

- 1 Rays
- 2 Presentation Topics
- 3 Identification and Classification
- 4 Differentiating Between Species
- 5 Size, Human Knowledge of Rays
 - Size in width
 - More than half > 20 inches, among largest fishes
 - Slow increase of knowledge
 - Unknown species, but 50 in past decade
 - Inshore ones mistakenly identified, hard to transfer
- 6
- 7 Evolution of Rays
 - Scientific debate...
- 8 Ray Fossils
 - Fossils are very rare (rays have no bones)
 - Teeth, composed of a hard enamel, fossilize well.
 - Earliest known fossils date back to the Jurassic Period.
- 9 Habitat
 - Rays live all over the world in seas, oceans, and sometimes estuaries.
 - Different rays prefer different types of ocean floor.
 - Depths down to 3,000 meters.
- 10 Distribution
- 11 Typical Behavior
- 12 Reproduction
 - Some are oviparous
 - Some reproduce via aplacental viviparity
 - Rays have a long gestation period, explaining the slow growth of ray population.
- 13 Ecomorphology
 - Basic life profile by body features:
 - Shape
 - Color
 - Size
 - Mouth structure
 - Fin details

– Internal anatomy

14 **Internal Features**

- Cartilage!
- High modified: strong, flattened skull
 - Chain of small vertebrae to tip of tail
- Rostral Keel
 - Absent in stingrays in order to poke around for food
- Brain

15 **Feeding Strategies**

16 **Swimming**

- Flap their wing-like pectoral fins.
- Mucus coating reduces drag and surface tension.
- Use their oily liver to maintain buoyancy.

17 **Movement and Propulsion**

18 **More Movement and Propulsion**

19 **Distance Swimming**

20 **Retreat!**

21 **Defenses**

- Whip-like tail
 - Poisonous sting
 - Electric shock
 - Scutes
 - Hiding
-
- Do not usually attack humans unless provoked

22 **Local Species**

23 **Cownose Ray**

24 **Cownose Ray Distribution**

25 **Cownose Ray**

26 **Atlantic Manta Ray Distribution**

27 **Atlantic Manta Ray**

28 **Spotted Eagle Ray**

- 29 Spotted Eagle Ray
- 30 Smooth Butterfly Ray
- 31 Smooth Butterfly Ray
- 32 Works Consulted