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Introduction

Helping youth to understand their environmental footprint and contribute to their future

Water is the essential resource of life, used for cleaning, farming, cooking, and drinking. It also ensures the flourishing of natural life, with the quantity and quality of water being an important factor for both the environment and the local people. Only a very small fraction of the water on Earth is readily available for human use, and the quality of this small fraction is frequently threatened by human activities. Agriculture is the largest cause of water degradation across the world; areas that utilize chemical pesticides and fertilizers are some of the worst offenders when it comes to water pollution. As the global population rises, water scarcity becomes an increasingly large concern and the need to conserve our water resources becomes more and more important. Environmental educational programs are becoming increasingly more common in order to educate the youth of today to become sustainable citizens of tomorrow. This program aims to provide students in grades 1-3 with a broad introduction to environmental sustainability in an interactive and fun fashion.

This teaching plan is student-driven, rich in active sessions using investigation and experimentation. Learning takes place in classrooms and outside. Teachers receive practical tips to help them conduct activities in a safe and effective way. These activities are intended for use in the classroom and as a part of a structured Sustainability Day; however, the program can be adapted to whatever environment is most convenient and would facilitate the most student learning. It is possible to carry out the teaching in the classroom only, but it is our aim to convince all teachers that activity-based learning is an effective and fun way for students to learn about their environment, with less effort than they might have imagined.
Sustainability Half-Day

A day of hands-on learning dedicated to teaching youth about the importance of water resources

This Sustainability Half-Day has been created to most effectively suit the needs of Baan Yang School. We recommend that the Sustainability Half-Day topics should rotate every year to prevent students from becoming bored with the topic from year to year. The Sustainability Half-Day should be conducted in groups of grades 1-3 and 4-6.

Within grades 1-3, teachers should create three groups prior to the sustainability day. The program is designed to have three activities running in parallel, with each group rotating from activity to activity within a designated amount of time. The Sustainability day can last as long as necessary; however, the schedule below allows for a three-hour schedule. If needed, the schedule can be modified to accommodate for a longer or shorter day.
# Basic Outline of Sustainability Half-Day Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Description</th>
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<tbody>
<tr>
<td>09:00</td>
<td>Program Introduction</td>
<td>Explain the reason for having the sustainability day and explain the theme for today. Be sure to take the time to thoroughly introduce the program and any outside volunteers who are present! The students should be aware of the day’s timeline from the beginning to prevent any confusion or boredom.</td>
</tr>
<tr>
<td>9:10</td>
<td>Ice Breaker</td>
<td>Ice breakers will let students play a quick game to introduce themselves better to the instructors. The goal of this is to make students comfortable to participate in the program and to provide an introduction to any outside volunteers.</td>
</tr>
<tr>
<td>9:20</td>
<td>&quot;Yes&quot; or &quot;No&quot; Game</td>
<td>A “yes” or “no” statement will be made and students will go to 1 corner if they believe the answer is yes and the other corner if they believe it is no. A person from each group can say why they are in that group. In a way, the Yes/No game is also an icebreaker game, and includes lots of running around, but also helps disseminate knowledge to the students.</td>
</tr>
<tr>
<td>9:30</td>
<td>Split</td>
<td>Teachers should have groups split ahead of time. Split team into 3 groups!</td>
</tr>
<tr>
<td>9:35</td>
<td>Activities Round 1</td>
<td>Students will split into groups of 20 each and go do different programs. Make sure to explain the point of the program and the program itself thoroughly before you begin!</td>
</tr>
<tr>
<td>10:05</td>
<td>Sanuk Break</td>
<td>Water-related Icebreakers and snacks, also possible to just let students play sports and run around. A list of possible games as at the end of this paper.</td>
</tr>
<tr>
<td>10:25</td>
<td>Activities Round 2</td>
<td>Students will split into groups of 20 each and go do different programs. Make sure to explain the point of the program and the program itself thoroughly before you begin!</td>
</tr>
<tr>
<td>11:15</td>
<td>Activities Round 3</td>
<td>Students will split into groups of 20 each and go do different programs. Make sure to explain the point of the program and the program itself thoroughly before you begin!</td>
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<tr>
<td>11:45</td>
<td>Conclusions and Prizes</td>
<td>Pass out prizes for students who participated in the activity</td>
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Icebreaker Games

Activity #1: Cat and mouse

Time: 10 - 15 mins

Introduction:
This activity needs an open space for students to run around, therefore, when planning this activity ensure the space selected is spacious.

Goal:
The goal of this activity is to engage students before starting any activities and to ensure students become comfortable with each other as well as with the teacher.

