

Shark Mystery: The Case of the Mermaid's Purse

Lesson Overview

In this lesson, Keatyn will dive into the fascinating world of shark reproduction. We will answer the big question: *Do sharks have eggs?* By the end of this lesson, Keatyn will understand the three different ways sharks are born and be able to identify a "Mermaid's Purse."

Learning Objectives

- Identify the three primary ways sharks are born (Oviparous, Viviparous, and Ovoviviparous).
- Explain what a "Mermaid's Purse" is and why it has such a strange shape.
- Compare and contrast shark eggs with the bird eggs we find in our kitchens.

Materials Needed

- Drawing paper and colored pencils/markers
- Playdough or modeling clay
- A piece of string or yarn (approx. 12 inches)
- A chicken egg (from the fridge) or a photo of one
- Tape or glue
- Internet access for a short video clip of a developing shark embryo (optional)

1. Introduction: The Hook (5-10 minutes)

The Mystery: "Keatyn, imagine you are walking along a windy beach. You look down at a pile of dried seaweed and see a strange, leathery, black object with curly 'horns' at the corners. It looks like a tiny, spooky backpack. Some people call these 'Mermaid's Purses.' What do you think they actually are?"

The Big Reveal: Explain that these are actually shark egg cases! Today, we are going to find out why some sharks leave their babies in "purses" on the ocean floor while others give birth just like humans do.

2. The "I Do": The Three Ways to be Born (15 minutes)

Instructional Note: Use these talking points to explain the concepts.

The Three Groups:

- **1. Oviparous (The Egg-Layers):** About 25% of sharks lay eggs outside their bodies. These eggs are tough and leathery to protect the baby from predators.
Fun Fact: Horn sharks and Swell sharks lay spiral-shaped eggs that they wedge into rocks so they don't wash away!
- **2. Viviparous (The Live-Bearers):** These sharks are like us! The baby grows inside the mother

and gets food through an umbilical cord. When they are ready, they swim out as fully formed "pups." Blue sharks and Hammerheads do this.

- **3. Ovoviviparous (The "Egg-Inside" Group):** This is the most common way. The mother has eggs, but they stay *inside* her body. They hatch inside, and then the baby is "born" live. It's like a secret internal egg party! Great White sharks do this.

Success Criteria Check:

Ask Keatyn: "If you were a shark and you wanted to make sure your baby was safe from a hungry crab, would you rather lay an egg in the seaweed or keep it safe inside your belly? Why?"

3. The "We Do": Comparing Eggs (10 minutes)

Activity: The Egg Comparison

Place a chicken egg next to a drawing of a "Mermaid's Purse" (an oblong pouch with long curly strings at the corners).

- **Hard vs. Leathery:** Discuss why a bird egg is hard (to support the weight of the parent sitting on it) and why a shark egg is leathery (to be tough in the salty water).
 - **The Anchor:** Point out the "tendrils" (the curly strings) on the shark egg. Ask: "What do these look like they are meant to do?" (Answer: They act like anchors to tie the egg to seaweed or coral so it doesn't drift into the deep ocean).
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4. The "You Do": Creative Application (20 minutes)

Activity: Design-a-Purse

1. **The Model:** Using playdough or clay, Keatyn will model a shark egg case.
 - She can choose to make a "Mermaid's Purse" (rectangular with horns) or a "Spiral Egg" (like a screw).
 2. **The Protection:** Have her use the string/yarn to create the "anchors" for her egg.
 3. **The Sketch:** On a piece of paper, have her draw what the baby shark looks like *inside* the egg.
 - *Requirement:* She must include a "yolk sac"—a little bag of food attached to the baby's belly that it eats while it's waiting to hatch.
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5. Conclusion & Recap (5-10 minutes)

Summary: Recap the three types of birth by playing "True or False."

- "True or False: All sharks lay eggs." (False! Some give live birth).
- "True or False: A Mermaid's Purse is actually a shark egg." (True!).
- "True or False: Baby sharks in eggs have a lunchbox called a yolk sac." (True!).

Final Reflection: Ask Keatyn to name one thing she learned today that she could tell a friend at the

beach to keep them from being scared of a Mermaid's Purse.

Assessment Methods

- **Formative:** The "True or False" recap and the discussion during the egg comparison.
- **Summative:** The Design-a-Purse model. Success is defined by including the three key features: a protective outer shell, an anchoring system (tendrils), and an internal food source (yolk sac) in the drawing.

Differentiation Options

- **For an extra challenge:** Research "Oophagy" (intrauterine cannibalism) where the first shark to hatch inside the mother eats the other eggs! (Recommended for brave 9-year-olds).
- **For a more visual learner:** Watch a time-lapse video of a bamboo shark developing inside a translucent egg case.
- **For a kinesthetic learner:** Create a "Shark Egg Hunt" around the house where Keatyn has to find hidden "purses" and identify which ones belong to which type of shark birth.