TiME (This is My Earth)

Climate Change and Nature Preservation

Curriculum for Elementary School

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Introduction

Greetings, esteemed educator, we truly appreciate your commitment to fostering awareness of conservation and biodiversity through the TiME project. This educational initiative integrates basic scientific knowledge, environmental perspectives, and the cultivation of personal responsibility.

Objective: The primary aim of this program is to elevate consciousness and nurture a sense of social responsibility toward the protection and preservation of biodiversity, through active participation in the TiME project.

Teaching approach: This program is thoughtfully structured, offering a comprehensive activity framework spanning approximately 30 hours of instruction on topics of climate change and biodiversity. It is flexible and thus allows for tailored adaptations to different grade levels, different countries, and societies depending on the needs and interests of your students.

Impact assessment: The crowning jewel of this program is the conclusion session where we delve into ways in which your students can sustain their impact. Encouraging them to personally champion biodiversity conservation beyond the confines of this program is a profoundly valuable outcome.

Your dedication to cultivating environmentally conscious and responsible citizens is highly appreciated.

TIME lesson #1: Endemic species.

Lesson goal: Introduction to TIME, introduction to some ecological terms.

Terms:

1. *** Biological species**- a group of individuals that are practically or theoretically capable of interbreeding and producing fertile offspring.
2. **Endemic species-** a species that exists in a small and limited distribution area, meaning it lives and breeds in a small and defined geographical area.
3. **Species diversity-** the number of different species in the area (diversity can be measured in 'richness' and in 'relative abundance of said species').
4. **Biodiversity Hotspots-** An area that has a large diversity of species and is in danger.

Lesson plan:

Opening: 20 min. Introducing TIME's goals via explanation and videos.

Online options:

TiME website: https://this-is-my-earth.org

Game: Building an organism. 10 min.

We'll open the lesson with a game that'll explain the terms 'species' and the 'biological differentiation'.

Students will divide into groups [2-3 students per group] and build an organism using different materials (following are suggested guidelines for animal species appearance but feel free to play!):

1. Number of body parts [2 or 3]
2. Number of limbs [4 or 6, also possibly more (e.g. arachnids or octopus 8 and crustaceans and squids 10]
3. Eye color [Brown, green or blue]
4. Limb length [3 or 5 centimeters]

Comparing, Discussing and Explaining. 30 min.

Each group will show their creation. The diversity of students' creations can be used to demonstrate the diversity of organisms in nature and give us an opportunity to talk about it.

Explain the terms:

- Biological species
- Endemic species
- Species diversity

Get on to the TiME website and get students acquainted with the three biodiversity hotspots TiME's Science Committee has identified for 2023 (hotspots may change in the following years):

Paroles, Peru

Help TiME preserve Paroles, a part of the Tropical Andes Biodiversity Hotspot, the most biologically diverse region on Earth. https://this-is-my-earth.org/habitat/peroles-peru/

Reserva Natural Los Magnolios, Columbia

Help expand the Los Magnolios nature reserve to establish an essential biological corridor for threatened and endemic species like the Critically Endangered Handley's Slender Opossum. https://this-is-my-earth.org/habitat/reserva-natural-los-magnolios/

Tapichalaca Reserve, Ecuador

Enhance connectivity between Ecuador's two large national parks and protect the habitat of many threatened species, including the Endangered Mountain Tapir, by expanding the Tapichalaca reserve. https://this-is-my-earth.org/habitat/tapichalaca-reserve-ecuador/

and get acquainted with the El Toro forest nature reserve which is a habitat of endemic and critically endangered species: the Peruvian yellow-tailed wooly monkey.https://this-is-my-earth.org/success-story/180

Things you'll need:

- Internet connection, a projector
- 'Parts' - Pine cones, toilet paper rolls, bottle caps, small branches, leaves, re-used paper snippets in different sizes, crayons/colored pencils/markers, glue.

*** The definition** of biological species gets complex when thinking of species with asexual reproduction or such that can transfer DNA directly. Also, in some cases, two species can have fertile offspring. This issue is under active discussion in the scientific community (e.g. https://education.nationalgeographic.org/resource/species). The physical resemblance may also be tricky as many times there are marked differences within the same species - i.e. male vs female, young vs adult (think caterpillar and butterfly), etc.

TIME lesson #2: Ecological corridors and Stepping Stones.

