

2027-03-12 · 80 minutes

Wk8 Lab notebook: CNS, PNS, and brain regions

Your goal: Analyze how the CNS and PNS divide labor and connect regions to functions.

One product: CNS/PNS sorting table (five body actions classified with justification) plus three brain-region-to-function matches referenced from the Thursday, March 11 map.

Question: How can CNS processing and PNS transmission contribute to the same action without determining one person's recovery?

Start the work

Brain regions contribute to shared functions. Injury location alone does not determine a person's exact loss or recovery.

1. Read E1 and answer both R1 warmups; compare your recovery prediction with E3.
2. Use the official block for the confirmed assigned portion, or record its missing input and continue original practice.
3. Complete all five action rows using A1–A5 and the E1 sorting rule.
4. Make all three E2 region-function matches using your actual map or labeled reference recovery.
5. Correct C1's recovery claims, check the record and submit one document. After uploading, check that Schoology shows Submitted.

If the assignment is unavailable, save the document and request it from the teacher. Ask for missing map links, official screens or weekly directions before using them.

Words you will use

CNS

Central nervous system: the brain and spinal cord.

PNS

Peripheral nervous system: nerves and ganglia outside the brain and spinal cord.

Neuron

A cell specialized for receiving and sending information.

Axon

A neuron extension that carries signals toward its endings.

Nerve

A bundle of nerve fibers in the PNS.

Ganglion / ganglia

One group / multiple groups of nerve-cell bodies in the PNS.

Sensory input

Information carried from receptors toward processing circuits.

Integration

Combining and processing information to guide a response.

Motor output

Signals that influence muscles or other responding tissues.

Pathway

A connected route through which neural information travels.

Spinal cord

The CNS structure connecting with the brain and supporting spinal processing circuits.

Reflex

A response organized by a neural circuit without requiring a conscious decision.

Cerebrum

The large brain region containing areas for information processing and voluntary movement.

Cerebellum

A brain region that helps coordinate movement and balance.

Brainstem

The region linking the brain and spinal cord, with circuits supporting vital functions.

Regeneration

Regrowth of damaged biological structures; here, nerve fibers such as axons.

Functional recovery

Improvement in the abilities a person can perform.

Stroke

Brain injury caused by disrupted blood supply or bleeding.

Paralysis

Loss of voluntary movement in affected muscles.

Severity

How extensive or serious an injury or impairment is.

Corticospinal pathway

A route carrying motor commands from cerebral cortex toward spinal circuits.

Crossing

Passage of pathway fibers to the opposite side of the nervous system.

Feedback

Information about a response used to adjust later output.

E1: Sort structures, then explain their roles

The central nervous system, or CNS, consists of the brain and spinal cord. Peripheral nerves and ganglia belong to the peripheral nervous system, or PNS. Ganglia are groups of nerve-cell bodies outside the CNS.

These are anatomical divisions: they describe where structures belong. Sensory input, integration and motor output describe jobs. Both divisions can contribute to one action. A PNS sensory nerve carries information inward; CNS circuits process it. A PNS motor nerve carries output to a muscle.

Use five rows labeled A1 through A5. In each row, name a CNS structure and its processing role. Then name a PNS structure and its relay role. Finish with a sentence explaining why both are involved. Do not force the whole action into just one division. These are simplified pathway accounts, not complete maps of every connection.

A: Five supplied action scenarios

Original paper scenarios: no person performed these tasks and no responses were measured. Each card supplies the pathway information needed for sorting.

A1: Feeling a light touch on a fingertip. Sensory fibers in the finger and arm carry input toward the spinal cord and brain. Brain circuits support conscious recognition of the touch.

A2: Choosing to raise a hand. Motor areas of the cerebrum help form the command. Signals travel through CNS pathways to spinal motor neurons, whose axons extend through peripheral nerves to arm muscles.

A3: Pulling a hand away from a painfully hot surface. Sensory input enters the spinal cord through peripheral fibers. A spinal circuit activates output through peripheral motor fibers to withdrawal muscles. Brain pathways also receive information. The initial spinal response does not require waiting for a conscious decision. Do not test this scenario.

A4: Adjusting balance during a step. Peripheral sensory fibers carry information from muscles and joints. Cerebellar circuits compare movement information with motor commands. Adjusted CNS output reaches muscles through peripheral motor fibers.

