

Seagrass: Send me over!

Objectives:

At the end of the activity students will have a better understanding of the role and purpose of lush seagrass beds on sand and sediment trapping, how these seagrass beds help stop sediment erosion and movement, and how seagrass provides habitat for permit and their prey.

Differentiation:

Students with differing abilities in terms of walking/running or putting their arms out can be the “caller” in place of the teacher. Students could also complete the activity with a “buddy” who helps them go to the other group of students. For students who have verbal ability issues the teacher can meet with them one on one to discuss their experience within the activity.

Lesson background:

Seagrass plays an important role in stopping erosion and catching sediment in place. This aids in the building of sandbar areas and most importantly offers a home, hiding place and protection to many species who live in the estuary and nearshore environments where seagrass is often found. Seagrass is also a primary producer, meaning that it is the first “rung” of many food chains/webs and seagrass plays a very important role in the diets and life cycles of many species. It is imperative that students understand and can synthesize this information into their own words. Studies have shown that active learning is a wonderful way to take classroom material outside and also aides in the retention and understanding of material introduced.

Florida State Standards (NGSSS)

- SC.4.L.17.4: Recognize ways plants and animals, including humans, can impact the environment.

National Standards (NGSS)

- 4-LS1-1: Structure & Function
- 4-ESS2-1: Earth Materials & Systems
- 5-LS2-1: Interdependent Relationships in Ecosystems
- 5-ESS3-1: Human Impacts on Earth Systems

Activity:

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Procedure:

- Prior to teaching the lesson the teacher should review the reading pages about permit and seagrass. He/she should become personally familiarized with permit and seagrass to best be prepared to present the material to the students.
- Prior to this outside activity it might be a great time to review expectations in terms of noise level, safety, courtesy to others and the fact that this lesson involves running and calling to classmates and that it is intended to be a “fun” activity. _____

This activity is to be done after the readings on seagrass and permit have been completed. After the readings students should discuss the importance and value of seagrass as well as the environmental purpose of seagrass. This activity is much like the old favorite game “red rover” but with seagrass as the focus. The lesson was developed with a class count of about 25 in mind but can easily be increased or decreased to meet your personal class size and space allotment. The activity would best be done in an open area (like a field or playground) where running and being loud would be acceptable. Feel free to change the activity as needed to meet the needs of your students and the available play space.

- Ask students if they have ever played the game “red rover”. Many likely have. Ask them to raise their hands and tell the class what they know about the game and how it is played. Once students have a general idea of how the game red rover is played explain to them that they are going to be playing a similar game today, but they will have a “role” to play in addition to just playing the game. Some students will be “sand” and some students will be “seagrass” when they play the game today. You will be dividing the class into these roles and the number of sand and the number of seagrass will change as the game goes on. You might want to explain that as the game is played you will be stopping in between sessions to ask questions and let them discuss points and that their active participation in the discussions is vital for them to be able to continue playing the fun part of the game.
- Taking the class of 25 (this can go up or down based on your actual class size) you should **break the class into a group of 20 “seagrass” and 5 “sand” kids**. The 20 seagrass kids should go to one side of the field and the 5 sand kids should go to the other side of the field. ****There needs to be some sort of marking showing the left and right boundary for where the students can stand. This will be vital to show the point that less seagrass means more sediment gets through. These boundaries will stay the same the entire activity**** The seagrass kids should put their arms out and just hold their arms out, not locking hands like a normal game of red rover would but just “flowing in the water” like a blade of sea grass would do. These kids might (should) be reminded that the goal is not to get hurt or hurt anyone but they are just going to be simulating what sea grass might do in the water. The sand kids will stand on the other end and the teacher will be the caller who calls which student to come over (all 5 will come over eventually). The seagrass kids with the prompting and aid of the teacher will call:

“Seagrass, seagrass, that waves and bends,
send (insert kids name here) over to your seagrass friends!”

- The student called will come running across and try and make it through the crowd of seagrass without being touched (this will be nearly impossible to do) and each sand student will be called over one at a time.
- After all the students who are “sand” have been called over the class should come into a group and the teacher should lead a discussion about what just happened with the following questions:
 - We had 5 friends come through the seagrass. How many of them got “touched” by the seagrass? (The answer is likely all of them.)
 - What would you call this amount of seagrass? (Words like lush, full, crowded, etc. are fitting.)
 - Would you consider this a healthy seagrass bed with lots of seagrass? (Yes or no and push them to explain why/why not.)