Procedure:
1. Ask for two student volunteers to play the cat and the mouse. The other students should form a circle and hold hands. The student who is the mouse should stand inside the circle and the cat should stand outside the circle.
2. The mouse must stay moving while inside the circle but cannot stay inside the circle for more than 10 seconds.
3. The cat cannot come into the circle but they can reach into the circle to grab the mouse. The circle players have to try and keep the cat away from the mouse by holding up their hands to let the mouse in and out of the circle.
4. If the mouse is caught, the mouse becomes the new cat and a student in the circle will be the new mouse. The old cat takes the place of a player holding hands.
Activity #2: Rock Paper Scissors

Time: ~10 mins

Introduction:
This game is a simple activity that will encourage students to be active before starting the real activity.

Goal:
The goal of this game is for a student to stay active and have fun.

Materials:
None

Procedure:
1. Let each student pair up then start to do “Rock Paper Scissor”
2. Loser needs to line behind the winner and then the winner needs to find a new competitor and do “Rock Paper Scissor” again.
3. Repeat until there are only two lines left and there is a loser!
Activity #3: You Never Walk Alone Game

Time: 10 -15 minutes

Introduction:
This activity needs an open space for students to run around, therefore, when planning this activity ensure the space selected is spacious.

Goal:
The goal of this activity is to engage students before starting any activities and to ensure students become comfortable with each other as well as with the teacher.

Procedure:
1. Make students sit in a circle
2. Choose one student out from the circle in order to create a hole between two students. Then the two students that sit between the hole need to stand up and run across the circle to take someone from other side and come back to their own seat in order to close their hole.
3. As the first two students grab another person from another side and after he/she left his/her seat this creates a new hole. Then two students who sit between that hole need to stand up and run across the place to get someone to fill in their hole.
4. This will repeat again and again until the time is over and who is left over, or who that don’t have a seat will lose.
Activity #4: Land - Water - Wind Game

**Time:** 5 - 10 minutes

**Introduction:**
This game will promote critical thinking

**Goal:**
The goal of this activity is to engage students before starting any activities and to ensure students become comfortable with each other as well as with the teacher.

**Procedure:**
1. Let the student sit in a circle and the teacher stands in the center
2. The teacher walks around the group and then points at a random student, saying either “Land” “Water” or “Wind”
3. The chosen student needs to give an example of the animal in that category as fast as possible
   a. Land; this word represents land animal
   b. Water; this word represents aquatic animal
   c. Wind; this word represents a type of bird
4. Play until there are 4 - 5 students who do not answer correctly or fast enough
Activity #5: Windy Windy Where's the Wind Blow

Time: 5 - 10 minutes

Introduction:
This game will make students run around and will allow the students to get to know each other.

Goal:
The goal of this activity is to engage students before starting any activities and to ensure students become comfortable with each other as well as with the teacher.

Procedure:
1. Ask the students to sit in a circle
2. One student volunteers to sit in the middle
3. The teacher recites the rhyme
   a. “Windy windy, where’s the wind will blow? Windy windy what's the thing that the wind will blow? Windy windy, the wind will blow... (state what type of people will the wind blow)”
   b. *eg: a person who wear a white shirt*
   c. *Students who are wearing a white shirt must switch seats*
      The student in the middle needs to steal the seat from a person who needs to switch their place
4. Whoever left out from the circle loses!
5. The teacher needs to start singing and choose any object that most of the students wear.
6. Repeat for multiple rounds
Activity #6: Snatch the Snake's Baby

Time: ~ 10 -15 minutes

Introduction:
This game will make student run around and allow the students to get to know each other.

Goal:
The goal of this activity is engage students before starting any activities, and want the student to be more comfortable with each other as well as the teacher.

Material:
1. Handkerchief

Procedure:
1. Divide students into groups (5 persons per group) and line up, the head of the line is snake’s head and the back of the line is snake's tail. Give handkerchief to the person who is tail.
2. Snake's head have to steal handkerchief from the snake's tail of the other snake.
Activity #7: Squirrels Going Back Home

Time: ~ 10 -15 minutes

Introduction:
This game will promote critical thinking and problem solving skills.

Goal:
The goal of this activity is to engage students before starting any activities and to ensure students become comfortable with each other as well as with the teacher.

Procedure:
1. Ask students to stand in a circle, girls are habitats and boys are squirrels
2. All students walk in a circle while singing a song (any kind of song)
3. The teacher will shout out the number of habitats and squirrels, then students have to come together into a group.
   a. If the teacher shouts out one habitat and three squirrels, the group would include one girl and three boys
4. If some students cannot combine as the request, those students will lose!
Theme 1: Water Conservation

Introduction

This theme helps students understand the importance of water conservation and the allocation of water resources. This theme discusses how Baan Yang gathers and uses their water. Students will be introduced to the water cycle and the concept that the earth only has a finite amount of water. While detailed water conservation concepts are slightly too complicated for students of this age, a broad introduction will serve as a good introduction to the detailed concepts that they will learn in later years.