Lesson goal: Getting acquainted with more ecological terms.

Terms:

1. **Ecological stepping stones -** An array of small, disconnected areas- natural vegetation 'islands' spread out within unnatural areas. These islands form 'stepping stones'- Animals and plants can move in "jumps" between the spots and thus pass between two habitats.
2. **Ecological corridor-** A continuous strip of open areas that connects natural areas in different locations - including areas with protected status.

Lesson plan:

Opening: 2-3 min. A reminder of the terms we learned last lesson: Biological species, Endemic species, Species diversity, and Biodiversity hotspots.

Game: 3 sticks. OR 'the floor is Lava'

Outside, split the class into 2 groups. Each group should have 3 long sticks [preferably such that won't roll around if stepped on].

For each group lay out 3 sticks in a row, one after the other: I I I

The game instructions:

Starting with a small distance between the sticks, every participant needs to pass perpendicular over the three sticks, making sure to step ONLY ONCE between every two sticks, and taking care not to step on or touch the sticks. The sticks represent ecological stepping stones.

Once everybody got a try crossing - lengthen the distance between the sticks and repeat.

When you've found a distance that is challenging, yet manageable for most of the group - take away the middle stick, leaving a large distance between the two remaining sticks.

Can anyone succeed in clearing over the two sticks with one step? (Alternatively use baseball bases or anything that can be stepped on/over.)

Back in the class:

Explain the terms.

- Ecological corridor: an open, natural space that continues and connects two or more protected areas and is used for the passage of animals and plants.
- Stepping stones: small natural/protected areas within a larger unnatural/unprotected area: islands of natural habitat. Depending on distance etc species can 'jump' from island to island and pass through a largely uninhabitable area.

Now let's understand what we demonstrated outside: we had an ecological corridor that was made up of stepping stones that were close together and pretty easy to maneuver. Slowly, the distance between each stepping stone grew- and when one stepping stone disappeared completely [because of a new highway, a settlement, etc.] it was impossible for most of the species to jump from one stone to the other!

Videos about Corridors and Stepping Stones (English Language)

Northern Cascades to Rocky Mountains
https://conservationnw.org/cascades-to-rockies-wildlife-corridor/

Oregon Wildlife Corridor Highway 97 video
https://oregonwild.org/about/blog/wild-and-scenic-wildlife-corridors

Oregon Gilchrist Wildlife Underpass
https://www.myowf.org/gilchristcrossing

Edmonton, Canada Stepping Stones for Wildlife
https://youtu.be/RjxTLZNNHaY

Scotland Bee Hotel (26 seconds showing bees "check in" to this stepping stone.
https://www.nature.scot/scotlands-biodiversity/helping-scotlands-pollinators/pollinators-get-busy-get-involved

Wildlife Migration Corridors and Stepping Stones

Inside Israel are a few important stepping stones. An example is Hula Lake, which was and still is a critical resting and feeding spot for all migrating birds- the last chance to do so before going on to cross the Sahara desert on their way to African from Europe.

The Hula lake in Israel has a story- it was dried in the 50s and is currently undergoing a long rehabilitation process.

Videos to show the class:

500 Million Birds in Hula Valley. Unbelievable!

BIrd migration above Israel

The Hula lake as a stepping stone in Israel [10 min in Hebrew]: זן נדיר - עופות נודדים (Rare species)

After the Game: After finishing the game, open TiME's website and look at Sun Angel's garden in Peru: take the time to point out the light green area, that TiME has protected in order to ensure an *ecological corridor*.

In conclusion: discuss the importance of purchasing and protecting Ecological corridors is .sometimes more important than other natural areas, and emphasizing why it's so important to avoid development in areas that serve as stepping stones.

Things you'll need:

- Internet connection, a projector
- 6 longish, thickish, twigs/branches
- OR paper/cardboard/rubber pieces to play 'the floor is lava'.

TIME lesson #3: Adaptation and compatibility to Habitat

Lesson goal: Getting acquainted with even more ecological terms.

Terms:

1. **Compliance of a species with the Habitat-**
2. **Ecological Niche-** a habitat with specific conditions that allow specific species to live in it. Abiotic conditions- non-living resources and conditions (temperature, humidity, precipitation, etc.) and Biotic conditions- Other living organisms that shape the environment.
3. **Keystone species-** an organism that helps define and shape an entire ecosystem and without it it would be different.

