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About *Journeys in Film*

Founded in 2003, *Journeys in Film* operates on the belief that teaching with film has the power to prepare students to live and work more successfully in the 21st century as informed and globally competent citizens. Its core mission is to advance global understanding among youth through the combination of age-appropriate films from around the world, interdisciplinary classroom materials coordinated with the films, and teachers' professional-development offerings. This comprehensive curriculum model promotes widespread use of film as a window to the world to help students to mitigate existing attitudes of cultural bias, cultivate empathy, develop a richer understanding of global issues, and prepare for effective participation in an increasingly interdependent world. Our standards-based lesson plans support various learning styles, promote literacy, transport students around the globe, and foster learning that meets core academic objectives.

Selected films act as springboards for lesson plans in subjects ranging from math, science, language arts, and social studies to other topics that have become critical for students, including environmental sustainability, poverty and hunger, global health, diversity, and immigration. Prominent educators on our team consult with filmmakers and cultural specialists in the development of curriculum guides, each one dedicated to an in-depth exploration of the culture and issues depicted in a specific film. The guides merge effectively into teachers' existing lesson plans and mandated curricular requirements, providing teachers with an innovative way to fulfill their school districts' standards-based goals.

Why use this program?

To be prepared to participate in tomorrow's global arena, students need to gain an understanding of the world beyond their own borders. *Journeys in Film* offers innovative and engaging tools to explore other cultures and social issues, beyond the often negative images seen in print, television, and film.

For today's media-centric youth, film is an appropriate and effective teaching tool. *Journeys in Film* has carefully selected quality films that tell the stories of young people living in locations that may otherwise never be experienced by your students. Students travel through these characters and their stories: They drink tea with an Iranian family in *Children of Heaven*, play soccer in a Tibetan monastery in *The Cup*, find themselves in the conflict between urban grandson and rural grandmother in South Korea in *The Way Home*, watch the ways modernity challenges Maori traditions in New Zealand in *Whale Rider*, tour an African school with a Nobel Prize-winning teenager in *He Named Me Malala*, or experience the transformative power of music in *The Music of Strangers: Yo-Yo Ma & the Silk Road Ensemble*.

In addition to our ongoing development of teaching guides for culturally sensitive foreign films, *Journeys in Film* brings outstanding documentary films to the classroom. We have identified exceptional narrative and documentary films that teach about a broad range of social issues in real-life settings such as famine-stricken and war-torn Somalia, a maximum-security prison in Alabama, and a World War II concentration camp near Prague. *Journeys in Film* guides help teachers integrate these films into their classrooms, examining complex issues, encouraging students to be active rather than passive viewers, and maximizing the power of film to enhance critical thinking skills and to meet the Common Core Standards.

Journeys in Film is a 501(c)(3) nonprofit organization.

A Letter from Chiwetel Ejiofor



I hope you enjoyed watching the film *The Boy Who Harnessed the Wind*.

William's story embodies the creativity of young people and acts as a powerful reminder of the achievements we can make when we are not afraid of failure. He encountered many obstacles, but his determination to get an education and unstoppable drive to do what he believed in will act, I hope, as an inspiration to you in this course.

This film tells the true story of a family in Malawi and the difficulties they faced; external factors like the weather, environment, politics, religion, and education have a profound effect on the daily life of many Malawians. I hope this film and the course spark a much wider discussion and action to engage with some of the issues that the film touches on.

William's story continues to inspire the next generation of innovators in Africa and around the world. I hope that watching *The Boy Who Harnessed the Wind* and the curriculum help to inspire you to never give up on your dreams.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Chiwetel Ejiofor'.

The Environmental Crisis

Enduring Understandings

- Natural systems are interdependent.
- Humans depend on Earth’s resources.
- The actions of humans impact the health of the environment.
- Climate change influences regional geography.
- Climate change impacts human communities.
- Climate-related environmental problems change over time.
- Risks to environmental and human health can be managed and reduced.
- A healthy, equitable, and sustainable future for human communities on Earth is possible.

Essential Questions

- What is “geography”?
- How do the climate-related movements of water affect the geography of a region?
- Why is it important to learn about climate change?
- How does the geography of a region impact the human communities of that region?
- How do the human communities of a region impact its geography?

- What is “desertification”?
- How is desertification related to climate change?
- What evidence of climate change is unique to sub-Saharan Africa?
- How does flood and drought cycling from climate change impact human communities in Africa?
- How does climate change affect the health and standard of living in African communities?
- Who is responsible for climate-related environmental justice in human communities?
- How can scientific research be used to study climate change?
- What types of scientific data are currently used to characterize climate change?
- How do scientists use data to make long-term climate forecasts?
- How will the earth’s climate patterns continue to change in the future?