This theme has a variety of resources to introduce students to these topics. We recommend that the activities are used in conjunction with a Sustainability Half-Day. The additional resources can serve as an in-class introduction to the topics covered during the Sustainability day. However, the Sustainability Half-Day can also stand on its own. This organization allows teachers to disseminate the information to their students as they see fit.

Subject Areas and Objectives

Subjects: water conservation, interpersonal skills, and citizenship.
Cognitive learning outcomes: water cycle; how to conserve water
Methodological learning outcomes: carrying out measurements; creating models; reasoning and critical thinking; finding creative solutions
Social/interpersonal impact: collaboration; applying knowledge to action for sustainable development.
Yes/No Game

Time: 10-20 mins

Introduction:
This activity is for some initial fun and moving around, along with assessing how much the students already know about water.

Instructions:
Tell students that each side of the room is designated for a different answer. Then read out one of the questions and assign an answer to each side of the room, students should move to the side of the room which represents the answer they agree with. Next, get one student from each side of the room to speak about why they think they are correct. Finally, tell students about the correct answer (only if there is one).

Questions:
1. When you brush your teeth should you keep the tap water on? (No)
   Yes   No
2. When does Thailand get the most water? (Wet Season)
   Wet Season   Dry Season
3. Should you take a shower or a bath?
   a. A bath uses up to 280 liters of water; a five-minute shower uses 40 to 100 liter.
4. How many liters of water does the average person use a day? (it's 250)
   More than 100   Less than 100
5. How many days do you think people can live without water? (3 days)
   3 days   one week
6. Does water cover more or less than 50% of the Earth’s surface? (70%)
   More than 50%   Less than 50%
7. The solid state of water is known as what? (Ice)
8. Which state of water that we can find in the north pole area? (Ice)
   Steam   ice
9. What is the nature of pure water? (Colourless)
   Colour   Colourless
10. If water is smelly, should we drink it? (No)
    yes   no
11. How much water you should drink a day? (more than 6 glasses of water)
Less than 6 glasses of water  more than 6 glasses of water
Activity 1: What is a Water Cycle?

**Time:** 20 - 30 mins

**Introduction:** This program aims to introduce young children (grades 1-3) to the water cycle and how water resources are used up and replenished. Students should learn about evaporation, condensation, precipitation, and collection of water, along with how all the different steps relate to one another.

Water covers more than 70% of the Earth's surface, and all living things need water to survive. The water cycle is nature's way of purifying, circulating, and replenishing water. The amount of freshwater on earth is finite and has been on earth for billions of years - thanks to the water cycle, it has been purified for reuse and is available for us!

The discussion questions in this activity can be modified if teachers have utilized in-class discussions about the water cycle previous to this activity.

**Part 1: Water Cycle Discussion**

**Discussion Questions/Guide:**

1. What are some ways that we get water here at school? How about at home?
   - a. Be prepared for a variety of answers - tap water, rainwater, bottled water
2. Where do you think that water comes from?
3. How old do you think the water that you drink is?
   - a. Answer: The water that we drink is four billion years old!

Earth only has a finite amount of water, but nature has a clever way of making sure that it can last for a very long time, like billions of years! This way is called the water cycle. Today we are going to learn about the water cycle and how it works.

4. Can anyone guess how many steps there are in the water cycle?
   - a. There are five (5) steps in the water cycle.

The five steps in the water cycle are evaporation, condensation, precipitation, collection and percolation.
a. **Evaporation**: When heat from the sun turns liquid water into gaseous water vapor, causing it to rise into the air.

b. **Condensation**: When gaseous water vapor cools at high elevations and becomes liquid (or solid) again.

c. **Precipitation**: When liquid water (e.g., rain) or solid water (e.g., snow) falls to the ground.

d. **Collection**: When large amounts of water gather in oceans, lakes, rivers, and streams.

e. **Percolation**: When water moves through the soil to underground lakes called aquifers.

**Part 2: Water Cycle Activity**

This experiment should be done in small groups (2-4) so that all students can observe the water cycle at work. The experiment can be set up beforehand by teachers so that students can observe the effects.

