

Under Pressure WebQuest Worksheet

*Instructions: Use the prompts on this document to complete the **Under Pressure WebQuest** found at <http://underpressurewebquest.weebly.com/>. The responses you provide will help you to identify a suitable pressure gauge for your intraocular pressure sensor prototype.*



1. Read the introduction under the BEGIN button.
 2. Click BEGIN.
 3. You will design and 3D print a prototype of an intraocular (implanted in the eye) pressure sensor. Read the definitions provided for the term “pressure” and answer the questions below:
 - a. Which definition would you use to define the word “pressure” in the phrase *intraocular pressure sensor*?

 - b. Why did you select this definition?

 - c. Since we would like to measure the pressure within the eye, what should at least one part of your design do?
 4. Go back to the WebQuest tab and press NEXT.
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5. Before you decide which part of your pressure sensor will “push” when pressure is applied, let’s explore the ways in which certain pressures are measured. Watch the slideshow and answer the questions below:
 6. In the slideshow, what kinds of pressure are shown? For example, “air pressure.”
 7. Click on ONE picture of your choosing within the slideshow.
 - a. Define the pressure you selected.

 - b. Explain why it is necessary to measure this form of pressure.

Name: _____ Date: _____ Class: _____

8. Return to the WebQuest tab and click NEXT under the slideshow.

9. Read the page and then click NEXT.

10. What is the name of the pressure gauge you will first explore? _____

11. Click on the speaker icon and listen to the pronunciation of this pressure gauge.

Say this term five times to your partner.

12. Read the page and watch the video. Then answer the questions that follow.

13. This pressure gauge would be most effective in measuring the pressure of (circle all that apply):

- a. nitrogen gas
- b. lead
- c. blood
- d. water vapor

14. Draw the shape of this pressure gauge in the space here. →

15. How is this pressure gauge used in the medical field?

16. Would you recommend the use of this pressure gauge in an intraocular pressure sensor?

Why or why not?

17. Click NEXT under the video.

18. What is the name of the second pressure gauge you will explore? _____

19. Read the page and watch the video. Then answer the questions that follow.

20. This pressure gauge would be most effective in measuring the pressure of (circle all that apply):

- a. heat
- b. water vapor
- c. water
- d. air

21. Draw the shape of this pressure gauge in the space here. →

Name: _____ Date: _____ Class: _____

22. How is the pressure of a gas or liquid determined with this pressure gauge?

23. Would you recommend the use of this pressure gauge in an intraocular pressure sensor?
Why or why not?

24. Click NEXT underneath the video.

25. What is the name of the third pressure gauge you will explore? _____

26. Read the page and watch the video. Then answer the questions that follow.

27. This pressure gauge would be most effective in measuring the pressure of (circle all that apply):

- a. heated water vapor
- b. heated water
- c. ice
- d. carbon dioxide

28. Draw the shape of this pressure gauge in the space here. →

29. Why would someone use this pressure gauge?

30. The average body temperature of a human is 98.6 °F. Would this cause someone to consider a diaphragm seal pressure gauge for an intraocular pressure sensor? Why or why not?

31. Would you recommend the use of this pressure gauge in an intraocular pressure sensor?
Why or why not?

Name: _____ Date: _____ Class: _____

32. Click NEXT under the video.

33. What is the name of the LAST pressure gauge you will explore? _____

34. Read the page and watch the video. Then answer the questions that follow.

35. Why would someone use this pressure gauge?

36. Draw the shape of this pressure gauge in the space here. →

37. How is this type of pressure gauge used?

38. Would you recommend the use of this pressure gauge in an intraocular pressure sensor?
Why or why not?

39. Click NEXT

40. Follow the instructions on the page. What is the name of the pressure gauge you will use in your intraocular pressure sensor? _____

41. Answer the questions below with “yes” or “no” and then explain how you know.

a. For the pressure gauge you selected:

i. Is it able to be designed small enough to fit in the eye? _____. How do you know?

ii. Could it act as a tag in an RFID system? _____. How do you know?

iii. Will it have a low mass? _____. How do you know?

iv. Does it require the use of a battery to function? _____. How do you know?

42. Click FINISH.

Name: _____ Date: _____ Class: _____

43. **BEFORE READING THE WEBPAGE:** Re-read your answers to #3 on this document.

44. What must happen in order for your pressure gauge to successfully measure pressure?

45. Read and watch the video on the webpage.

46. The tuning forks in this video were placed on spruce wood boxes between the years of 1870 and 1900. The spruce wood boxes act as **resonators**. When the forks are struck, the energy from the vibrations in the forks is transferred to the boxes, which vibrate. The spruce wood boxes were selected for their ability to form sound waves due to vibrations. When watching the video, what evidence exists to prove that the sound waves can also transfer their energy to another object?

47. In the space below, draw a diagram of the parts an intraocular pressure sensor must include. Label each part and briefly describe the function of each.