

Pre-K & Kindergarten Lesson Plan

Caterpillars of the Ocean: Larval Coloring Pages

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1. Title & Grade Level

Caterpillars of the Ocean: Larval Coloring Pages (Pre-K & Kindergarten)

2. Lesson Summary

Many deep-sea animals have a two-stage life cycle similar to those of butterflies. As students may have learned before, butterflies spend the first part of their lives as caterpillars which is the larval stage. Caterpillars go through a metamorphosis to become the butterfly which is the adult stage.

Students will be introduced to the idea of life cycles. *The Very Hungry Caterpillar* by Eric Carle is read aloud to the class to illustrate that a baby's job before metamorphosis is to eat. Students will explore the growth needs of animals, focusing on the idea that animals need to eat to gain energy and grow. Students will answer a few follow-up questions before coloring their own marine babies on the deep-sea coloring pages.

3. Objectives

- a. Introduce students to the concepts of life cycles and metamorphosis.
- b. Students explore that animals need food to survive.
- c. Students observe that larvae (babies) and adults do not always look alike.

4. Estimated Time

30-60 minutes

5. Alignment with Next Generation Science Standards**K-LS1-1 From Molecules to Organisms: Structures and Processes**

Use observations to describe patterns of what plants and animals (including humans) need to survive. Performance Expectation Grade: K-2, K

6. Alignment with Ocean Literacy Principles

OLP 5: The ocean supports a great diversity of life and ecosystems

7. Focus Question: How are babies of some marine animals the same as caterpillars?**8. Materials**Included:

- a. Coloring pages to print
- b. Background information
- c. Diagram of butterfly life cycle

Not Included:

- a. Coloring supplies
- b. *The Very Hungry Caterpillar* by Eric Carle

9. Preparation

- a. Review the background information and lesson steps below
- b. Print out coloring pages
- c. Gather coloring supplies
- d. Find the book *The Very Hungry Caterpillar* by Eric Carle
- e. Review the [Larval Biology Basics page](#) on the Born in the Abyss Website (Optional)

10. Lesson Steps

Step one: Read the book *The Very Hungry Caterpillar* by Eric Carle to the class.

Step two: Ask students what animals, including humans, need to survive. Answers might include food, water, and shelter. In thinking about food, challenge them to think of any animals that don't need to eat to grow. Lead them to understand that eating is fundamental to animals' needs and provides the energy for their growth into adulthood.

Step three: Discuss how the job of a baby caterpillar is to eat so that it can go through a big change to become a butterfly. Consider watching the time-lapse of caterpillar metamorphosis (linked below).

Step four: Share that many animals in the ocean, including sea stars, sea urchins, snails, and others, have a similar life cycle with tiny babies that have to eat a lot to reach a big change (metamorphosis) that turns them into an adult.

Step five: Give students independent time to color their marine larvae coloring pages.

Step six: Use the provided answer key to point out examples of baby and adult pairs on coloring page 2 (point out baby sea urchin and adult sea urchin, for example).

11. Extensions

- a. Watch this video to learn see a time-lapse of caterpillar metamorphosis:
 - i. [Monarch Butterfly Metamorphosis](#)
By FrontYardVideo on YouTube
- b. Visit the [Born in the Abyss website](#) to view life cycle diagrams and videos for each of the marine babies on the coloring pages.

12. References

[Next Generation Science Standards](#)
[Ocean Literacy Principles Handbook by NMEA/NOAA](#)
[Born in the Abyss Film Website](#): Larval Biology Basics from Marine Larvae
 Exhibit at the University of Oregon's [Charleston Marine Life Center](#)
 Butterfly Background Information from [butterfly-conservation.org](#)

13. Background Information:

Butterfly Life Cycle [Click this link to learn more](#)

Egg – Adult butterfly mothers look for specific plants to lay their tiny eggs on. They use a special glue to stick their eggs to plants that their babies will eat when they are ready to hatch.

