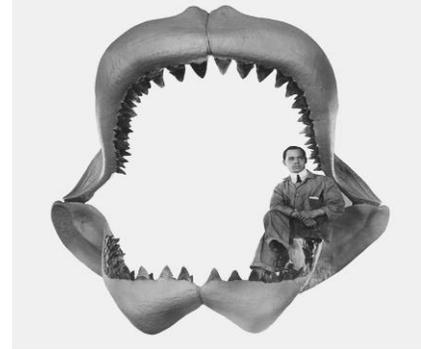


LESSON 3: SHARK JAWS & TEETH!

Shark Unit. Lesson 3: Grades 6-8

ESSENTIAL QUESTION OF THE DAY (EQOD):

How do differently shaped teeth allow an organism to be better suited for their prey?



Sharks routinely lose teeth throughout their lives. In this lesson, students will be able to observe & analyze the reasons behind this phenomena. Students will also be able to correlate tooth form according to tooth function.

MATERIALS:

- Block of wood
- Jello 'block'
- 20 Nails
- Rulers (class set)
- Shark Teeth ID Sheet
- Teeth Form & Function Data Sheet
- Apple or Celery pieces
- Fruit Snacks
- Bread

INTRO

DEMO:

Sharks routinely lose their teeth throughout their lives (~30 teeth per month!) In this demo, students will observe the reasons behind this, as well as pose questions as to why this is beneficial for the shark.

Instruction: Two set of Shark 'Jaws' will be prepared prior to this demo. One set will be made of wood, and another made of jello. The wood jaws are to resemble bone, whereas the jello is aimed to resemble cartilage.

JAW #1 : Prior to class, lightly hammer 10 nails into a block of wood. (so that the tips of the nails are barely in the wood)

(Note: nails can be hammered in at different depths, to model loose vs. stable teeth!)

JAW #2: Prior to class, place 10 nails into a comparable-sized block of jello, so that they stand up in the jello.

1. In front of the class, display the wood jaw. Using a ruler, gently go down the row and tap each nail on its side. Upon completion, reverse your direction. Count the number of laps it takes until 5 nails fall over.
2. Next, display the jello jaw to the class. Using a ruler, gently go down the row and tap each nail on its side. Upon completion, reverse your direction. Count the number of laps it takes until 5 nails fall over.

Explain to the class that:

Shark Jaws are not rigid and fixed like ours (ours are made of bone). They are made of cartilage (like our ears!). As a result, teeth are not as permanent within their jaw as they are in our mouths. Sharks can lose up to 30 teeth per month as a result.

TALKING POINTS:

Why don't sharks just have bony jaws?

Shark jaws are meant to move, and be flexible, just like a saw! Since sharks have no arms, this sawing motion allows them to break their food up into smaller bites. (Like we use a fork and knife!)

How long does it take for a shark to replace a lost tooth?

Unlike our mouths, sharks have rows and rows of teeth fully developed and ready to be used when they are called upon (they can be replaced in as little as 1 day!)

How do sharks actually lose teeth?

Unlike in the demo, sharks don't typically lose teeth simply by shaking their heads. However, due to their 'sawing' technique when eating, shark teeth often times will remain stuck in prey, or even fall out during the meal! (that is why you can find shark teeth on the beach!)

Do shark teeth 'wear out'?

Yes! As you can see in our class set of jaws, shark teeth that are exposed out front are much duller than those that are yet to be used.

If sharks change their prey as they get older (fish → marine mammals), do their teeth change as well?

They do! Over time, shark teeth in the back of the jaws, will fully replace teeth up front. These teeth slowly but surely are wider and larger as the shark grows. Sharks that prey on fishes & stingrays (juveniles) tend to have more pointy teeth than their adult brethren, whose teeth are broader and more serrated.

If shark jaws are flexible, why do the jaws in the class set seem so rigid?

