Date: _____ Due 8th March.

Nervous System Investigation

Name: Jeli Mairi **Investigation:** _____

Your Task: Design an experiment to illustrate the effect of stimulus on response times.

SECTION	COMPONENT	Possible Marks	Mark allocated
PLANNING	**Aim:**	1	
	Variables		
	Independent Variable:	1	
	Dependent Variable:	1	
	Controlled Variables: *at least 5 are listed*	5	
	Prediction: The student states what they thought would happen and why	2	
	Hypothesis: A hypothesis is presented that states the effect of the independent variable on the dependent variable	2	
	Equipment: Listed correctly	1	
	Method: Detailed numbered steps are written. Instructions are clear and can be followed exactly at another time. Variables are clearly controlled. A diagram is used and labelled appropriately that clearly enhances the method	5	
RESULTS	**Results:** Displayed appropriately. Tables are used observations are adequately documented. Figures written to the same decimal place. Repeats or replicates are used. The mean is shown in the table. Units are used.	5	
	Graphing (if applicable): Results are graphed on the correct axis and the scale is correct. The correct type of graph has been used without any aid from the teacher. Labelling of units is correct and the graph is easy to interpret	5	
CONDUCTING	**Practical Application:** Safety, behaviour, laboratory skills and application during the investigative process can not be faulted	4	3
DISCUSSION **Analysis**	The results are summarised in a mature manner and pattern/trends in the results are identified and commented on.	2	
Evaluation	Inconsistencies in the results are identified and explained.	2	
	The experiment is classified as: valid; accurate; reliable. Valid reasons are given for the classification.	3	
	Problems and difficulties within the experimental design are identified and the student describes improvements.	4	
	The results of the experiment have been explained based on sound scientific principles taught in class or by doing extra research.	4	
	The discussion must make sense.	1	
CONCLUSION	Major findings are summarised.	1	
	Statement of whether hypothesis has been supported or not	1	
	TOTAL	50	

①

PLANNING

Jess Maari

Nervous System Investigation 2/3/18

Aim → To design an experiment to investigate the effect of stimulus on response times.

Variables:

Independent → ~~Reaction~~ Response time (it takes to react)

Dependent → Amount of time from distractions

Controlled variables → 1. height finger is above phone screen

2. phone screen size

3. height of screen

4. same test

5. same dominant hand

prediction → I think the results will show that the more you're distracted by the environment around you, the more time it will take to respond to a reaction.

Hypothesis → ~~The experiment~~ Reaction times to listening to sounds can be decreased due to environmental factors that surround the participant.

Equipment → - pen/pencil - ruler

- paper - participants

- phone - (app for sound)

Method → 1. Make a rough table to write down all results, this would include the number of trials you carried out and your 3 factors which influenced the results (no distraction, looking away & talking)

2. Set up app on phone to carry out experiment. Use ruler to measure 2-3cm above the phone screen and place participants finger around this height.

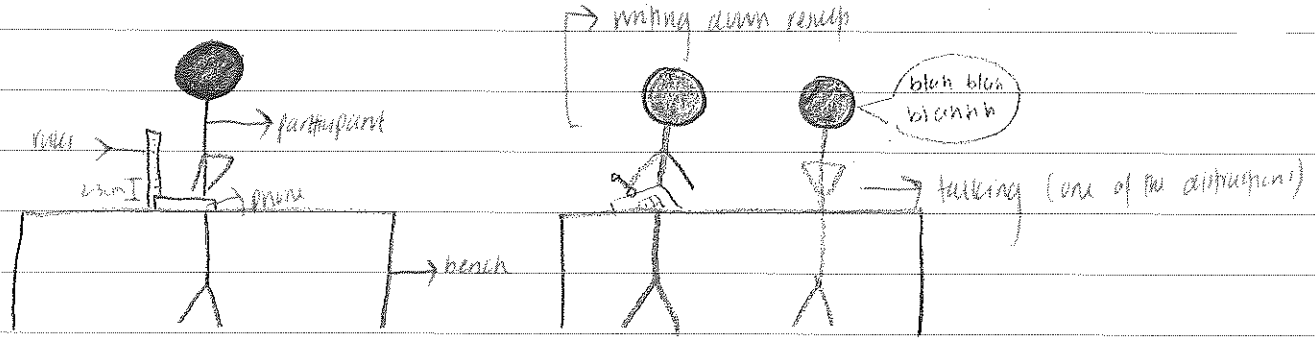
3. Start your 5 trials ~~out~~ of each category to get the average score of each result.

