Conservation & Technology

Learning Objectives

By the end of this lesson, students will be able to:

- Describe how modern technology is being used to support conservation efforts.
- Explain the role of companies like Colossal Biosciences in developing tools like vaccines, bioacoustic technology, AI-powered tools, and genetic biovaults.
- Identify real-world conservation problems that require innovative solutions.
- Apply engineering thinking to propose and communicate their own design-based conservation ideas.

Key Takeaways

- Conservationists are using new technology to fight back against the biodiversity crisis.
- Engineering and creative thinking are essential to solving modern biodiversity challenges.
- Combining existing conservation efforts with additional resources and cutting-edge technologies could have major impacts on wildlife and ecosystems.
- Good news exists within conservation, and scientists are making progress when it comes to helping animals persist.

Preteaching

Vocabulary

a. Pass out the viewing guide so the students can start the lesson with the first two questions.
   i. What do you think “bioacoustics” means?
   ii. What do you think “genetic rescue” means?

Preteaching

Video

b. Students will continue filling out the viewing guide as the video plays.
c. Optional: Before transitioning to the next activity you can have students pair up and discuss their answer to question 10.
d. You can also have them brainstorm some other potential ways they could see the technology being used.

Activity A: Design Challenge | Engineering for Conservation

This activity encourages students to apply STEM thinking to real-world conservation.

Instructions:
Optional: If you think it would be helpful and your class does well with "research time", you can give students some time to look up some different endangered animals and learn about the problems they are facing. This may be helpful if students are lacking background knowledge prior to the design challenge - and it may help inspire some ideas.

1. Choose a real conservation challenge (disease, habitat fragmentation, poaching, invasive species, climate-related / natural disaster-related threats).
2. Design a solution. It could be:
    a. A tracking or acoustic monitoring device
    b. A specialized drone
    c. A reforestation robot
    d. A disease-delivery vaccine system
    e. A way to non-invasively gather dna from wild animals
    f. Something brand new!
3. Sketch it and label key features.
4. Write a short description explaining what it solves, how it works, and why it matters.
5. Once complete, consider how realistic of an option this is. What could potentially stop something like this from being put to use? Too complex? Too expensive?

Activity B: DNA Tier List

Instructions:

Note: This activity can simply be done with a blank piece of paper and a pencil. You can customize this by having students choose a different number of animals. The more they choose, the longer it will take. For these instructions I am going to have them choose 8.

1. Give students a few minutes (set a timer) to look at the list of animals and write 8 down on their piece of paper. Do not tell them what this will be for.
    a. Once students have had enough time to choose, let them know that they are NOT to change their animals from this point on.
2. Once students have their list let them know that they are now required to place the animals into three different categories, or "tiers". Each tier must have at least 2 animals. If possible, let them use technology to research as they make their decisions.
    a. Tier 1: Critical – Highest Priority
    b. Tier 2: Important
    c. Tier 3: No Rush – Low Priority
3. After their list has been tiered, students will take it further and rank their list 1-10. This is where the real payoff comes from.
4. Once all students have had time to work through the assignment and create their lists, have them pick a partner.
5. They then have to share their final list with their partners and see whether they agree or disagree. The goal is for this to inspire engaging discussion that has students defending the decisions they made.

Links

Viewing Guide
Engineering Activity
Animals to Tier
