**Gut Morphology Card**
The gut morphology or internal anatomy of the three fish groups can provide evidence of their feeding habits.

**Whalefishes** have normal gut morphology and all of the organs and structures you expect to see in most fishes (only some are shown here).

**Bignose fishes** are missing some typical features and others are enlarged.

**Tapetails** can have all of the organs and structures you would expect to see in most fishes. However, some are found with stomachs full of more copepods than a fish could digest in a short time frame.
Muscle Morphology Card

These are photos of the muscle tissue from a member of each clade. There are two different types of muscle tissue — ‘red’ and ‘white’.

**Red muscle** appears white or cream when preserved. It is aerobic meaning it has many capillaries and a high myoglobin content, providing lots of oxygen to the tissues. More red muscle indicates active fish that are steady, strong swimmers.

**White muscle** appears red or brown when preserved, has few capillaries and lacks myoglobin. This tissue is anaerobic. Lots of white muscle indicates a relatively inactive lifestyle (e.g. floating in currents) with short bursts of movement.
These are pictures of cleared and stained gill arches from a Whalefish (Specimen 1) and a Tapetail (Specimen 2). Three features are labeled.
Gill Arch Morphology Card B

Transitional Whalefish specimens from museum collection; individual fish represent very small specimens of their particular species (i.e. the middle developmental stages of growth from larvae to adult).

Specimen 3: Young Whalefish

Specimen 4: Young Whalefish