Larva (Caterpillar) – The soft and delicate larvae that hatch from butterfly eggs are known as caterpillars. They are usually multi-colored or camouflaged, and many caterpillars are hairy, since the hairs can protect them from other insects and some birds that might want to eat them. Caterpillars spend almost all of their time eating, and they also can shed their skin, just like snakes, many times during this stage, which can last for a few weeks or months.

Chrysalis – When a caterpillar is ready, it finds a hidden place, usually on the underside of a leaf, to stick itself to and then covers itself with a hard shell. Inside, it begins to grow and change. During this stage, it is called a chrysalis. The chrysalis starts to grow all the parts we recognize in butterflies, including wings, legs, and a mouthpart. This stage may last a few weeks or months.

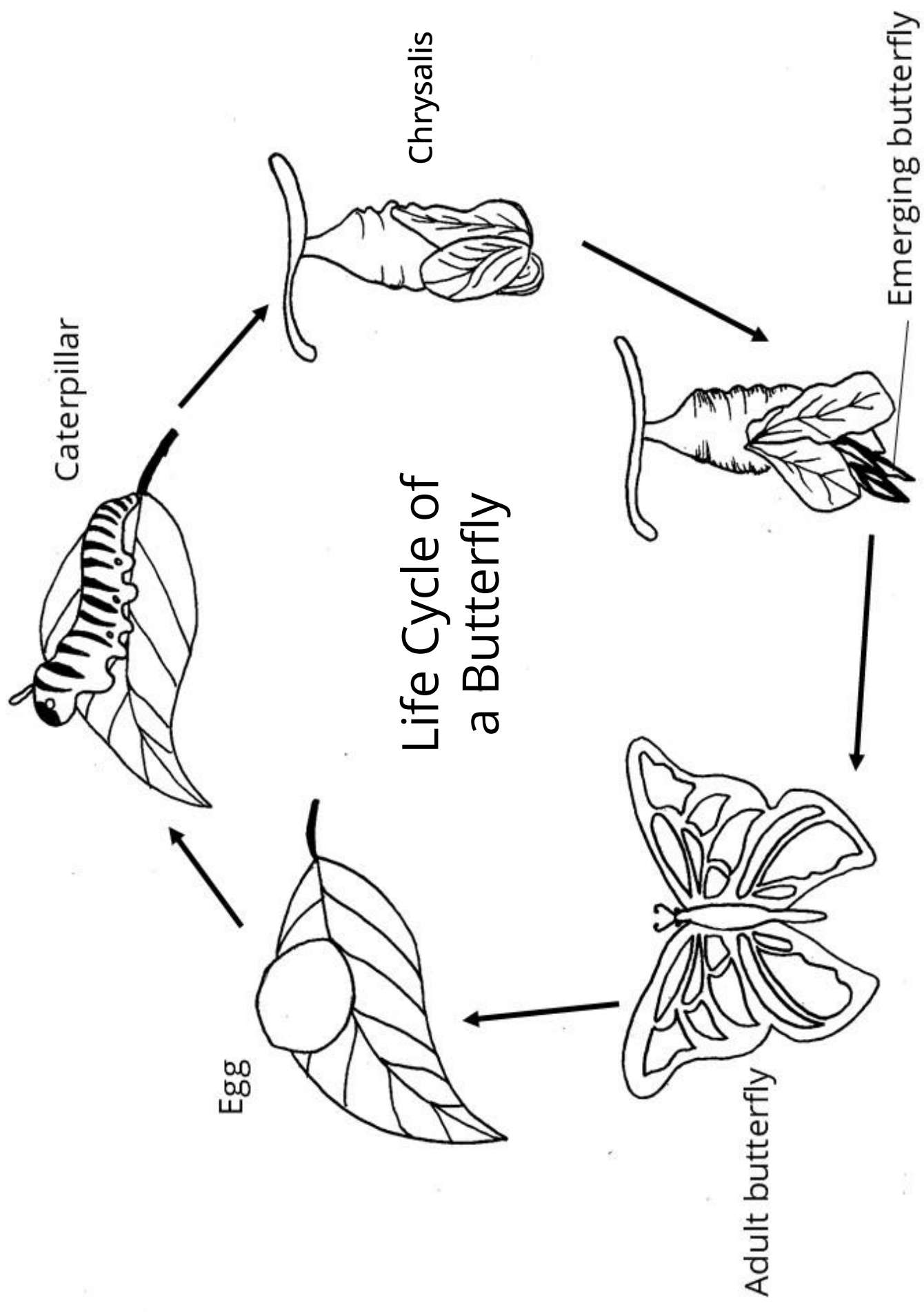
Adult Butterfly– Finally, the adult butterfly emerges from its hard casing and starts to fly. In this stage, the adult has a long mouthpart called a proboscis used to suck up food such as flower nectar. It also has light, fragile wings that allow it to move around and mate, so the cycle can begin again.