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- Now break the group up again with a new number of sand and seagrass. This time there should be less seagrass and more sand. ****It is important to keep the seagrass kids within the same boundary as the lesson started with**** **The number of seagrass should be 15 and the sand should be 10.** The procedure of calling sand over should be repeated and the discussion questions asked again. The question “how did this compare to when we had 20 seagrass friends” should be asked and a discussion relating to this should be pursued. The takeaway point is that there were less seagrass kids and more sand got through. It should also be deduced that the seagrass bed was less full, lush etc then it was when there were 20 seagrass kids.
- You should lead a discussion about what just happened with the following questions:
 - We had 10 friends come through the seagrass, how many of them got “touched” by the seagrass? (Likely most of them, maybe not all.)
 - What would you call this amount of seagrass?
 - Would you consider this a healthy seagrass bed with lots of seagrass? (Yes or no and push them to explain why/why not.)
- Now **break the class into 10 seagrass and 15 sand.** Repeat the exercise and the questioning. It should be getting clearer that the number of seagrass has a dramatic impact on if the sand is touched or not.
- **Finally break the class into 5 seagrass and 20 sand.** This should demonstrate what a barren seagrass bed looks like. This portion should lead to a more robust discussion on the impacts of seagrass and now you can introduce and really emphasize the concept that if there was no seagrass what would happen. Touch on the following points in this final discussion:
 - We know that seagrass catches sand and sediment. What do you think would be happening to the sand and sediment in a seagrass bed that was as barren as our last bed was? (They should be able to verbalize that the seagrass wouldn't stop much sand and that there would be lots of sand moving around.)
 - When they get to the understanding that the sand would be moving all around, touch on the water clarity and how much clarity there would be with that much sediment moving around. You can trigger their prior knowledge at this point by asking them if anyone has ever walked on a river or lake bed with no seagrass or rocks and mud in it? What happened to the water? How clear or murky was it before you walked and compare that to after you walked through it. Now ask them how they think the water would look on that seagrass bed when the wind kicked up and the waves increased?
 - Point out that they learned about photosynthesis. What were some of the things needed to complete photosynthesis? Light will be one thing that should be named. Use this as your opportunity to point out how little light will be getting to that seagrass when the water is murky and full of sediment. This will make the grass unable to do photosynthesis and lead to death or at the very least inadequate growing.
- Your goals for leading this discussion should be the following takeaways:
 - Seagrass is important at stopping sediment and sand from moving around in the aquatic environment.
 - Seagrass beds need to be lush in order to stop sediment transport and also lush to provide habitat for animals that require it.
 - Seagrass beds can change over time due to natural and human impacts.
 - Seagrass beds need clear water to do photosynthesis.
 - Seagrass beds are vital and should be protected and respected for the role that they play in the ecosystems in which they are found.

Activity Rubric:

Area	1 Does not meet expectations	2 Partially meets expectations	3 Meets expectations	4 Exceeds expectations
Science Content	NONE of the discussion questions are answered and students appear to be lost as to the concept being presented.	SOME of the discussion questions are answered and students appear to be lost as to the concept being presented.	MOST of the discussion questions are answered and students appear to have a general and adequate grasp as to the concept being presented.	ALL of the discussion questions are answered and students appear to have a fully developed and above grade level grasp as to the concept being presented.
Use of science vocabulary	NONE of the introduced scientific vocabulary is present in the discussion portion of the activity	SOME of the introduced scientific vocabulary is present in the discussion portion of the activity	MOST of the introduced scientific vocabulary is present in the discussion portion of the activity and they are using vocabulary that has not been directly introduced	ALL of the introduced scientific vocabulary is present in the discussion portion of the activity and students are bringing in outside experiences and complex understandings to the discussions.
Writing fluency	This activity does not address writing	This activity does not address writing	This activity does not address writing	This activity does not address writing
Sportsmanship	Students are not able to follow directions and the activity had to end early.	Students are having difficulty following directions and the activity had to end without full discussion.	Students are able to follow directions and the activity was completed with discussion.	Students were able to complete the activity and participate in a deep discussion on the subject.