WLSH/Marine Biology/Oppelt Name _____

Marine Ecology

Directions: Read the following passage and answer the questions that follow.

A warm summer's day is a relative term in the chilly waters of the great southern ocean. Even still, the sun shines down on the water and is absorbed by the **phytoplankton**, (microscopic photosynthetic organisms) and by the gazillions, they hungrily store solar radiation in glucose molecules. Also ever-present in these waters are copepods and other **zooplankton**, microscopic herbivores happy to make a meal of the phytoplankton. Some of the phytoplankton, caught in a swirling coastal current, are brought in close to shore and filtered out of the water by **mussels**, clinging firmly to the rocky shoreline in the tidal zone.

The currents also carry along schools of **krill**, small shrimp-like creatures, happy to make a meal of the zooplankton as they float along. During summers in the great southern ocean the sun shines nearly 24/7, and so many creatures await the blooms of phytoplankton and the quick-to-follow zooplankton. Schools of **sardines** are collect to dine on the zooplankton and krill, while trying to avoid the predacious **cod** that swim up from the deep.

Back along the rocky shore line, **kelp** have anchored along side the mussels, sharing the waters, but 'dining' on the sunlight rather than microorganisms in the rich waters swirling around them. The kelp forests are home to many creatures, as they provide both and shelter. The **abalone** slowly move along the rocky bottom, munching on kelp as they go in search of a mate. Only slightly faster, the colorful **sea stars** move along the rocks, happy to dine on whichever mollusk they encounter, mussels or abalone, clamping to their shells, turning their stomachs inside out and digesting the meal right out of the shell. The **kelp crabs** find both food and home within the abundant kelp forests. As they scuttle along, climbing and eating kelp they hope to avoid the prowling **octopuses** which also make these shallow waters their home. But octopi and crab alike must be wary of the non-discriminating **sharks** as they cruise these rich waters, happy to munch up any moving thing that might make a tasty snack. As the tide retreats many mussels find themselves above water and are now exposed to the gulls flying overhead. The **gulls** swoop down and peck at mussels, sea stars or sardines, whatever is close enough to the surface to grasp with their bills.

Further out off shore some larger fish, like **orange roughy** come up along with the cod from the deep to dine on the sardines, or perhaps some young **squid**. In the summer months these waters are rich with all manner of marine life, all taking advantage of the rich food supplies available for a short time each year. A school of **tuna** has moved in from the open ocean to feed on whatever large meals they might devour. The tuna, able to swim at speeds of 45 mph are generally free to dine whatsoever they may please, like orange roughy, cod or even schools of young squid. Yet, as fast as they are, they must be mindful of top carnivores like the sharks or killer whale, also known as an **orca**. Along with leopard seals, the orcas swim quickly in short bursts to catch large prey like squid or even the **penguins** which are also out in the deeper water looking for a calorie-rich fish meal.

Tired of little snacks, the shark also moves to deeper water in search of a more substantial meal. Never a picky eater the shark is happy to nip on a smaller squid, a slow tuna, a penguin, or even a gull bobbing on the water overhead. The shark ignores the behemoth of a **blue whale** that has been drawn to these rich waters. The largest mammal ever to live, the blue whale is actually moving in to dine on large

mouthfuls of krill that it filters in through its baleen. It is unconcerned with most other things in these waters, save a giant squid or perhaps a pod of orcas which might move in to make a meal of its calf.

After reading the passage above, answer the following questions:

1) Use the pictures of the organisms to arrange a food web on your lab table. In the space below, draw the food web you have created. Make sure that the arrows from one organism to the next are going in the correct direction.

2) Examine the food web that you created above, identify the following groups in the food web:

a) Identify the producers –

b) Identify the consumers –

c) Identify the secondary consumers –

d) Identify the tertiary consumers –

e) Is there a top carnivore in this food web? If so, which organism? Can there be more than one?

3) If a disease were to wipe out the abalone what would happen to the following populations (give reasons for your answers)

- Kelp crabs

- Gulls

- Sharks

- Phytoplankton