

Woman Crush Wednesday: Marjory Stoneman Douglas

Ecosystems

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Grade Level	9th – 10th Grade	**Time Frame**	1-2 class period(s)
Subject	Science	**Duration**	60 minutes
Course	Biology		

Essential Question

How have female scientists shaped science today? What threatens ecosystems?

Summary

This lesson is part of a series, titled "Woman Crush Wednesday" in which we look at how female scientists have shaped our view of science. In this biology lesson, students will explore the contributions of Marjory Stoneman Douglas, the interconnectedness of an ecosystem, and endangered species.

Snapshot

Engage

Students complete a Bell Ringer activity to assess their prior knowledge about ecosystems and endangered species before being introduced to Marjory Stoneman Douglas.

Explore

Students research the Florida Everglades and use the TIP Chart strategy to explore the organisms and their adaptations to thrive in the Everglades ecosystem.

Explain

Students use the Jigsaw strategy to read and discuss the "Bison Are Back" article.

Extend

Students explore a local ecosystem and create a public service announcement (PSA) about what threatens them.

Evaluate

Students participate in a gallery walk to share their PSA and explore their classmates' ecosystems. Students use the POMS strategy to summarize something they can do to help protect an ecosystem.

Standards

ACT College and Career Readiness Standards - Science (6-12)

IOD403: Translate information into a table, graph, or diagram
IOD505: Analyze presented information when given new, simple information
EMI401: Determine which simple hypothesis, prediction, or conclusion is, or is not, consistent with a data presentation, model, or piece of information in text

Next Generation Science Standards (Grades 9, 10, 11, 12)

HS-LS2-6: Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.
HS-LS4-5: Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

Oklahoma Academic Standards (Biology)

B.LS2.6 : Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.
B.LS4.5 : Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

Attachments

- Bell-Ringer-Marjory-Stoneman-Douglass - Spanish.docx
- Bell-Ringer-Marjory-Stoneman-Douglass - Spanish.pdf
- Bell-Ringer-Marjory-Stoneman-Douglass.docx
- Bell-Ringer-Marjory-Stoneman-Douglass.pdf
- Lesson-Slides-Marjory-Stoneman-Douglas.pptx
- TIP-Chart-Marjory-Stoneman-Douglas - Spanish.docx
- TIP-Chart-Marjory-Stoneman-Douglas - Spanish.pdf
- TIP-Chart-Marjory-Stoneman-Douglas.docx
- TIP-Chart-Marjory-Stoneman-Douglas.pdf

Materials

- Lesson Slides (attached)
- Bell Ringer handout (attached, one per student)
- *Women in Science: 50 Fearless Pioneers Who Changed the World* by Rachel Ignotofsky
- TIP Chart handout (attached, one per student)
- "Bison are Back" handout (linked, one per student)
- Art supplies and poster board
- Student devices with internet access

15 minutes

Engage

Go to **slide 3**. Before class begins, invite students to complete a Bell Ringer activity that will assess their prior knowledge. Give students the **Bell Ringer handout** and ask them to record their responses to the following questions:

1. What is an ecosystem?
2. Can you name any endangered species and how they became endangered?
3. How do you think a species being endangered affects the other species in the ecosystem?

Bell Ringer Questions

Feel free to add questions based on the content you have already covered in class. Encourage students to answer the questions posed even if they aren't sure yet. Avoid giving answers to anything you have not yet covered.

Go to **slide 4** to introduce the essential questions and then to **slide 5** to introduce the lesson objectives.

Go to **slide 6**. If you have a copy of **Women in Science: 50 Fearless Pioneers Who Changed the World** by Rachel Ignotofsky, read students the Marjory Stoneman Douglas excerpt (pages 42-43). If you do not have access to that book, show students the video The Everglades River of Grass on **slide 7**.

Embedded video
https://youtube.com/watch?v=stU7K1zU0r4

Teacher's Note: “Women in Science”

Yes, high schoolers can be engaged by a picture book. Humans rely on sight observations more than any of us would like to admit, and a picture book capitalizes on that. It'll be nostalgic for them, can be a break from the seriousness, and gives a low entry point so any student can participate.

Teacher's Note: “The Everglades River of Grass”

Recommended to watch the video to 3:48, you can finish the rest of the video after students complete the Explore. This video covers much of the content about the threat to the Everglades and would be too much information at this point.

45 minutes

Explore

Go to **slide 8**. Use the TIP Chart strategy to allow students to organize organisms and their threats. Provide the **TIP Chart handout** (virtual or hardcopy) to each student. Students will research organisms that live in the Florida Everglades. Assign each student the task of finding five (5) plants and five (5) animals that live in the Everglades. Students can use bullet points, drawings, etc. to document their knowledge.