A5: Breathing without consciously choosing each breath. Brainstem circuits contribute to respiratory control. Output reaches breathing muscles through peripheral motor nerves. This account identifies nervous-system roles; it does not imply the brainstem or nerves act alone.

E2: Three regions and the actual prior map

Cerebrum: includes areas involved in voluntary movement and information processing. Cerebellum: helps coordinate movement using feedback, including balance information. Brainstem: includes circuits involved in vital functions such as breathing. These are useful associations, not exclusive one-region/one-job rules.

Use your actual brain-region map from Thursday, March 11, 2027. Record the map date and identify where each of the three regions is labeled. Do not state that you examined a specimen if you did not.

Match each region to one function card: FC1, coordinating a movement using balance feedback; FC2, contributing to automatic breathing control; FC3, planning a voluntary hand movement. Explain each match using the region-function descriptions above.

If the actual map is missing, request it or recover your saved work. Use this supplied E2 reference to practice all three matches, labeling them reference recovery. Ask the teacher for the required link to your map. This text supplies function information, not a replacement specimen observation.

E3: Regrowth and recovery are different claims

Regeneration means regrowth of damaged neural structures, such as an axon. Functional recovery means an improvement in what a person can do. These are related but are not identical.

A neuroscience review describes adult mammalian CNS axon regeneration after injury as very limited. Peripheral axon regrowth can occur under suitable conditions. This broad biological contrast does not set one person's outcome.

MedlinePlus explains that stroke rehabilitation can help people relearn movement and daily skills. Effects and recovery pace vary with the affected brain areas, severity and complications. Improvement does not require claiming that every damaged neuron grew back.

AAOS describes how peripheral nerve injury can interrupt signals. Some nerve fibers can regrow, but injury type, location and treatment matter. Lasting loss of function can remain even with treatment. Therefore, neither CNS injury nor PNS injury alone establishes a recovery timetable or a certain outcome.

C1: Repair the injury comparison

Consider an invented comparison: case C has continuing movement loss after a stroke involving the brain. Case P has improved hand function after an injury to an arm nerve. These are stipulated story outcomes, not patient records or measured research results.

Classify the injured structure in each case as CNS or PNS. Explain how E3 makes the different outcomes possible without making them inevitable. Name one missing clinical detail that would matter, such as injury severity or treatment.

Self-check the statement: location alone explains everything; every stroke deficit is permanent and every cut arm nerve fully heals. Correct both absolute claims with E3. If you only rename CNS and PNS, revise by separating possible regrowth from functional recovery. Do not diagnose either fictional case or prescribe care.

R1: Restart with one complete pathway

First name the two CNS structures, then identify peripheral nerves as part of the PNS. Before reading E3, explain why a finger-nerve injury and brain injury might recover differently. After reading, revise any claim that the division alone guarantees the outcome.

If sorting is difficult, practice first on an action that is not on the cards: lifting a bare foot off a sharp tack. Trace sensory leg fibers, spinal circuit and motor leg fibers. Classify the fibers outside the spinal cord as PNS and the spinal circuit as CNS. Brain processing is CNS too. Do not test this scenario.

Then use E3 to explain that peripheral regrowth can occur under suitable conditions, while CNS regrowth is limited. Neither statement predicts complete recovery. Return to all five action rows and three matches. If unfinished, label the missing parts; the one-row restart does not waive the full product.

X1: Optional crossed-pathway extension

The corticospinal pathway carries commands related to voluntary movement from cerebral motor areas toward spinal motor circuits. Many of its fibers cross to the opposite side in the lower brainstem.

A right-sided brain injury affecting this pathway before the crossing can therefore impair left-sided limb movement. This is a conditional pathway explanation, not a rule that every right-sided stroke causes the same deficit.

If assigned the extension, sketch right motor area, crossing and left-side movement pathway. Explain the possible opposite-side effect and name what is missing before predicting an individual deficit. The exact damaged pathway and extent of injury are not supplied.

S1: Practice, official work and weekly checks

The 25–45-minute block remains official work time. Today's official work is the CNS/PNS analysis in Activity 2.1.1 Mind Matters and Activity 2.1.2 Mapping Brain Function, finishing the assigned Lesson 2.1 activities. Ask for the exact screens, assigned portion, stopping point and completion evidence.

