2019 Global Teacher Seminar- Global Environmental Issues: The Problems, Solutions and Potential Outcomes
Global Environmental Issues Lesson Plan
Leslie Bradley
Triad High School
10th Grade Biology
Ecology Unit

<u>Ohio State Learning Standards, Biology:</u>
Diversity and Interdependence of Life
B.DI.1 Biodiversity (genetic and species biodiversity)
B.DI.2 Ecosystems (equilibrium and disequilibrium, carrying capacity)
B.DI.3 Loss of Diversity (climate change, anthropocene/human effects, extinction, invasive species)

This lesson follows the 5E method of lesson design often used in science teaching. (5E= engage, explore, explain, extend, evaluate)

Duration=(Based on one class period being approximately 50-55 minutes in length) 2-3 weeks

Materials= computers with access to Google docs and slides and the internet, student whiteboards and markers, teacher whiteboard/smartboard display

ENGAGE (1 class period)

Ask students to brainstorm with a partner and write down on whiteboards 5 global environmental issues that they feel are the most important. After about 5 minutes, call on groups to share the issues, the teacher can make a list (and SAVE it!) on the front board or "smartboard." Students can also give reasons for their choices.

Next, show a video such as "Global Issues for Students," ~26 minutes, https://www.youtube.com/watch?v=EVyXjxLceBg, OR "10 Major Current Environmental Problems," ~6 minutes, https://www.youtube.com/watch?v=A0pB1qw8SMs. After the video(s), refer back to the class list of environmental issues and see how many were chosen compared to the video and/or which ones were added, excluded, etc.

Transition into introducing the upcoming project below and placing students in groups of 4. Verbal and written instructions can be given to students along with grading rubrics.

EXPLORE (3-4 days)

Students will be placed in groups of 4 (teacher or student selected). Each group will be assigned a region of the globe (East Asia, Middle East, Latin America/Amazon, Africa, and/or Northern Eurasia/Arctic) to **explore** the geographical landscape, climate, and the environmental issues affecting each region. Students will work independently and collaboratively to research the following issues: 1. geography and climate, 2. At least 2 flora and 2 fauna that are threatened and/or endangered AND include at least one invasive species, 3. statistics on biodiversity and the loss of biodiversity, 4. human impact and

environmental issues that may or may not have solutions. (Students and/or teacher can divide the topics evenly or add/eliminate any if necessary based on the number of students in each group/class). Students will put information into a shared Google doc file. The teacher might need to do mini-meetings with each group to guide research and give direct instruction on the different countries/regions if necessary.

EXPLAIN (1 class period)

The teacher will give instructions on the "jigsaw" teaching method. Students will then participate in this sharing opportunity with other students for approximately 25-30 minutes. The jigsaw method will require each student from each Country/region to be placed in another group with students who are researching similar topics (example: all students researching endangered and invasive species from Asia, Africa, Arctic, and the Amazon will form a group together and share their research.) Students will take turns speaking and sharing their research and they will become content experts on their country/region. This method will also help generate new ideas/questions to research.

After students participate in the jigsaw method, students can return to their "home" group and reflect on their own research and adjust their research in any way necessary.

A 3-2-1 "Exit Slip" can then be administered or have students write down 3 things they learned, 2 things that they still need to research, and 1 question that they might have and turn into the teacher.

*The jigsaw method could be used more than once if different topics need to be shared to guide learning and further research. This could cover more than one class period as needed.

EXTEND (3-5 class periods)

2-3 class periods: Students will conduct a schoolyard biodiversity study and calculate the level of biodiversity for this ecosystem. Students will need at least one class period to explore outside in the schoolyard to collect data. The next class day, students can use the Simpson's Diversity Index to calculate the schoolyard biodiversity. Students will then compare/contrast their findings to the findings of the country/region that their group is researching. Students can develop a plan on how to increase and/or equalize the diversity in the schoolyard ecosystem.

1-2 class periods: Students will calculate their own Ecological Footprint using an online resource such as…….

EVALUATE (2-3 class periods to prepare presentation, 1 class period to present to class)

As a group, students will share and prepare a Google Slide presentation of their research (at least 15 slides). The presentations will involve all students within the group developing at least 3 slides and speak on their research. Presentations can be up to 10 minutes in length and should include summarized information, pictures of geography, statistical charts and graphs, pictures of artifacts, pictures of species, etc. Students will present to the class on a designated date. All audience members will fill out the "Presentation Audience Sheet" while listening to each presentation to show learning and understanding.

Resources: