While you watch the video, write down any questions you have (including any words you do not know).

After you watched the video, circle any of the words here that you did not know.

academia  accompanying  adapted  approaches  automate  capability  constant  contact
context  distributed  enables  environment  equipment  experts  incorporated  innovations
innovative  intelligence  monitored  normal  options  perceive  perception  persistence
perspective  potentially  purchase  react  research  revolutionary  route  scenario
scenarios  security  target  technique  technology  vehicles

Then, answer these questions. You may need to watch parts of the video again to answer some questions.

1. Who produced this video? Office of Naval Research / ONR

2. How do you know? Title/First Screen in Video/Narrator says ONR slogan

3. What technology previously used some of the robotic technology shown in this video?
   a. Hubble telescope
   b. NASA’s Mars Rover
   c. the new aircraft carrier USS Gerald R. Ford
   d. James Cameron’s Deepsea Challenger submarine

4. Circle the three discoveries allowed for the Swarm technology.
   a. nuclear fusion
   b. nuclear fission
   c. machine perception
   d. artificial intelligence
   e. distributed data fusion
   f. orbiting satellite technology

5. At 5:40 in the video, Rick Simon talks about the “eyes and ears” of a ship. Put an X on the technology listed in Question #4 that gives the ship “eyes and ears”.

6. How does Rick Simon use “guard dogs” to make his point clear at 2:31 in the video?
   a. in a simile about the shape of the boats
   b. in an allusion to the damage ships can cause
   c. in a metaphor for the US Navy’s role in the world
   d. in an allusion to the amount of damage ships can receive
   e. in a metaphor to show that these boats are exactly like guard dogs
   f. in a simile that shows the role of the Swarm ships and the larger ship

7. The narrator mentions CARACaS, and CARACaS stands for Control Architecture for Robotic Agent Command and Sensing. What are the two components of CARACaS?

   7a. Sensors
   7b. Accompanying software kit

8. What are “surface assets”? Ships on the surface of the water

Video by ONR at: https://www.youtube.com/watch?v=xia22RMzCmQ.
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9a. Meggan Schoenberg explains this experiment. What does she say should happen when the adversary approaches?

The Swarm surrounds the adversary (@3:11)

9b. Is their prediction accurate? How do you know?

Yes, the demonstration was a success. (@5:59)

10. What types of people worked on the Swarm technology? (Circle all that apply.)

a. men  
b. women  
c. fast swimmers  
d. university professors  
e. researchers in centers and labs  
f. governments of other countries  
g. Office of Naval Research experts  
h. strong people that can paddle quickly  
i. naval engineers in private companies

11. What do unmanned ships add according to Dr. Robert Brizzolara (5:10)? persistence

12. What does autonomous mean in this context? acting without humans onboard

13. What type of engineer is Andreas Marcial? electrical (@6:05)

14. Why did they interview Andreas Marcial?

a. He drove a Swarm boat.  
b. He worked on the Swarm boats.  
c. He designed the Swarm technology.  
d. He invented the idea of autonomous boats.  
e. He paid for the research into autonomous boats.

15. Do you agree with the narrator when he says that Swarm is “unleashing a new era in advanced ship protection”? Why or why not?

Many Answers; needs supporting evidence. For example:

Yes, autonomous ships can protect sailors without risking human life

16. Is there anything still unclear about the Swarm technology or this video? You can write it here.

Note: If you want to read, more about this topic see this ONR press release: http://bit.ly/2wZlrFN

Video by ONR at: https://www.youtube.com/watch?v=xia22RMzCmQ.  
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