**Materials:**
1. Large bowl
2. Smaller bowl (should fit inside the larger bowl)
3. Plastic cling wrap
4. Ice cubes
5. Warm/hot water

**Procedure**
1. Fill a large clear container with warm/hot water
2. Place a smaller container inside, floating on the water
3. Cover the container with plastic wrapping (if the water is very hot, evaporation should be immediately visible)
4. Place ice cubes on top of the plastic wrap (condensation of water around the cool area of the ice cubes should be visible and precipitation of water into your collection bin will follow soon after)
5. Remove the plastic wrap and show the water collected in the smaller container

**Part 3: Water Cycle Debrief/Discussion**
Ask students to come up with times that they have seen the water cycle at work. Possible answers include rain, morning dew, fog, rivers, etc.
Activity 2: Convince Baan Yang to Conserve Water!
Poster Competition

Time: 30-45 mins

Introduction:
Water conservation, or making the most out of all of the water that we have, is important to make sure that we do not waste water! Water is a precious resource, and there is only so much of it present on Earth. We must be cautious with our water use to ensure that we all have enough water to perform our day-to-day tasks. If this is the first activity of the day, make sure to help students come up with ideas! If it is the second or last activity of the day, have students reflect on what they have learned! The posters should be illustrative and not fact-based, so it’s ok for it to be the first activity of the day.

Part 1: Water Conservation Discussion
There are a lot of ways that we can conserve water, from turning the tap off when we brush our teeth to reusing water from showers to water plants. What are some ways that we can conserve water here in Baan Yang?

Part 2: Water Conservation Activity
This activity should be performed individually to promote independent critical thinking! Students should be sitting together to discuss ideas.

Materials
1. Small poster paper
2. Markers, crayons, colored pencils

Discussion Guide
1. Have you ever wondered why your mom tells you to turn the tap off when you brush your teeth?
2. Do you think that there is enough water to last the entire village a long time? Why or why not?
3. Do you think that it is important to be smart about your water use?

Procedure
1. Inform the students that the villagers in Baan Yang do not understand the importance of conserving and taking care of their water sources, the students have to teach them!

2. Instruct the kids to create colorful, illustrative posters to highlight the importance of water conservation. It’s a competition!

3. The posters will be hung in the town hall and the community will vote on the best poster, the creator of which will receive a prize!
Activity 3: The World’s Water

**Time:** 30-45 mins

**Introduction:** This activity aims to solidify students’ understanding of the finite nature of Earth’s water. This activity allows students to create a visual display of the amount of water that is available for human use. While it is unnecessary for all student groups to keep their displays, it may be useful to keep one of the displays in the classroom for a couple of weeks to remind students about water availability and conservation.

Over 70% of the Earth’s surface is covered by water, but very little of that is available for us to use. This activity allows students to create their own visual aids to demonstrate the true limitations of water availability on Earth.

**Part 1: Water Conservation Discussion**
Part of the reason that the water cycle is so important is that the Earth only has a finite amount of water. For this reason, nature has come up with a way to make sure that all of the water is recycled for use over billions of years. But how much water goes through the water cycle anyway? Let’s find out!

**Part 2: Water Conservation Activity**
This activity should be performed in small groups of 3-4 each. If necessary, separate students by age and have older students constitute two groups.

**Materials**
1. 7 1.5-L plastic water bottles (per group)
2. Water
3. Food coloring/non-toxic dye
4. Pitchers
5. Permanent marker
6. Sticky notes/paper with tape

**Procedure**
1. Prior to the activity, use the chart below to mark on each water bottle a separate volume; repeat for each set of bottles. The number of sets is dependent on the number of groups of students!
   a. Optional: For older children who know about fractions, multiplication, and division, allow them to calculate these volumes themselves!
   b. | Bottle # | Type of Water                      | % of Earth’s Supply | Volume  |
       |         |                                 |                    |         |
       | 1       | All of Earth’s water             | 100%               | 1,500 mL|
       | 2       | All of Earth’s salt water        | 97.2%              | 1,458 mL|
       | 3       | All of Earth’s fresh water       | 2.8%               | 42 mL   |
       | 4       | Fresh water locked up as ice     | 2.3%               | 34.5 mL |
       | 5       | Underground fresh water          | 0.4%               | 6 mL    |
       | 6       | Surface fresh water              | 0.05%              | .75 mL  |
       | 7*      | Water in soil and air            | 0.01%              | .15 mL  |
   c. Because this final volume is so small, this water bottle/category may be omitted.

2. Once students are separated into their groups, provide each group with a set of water bottles and a pitcher. The first water bottle should already be filled with dyed water; this will serve as a reference throughout the activity. The water in the pitcher should be dyed as well.

3. Students should take turns carefully filling the other water bottles up to the pre-measured lines.
   a. Optional: For the bottles that require very small measurements, consider having eyedroppers or other smaller tools available to help students get the correct measurements.
4. Provide each group with a set of pre-labeled sticky notes and ask them to label each bottle according to the amount of water in the bottle. Allot no more than 2-3 minutes for this part of the activity, and encourage discussion about each selection.

**Part 3: Debrief and Discussion**

Go over the groups' labeling, and choose several students to share their thoughts on the labels and ask if there were any inconsistencies with the answers and what students guessed.