Complete that confirmed portion if available. Otherwise record the missing input and continue the supplied pathway practice. Do not mark myPLTW complete because this record is finished. The earlier brain-region task and actual map are not assumed complete.

The weekly brain structure-function check, tracker and online evidence through Activity 2.1.2 remain separate requirements. The teacher-posted data/model packet is a separate asynchronous route; request it if missing. Supplemental Khan or BioDigital access does not establish that packet.

Today is Friday, March 12. The prior map is dated Thursday, March 11. No homework is due before this class. Follow today's teacher-confirmed requirements; this practice record does not finish the week.

M1: A different system with shared work

Original teaching model: a building controller receives a room-temperature signal over a cable and sends a command to a fan. This is a fictional control diagram, not a body experiment.

Model classification: the controller compares the temperature with its setting; the cable carries the signal and command. Both contribute to one cooling response, so classifying the whole response as cable-only would miss the controller.

Use the structure-role-justification pattern for the nervous-system rows. A brain is not one thermostat and nerves are living tissue, not metal cables. The model teaches classification of parts; it supplies no rule about injury recovery.

Try the decision

A learner labels hand withdrawal PNS-only and says any injured arm nerve will completely heal. Which revision fits the supplied cards?

- Include spinal processing and peripheral transmission; describe recovery as dependent on more than division.
- Keep the whole action PNS-only because the hand lies outside the brain.
- Add the spinal cord but claim all CNS damage prevents any functional improvement.

Explain your choice using the reading. Discuss it or say it to yourself. This practice does not add another submission.

Your 80-minute flow

0–8 minutes	Answer both warmups and identify CNS structures.
8–25 minutes	Read E1–E3 and cards; compare the different M1 model.
25–45 minutes	Do confirmed official work, or record the gap and begin pathway practice.
45–62 minutes	Complete and justify all five action rows.
62–75 minutes	Make three matches, check the actual-map link and repair C1; optional X1 if ready.
75–80 minutes	Review, save or submit one document and record remaining work.

Your response record

Use these labels on paper or in your document. The space below also works when this page is printed.

Start with location and recovery

Name the two CNS structures. Predict why finger-nerve and brain injuries might recover differently, then revise your prediction using E3.

Use a possible difference, not a guaranteed outcome. R1 supplies a restart.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

Five-action CNS/PNS sorting

For A1–A5, name a CNS structure and role, a PNS structure and role, and justify how they participate together.

Use E1 and the supplied card details. Do not assign the whole action exclusively to one division.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

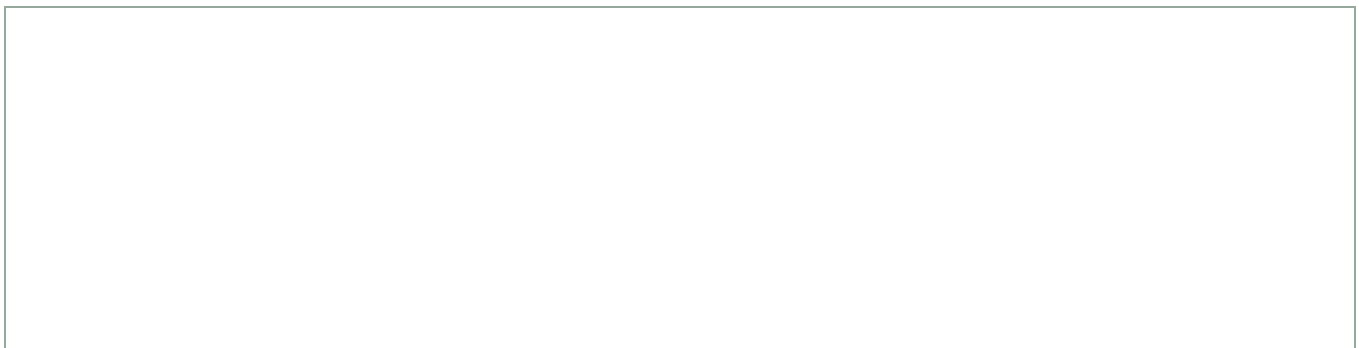


Three region-function matches

Match cerebrum, cerebellum and brainstem to FC1 through FC3. Explain each match and cite its location on your actual March 11 map.

If you cannot find your map, label the work E2 reference practice and ask the teacher how to recover the assigned map.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.