Lesson plan:

Opening: 2-3 min. A reminder of the terms we've previously learned: Biological species, Endemic species, species diversity, biodiversity hotspots, ecological corridors and ecological stepping stones.

Game: Hunting for Food.

Divide the class into groups of 3 and give each member a different utensil.

Hand each group a plate with 20 types of 'food' and time them: everyone has 30 seconds [time length optional] to 'hunt'- take- as much food as they can, using ONLY the utensil they have in their hand.

Repeat 3 times:

- At the end of every time, ask the students to write down how much and which foods they succeeded in gathering, and with which utensil.
- Every time, switch the utensils around so everybody tries everything.

Summarize all results in a table on the board - 'food' type, utensil, and pieces collected.

Discuss the difference and the suitability of each utensil to the specific 'food' properties (softness/hardness, size, etc).

Talk about it: what differences did you see? Which utensils were good for which food types?

You have demonstrated 'biological adaptation': every species hunts and eats food that they are built to hunt and eat.

Show a movie describing the discovery of Darwin's finches and their beaks. For example https://www.nhm.ac.uk/schools/teaching-resources/galapagos-finches-show-beak-differences.html (You can also use TiME's website to look at the connection between the Compliance of a species with the habitat and Endemic Species.)

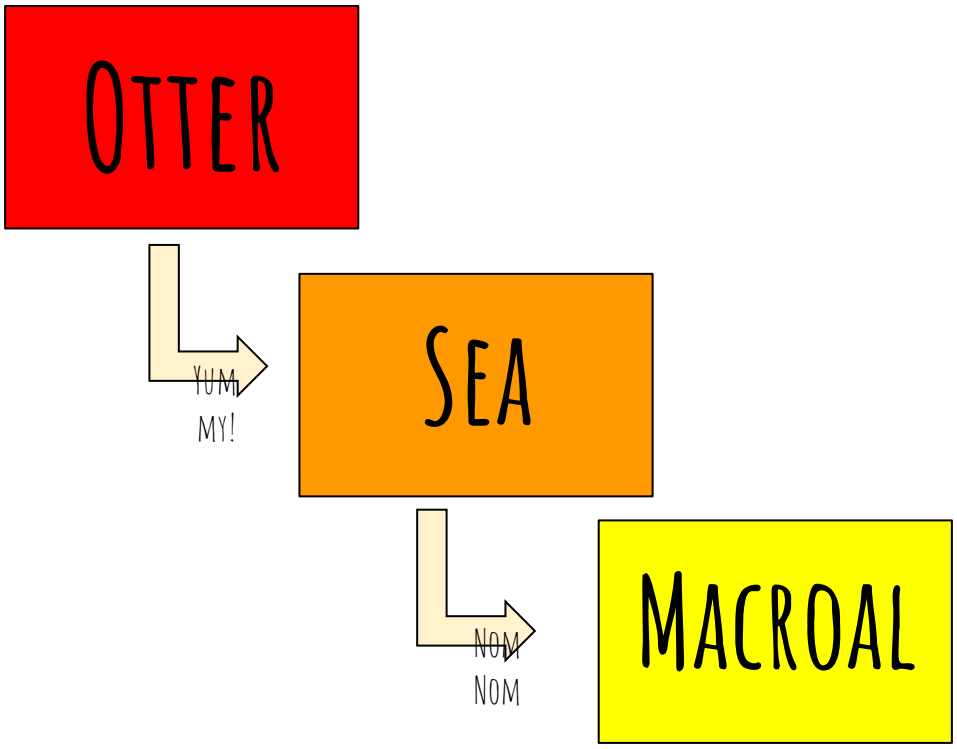
Moving on to understand Key Species, let's talk about Sea Otters! Short introductory film: https://www.youtube.com/watch?v=_pFzgHTjuGQ

Otters are a great example of a Key Species. Hunters are after them for their pelts, and as the number of Otters dwindle down change is caused in the Marine Ecosystem:

Less Otters —- less predators for the Sea Urchins. More Sea Urchins —- Less macroalgae. Dwindling of Macroalgae —-Dwindling of Kelp forest, which serves as a source of food and a habitat for many, many species.

When the Otters no longer keep the Sea Urchins 'in line', a whole habitat is lost and with it the fish, Invertebrates and other species that depend on it. Don't be surprised- even humans feel the loss, as we eat a lot of these fish!!