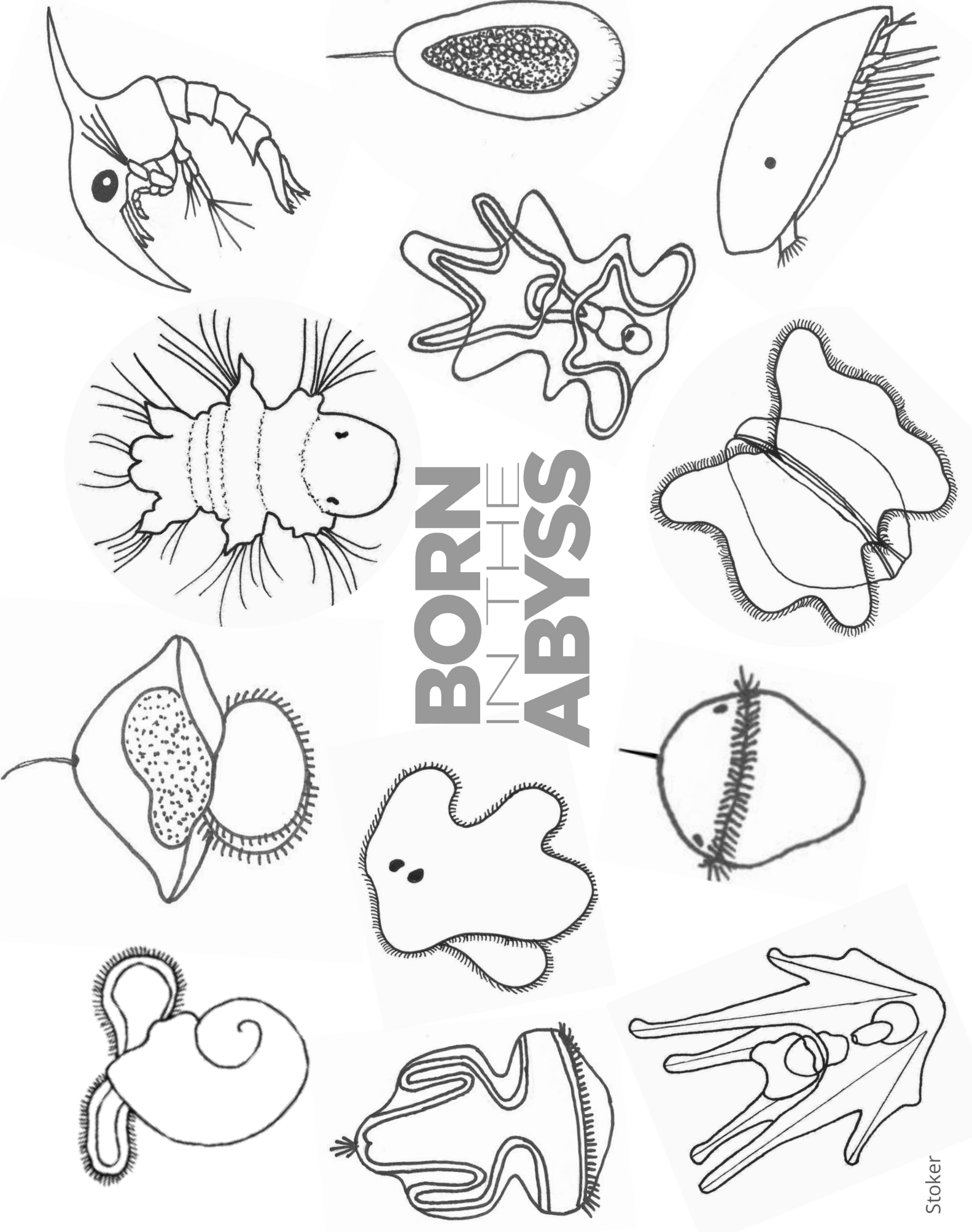
Marine Larvae [Click this link to learn more](#)

