tpo_45_passage_3

In the open sea, animals can often find food reliably available in particular regions or seasons (e.g., in coastal areas in springtime). In these circumstances, animals are neither constrained to get the last calorie out of their diet nor is energy conservation a high priority. In contrast, the food levels in the deeper layers of the ocean are greatly reduced, and the energy constraints on the animals are much more severe. To survive at those levels, animals must maximize their energy input, finding and eating whatever potential food source may be present. In the near-surface layers, there are many large, fast carnivores as well as an immense variety of planktonic animals, which feed on plankton (small, free-floating plants or animals) by filtering them from currents of water that pass through a specialized anatomical structure. These filter-feeders thrive in the well-illuminated surface waters because oceans have so many very small organisms, from bacteria to large algae to larval crustaceans. Even fishes can become successful filter-feeders in some circumstances. Although the vast majority of marine fishes are carnivores, in near-surface regions of high productivity the concentrations of larger phytoplankton (the plant component of plankton) are sufficient to support huge populations of filter-feeding sardines and anchovies. These small fishes use their gill filaments to strain out the algae that dominate such areas. Sardines and anchovies provide the basis for huge commercial fisheries as well as a food resource for large numbers of local carnivores, particularly seabirds. At a much larger scale, baleen whales and whale sharks are also efficient filter-feeders in productive coastal or polar waters, although their filtered particles comprise small animals such as copepods and krill rather than phytoplankton. Filtering seawater for its particulate nutritional content can be an energetically demanding method of feeding, particularly when the current of water to be filtered has to be generated by the organism itself, as is the case for all planktonic animals. Particulate organic matter of at least 2.5 micrograms per cubic liter is required to provide a filter-feeding planktonic organism with a net energy gain. This value is easily exceeded in most coastal waters, but in the deep sea, the levels of organic matter range from next to nothing to around 7 micrograms per cubic liter. Even though mean levels may mask much higher local concentrations, it is still the case that many deep-sea animals are exposed to conditions in which a normal filter-feeder would starve. There are, therefore, fewer successful filter-feeders in deep water, and some of those that are there have larger filtering systems to cope with the scarcity of particles. Another solution for such animals is to forage in particular layers of water where the particles may be more concentrated. Many of the groups of animals that typify the filter-feeding lifestyle in shallow water have deep-sea representatives that have become predatory. Their filtering systems, which reach such a high degree of development in shallow-water species, are greatly reduced. Alternative methods of active or passive prey capture have been evolved, including trapping and seizing prey, entangling prey, and sticky tentacles. In the deeper waters of the oceans, there is a much greater tendency for animals to await the arrival of food particles or prey rather than to search them out actively (thus minimizing energy expenditure). This has resulted in a more stealthy style of feeding, with the consequent emphasis on lures and/or the evolution of elongated appendages that increase the active volume of water controlled or monitored by the animal. Another consequence of the limited availability of prey is that many animals have developed ways of coping with much larger food particles, relative to their own body size, than the equivalent

shallower species can process. Among the fishes there is a tendency for the teeth and jaws to become appreciably enlarged. In such creatures, not only are the teeth hugely enlarged and/or the jaws elongated but the size of the mouth opening may be greatly increased by making the jaw articulations so flexible that they can be effectively dislocated. Very large or long teeth provide almost no room for cutting the prey into a convenient size for swallowing; the fish must gulp the prey down whole.

question 1

What can be inferred from paragraph 1 about why energy conservation is not a high priority for ocean animals in coastal waters during the spring?

A Those animals are least active during the spring.

B Those animals have a plentiful supply of food.

C Those animals have to expend energy to avoid predators.

D Those animals store energy during the colder seasons.

question 2

According to paragraph 2, how do sardines and anchovies obtain food near the surface of the ocean?

A They rely on the large quantities of food resources also available to local carnivores.

B They capture the larvae of some crustaceans.

C They feed on the organisms left over by commercial fisheries.

D They obtain algae by using their gills as filters.

question 3

According to paragraph 2, in which of the following ways are baleen whales and whale sharks different from smaller filter-feeders like sardines and anchovies?

A They are not found in coastal waters.

B They are caught by commercial fisheries.

C They filter small animals instead of phytoplankton.

D They are not carnivores.

question 4

Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

A An organism may obtain food particles from seawater when currents generated by the organism cause water to pass through its filter.

B The nutritional content of the food particles in seawater is sufficient to meet the energy demands of most planktonic animals.

C As planktonic animals require a lot of energy, they have to generate a current strong enough to bring them sufficient particles of food.

D Organisms that filter seawater to meet their nutritional needs expend a lot of energy, especially those organisms that have to create their own currents.

question 5

According to paragraph 4, deep-water filter-feeders have adopted all of the following ways to obtain food EXCEPT

A developing larger filtering systems

B capturing prey using sticky tentacles

C swimming up to the surface at feeding time

D searching in ocean layers that contain a substantial amount of particles

question 6

9. Why does the author include the information that animals in the deep ocean place an “emphasis on lures” and have evolved “elongated appendages” ?

