

Katrina A. Catalano

Outreach Activities for K-5th grade students at Little Owl Enrichment Center

All activities assume that you go through a short presentation explaining the topic beforehand. Thanks to all that helped develop these games!

Bee Communication

Learning Objectives: Bees communicate food sources to each other using the “waggle dance”

Best for large to small groups. Print out pictures of different colored flowers, and tape them on the walls all around the room. Underneath the flowers, put a juice box as a “nectar source” reward. Then, break students off in pairs and have them use the waggle dance (shaking their “abdomen”) to communicate the which color flower they want their partner to go to. If the partner guesses right, they get the juice box. The “dance” is done by shaking their “abdomen” in the direction of the target flower, and for a different amount of time to indicate how far away the flower is. Near is a 2 second shake, medium range is a 6 second shake, far is a ten second shake. Now emphasize that bees do the same thing, but in the darkness of their hive! Great opportunity to talk about non-verbal/non-visual communication as an advanced topic.

Food Webs

Learning Objectives: Trophic level basics. Food webs are complex, and the loss of one trophic level can affect the whole community.

Print out pictures of different animals in a particular food web, like a baleen whale, toothed whale, krill, phytoplankton, zooplankton ground fish, herring, etc. Give each student an animal print out as a sign to drape over their neck with yarn, indicating who they are in the food web. Then go outside with yarn, and “connect” different pairs of students whose animals interact (so connect toothed whales with the forage fish, baleen whales with krill, etc). Then after you’ve made a food web together, drop an animal out of the web and talk about how that affects the rest of the web. Talk through affects as changes in abundance, to get at some advanced population dynamics topics.

Camouflage

Learning Objectives: What is mimicry, and what are Mullerian/Batesian mimicry specifically?

Collect photos of different camouflaged organisms, project them, and have students try to find the organism. Students also have a lot of fun with this.

Phenotypic Plasticity

Learning Objectives: Phenotypes vs genotypes, what is natural selection?

This is an advanced topic that requires some skillful topic explanation first. This activity uses red eyed tree frog hatching plasticity (Dr. Karen Warkentin et al) as the example. In this system, tree frog embryos laid on leaves above ponds can sense predation on their clutch, and hatch early so they can escape predation and transition to tadpole early. Eggs can differentiate the sound of a snake/wasp predating on the clutch from the sound of rain falling on the leaves. Print out paper

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sign to hang around the students' necks with an egg on one side, and a tadpole on the other. Then, choose two students to be rain and snake. I made shakers (can easily be done janky with Advil bottle tied up in a sock), one of a high pitch to be rain and one lower pitch to be the snake sound. Then, students have to close their eyes and listen to the sound of the shaker, deciding whether they want to hatch (turn their sign over to be a tadpole), or stay an egg. If they "hatch", but it was only rain, they are out of the game. Likewise, if they don't hatch and it was a snake, they are out. Students tend to love this game. Great opportunity to discuss natural selection.

Oysters & Ecosystems

Learning Objectives: What is an ecosystem (abiotic vs biotic)? What are the interactions between organisms and their environments? What is an "ecosystem service"?

All students are assigned an organism (oyster, pea crab, oyster drill, blue crab, tunicate, mussel), and then interact with each other. First, need to all go over who is predator/prey/competitor/etc in this system. Students have to move like their organism (kind of like "oyster yoga"), this is really fun, and students are very creative in how they represent their organism. When oysters are "killed" by predators or competitors, they become abiotic habitat for the rest of the organisms. Use the rest of the time to talk about what "ecosystem services" oysters provide. Great activity in the Mid-Atlantic states because students learn about local ecology.

Anole communication

Learning Objectives: What's the difference between an amphibian and a reptile? What sorts of things do animals communicate and how?

Anoles do "push ups" to mark out territories. Make the room or outside area a life size board game, with chalk or tape marking grids on the floor. Then, give each student a grid "territory". Students can try to take over each other's territory, and at the end, whoever has the largest territory wins. To take over territory, students do a push up contest! If the invader wins, the resident gives them half of their grid. If the resident beats the invader, they can take half of the invader's grid, and then it's their turn to make a move. Try not to allow students to go below half a territory size, as in no student who has already been invaded once can be invaded again. Otherwise, the students can get a little needlessly competitive...