Marine Mystery – A Watery Who-dunnit!

Roles
1 police commissioner (instructor): guides the activity

15 students:
1 police deputy: conducts the investigation (needs badge and/or whistle)
4 suspects
   - Glowball warming
   - Seddi Mentation
   - All-gal Bloom
   - Industrial plant

4 witnesses: provide accounts that implicate suspects
3 scientists: analyzes DNA samples (need lab coats and safety glasses)
3 jury members: collect evidence and decide who is guilty

IMPORTANT – FOLD AND SEAL THE BOTTOM THIRD OF THE SCRIPTS FOR JURORS
2 AND 3 – THE GUILTY SUSPECT IS REVEALED IN THEIR SCRIPTS, SO IT IS
IMPORTANT THAT THEY DON’T READ THIS INFORMATION AHEAD OF TIME!

Schedule (two hours total)
Introduction to corals and threats to reef health (30 min)
   Ask kids to look through vocabulary list to see if there is anything they don’t understand
   Review rules: 1. Listen when someone else is talking; raise your hand to ask a question.
   2. You are only allowed to find one clue. 3. Everyone must circle up and
   share the evidence before moving to the next station.

Orientation to roles (15-20 min)
   - Kids get a profile packet and practice their lines
   - Dress up in costume
   - Learn about their organism

Town Hall meeting (20-25 min) FULL SCRIPT:

   - Police commissioner (P.C.) will announce the missing zooxanthellae and Seymour
     Coral’s death and will ask for help with the case.

   - PC: “Good evening, I am Police Commissioner Sharky and this is Deputy Zebra
     Moray. I have invited you all here tonight to share the news of a tragic loss in our
     community. Mr. Seymour Coral was found dead in his garden early this morning.
     His zooxanthellae are also missing. We have not yet concluded whether they are still
     alive. I know that this is a terrible shock, but I need your help to find and collect
     evidence.”
DM: “We have a handful of witnesses that saw our wanted poster and have courageously come here to report information. Please state your name and position and what you saw or heard. Let’s start with the crab.”

Witnesses will share information that implicates different suspects

- Crab: “Hi, my name is Pinchy and I’m the local gardener. Last week, while I was trimming my limu, I smelled weird chemicals coming out of the Industrial Plant. They looked kind of greasy and shiny. I think they may have been toxic.”

- DM: “Hmmm…that’s rather strange. We’ll certainly need to follow up on that. What does the Lionfish have to share?”

- Lionfish: “Hello, my name is Dr. Simba, and I was the victim’s doctor. Last month, he complained of fevers and low blood sugar. This can happen sometimes when ocean temperatures rise. But when I followed up the next week, he seemed fine.”

- DM: “That seems reasonable. And what did the pencil urchin see?”

- Urchin: “My name is Pokey, and I am, well I was (*choke*, *sob*) Seymour’s neighbor. He was such a friendly coral head.”

- DM (sympathetically): “Yes, yes. Please continue.”

- Urchin: “Well, I saw Seymour fighting with Seddi Mentation a few days ago. Seddi was trying to smother Seymour and wouldn’t leave him alone. Now I feel like I should have done something!”

- DM: “Well, don’t you worry about that now. Let’s hear from our last witness, the octopus.”

- Octopus: “My name is Tako Bell, and I deliver the mail. I was taking a package to old Mrs. Manini when I saw a cloud pass over head. But this cloud hung around for a while. I then realized that it wasn’t a cloud but that All-gal Bloom was in the neighborhood and casting us into shadow. Brrr….she gives me the shivers!”

- P.C. recaps the witnesses’ information and has everyone identify the four suspects.

- PC: “Alright, let’s review and have the suspects come up to the front. Who did Pinchy think was responsible? Who did Dr. Simba suggest was guilty? That’s right, and what did Pokey witness? And finally, who did Tako Bell say he saw? OK, Deputy Moray, let’s hear what our suspects have to say.”

- The P.C. and Deputy will provide potential motives/methods and ask for alibis

  - DM: “Industrial Plant, let’s start with you. Please explain why strange chemicals were coming off of your property last week.”
IP: “No problem. I owners care a lot about the environment and I have very strict rules about my waste products. While they may not smell very good, all of my waste has been treated and breaks down naturally in the environment. I promise that these chemicals were not toxic.”

