# **Chapter 16: Activities**

## **Education for Sustainability and Well-Being**

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# 1. Fill the Bucket

***Equipment***

Two buckets per team (one full of water)

***Setup and Formation***

* Number of players: six or more
* Where to play: field
* Mark out the playing area with a start and finish line.
* Divide the class into two groups.
* Provide each group with one bucket of water and one empty bucket.

***How to Play***

1. Each team lines up between its bucket of water and its empty bucket.
2. The first team member takes a handful of water and passes it to the second person in line.
3. The second person passes the water to the next person in line, and so on until the last person in line receives the water.
4. The last person drops the water into the empty bucket, runs to the front of the line, and starts the relay again.
5. The game continues in this fashion until the person who started the activity is at the front again.
6. On the next try, challenge teams to collect more water than they did the preceding time.

***Guiding Discussion and Assessment***

This system for passing water along does not seem very efficient; in fact, it wastes a lot of water. What other systems in your life waste resources because of the way they function?

***Safety***

Let students know ahead of time to come to school dressed in clothes that they don’t mind getting wet.

# 2. Sinking Island

***Equipment***

For each group, a blanket (or other foldable material) that, when unfolded, is large enough for all members to stand on comfortably

***Setup and Formation***

* Number of players: 10 or more
* Where to play: field, gym, or large room
* Divide the class into two groups.
* Provide each group with a blanket (or other foldable material).

***How to Play***

1. With the blankets unfolded, each group tries to stand on its blanket for 10 seconds without any part of anyone’s body touching the ground beyond the blanket.
2. Fold the blanket in half and repeat step 1.
3. After each successful attempt, fold the blanket in half again and repeat.
4. Continue until the group can no longer succeed.

***Guiding Discussion and Assessment***

* The rapidly shrinking size of the blanket could be viewed as representing the rapidly shrinking amount of fertile soil on the planet or the rapidly shrinking size of the world’s rain forests. What problems for human life are linked to the shrinking of each of these resources?
* What are some ethical problems that arise when the place we “stand on” shrinks so fast?

# 3. Systems Sprint

***Equipment***

* 5 oranges (or other handheld fruit); alternatively, one fruit for each student
* 25 tennis balls (or, if you have the funds, oranges)
* Masking tape
* Marker
* 5 flags (or shirts) of different colours

***Setup and Formation***

* Number of players: 10 or more
* Where to play: field or gym
* Before the lesson, wrap a line of masking tape around each tennis ball, then write a term on each tennis ball (5 tennis balls for each term [25 total tennis balls]):

***Vehicle Pollution***

***Truck Driver***

***Farmer’s Parents***

***Farmer***

***Sun***

Distribute the balls evenly around the perimeter of the gym or a large playing field.

* Carve an X into the skin of each of the five oranges so that students can easily remove the peel. (Note: If you have any parent volunteers, ask them to help you with the setup).
* At the beginning of the activity divide the class into five groups (as equal in sizeas possible).
* Give each group an orange and have the members look closely at it. Ask the students to name the elements of the orange (answers may address aspects such as colour, taste, and texture).
* Now ask the students to identify the “non-orange” elements that are necessary for the orange to exist (answers may include elements such as sun, clouds, soil, tree).
* Try to expand this discussion into the human world as well. Use guiding questions, such as, “What people had a hand in this orange’s existence?” and “How did this orange end up here?” (Note: It is not necessary for students to identify the exact elements written on the tennis balls.)
* Tell the students that if you look closely at an orange, you will see all of these non-orange elements, because without them the orange would not exist.
* Explain the following rules, then allow the students to equally divide and eatthe orange before starting the game.

***How to Play***

1. Each group sits in a separate circle at the centre of the playing area with its flag marking its spot.
2. On your signal, all students run in any direction toward the edge of the field while searching for elements of an orange—that is, the taped tennis balls with elements written on them.
3. Upon finding a ball, the student must decidewhether the term written on the ball is an element of an orange (the hope is that the students will see that all of these elements are part of an orange).
4. If the students decides that the term is an element of an orange (and an element that the group doesn’t already have), the student runs the ball back to the group’s centre circle flag and then searches for more balls (players may carry only one ball at a time). If the student decides that what is written on the ball is *not* an element of an orange, he or she puts it back where it was found and continues searching.
5. Each group should find five *different* elements. If a student returns with an element and discovers that an identical one has already been found, the student should quickly return the ball to where it was discovered.
6. The group to collect all five elements wins.

***Guiding Discussion and Assessment***

* What elements of this activity surprised you?
* How is vehicle pollution linked to an orange? In our car-focused culture, driving has a negative effect to the health of the planet. How else do humans harm the ecosystems that support the Earth’s plants and animals (including humans)?
* How might thinking about how things are connected (rather than separate) affect decisions such as where we live and where we work and play? How might this kind of thinking about nature as a web, rather than a collection of separate beings (termed systems-thinking) inform political decisions, such as funding for mass transit or road infrastructure or the type of road infrastructure (e.g., promoting active transportation or more efficient transit corridors)?
* Oranges must be shipped long distances to reach our mouths; therefore, they contribute to vehicle pollution and climate change. How might this understanding affect our choices about food selection and consumption? How might a systems-thinking approach affect other decisions that we make?
* John Muir once wrote, "When we try to pick out anything by itself, we find it hitched to everything else in the Universe." How does that thought apply to this activity and this discussion? What are some other examples of how things are connected?