Injury comparison and self-check

Classify case C and case P in C1 by division. Explain why outcomes are not guaranteed, correct both absolute claims and name a missing clinical detail.

The cases are fictional. Use E3; do not diagnose or prescribe.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

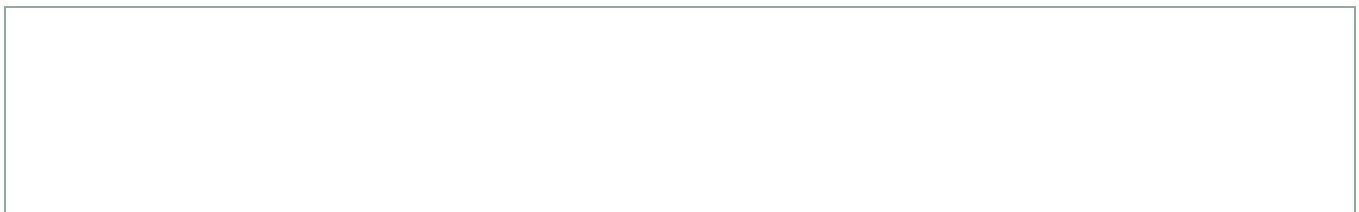


Final check and remaining work

Check all five rows and three matches. Identify the map you used and ask for any missing official or weekly materials. If assigned, add X1's crossed-pathway explanation.

Save or submit one document. A finished practice page does not mark the official tasks complete.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.



Check your product

- All five action rows identify CNS processing and PNS transmission with a justified connection.
- Cite your assigned map in the three region-function matches. If you used the supplied reference instead, label that practice and ask for the map link.
- The injury explanation distinguishes possible regeneration from functional recovery and avoids certain outcomes.
- Keep the sorting and matches in one document. Use only evidence from your actual map and assigned official or weekly work; ask for missing materials.

Keep the limit: These supplied scenarios support practice explanations. They cannot establish observed patient outcomes, an individual prognosis, prior lab completion or completed official coursework.

Turn in your work

Submit your sorting table and region-function matches as one document to Wk8 Lab notebook: CNS, PNS, and brain regions in your HBS section. Keep your checks and any questions for the teacher with that record. Follow the posted deadline.

If the assignment is unavailable, save the document and request it from the teacher. Ask for missing map links, official screens or weekly directions before using them.

[Section 1292: Wk8 Lab notebook: CNS, PNS, and brain regions](#)

[Section 6792: Wk8 Lab notebook: CNS, PNS, and brain regions](#)

Carry forward

Classify the structure, explain its role, and keep injury location separate from a guaranteed outcome.

Carry accurate region and pathway distinctions into later nervous-system analysis. Where does a signal pass between the central and peripheral nervous systems?

Sources and resources

[Open today's page](#)

OS12 · Basic Structure and Function of the Nervous System, 12.1

OpenStax Anatomy and Physiology 2e; anatomical and functional divisions inspected September 11, 2026.

<https://openstax.org/books/anatomy-and-physiology-2e/pages/12-1-basic-structure-and-function-of-the-nervous-system>

OS13 · The Central Nervous System, 13.2

OpenStax Anatomy and Physiology 2e; cerebral, cerebellar and brainstem functions inspected September 11, 2026.

<https://openstax.org/books/anatomy-and-physiology-2e/pages/13-2-the-central-nervous-system>

OS14 · Motor Responses, 14.3

OpenStax Anatomy and Physiology 2e; descending pathways and reflexes inspected September 11, 2026.

<https://openstax.org/books/anatomy-and-physiology-2e/pages/14-3-motor-responses>

MED · Stroke Rehabilitation

MedlinePlus, National Library of Medicine; summary and recovery sections inspected September 11, 2026.

<https://medlineplus.gov/strokerehabilitation.html>

AAOS · Nerve Injuries in the Hand and Fingers

American Academy of Orthopaedic Surgeons, OrthoInfo; injury, healing and outcomes sections inspected September 11, 2026.

<https://www.orthoinfo.org/diseases--conditions/nerve-injuries/>

REGEN · Axon regeneration in the peripheral and central nervous systems

Huebner and Strittmatter, 2009 review; PubMed abstract only inspected September 11, 2026.

Background synthesis, not a patient-outcome experiment.

<https://pubmed.ncbi.nlm.nih.gov/19582408/>