UN environment programme

SUSTAINABLE DEVELOPMENT GOALS

GOETHE INSTITUT

Science Film Festival Knowledge Through Entertainment

FOR THE COMMON GOOD

KEY OBJECTIVES

1. **Identify a strategy that would produce a sustainable use of resources in a simulation game;**
2. **Draw parallels between the chips used in the game and renewable resources upon which people depend; and**
3. **Analyze how the actions of participants in resource simulation games are similar or different from the actions of people in real-world situations.**

INTRODUCTION

A simple and fun demonstration to teach students about the Tragedy of the Commons. Students compete to earn candy without communicating with their peers, and will almost always experience the "tragedy" of running out of their shared resource after just a single round. Then they have the opportunity to play again—this time after talking out a strategy and working together to make a plan for the future. Through dialogue and holding each other accountable, students learn how to share their resources fairly, so that everyone can earn the coveted candy reward.

Renewable resources, such as trees or fish, can be maintained if managed properly. But if not given an opportunity to replenish, these resources can be exhausted quickly, especially as the demand for the resources grows. Garrett Hardin's theory, Tragedy of the Commons, asserts that people tend to act in their own self-interest and not in the interest of the "common good." In managing renewable resources, it is important for people to use them cooperatively and to not sacrifice long-term gain for short- term profits. A similar concept holds true in social dilemmas – cooperation, rather than selfishness, brings more long- term benefits to society. It is valuable to understand the benefits of cooperation and sustainable resource management in order to preserve our limited resource base as the population continues to grow.

GUIDING QUESTIONS

1. **What are renewable and non-renewable resources?**
2. **Give examples of renewable and non-renewable resources in the environment/in your community.**
3. **Describe how each example is being harnessed and their uses and/or products produced from the particular resource.**
4. **What are the problems/issues concerning these resources?**
5. **Why are these problems occurring?**
6. **What will happen if these resources are depleted?**
7. **What are the possible solutions to address these problems?**
8. **Why is cooperation important in conserving these resources?**
9. **Give some examples of how people cooperate in your community?**

MATERIALS

- Poker chips (substitute material could be One Peso Coins)/125 pcs/10 player
- Candies or stickers
- Music

CONNECTION TO SDGS

TOPICS

THE INTERACTION FOR SURVIVAL AMONG LIVING AND NON-LIVING THINGS THAT TAKE PLACE IN TROPICAL FORESTS, CORAL REEFS AND MANGROVE SWAMPS AND THE NEED TO PROTECT AND CONSERVE THESE ECOSYSTEMS, THE ONE-WAY FLOW OF ENERGY AND THE CYCLING OF MATERIALS IN OUR ECOSYSTEM, SPECIFICALLY THE TRANSFER OF ENERGY THROUGH THE TROPHIC LEVELS, ROLES OF ORGANISMS IN THE CYCLING OF MATERIALS, HOW THE MATERIALS CYCLE IN AN ECOSYSTEM, AND THE WAYS TO MINIMIZE HUMAN IMPACT ON THE ENVIRONMENT, THE INFLUENCE OF BIODIVERSITY ON THE STABILITY OF ECOSYSTEMS; AN ECOSYSTEM AS BEING CAPABLE OF SUPPORTING A LIMITED NUMBER OF ORGANISMS; AND THE RELATIONSHIP BETWEEN POPULATION GROWTH AND CARRYING CAPACITY

CROSS LINKS

GOAL 6: Clean Water and Sanitation
GOAL 7: Affordable and Clean Energy
GOAL 11: Sustainable Cities and Communities
GOAL 14: Life Below Water
GOAL 15: Life on Land

KEYWORDS

RENEWABLE AND NON-RENEWABLE RESOURCES **TRAGEDY OF THE COMMONS** **ARRYING CAPACITY** **SUSTAINABLE RESOURCES** **POPULATION GROWTH** **COOPERATION**

LEVEL

Primary and Secondary

RESOURCE TYPE

DEMONSTRATION/GAME

INTENDED AUDIENCE SIZE

10-20 players, one facilitator/teacher

MODE OF DELIVERY

Small group to large group / may be adapted to be played live online

TIME FOR ACTIVITY

15-30 min. depending on the number of players and rounds

FOR THE COMMON GOOD

TASK

1. Count out, but do not distribute, 10 chips for each student playing the game.
2. Seat students in a circle.
3. In the center of the circle, place a pile comprising one-fourth of all the chips. For example, if you have 10 students, you use 100 chips, and put 25 in the center.
4. Read the following rules to the students:
   - The chips belong to all of you.
   - Music will be played, and while it is playing, everybody may take chips out of the pool of chips in the center.
   - You may not put chips back into the pool once you have taken them out.
   - You may trade in 10 chips for a piece of candy (or sticker).
   - As soon as the music stops, I will double the number of chips left in the pool at that time, and then continue the game.
   - There will never, however, be more chips in the pool than there are at the start of the game; this is the maximum number of chips the pool can hold.
   - MOST IMPORTANTLY: You may not talk or communicate in any way to anyone during the game. This includes gestures, eye-contact, etc.
5. Notes to the facilitator/teacher: DO NOT explain the significance of the chips before playing the game. The rules are the only instruction the players get.
6. The players will most likely empty the pool at the start of the game. Point out that, as it's impossible to double zero, the game is over. Ask if they'd like to try again. Each student must return all of his/her chips to the pool.
7. Continue to play the game for several rounds without giving the students time to communicate with one another in between.
8. When doubling the chips in the pool, remember there can "never be more chips in the pool than at the start of the game." This is the pool's carrying capacity for chips.
9. After several rounds, you may allow the students to talk while the music plays so they can discuss strategies.
10. After five or six rounds, ask students how they feel about the way the game worked out. As a group, help students think of ways they could cooperate to allow more of them to get their 10 chips without depleting the pool of resources. Play again using the strategies developed by the students.