A film about Otters as a key species: https://www.britannica.com/video/162778/keystone-species-parts-coast-kelp-forest-ecosystem



In conclusion:

After we've explained the term- and the Importance- of Key Species, we can turn to TiMEs website to the nature reserve Turneffe Atoll in Belize: we can see the different species- and Key Species- that the nature reserve is their habitat. Have a discussion about how TiME chooses which habitats to purchase: Natural spaces that are habitats to Endemic and Key species. Purchasing and saving such ecosystems in turn saves lots of different species!

https://this-is-my-earth.org/success-story/turneffe-atoll-belize

Things you'll need:

- Utensils [as the number of participants.] Reusable: (dull) spreading knives, forks and (tea/table) spoons.
- Food items: cucumber and carrot slices, bread pieces, marshmallows, toffee, chocolate cubes, etc - 20 pieces per group (3 students per group). *If food is undesirable other things can be used - lego bricks, sponge pieces, etc, but try to get diversity of softness etc.*
- Internet connection, a projector.

TiME lesson #4: Vulnerable, Endangered, and Critically Endangered species

Lesson goal: Bringing it closer to home, making it 'personal'.

Terms:

1. **Vulnerable Species-** In the next 10 years, a decrease of 30% of the species is expected.
2. **Endangered Species-** In the next 10 years, a decrease of 50% of the species is expected.
3. **Critically Endangered Species-** In the next 10 years, a decrease of 80% of the species is expected.

Lesson plan:

Lesson opening: 2-3 min. A reminder of the terms we've previously learned: Biological species, Endemic species, species diversity, biodiversity hotspots, ecological corridors and ecological stepping stones, Compliance of a species with the Habitat, Ecological Niche, Keystone species.

Watch the first part of "There's a Rang Tan in my bedroom" (up until the kid tell the orangutang to leave, time 0:22)

https://www.youtube.com/watch?v=zyOAKLC7fPc?&start=0&end=22

Discuss:

Why is the kid kicking the orangutan out of her room?

What product in the girl's room is the orangutan mostly mad at?

Watch the rest of "There's a Rang Tan in my bedroom", until the end.

Discuss:

Why is the orangutan in the girl's room?

What happened to the orangutan habitat? What are his needs?

What would you tell her to do?

Teach the terms:

Vulnerable Species- In the next 10 years, there is expected a decrease of 30% of the species.

Endangered Species- In the next 10 years, there is expected a decrease of 50% of the species.

Critically Endangered Species- In the next 10 years, there is expected a decrease of 80% of the species.

Open TiMEs website [Together in front of the class, personally or in small groups.]

Explain a little bit of the work TiME does, and then ask the class to search the website:

Which species are we trying to help? Under which category do they fall?

Introduce the class to the first research assignment [Appendix #1].

Things you'll need:

- Internet connection, a projector.
- Personal computers [recommended].

TiME lesson #5-#7: Research Assignment.

Lesson Goal: Independent Research

Lesson plan:

Lesson opening: A quick reminder of how to open and work with TiMEs website, A quick reminder of the Research assignment explained last lesson [Appendix #1].

Divide the class into research groups [2-3 in a group] and assign each group one of the territories found on TiME's website.

In the next 3 lessons, the groups will work on the assignment.

Things you'll need:

- A computer for every group
- Internet connection
- Pages/notebooks and pens
- A copy of the assignment for every group.

TiME lesson #8: Involvement.

This part of the lesson plan is absolutely optional but very much recommended in order to assist TiME in inspiring students to exercise and strengthen values for democracy and equality.

There are a couple of options, and of course you can even arrange a special event and invite the school/parents/community to participate!

Class vote.

After the students have explained their reasoning before the class hold a class vote as to which territory they choose to support.

An exciting option is to bring guests to the debate and voting event! [Appendix #2]

Personal vote.

Voting through the website is made possible immediately after donating money [a minimum of 1 dollar], so if you'd like for each kid to vote independently- you'll have to first collect the money and donate through a credit card- for each vote, a separate donation. [the schools/parents/parents committee credit card].

The money can be collected through a class activity- bottle collection, car wash, food fair, second hand sale, etc. You can also decide to just ask each parent to donate in their childs name ahead of time, or bring in the sum you've decided each student will donate.

