***Biology notes:***

A picture containing object

Description automatically generated***Paper 2 – Required Practical’s:***

**Practical 7 – Reaction Time:**

* Reaction time is the time it takes to respond to a stimulus, its often less than a second
  + It can be affected by factors such as age, gender or drugs

**Method:**

We can use this method to experiment the effect of caffeine on reaction time

1. The person being tested should sit with their arm resting on the edge of the table
   1. This stops them moving their arm up or down and keeps it a fair test
2. Hold a ruler vertically between their thumb and forefinger
   1. Make sure that 0cm is level with their thumb and finger
3. Then let go without any warning
4. The person being tested should try to catch the ruler as quickly as they can – as soon as they see it fall
5. Reaction time is measured by the number on the ruler where it’s caught
   1. The number should be read from the top of the thumb
   2. The higher the number on the ruler, the slower the reaction time
6. Repeat steps 1-5 several times and then calculate the mean distance that the ruler fell
7. The person being tested should then have a caffeinated drink after ten minutes and repeat steps 1-6

* Control Variables:
  + Use the same person, the ruler should be dropped from the same height, the person shouldn’t have had anything that would affect their reaction time prior to the experiment

**Practical 8 – Plant Responses:**

**Method:**

A picture containing indoor, table, wall

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1. Place 10 cress seeds into three different Petri dishes, each lined with moist filter paper
   1. Label them A, B and C
2. Shine a light on one of the dishes from above, and two of the dishes from different directions
3. Leave the seeds alone for one week until you can observe their responses
   1. The seedlings will grow towards the light
4. You know that the growth response of the cress is due to only light if you control all other variables
   1. These include:
      1. Number of seeds – use the same amount
      2. Type of seed – use ones from the same packet
      3. Temperature – keep it the same
      4. Water – add the same amount of water
      5. Light intensity – keep the distance between bulb and dish the same

**Practical 9 – Sampling Organisms:**

**Method:**

1. Place a 1 m2 quadrat on the ground at a random point within the first sample area
   1. We use random sampling in order to make sure it is a fair test
2. They should count all the organisms within the quadrat
3. Repeat steps 1 and 2 as many times as possible
4. Work out the mean number of organisms per quadrat within the first sample area
   1. Using this formula
      1. Total number of organisms / number of quadrats
5. To find the comparison between two sample areas
   1. Repeat steps 1-4 in the second sample area
   2. Compare the two means
6. A close up of a logo

   Description automatically generatedTo find the population size of an organism in one area
   1. Using this formula
      1. (Total sample area / area sampled) x number of organisms of the species counted in the area

**Investigating the effect of a factor on the distribution of daisies – Method:**

1. Place a tape measure as shown by the line on the right
   1. This is a transect
2. Place a quadrant at the start of the transect
   1. Record the light intensity using a light meter
   2. Record the number of organisms in the quadrat
3. Move the quadrant 1m along the transect
   1. Repeat steps 2a and 2b
   2. Continue this all along the tape measure
4. We might see that there are more daisies as you move further away from the tree
   1. This is because trees need light to photosynthesise
   2. Light isn’t the only factor which affects it

A close up of a device

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* You can investigate decay by observing the action of the enzyme lipase on a sample of milk that has been made alkaline
  + When lipase breaks down the milk, the pH of the milk decreases
* A close up of a device

  Description automatically generatedThis practical looks at how temperature affects the rate of decay

**Method:**

1. Measure out 5 cm3 of lipase solution and add it to a test tube
   1. Label this tube with an ‘L’ for lipase
2. Measure out 5 cm3 of milk and add it to a different test tube
3. Add 5 drops of phenolphthalein indicator to the tube containing milk
4. Then measure out 7 cm3 of sodium carbonate solution
   1. Add it to the tube containing milk and phenolphthalein
      1. This makes the solution in the tube alkaline, so it should turn pink
5. Put both tubes into a water bath set to 30 °C
   1. Leave them to reach the temperature of the water bath
      1. Confirm by putting a thermometer into the milk tube
6. Once the tubes have reached 30 °C
   1. Use a calibrated dropping pipette (a dropping pipette with a scale)
      1. To put 1 cm3 of lipase solution into the milk tube
      2. Start a stopwatch straight away
7. Stir the contents of the tube with a glass rod
   1. The enzyme will start to decompose the milk
8. A close up of a device

   Description automatically generatedAs soon as the solution loses its pink colour
   1. Stop the stopwatch
      1. Record how long the colour change took in a table
9. A close up of a device

   Description automatically generatedRepeat the experiment at a range of different temperatures
   1. E.g. 10 °C, 20 °, 30 °C, 40 °C, 50 °C
   2. Make sure you carry out the experiment three times at each temperature
      1. Then calculate the mean time taken for the colour change to occur at each temperature
10. You can use your results to calculate the rate of decay using this formula
    1. Rate = 1000/Time
       1. The units will be s-1 since rate is given per unit of time