

Vocabulary Workshop[®]

Tools for Excellence

Differentiated Passages

Grade 8

PASSAGE 1

UNIT 8

Read the following passage, taking note of the **boldface** words and their contexts. These words are among those you will be studying in Unit 8. As you complete the exercises in this unit, it may help to refer to the way the words are used below.

Aquatic Robotics

<Technical Essay>

Two-thirds of Earth's surface is covered with water. Human beings have yet to **infiltrate** most of this unexplored and **cryptic** terrain. Instead, their most important **proxies** underwater are robots. The field of undersea robotics has grown rapidly in recent years. It is now an essential part of ocean exploration.

At the very foundation of robot design is the performance of tasks that are difficult, repetitive, or dangerous. These same words describe undersea exploration. For example, the important missions of marine research often require a descent to great depths. Vast areas of the ocean floor remain inaccessible to humans no matter what

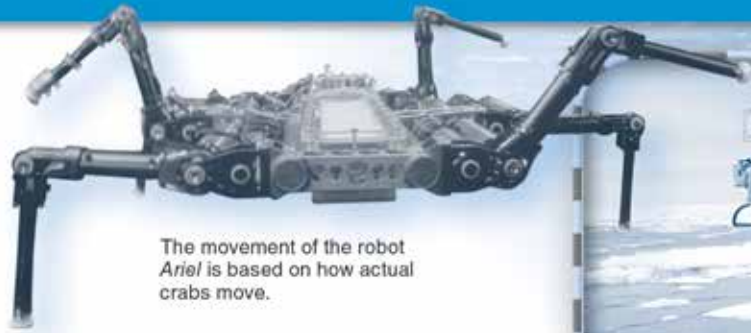


protective **attire** they wear or equipment they use. And no eager explorer, however **fervent**, would carry out a deep diving **stint** lasting months at a time.

Robotics engineers began to pick up on these challenges in the 1990s. They channeled their efforts into developing three **divergent** types of undersea robots. One type is a remote-controlled vehicle that is towed behind ships. Another type is really a miniature submarine that carries a human crew and is equipped with robot arms. A third type of robot is fully autonomous, carrying out a survey in an **unflagging** fashion that no human could hope to match.



PASSAGE 1



The movement of the robot *Ariel* is based on how actual crabs move.

Undersea robots are designed to aid humans in a variety of endeavors. Some of these are ecological. For instance, an early objective of the *Odyssey* robot series that was developed at the Massachusetts Institute of Technology was to investigate the decreasing number of humpback whales on Stellwagen Bank, a large underwater plateau at the mouth of Massachusetts Bay. Another *Odyssey* mission took the robot to the bottom of the Labrador Sea between Newfoundland and Greenland. There, even the notoriously rough winter weather could not **nullify** the robot's mission to explore ocean oxygenation. In this process, surface waters in high latitudes near the poles become oxygen-rich but also cold and dense. The cold, dense water **plummets** to the bottom in plumes, where it provides energy for many kinds of life. Without *Odyssey's* assistance in such missions, human efforts would have been to no **avail**, given the conditions. The latest *Odyssey* robot can even hover in place, like a helicopter. It can be controlled remotely with a joystick.

Scientists are not the only ones using aquatic robots. Undersea robots are also important for military uses. The robot crab *Ariel*, for example, may be used to clear mines from minefields that **abut** the shore. No obstacle or crevice stops *Ariel*. Few humans would remain calm and **stoical** performing such a hazardous duty. Military robots are also used to find enemy submarines and to protect coastal areas.

At present, there is virtually no **perceptible** limit on the array of uses



for undersea robotics. The British independent robot *Autosub4*, for example, has been used to explore herring behavior in the North Sea and to locate valuable metals at the bottom of a Scottish lake. Tethered underwater vehicles called ROVs have assisted marine archaeologists in locating and exploring shipwrecks, including that of the *Titanic*. And after the massive Gulf oil spill disaster in 2010, cleanup analyses and efforts relied heavily on ROVs. It is safe to **proclaim** that undersea exploration in the twenty-first century will increasingly be the domain of robots as they go where humans cannot hope to follow.

PASSAGE 2

UNIT 8

Read the following passage, taking note of the **boldface** words and their contexts. These words are among those you will be studying in Unit 8. As you complete the exercises in this unit, it may help to refer to the way the words are used below.

Aquatic Robotics

< Technical Essay >

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divergent types of

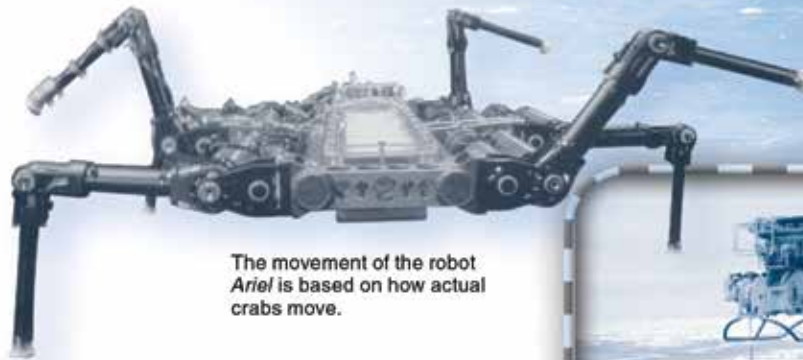
At the foundation of robot design is the performance of difficult or dangerous tasks. This includes undersea exploration. Vast areas of the ocean floor remain inaccessible to humans, no matter what protective **attire** they wear. And no eager explorer, however **fervent**, would carry out

undersea robots. One is a remote-controlled vehicle that is towed behind ships. Another is a miniature submarine with robot arms that carries a human crew. A third is fully independent. It carries out research in hazardous ocean environments where humans cannot go.



Unit 8

PASSAGE 2



The movement of the robot *Ariel* is based on how actual crabs move.

Undersea robots are **unflagging** in aiding humans in a variety of ecological ventures. The *Odyssey* robot series investigated the decreasing number of humpback whales at the mouth of Massachusetts Bay. On another mission, the *Odyssey* went to the bottom of the Labrador Sea between Newfoundland and Greenland. Even the rough winter weather could not **nullify** the robot's mission to explore ocean oxygenation. In this process, surface waters in high latitudes become oxygen-rich but also cold and dense. The cold, dense water **plummets** to the bottom in plumes. There it provides energy for many kinds of life. Human efforts would have been to no **avail**, given the conditions.

Undersea robots are also important for military uses. The robot crab *Ariel*, for example, may be used to clear mines from minefields that **abut** the shore. Few humans would remain calm and **stoical** performing such a risky task. Military robots are also used to find enemy submarines and to protect coastal areas.

There is virtually no **perceptible** limit on the array of uses for undersea robotics. Tethered underwater vehicles called ROVs have assisted marine



archaeologists in locating and exploring shipwrecks. And after the massive Gulf oil spill in 2010, cleanup efforts relied heavily on ROVs. It is safe to **proclaim** that undersea exploration will increasingly be the domain of robots as they go where humans cannot.

Unit 8