1. Ask students how much water the full bottle corresponds to. In other words, how many liters of water are on Earth?
Theme 2: Water Contamination

Introduction

This theme helps students understand the importance of water conservation and the allocation of water resources. This theme discusses how Baan Yang gathers and uses their water. Students will be introduced to the water cycle and the concept that the earth only has a finite amount of water. While detailed water conservation concepts are slightly too complicated for students of this age, a broad introduction will serve as a good introduction to the detailed concepts that they will learn in later years.

This theme has a variety of resources to introduce students to these topics. We recommend that the activities are used in conjunction with a Sustainability Half-Day. The additional resources can serve as an in-class introduction to the topics covered during the Sustainability day. However, the Sustainability Half-Day can also stand on its own. This organization allows teachers to disseminate the information to their students as they see fit.

Subject Areas and Objectives

Subjects: water contamination, interpersonal skills, and citizenship.
Cognitive learning outcomes: ways that water can be polluted; how to determine if a water source is healthy
Methodological learning outcomes: carrying out measurements; creating models; reasoning and critical thinking; finding creative solutions
Social/interpersonal impact: collaboration; applying knowledge to action for sustainable development.
Yes/No Game

Time: 10-20 mins

Introduction:
This activity is for some initial fun and moving around, along with assessing how much the students already know about water.

Instructions:
Tell students that each side of the room is designated for a different answer. Then read out one of the questions and assign an answer to each side of the room, students should move to the side of the room which represents the answer they agree with. Next, get one student from each side of the room to speak about why they think they are correct. Finally, tell students about the correct answer (only if there is one).

Questions:

1. What is the main cause of water pollution (Human)
   - Plants
   - Human
2. It only takes a bit of pollution to make water unsafe to drink? (True)
   - True
   - False
3. You can help reduce water pollution (True)
   - True
   - False
4. If the water test good then its safe? (False)
   - True
   - False
5. What is water pollution? (water being contaminated with pollutants)
   - Water being contaminated with pollutants
   - When fish over populate in a lake
6. What word means dirty or unsafe? (contaminated)
   - Chemicals
   - Contaminated
7. Where does water pollution usually come from? (Human activities)
   - Human activities
   - Animals
8. What is one way that water gets contaminated? (When factories release chemicals into the river)
   - When you drink too much water
- When factories release chemicals into the river

9. Many people on earth do not have access to clean water. **(True)**

   True          False

10. Although water pollution is bad, it doesn't actually cause anyone to die. **(False)**

    True          False
Activity 1: Watersheds

Time: 30-45 mins

Introduction: This activity looks to introduce the idea of watersheds to grades 1-3 and to emphasize that pollution to one area can affect water on a much larger scale. The discussion before the activity is a great time to introduce the topic of pollution.

Part 1: Watershed Discussion

Watershed areas are affected by multiple water sources and their contaminants.

Discussion points:
1. Does anyone know what a watershed is? (define it)
2. What are some sources of water that can feed a watershed?
3. Does anyone know what a pollutant is? (can be litter, chemicals, or anything that makes water too dirty or unsafe to drink or cook with)
4. What happens to a watershed when one of its sources of water is polluted? Does it become polluted too? Let’s find out!

Part 2: Watershed Activity

This activity should be performed in small groups of 3-4 each. If necessary, separate students by age and have older students constitute two groups.

Materials
1. 1 Piece of white paper per group
2. Markers
3. Water in spray bottle

Procedure
1. Have each group crumple up their piece of paper and then flatten it out just a little bit.
2. Instruct the students to trace the creases with different colored markers, one to represent pure water and others to represent different pollutants like pesticides.
3. Spray the paper with water until pools of colored water begin to form, these are the watersheds!
4. Point out how the pollutants from different places affect the whole watershed!

**Part 3: Watershed Debrief/Discussion**

1. What did this activity show you about pollution? Was the whole watershed affected by the pollution of one of its sources?
2. Can someone give me an example of a pollutant? How about one you use everyday?
3. Is it important to try not to pollute the water? Why or why not?
Activity 2: Cabbage pH Test!

Time: 25 - 30 mins

Discussion: This activity introduces grades 1-3 to the concept of pH and the importance of testing your water before drinking it.

Part 1: pH Discussion

Not all water pollution can be seen by the naked eye! Just because the water is clear does not mean it is safe to drink. Water’s pH has to fall in the neutral zone (between 6.5 and 9.2) for the water to be safe to drink.

Discussion Points
1. What does water look like when it’s dirty?
2. When water is clear, does that mean it’s clean?
3. What are some ways you can tell that water is clean?

Part 2: pH Activity

Materials
1. Red Cabbage
2. Water
3. Blender
4. Strainer
5. Clear plastic cups
6. Vinegar
7. Hand soap

Preparation
1. Blend together 2 big cabbage leaves and 3-4 cups of water
2. Strain the cabbage blend and save the liquid cabbage juice for use in this experiment!
3. Prepare a table with various household products and plenty of cups of cabbage juice for the students to test and determine the products acidity!