Notes to the Teacher

For most American students, the East African terrain between Egypt and South Africa is a mystery. In this lesson students learn about the geography of the landlocked sub-Saharan country of Malawi and its sub-tropical climate with rainy and dry seasons. The alternation of droughts and floods, which creates food shortages despite the government's promise of access to nutritionally adequate food, means that approximately two-thirds of the people experience hunger during the year. While using Malawi as a case study, the lesson also points to the additional threat of drought in much of Africa due to climate change. Prior to the lesson students should view *The Boy Who Harnessed the Wind*; alternatively, if you are using the lesson to introduce the film, show a selection of clips from the film that focus on climate.

The activities in this lesson have been designed for use as individual modules or tiered instruction with each new lesson component building upon the last. A review of the activities prior to delivery is highly suggested to best determine the class time needed for each one and appropriately plan for materials acquisition. While the suggested lesson duration is between three and five one-hour periods, the activities can easily be modified based on time available or the place in the course curriculum where the lesson can best be integrated. The components for this lesson collectively explore the relationship between human communities and shifting climate trends in Africa and elsewhere on our planet.

This lesson assumes students have some background on the fundamentals of weather and climate, the water cycle, and climate change. The following videos are great resources in the event review material is needed:

Weather and Climate:

https://www.youtube.com/watch?v=cBdxDFpDp_k

Water Cycle:

<https://pmm.nasa.gov/education/videos/tour-water-cycle>

Climate Change:

<https://www.climaterealityproject.org/climate-101>

Please note that all suggested video links in this lesson can be projected for students as a group or shared with students for use on individual devices, depending on the classroom technology available. Students should also be familiar with introductory coordinate-system (x-/y-axis) graphing/graph analysis.

Part 1 of this lesson investigates the complex role of human communities as part of the geography of the sub-Saharan region, casting a unique spotlight on the climate-related factors which can influence this positioning. A full set of copies of **HANDOUT 1: MALAWI: SENSING PLACE** and **HANDOUT 2: 30-MINUTE PH.D.** should be made for each class. It should be noted that devices with Internet access are needed for this portion of the lesson. In addition, the research component of **HANDOUT 2: 30-MINUTE PH.D.** can be completed in class or assigned as homework ahead of Part 2 of the lesson.

In Part 2 of this lesson, students explore the influence of flood and drought cycling from shifting climate trends on the human experience in the communities of Malawi. They begin thinking about the unique impact of climate-related changes on human health and standards of living through the lens

Lesson (ENVIRONMENTAL SCIENCE)

of equity across the African continent. Copies of **HANDOUT 3: A DAY IN THE LIFE** and **HANDOUT 4: NO TWO COUNTRIES THE SAME** should be made for each class for this part of the lesson. It should also be noted that the images from **HANDOUT 3: A DAY IN THE LIFE** can either be printed and distributed to individual groups or simply shared with the class depending on the classroom technology available.

Furthermore, the activity components which accompany **HANDOUT 3** and **HANDOUT 4** can be completed in class or assigned as homework depending on the amount of time available. It is also important to note that Internet access is needed for use on **HANDOUT 4**.

Part 3 introduces students to the concept of scientific modeling as well as the data reporting involved in climate forecasting in Africa and worldwide. This portion of the lesson requires a class set of **HANDOUT 5: AND THE DATA SUGGEST?** and individual device access to the Internet. Please note that the duration of this activity can vary as a function of class and/or curriculum time available.

COMMON CORE STANDARDS ADDRESSED BY THIS LESSON

History/Social Studies

CCSS.ELA-LITERACY.RH.9-10.1

Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.

CCSS.ELA-LITERACY.RH.9-10.2

Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.

CCSS.ELA-LITERACY.RH.9-10.3

Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.

CCSS.ELA-LITERACY.RH.9-10.4

Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science.

CCSS.ELA-LITERACY.RH.9-10.5

Analyze how a text uses structure to emphasize key points or advance an explanation or analysis.

CCSS.ELA-LITERACY.RH.9-10.7

Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.

CCSS.ELA-LITERACY.RH.9-10.9

Compare and contrast treatments of the same topic in several primary and secondary sources.

Science and Technical Subjects

CCSS.ELA-LITERACY.RST.9-10.1

Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

CCSS.ELA-LITERACY.RST.9-10.2

Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.

CCSS.ELA-LITERACY.RST.9-10.4

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.