Question: What is a larva?

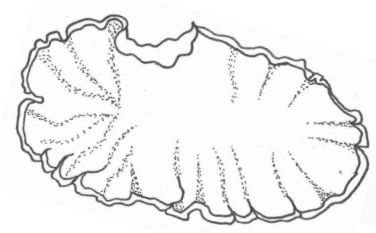
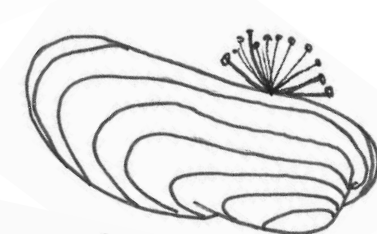
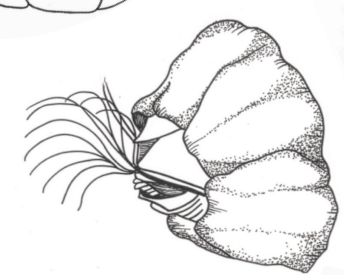
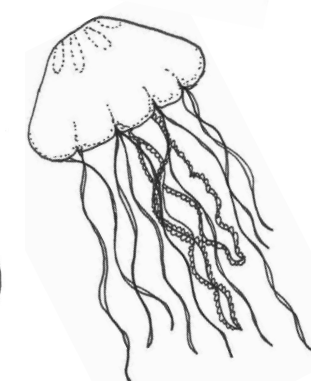
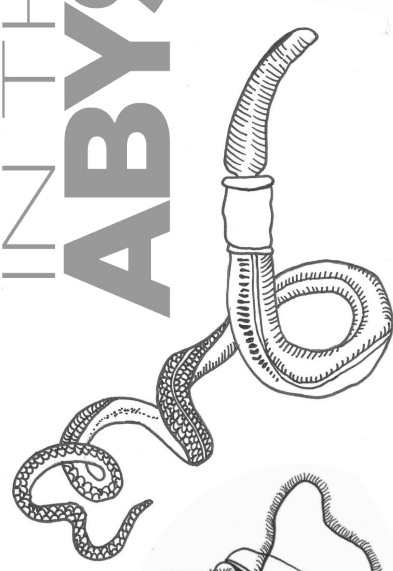
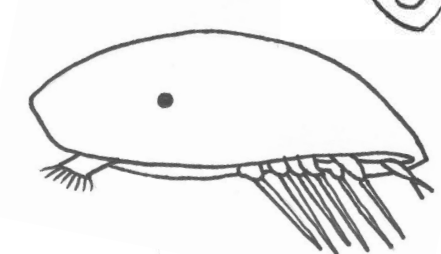
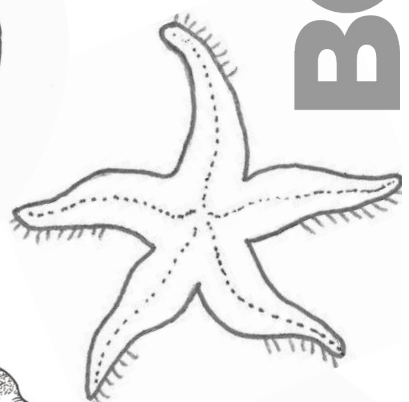
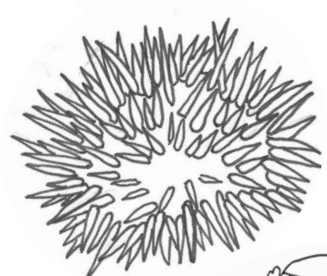
