
You: The Frog Biologist!

Objective

Students will be able to experience one way in which real-life biologists study threatened amphibian populations by participating in a simulated frog egg-mass counting activity.



Materials

Provided in Kit:

- Google Slides presentation on frog populations and the Oregon Spotted Frog, *Rana pretiosa* (shared virtually)
- 50 ZipLock bags containing beans (frog “egg masses”)
- Example frog ‘eggs’ from Activity 1 box
- A worksheet with critical thinking questions to end the lesson

Not Provided:

- Copies of worksheet

Appropriate Grade Level: 6-8th

Time Required: 1 to 2 hours

NGSS and Common Core Standards: MS-LS2-1, MS-LS2-4, MS-ESS3-3, MS-ETS1-4

Background Information

This activity focuses on how biologists monitor frog populations, particularly the Oregon Spotted Frog, *Rana pretiosa*. The Oregon Spotted Frog (*Rana pretiosa*) can be found throughout the Pacific Northwest, but is particularly widespread in Oregon. Oregon populations are currently found in Wasco, Deschutes, Klamath, and Lane Counties. The Oregon Fish and Wildlife Office has reported that this frog’s range has decreased by at least 78% from its historic range.

The Oregon Spotted Frog is particularly easy to study because each female in the population generally lays only one egg mass per season. This makes it easy to estimate the number of breeding females in wood frog populations, and from there scientists can use “math magic” (statistics) to estimate the total number of wood frogs in that location. In this activity, students will pair up as teams of “biologists” to estimate the number of breeding females in the “pond’s” (classroom’s) wood frog “population” by counting the number of “egg masses” (simulated here using Ziplock bags filled with beans).

Activity

1. Explain to the students that, unfortunately, they won’t be using actual frogs or frog eggs to study frog populations today. However, because you want them to experience what handling actual frog eggs might be like, you will pass around the simulated eggs for the students to touch and feel as you are going through the Powerpoint. Warn them to be gentle with the “eggs” so that all of the students get a chance to feel them. (Note: you can also choose to pass these out later in the lesson while the kids are waiting in the hallway)
2. Go through the Powerpoint with the students. It should be fairly self-explanatory after reading the background information provided above. I would practice a couple of times before class, as some of the Powerpoint is interactive.
3. Now, it’s time for some fun! You are going to have the students leave the room and you are going to hide Ziplock ‘bean bags’ around the room while they are waiting outside the door. They are going to pretend that these baggies are frog egg masses and they are going to come back into the room and count them to try to estimate how many breeding Oregon Spotted Frog females they have in their classroom.
4. Explain the rules of the activity: the students will only have 1 minute to count the “egg masses” when they enter the room. They also aren’t allowed to touch the “egg masses” or to run in the classroom. Several baggies (5) contain black-eyed

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peas, not the Oregon Spotted Frog pinto beans. Tell the students that these are meant to represent eggs of another frog species, and to try not to count them (show them a baggie so they can see what these “eggs” look like).

5. Before the students file out of the room, have them pair off in teams of two.
6. Hide the baggies around the classroom. Bunch some of them together and hide some by themselves. Remember: frog ponds have structure! Some egg masses should be easy to find and some should be difficult. (Note: if you have an odd number of students, it might be a good idea to get a volunteer to hide the egg masses so you can supervise the students in the hallway)
7. Once the baggies have been hidden, invite one pair at a time into the classroom and time them (1 minute) while they count the baggies.
8. When they have finished, record the number of egg masses they counted next to their team name on a piece of paper. Have them stand in a designated corner of the room (so as not to interfere with other teams’ counting) and wait quietly as the other teams come in and do their counting.
9. Once all of the teams have had a turn to count and all of the “data” has been recorded, write all of the data up on the board in a table along with a row stating what the “actual” number of egg masses was.
11. Have the whole class brainstorm to decide how many breeding females there are in the classroom based on their data (should they take an average, use the minimum or maximum number of egg masses reported, or use some other method?) Make sure they note how their estimate does or does not differ from the “actual” amount of egg masses that were hiding in the “pond.” If the numbers differ, you can talk about error in science and how we simulated that in this activity.
12. Pass out a copy of the provided worksheet to each student.
13. Collect the worksheets and go over the answers to the questions with the students.

Additional Information

The following websites give a good overview of the current worldwide state of amphibian populations and provides further resources and updated studies, as well as more information about the Oregon Spotted Frog:

- <https://amphibiaweb.org/declines/declines.html>
- https://www.usgs.gov/faqs/why-are-frog-and-toad-populations-declining?qt-news_science_products=0#qt-news_science_products
- <https://www.fws.gov/Oregonfwo/articles.cfm?id=149489458>

This is an original activity created by Emily Patrick, a Master's student in the Environmental Education program at Southern Oregon University (2013).

This activity was updated in November 2020 by Caroline McIver, Annie O'Shea, and Cassandra Fricke, Master's students in Southern Oregon University's Environmental Education program.