Blooming Jeopardy

This activity center is part of the **Water Protection** theme.

What's the purpose of this activity?

Blue Green Algae (Cyanobacteria) naturally exists in our waters but occurrences of blooms seem to be on the rise. This fun, team "game show" activity will help students understand more about this water inhabitant, the effect of blooms and what they can do to help decrease them from happening.

Key messages:

- Blue Green Algae is a naturally occurring cyanobacteria
- Cyanobacteria are bacteria that live in water and make food similarly to plants (Photosynthesis).
- Blue Green Algae blooms can cause problems.
- Humans can help decrease Blue Green Algae blooms

Materials:

- Blooming Jeopardy Game Board
- Numbered honking horns (3-4, 1-2 extras)
- 26 Laminated question/answer cards.
    - 5, 100 point cards
    - 5, 200 point cards
    - 5, 300 point cards
    - 5, 400 point cards
    - 5, 500 point cards
    - 1, Final Jeopardy card
- 4 hoola hoops
- 2 Small whiteboards
- White board markers (dry erase) & eraser
- Fun Glasses for Facilitator
- Timer
- Calculator
- Laminated Posters:
    - Blue Green Algae Bloom
    - Photosynthesis
    - Diffusion

Activity Set Up:

1. Set Game Board up on table and brace with chairs if necessary.
2. Place numbered horns in a row in front of the game board, a running distance from the hoola hoops/pylons!
3. Spread hoola hoops/pylons in a row a slight running distance from the horns. Be sure to place each hoola hoop/pylon in line with a numbered horn!
    - You want the teams far enough away to have a bit of a run to the horns but are able to see and read the board.
    - Close enough so you don't have to yell!
4. Divide each whiteboard into two and write, "Team #1", "Team #2", etc. in each of the sections
    - Each facilitator of the activity can keep track of teams on one white board
5. Place the timer close to you, where you can set it easily!
6. Place the calculator by the white board … this is for easy calculation of points!

What will I be doing?

- This activity runs like the game show, Jeopardy.
    - As the game show host be over the top fun! Put on the fun glasses and become animated!
- Depending on the size of the group, you can divide into 3 or 4 teams. (There should be 3-4 on each team).

1. When students arrive, show them the poster of a blue green algae bloom … ask them: **"Do you know what this is?"**

   A: It is a Blue Green Algae bloom … have you heard of these?

   Q: **Does anyone know what it is?** (let students answer)

   Q: **How much do you know about this Blue Green Algae stuff?** … let them answer

- **"Well, we are going to find out! It is time for Blooming Jeopardy!"**

2. Divide students up into smaller groups and place in the different "team huddling areas" (the hoola hoops)/pylons
    - Explain that they are to stay on the outside the hoola hoops with 1 foot inside and face the game board in a semi-
    - All teams choose a designated "honker" who will run to the horn after each question is asked. The "honker" rotates for every question so that everyone gets a chance to run and honk for their team!
3. Explain to the students that they will be playing Blooming Jeopardy for about 7 minutes and the winning team is the one with the most points. This is how you are going to play the game!
    - Starting with Team#1, they choose a topic category":
        - "It's a Plants Life!"; "What Is It?"; "This & That!"; "What Can We Do?" or "Why We Need to Know!"
    - Then they choose a point category:
        - 100, 200, 300, 400 or 500
    - The team chooses one person to say … ***"We will take "What is It?" For 200 please!***
        - Explain that they only have 5 seconds to make their choice, otherwise they are disqualified for that round and the choice goes to Team#2, then Team#3 … and so one.
4. Once the team has decided on their question, explain that you will be pulling out that card and reading from it.
    - Everyone must wait for the entire question to be read …
    - Indicate that you have finished the entire question by saying … ***"What is your answer?"***
5. Once the facilitator has asked "What is your answer?" the designated "honker" from all teams can run to their horn.
    - The first horn to honk, can answer the question
    - If the team is correct, they get the indicated number of points
        - Record on whiteboard
    - If the team is incorrect, the other teams have a "honk off"
        - That is, the other teams see who honks first after you finish saying **"Honk Off"**
        - Continue until the correct answer is given
        - If no teams give the correct answer, then read out the right answer and no points are given
    - Now, onto the next question!
6. If a team gives the correct answer, they choose the next category …
    - If no team gave the correct answer, you allow the next team in line to choose the category
        - For example, if Team#1 started, and no correct answers were given, then Team#2 starts the next round … and so on!
7. Play for 5-7 minutes, set the timer!
    - Then play the ***Final Jeopardy Round***
        - Instruct that all teams participate in this round
        - Read the question and the first team to honk gets to answer
        - If they get it right, they get a bonus 1000 points
        - If they do not get it correct, then you read the answer and no one gets the bonus points
    - Quickly add up the teams' points, announce the winning team and congratulate them all for playing "Blooming Jeopardy"!