CCSS.ELA-LITERACY.RST.9-10.5

Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).

CCSS.ELA-LITERACY.RST.9-10.7

Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

CCSS.ELA-LITERACY.RST.9-10.8

Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.

CCSS.ELA-LITERACY.RST.9-10.9

Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

Writing

CCSS.ELA-LITERACY.WHST.9-10.6

Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

CCSS.ELA-LITERACY.WHST.9-10.7

Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

CCSS.ELA-LITERACY.WHST.9-10.8

Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

CCSS.ELA-LITERACY.WHST.9-10.9

Draw evidence from informational texts to support analysis, reflection, and research.

Duration of Lesson

Three to five one-hour periods

Assessments

Completion of the *Malawi: Sensing Place* map analysis

Completion of the *30-Minute Ph.D.* research activity

Completion of the *A Day in the Life* visual analysis activity

Completion of the *No Two Countries the Same* analysis activity

Completion of the *And the Data Suggest?* data analysis activity

Group discussion

Student presentations

Materials

Writing utensils

Blank index cards

Blank paper

White board

White board markers

Presentation Devices with Internet access

Individual devices with Internet access (if available)

Colored pencils

Markers

HANDOUT 1: MALAWI: SENSING PLACE HANDOUT 2:

30-MINUTE PH.D.

HANDOUT 3: A DAY IN THE LIFE

HANDOUT 4: NO TWO COUNTRIES THE SAME

HANDOUT 5: AND THE DATA SUGGEST?

Access to Bill Nye video at <https://www.climaterealityproject.org/climate-101>

Procedure

Part 1: Malawi: Portrait of a Place

1. Begin by distributing the index cards and writing utensils to the class (one index card per student). Ask the students to write (1) the word “geography” on one side of the index card and (2) their best definition of the term on the same side. Allow the students to work independently.
2. When a few minutes have passed, ask the students to exchange their index cards with a partner. Invite a few students to share the definition on the card they received. Then read aloud a definition of the term from the Oxford English Dictionary; it can be found at <https://www.lexico.com/en/definition/geography>.
3. Host a brief discussion with the class using the following questions as prompts.
 - How does the definition of “geography” on your index card compare with the official one from the Oxford English Dictionary? Please explain.
 - What elements of the formal definition of “geography” are missing from the one on your index card? (An example here might be the relationship between human activity and Earth’s features).
 - How would you describe the geography of your own region?
 - Consider the film *The Boy Who Harnessed the Wind*. How would you describe the geography of Malawi? What evidence do you remember from the film?
4. On the board, draw two columns titled “Similar” and “Different.” Ask the students to think about the similarities and differences between the geography in their own region and in Malawi. Invite students to come to the board and add their thoughts to each column. Ask the students what they think is the biggest difference in geography between their region and Malawi. Host a brief discussion using the students’ responses as a framework for the conversation.
5. Tell the students they will have the opportunity to learn a little more about the geography of Malawi. Divide the class into groups of 2–3 students. Distribute copies of **HANDOUT 1: MALAWI: SENSING PLACE** to each group. Read the instructions out loud and allow approximately 20 minutes (more or less, as time permits) for students to complete the handout. NOTE: For this activity, students should have access to the Internet and/or other print resources such as journals or newspapers. When groups are finished, review their responses to each prompt in the form of a short discussion.

Suggested responses for **HANDOUT 1**:

- A. Answers to the first part of this question will vary depending on where this lesson is taught. Malawi is a landlocked country located in southeastern Africa.

B.



- C. The southern border of the Sahara Desert does not appear on this map. Malawi is approximately 4000 km from the Sahara Desert.
- D. Sub-Saharan countries are African countries which are located to the south of the Sahara Desert. Sub-Saharan countries have climate and weather trends which are related, but not the same as Saharan countries.
- E. The climate of Malawi is semi-arid (dry) due to its location just south of the equator. Weather patterns in the country demonstrate strong seasonal variability, however. A hot and humid rainy season ranges from November to April. The country is dry and cool the remainder of the year.
- F. Answers to this question may vary. According to the United Nations, Malawi is experiencing one of the highest rates of desertification in the world. The number of people who inhabit degraded land increases dramatically on a yearly basis. These trends are the strongest in rural communities, where non-sustainable agricultural practices, high rates of deforestation, and soil erosion from highly-variable climate patterns are most prevalent.
- G. Answers to this question may vary, but should include heavy seasonal rain, increased seasonal flooding, extremely dry conditions, increased soil erosion from heavy rains, extended drought conditions, poor crop production, reduced vegetation, reduced water availability.
6. Ask the students to consider the shifts in climate they discussed in their answers to Question 7 from **HANDOUT 1: MALAWI: SENSING PLACE**. Ask them to think about the impacts these changes might have on human communities

in Malawi. Invite several students to share their thoughts with the class and host a brief discussion. The following questions may be helpful to guide the conversation.

