



# "Designing Submersibles" Assessment

Today the date is:		
MONTH	DAY	YEAR
<input type="radio"/> January		<input type="radio"/> 2006
<input type="radio"/> February		<input type="radio"/> 2007
<input type="radio"/> March	<input type="radio"/> 0	<input type="radio"/> 2008
<input type="radio"/> April	<input type="radio"/> 1	<input type="radio"/> 2009
<input type="radio"/> May	<input type="radio"/> 2	<input type="radio"/> 2010
<input type="radio"/> June	<input type="radio"/> 3	<input type="radio"/> 2011
<input type="radio"/> July		<input type="radio"/> 2012
<input type="radio"/> August		
<input type="radio"/> September		
<input type="radio"/> October		
<input type="radio"/> November		
<input type="radio"/> December		

Marking Instructions
<ul style="list-style-type: none"> <li>Use a No. 2 pencil or a blue or black ink pen only.</li> <li>Do not use pens with ink that soaks through the paper.</li> <li>Make solid marks that fill the response completely.</li> <li>Make no stray marks on this form.</li> </ul>
<p><b>CORRECT:</b> ●      <b>INCORRECT:</b> ☒ ☓ ☉ ☊</p>

For each question, fill in the bubble for the **BEST** answer.

My initials:		
FIRST	MIDDLE	LAST
(A)	(A)	(A)
(B)	(B)	(B)
(C)	(C)	(C)
(D)	(D)	(D)
(E)	(E)	(E)
(F)	(F)	(F)
(G)	(G)	(G)
(H)	(H)	(H)
(I)	(I)	(I)
(J)	(J)	(J)
(K)	(K)	(K)
(L)	(L)	(L)
(M)	(M)	(M)
(N)	(N)	(N)
(O)	(O)	(O)
(P)	(P)	(P)
(Q)	(Q)	(Q)
(R)	(R)	(R)
(S)	(S)	(S)
(T)	(T)	(T)
(U)	(U)	(U)
(V)	(V)	(V)
(W)	(W)	(W)
(X)	(X)	(X)
(Y)	(Y)	(Y)
(Z)	(Z)	(Z)

Do Not Mark

I was born in:
<input type="radio"/> January <input type="radio"/> July <input type="radio"/> February <input type="radio"/> August <input type="radio"/> March <input type="radio"/> September <input type="radio"/> April <input type="radio"/> October <input type="radio"/> May <input type="radio"/> November <input type="radio"/> June <input type="radio"/> December

I am a:	<input type="radio"/> Girl	<input type="radio"/> Boy
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Do Not Mark	Do Not Mark
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(0) (0) (0) (0) (0) (0)	(0) (0) (0) (0) (0) (0)
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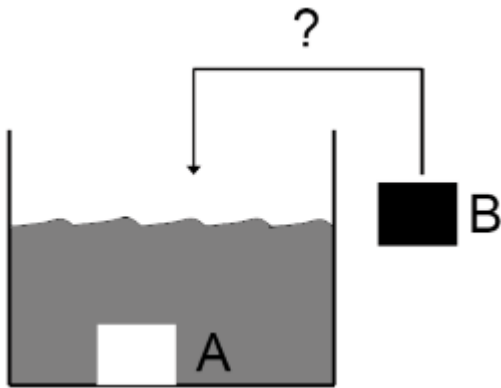
1. What might an ocean engineer do for his or her job?

- (A) Design a playground on the beach.
- (B) Study animals that live in the ocean.
- (C) Scuba dive to search for sunken treasures.
- (D) Improve instruments to collect data underwater.

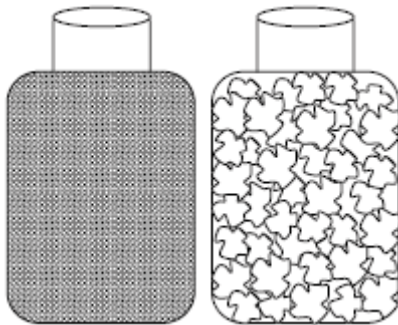
2. To figure out how dense an object is, you need to know:

- (A) its mass and volume.
- (B) its shape and weight.
- (C) its mass and hardness.
- (D) its texture and hardness.

3. The black block is more dense than the white block. The white block sinks in a tub of water. What will the black block do?



- (A) float at the top of the water
- (B) sink to the bottom of the tub
- (C) float below the surface of the water
- (D) there is no way to know what will happen
4. A student has two plastic bottles that are exactly the same. One is full of sand and the other is full of popped corn. Which is more dense?



- (A) the bottle filled with sand
- (B) the bottle filled with popped corn
- (C) both are the same density
- (D) there is no way to know

5. A jar of rocks sinks in a tub of water. What could you do to make the rocks float?

- (A) add more water to the tub
- (B) put the rocks in a larger jar
- (C) put the rocks in a smaller jar
- (D) it is not possible for a jar of rocks to float

6. A submersible is something that can float on the water and also carry things or people under the water. A submarine is a kind of submersible. The best way to get a submersible to float is to change its:

- (A) shape.
- (B) weight.
- (C) density.
- (D) volume.





7. Which objects always sink in water? Objects that are:

- (A) very heavy.
- (B) made of metal.
- (C) denser than water.
- (D) all of the above.

8. An ocean engineer would probably help to design:

- (A) a cargo ship.
- (B) a submarine.
- (C) an underwater microphone.
- (D) all of the above.

A student is dropping some bottles of marbles into a water tank to see if they sink or float. The large bottle has twice the volume of the small bottle. Both bottles are made of the same materials. The table shows what she has found so far.

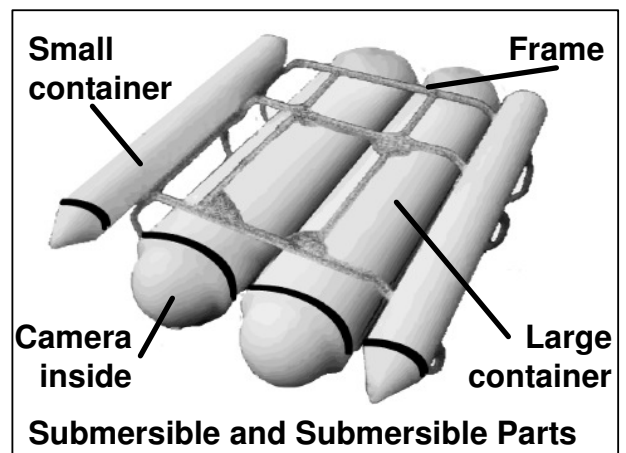
Container	Filling	Looks like	Result
Small Bottle	10 marbles		Floats
Small Bottle	20 marbles		Sinks
Large Bottle	40 marbles		Sinks
Large Bottle	20 marbles		????????

9. Which of the following is true, based on the data?

- Ⓐ The more full a bottle is, the more likely it is to sink.
- Ⓑ The more empty a bottle is, the more likely it is to sink.
- Ⓒ Smaller bottles of marbles are more likely to float than larger bottles of marbles.
- Ⓓ Larger bottles of marbles are more likely to float than smaller bottles of marbles.

10. Some students are designing a submersible to take underwater pictures. Their first design didn't work because it sank. What is the BEST thing they can do to improve it so it floats?

- Ⓐ Add some empty containers to the submersible.
- Ⓑ Add some containers filled with water to the submersible.
- Ⓒ Remove the camera so the submersible weighs less.
- Ⓓ None of the above.



11. What is an example of a technology used by scientists and ocean engineers to explore the ocean?

- Ⓐ SONAR
- Ⓑ sounding
- Ⓒ submersibles
- Ⓓ all of the above

12. What might an ocean engineer do for his or her job?

- Ⓐ Design an underwater vehicle to explore the ocean.
- Ⓑ Design technologies that are used by marine biologists
- Ⓒ Figure out new ways to measure the depth of the ocean.
- Ⓓ All of the above.

13. What might an ocean engineer do to help scientists learn about fish that live in deep water?

- Ⓐ Go scuba diving to take pictures of the fish.
- Ⓑ Create a device that keeps track of where the fish swim.
- Ⓒ Drive the boat to bring the scientists to where the fish live.
- Ⓓ An ocean engineer wouldn't help scientists with this problem.

14. What is the BEST way to figure out where a pond is exactly five feet deep?

- Ⓐ Look into the water with a flashlight.
- Ⓑ Use a stick to measure the depth in the middle.
- Ⓒ Use a stick to measure the depth in several different areas.
- Ⓓ There is no way to know without draining the pond.

15. A scientist in a ship can use SONAR to figure out:

- Ⓐ how deep the ocean is under the ship.
- Ⓑ if the ocean bottom is sandy or rocky.
- Ⓒ whether there is a sunken ship at the ocean bottom.
- Ⓓ all of the above.

16. The ocean is largely unexplored because:

- Ⓐ it is extremely large.
- Ⓑ most people don't live near the ocean.
- Ⓒ people don't like to spend time in the ocean.
- Ⓓ it is impossible to send cameras into the deep ocean.

17. Ocean engineers sometimes have to re-design a technology so it can be used in the ocean. This is because:

- Ⓐ salt water might damage the technology.
- Ⓑ the water in the ocean is always moving.
- Ⓒ the technology might harm ocean animals.
- Ⓓ all of the above.