

Combined Science - Biology - KS4

Homeostasis and Response

# **Required Practical Reaction Time - Part 2**

Miss Ray

# Exam style question

Annie investigated the impact that a lack of sleep has upon reaction time. Her method is stated below.

1. Each student sleeps for either 2, 4, 6, 8 or 10 hours.
2. Each student then completes a reaction time test on the computer three times.

The computer program asks the students to press a key on the keyboard when they see a red dot flash up on the screen. The table below shows the results of the investigation.

Student	Number of hours of sleep	Reaction time in milliseconds			
		Test 1	Test 2	Test 3	Mean
<b>A</b>	<b>10</b>	129.6	153.3	133.4	138.8
<b>B</b>	<b>8</b>	198.3	108.7	169.1	158.7
<b>C</b>	<b>6</b>	111.2	118.9	106.5	112.2
<b>D</b>	<b>4</b>	349.3	345.2	341.9	345.5
<b>E</b>	<b>2</b>	612.0	517.9	615.3	615.1

- a) Apart from using a computer program, describe how reaction time could be measured. [4]



**Hold metre rule above hand of person to be tested so the 0cm is in line with the top of the thumb/finger**

1

**drop the ruler without warning and the other person catches it**

1

**Measure the distance that the ruler fell from the top of the finger**

1

**convert the distance into time using a standard (scale) chart or calculation**

1



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b) Other than accurate measurements, state one other reason Annie chose to use a computer programme to measure reaction time. [1]



**any one from:**

- **Computer is able to record results in milliseconds/ higher resolution**
- **Fewer random errors/miscalculations/errors when recording the results**



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c) Based on her results, Annie concluded that a lack of sleep increases reaction times. State two reasons why this may not be a valid conclusion. [2]



**any two from:**

- **A different person is used in each of the tests, they may already have different reactions times.**
- **Different people need different amounts of sleep**
- **No control experiment**
- **Sample size was too small**
- **There is a wide variations in each of the results**
- **They should complete more repeats**
- **Other factors such as diet, caffeine intake, age and distractions when testing also need to be controlled - there is no reference to this in the method.**