- How might shifts in climate impact human communities in Malawi?
- What do you think people in this region need the most in terms of their challenges with climate-related lifestyle shifts?
- What groups of people do you think are affected most by climate-related changes in this region?

7. Explain to the students they will have the chance to examine the geography of Malawi in a bit more depth through the lens of human communities. Divide the class into small groups. Distribute a copy of **HANDOUT 2: 30-MINUTE PH.D.** to each student and assign each group a number from 1 to 5. The group numbers correspond to the numbered prompts on the handout. Read the instructions out loud and allow students time to complete the assignment. Student presentations at the end of this activity should be informal and no longer than 3–4 minutes. NOTE: This activity can be completed using 30–45 minutes of in-class time or can be assigned as homework for the next class; access to the Internet is necessary. If your students have difficulty finding articles or you wish to save time, here are a few articles you can suggest to them:

Prompt 1

Why climate scientists predict even bigger hurricanes are coming to our coasts

<https://qz.com/africa/1580662/cyclone-idai-shows-more-devastating-hurricanes-coming-to-coasts/>

UNICEF Malawi humanitarian situation report—flood situation report: No. 4 (5 April 2019)

<https://reliefweb.int/report/malawi/unicef-malawi-humanitarian-situation-report-flood-situation-report-no4-5-april-2019>

Prompt 2

Malawian women struggle for land rights despite equality drive

<https://www.reuters.com/article/us-malawi-landrights-women/malawian-women-struggle-for-land-rights-despite-equality-drive-idUSKCN1M51GQ>

Prompt 3

Why Cyclone Idai was so destructive

<https://www.nationalgeographic.com/environment/2019/03/why-mozambique-cyclone-idai-was-so-destructive/>

Warning: Climate change can harm your health

<https://www.sciencenewsforstudents.org/article/warning-climate-change-can-harm-your-health>

While the rich world braces for future climate change, the poor world is already being devastated by it

<https://www.cnn.com/2019/03/31/africa/poorest-hit-the-hardest-climate-change-mozambique-intl/index.html>

Prompt 4

Malawi forests shrink as power deficit fuels charcoal business

<https://www.reuters.com/article/us-malawi-forests-climate/malawi-forests-shrink-as-power-deficit-fuels-charcoal-business-idUSKBN0A12P20150525>

Malawi: Government reaffirms commitment towards environmental conservation

<https://allafrica.com/stories/201906250098.html>

Malawi turns to coal to address its energy crisis

<http://www.earthisland.org/journal/index.php/articles/entry/malawi-turns-to-coal-energy-crisis/>

Prompt 5

Mining in Malawi brings forced evictions and ruined crops, report says

<https://www.theguardian.com/global-development/2016/sep/27/mining-malawi-brings-forced-evictions-ruined-crops-human-rights-watch-report-says>

Early action to protect and enhance the livelihoods of drought-affected smallholder farmers in Malawi against the lingering 2018/2019 El Nino event

<https://reliefweb.int/report/malawi/early-action-protect-and-enhance-livelihoods-drought-affected-smallholder-farmers>

Part 2: Does Geography Matter?

- After having watched all or part of the film *The Boy Who Harnessed the Wind*, begin this part of the lesson by asking the students to reflect on ways in which climate change has impacted the lives of the people living in Malawi. Invite several students to share their thoughts, hosting a brief discussion based on the responses.
- Next, distribute one piece of blank paper (lined paper also works) to each student in the class. Write the following four prompts on the board, asking the students to record the prompts at the top of the paper.
 - Describe what is happening in this photo.
 - What aspects of this photo tell you about the geography of Malawi? List as many as possible.
 - How does this photo show the impact of alternating flood and drought cycling on the people of Malawi?
 - How does this photo make you feel? Be specific.
- Divide the class into 6 groups, explaining to the students that they will be looking at images related to Malawi's alternating flood and drought cycles. Distribute the images from **HANDOUT 3: A DAY IN THE LIFE**; each group should begin with a different image.
- Tell the groups they will have time to examine and discuss each image. They should respond to the four prompts on the board for each image. Allow 3–5 minutes for students to respond to their first image. If time permits, invite the groups to exchange images and conduct a second round of analysis. [NOTE: Work on this activity can vary from one to all six images, depending on the time available. If time is limited, one or more of the images can be assigned as homework.]
- When students have finished their analysis, collect the photos. Invite each group to share their responses to the prompts. Host a discussion based on students' responses, placing emphasis on the feelings students have about the images they assessed. Each image discussed should be held so it can be seen by everyone during the discussion. Alternatively, the images can be shown on a projector.
- Next, ask the students the following questions, inviting several to share their thoughts with the class.

