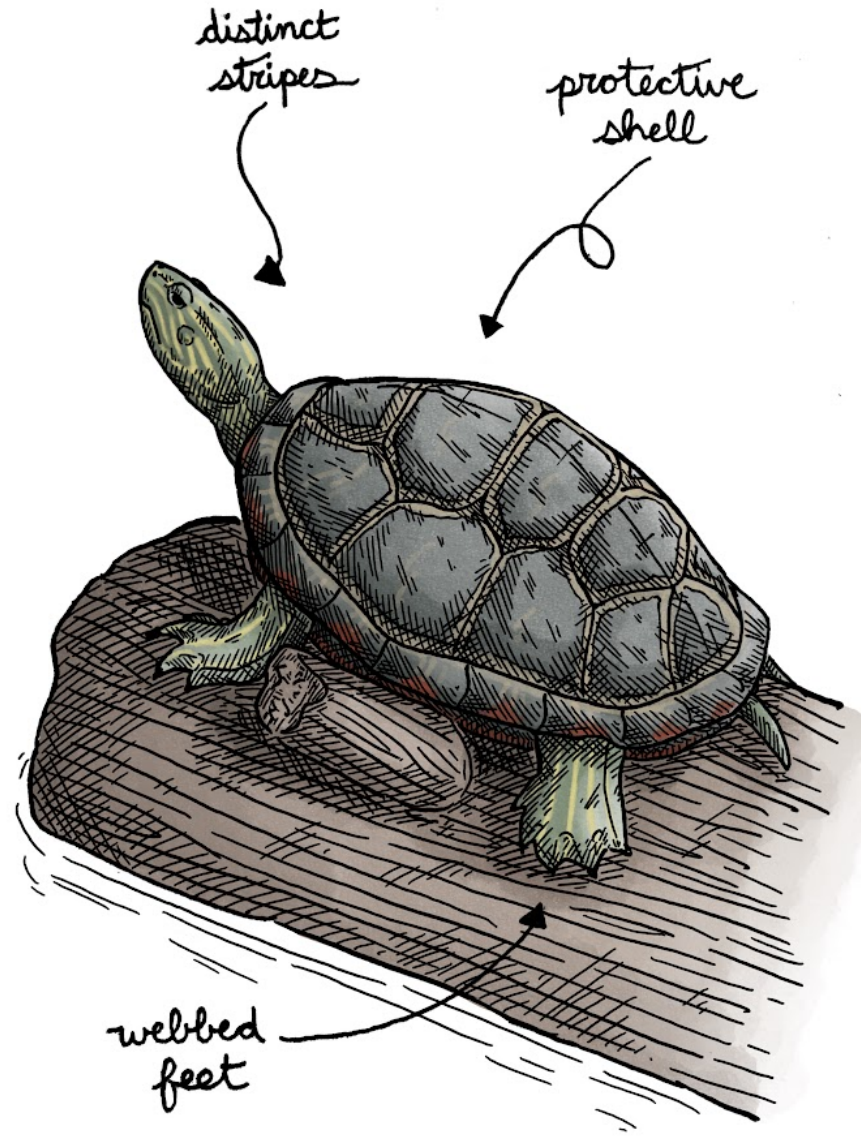


Farther down the path, he is suddenly startled by a strange bug fluttering towards him.

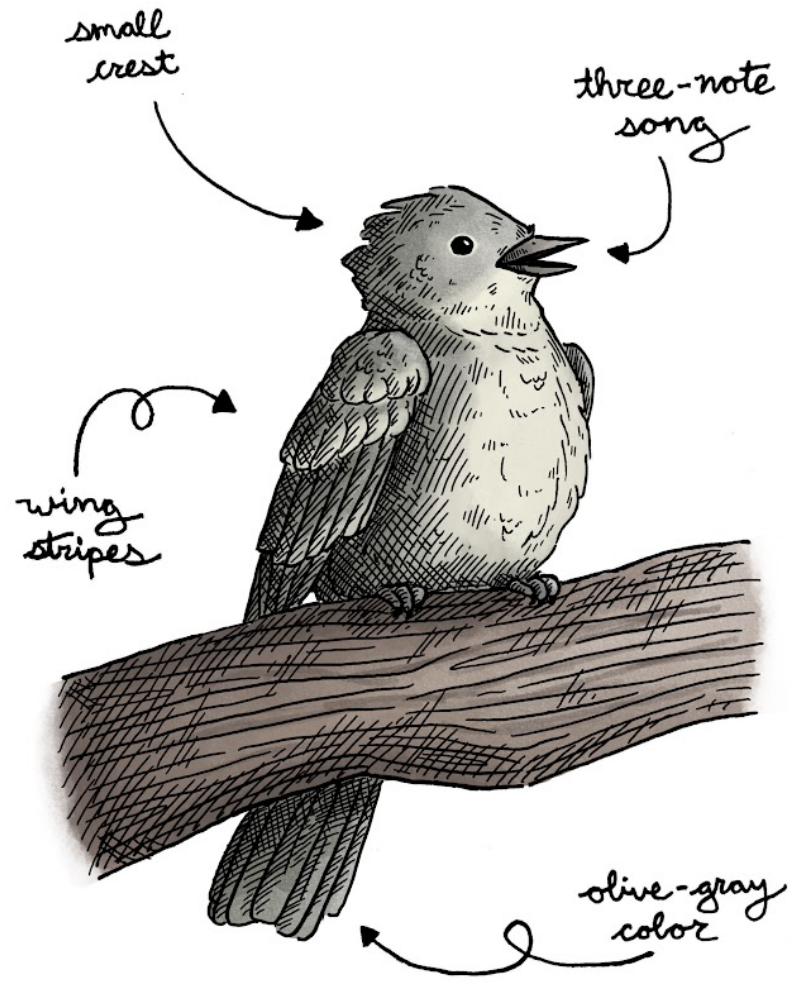


It seems a bit too inquisitive for his liking.

Where the trail branches to meet a pond, the baleful stare of a turtle catches his eye.



Farther down the path, he hears a little bird singing, and spots it on a tree branch.



Mr. Warbler returns home, feeling tired and unkempt, but also rather accomplished.

After a brief shower, he eagerly turns his attention to the small stack of books now sitting on his counter -- the spoils of a detour to the city library.

Each one is filled with detailed illustrations and notes, all about the local flora and fauna in the surrounding area.

Their covers proclaim them to be field guides.

The following morning, Mr. Warbler goes back to work.

Perhaps he'll walk this way more often.

The End

Species Key


Oak leaf (Quercus sp.)


Common Wood-Nymph (Cercyonis pegala)


Painted Turtle (Chrysemys picta)


Eastern Wood-Pewee (Contopus virens)


Creeping Buttercup (Ranunculus repens)


Ox-eye Daisy (Leucanthemum vulgare)


Forget-me-not (Myosotis sp.)


Johnny-jump-up (Viola tricolor)

Author's Note

This story was inspired and influenced by my own experiences walking through the woods of northern Minnesota. Themes were also incorporated from the following articles:

"A systematic review of evidence for the added benefits to health of exposure to natural environments," by Bowler, D. E. et al., 2010.

"The benefits of nature experience: Improved affect and cognition," by Bratman, G. N. et al., 2015.

"The restorative benefits of nature: Toward an integrative framework," by Kaplan, S., 1995.

"Stress recovery during exposure to natural and urban environments," by Ulrich, R. S. et al., 1991.

"The effect of exposure to the natural environment on stress reduction: A meta-analysis," by Yao, W. et al., 2021.