

Activity 2.1.2

Vital Signs

Five measurements, five instruments, five ways to get it wrong. Station rotation. You measure temperature, heart rate, respiratory rate, oxygen saturation and blood pressure on yourself and a partner, and you record every number with its unit.

DATE	PORTAL DAY	LESSON	TURN IN
Wednesday 2026-10-12	Vital signs practical	Lesson 2.1 Talk to Your Doc	Data table

Where this sits. Day 1 of 2. Portal calendar label for today: Vital signs practical.

01 Why today matters

Tomorrow you have to decide whether a real patient's numbers have changed in a way that matters, and you cannot judge somebody else's measurement until you have taken one yourself and felt how easy it is to be off.

Today is the hands-on half: five stations, five instruments, one honest data table.

02 What you already know

- You know from Unit 1 that a measurement without its unit is not data. You know what homeostasis means: the body holding a stable inside while the outside moves.
- Vital signs are the cheapest window onto whether that holding is working. You also met a wearable sensor in Unit 1 when you used the respiration belt, which is the same idea with a cable attached.

WHAT THIS SHEET WILL NOT TELL YOU

- Nothing on this sheet interprets anybody's numbers. Reading a patient's results against these ranges is tomorrow's work.

03 Vocabulary

TERM	WHAT IT MEANS, PLAINLY
Vital signs	The small set of measurements that tell you whether the basic machinery of a body is running: pulse, breathing rate, temperature and blood pressure.
Homeostasis	The body holding its internal conditions steady while the outside world changes. Sweating in heat and shivering in cold are the same system working in two directions.
Pulse	The pressure wave that travels down an artery each time the heart contracts. Count the waves and you have counted the beats.
Radial artery	The vessel on the thumb side of the inner wrist. One of the two easy places to feel a pulse.
Carotid artery	The vessel in the neck, found where the jaw meets the neck. The other easy pulse point. Press lightly and on one side only.

Respiratory rate	Breaths per minute, where one breath is one inhale plus one exhale. Counting only the inhales and only the exhales gives the same number, which surprises people.
Oxygen saturation	The percentage of the oxygen-carrying capacity in the blood that is actually carrying oxygen.
SpO2	The saturation figure specifically as read by a finger, toe or earlobe clip. The p stands for peripheral, meaning out at the edge of the body rather than at the heart.
Pulse oximeter	The clip that reads saturation by shining light through a fingertip and measuring what comes out the other side.
Sphygmomanometer	The blood pressure cuff and its pressure gauge. Say it sfig-mo-ma-NOM-eter.
Systolic pressure	The higher number. The pressure in the arteries at the instant the heart squeezes.
Diastolic pressure	The lower number. The pressure that remains between beats, while the heart is refilling.
Brachial artery	The vessel on the inner side of the elbow. This is what you listen to under a blood pressure cuff.
mm Hg	Millimeters of mercury, the unit of blood pressure. It comes from the height of a mercury column the pressure could hold up.
Fever	A body temperature at or above 100 degrees Fahrenheit, usually a sign the body is fighting something.
Hypothermia	A body temperature below 95 degrees Fahrenheit. Serious, because organs stop working properly well before the person feels it.

Every term on this list is flagged for the illustrated glossary, scoped to this activity only. Terms are not shared forward or backward between activities, because a definition from a later activity can hand you an answer you were supposed to derive.

04 How to do the work

You will rotate through five stations with a partner. Build your table first. Every row gets a unit.

- 1 Build the data table before you touch anything. Columns: vital sign, what it measures in your own words, the expected range, your value, your partner's value, unit. One row per vital sign. A number without a unit does not count.
- 2 Temperature station. Wash hands. Nothing eaten or drunk for five minutes. Place the disposable thermometer under your tongue, close your mouth, and hold it for the full three minutes on a timer. Read the last dot that turned dark. Record in degrees Fahrenheit.
- 3 Heart rate station. Sit still for a moment first. Find the radial pulse on the inner wrist, thumb side, with two fingers, or the carotid pulse at the jaw line. Partner runs a fifteen second timer. Count every beat. Multiply by four.
- 4 Repeat the heart rate count three times and average the three. Then swap and do the same for your partner. Record all three values and the average, not just the average.
- 5 Respiratory rate station. Sit with both feet flat and breathe normally. Your partner runs a full sixty second timer and counts your breaths, counting each rise of the chest as one. Do not count your own. Swap.
- 6 Oxygen saturation station. Turn the oximeter on. Push the marked end to open the clip. Slide it onto your partner's index finger until the finger stops against the ridge. Wait for the display to settle before you read it. Record the percentage and the pulse it also shows. Swap.
- 7 Blood pressure station. Wipe the earpieces. Seat your partner with the arm supported. Place the cuff snugly on the upper arm about one inch above the elbow, tubing running down the inside of the arm.
- 8 Fit the stethoscope, then slip the disc a quarter to a half of the way beneath the lower edge of the cuff so it sits over the inner elbow. Position the gauge where you can read it without moving.