Procedure
1. Provide each group with 3 plastic cups filled with the cabbage juice
2. Inform the students about the color code, what color indicates acidity and water color indicates basicity.
3. Instruct students to put vinegar, hand soap, and water into the three separate cabbage juice cups; observe the color change! What do the colors mean?
4. Allow students to test out various household products!

Part 3: pH Debrief/ Discussion
pH is an initial indicator of water’s cleanliness! A neutral pH is a good sign but does not mean there are no chemicals or bacteria that are harmful to drink!
1. Did your school’s water pass the pH test?
2. What other things can we do to help us see if the water is clean?
Activity 3: Bioindicators

Time: 25 - 30 mins

Introduction: This activity aims to teach kids other methods of gauging how clean a water source is!

Part 1: Bioindicator Discussion

Looking for bioindicators is a great way to gauge how clean a water source is.

1. What are some examples of sources of water?
2. How can you tell if a water source is clean and healthy?
3. Is water clean if its clear?
4. Is water clean if there is life in and around it?
5. What does it mean if the water is running instead of standing still?
6. Does anyone know what a bioindicator is?

Part 2: Bioindicator Activity

Materials

1. Paper
2. Markers
3. Ball or other object

Procedure

1. Sit in a circle and have a discussion about bioindicators; reference the discussion points above. Through the object to each student who wants to volunteer an answer!
2. Split the students into groups of 3-4, have them brainstorm bioindicators/what a clean source of water would look like.
3. Give each group poster paper and have them draw a clean water source!
4. Allow each group to present their poster!

Part 3: Bioindicator Debrief/Discussion

Give positive feedback for each poster and base your closing discussion off of their responses!
Theme 3: Reduce, Reuse, Recycle

Introduction

Many of the products available in today’s markets use materials that are not biodegradable, and most of these products end up in oceans and landfills. However, if products are not treated properly, they can hurt the environment in a large variety of ways. For example, marine animals can accidentally eat plastics like straws or plastic bottle rings, and dirty trash can affect the quality of our drinking water. The best way to minimize the amount of waste that enters the environment is by being a conscious environmental citizen and following the three R’s: reduce, reuse, and recycle.

This section aims to introduce students to the concept of waste minimization through the three R’s. The activities below can be used on their own or in conjunction with in-class lessons and discussions about recycling and the impact of trash on the environment and the world’s waterways.

Subject Areas and Objectives

Subjects: the importance of recycling, responsibility, interpersonal skills, and citizenship.
Cognitive learning outcomes: water cycle; how to conserve water
Methodological learning outcomes: carrying out measurements; creating models; reasoning and critical thinking; finding creative solutions
Social/interpersonal impact: collaboration; applying knowledge to action for sustainable development.
Yes/No Game

**Time:** 10-20 mins

**Introduction:**
This activity is for some initial fun and moving around, along with assessing how much the students already know about water.

**Instructions:**
Tell students that each side of the room is designated for a different answer. Then read out one of the questions and assign an answer to each side of the room, students should move to the side of the room which represents the answer they agree with. Next, get one student from each side of the room to speak about why they think they are correct. Finally, tell students about the correct answer (only if there is one).

**Questions:**
1. How many years will it take a plastic bag to decompose? Less than 500 or more than 500 **(It's 1000 years)**
2. You might have something in your house that is made from old bottles. **(True, bottles can be turned into carpet, coats, and other things)**
3. It it better to recycle or reuse an item? **(Depends on the answers, but reusing does not use any energy, and recycling does)**
4. You can recycle and reuse food waste. **(True, you can create a compost)**
5. Burning trash is directly bad for human health. **(True, this creates toxins in the atmosphere that we breathe)**
6. Compost can be used as fertilizer for crops. **(True)**
7. 50% of our waste is recyclable. **(False, 75% is)**
8. How long does it take an orange peel to decompose? 6 years or 6 months **(6 months)**
Activity 1: Make your own compost

Time: 30 - 45 mins

Introduction:
In this activity students will work to create their own bottle of compost using waste that they might just usually throw away. While it does not work immediately, over the period of a few weeks the students will be able to see their food waste turn into dirt.

Part 1: Compost Discussion

The earth needs us all to reduce, reuse, and recycle! This activity focuses on the reuse aspect by showing kids a fun way to reuse their waste!

Pre-Questions:
1. What do you normally do with food waste?
2. What happens to that food waste if you throw it away?
3. Do you know what compost is?

Part 2: Compost Activity

This activity should be performed in small groups of 3-4 each. If necessary, separate students by age and have older students constitute two groups.