4. Repeat this with 5 participants then conclude your experiment.

Diagram of participation is on back of this page.

Jeu mural

Investigation 7/3/18



②

Jess Muir — Investigation — 7/3/18

RESULTS

Hearing (Auditory)

	Participant	No Distractions	Eyes Shut	Talking on Background
Right Hand (dominant)	P1	512ms	493ms	589ms
	P2	461ms	523ms	741ms
	P3	463ms	429ms	468ms
	P4	517ms	433ms	675ms
	P5	471ms	482ms	556ms

Mean → 520.86

Observation → - Participants struggled with the sensitivity of the phone screen when tapping to get results - thus reducing the correct time they reacted (Screen sensitivity)
- Some participants focused on the screen more than others

Repeats → Each trial was done 5 times to get an average score, thus meaning each category of the 3 variables has a wide range of data, meaning a fair test.

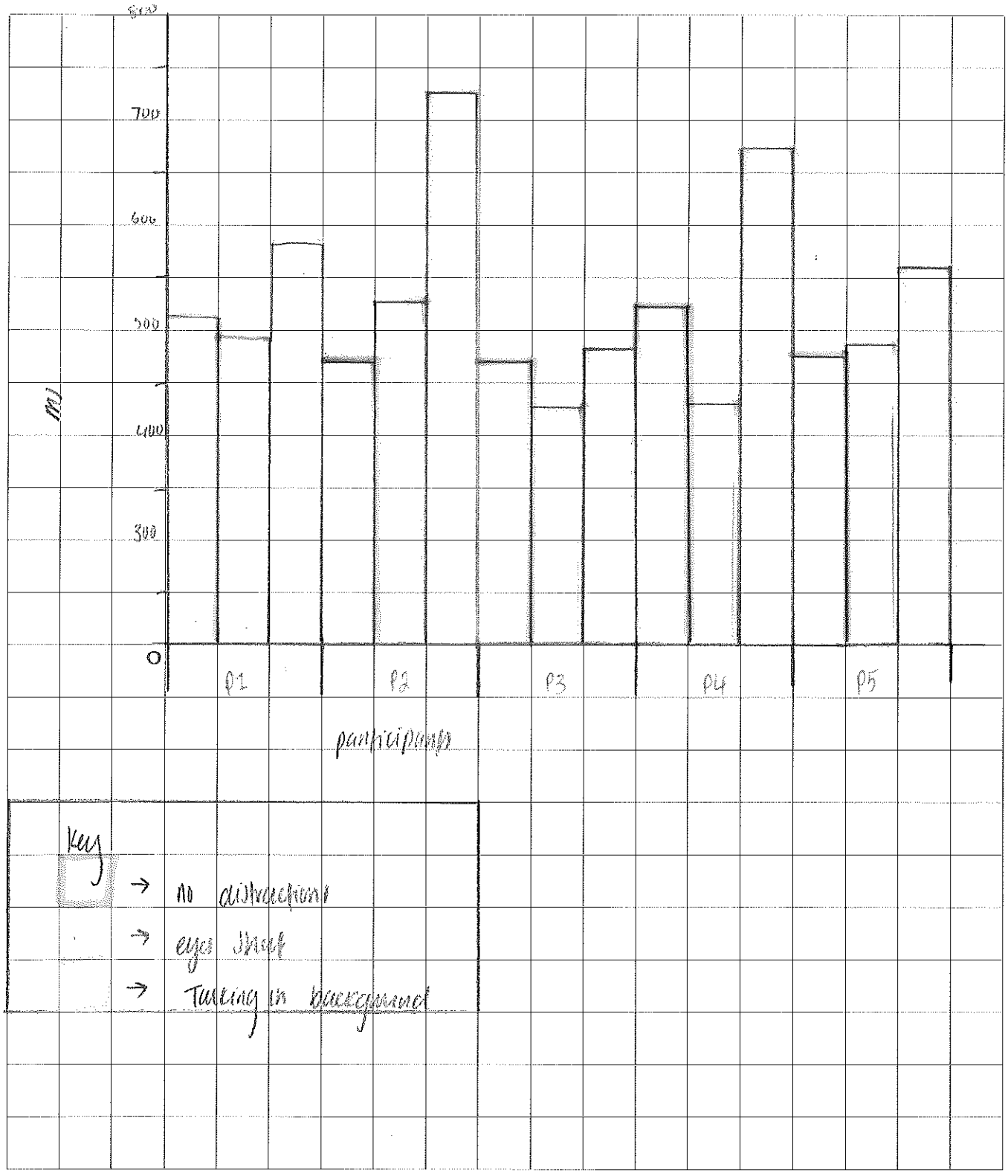
Graph → on attached sheet of paper.