- 9 Pump the bulb until you hear nothing at all. For people your age, 160 to 180 mm Hg is usually enough. Then open the valve slowly so the needle falls about two to three units per second.
- 10 The first clear rhythmic tapping is systolic. Note the gauge at that moment. Keep releasing. The point where the tapping stops is diastolic. Record as systolic over diastolic in mm Hg. Wipe the earpieces and swap.
- 11 When all five stations are done, look at your completed table and write one sentence on why each of these five is worth measuring at every visit, not just once.

Reference ranges for a resting adult. These are the brackets this activity uses.

MEASUREMENT	USUAL RESTING RANGE	UNIT
Body temperature	97.8 to 99, fever at 100 and above, hypothermia below 95	degrees F
Heart rate	60 to 100	beats per minute
Respiratory rate	12 to 20	breaths per minute
Oxygen saturation	95 to 99, urgent below 90	percent
Blood pressure	see the category table in tomorrow's sheet	mm Hg

MATERIALS

- Disposable oral thermometer, one per student
- Timer or stopwatch
- Pulse oximeter
- Sphygmomanometer with pressure gauge
- Stethoscope
- Alcohol wipes
- Lab notebook and a pen that is not a pencil

05 Safety

READ EVERY LINE BEFORE YOU START

- These readings are practice, not diagnosis. If a number worries you, take it to your caregiver, the school nurse or your doctor. Do not act on it in this room.
- Wipe the stethoscope earpieces with an alcohol wipe before and after you use them. Every time, including when it is your own.
- A thermometer is single use. Yours is yours, and it goes in the waste when you are finished.
- Never use your thumb to find a pulse. Your thumb has a pulse of its own and you will count it instead.
- Press only one carotid artery, and press gently. Never both sides at once.
- Do not inflate a blood pressure cuff and leave it inflated. If your partner says the arm hurts or tingles, open the valve immediately.
- Do not eat or drink for five minutes before an oral temperature.
- Anyone with a latex allergy tells the teacher before the rotation starts, not during it.

06 Where students get stuck

- Counting for fifteen seconds and forgetting to multiply. Or multiplying by the wrong number. Fifteen seconds is a quarter of a minute, so the count times four. Write the raw count next to the converted value so a marker can see where your number came from.
- Using the thumb to feel a pulse. Your thumb contains a vessel large enough to have its own beat. You will end up counting a mixture of two hearts and it will look like a clean number.
- Counting your own breathing. The moment you pay attention to your breathing you change it, usually slowing it down. That is why the procedure has your partner count while you look somewhere else. If you counted your own anyway, write that on the table. A known bias you have recorded is data. A hidden one is not.
- Deflating the cuff too fast. At more than two or three units per second the needle sweeps past the first sound before your ear registers it, and your systolic reads low. If you hear tapping the instant you open the valve, you did not pump high enough. Let the cuff down completely, wait, and start again.
- Reading the oximeter before it settles. The first numbers it shows are the device hunting. Wait until the value holds steady for a few seconds. Cold fingers, nail polish and a loose clip all push the reading down for reasons that have nothing to do with lungs.
- Treating one reading as the truth. Every one of these numbers moves with position, activity, temperature, stress and time of day. That is exactly why the procedure asks for three heart rate readings and an average, and it is why one high blood pressure reading is not a diagnosis of anything.

07 What you turn in

DATA TABLE

The completed vital signs table for you and your partner. Every row must carry: the vital sign, your own one-line definition, the expected range, your value, your partner's value, and the unit. Heart rate shows all three trials and the average. Underneath the table, one sentence per vital sign on why it is measured at every visit. If any measurement had to be repeated, say so and say why.

08 Check yourself

- ☐ You count 19 beats in fifteen seconds. What is the heart rate, and what unit do you write next to it? (How to do the work, step 3)
- ☐ Your partner's oxygen saturation reads 91 percent on a cold finger with the clip sliding off. Name two reasons that number may be wrong before you assume anything about their lungs. (Where students get stuck)
- ☐ Why does the procedure ask for three heart rate readings but only one temperature? (Where students get stuck, the last two)