- Do you think the scenes of droughts and floods in Malawi from the film *The Boy Who Harnessed the Wind* are similar to the images you viewed with your group? Please explain.
 - What elements of the images you viewed are different from where you live?
 - A large percentage of people in Malawi experience hunger due to food shortages from droughts and floods each year. Is this a problem where you live? Please explain.
 - Do you think it is fair for the people of Malawi to suffer food shortages as the result of an environmental dilemma at least partially created by humans (such as climate change)? Please explain.
 - How do you think food access for the people of Malawi will continue to change as the result of shifting climate trends on Earth?
7. Ask the students what percentage of the population in Malawi they think experienced poverty as the result of conditions related to climate. (According to the International Monetary Fund¹, in 2010, 50% of people in Malawi lived below the international poverty standard of \$1.90 per day; 25% were in extreme poverty, unable to satisfy food needs. Poverty was worse in rural areas.) Ask students how they think this aspect of Malawi compares to other countries in the world. Call on several students to share their thoughts.
8. Explain to the students that the next activity invites them to examine a system designed by the United Nations to evaluate the health and standard of living of different countries; it is called the Human Development Index (HDI). Tell them this system is used worldwide and assesses key dimensions of human development using such metrics as healthy lifestyle and standard of living. Tell the students they will explore aspects of the HDI resulting from poor environmental conditions related to climate change (such as food shortage) in both Malawi and their country of origin.
9. Divide the students into groups of 2–3 and distribute copies of **HANDOUT 4: NO TWO COUNTRIES THE SAME**. Read the instructions out loud and be sure students understand the meaning of each term on the list. Some are obvious; for other topics such as gender, it would be helpful to show students how to click on the “+” to view the factors that have been evaluated. Allow groups 20–30 minutes to complete the data table and thought questions. Explain that the students will need to click the (+) to expand the list of category subheadings for each Human Development Indicator as part of their research for Question 3. [NOTE: While this activity is designed for in-class completion, a part or all of it could easily be assigned as homework for the next class.]
10. When groups are finished, review the student responses to each prompt in the form of a short discussion.
11. As an optional assignment for the next class, invite students to refresh their understanding of climate change as presented by Bill Nye in this short video: <https://www.climaterealityproject.org/climate-101>
-
- ¹ <https://www.imf.org/-/media/Files/Publications/CR/2017/cr17184.ashx>

Part 3: The Bigger Picture

1. Begin by distributing a blank sheet of paper and colored pencils to each student in the class. Ask the students what images come to mind when they think about climate change. Give the students 10-20 minutes to create a “sketch” of climate change as a warm-up challenge; they should work quietly and independently.
2. Invite several students to share their sketches with the rest of the class. Host a brief discussion about climate change using the following questions as a framework for the conversation.
 - On a scale from 1 to 10, how familiar are you with climate change? (1 = What is climate change?/10 = Superstar expert climate change specialist) Please explain.
 - How does climate change impact your life?
 - How does the story of climate-related floods and drought in Malawi relate to the rest of the African continent?
 - What do you think might be the best way of teaching and inspiring people to want to do something about climate change?
 - How do we know that the Earth’s climate will continue to change in the future?
3. Explain to the students that they will use an online tool called the Climate Reanalyzer to examine sets of past and current data collected about shifting climate trends in Africa. They will use the site, produced by the Climate Change Institute at the University of Maine, to visualize long-term predictions for how climate will continue to change in this part of the world.
4. Divide the students into groups of 2–3. Distribute copies of **HANDOUT 5: AND THE DATA SUGGEST?** to each group. Read the instructions out loud; allow groups approximately 30 minutes to complete the data table and thought questions. [NOTE: The students will need Internet access for this activity. Students who finish early should be encouraged to explore other pages of the website.]
5. When groups are finished, review their responses to each prompt in the form of a short discussion. Then, ask the students these final questions. NOTE: Student responses to these prompts may offer an elegant segue into one or more of the proposed extension activities that follow, many of which highlight climate advocacy as a main theme.
 - Based on your work using the Climate Reanalyzer, how concerned should we be for the well-being of African countries if climate change becomes worse over time? Please explain.
 - What are some ideas you have to help bring awareness and inspire positive change in African communities that, like those in Malawi, are affected by flooding, drought, and famine due to climate change?
6. If time permits, students can experiment with changing the “Variable” option in the drop-down menu box provided as a way of thinking about shifting temperatures and other climate-related factors which may continue to impact African communities in the future. Suggested variables to explore include precipitation, wind speed, and cloud cover. The students can also compare these changes in Africa and those in other world locations by manipulating the “Region” menu.