Conclusion → answered during class hours.

2-1

Jen Mann

1 cm Graph Paper



Jess Mach

Investigation → Nervous System

Discussion

From the finding of the result given in the table, it clear to see that when there's distraction in like texting, result are higher, proving that it take a longer time to stimulate a response from your body.

→ inconsistencies = phone screen sensitivity - some participant were able to gently tap the screen to achieve result while other struggled to touch the screen.

→ This experiment is classified as valid as each category was done 3 times with each participant to get an average score.
- All component of the investigation were acceptable and comprehensible, meaning it was done appropriately.

→ problems:
- keeping participant fingers between 2-3cm off the table.
- participant struggled to do this so took in order to fix this problem we moved their finger to the correct height boundaries each time after they tapped their finger on the screen.
- phone screen sensitivity
- phone screen when tapped too hard would scroll down the page instead of altering the app of result.
- This was resolved by making the participant gently tap the screen, not forcefully tapping the screen.

→ Sound scientific principles
- The result from this investigation have been based on sound scientific principles.
- Stimulus → response → effector → response
↳ Sensory or cranial neurons, in this case, cranial neurons.
↳ carried to the CNS along nerve impulses

Jeli Mum

N1 investigation

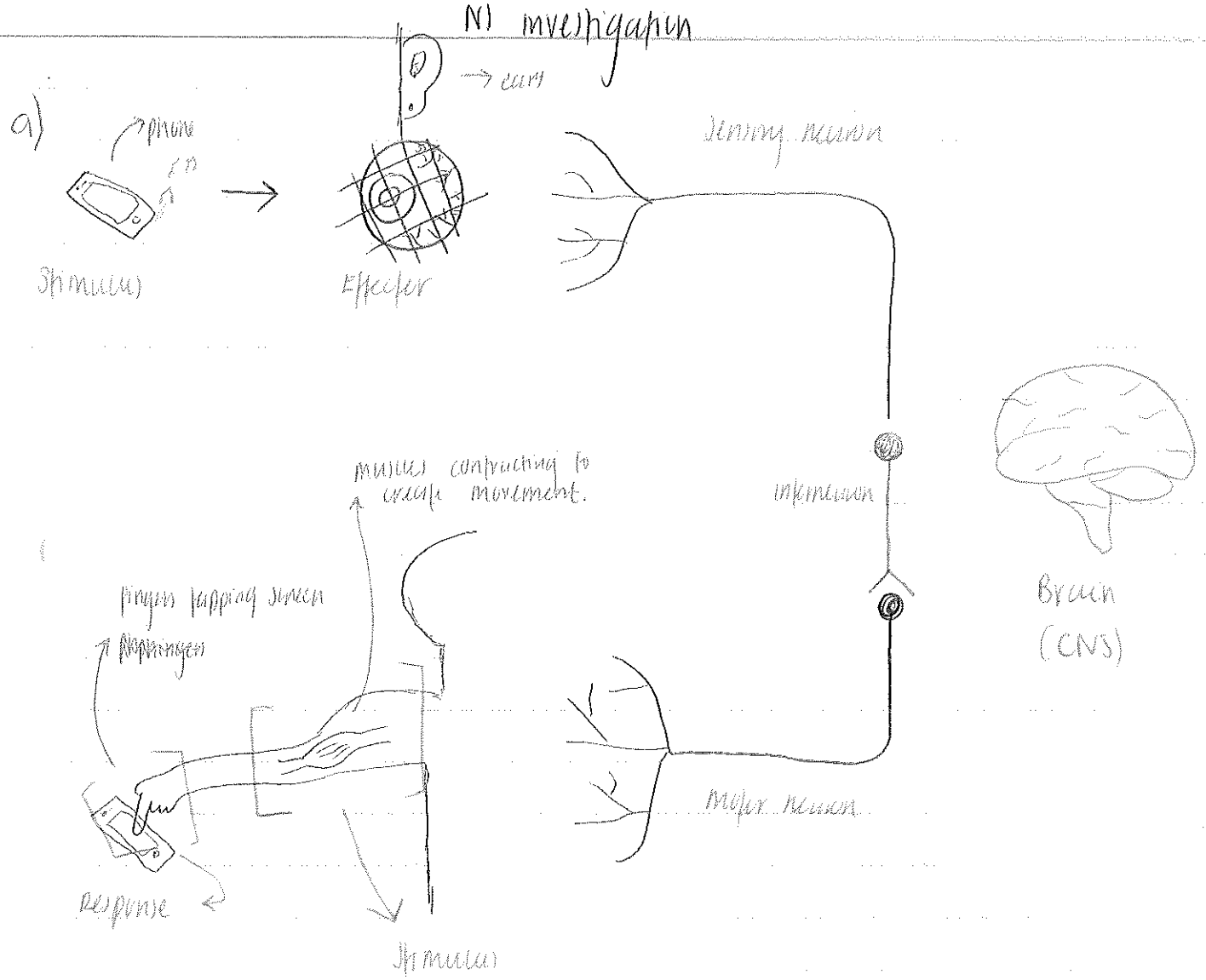
Conclusion

→ From the results on the table and graph, finding from the investigation are evidant that each participant showed a higher response time when there's talking going on around them. The results also show that there only 70-80ms difference between having no distractions to having the participants eyes shut.

→ hypothesis: The hypothesis that reaction times ~~can be~~ to listening for sounds can be decreased due to environmental factors that surround the participant ~~has been proven true~~ can be supported.

(3)

Jess Nacri



(annotation)

→ When the purple pump heard the noise, their sensory neuron sent a message to the brain through the CNS to produce a response. When in the brain, the message is converted to motor neurons which send nerve impulses away from the CNS. This message travelled through the purple pump brain to its dominant hand (in this case right hand) to tap the screen. Messages were sent to the purple pump hand and fingers to cause movement to touch the screen. These messages were carried over nerve fibres (impulses). These pathways are the way in which the neurons related to the stimulus of hearing a sound on the phone.