Additional Background Information:

***Topic Categories*:**

Topic 1 – It's a Plant's Life! (Or Plants and water)
- General questions on plant ecology
- General questions on where oxygen, etc. is in water

Topic 2 – What Is It?
- Algae vs. bacteria
- What is blue green algae
- Cyanobacteria … unique characteristics

Topic 3 – This & That!
- Facts that don't fit under any other categories or extra info
- Toxin vs. poison

Topic 4 – What We Can Do!
- prevention

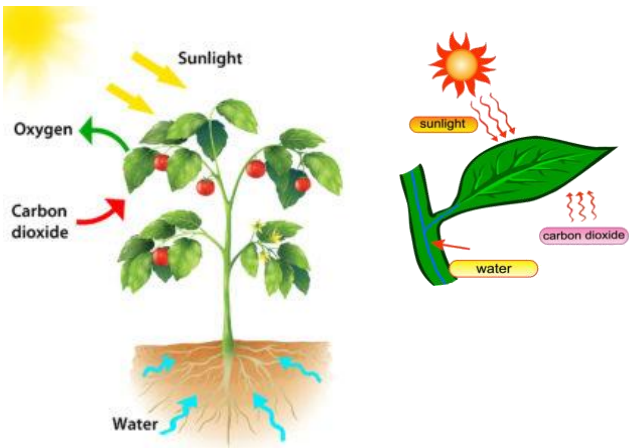
Topic 5 – Why We Need to Know!
- Safety concerns

Question Cards:

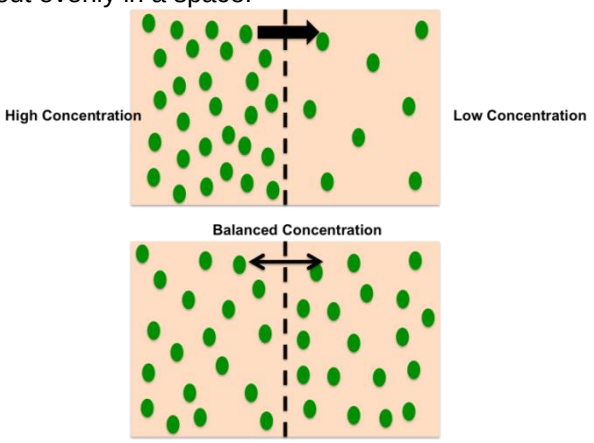
*** indicates the correct answer.

Topic 1 – It's a Plant's Life!

1. Plants use the energy of the sun to make their own food. This process is called …
   a) Photobiosis
   b) Symbiosis
   c) Photosynthesis ***
   - Photosynthesis! Symbiosis is when two different kinds of organisms or living things have a close relationship.
2. Photosynthesis can be broken down into 2 smaller words or parts: “photo” meaning light and “synthesis” meaning, putting together. We know it is a process which produces food for the plant, but what is needed for this food to be made?
   a) Water
   b) Sunlight
   c) Carbon Dioxide
   d) All of the above ***
   - Show poster. Sunlight is absorbed by the green chlorophyll in the leaves (that is why leaves are green). Carbon dioxide is absorbed through small pores in leaves and water is absorbed by the roots.



3. Algae belongs to a group of simple, plantlike organisms that do not have roots, leaves or other structures which is typical of true plants.
   a) True***
   b) False
4. Algae produce more oxygen (as a by-product of photosynthesis) than all plants combined.
   a) True***
   b) False
   - Algae is the most important photosynthesizing organisms on Earth!
5. To make their food, water plants get carbon dioxide (CO^2) from the surrounding water that is found in very tiny bubbles.
   a) True***
   b) False
   - Similar to the bubbles found in soda pop, but even smaller! Water plants take in carbon dioxide and give off oxygen by diffusion. Diffusion is the movement of molecules (like oxygen and CO^2) from an area of high concentration to an area of low concentration. It is the process of the tiny particles spreading out evenly in a space.



Topic 2 – What Is It?

1. Blue Green Algae is an algae?
   a) True
   b) False***
   - Blue green algae is a cyanobacteria!
2. Cyanobacteria are bacteria that live in water and make food like plants do, using photosynthesis
   a) True***
   b) False
3. Fossils of Cyanobacteria, blue green algae, are among the oldest fossils of any life form found on Earth and date back to 3.5 billion years.
   a) True***
   b) False
4. Cyanobacteria, blue green algae, are microscopic and found naturally in all types of water: ponds, rivers, lakes and streams.
   a) True***
   b) False
5. What colour is blue green algae?
   a) Brown
   b) Blue/Green
   c) Orange
   d) Red
   e) All of the above***

- Although the name, Blue Green Algae, makes you think it should only be blue, green or turquoise (even Cyan is a blue green colour), Blue Green Algae can also be brown, orange, red and dark purple!

Topic 3 – This & That!