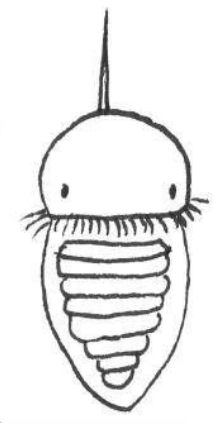
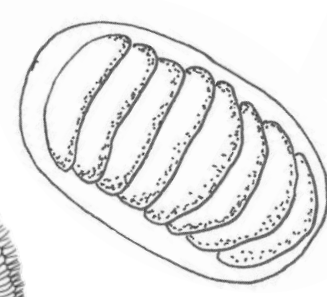
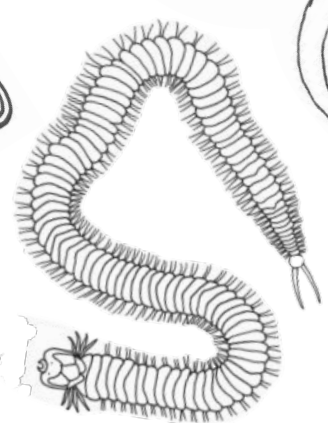
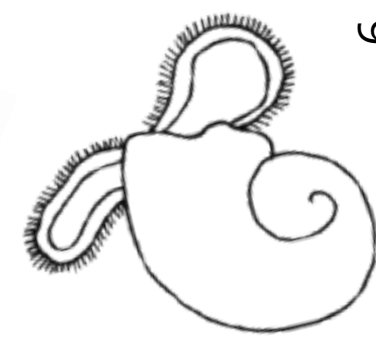
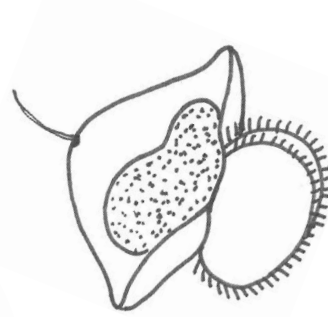
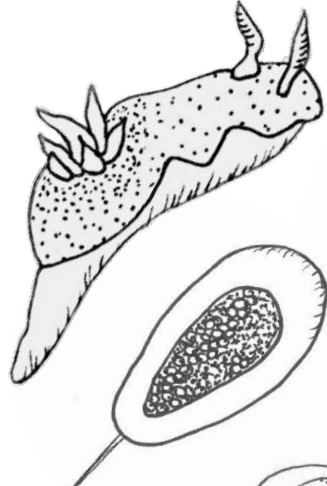
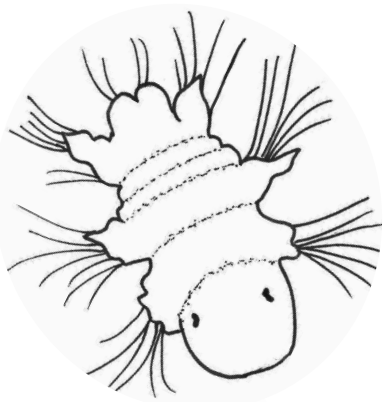
Answer: The beginning stage, or baby, of many animals that does not look like the adult.