Instruct students to write the name of each plant and animal in the "Term" column. In the "Information" column, have students describe each organism and its adaptations to thrive in the everglades. Assign students to either paste a picture or draw a sketch of each plant and animal in the “Picture” column.

Teacher’s Note

You can guide your students on what to include in each column. For example, assign them to write both the scientific and the common names for each plant and animal in the “Term” column. Before they begin this exercise, provide questions that will help them fill in the “Information” column, such as "How has the plant and animals adapted to their environment?" or "What factors have limited this organism's population growth?"

Go to **slide 9**. Once students have completed their TIP Chart, have them add one (1) plant and one (1) animal organism from their individual lists to a master classroom list. Ask students to answer the following questions to debrief.

- What are some of the common adaptations of organisms in the Everglades?
- What would happen if the everglades no longer had water?
- How would the loss of one plant species, such as seagrass, affect other organisms?

Teacher's Note: “The Everglades River of Grass”

You can finish the rest of the video from the engage at this point.

45 minutes

Explain

Teacher's Note: Species and Geography

Draw students' attention to the geographic location of the near extinction and recent expansion of the bison herds. You may want to discuss the differences between the Oklahoma plains and the wetlands in the Florida Everglades.

Go to **slide 10**. Hand out the "Bison are Back" article or provide the link for students to access the article. Group students and have them use the Jigsaw strategy to read a portion of the article and share out what they learned.

Teacher's Note: Pairing Strategies

You might choose to use a strategy such as Fold the Line, Appointment Clocks, or Elbow Partners to pair students

Have a quick discussion with students after the Jigsaw strategy and before moving to the Extend activity. Discussion topics could include:

- How organisms are adapted to their environment.
- How a change in an ecosystem creates a chain reaction of changes.
- Other types of Ecosystems and the organisms that live there.
- Human impact and our responsibility as conservationists.

45 minutes

Extend

Go to **slide 11**. Have students return to their partners to discuss the new things that they have learned. Together, students should decide how Marjory Stoneman Douglas fought for the everglades. Ask students to think about how they could champion a local ecosystem like Marjory Stoneman Douglas did for the everglades.

Go to **slide 12**. Students research a local ecosystem and the ways that the ecosystem is being threatened. Instruct students to create a public service announcement (PSA) examining the dangers of harming an ecosystem and the steps they recommend to help the ecosystem. Tell students in advance that their individual PSA projects will be posted around the room for a Gallery Walk / Carousel.

Teacher Note

Explain what the purpose of public service announcements is. Have them name public service announcements they have seen on billboards, on television or radio, or on the internet. Before they create their PSA projects, have them identify the purpose of their PSA.

Students could create their PSA in any mode: video, poster, flyer, poster, PowerPoint, etc.

15 minutes

Evaluate

Go to **slide 13**. Instruct students to set up their PSA projects around the room. Have students participate in a Gallery Walk / Carousel to see classmates' projects. When students have reviewed all of their classmates' projects, have them use the POMS: Point of Most Significance strategy and write down the most significant thing they can do to champion an ecosystem.

Resources

- Ignotofsky, R. (2016). Women in science: 50 fearless pioneers who changed the world. New York: Potter/TenSpeed/Harmony.
- K20 Center. (n.d.). Jigsaw. Strategies. https://learn.k20center.ou.edu/strategy/179
- K20 Center. (n.d.). POMS: Point of Most Significance. Strategies. https://learn.k20center.ou.edu/strategy/101
- K20 Center. (n.d.). Tip Chart. Strategies. https://learn.k20center.ou.edu/strategy/185
- K20 Center. (n.d.). Gallery Walk / Carousel. Strategies. https://learn.k20center.ou.edu/strategy/118
- K20 Center. (n.d.). Fold the Line. Strategies. https://learn.k20center.ou.edu/strategy/171
- K20 Center. (n.d.). Appointment Clocks. Strategies. https://learn.k20center.ou.edu/strategy/124
- K20 Center. (n.d.). Elbow Partners. Strategies. https://learn.k20center.ou.edu/strategy/116
- Moran, Matthew D. (2019, January 24). The bison are back. The Conversation. https://theconversation.com/bison-are-back-and-that-benefits-many-other-species-on-the-great-plains-107588
- Kern, R. C., & Kern, R. S. (2016). *The Everglades River of Grass*. *YouTube*. Odyssey Earth. https://youtu.be/stU7K1zU0r4.