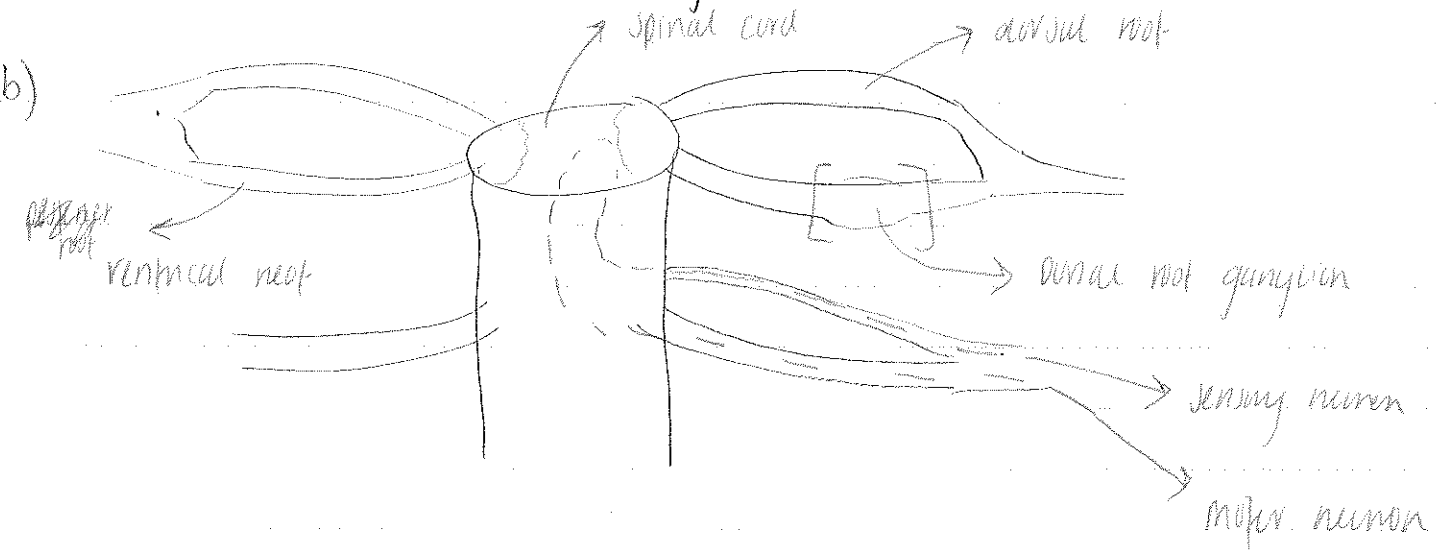
(4) - Q3b+c

5

Jeff Mucci

N) investigation

b)



→ In the ~~reflex~~ spinal reflex arc above, it shows the pathway in which both the sensory neuron and motor neuron travel into and out of the spinal cord. The line coloured in red shows the path a sensory neuron travels; this is how the stimulus of hearing a noise from the phone was sent to the brain to transmit the message into a motor neuron. The motor neuron (in the connecting blue line) shows how the message is left from the spinal cord. This message is what sent an impulse to the dominant hand to tap the screen.

c). → Both pathways discussed in question 3 a and 3b control nervous movement. The spinal reflex arc demonstrates how nerve impulses are converted from sensory neurons into motor neurons and the pathway shown in question 3a demonstrates how the stimulus effected the response. Both pathways show a clear understanding of how neurons are converted to another type and transmitted however, the spinal