Human babies have the same basic features as adults (such as fingers, toes, nose, eyes), but butterflies do not look much like their caterpillar babies. Neither do frogs look much like tadpoles. Unlike humans, these animals undergo indirect development, in which a larval form (baby) undergoes a dramatic change called metamorphosis to become the adult form. Metamorphosis is Greek for “transformation” and often involves a change in both behavior and anatomy. Marine larvae are tiny and diverse. Like butterflies and other insects, many marine animals lack backbones and are called invertebrates. The larvae (plural of larva) of marine invertebrates are microscopic, and many are smaller than the period at the end of this sentence.





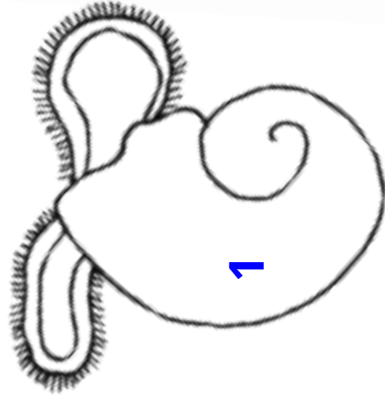
BORN IN THE ABYSS



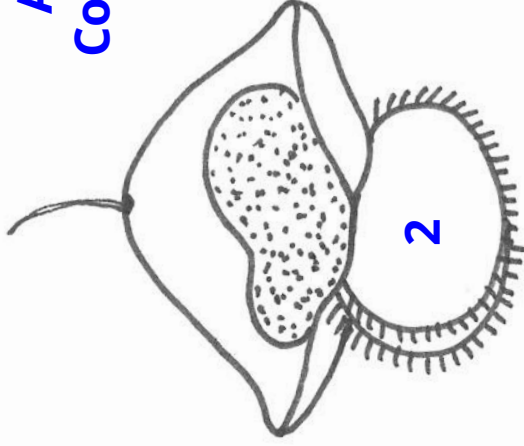
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Answer Key Coloring Page 1

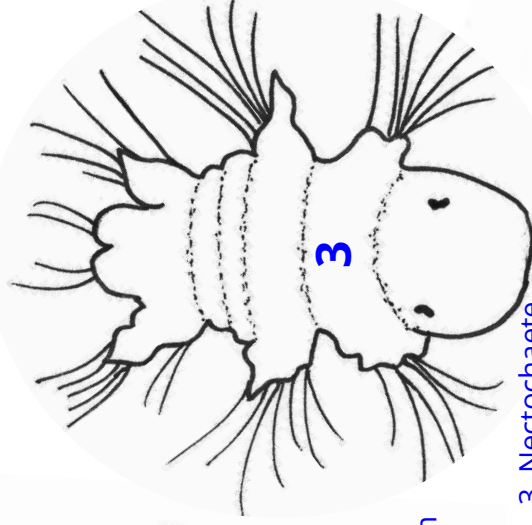
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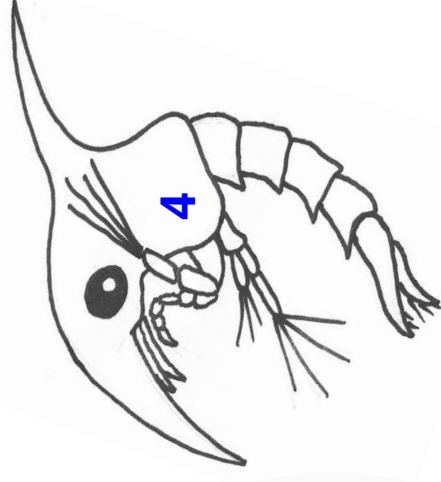
1. Gastropod veliger
= baby sea slug



