**Blue Planet – Frozen Seas**

**Background**

The seas surrounding the arctic and Antarctic are the coldest and harshest. Very few organisms are able to survive for long periods in these ecosystems. The ones that are able have specific adaptations and behaviors to combat the elements.

**Questions**

These questions are written in sequence with the frozen seas episode. Ask about any missed questions at the end of the video.

1. What is a **polynya**?
2. Why does the Bowhead whale shown stay close to the polynya, even though there is no food for it there?
3. What strategy do Beluga whales use to maintain their polynya?
4. The relationship between polar bears and sea gulls (or arctic foxes) is best described as: (choose one)
   1. Mutualism
   2. Commensalism –
   3. Parasitism
5. Why do harp seals give birth on pack ice instead of land?
6. Describe one adaptation of the *harp seal*.
7. Hooded seals have the shortest nursing period – four days of any known mammal. Why?
8. What predatory adaptation do polar bears have? How do ring seals, their prey, counter this?
9. *Brṻnnich’s guillemots* could be considered an example of divergent evolution from the penguins of the Antarctic. What is one significant way they are physically different? Why is this important in the Arctic?
10. Bowhead whales are the only large sea mammals that remain in the arctic all year. How do they feed?
11. What is molting, and why do the walrus need to do it?
12. Surviving in the Antarctic is extremely difficult. What advantage do Emperor Penguins have that animals in the less-harsh Arctic do not?
13. How do Weddell seals maintain access to the air when the sea is frozen? What is the drawback to this technique?
14. How are krill able to survive through the harsh winter?
15. Zavodovski Island has the world’s largest penguin colony. What geographic feature makes this island so attractive as a breeding site?
16. The number of mammals in the seas around Antarctica increases dramatically in the spring. What changes occur that allow the ecosystem to support these organisms?
17. Leopard seals are a **top predator**. What does this mean?

**Analysis**

This is a food web from an Antarctic community. What do the arrows represent? Who are the primary producers of this community? What would happen if one or more of the organisms at the base of the food web were to disappear?