PC: “Hmmm…that doesn’t sound so bad, but depending on how our investigation goes, we might want to test those so-called safe chemicals anyway. And how about you, Glowball Warming? Dr. Simba said that Seymour was suffering from fevers and low blood sugar. You know that warming up the oceans can cause zooxanthellae to abandon the coral, which can slowly starve the coral?

GW: “No way! Dr. Simba said that Seymour looked just fine after his first visit. Plus, if Seymour’s zooxanthellae left him, then where are they? Without them to ask, you’ve got no evidence against me!”

PC: I’m not so sure about your story, but why don’t we hear from Seddi Mentation. Seddi, you can smother the reef with soil particles and were seen bullying Seymour. What do you have to say for yourself?”

SM: I only really cause trouble when dirt gets washed off land during big storms, and there haven’t been any for weeks. I didn’t do it!

PC: That’s true, hmmm. OK, what about All-gal Bloom? You can multiply quickly and block out light that zooxanthellae need for photosynthesis. How do we know you didn’t starve them of light and cause Seymour’s death?

AB: The winds have been strong and blew me right out of town. I didn’t hang around long enough to cause that much trouble.

PC: All of you have decent alibis, but let’s review the facts.

DM: We now need our scientific team to sample your DNA before we release you.

Scientists collect DNA samples from the suspects and take turns explaining what it is and how they will use it. (Place DNA strands into plastic baggies)

- Cowfish: “Hello, everyone. I am Dr. Moo, and these are my assistants, Skippy and Bacon. We are collecting DNA, which is the microscopic genetic material found in every living thing.”

- Hogfish: “DNA is very delicate, so you have to be careful when handling it.”
- Sea Hare: “Even though two individuals may be from the same species, some of their DNA is just different enough to be able to tell them apart, just like a fingerprint.”

- Cowfish: “But DNA is even better than a fingerprint, because it’s found in almost everything: blood, saliva, bones, hair, and even fish scales!”

- Hogfish: “So if we find even a little bit of one of these things at a crime scene, we can figure out who was responsible by matching it to a sample we collect from a suspect.”

- Sea Hare: “I’ll pass my samples around so that everyone can see that no two individuals have exactly the same DNA.”

- PC: “OK, does everyone understand what DNA is?

- PC: “In my experience solving reef mysteries, I’ve found that suspects always leave behind 3 pieces of DNA, so it’s important to find all three before moving on to the next site. Alright everyone, it’s time to start the investigation. Let’s begin at the crime scene.”

Search for clues and analyze DNA (30 min)
- The investigation will start at Seymour’s body, and then six different clues plus DNA fragments will lead the group to 5 other sites.
- A clue is found at Seymour’s body and leads the group to the next station.
- Three* identical DNA fragments near the station match 3 of the suspects (GW, SM, and AG) but are too small to distinguish among them.
- A second clue leads the group to the next station, where another set of DNA fragments that match GW and AG is found, as well as a third clue.
- The group eventually arrives at the next station where a fourth clue is found, which leads the group to another station.
- A fifth clue is found that leads the group to the next station where a key is found.
- The only suspect missing a key is AG. The group goes to his/her house and the group finds the zooxanthellae are held captive there.
- But! Another set of DNA strands that matches GW’s DNA is found and incriminates him/her.

*Placing 3 identical DNA fragments at a station allows the students to break into smaller groups so that everyone can participate in analyzing the DNA.

Court hearing, verdict, and recap of lesson (10-15 min)
- PC: “Will the jury please take a few moments to discuss the case and report the verdict?”
- Butterflyfish (juror #1): “With 4 different suspects and many pieces of information from witnesses, it was difficult to figure out who was responsible.”
- Tiger Cowry (juror #2): “But then we found Glowball Warming’s DNA at All-gal Bloom’s house with the missing zooxanthellae, and it became clear who did it.”
- Sea Horse (juror #3): “Therefore, we have decided that Glowball Warming was responsible for driving the zooxanthellae away from Seymour, which resulted in his death!”
- Butterflyfish (juror #1): “Police Commissioner, lock him up!”
- GW – “This isn’t fair! Those darn zooxanthellae were stealing my greenhouse gases!”