A To argue against the view that animals in the deep ocean use more energy to find food than do animals in shallow waters

B To emphasize the importance of an animal' s ability to control a large volume of water

C To identify some feeding strategies that animals have developed to minimize their energy expenditure

D To give examples of body structures that help those animals move quickly in deep ocean waters

question 7

The word "flexible" in the passage is closest in meaning to

A huge

B adaptable

C powerful

D precise

question 8

According to paragraph 5, why do some fish swallow their prey whole?

A Their teeth are too large to allow for cutting prey.

B They have no jaw muscles to allow chewing.

C Swallowing prey whole results in a higher net energy gain.

D Chewing can cause their jaws to dislocate.

question 9

Look at the four squares [ ] that indicate where the following sentence could be added to the passage.

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energy conservation a high priority. In contrast, the food levels in the deeper layers of the ocean are greatly reduced, and the energy constraints on the animals are much more severe. To survive at those levels, animals must maximize their energy input, finding and eating whatever potential food source may be present. In the near-surface layers, there are many large, fast carnivores as well as an immense variety of planktonic animals, which feed on plankton (small, free-floating plants or animals) by filtering them from currents of water that pass through a specialized anatomical structure. These filter-feeders thrive in the well-illuminated surface waters because oceans have so many very small organisms, from bacteria to large algae to larval crustaceans. Even fishes can become successful filter-feeders in some circumstances. Although the vast majority of marine fishes are carnivores, in near-surface regions of high productivity the concentrations of larger phytoplankton (the plant component of plankton) are sufficient to support huge populations of filter-feeding sardines and anchovies. These small fishes use their gill filaments to strain out the algae that dominate such areas. Sardines and anchovies provide the basis for huge commercial fisheries as well as a food resource for large numbers of local carnivores, particularly seabirds. At a much larger scale, baleen whales and whale sharks are also efficient filter-feeders in productive coastal or polar waters, although their filtered particles comprise small animals such as copepods and krill rather than phytoplankton. Filtering seawater for its particulate nutritional content can be an energetically demanding method of feeding, particularly when the current of water to be filtered has to be generated by the organism itself, as is the case for all planktonic animals. Particulate organic matter of at least 2.5 micrograms per cubic liter is required to provide a filter-feeding planktonic organism with a net energy gain. This value is easily exceeded in most coastal waters, but in the deep sea, the levels of organic matter range from next to nothing to around 7 micrograms per cubic liter. Even though mean levels may mask much higher local concentrations, it is still the case that many deep-sea animals are exposed to conditions in which a normal filter-feeder would starve. There are, therefore, fewer successful filter-feeders in deep water, and some of those that are there have larger filtering systems to cope with the scarcity of particles. Another solution for such animals is to forage in particular layers of water where the particles may be more concentrated. Many of the groups of animals that typify the filter-feeding lifestyle in shallow water have deep-sea representatives that have become predatory. Their filtering systems, which reach such a high degree of development in shallow-water species, are greatly reduced. Alternative methods of active or passive prey capture have been evolved, including trapping and seizing prey, entangling prey, and sticky tentacles. [] In the deeper waters of the oceans, there is a much greater tendency for animals to await the arrival of food particles or prey rather than to search them out actively (thus minimizing energy expenditure). [] This has resulted in a more stealthy style of feeding, with the consequent emphasis on lures and/or the evolution of elongated appendages that increase the active volume of water controlled or monitored by the animal. [] Another consequence of the limited availability of prey is that many animals have developed ways of coping with much larger food particles, relative to their own body size, than the equivalent shallower species can process. [] Among the fishes there is a tendency for the teeth and jaws to become appreciably enlarged. In such creatures, not only are the teeth hugely enlarged and/or the jaws elongated but the size of the mouth opening may be greatly increased by making the jaw articulations so flexible that they can be effectively dislocated. Very large or long teeth provide almost no room for cutting the prey into a convenient size for swallowing; the fish must

gulp the prey down whole.

question 10

Directions: An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the THREE answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. This question is worth 2 points.

A. Large carnivores near the ocean surface feed mainly on organic matter left over after it passes through the filters of the filter-feeders.

B. Near the surface of the water, many animals obtain food by using specialized body parts to filter plankton from the water.

C. Even in deep ocean layers where prey is relatively hard to find, filter feeding is still the least energetically-demanding method of obtaining food.

D. Filter-feeding is more common in shallow water, where there is a higher concentration of organic matter than there is in deeper water.

E. Animals in deeper water have evolved strategies and body structures that allow them to use as little energy as possible in obtaining food.

F. At deeper ocean levels plankton is relatively rare, requiring animals at those levels to actively search for their food sources.