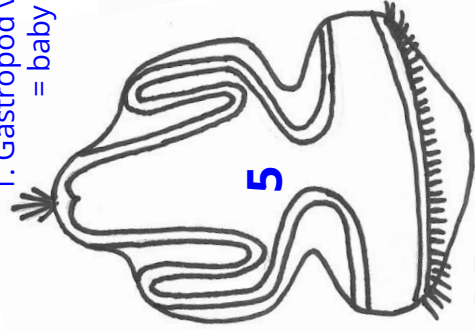
2. Pilidium = baby ribbon worm



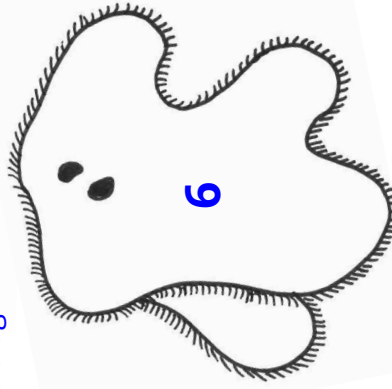
3. Nectochaete
= baby polychaete worm



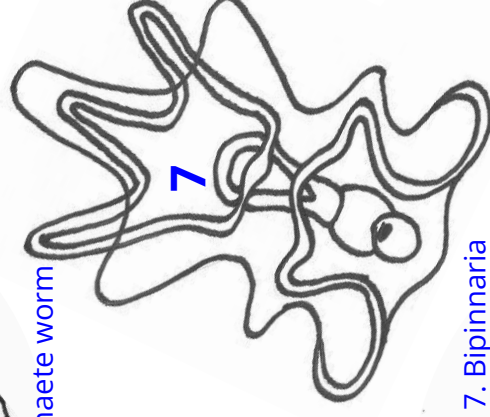
4. Zoea = baby crab



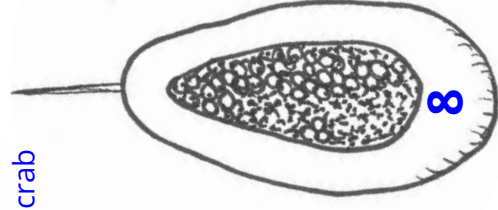
5. Tornaria
= baby acorn worm



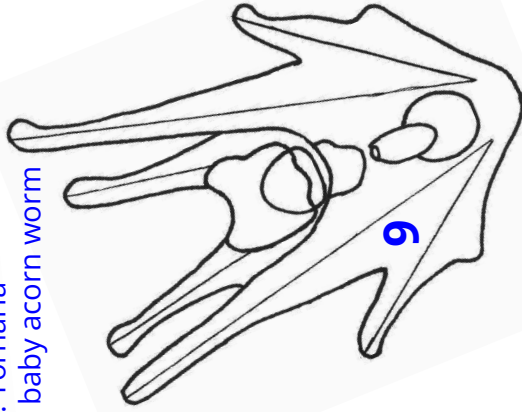
6. Müller's larva
= baby flatworm



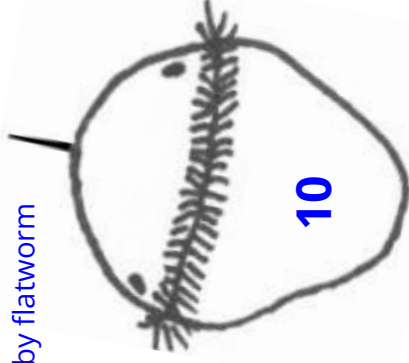
7. Bipinnaria
= baby sea star



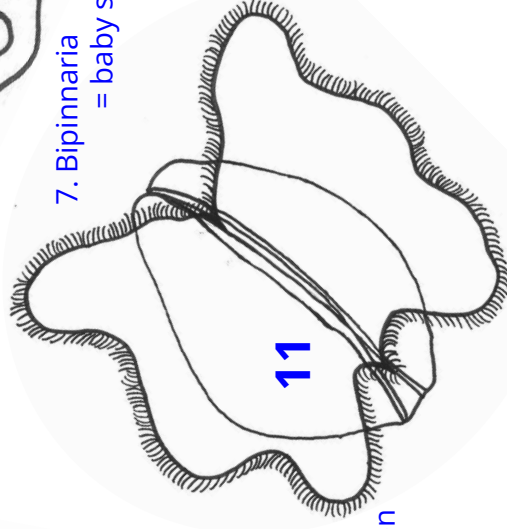
8. Planula = baby jellyfish



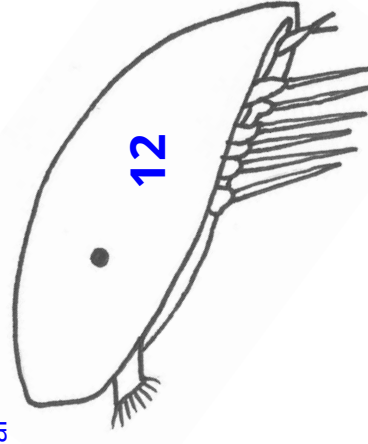
9. Pluteus = baby sea urchin



10. Trochophore = baby chiton



11. Bivalve veliger = baby mussel



12. Cyprid = baby barnacle

