

VISUAL SYSTEM:

*Grading is relative to their visual field (test question1)

Item 1: Red on Left visual field. Blue on Right visual field

- Both sides filled in correctly = 1
- Only $\frac{1}{2}$ the screen is filled out, but is filled out correctly = $\frac{1}{2}$
- Filled out both sides and only $\frac{1}{2}$ is correct = 0
- Filled out both sides incorrectly = 0

Item 2: Light on Top. Dark on Bottom

- Both halves filled in correctly = 1
- Only $\frac{1}{2}$ the screen is filled out, but is filled out correctly = $\frac{1}{2}$
- Filled out both halves and only $\frac{1}{2}$ is correct = 0
- Filled out both halves incorrectly = 0

Item 3: Flip left visual field onto right of eye & right onto left*

- Per eye
- Both hues correct in both eyes = 1
- Correct location of only one hue = $\frac{1}{2}$
- Only one eye filled in correctly = $\frac{1}{2}$
- Only one hue per eye = 0
- Requires that the visual field be consistent with only one hue per side.
 - If left or right visual field is red & blue = 0

Item 4: Flip top visual field onto bottom & bottom on top*

- Per eye
- Both lightness levels correct in both eyes = 1
- Correct location of only one lightness = $\frac{1}{2}$
- Only one eye filled in correctly = $\frac{1}{2}$
- Only one hue per eye = 0
- Requires that the visual field be consistent with only lightness per half.
 - If top or bottom visual field is light and dark = 0

Item 5: Entire field is represented in both eyes

- Per eye
- Regardless of spatial accuracy
- 2 hues & 2 lightness levels in each eye = 1
- Only one eye with 2 hues and 2 lightness levels = $\frac{1}{2}$
- Both eyes missing at least one hue or lightness = 0

Item 6: Left & Right structure labels match and are correct (each $\frac{1}{4}$)

- Each structure $\frac{1}{4}$ point
- Must match across hemispheres for each $\frac{1}{4}$ point

- If only one hemisphere labeled = 0 points

Item 7: Two hues come from each eye

- Per eye
- Two hues come from both eyes = 1
- Two hues come from only one eye = $\frac{1}{2}$
- One hue comes from each eye = 0

Item 8: Two lightness levels come from each eye

- Per eye
- Two lightness levels come from both eyes = 1
- Two lightness levels from only one eye = $\frac{1}{2}$
- One lightness from each eye = 1
- Regardless of hue
 - Ex: dark of one hue and light of other -> full points

Item 9: Crossover occurs once and only once

- ONE crossover, regardless of location accuracy = 1
- No crossovers = 0
- Two or more crossovers = 0
- Only one side crosses over = 0
- Graded by a coder

Item 10: A crossover occurs at the optic chiasm

- If more than one crossover, at least one occurs at chiasm = 1
- No crossovers at all = 0
- Crossover not at chiasm = 0
- A crossover is defined as left half of the right retina being present at the left LGN & the right half of the left retina being present at the right LGN.
 - This was necessary to account for inability to assess whether there is a crossover present vs just connecting to the optic chiasm and staying on the same hemisphere
 - If two hues present at both LGNs & each inner half of the retina are different hues = 0
 - If no fibers connect to the LGN = 0

Item 11: Only one hue per hemisphere at V1

- Per hemisphere
- Regardless of hue accuracy
- Regardless of lightness

Item 12: Two lightness levels per hemisphere at V1

- Per hemisphere
- Regardless of hue(s)

Item 13: Hue from left visual field ends on right V1 & hue from right ends on left V1*

- Per hemisphere
- Regardless of lightness
- Only ONE hue per hemisphere
- If more than one hue per hemisphere = 0

Item 14: All four stations visited in correct order

- Per hemisphere- all or nothing
- Any skipped or wrong order = 0 points for that hemisphere.
- Correct order for both hemispheres = 1
- 1 correct hemisphere, 1 hemisphere with skips/wrong order = $\frac{1}{2}$
- Both hemispheres skip/wrong order = 0
- All fibers must travel through all stations
 - If errant fiber pathways exist = 0 (per hemisphere)

Item 15: Only used one hue

- Only score V1 even if colors used elsewhere
- Regardless of lightness
- If pathway drawn instead of shading- score the pathway termination within V1
- Graded by a coder

Item 16: Light & Dark both used

- Only score V1 even if colors used elsewhere
- Regardless of hue
- Graded by a coder

Item 17: Light & Dark location correct*

- Only score V1 even if colors used elsewhere
- Regardless of hue
- Graded by a coder

Item 18: Hue used is correct*

- Only score V1 even if colors used elsewhere
- Matched with their left visual field
- If pathway drawn instead of shading- score the pathway termination within V1
- Graded by a coder

AUDITORY SYSTEM

Item 1: Used purple for frequencies

- Regardless of lightness
- Per side
- Both frequencies per side must be purple = 1

