

Aim: Plan & carry out an investigation into the effect of a factor on human reaction time.

Equipment



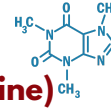
Reaction time is the taken to respond to a visual stimulus



- Choose a factor to investigate that you believe has an effect on reaction time
- Carry out experiments to measure reaction time

Factors affecting reaction time:

- Age
- Drug use (e.g. caffeine)



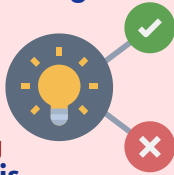
- Stress
- Distractions



Creating a Hypothesis

A hypothesis predicts a relationship between two variables:

- Observe which variables might be having an effect on variable.
- Select a variable to investigate.
- Create a question you want to answer, followed by a prediction backed by scientific reasoning - this is your hypothesis.



What is happening?



Independent variables include:

Background noise

- Perform experiment in silence
- Repeat experiment with loud background music

Caffeine consumption

- Carry out experiment
- Repeat after the person has drunk a caffeinated drink

Dependent variable → Distance caught (equates to reaction time)



Control variables include:

- Use of dominant hand
- Height the ruler is dropped from
- Ruler orientation
- Practice time

REQUIRED PRACTICAL 7 REACTION TIME

Example Results Table (Independent variable - noise)

Drop test attempt	Ruler measurements in cm				Reaction time in seconds			
	Person 1 No noise	Person 2 No noise	Person 1 Noise	Person 2 Noise	Person 1 No noise	Person 2 No noise	Person 1 Noise	Person 2 Noise
1	29		52		0.24		0.33	
2	26		42		0.23		0.29	
3	31		45		0.25		0.30	
4	31		25		0.25		0.23	
5	26		39		0.23		0.28	

Repeat as many times as possible

This experiment often results in lots of errors because many factors can affect results.

Analysis of Results

The lower the reaction time, the faster the reaction time. For example in the table above:

"Person 1's reaction time was faster before it was caught with noise. with average time before noise was 0.24 seconds compared to 0.29 seconds. This supports the hypothesis that noise increases the reaction time of Person 1."

Considerations

It is very difficult to control variables.

E.g. Results could show someone is faster after the independent variable was changed but because they have practiced catching the ruler, not because of the independent variable.

Potential Improvements

Measure reaction time in milliseconds to increase accuracy.

Lots of participants and attempts are needed to produce reliable results.



Alternative practical

Use a computer programme.



Participants click the mouse when the colour on the screen changes

Extract from table

Ruler reading (cm)	Reaction Time (s)
1	0.05
2	0.06
3	0.08
4	0.09
5	0.10



Method:

Preparation

- In a pair, decide who is Person 1 and Person 2.
- Person 1 sits down on a chair and puts the forearm of their dominant arm across the table, with their hand overhanging the edge.
- Person 2 holds a ruler vertically (from a chair) with the bottom end (0cm mark) between Person 1's thumb and 1st finger.
- Person 2 tells Person 1 to be ready to catch the ruler.
- When ready, Person 2 releases the ruler.
- Person 1 catches the ruler as quickly as possible.
- Record the number on the ruler level with Person 1's thumb on a table.
- Repeat steps 2-7 several times with Person 1 catching the ruler.
- Swap roles, so Person 2 catches the ruler and Person 1 drops it.
- Use a conversion table to convert ruler measurements into reaction time.
- Make the necessary changes in order to investigate the chosen variable.
- Repeat steps 1-10 with the new variable.