Extension Activities

1. Assign students into groups where each student will play the role of a community member in Malawi. Conduct a mock town-hall meeting and have members of each group address the following question through the lens of the role: *What can be done to prevent food shortages due to heavy flood and drought cycling in this village?* Roles might include government officials, teachers, health care workers, local business owners, tourists, and/or visiting scientists.
2. To inspire students to begin thinking about their own water use as they study the cycles of flooding and drought in Africa, ask them to calculate their own water footprint using this online water usage calculator: <https://www.watercalculator.org/>. This activity could serve as a preliminary component to the lesson as a warm-up prompt or could be assigned ahead of any of the individual lesson sections as homework.
3. Invite students to write a letter to a newspaper or government official to share their concerns about and demand actions on the impact of climate change on African countries such as Malawi.
4. Have students write and produce a podcast about climate change and famine in Africa. The following links may be a helpful place to start: **STARTING YOUR PODCAST: A GUIDE FOR STUDENTS** (<https://www.npr.org/2018/11/15/662070097/starting-your-podcast-a-guide-for-students>), **PROJECT AUDIO: TEACHING STUDENTS HOW TO PRODUCE THEIR OWN PODCASTS** (*New York Times*) (<https://www.nytimes.com/2018/04/19/learning/lesson-plans/project-audio-teaching-students-how-to-produce-their-own-podcasts.html>).

Additional Resources

William Kamkwamba's 2007 TEDx Talk

https://www.ted.com/talks/william_kamkwamba_on_building_a_windmill?language=en

Water Footprint Calculator

<https://www.watercalculator.org/>

Weather Versus Climate Change

https://www.youtube.com/watch?v=cBdxDFpDp_k

A Tour of the Water Cycle

<https://pmm.nasa.gov/education/videos/tour-water-cycle>

Climate 101 with Bill Nye

<https://www.climaterealityproject.org/climate-101>

350.org

<https://350.org/about/>

350.org Africa

<https://350africa.org/>

Climate Reanalyzer

<https://climatereanalyzer.org/>

United Nations Human Development Reports

<http://hdr.undp.org/en>

United Nations Environment Programme: Africa

<https://www.unenvironment.org/regions/africa>

United Nations Africa Renewal Programme

<https://www.un.org/africarenewal/>

Africa feeling the heat of climate change

<https://www.un.org/africarenewal/magazine/may-july-2017/africa-feeling-heat-climate-change>

Lesson (ENVIRONMENTAL SCIENCE)

Beyond Carbon

https://www.beyondcarbon.org/?utm_medium=ads-dcm&utm_source=google&utm_campaign=BeyondCarbon&utm_content=climatechange_BeyondCarbon

Global heating to inflict more droughts on Africa as well as floods

<https://www.theguardian.com/science/2019/jun/14/africa-global-heating-more-droughts-and-flooding-threat>

Hike in record-dry months for Africa's Sahel worries scientists

<https://www.reuters.com/article/us-climatechange-africa-drought/hike-in-record-dry-months-for-africas-sahel-worries-scientists-idUSKBN1OC1PT>

Climate change is creating a new atmosphere of gender inequality for women in Malawi

<https://www.teenvogue.com/story/climate-change-gender-inequality-women-malawi>

Planet is entering a 'new climate regime' with 'extraordinary' heat waves intensified by global warming, study says

https://www.washingtonpost.com/weather/2019/06/11/climate-change-intensified-last-summers-northern-hemisphere-heat-wave-it-may-be-starting-all-over-again/?utm_term=.f4c8176973be

Handout 1

Malawi: Sensing Place

Instructions: Use the map provided to answer the questions below on a separate sheet of paper. NOTE: You may use the Internet or other resources for research where needed.