FOSTERING DISCUSSION

1. What do the chips/coins represent? Renewable resources, such as fish or trees. A resource is renewable if it can replace itself in the course of a human lifetime. Fossil fuels and minerals are examples of non-renewable resources, and therefore aren't applicable in this exercise. Water is also not a renewable resource; we have the same amount of water now as we ever had or will.
2. The chips/coins, we said, belong to everyone. Can you think of examples of resources that belong to everyone? Answers may include: water, land and air resources, classroom materials.
3. Can we draw any parallels between the way the group treated the chips and the way individuals and society as a whole use or overuse renewable resources? Answers may include: Deforestation: cutting trees down without planting replacements or at a rate that does not give new trees enough time to grow to maturity before harvesting. Overfishing: taking so many fish that not enough are left to reproduce and replenish the stocks for next year. Overfarming: depleting the soil of nutrients without giving it time to regenerate.
4. What happened in the first round of the game? How did it make you feel about the other members of the group?
5. How did removing the 'no talking' rule change how the game was played? Did it allow you to strategize? What are some of the strategies you came up with?
6. Was there an ideal number of chips to take out of the pool? If so, what was it and why?
7. Students build up their supply of chips the fastest if they take exactly half of the chips out of the pool during each round. That allows the maximum number to be added for the next round. If students take more than half, the number of chips to be doubled is lower, and there will be fewer available to take in the future. If they take fewer than half, it will take them much longer to build up the supply that they need for trade-in. Wildlife managers call this concept the Maximum Sustainable Yield and use it to figure out limits for hunting and fishing.
8. What would happen if we added people to the game? What do you think this would represent?
9. It would be harder and harder to cooperate with everyone and develop a strategy for sharing resources. It would take longer for everyone to get a piece of candy. Adding people would represent global population growth and the challenges of sustainably managing resources as demand increases.
10. Do you have an experience where you have had to share a resource with others? If so, what was the commodity, and what were the results?

FOR THE COMMON GOOD

11. This game is a called 'For the Common Good.' Have you ever heard this phrase? What does it mean? Explain to students the meaning of the phrase, namely that the 'common good' refers to Aristotle's philosophical/ethical theory wherein moral choices are balanced by weighing the benefits of the group over benefits for the individual. You can also refer students to the 'Tragedy of the Commons,' Garret Hardin's theory that individuals will often overlook the consequences to others when drawing from a shared resource.

SAFETY INSTRUCTIONS

None

POSSIBLE EXTENSIONS

Variation in the "rules" and procedure for the game should be explored. for example

The pool of tokens might be hidden from the players, and the available size of the pool NOT DISCLOSED - and the players can see how the game evolves, what are the consequences of not knowing the size of the pool.

The rate of reproduction could be altered for some games - rather than doubling the size of the pool between turns, it might grow by 20% - or a VARIABLE amount (from the roll of a dice) -

These variations would serve to highlight that sustainable harvesting of a renewable resource needs data - to know the size and dynamics of a population - this is one of the key contributions basic science can make to such management challenges.. if you don't understand the size/dynamics and effects on population growth you cant manage the harvesting -- for older students even more sop[histicated (and realistic) parameters could be brought in -- that the fish in the pool might not reproduce until they are 5 turns old - what is the effect -- for a STEM or ICT teacher can the students take the learnings from the game and create a simulation, a mathematical model of a system and explore the dynamics and sustainable harvest levels.

The module can be extended to higher grades to explain how people in a community are able to manage common pool resources that are limited, but are essential to the members of that community. Examples of resources that may be used are water resources, fisheries, forests, mineral deposits, land resources and their conversion, biodiversity, among others.

On a higher level, the activity can be applied to climate change action of nation states, industry, transportation, energy, and other sectors, and even of individuals on the decisions they make as to whether to cooperate to reduce their carbon footprints, and minimize global warming and climate change, and their effects to the world and to human beings.

It can extend to how each of the countries commit their respective Nationally Determined Contributions (NDCs) to the Paris Agreement, and how cooperation can be achieved to solve the problem of emitting too much greenhouse gases (GHG) to the atmosphere.

A model of successful cooperation among nation states that can be used as a case example is the Montreal Protocol where countries agreed to phase out ozone-depleting substances which led to the healing of hole in the ozone layer.

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For the Common Good activity was developed by Kurt and Ursula Frischknecht and Karen Zimbelman found in Thinking Globally and Acting Locally: Environmental Education Teaching Activities by Lori D. Mann and William B. Stapp
https://populationeducation.org/wp-content/uploads/2017/10/for-the-common-good-1.pdf