



Community Science

Pollinators - Grade 3

Lesson 7: Pollinator Life Cycle Game

Duration: 45 minutes **Location:** Outdoor

Overview

In this lesson students will be introduced to the complex life cycle insect pollinators and taught why many pollinator species are at risk and how individuals and citizen science can help save them.

Learning objectives

By the end of the session, students will be able to:

- Cite the various life stages of a pollinator.
- Understand that pollinators have a complex life cycle.
- Cite 3 threats to the survival of pollinators today.
- Cite 3 ways individuals can help protect pollinator species.

Curriculum links

Grade: 3

Science and Animal Life Cycles

- Predict the next stages in the growth and development of at least one animal from each of the following groups: mammals, birds, fish, reptiles, amphibians, insects, etc.
- Identify examples of environmental conditions that may threaten animal survival and identify examples of extinct animals. Recognize that habitat preservation can help maintain animal populations and identify ways that student's actions can assist habitat preservation.

Social Studies and Global Citizenship



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- Understand, in what ways can individuals and groups contribute to positive change in the world.
- Understand, what are some environmental concerns that Canada and communities around the world share?

Equipment required

- An equal number of bean bags for the number of teams.
E.g., 28 students will be split into 7 teams. You will need 7 bean bags.

Additional information

Participants should have an understanding of citizen science, its importance and the project iNaturalist. This game can be played inside a gym or outside in the field.

Lesson plan

Time	Activity	Equipment Needed
10 minutes	<p>Game Prep</p> <p>Bring your group to an open and safe playing field (e.g., soccer field or gymnasium). Separate the class into groups of four, if there isn't enough, a teacher or volunteer can be added to a team. Have groups name themselves after a specific species of insect pollinator. After, allow each group to share what species they are.</p> <p>Have one member from each group raise their hand. Identify these members as the first life stage of insects, eggs! Ask these eggs to come and create a circle in the middle of the</p>	



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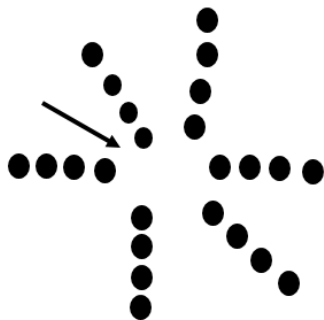
playing field. Ensure that there is at least 1 m between the participants (they cannot touch fingers when extending their arms).

Have one of the three remaining members in each group raise their hands. Identify these members as the next life stage of pollinator insects, larva. Have the larva stand behind the egg member of their species group, facing toward the circle.

Have one of the two remaining members in each group raise their hands. Identify these members as the next life stage of pollinator insects, pupa. Have the pupa stand behind the larva member of their species group, facing toward the circle.

Have the last member of each group as the final life stage of adults. Allow them to join their team members line.

At this time, members of each species group should be standing one behind the other facing toward the inside of the circle with egg being first, larva second, pupa third and adult last.





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15 minutes	<p>Game Play</p> <p>Place 1 fewer bean bags than groups in the centre of the circle (e.g., if there are 10 groups, you only need 9 bean bags). Tell participants that each of these bean bags represents a citizen scientist.</p> <p>Explain that pollinator insect populations around the world are declining and some are at risk of extinction. Identify that many of the species they have chosen as their group pollinator are included in this population decline. Identify that citizen scientists are one way to help protect our important insect pollinator species, because data provided by citizen scientists informs government policy which can protect pollinators and their habitats.</p> <p>Tell students that the goal of this game is to try and get a citizen scientist every round. However, every round there will be one fewer citizen scientist than group – so they will have to work hard to ensure they get one!</p> <p>If a group does not have a citizen scientist at the end of the round, they, unfortunately have gone extinct because there were no citizens collecting data to notify scientists that their species was at risk. So, nothing was done to save them!</p> <p>Each round will contain the following steps.</p> <ul style="list-style-type: none">• The instructor will either yell, 'egg', 'larva', 'pupa', or 'adult'.	<ul style="list-style-type: none">• Bean bags