[Source: <https://commons.wikimedia.org/wiki/File:LocationMalawi.svg>]

1. The country of Malawi is shaded red on the map. How would you describe the location of Malawi in relationship to your own country? To the rest of Africa?
2. Label Malawi on the map. Then, research the names of all countries which share a border with Malawi. Label these countries on the map.
3. Research the location of the Sahara Desert in Africa. Does the southern border of the Sahara Desert appear on this map? Using online resources, can you determine approximately how far Malawi is from the Sahara Desert?
4. Malawi is considered a sub-Saharan country. What does this mean? Why might Malawi become a Saharan country at some point?
5. Malawi has a sub-tropical climate. Using your understanding of climate, what kind of weather and climate patterns might exist in sub-Saharan countries like Malawi that allow them to be considered “sub-tropical”? Please explain.
6. The United Nations describes desertification as *land degradation in typically dry areas resulting from various factors, including climatic variations and human activities*. Based on this definition, do you think Malawi is experiencing desertification? Please explain.
7. What evidence from the film *The Boy Who Harnessed the Wind* demonstrates shifts in climate related to desertification in Malawi?



Handout 2

30-Minute Ph.D.

Instructions: Each of the prompts below relates to some aspect of the definition of geography with respect to human communities. For this assignment, you will become a Ph.D.-level expert on a unique, human-based feature of the geography of Malawi in a short period of time. Circle or highlight the prompt below to which your group has been assigned. Then, using the Internet, find an article which deals with your assigned topic. Read and summarize the article with your group, making sure you record (1) the title of the article and (2) the website/publication from which it came. Your group should be prepared to give a brief presentation (your dissertation!) to the class summarizing the article and explaining how it relates to your assigned prompt.

Prompt 1	How does the land in Malawi influence where the country's people live?
Prompt 2	Who owns the land in Malawi?
Prompt 3	How does the land in Malawi influence human communities in the region?
Prompt 4	How do human communities impact the land of Malawi?
Prompt 5	How do human communities in Malawi rely on the land in the surrounding region?

Handout 3 ▶ P. 1

A Day in the Life

Instructions to teacher: Print, cut out, and distribute the photos below (one photo per student group; group size will vary depending on class size). Then, follow the instructions in Part 2 of the Procedure above, beginning with Step 3.



Photo 1

Source: [wikimedia.org](https://commons.wikimedia.org/wiki/File:ILRI,_Stevie_Mann_-_Household_takes_refuge_from_the_rain_in_central_Malawi.jpg)

https://commons.wikimedia.org/wiki/File:ILRI,_Stevie_Mann_-_Household_takes_refuge_from_the_rain_in_central_Malawi.jpg



Handout 3 ▶ P. 2 A Day in the Life



Photo 2

Source: wikimedia.org

[https://commons.wikimedia.org/wiki/File:Africa_Food_Security_15_\(10665294293\).jpg](https://commons.wikimedia.org/wiki/File:Africa_Food_Security_15_(10665294293).jpg)

Handout 3 ▶ P. 3

A Day in the Life



Photo 3

Source: [wikimedia.org](https://commons.wikimedia.org/wiki/File:Hauling_water_in_Malawi.jpg)

https://commons.wikimedia.org/wiki/File:Hauling_water_in_Malawi.jpg

Handout 3 ▶ P.4 A Day in the Life



Photo 4

Source: wikimedia.org

https://commons.wikimedia.org/wiki/File:Displaced_people_in_Bangula_evacuation_camp.jpg



A Day in the Life



Photo 5

Source: [wikimedia.org](https://commons.wikimedia.org/wiki/File:Harvesting_in_Chikhwawa_Malawi.jpg)

https://commons.wikimedia.org/wiki/File:Harvesting_in_Chikhwawa_Malawi.jpg

Handout 3 ▶ P. 6 A Day in the Life



Photo 6

Source: [wikimedia.org](https://commons.wikimedia.org/wiki/File:Malawi_AIDS_Orphans.jpeg)

https://commons.wikimedia.org/wiki/File:Malawi_AIDS_Orphans.jpeg

Handout 4 ▶ P. 1

No Two Countries the Same

Instructions: The United Nations asserts that “people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone.” The Human Development Index (HDI) designed by the United Nations assesses key dimensions of human development, among which are a long and healthy life and decent standard of living. In this activity, you will explore aspects of the HDI resulting from poor environmental conditions related to climate change. Your mission is to examine the difference in HDI between Malawi and the country where you live.

To begin, visit the United Nations Development Report website at <http://hdr.undp.org/en>. Click the menu at the top and choose “Country Profiles.” Choose “Malawi” and record the listed values for each Human Development Indicator in the appropriate column. Then, repeat the process for “Your Country” (be sure to list the name). When you are finished, please answer the thought questions on the next page.