Materials
1. 1 empty two-liter soda bottle
2. Shredded newspaper
3. Dirt (not potting soil, use dirt from outside)
4. Compost materials (such as grass clippings or vegetable scraps)
5. Small handful of dead leaves
6. Flat dish to hold composter
7. Spray bottle with water

Preparation
1. Rinse the bottle and peel off the label.
2. Cut off the top of the bottle as shown. Set the top aside.
3. Use the nail to punch 8 to 10 small air and drainage holes along the sides and bottom of the bottle.
4. Put the bottle on the tray.

Procedure
1. Have each group put some dirt, shredded newspaper and old leaves inside the composter. This is the compost starter.
2. Use the spray bottle to wet the compost starter.
3. The students are ready to add to their compost! (Try grass clippings, vegetable scraps, coffee grounds, or eggshells, but do not add dairy or meat.)
4. Turn the bottle top upside down and put it in the open top of the bottle. It will act like a funnel for adding a little bit of water each day to keep the contents damp.
5. Place in a spot where sunlight can reach it.
6. Have the kids stir it every few days, keep the contents damp, and let it rot! As the compost breaks down, they can add more kitchen scraps or plant litter, as well as some more soil from outside to mix in.
7. Cover the top of the compost with a kitchen towel when not in use.

Part 3: Compost Debrief/Discussion

Creating compost is an easy way to reuse food waste. Furthermore, this compost can be used as fertilizer for crops, which is also good for the crops.
1. Do you think you can use your compost in the future?
2. Do you think it would be possible to make compost in your own home?
3. Are there other things you can do with food waste such as to not throw it out?
Activity 2: Egghead Planters

Time: 20 - 30 mins

Introduction:
In this activity students will reuse eggshells to do a fun art activity. Students should have fun, but also realise that this is a form of reusing, and might be able to be done with other materials.

Part 1: Egghead Activity

This activity should be performed individually to ensure each student gets to participate and express their creativity.

Materials
1. Eggs
2. Seeds
3. Soil
4. Permanent Markers (color or black/white)
5. Card stock (fold into a round shape; egg holder)

Procedure
1. Made a small hole in the top of the egg by tapping it gently with the edge of a fork or spoon.
2. Then carefully pick the small bite of shell off until you have a hole the size of a quarter.
3. Get rid of the egg yolk and use your finger gently rub the inside of the eggshell to remove the egg’s membrane. **If the membrane is left on, it could cause mold to grow on your sprouts as it decomposes**
4. When the shells are rinse and ready to plant. Then we can allow the students to draw the face on the egg with a permanent marker.
5. Use a teaspoon to put down some dirt into the eggshell, then spoon the seeds into each shell.
6. Use a tablespoon to spoon a little water over the seeds, be careful not to overwater the seeds. Since there is no drainage, the seeds can rot pretty quick if over water.
7. Then have students create a simple egg holder to allow the egg to stand upright for the sun. Use ½ x 5 inch strips of cardstock taped into a ring shape.

Part 2: Egghead Debrief/Discussion

Hopefully the students had fun making their eggs with hair! Now they should discuss about what other things they could reuse for art purposes.

1. What would you have done with the egg shells regularly?
2. Can you think of any other waste items that you may use for art rather than throwing it out?
Activity 3: Reduce, Reuse, Recycle Poster

Time: 25 - 35 mins

Introduction: In this activity students will make posters to convince Baan Yang to reduce, reuse, and recycle more.

Part 1: Reduce, Reuse, Recycle Discussion

We all need to reduce, reuse, and recycle. This activity allows kids to think about why that is and convince someone else how important it is!

1. What are some ways we can reduce usage in Baan Yang?
2. What are some ways we can recycle more in Baan Yang?
3. What are some ways we can reuse more in Baan Yang?

Part 2: Reduce, Reuse, Recycle Activity

This activity should be performed individually to promote independent critical thinking! Students should be sitting together to discuss ideas.

Materials

1. Small poster paper
2. Markers, crayons, colored pencils

Procedure

1. Inform the students that the villagers in Baan Yang do not understand the importance of recycling and taking care of the earth!
2. Instruct the kids to create colorful, illustrative posters to highlight the importance of recycling. It's a competition!
3. The posters will be hung in the town hall and the community will vote on the best poster, the creator of which will receive a prize!

Part 3: Reduce, Reuse, Recycle Debrief/Discussion

Have students present their posters to the class and make sure that everyone has a chance to present!
Sanuk Break Games

These games are designed to be implemented during the breaks in the program. They should allow the students to burn off energy while still keeping on theme and learning about the topics at hand in a fun, active way.

Activity #1: Water Counting Game

Time: 10-15 minutes

Introduction:
In this activity, each student represents one predetermined amount of water. Then we will let them think or guess about how much water they use for each activity and let them group up together.