Don't miss out: refreshing TiMEs website as the vote proceeds will show how every vote influences the amount that every territory has collected.

Every vote, no matter the sum of the donation, holds the same weight as the rest. In this way the money that each territory has collected is changed as the votes come in [more donations = more money to share, more votes = a territory will get a bigger part of the funds].

Important reminder:

100% of the donations are designated for the purchasing of the territories shown on TiME website!

Appendix #1: Research project!

1. **Basic information:**

- Which territory are you researching?
- On which continent is this territory?
- In which country is this territory? What language do they speak there?
- How much does this territory cost?

2. **Biome Challenge.**

- Find out what a Biome is? With a google search you can find a cool map of all the biomes on earth: every one of them coloured in a different color.
- In which Biome is your territory located? [You can use google maps to find the specific location, then coordinate that with the Biome map..]

3. **Sizing up your territory:**

- What size- in acres- is the territory? [*TiME's website measures in hectors].
- How much is an acre?
- How big is your classroom, in Square meters? And in Acres?
- How big is your school, in Square meters? And in Acres?
- How much does every acre of this territory cost?

4. **Researching your territory:**

- What is the definition of **Vulnerable species** [VU]**?**
- What is the definition of **Endangered species** [EN]**?**
- What is the definition of **Critically endangered species** [CR]**?**
- What is the difference between **Vulnerable, Endangered** and **Critically endangered** species?
- Find an example of a species that is critically endangered in your country. Why is it in such danger? What happened?
- If we don't notice and help preserve critically endangered species- they will go extinct. Find an example of a species that has gone extinct in your country.

Fill out a chart: which vulnerable, endangered and critically endangered species are living in the territory that you're researching?

Vulnerable species [VU]	**Endangered species** [EN]	**Critically endangered species** [CR]

- What's the definition for **Endemic Species**? Which endemic species reside in your territory?

5. **Talk amongst your group** and come up with some compelling arguments:

- Is the territory you're researching worth saving, more than the others?
- What's special about the territory you're researching?
- What are the problems threatening the territory?

Unite the information you've acquired in a short [no longer than 5 minutes] slideshow, and fill in the most important info in a table on the class whiteboard.

Appendix #2: Presenting an Argument

This provides students an opportunity to sway public opinion! As there are 3 options on TiME's website, three groups will present to classmates to persuade them to support their assigned hotspot. Groups that have researched the same territory can pool their findings and present arguments together.]

Presentation Guidelines:

1. Each group has 5 minutes to present their argument.
1. Presenters get a reminder as he/she begins the last minute of the argument.
2. Questions may be asked only after 1 minute has passed, and before the last 1 minute begins.

Subjects the presenters should address:

- Present your territory, briefly
- Present the need to purchase and save this territory
- Present your strong, main arguments that explain why the hotspot is most important?

* The group can be creative with slideshows and other auxiliary materials.

Tips for the presenters:

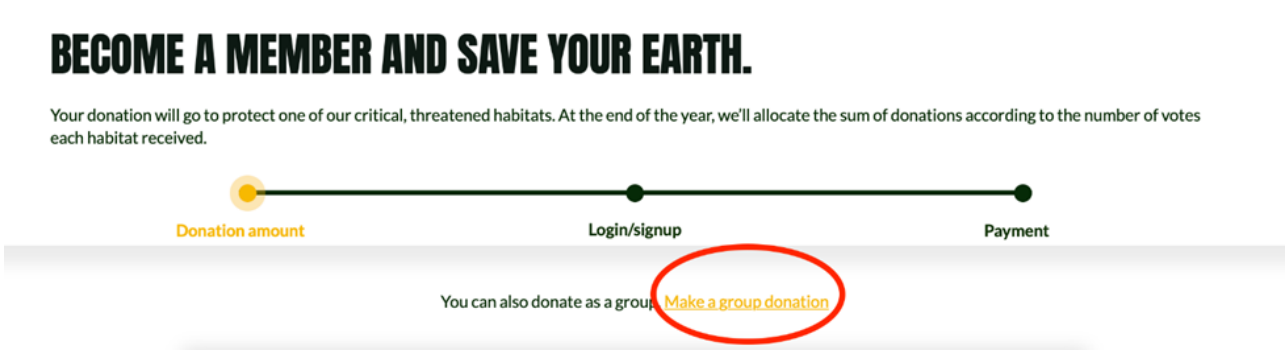
1. Stay calm, speak slowly and with confidence! You've got this :]
2. Remember you're representing only your reserve: focus the audience on it and its importance.
3. Cue cards may help you but try not to focus solely on them. Engage eye contact with your audience.

