



Khaled bin Sultan
Living Oceans
Foundation

STANDARDS

- **CCSS:** RST.9-10.1, 2, 3, 4, 5, 6, 7, 8, 9, 10; RST.11-12.1, 2, 3, 4, 6, 10; SL.9-10.1, 6; SL.11-12.1, 6
- **NGSS:** HS-LS2-8
- **OLP:** 5.C.44, 5.C.47, 5.C.48, 5.C.50, 5.C.53, 5.C.54, 5.C.55, 5.C.56

ONLINE CONTENTS

- [Coral Reproduction Quiz](#)
- [Corals: The Birds and the Bees Video](#) How do coral colonies ensure their own survival generation after generation? Corals reproduce sexually (mass spawning and brooding) and asexually (budding and fragmentation).

CORAL REPRODUCTION

This lesson is a part of the *Coral Reproduction* unit, which explains different strategies that corals use to reproduce. Below is a summary of what is included in the entire unit.

UNIT CONTENTS

A. [Background Information](#)

- Reproduction
- Sexual Reproduction
- Asexual Reproduction

B. Lessons

[Watch it! Birds and the Bees](#)

- A worksheet to accompany the [Birds and the Bees](#) video

[Safety in Numbers](#)

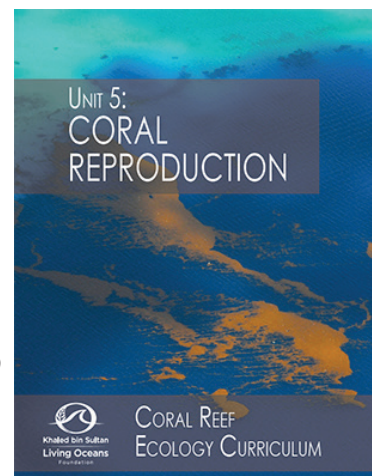
- A game of tag adapted to learn the advantages of mass spawning

[Comic Clones](#)

- An activity to make a comic strip describing a form of asexual reproduction

[Read it! Rolling Stones](#)

- A worksheet to accompany the [Rolling Stones](#) field blog



LESSON 1

SAFETY IN NUMBERS

INSTRUCTIONS: Mass spawning takes advantage of the concept, safety in numbers. Answer the following questions regarding these concepts.

1. Define mass spawning.
2. What does the phrase, safety in numbers, mean to you?

You will demonstrate the concept of safety in numbers by playing a version of the game Tag. There are two types of players: gametes and predators.

Gamete: Your goal is to be released from your parent on the bottom of the water column (original end of the field), get up to the surface (opposite end of the field) to become an embryo, then get back to the bottom (original end of the field) to settle and grow into an adult coral.

Predator: You are “it”! Your goal is to eat (“tag”) as many gametes as you can.

RULES:

1. Predators start at the surface; gametes start at the bottom. Look at *Data Table 1* to see how many of each should be in each round.
2. When gametes are released (i.e., teacher says, “Go!”), they will race to the surface, while trying to avoid predators.
3. The surface is a safe zone. Predators cannot enter this area. Gametes may stay for a maximum of fifteen seconds before they head back to the bottom; once gametes leave the surface, they may not go back.
4. All gametes who make it all the way to the surface and back to the bottom are counted and recorded at the end of the round. (Congratulations! You get to grow into an adult coral!)
5. Gametes that are “eaten” by a predator at any time, will not become an adult and should join the teacher on the sidelines.
6. Everyone must stay in bounds, at all times, or you will “dry out.” If this happens, join your teacher on the sidelines.

DATA TABLE 1:

Round	A. Number of Predators	B. Number of Gametes (at start)	C. Number of Gametes who reached adulthood	D. Gamete Success Rate (B-C) / B x 100
1	3	3		
2	3	6		
3	3	10		
4	3	20		
5	3	25		

INSTRUCTIONS: Answer the questions below.

1. How do corals and other organisms benefit from Safety in Numbers?
2. How did this version of Tag illustrate Safety in Numbers?
3. Can lone gametes be successful? Give an example from today's Tag activity in your explanation.
4. Which role did you play today? Now that you have played this game, how would you change your strategy (or how did you change your strategy, if you played more than one round)?
5. How would you change this game to make it better illustrate the concept of Safety in Numbers?
6. List the best set of three traits you think would be necessary to survive in the wild. Explain why you chose this set of traits.