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	<ul style="list-style-type: none">• That member of the group will run (crab walk, skip, hop, etc.) clockwise on the outside of the circle until they reach their group again.  <ul style="list-style-type: none">• When the running member reaches their group, the remaining members of the group will open their legs wide OR create an arch with their bodies/arms for their group member to pass through, crawling between their legs OR running through their arch. <i>Pick one of the options depending on what best fits the needs of your group.</i>• The running member will then attempt to grab one of the citizen scientist bean bags in the middle of the circle. If they do grab a bean bag, they will run back to their spot in their group line and have all group members sit down (this signifies they are safe).• If the member is unable to collect a citizen scientist, their group is eliminated and will sit down for the rest of the game.	
10 minutes	<p>Game Play Continued</p> <p>Play one round. At the end of the round, identify one threat to pollinator insect species (<i>habitat loss due to farm development/residential development/commercial development, climate change impacts such as hail storms/drought, pesticides, etc..</i>). Feel free to have participants give you an example of a threat to insect survival as a way to make this more of a brainstorming activity.</p> <p>When you identify the threat for that round, take one citizen scientist away. Play another round.</p>	<ul style="list-style-type: none">• Bean bags



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	Repeat this process until there is a winner (one group left standing).	
10 minutes	<p>Game Conclusion</p> <p>Explain that citizen scientists are an incredibly important part of protecting insect species both locally and globally. Because many of these threats you identified are not just happening where you live but also around the world. This is a common environmental problem not just in Canada, but in all other countries around the world. By practicing citizen science and logging insect species into citizen science projects, like iNaturalist, we are all making a positive change for our environment.</p> <p>Have groups give you examples of how they/our communities can help insect pollinator species (<i>plant gardens, protect nature by creating parks, build bee or insect hotels, participate in citizen science, clean up litter, reduce our greenhouse gas emissions/carbon footprint, etc.</i>)</p> <p>Every time a group gives you an example of actions they/their community can take to help insects, that group can re-enter the game and stand up. Repeat this process until all groups are standing again. Then, put an equal amount of bean bags to groups in the middle (e.g., 10 bean bags for 10 groups). Play 1+ more round(s) to conclude the game on a positive note, explaining to participants that when we take positive actions we make positive changes in the environment – like saving insect species!</p>	

Extension



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1. Play this game as is, but shift the focus to teach about habitat. Change the bean bags in the centre of the playing field from being citizen scientists to being food/water/shelter/space – the four parts of every habitat. The insect pollinator groups will compete for these vital resources. However, because of many human impacts (which you will mention as you remove bean bags), these resources are becoming scarcer. Which means, more competition amongst and within insect species, eventually leading to population decline and extinction. Continue the game to its conclusion, just shifting the focus from citizen science to habitat loss.

This will meet the science unit, Animal Life Cycles curriculum point,

- a. demonstrate awareness that animals require different habitats in order to meet their basic needs of food, water, shelter and space.
2. Play this game as is, but shift the focus to teach about food needs. Change the bean bags in the centre of the playing field from being citizen scientists to being sources of food for insect pollinators. When the playing circle is formed and you are placing bean bags in the middle of the circle, have students brainstorm foods that their specific insect life stage would eat. Have them also highlight how they would acquire this food. E.g., A bumble bee larva receives nutrients from the worker bees bringing nectar, however, butterfly adults have to fly from flower to flower to gather nectar from flowers. If you do not know, guess and be creative! Learning together and making educated guesses is important. Next, after all the bean bags have been placed in the centre of the playing field, the insect groups will compete for the various different food sources (bean bags). However, because of many human impacts (which you will mention as you remove bean bags), these resources are becoming scarcer. Which means, more competition amongst and within insect species, eventually leading to population decline and extinction. Continue the game to its conclusion, just shifting the focus from citizen science to food needs.



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This will meet the science unit, Animal Life Cycles curriculum point,

- a. Identify the food needs of at least one animal from each of the following groups: mammals, birds, fish, reptiles, amphibians, insects; and describe changes in how each animal obtains food through different stages of its life.