Reading and Interpreting a Scientific Investigation – Natural Sciences

THE ANSWER SERIES *Your Key to Exam Success*

Introductory information
Creates background and connection to curricular content and may give hints with regards to interpretation of questions.

Sample size
Number of participants.
A larger sample is more reliable.

Procedure
Detailed steps on how the investigation was conducted, e.g.:
- Sample size
- Duration
- Constant variables
- How measurements were taken

Results
Provided in table, graph or paragraph form.
Look for a relationship or trend between the two variables.

General TIPS and TRICKS
Use a highlighter when reading the question to indicate the constant variables.

Look out for large sample sizes/many groups or repetition in the procedure section to check how reliability was ensured.

Natural Sciences learners read the extract below in a scientific magazine:

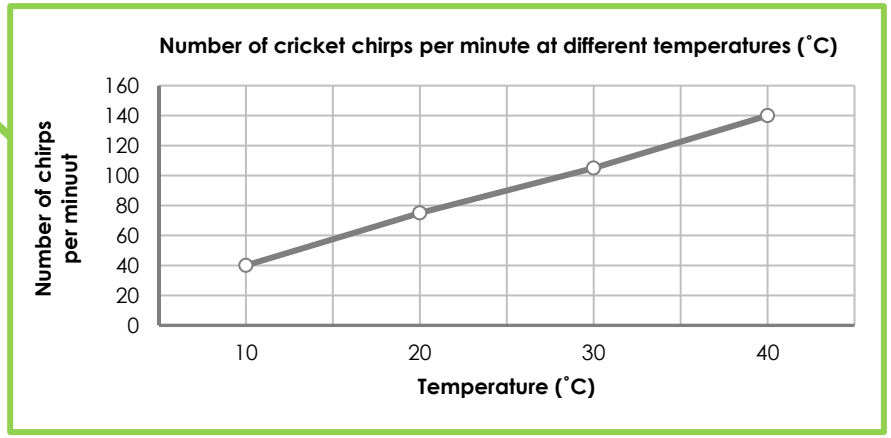
HOW IS A CRICKET'S CHIRP RELATED TO TEMPERATURE?

Crickets are insects. Like all living things, they have many chemical reactions, e.g. reactions that allow muscles to contract to produce the chirping sound. All insects are ectothermic ('cold-blooded') and take on the temperature of their surroundings. Changes in temperature affect how quickly these chemical reactions occur.

They decided to conduct an experiment **to** determine the relationship between **the temperature** and **the number of chirps per minute**. The procedure was done as follows:

- They collected four crickets of the same species.
- They took four wooden boxes of the same size and placed one cricket in each box.
- Each box was also fitted with a temperature-controlled heater.
- The boxes were labelled **A**, **B**, **C** and **D**.
- The heater in box **A** was set at 10˚C, box **B** was set at 20˚C, box **C** at 30˚C and box **D** at 40˚C.
- Each box was left for 10 minutes so that the crickets could get used to the temperature.
- They then recorded the number of chirps per minute.

The results are shown in the line graph below



Aim of the investigation
Look for a '**TO**' i.e. '**to** determine…' , '**to** investigate…' , '**to** compare… '
The aim contains both variables and can be used for the hypothesis, variables and conclusion.

Dependent variable
the variable that is **measured**

Independent variable
the variable that is **manipulated**

Constant variables
Factors that were kept the same. This ensures that the investigation is valid.
IMPORTANT: These factors are noted here, but there may be other factors that **should also be kept constant**.

General TIPS and TRICKS
If a question asks for variables that **were kept constant** (past tense) – use the variables provided in the question.

If a question asks for variables that **should have been kept constant** (future tense) – suggest other factors that have NOT been mentioned.