

## HOW VITAL ARE YOUR SIGNS?

### Performance Standard 7A/7C.I

Measure the vital signs on four classmates using a variety of methods and instruments:

- *Mathematical knowledge*: measure temperature, pulse, respirations and blood pressure using appropriate instruments.
- *Strategic knowledge*: check measurement computations and solve problems involving customary and metric systems.
- *Explanation*: explain completely and clearly what was done and why it was done.

### Procedures

1. *In order to measure and compare quantities using appropriate units, instruments and methods (7A) and select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings (7C)*, students should experience sufficient learning opportunities to develop the following:

- Convert between the U.S. customary and metric systems given the conversion factor.
- Solve problems using indirect measurement by choosing appropriate technology, instruments and/or formulas.

Students employed in various health occupations are required to measure and report client vital signs or other indicators of health status, use appropriate evaluation tools and instruments, recognize abnormal results and take action consistent with level of training. Both mathematical and analytical skills are critical to accurately perform these job duties.

2. Provide each student a copy of the "How Vital Are Your Signs?" task sheets and the rubric. Have students review and discuss the task to be completed and how the rubric will be used to evaluate it.
3. Ask the students to solve the following problem:  
In health care, many different instruments and methods are available to measure vital signs. Vital signs are important indicators of a client's health status. Accuracy is not only needed to diagnose a condition but may also help determine the treatment used. Using the various methods and instruments provided, take and record the measurements as indicated on the task list.
4. Evaluate each student's measurements and narratives using all three dimensions of the rubric and its guide to determine the performance level. Temperature conversions are made by using the formulas:  $F=C(1.8) + 32$  and  $C=(F-32) 0.5556$  and rounded to the nearest tenth. Observations made on pulse include rate, rhythm and volume/force. Observations on respirations include rate, character and rhythm. Blood pressures should be taken in the sitting position and may be measured again to determine accuracy after waiting 30-60 seconds between each measurement.

### Examples of Student Work

- [Meets](#)
- [Exceeds](#)

### Time Requirements

- One 90-minute class period, depending on the availability of equipment

### Resources

- Copies of the "How Vital Are Your Signs?" task sheets
- Nursing assistant textbook
- Electronic, tympanic and disposable (tempa-dot) thermometers
- Stethoscopes
- Electronic vital machine
- Mercury and aneroid sphygmomanometers
- Mathematics Rubric

NAME \_\_\_\_\_ DATE \_\_\_\_\_

## HOW VITAL ARE YOUR SIGNS?

### Student Task Sheet

Take turns measuring vital signs on four classmates.

1. Use these four methods to measure a temperature: oral digital, oral disposable, axillary digital and tympanic. Record these findings on the graphic sheet.
2. Measure the radial, apical and carotid pulse and record them. Then measure the pulse with an electronic monitor and record.
3. Use the auditory and visual methods to measure respirations and record your findings.
4. Measure the blood pressure with the electronic monitor or vital machine (usually at the same time you do the pulse). Then measure the blood pressure with an aneroid and mercury sphygmomanometer and record all findings.

When you have completed your measurements, answer the following questions.

1. What is the normal range for an oral temperature? Tympanic? Axillary?
2. An axillary temperature is usually how many degrees below an oral temperature?
3. How did the readings from the various methods compare?
4. Mrs. Jones is to have her temperature taken every 4H. You are to report immediately to the nurse if she has an oral temperature of 38.3 degrees Celsius or above. The nursing unit only has Fahrenheit thermometers. What temperature (or greater) in Fahrenheit must be reported?
5. What is the normal range for respirations in an adult?
6. What respiratory assessments could you make using the two methods?
7. What is the normal range for an adult pulse?
8. How did the readings from the various pulse-taking methods compare?
9. What observations from each of the four pulse methods could be made, and what are the advantages of using each method, based on the observations?
10. What are considered the normal parameters for a blood pressure?
11. How did the different blood pressures compare? How long do you wait between measurements to ensure accuracy?
12. What is an advantage of using the aneroid and mercury sphygmomanometers? What is an advantage of using the electronic monitor?

Name																
	Oral	T Dot	Tympanic	Axillary	Oral	T Dot	Tympanic	Axillary	Oral	T Dot	Tympanic	Axillary	Oral	T Dot	Tympanic	Axillary
104																
103																
102																
101																
100																
99																
98																
97																
96																

Pulse			
Radial			
Carotid			
Apical			
Monitor			
Respiration			
Auditory			
Visual			
Blood Pressure			
Aneroid			
Mercury			
Monitor			

NAME \_\_\_\_\_

## MATHEMATICS RUBRIC

NAME \_\_\_\_\_ DATE \_\_\_\_\_

- Exceeds standard (must receive a 4 in each area)
- Meets standard (must receive all 3's or a combination of 3's and 4's)
- Approaches standard (must receive all 2's or any combination which may include a 3 or a 4)
- Begins standard (has no 3's or 4's but not all 1's)
- Absent (has all 1's and 0's)

	<b>Mathematical Knowledge</b>	<b>Strategic Knowledge</b>	<b>Explanation</b>
<b>4</b>	<ul style="list-style-type: none"> <li>• Wrote the right answer.</li> <li>• Used math words correctly to show understanding of how math works.</li> <li>• Worked it out with no mistakes.</li> <li>• Used the right math words and labeled the answers.</li> </ul>	<ul style="list-style-type: none"> <li>• Identified all the important parts of the problem, and knew how they went together.</li> <li>• Showed all the steps used to solve the problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Wrote what was done and why it was done.</li> <li>• If a drawing was used, all of it was explained in writing.</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>• Knew how to do the problem, but made small mistakes.</li> </ul>	<ul style="list-style-type: none"> <li>• Identified most of the important parts of the problem.</li> <li>• Showed most of the steps used to solve the problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Wrote mostly about what was done.</li> <li>• Wrote a little about why it was done.</li> <li>• If a drawing was used most of it was explained in writing.</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>• Understood a little, but made a lot of big mistakes.</li> </ul>	<ul style="list-style-type: none"> <li>• Identified some of the important parts of the problem.</li> <li>• Showed some of the steps used to solve the problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Wrote some about what was done or why it was done but not both.</li> <li>• If a drawing was used, some of it was explained in writing.</li> </ul>
<b>1</b>	<ul style="list-style-type: none"> <li>• Tried to do the problem, but didn't understand it.</li> </ul>	<ul style="list-style-type: none"> <li>• Identified almost no important parts of the problem.</li> <li>• Showed almost none of the steps used to solve the problem.</li> </ul>	<ul style="list-style-type: none"> <li>• Wrote or drew something that didn't go with the answer.</li> <li>• Wrote an answer that was not clear.</li> </ul>
<b>0</b>	<ul style="list-style-type: none"> <li>• No answer attempted.</li> </ul>	<ul style="list-style-type: none"> <li>• No strategy shown.</li> </ul>	<ul style="list-style-type: none"> <li>• No written explanation.</li> </ul>
<b>Score</b>			