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

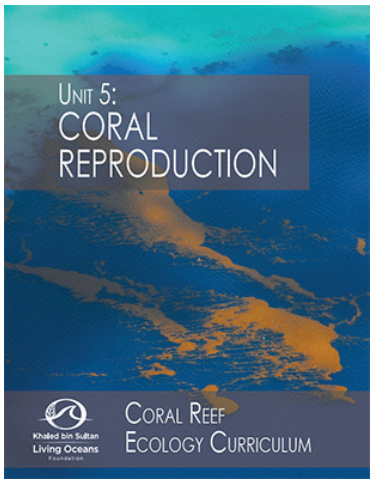
## ONLINE CONTENTS

- 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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# LESSON 2 TEACHER'S NOTES

## AUTHORS

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## LEARNING OBJECTIVES

- Define fragmentation, fission, bailout, and budding.
- Describe one of the four types of asexual reproduction found in corals.

## KEYWORDS

- Asexual Reproduction
- Bailout
- Budding
- Extra-tentacular Budding
- Fission
- Fragmentation
- Intra-tentacular Budding
- Polyp

## MATERIALS

- Colored pencils, crayons, or markers
- **Watch It! Birds and the Bees** student worksheet
- **Lesson 2: Comic Clones** student worksheet

## EXTENSION

- Display the comic strips around the classroom or school building. Have the class critique each one, explaining what is correct or incorrect and how they would improve each strip.

## EVALUATION

- Use the grading rubric.

## STANDARDS

- CCSS: RST.9-10.4, 5, 7; RST.11-12.4; SL.9-10.1, 6; SL.11-12.1, 6
- NGSS: HS-LS2-8
- OLP: 5.C.44, 5.C.47, 5.C.48

## PROCEDURE

1. Watch *Birds and the Bees* YouTube video (*https://www.youtube.com/watch*) and answer questions on **Watch It! Birds and the Bees** student worksheet.
2. Teach *Background Information* section B*) Asexual Reproduction*.
3. Hand out **Lesson 2: Comic Clones** student worksheet and go over the grading rubric.
4. Students will work in pairs to design a comic strip version of one of the four forms of asexual reproduction (fragmentation, fission, bailout, or budding). Encourage creativity in creating characters (e.g., to represent the corals, their offspring, or a narrator).
5. Get students to volunteer to present their comic strip to the class. Try to have a presentation of at least one depiction of each form of asexual reproduction.

 Name: _____ Date: _____

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# LESSON 2 COMIC CLONES

It's time to make some new corals! But how do these animals reproduce? Many corals can reproduce *asexually*. That means new organisms are created from a single organism – they clone themselves! There are four ways corals reproduce asexually: *fragmentation*, *fission*, *bailout*, and *budding*. Now that we know how corals make new corals, it's your turn to draw the reproductive cycle!

## INSTRUCTIONS:

1. Define the types of asexual reproduction in the space below.

| Type | Definition |
|---|---|
| Bailout | |
| Budding | |
| Fission | |
| Fragmentation | |

2. Choose one of the four types of asexual reproduction found in corals.
3. Make a cartoon strip about your chosen type of asexual reproduction by dividing the large box, on the following page, into 4-6 smaller boxes. Work with a partner to come up with a story and character(s) to demonstrate the process corals go through to make new corals.

Cartoon Strip Title: _____ By: _____

## GRADING RUBRIC:

| Category | 4 | 3 | 2 | 1 | Score |
|---|---|---|---|---|---|
| **Neatness** | Images are neat and attractive to the eye. | Images are attractive to the eye. | Images are messy, but still mostly attractive. | Images are messy and distracting. | |
| **Complete Information** | Comic strip includes all of the information in the definition. | Comic strip includes more than half of the information in the definition. | Comic strip includes more than a quarter of the information in the definition. | Comic strip includes less than a quarter of the information in the definition. | |
| **Organization** | Exceptionally clear, logical, and thorough development with excellent transitions between comic strip frames. | Clear and logical order with good transitions between comic strip frames. | Somewhat clear and logical development with basic transitions between comic strip frames. | Lacks development of ideas with weak or no transitions between comic strip frames. | |
| **Grammar/ Spelling** | Comic strip is free of errors. | Comic strip has only 1-2 errors. | Comic strip has 3-5 errors. | Comic strip has more than 5 errors. | |
| **TOTAL** | | | | **Out of 16:** | |

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## INSTRUCTIONS:

1. Define the types of asexual reproduction in the space below.

| Type | Definition |
|---|---|
| Bailout | **A form of asexual reproduction where a single polyp abandons its colony and settles on substrate to create a new colony.** |
| Budding | **A type of asexual reproduction where a portion of the parent polyp pinches off to form a new individual.** |
| Fission | **A type of asexual reproduction where some coral colonies have the ability to split into two or more colonies, during early developmental stages.** |
| Fragmentation | **A type of asexual reproduction when a coral is intentionally or unintentionally broken off from the parent coral.** |

2. Choose one of the four types of asexual reproduction found in corals.
3. Make a cartoon strip about your chosen type of asexual reproduction by dividing the large box, on the following page, into 4-6 smaller boxes. Work with a partner to come up with a story and character(s) to demonstrate the process corals go through to make new corals.