Human Development Indicators	Country	
	Malawi	Your Country:
Health		
Education		
Income/Composition		
Inequality		
Gender		
Poverty		
Work, Employment, and Vulnerability		
Human Security		
Trade and Financial Flows		
Mobility and Communication		
Environmental Sustainability		
Demography		
Socio-Economic Sustainability		
Human Development Index (HDI)		
Country Rank		

No Two Countries the Same

Thought Questions

1. In your own words, describe the Human Development Index (HDI). How is it used?

2. Why do you think the HDI is so low in Malawi? What evidence of this did you see in the film *The Boy Who Harnessed the Wind*?

3. Consider aspects of the HDI in Malawi that might be the result of poor environmental conditions related to a changing climate. Using the website provided in the instructions, research three Human Development Indicators with category subheadings that may be direct or indirect consequences of climate change. *Record your findings in the table below.*

Human Development Indicator	Subheading	Relationship to Climate Change
(Example) Health	(Example) Child malnutrition	(Example) Child malnutrition may be the result of food shortages related to severe drought conditions from increasing temperatures in Malawi.

Handout 4 ▶ P. 3

No Two Countries the Same

4. How does the HDI of Malawi compare to your country? Be as specific as possible.

5. How does it make you feel to learn that countries like Malawi have such a low HDI?

6. Who should be responsible for addressing low standards of living related to climate-related changes in environmental conditions (such as drought-related food shortages)? Be specific.

Handout 5 ▶ P. 1

And the Data Suggest?

Instructions: One of the most challenging aspects of climate science relates to the difficulty in predicting the long-term trends and impacts of a shifting climate. One of the best tools available to the scientific community is the practice of scientific modeling, the process of using historical data to best inform forecasts for future trends. In this activity, you will use an online tool called the *Climate Reanalyzer* to examine data sets related to temperature in Africa and other parts of the world. You will then use the results of your analysis to make informed predictions about future temperature trends in these locations.

To begin, visit the Climate Reanalyzer website at <https://climatereanalyzer.org>. On the menu to the left of the large image of Earth, click “Monthly Reanalysis Timeseries.” Then, use the data and images provided to answer the thought questions below to the best of your ability.

1. On the “Monthly Reanalysis Timeseries” page, set the following graph parameters using the drop-down menus provided:

Dataset	Reanalysis [3rd Gen] – ERA-Interim (1979-2015)
Variable	Mean Temperature 2m
Level	1000 mb (this should be a set value)
Month	Annual
Region	Africa

2. Click the “Plot” button. Use the “Annual Temperature at 2 meters” graph that is generated to answer the questions below:

A. What do the x- and y-axes on this graph represent?

B. How would you describe the relationship between temperature and time in Africa as demonstrated by this graph?

C. What is the highest temperature shown on this graph? What year was this temperature recorded?

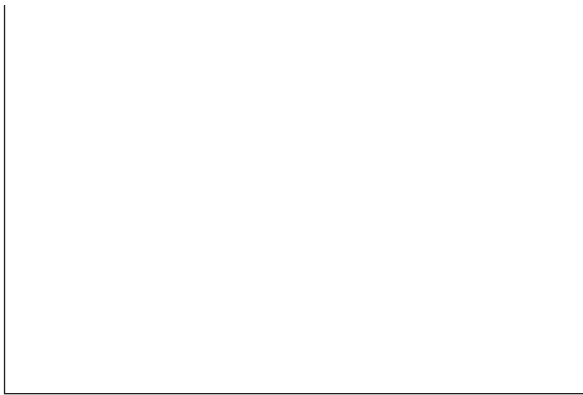
D. What range of time (in years) does this data set cover?



Handout 5 ▶ P. 2

And the Data Suggest?

3. Consider ways in which annual temperatures in Africa could continue to change over the next fifty years.
- A. On the graph below, plot what you think the annual temperature trend in Africa will look like for a period of fifty years from today. Be sure to appropriately scale and label your x- and y-axes.



- B. Please describe the graph you created above. What factors do you think will contribute to your forecasted temperature trends in Africa?

4. According to the National Aeronautics and Space Administration (NASA), the Intergovernmental Panel on Climate Change (IPCC) asserts the following:

“...increases in global mean temperature of less than 1 to 3 degrees Celsius above 1990 levels will produce beneficial impacts in some regions and harmful ones in others. Net annual costs will increase over time as global temperatures increase. Taken as a whole, the range of published evidence indicates that the net damage costs of climate change are likely to be significant and to increase over time.”¹

If you lived in Africa, would you be concerned about the predicted annual temperature trends moving into the future? Please explain, using the data you analyzed here to support your assertions.

<https://climate.nasa.gov/effects/>



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