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

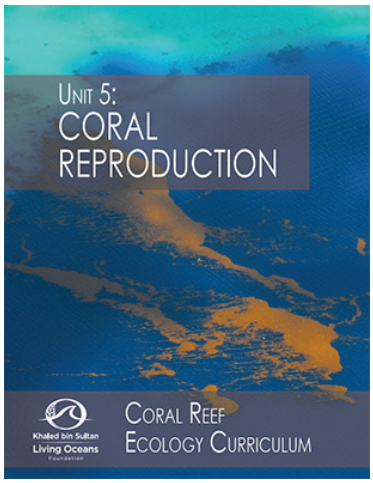
ONLINE CONTENTS

- 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

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WATCH IT! Birds and the Bees

INSTRUCTIONS: Watch *Birds and the Bees* YouTube video (*https://youtu.be/rpKSQM2cDk0*) and answer the following questions.

1. What percentage of the ocean floor is covered by coral reefs? _____
2. Why are coral reefs important?

   _____

   _____
3. What are the two types of coral reproduction? Define each type.

   a. _____

   b. _____
4. What is a mass spawning?

   _____

   _____
5. What is a gamete?

   _____

   _____
6. What type of reproduction is a mass spawning? _____
7. Who else benefits during a mass spawn?

   _____

   _____
8. What is a planula?

   _____

   _____
9. What is brooding?

   _____

   _____
10. What type of reproduction is brooding? _____

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WATCH IT! Birds and the Bees

11. What is one benefit that brooders have over mass spawners? Explain.

_____

_____

12. What is budding?

_____

_____

13. What type of reproduction is budding? _____

14. What is fragmentation?

_____

_____

15. What type of reproduction is fragmentation? _____

16. Why do corals need to reproduce? Explain.

_____

_____

_____

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WATCH IT! Birds and the Bees

VIDEO SCRIPT:

Coral reefs only make up about one percent of the ocean floor, but they help support up to thirty percent of the ocean's fish.

Without the nutrition and shelter coral reefs provide, many other creatures too couldn't survive.

But how do coral colonies ensure their own survival generation after generation?

Well, birds do it, bees do it, and even corals do it.

Reproduce, create offspring that keep their species going.

Corals use two reproduction techniques: sexual, requiring both males and females; and asexual, by themselves.

The most common kind of sexual reproduction is called mass spawning. This happens when corals release their eggs and sperm, called gametes, into the water.

Regionally, each coral species spawns at the same time. That's because most corals can't move, so they can't come into reproductive contact.

Instead, scientists think they release large amounts of eggs and sperm when triggered by environmental cues, like temperature and the phase of the moon.

For fish and invertebrates, coral spawning means a feeding frenzy!

At spawning, male and female gametes combine and form a free-floating planula, or coral larva.

Tiny planulae can drift for weeks in ocean currents before settling on a hard surface, like rocks, and developing into the corals that make up a reef.

In another kind of sexual reproduction called brooding, male corals release sperm into the water.

The sperm can be taken in by female corals, which contain eggs.

Fertilization occurs inside the female.

The planulae exit through the coral's mouth when they're mature, so they can settle sooner.

With less distance to travel, planulae created by brooding are less likely to be eaten.

Then there's asexual reproduction, which takes place in several ways.

One of the most common is budding.

When a mature coral polyp reaches a certain size, it starts to divide first elongating, then forming two mouths, and finally separating into two polyps.

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WATCH IT! Birds and the Bees

This process is called budding.

It continues throughout the coral colony's life. The constant addition of new polyps allows corals to grow, creating the foundation of the reef.

Storms and hurricanes can trigger another kind of asexual reproduction called fragmentation.

When corals are broken, they can reattach, just like some plants do, and grow into a new coral colony.

Sexual and asexual reproduction have given corals a brilliant assortment of techniques to ensure that they survive from one generation to the next.

That's good news for the multitude of ocean animals that make coral reefs their home.

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