***Safety***

Check for allergies to oranges or other selected fruit.

Adapted by permission from T.N. Hanh *A Pebble in Your Pocket: Mindful Stories for Children and Grown-Ups* (Berkeley, CA: Plum Blossom Books, 2001).

# 4. Systems Sync

***Equipment***

* Number of players: 10 or more
* Where to play: field

***Setup and Formation***

Before taking the group outside, explain the rules and purpose of the game (see the next section).

***How to Play***

1. Ask the students to each secretly choose two people in the space as points of reference.
2. Ask everyone to stand in a position that is the same distance away from each of their two points of reference.
3. It doesn't make any difference how far apart they are from the others, as long as they are equidistant from both of their points of reference.
4. Typically, after a lot of initial movement, the group will start to settle down. However, it just takes one person shifting a bit to set off a chain reaction that puts the whole room into motion again. Sometimes it just keeps going.
5. Continue long enough for your students to have a sense of the activity—namely, how it demonstrates the complexity of systems and interdependence of various elements within a system, as well as the delays involved in reactions.

***Guiding Discussion and Assessment***

Examples where systems thinking is relevant include ecosystems, in which various elements (e.g., air, water, movement, plants, animals) interact to determine survival and death. What are some examples of how living systems can be negatively affected by human activity? How might such activity be redesigned so that we can live in better balance within life systems? Are there patterns in the natural world from which we can learn in order to live in a more integrated way?

National Centre for Sustainability. (n.d.). Systems Thinking Activity. Swinburne University of Technology. www.swinburne.edu.au/ncs/efshub/Activities/Systems%20Thinking%20activity.pdf

# 5. Shelter Shuffle

***Equipment***

Four markers to establish boundary lines

***Setup and Formation***

* Number of players: 10 or more
* Where to play: field
* Before heading outside, invite students to name some of the resources that all living things need to survive. Then narrow the list down to three basic needs: food, water, and shelter. (Of course, survival also requires other things, such as oxygen, but for this game we assume there is enough of that to go around.)
* Inform the students that, in this game, their homes contain the food, water, and shelter they need in order to survive—and that the same holds true for all living things.
* Ask the students to decide which animal each of them would like to be during this game. Tell them to choose an animal that might live in your schoolyard or a nearby park or natural area (remind them that humans are animals too).

***How to*** ***Play***

1. Take students to a large open space outside and have then count off in fours. All the number ones should form a shoulder-to-shoulder line. All the others (i.e., twos, threes, and fours) should form a similar line facing the number ones. The two lines should be about 2 meters apart. The number ones will act as animals, and the rest of the students will act as components of the habitat: food, water, and shelter.
2. At the beginning of each round, each animal decides whether it needs water, food, or shelter for that round.

* Animals who need food place their hands over their stomach.
* Animals who need water place their hands over their mouth.
* Animals who need shelter place their hands together over their head.

1. Once the animals decide what they want, they cannot change their minds during that round. If an animal survives the round, it can change what it is looking for in the next round.
2. The number twos, threes, and fours decide which habitat component (food, water, or shelter) to be during the round and make one of the same three signsto indicate their choice. As with the animals, these players cannot change their minds during that round; they can, however, choose to be a different component in the next round.
3. The game should consist of at least a dozen rounds, the first of which is a trial round.
4. To begin, have both lines of students turn their backs to the other line.
5. Ask the animals to make a sign for what they need and the habitat students to make a sign for what resource they are for that round. When the students have made their signs, say, “1-2-3, turn around,” whereupon the two lines turn and face each other. Animals hold their signs (i.e., with their hands in the appropriate position) while walking calmly to a habitat component with the same sign. The animal tags the habitat student, transforming the habitat into an animal, and takes the newly designated animal back to where to the original line, effectively increasing the number of animals. This sequence demonstrates to students that when an animal is able to meet its needs, it can reproduce.
6. An animal that doesn’t meet its needs dies; therefore, an animal that cannot tag its habitat requirement must (after expiring noisily on the ground!) join the habitat line and become food, water, or shelter. Habitat components stand still in their line until an animal takes them. If no animal needs the habitat component, it stays as part of the habitat.
7. Next, tell students that this is no longer a walking game but is now a running game and that animals must run (while holding their signs) in order to tag habitat students (who still do not move from their spots). To do this part of the game, have the number one students move to a line 30 to 40 meters away from the habitat line.
8. Play 12 rounds and keep the pace brisk.