reflex arc contains of more smaller components that pulses and conveys the neuron whereas the diagram in question 3a shows what has been effected. These two methods of control of movement differentiate from each other as ~~one~~ the spinal reflex arc is always responsible for conveying neuron pathways and connected with are stimulus + response whereas the other method (3a) is only responsible for ~~the~~ processing that one method of tapping the screen when responding to a stimulus.

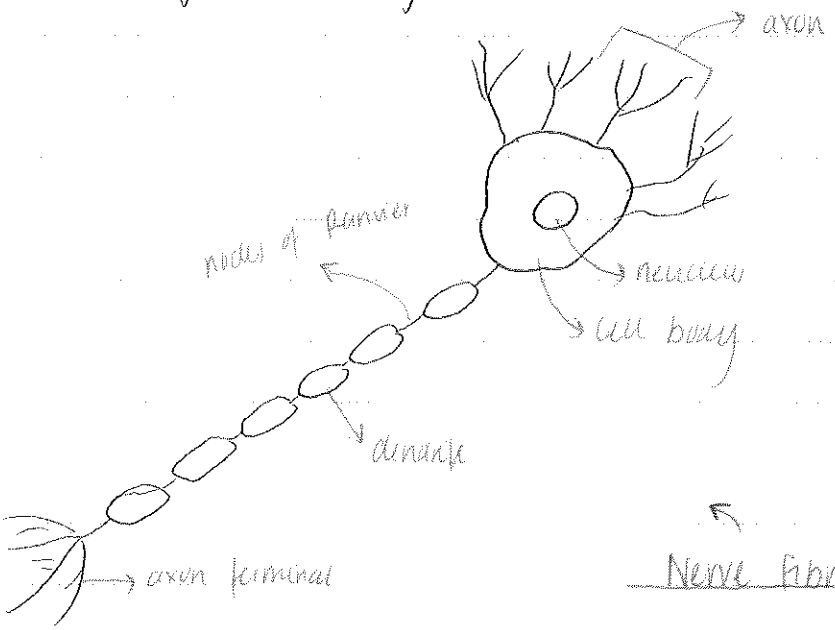
- continue to point 4 for how nerve impulses are carried

(5) → 3c.

Jess Macri

Nervous System Investigation.

c).



Nerve fibre

→ Messages are carried along a nerve fibre. The above diagram shows what a nerve fibre looks like. Impulses will come in via the axon, travel down the dendrite, cross the node of Ranvier, gain up the axon terminals via the ~~the~~ synapse and ~~of~~ cross over into another nerve fibre via the synapse.

→ Impulses and messages carried along nerve fibres