Appendix #3: Register your students to TiME's website.

This process is so that every student can vote individually on the website!

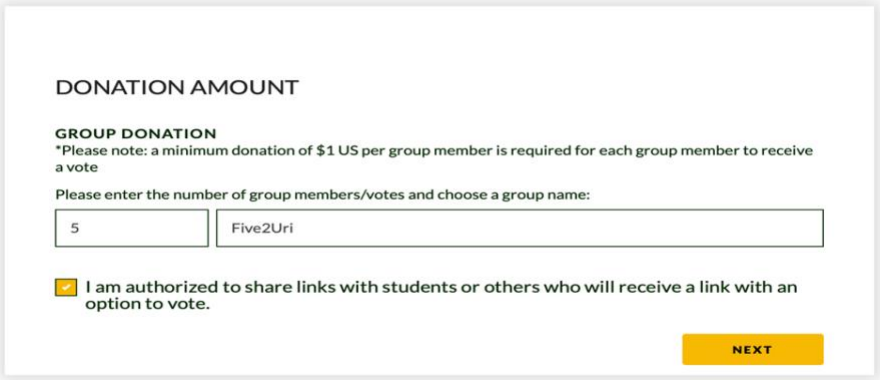
#1. At the websites main page choose 'donate'.

#2. At the bottom of the next page choose 'Make a group donation'



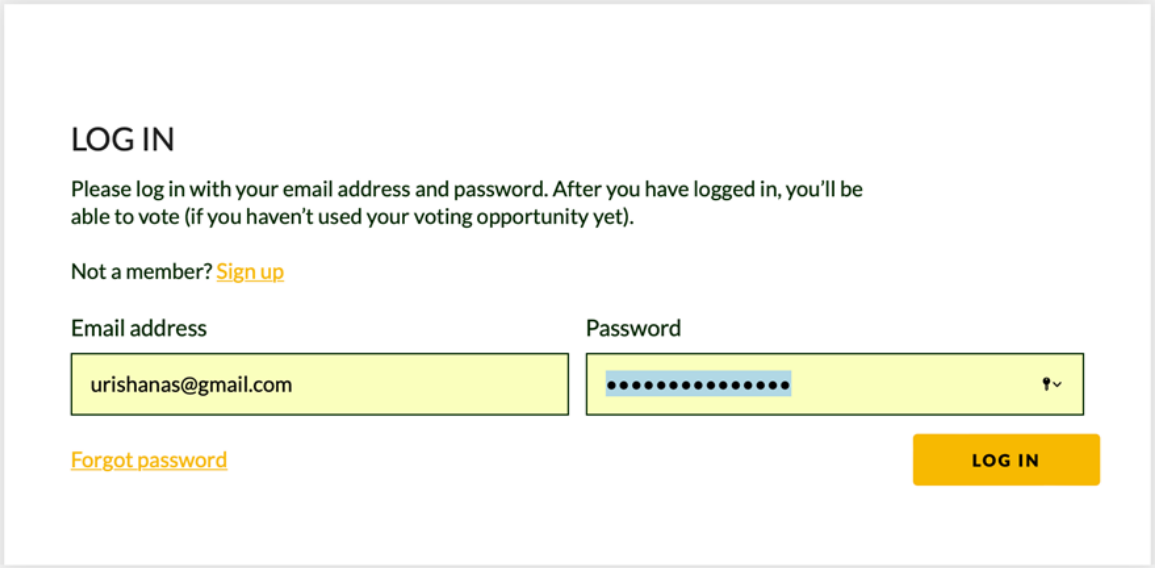
#3. Fill in some info:

You'll be asked to name the group, put in the number of members [the number of votes your donation will receive] and confirm that you have permission to share the link with your group.



#4. More info: fill in the sum your donating [minimum- a dollar for a student] and confirm that the donation is on behalf of your school or institution.