Shark jaws will 'dry out' once removed from a dead shark. Typically, shark jaws that you see (at a gift shop, or here in class) are manually spread out as they dry so that they don't close shut.

PROCEDURE:

There are over 400 species of shark on the planet. Not all sharks eat the same food, or even eat food in the same way! Shark teeth can be categorized into 3 main shapes:

- Thick & Pointy (fish eaters)
- Broad & Serrated (Marine Mammals),
- Flat & Molar-like (mollusks)

Sharks don't typically have the luxury of having different shaped teeth within their mouth like we do, let's first explore how our teeth work!

HUMAN TEETH

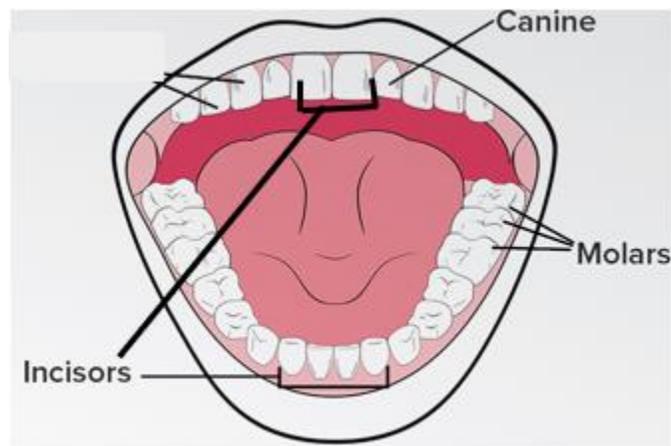
Materials:

- Apple or Celery pieces (crunchy, incisor use)
- Fruit Snacks (soft/gummy, molar use)
- Bread (soft/tearing, canine use)

Hypothesis:

*use tooth form & function data sheet

Prior to distributing the materials (snacks) have the students write hypotheses according to which teeth (incisor, molar, canine) they might predominantly use while eating.



Observe & Record

Students will observe and record which tooth they predominantly used whilst snacking.

*Note: students should eat and record one snack prior to moving onto the next, so as not to confuse snacks/teeth

Have students Think, Pair, & Share their findings with group members.

MYSTERY JAWS INVESTIGATION

Materials:

- Shark Jaws (2 per group)
- Rulers
- Shark Teeth ID Sheets

Distribute 2 different shark jaws per group, if applicable. (Cover up the shark species label, and reveal at the end!)

Have students complete the mystery shark jaw data table.

Be sure to highlight the fact that students are counting only the **front row** of teeth for Column 3

SHARK TEETH

*use tooth form & function data sheet

Distribute the 3 Shark Teeth ID Cards to each group.

Tooth Characteristics

Ask students to fill in column 1 within their 'shark teeth' data table. Students are to simply observe and record the visual anatomical characteristics of the shark teeth within the ID cards.

Prey CER

Have students develop a CER based on which type of prey each shark may prefer.

Question: Based on their teeth, what type of prey does this shark prefer?

Claim: Answers the question

Evidence: Provides evidence from teeth ID sheets

Reasoning: Connect evidence from ID sheets to the claim based on scientific principles and knowledge gained from 'human teeth' and 'mystery jaw' investigations

* For a fun, interactive data tracking activity, distribute 3 post-its to each student.

Draw 3 columns on the board for each of the 3 shark species.

Have students write their prey choice on their post-it and stick it under their shark of choice on the board.

Horn Shark	Mako Shark	Tiger Shark

**** Teacher Cheat Sheet:**

Horn Shark → Hard shelled mollusks: Clams, Snails, Crabs, etc.

Tiger Shark → Notorious wide range of prey: Fish, Seals, Sea Turtles, Birds, etc.

Mako Shark → Large, open ocean fish: Tuna, Bonito, Swordfish, etc.

After sharing students' results, keep a tally on any commonly placed prey items before revealing the sharks' true preferred prey.