EDUCATOR GUIDE

Wiring your shark's brain

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Time to complete: 40-60 min
Age level: Grades 11-12 or College
Bloom's levels: 1 & 3
Description: In this module, your students will learn the shark cranial nerves by connecting nerves to a brain model of the spiny dogfish shark (*Squalus acanthias*), tracing their paths out of the braincase, and completing a schematic diagram.
Materials needed:

- SA03 Student Guide & Notebook v1.0
- Dogfish Shark Skull Kit v1.0 **OR**

Systems:

- Nervous
- Sensory
- Skeletal

Core concepts:

- Structure & function

Competencies:

- Depiction of anatomy

Module ID: SA03
Module version: 1.1
Module sequence (suggested):

Dogfish Neuroanatomy Kit v1.0 SA02 → **SA03** → SA01 → SA05 → SA04

How to use and edit this module

This is an open-source active learning module created by 3D Anatomy Studios and licensed under CC NC-BY-SA for use with the Dogfish Shark Skull Kit or Dogfish Neuroanatomy Kit.

Module Structure

This module has an **Educator Guide**, a **Student Guide**, and a **Student Notebook** and is divided into one or more sections, each with a number, a motivating question as its heading, and a learning objective.

Educator Guide

The **Educator Guide** is intended for educators and contains a pedagogical schema for the module to help implement the module in a course (e.g., learning objectives, target Bloom's level and competencies, core concepts), an answer key for certain prompts/questions in the the **Student Notebook**, and module updates.

Student Guide

The **Student Guide** is intended for students to read as they complete the module's activities and can be read on a device or printed out.

Student Notebook

The **Student Notebook** contains worksheets or diagrams on which students can write or draw as a part of the module's activities. The **Student Notebook** can be printed out or filled in using a digital tablet.

Sharing and Editing

The CC NC-BY-SA license allows you to share and edit this module as long as you (1) do not sell the module or module derivatives ("NC"), (2) attribute the author(s) of all the content, including preserving text and graphic attributions ("BY"), and (3) share the module under the same license ("SA"). You can edit this module by copying the current Google Doc of this module (accessible at 3danatomystudios.com/guides/SA00) and editing that copy.

Purchasing Kits

To purchase kits, please visit 3danatomystudios.com/shop/dogfish-skull-kit.

Pedagogical schema

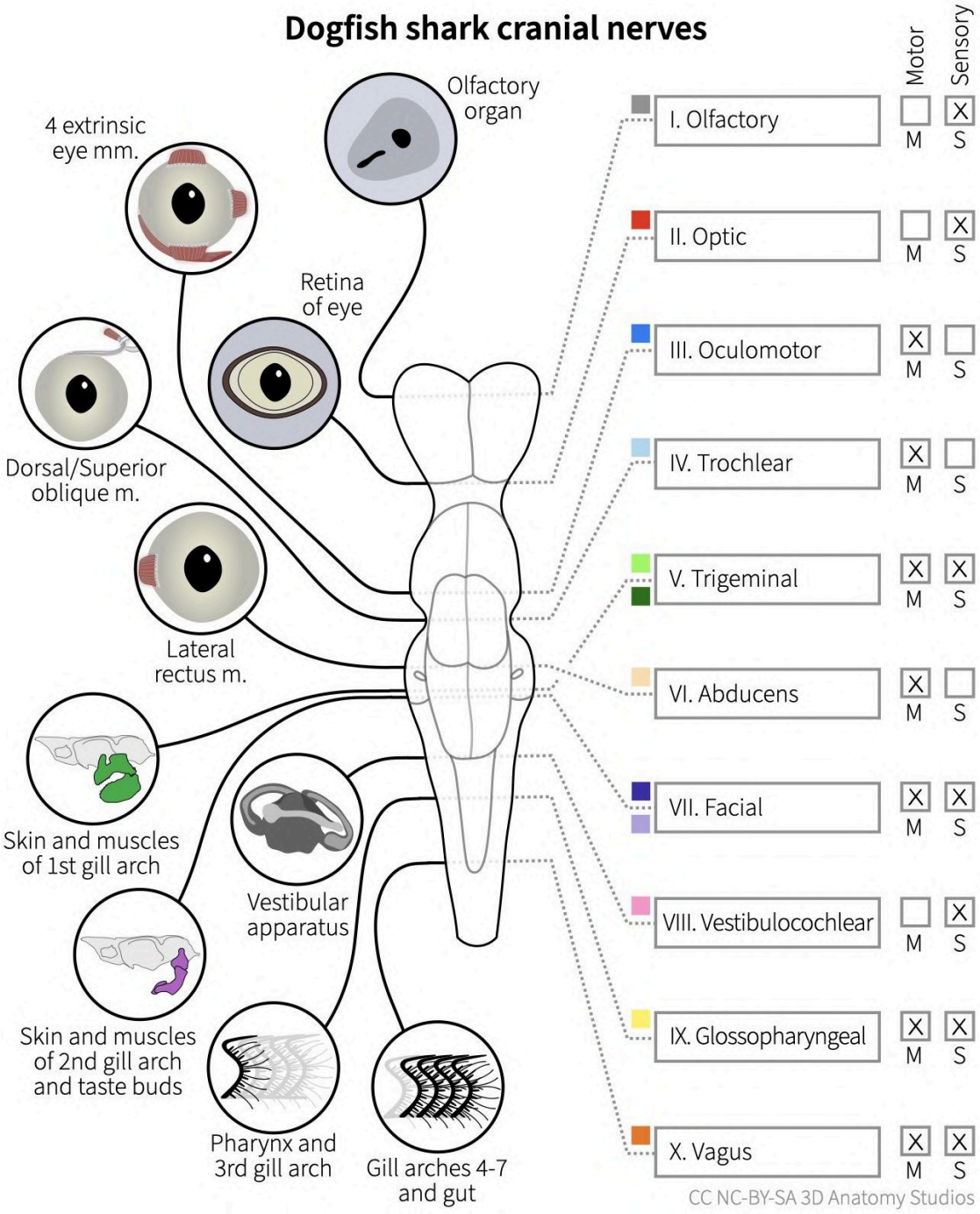
Section 1. What are your shark's cranial nerves and where do they go?

Learning objective	**Label (Bloom's Level 1 - Remember)** the name and number of each shark cranial nerve by fill-in-the-blank and **solve (Bloom's Level 3 - Apply)** the paths of the shark cranial nerves out to their target organs by **diagramming/sketching (Bloom's Level 3 - Apply)** a conceptual anatomical image of the brain and chondrocranium.
Activity	Attach pipe cleaners representing all the shark cranial nerves to a model of the shark brain, trace their paths out the foramina of a chondrocranium model, and fill in the blanks on a conceptual anatomical diagram
Self-assessment	Compare fill-in-the-blank responses with possible responses in the student guide
Systems	**Nervous** **Sensory** **Skeletal**
Core concepts	**Structure & function**
Competencies	**Depiction of anatomy**

Answer key

Section 1. What are your shark's cranial nerves and where do they go?

What are your shark's cranial nerves and where do they go?



How would you explain the structure and function of the chondrocranium in a single sentence?

The chondrocranium is structured as a series of four main "contained spaces" for the brain, olfactory system, visual system, and vestibular system and with foramina to convey nerves between the brain and each of these systems.

Updates

Version 1.1

- Moved filled-in schematic from the Student to Educator Guide.
- Added short-form summary question to Student Notebook at the end of Section 1.