Name: _____ Date: _____ Period: ____

Weekly Reading HW HW Wk ___

Directions: Read and annotate the passage below. Then answer the questions.

A Wealth of Data in Whale Breath

On her trainer's command, a beluga whale named Naku placed her chin on the deck of her pool and exhaled. The vapor rose into a petri dish a researcher held over her blowhole. It turns out, those tiny drops contain a wealth of information. Researchers are learning how to use the breath, or "blow" of whales to measure hormones, microorganisms, and even DNA. Their goal is to improve the health of captive cetaceans and develop a powerful, unobtrusive technique for studying them. While blood is the gold standard in research, it can be hard to obtain — and all but impossible from large whales. Breath analysis may prove to be the next best thing.

Doctors have long sniffed their patients' breath to diagnose a variety of diseases. But gadgets, like chemical breath tests that can detect asthma, cancer, and diabetes, may soon replace noses. Trainers working with captive whales also smell their breath. Normal whale breath has a fishy smell, but rotten-egg scents signal digestive problems, and sweet ones indicate bacterial pneumonia.

In 2009, researchers reported detecting the hormones progesterone and testosterone in the blow from humpback and North Atlantic right whales, offering clues to their sex and reproductive state. Another team, using a remote-controlled helicopter to collect samples, reported finding potentially pathogenic bacteria in the breath of five whale species.

Scientists at Mystic Aquarium are studying reproductive and stress hormones in the breath of Naku and her three poolmates. Not only do the whales blow on demand, but they also allow researchers to draw blood, take saliva, and collect fecal samples. Being able to compare results from all four bodily fluids is a huge advantage, said Tracy Romano, the project's leader. So is being able to monitor and control virtually every aspect of the whales' lives. "We know the health of the animals," she said. "We know their age, diet, and water chemistry in which they live eating."

Wild whales are not so easily studied because they spend much of their time offshore and underwater. Scientists suspect they are under stress from human-caused problems like pollution. Blow testing could be used to help determine their health.

1. (RST.9-10.2) The main idea of the passage is that:
   a. Whale breath is being used to determine digestive problems or bacterial pneumonia.
   b. Whale breath has proven that whales are stressed from human-caused problems.
   c. Whale breath contains a lot of information that scientists can use analyze whale health.
   d. Whale breath contains more informative information than blood, saliva, or feces.

2. (RST.9-10.4) The term, *cetacean*, most likely refers to a:
   a. Reptile
   b. Amphibian
   c. Terrestrial organism
   d. Marine mammal

3. (RST.9-10.1) According to the passage, the main advantage of analyzing whale breath is that:
   a. It has hormones only found in blow
   b. It is noninvasive
   c. Only captive animals can be tested
   d. It offers more information than blood

Name: _____ Date: _____ Period: ____

4. (RST.9-10.1) Chemical tests can detect all of the following in humans, EXCEPT:
   a. Cancer
   b. Asthma
   c. Diabetes
   d. Pathogenic bacteria

5. (RST.9-10.1) What are all the possible things that scientists can measure in whale breath?

   _____

   _____

   _____

   _____

6. (RST.9-10.1) Describe the advantages of testing captive whales as opposed to wild whales.

   _____

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Adapted from the article, "A Wealth of Data in Whale Breath" by Rebecca Kessler for The New York Times*, on September 30, 2013.*