Name _____

Arctic Shift

Directions: Read the passage carefully. Then answer the analysis and reflection questions in complete, well developed sentences.

Warming Trends and Ecosystem Change in the Arctic Ocean

The Arctic Ocean is warming faster than nearly any other region on Earth. Rising air and water temperatures cause large sections of sea ice to melt earlier in the year and form later in the winter. This shift reduces the overall amount of permanent ice and increases the amount of open water. Open water absorbs more sunlight than ice because it has a lower **albedo**, meaning it reflects less solar energy back into space. As a result, the Arctic Ocean warms even more quickly, which leads to further melting in a self reinforcing cycle.

These warming trends affect the ocean's ecosystems in significant ways. Some species, such as polar bears and ice dependent seals, rely on sea ice for hunting, resting, and raising their young. As ice becomes less stable, their survival becomes more challenging. At the same time, species that prefer warmer waters are slowly moving north. This shift changes food webs and introduces new competition for resources.

The melting of sea ice also influences ocean circulation. Freshwater from melted ice can reduce salinity and disrupt the formation of dense water that normally sinks to the deep ocean. This process is an important part of global circulation, which helps distribute heat around the planet. Scientists are concerned that changes in the Arctic Ocean could weaken or slow these systems, with long term consequences for global climate and weather patterns.

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Arctic Shift

1. Explain how the albedo effect contributes to faster warming in the Arctic.

2. Identify two specific ways melting sea ice affects Arctic animals and describe why these changes matter.

3. According to the passage, how do warming trends influence the movement of species within the Arctic ecosystem?

4. Describe why changes in salinity can affect global ocean circulation.

5. What evidence from the passage shows that Arctic warming is connected to global climate systems?

6. In your view, which impact of Arctic warming is the most concerning and why? Support your reasoning with evidence.

7. Describe one possible long term consequence for human populations if Arctic climate change continues.

8. Propose one research question scientists could investigate to better understand future Arctic changes.

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