***Guiding Discussion and Assessment***

* Who became an animal more than once? (This game illustrates the concept of cycles: the molecules that make up an animal’s body may spend some time, after the animal dies, as a piece of habitat but may later become part of an animal again.)
* Did the number of animals go up after the first round of the game? (Yes, the animals were able to meet their needs and repopulate. During the first few rounds, the number of animals goes up.)
* Recall a round when there were more animals than habitat components. What happened after this round? (The habitat was depleted and there was insufficient food, water, and shelter for all of the animals. As a result, lots of animals died and returned to the habitat, thus restoring the balance of nature. Have the students act out this dynamic with a simple teeter-totter action of their hands to illustrate how nature establishes a balance.)
* What factors could make a habitat endangered? (Students should realize that such factors can be either natural or caused by humans. Natural factors include forest fires, natural calamities [e.g., rockslides], volcanic activity, and natural climatic warming or cooling. Human-related factors include land development [e.g., roads, buildings, golf courses, farming], development around water [e.g., dam-related flooding, draining of wetlands], acid rain, greenhouse warming of the Earth, oil spills, and agricultural and forestry activities.
* Graph what happened to the animal population as the game progressed. (This work can be done in the game area using poster board.) The result will provide a visual reminder of what you have learned in the game. Your chart should show years (rounds) and number of animals, as shown in the example below.

How might graphs such as this one be used to help us understand the complexity of wildlife areas and take appropriate action? What action would be appropriate to support the complexity of wildlife areas, given what is at stake?

Adapted from G. Thomson and S. Arlidge, *Five Minute Field Trips: Teaching About Nature in Your Schoolyard* (Canadian Parks and Wilderness Society. Global, Environmental & Outdoor Council, 2002), 22. Copyright ©2018 The Alberta Teachers’ Association (ATA), 11010 142 Street. Edmonton, AB Canada T5N2R1. Any reproduction of this material in whole or in part without the prior written consent of the ATA is prohibited.

# 6. Toxic Waste Challenge

***Equipment***

* Number of players: 10 or more
* Where to play: field
* Two buckets
* Enough small objects to fill one of the buckets (e.g., foam or plastic balls)
* 10 to 12 ropes (at least 2.5 meters long)
* Start and stop lines

***Setup and Formation***

* Drill holes on the sides ofone of the buckets, slip the ropes through the holes, and tie a tight knot at the end of each of the ropes.
* Fill the bucket with foam or plastic balls to represent toxic waste material.
* Place the bucket with the ropes and toxic waste material on the floor about 12 to 15 meters from the second container.

***How to Play***

1. The group must carefully transport the contents of the toxic waste container by manipulating the ropes and moving together.
2. As the group transfers the contents of the first container into the second container, participants must be careful not to let the toxic waste spill.
3. If the toxic waste bucket touches the floor, the entire group must start the task from the beginning.
4. If a group member touches any toxic waste from the transport bucket, the group must start the task again.
5. If a group member touches a rope anywhere other than at the end being held, the group must start the task again.
6. The task is completed when the group has transferred all the contents of the transport bucket into the second container without any of the material being left on the floor.

***Guiding Discussion Questions and Assessment***

* Humans produce a lot of waste, and some of it is toxic to humans and other forms of life. What are some examples of toxic waste?
* Why do we produce toxic waste that can endanger the life of humans and other forms of life?

Adapted by permission from D. Midura and D. Glover, *More Team Building Challenges* (Champaign, IL: Human Kinetics, 1995).

# 7. Climate Change Tag

***Equipment***

Number of players: 10 or more

Where to play: field or gym

***Setup and Formation***

* The object of the game is for one team to get from one side of the field to the other without being tagged by the other team.
* Divide the class into two groups, one of which acts as trees while the other acts as carbon dioxide molecules.

***How to Play***

1. Explain to the students acting as carbon dioxide molecules that they will pretend to float in the air while trying not to be absorbed by the trees. If they get tagged by a tree, then they become oxygen, leave the playing area, and return to the starting point.
2. Explain to the students acting as trees that they will pretend to absorb the students acting as carbon dioxide molecules by tagging them. They must stand rooted to the ground with their feet together so that they can’t move. They should be spread out in the playing area so that they cannot touch any other tree when their arms are stretched out.
3. The students acting as molecules line up on the start line (along the end of the playing area) and begin trying to move through the trees to get to the other side. Meanwhile, the students acting as trees try to tag them.
4. Once all of the molecules have made it through the trees or been tagged, stop the game and have the teams switch roles. You will likely need to switch a couple of times or add more trees or more carbon dioxide molecules in order to simulate changes in the environment.

***Guiding Discussion and Assessment***

* How do greenhouse gases affect our health and well-being?
* How did having more trees affect the greenhouse gases in the atmosphere?
* How else might we reduce greenhouse gas emissions? What actions can we take today? What actions can we plan for the long term? At the community level? At the municipal, provincial, and federal levels?
* How will we begin to engage politicians and fellow citizens in this discussion?

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