- If high frequencies are purple, low are red for both sides = 0

Item 2: High frequency = Light & low frequency = Dark

- Regardless of hue

Item 3: Light & Dark of SAME hue used within an ear **

- Per ear
- Need light & dark of ONE hue per ear
- Light & dark of one hue in both ears = 1
- Only one lightness in each ear = 0
- Graded by a coder

Item 4: Light & Dark used for inner and outer portions of cochlea **

- Per ear
- Middle portion = one lightness, outer portion = other lightness
- Inner/outer different lightness for both cochlea = 1
- Inner/outer different for only one cochlea = 1/2
- If light and dark running parallel = 0
- Only one lightness used per cochlea = 0
- Graded by a coder

Item 5: High frequency = Light (outer) & low frequency = Dark (inner) **

- Per ear
- Middle portion = low, outer portion = high
- Inner/outer correct lightness for both cochlea = 1
- Inner/outer correct for only one cochlea = 1/2
- If light and dark running parallel = 0
- Only one lightness used per cochlea = 0
- Graded by a coder

Item 6: Left & Right structure labels match and are correct (each 1/6)

- Each structure 1/6 a point
- Must match across hemispheres for each 1/6 point
- If only one hemisphere labeled = 0 points

Item 7: Light & Dark of SAME hue leave matching cochlea

- Per cochlea
- Need light AND dark of same hue
- Need clear intersection of pathway leaving cochlea within designated region
- If only used one lightness = 0
- If used multiple hues = 0
- Checked by coder to ensure the hue used matches the cochlea. Automatic grading assumes that the hue is the correct. Coder can reduce points if does not match.

- Coder checks if painted hue of cochlea matches fiber hues (in coder grading sheet):
- If both cochlea doesn't match fibers: -1
- If one cochlea doesn't match fibers: -.5
- If they match: 0
- If there aren't correct fibers: 0

Item 8: Cochlear Nucleus to inferior colliculi = straight shot with same hues

- Per hemisphere
- One hue (disregard lightness)
- Need clear intersection of pathway with structures or designated region
- Straight shot correct on both sides = 1
- If straight on both sides and crossover = 1 (ignore crossover)
- If straight on one hemisphere = $\frac{1}{2}$
- Must be direct path (skips over superior olive)

Item 9: Some hues cross AND some go straight at crossover location

- Regardless of location
- Regardless of lightness
- Must have at least one side to crossover to receive any points
- Cross can be horizontal or diagonal
- If cross over and straight on both hemispheres = 1
- If only cross over on both hemispheres (no straight) = $\frac{1}{2}$
- If cross over from only one hemisphere and straight on both = $\frac{3}{4}$
- If cross over on both and straight on only one = $\frac{3}{4}$
- Only vertically straight = no crossover = 0

Item 10: Crossover occurs once and only once

- ONE crossover, regardless of location accuracy = 1
- No crossovers = 0
- Two or more crossovers = 0

Item 11: A crossover occurs between cochlear nucleus and superior olives

- If more than one crossover, at least one occurs at correct location = 1
- No crossovers at all = 0
- Crossover not at correct location = 0

Item 12: Starting at and everything after inferior colliculus is purple and STAYS purple

- Regardless of lightness
- Both hemispheres are purple = 1
- Only one hemisphere is purple = 0
- No purple = 0
- If becomes purple and then switches back to a different hue = 0

Item 13: Light & Dark present at A1

- Per hemisphere
- Regardless of hue or hue combinations
- Both hemispheres have light AND dark = 1
- Only one hemisphere has light & dark = $\frac{1}{2}$
- Only light OR dark present = 0

Item 14: All stations visited in correct order

- Per hemisphere- all or nothing
- Any skipped or wrong order = 0 points for that hemisphere.
- Correct order for both hemispheres = 1
- 1 correct hemisphere, 1 hemisphere with skips/wrong order = $\frac{1}{2}$
- Both hemispheres skip/wrong order = 0
- At least one pathway per hemisphere traveling from:
 - Cochlea → cochlear nucleus → superior olives → inferior colliculus → MGN → A1
- Regardless of crossovers, splitting fibers, etc.
- All fibers must travel through all stations
 - If errant fiber pathways exist = 0 (per hemisphere)

Item 15: Only used one hue

- Only score A1 even if colors used elsewhere
- Regardless of lightness
- Graded by a coder

Item 16: Light & Dark both used

- Only score A1 even if colors used elsewhere
- Regardless of hue
- Graded by a coder

Item 17: Light & Dark splitting left/right (horizontally)

- Only score A1 even if colors used elsewhere
- Regardless of hue
- Regardless of WHICH lightness is on left/right just must be splitting horizontally
- Graded by a coder

Item 18: Only used purple

- Only score A1 even if colors used elsewhere
- Regardless of lightness
- Graded by a coder