1. Algae blooms are the flowers produced by algae growing on the surface of the water.
   c) True
   d) False***
2. Normally, blue green algae are not visible in water but populations can grow very quickly causing large masses or scum on and in the water body. This large mass or scum is called …
   a) An Ickyblob.
   b) A bloom.***
   c) A clump.
   - Blooms usually occur in late summer and early fall.
3. Conditions which promote blooms of Blue green algal are:
   a) Shallow water
   b) Slow moving water
   c) Warm water
   d) High nutrients such as phosphorous and nitrogen
   e) All of the above.***
   - Blue green algal blooms can be caused by runoff from agricultural, urban and storm water as well as leaching from septic systems.
4. What is a toxin?
   a) An unnatural chemical that is created in a lab and is harmful if ingested.
   b) A natural chemical produced by biological processes and affects normal functions of other organisms.***
   c) A natural chemical found only in plants.
5. Toxin, poison and venom all mean the same thing?
   a) True.
   b) False.***
   - Toxin, poison, and venom are similar but are not the same! Poisons and venoms are toxins. Poisons are ingested (like some amphibian secretions are deadly or taste really bad if eaten) and venoms are injected (like a snake will bite and inject its venom). Toxin describes the natural chemical produced that alters the normal function of another organism.

Topic 4 – What Can We Do!

1. Phosphate is a leading nutrient in Ontario contributing to blue green algal blooms and is found in many of our cleaning products.
   a) True ***
   b) False
   - Use phosphate free detergents, personal care and household cleaning products.
2. Garden and lawn fertilizers are filled with nutrients such as nitrogen and phosphate. These help our garden plants grow but if they run into our water systems, they can also help increase blue green algae growth!
   a) True ***
   b) False
   - Fertilizers are meant to help plants grow; therefore they will help water plants grow too … including blue green algae! Avoid using fertilizers on gardens and lawns close to water bodies.
3. If you live on a lake or on a river front, you should ...
   a) Clear all shrubs and trees and plant grass down to the water's edge.
   b) Replace all shoreline vegetation with sand.
   c) Maintain a natural shoreline with shrubs and other shoreline plants.***
   - Natural shorelines with shoreline, or riparian, vegetation act as a buffer and slows down runoff and helps absorb nutrients.
4. Agricultural runoff can be reduced by ...
   a) Minimizing fertilizer use.
   b) Planting and maintaining vegetation along waterways.
   c) Keeping livestock out of waterways
   d) All of the above.***
5. Modern septic systems are good for a life time and once properly installed do not need to be checked on.
   a) True.
   b) False.***
   - Septic systems should be checked on a regular basis to ensure that they are not leaking into the surrounding ground and eventually water system!

Topic 5 – Why We Need to Know!

1. All cyanobacteria (blue green algae) blooms produce toxins and are dangerous to our health?
   a) True.
   b) False.***
   - Not all cyanobacteria (blue green algae) blooms are toxic, in fact most are harmless. There are many different types of these bacteria and most do not produce toxins. **BUT** a few produce toxins that can be harmful to people and pets! Unfortunately, you can't "see" the toxins and it's not possible to know if it will hurt you. Therefore, it is important to report and stay away from any blue green algal blooms.
2. You can see and smell the toxins produced by Blue green algae (cyanobacteria).
   a) True.
   b) False. ***
   - No! You cannot see, smell or taste the toxins produced by cyanobacteria or blue green algae!
3. Swimming in Cyanobacteria (Blue green algae) blooms can cause ear, eye and skin reactions?
   a) True.***
   b) False.
4. Any toxins in water with Blue green algae are killed if you boil the water long enough.
   a) True.
   b) False.***
   - Never drink water from a source which has blue green algae! Do not cook or clean dishes with the water either. You can't see or smell any toxins which may be harmful to you therefore it is not possible to know if that blue green algae (cyanobacteria) is producing any dangerous toxins. Therefore … be safe and stay away!
5. Toxins from blue green algae blooms can cause serious harm to pets and livestock if they drink from water sources with blue green algae (cyanobacteria) blooms.
   c) True.***
   d) False.***
   - Just like people, animals can be affected by contaminated water. If animals ingest contaminated water it can cause serious illness and sometimes death.

FINAL JEOPARDY QUESTION

If you see that your lake has a thick soupy/painty like scum on top that is coloured, you should…

a) Avoid going in the water and ignore it.
b) Avoid going in the water or playing in it.
c) Avoid going in the water or playing in it and keep your pets away.
d) Avoid going in the water or playing in it and keep your pets away. Tell an adult and report to the Ministry of Natural Resources! ***

Clean Up Procedures:

- Collect all category cards and arrange in order (100's together, 200's together, etc.)
- Place cards in Ziploc.
- Gather and place horns into bin.
- Clean off whiteboards and place into bin.
- Place white board markers and eraser into bin.
- Place glasses, timer and calculator into bin
- Put bin by Game board.
- Gather hoola hoops and place under bin. If pylons are used, they may fit inside bin.