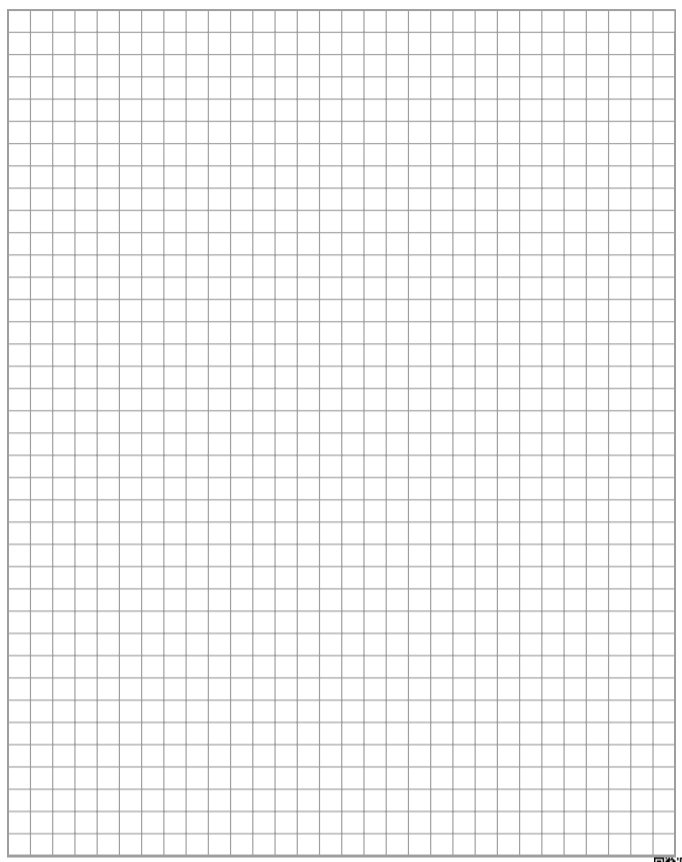
**Human Biology Unit 3**

**Practical Activity – CNS Integration and Discrimination ANSWERS**

Graph the Class Average Discrimination Time on the grid below:



Teacher may have gone through this in class

**Discussion Questions:**

1: Task A is used as a control.

1. What is a control?

*A control is a sample identical in every way to the test sample, but without the independent variable present. It is used as a comparison, so that changes seen in test samples can be attributed to the independent variable and not any other factor.*

1. Why was task A used as a control in this case?

*Task A was used as a control because it required only the motor function of turning the cards, rather than any required discrimination (eg putting different colours or suits in piles). The task was the same in every way as the other tasks, but required minimal discrimination, the independent variable. It could therefore be compared to tasks requiring discrimination to establish whether they took longer to complete. It was also used to calculate the discrimination time from the rest of the task.*

2: What trends were seen in the data as the discrimination requirements of the tasks increased?

*As discrimination requirements of the tasks increased, the time taken to complete them increased, compared to the control group.*

3: Why did Task D required greater discrimination compared to Task C?

*Task C involved putting the cards into four piles according to suit. Task D had the additional discrimination requirement of putting the even cards face down, meaning it required greater discrimination.*

5: Using your understanding of the nervous system, relate discrimination time to the probable number of neural connections involved in completing the task.

*Discrimination involves integrating information and then forming a conscious decision. The more decisions that need to be made, the more neural connections are active due to action potentials and neurotransmission. These take time, and this is why discrimination time is longer when there are more discrimination requirements.*

6: Which area and lobe of the cerebral cortex is involved in each of the functions listed below?

|  |  |  |
| --- | --- | --- |
| **Function** | **Lobe** | **Area** |
| Receiving sensory input from the eyes | *Occipital* | *Primary Visual Area* |
| Processing sensory input form the eyes | *Occipital* | *Visual Association Area* |
| Making conscious decisions on the actions required | *Frontal* | *Frontal Association Area* |
| Processing and sequencing the motor movements required | *Frontal* | *Motor Association Area* |
| Sending motor output to the peripheral nervous system | *Parietal* | *Primary Motor Area* |

7: In which lobe and area of the cerebrum is the majority of the discrimination happening?

*The majority of discrimination is occurring in the frontal association area in the frontal lobe of the cerebrum. This is because the frontal association area is where conscious thought and decision making occur.*

8: Which part of the brain is involved in smoothing the motor output so that fine motor control is achieved when sorting the cards?

The cerebellum