Goal:
For this game, we want the students to think about their water usage every day. After the student assigns a volume of water to the given task, we can ask them whether is it too much or too small and ask them to decide how they can conserve it.

Procedure:
1. Ask every student to stand up and prepare to run into a group.
2. Tell the students that each of them is representing to 2, 5, 10, and 20 liters of water for each round respectively.
3. Come up with everyday activity and ask students to form a group that represents the water that might be used on each activity
   a. Activities
      i. Machine Laundry (164 liters)
      ii. Showering (68 liters per 8 minutes)
      iii. Cooking (7 liters; average per day)
      iv. Washing dishes (10.5 liters)
      v. Drinking (average 2 liters per day)
      vi. Brushing our teeth (6 liters; twice a day)
      vii. Toilet (100 liters per day)
4. After groups are formed, call on one or two groups to discuss their rationale for the volume that they came up with. Ask the groups
whether they believe that their estimate is too large, too small, or just right.
5. Then give the right amount of the water that is used for the activity and move onto the next activity.
Activity #2: Hot Potato

Time: 10-15 minutes

Introduction:
In this game, students will sit in a circle, the students will pass around a ball as music is playing. We will ask them some question before we give the ball and let them answer when the music stops. This game will play for three rounds and each round should have four to five different answers from the student.

Goal:
In this game, we want the students to discuss their thoughts on water conservation.

Material:
1. Ball or any tangible object (doll, napkin, toy etc.)
2. Speaker or stereo to play music

Procedure:
1. Let the student sit in a circle and hand them a ball.
2. Ask one question before starting the music (Pick one question for each round)
   a. Why do we need to save water?
   b. What are some ways that we can conserve water?
   c. How can you use less water at home?
   d. Where does water come from?
   e. How do we collect water to use?
3. Play the music and have the students begin to pass the ball around the circle. Randomly choose a time to pause the music; the student who has the ball when the music stops must answer the question.
4. Play the music again and allow at least two more students to give answers to the same question.
5. Ask a different question and repeat steps 3-4.
Activity #3: Reuse, Reduce, Recycle

**Time:** 10 - 15 minutes

**Introduction:**
In this activity, the students will be divided into two different teams and the teams will be competing with each other. Each team will have one basket; each basket will contain photos of several simple objects such as plastic bottles, leaves, and paper. At the corner of the class, there will be three boards that will say “Reduce”, “Reuse”, and “Recycle”. Teams must race to place all of their pictures in the correct baskets.
Goal:
This game will encourage a student to learn how to “REDUCE”, “REUSE” and “RECYCLE” things that they have in their house. This will help a student to learn how to protect the environment, conserves natural resources and know how to reduce pollution in their society.

Materials:
1. 8 baskets (can also be any container that will hold the pictures)
2. Pictures:
   a. Reduce | Reuse | Recycle
      Plastic bag | Refillable bottle | Books | Can
      Car | Lunch box | Paper | Cardboard
      Water Usage | Grocery bag | CD, DVD | Leaves
      Energy | Clothes | Batteries
      Plastic bottle | Gallon Jugs | TV
      Air conditioning | | Plastic
   b. Large posters that state “REDUCE”, “RECYCLE”, “REUSE”

Procedure:
1. Divide students into two groups equally and let each team be on their station. Each station should have a copy of each photo, mixed randomly together.
2. Before starting the game, make sure that the opposite station is ready for the student to put each picture in the basket that state “REDUCE”, “REUSE”, “RECYCLE”.
3. After preparing all of the materials, line the students up and start the game!
4. Allow ONE STUDENT per one time and allow them to take only ONE PICTURE at one time.
5. A person who has the picture on hand should put that picture in the right basket as fast as possible and return to their team.
6. Whichever team can correctly distribute all of the pictures first wins the game.
Activity #4: Fishy, Fishy Cross my Ocean

Time: 10 min

Instructions:

1. Have 2-4 kids volunteer to be sharks.
2. Have other students line up on the other end of the field - they are the “fish”
3. Sharks should say “Fishy, Fishy, cross my ocean!” to start the game
4. Fish then have to run across to the other side of the field without being tagged by the sharks.
5. If they are tagged by the sharks, they become “Seaweed” and have to stand still and tag any “Fish” who get too close to them.
6. Repeat 3-6 until there is only one fish left - they are the winner!
Activity #5: Water State Game

Time: 10 mins

Instructions:

1. Explain the three different states of water (solid, liquid, gas) and how particles behave in each state.
2. Have the students spread out into the field and listen to the instructor’s directions.
3. When the instructor shouts....
   a. Ice - the students should get really close together, like particles in a solid
   b. Water - the students should walk around very close to each other while bumping into each other, like particles in a solid
   c. Water Vapor - the students should run around without touching each other, like particles in a gas
References