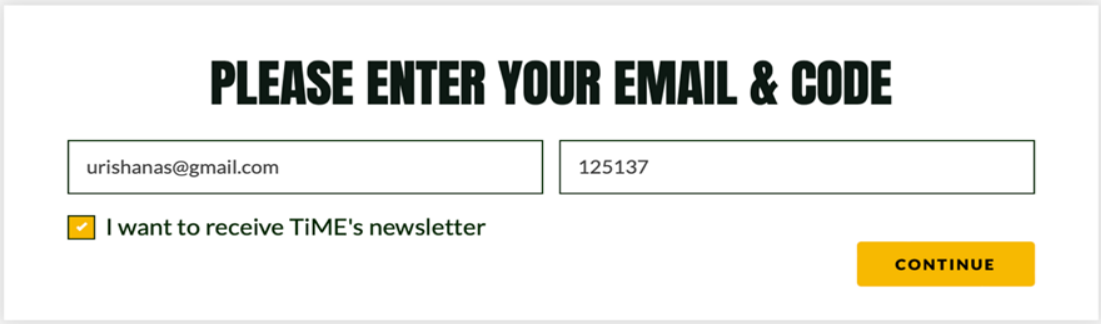
#5. Log in again. Sign up, or if you have an account- just log in!



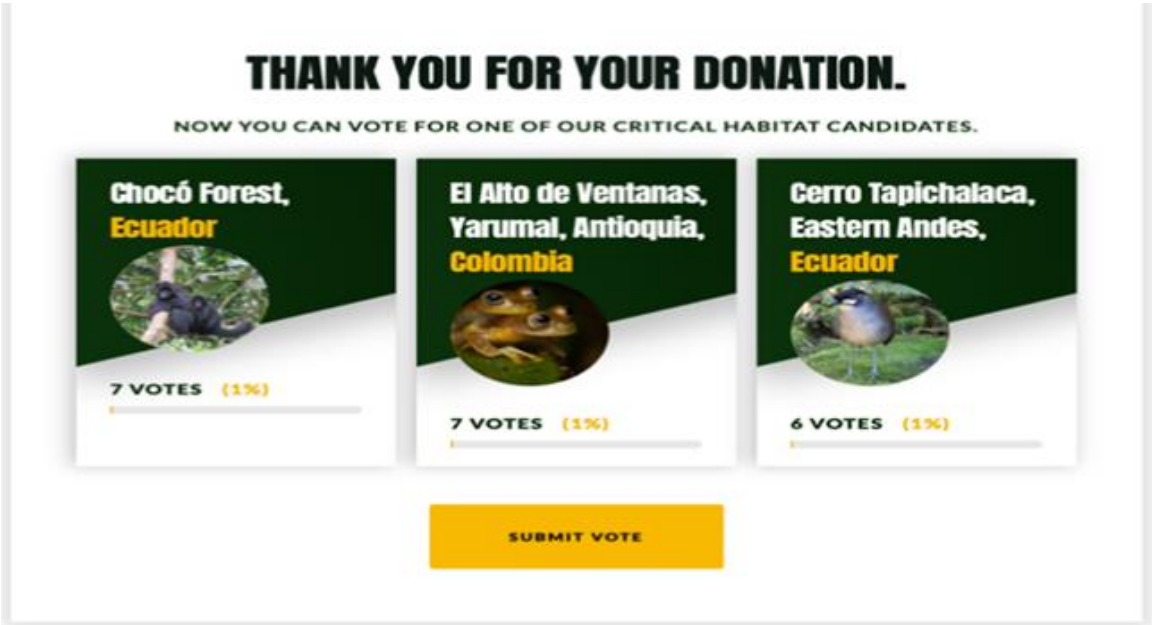
#6. Payment Info.

#7. Confirmation. On the screen you will see a confirmation of your donation, a voting link and a group code [remember the code!] send the link to all the voters in your group!

#8. Students enter the website, they must sign up using an email they have access to- and also enter the code.



#9. Vote! Proceed to the voting screen, each student is free to cast his or her own vote! You will see the tally on the screen as the votes come in.



Appendix #4 - Copyright and contact details

The booklet was prepared voluntarily by TiME's education team.

Contact: time@this-is-my-earth.org

The international volunteer organization TiME (this-is-my-earth.org) acquires and preserves important natural areas in the world, with the help of mass mobilization and a transparent, democratic and egalitarian model allowing every citizen on Earth to be an active partner in nature conservation. The organization's activities are based on volunteers from all over the world so that 100% of the membership fees (one dollar only) and donations will be used to purchase and maintain land and prevent carbon emissions