Name: _____ No.: ____ Class: _____

Unit 11

Reading : Water for Life: A Use of Nanotechnology

Vocabulary:

distressed (adj.) filter (n.) manipulation (n.)
matter (n.) filthy (adj.) sterile (adj.)
pathogen (n.) contaminated (adj.) foul-tasting (adj.)
prototype (n.) disposable (adj.)

Directions: Match the words with the definitions

1. .....: the process of skillfully handling, controlling, or using something (การควบคุมหรือการใช้)
2. .....: the material that universe is made of (วัตถุ, สสาร)
3. .....: something that produce disease like bacteria (เชื้อโรค)
4. .....: very dirty (ที่สกปรก, ที่โสโครก)
5. .....: completely clean and not containing any bacteria (ปราศจากเชื้อโรค)
6. .....: containing dangerous or poisonous substances (ทำให้เน่า, ทำให้มีเชื้อโรค)
7. .....: tasting bad (ที่รสชาติไม่ดี)
8. .....: upset (โศกเศร้าเสียใจ)
9. .....: a model of an invention used to test its design before it is produced(ต้นแบบ, แบบฉบับ)
10. .....: able to be thrown out (ที่ใช้แล้วทิ้ง, ทิ้งได้เลย)
11. .....: something that gas or a liquid is put through to remove unwanted substances (เครื่องกรอง)

Nanotechnology is the manipulation of matter at an atomic or molecular scale. It enables the development of simple structures from 1 to 100 nanometers.*

This advanced technology has been incorporated into a new efficient water filtration system, and it comes in the form of a bottle or large can called a Lifesaver bottle. This container removes bacteria, viruses, parasites, and other microbiological pathogens from water. It uses a simple device that turns filthy
water into safe, sterile drinking water, no matter how badly contaminated it was in the first place. And this is done without the aid of foul-tasting chemicals. It is done with the use of a filter that incorporates nanotechnology. The can version holds 18.5 liters of water, and can process up to 20,000 liters in its lifetime. It can provide safe drinking water for a family of four up to a period of five years.

The Lifesaver bottle or can is the creation of Michael Pritchard, a water-treatment expert in England. Pritchard was distressed by the number of people who died by drinking contaminated water after two natural disasters, the 2004 Asian tsunami and the 2005 Hurricane Katrina in the U.S. He began working on the Lifesaver bottle and presented the prototype in 2007 at the Defense and Security Show in London. Pritchard's stock of 1,000 bottles sold out within four hours of his presentation. Since then the Lifesaver bottle or can has been present in most of the world's catastrophes, such as the 2010 earthquake in Haiti.

The actual mechanism of the can or bottle is very simple. It uses a disposable carbon filter that can process 0.71 liters of water in 20 seconds. To filter the water, one puts contaminated water in the back of the bottle, and then screws the lid on. The lid has a built in pump that is operated manually. The pumping action forces the contaminated water through the nano-filter, and safe drinking water collects in another chamber in the bottle. The drinker then opens the top of the bottle, from which safe drinking water comes out.

Dirty water is the number-one killer of children in developing countries around the world. Children need at least two liters of water a day to survive. Nowadays, 1.1 billion people do not have access to safe drinking water, and each year approximately 600,000 children die globally as a result of drinking unclean water.

Recently this new water filtration system has reached many homes in rural areas and provides drinking water to thousands of families. This is thanks to innovative technology and innovative people like Michael Pritchard.

* Note: Nanometer is used to express dimensions on an atomic scale: it is one billionth of a meter.

1. Who is the creator of the Lifesaver bottle or can, a water filtration system using nanotechnology?

   Ans.: _____ .

2. What is the primary purpose of the Lifesaver bottle or can?

   Ans.: _____ .

3. How much water can the Lifesaver can version hold?

   Ans.: _____ .

4. How many liters of water can the Lifesaver bottle or can process in its lifetime?

   Ans.: _____ .

5. What event prompted Michael Pritchard to develop the Lifesaver bottle or can?

   Ans.: _____ .

6. How does the Lifesaver bottle or can filter water?

   Ans.: _____ .

7. What is the main impact of dirty water in developing countries, according to the passage?

   Ans.: _____ .