

Draft - subject to change and accreditation

Paper Reference(s)

**XXXX/XX**

# **Edexcel GCSE**

## **Statistics**

Sample Controlled Assessment Material  
**DRAFT**

Theme: Human Body  
Student Booklet

**Valid from XXX to XXX**

**NXXXXXX**

W850/.../57570

## Formulae sheets

### Edexcel GCSE Statistics

#### Formulae Sheet

#### Foundation Tier

$$\text{Mean of a frequency distribution} = \frac{\sum fx}{\sum f}$$

$$\text{Mean of a grouped frequency distribution} = \frac{\sum fx}{\sum f}, \text{ where } x \text{ is the mid-interval value.}$$

**Edexcel GCSE Statistics****Formulae Sheet****Higher Tier**

$$\text{Mean of a frequency distribution} = \frac{\sum fx}{\sum f}$$

$$\text{Mean of a grouped frequency distribution} = \frac{\sum fx}{\sum f}, \text{ where } x \text{ is the mid-interval value.}$$

$$\text{Variance} = \frac{\sum (x - \bar{x})^2}{n}$$

$$\text{Standard deviation (set of numbers)} = \sqrt{\left[ \frac{\sum x^2}{n} - \left( \frac{\sum x}{n} \right)^2 \right]}$$

$$\text{or } \sqrt{\left[ \frac{\sum (x - \bar{x})^2}{n} \right]}$$

where  $\bar{x}$  is the mean set of values.

$$\text{Standard deviation (discrete frequency distribution)} = \sqrt{\left[ \frac{\sum fx^2}{\sum f} - \left( \frac{\sum fx}{\sum f} \right)^2 \right]}$$

$$\text{or } \sqrt{\left[ \frac{\sum f(x - \bar{x})^2}{\sum f} \right]}$$

$$\text{Spearman's rank correlation coefficient} = 1 - \frac{6\sum d^2}{n(n^2 - 1)}$$

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## THEME: Human body

When you look round a room full of people you will see that the human body has many shapes and sizes. We are very diverse animals. You can investigate the human body statistically in many different ways.

Some of the variables you could investigate are:

- eye/hair colours,
- handedness,
- lengths of arms/legs,
- height,
- weight,
- body mass index.

There are many questions that can be investigated statistically:

Do you expect there to be more people with brown eyes than any other colour?

Do you expect people with long arms to be tall?

Do you expect tall people to weigh more than short people?

Do you expect people to cluster around an average height or are heights distributed evenly?

There are many other questions you could ask and variables you could investigate.

The project must be done in three stages.

The **first stage** must be done under formal supervision with your teacher present and you will not be able to take this work out of the classroom until it has been completed. In this stage you will plan your investigation.

In the **second stage** you may work under informal supervision outside the classroom. In this stage you will collect your data, draw diagrams and do calculations.

In the **third stage** you must again work under formal supervision with your teacher present. You will write up your investigation. This will involve analysing and interpreting your data, drawing conclusions and evaluating your work.

## Stage 1: Planning

You need to plan how you are going to do the investigation.

What are you going to investigate?                      Discuss this with your teacher.

Your teacher will give you some ideas but the highest marks are for originality - that means your own ideas.

Develop a question or hypothesis to investigate.

You can have just one question, but it would be better if you considered related questions or hypotheses.

### Remember

- The questions you decide to investigate will influence the sample you collect.
- You need to think about what you expect the answers to your questions or hypotheses to be and why you expect these answers.

### Data Collection

Think about the data you want to collect.

- Where will your data come from?
- How reliable is your source?
- How big a sample will you need? Discuss a suitable size with your teacher. The sample size will depend on the questions you are trying to answer but usually you should collect at least 30 pieces of data for each variable you are investigating.
- How are you going to collect the data? What sampling method is to be used? You can work with others to share the data collection but you must write down exactly what you did and what they were asked to do.
- How are you going to record the data you collect?
- What will you do about outliers or anomalies? (Pieces of data that appear to be out of place or incorrect).

### Diagrams:

- What are the best diagrams to draw to represent your data and what are the reasons for your choice?
- You should always choose the best diagram - there is no need to draw several diagrams to represent the same data.

### Calculations:

- What calculations will best summarise your data and answer the questions you have asked?
- Remember to consider outliers.

- You should not do calculations that do not answer your initial questions. You will get no extra credit and will be wasting your time.

Now write up your plan and give it in to your teacher.

Your plan should state the questions you are going to investigate and information on your plans for data collection, diagrams and calculations. You should write down reasons for your choices of all these.

Your teacher will discuss your plan with you. If you wish, at this point, you will be able to adapt your plan, taking into account your teacher's comments.

## Stage 2: Collecting, processing and representing data

Now you have completed the first stage of your work you need to do some work alone.

You need to:

- Collect your data as you have planned in stage 1, using any collection sheets you have designed, and keep a record of the raw data.
- Write down any problems that arose.
- Put your data into the form you need.
- Do your calculations and your diagrams neatly, by hand or using IT.
- Collect together everything you need to complete writing your report.

## Stage 3: Interpreting and evaluating

The final writing of the rest of your report will be done in the classroom.

You will have completed most of your diagrams and calculations already, but now everything needs to be put together so that it makes a complete report.

You need to:

- Place your **Plan** at the beginning of your report
- Under the title **Data Collection**, present the data you collected in tables.
- Write down any extra information about the data that was not in your plan. This might include problems that you found and how you resolved them.
- Under the title **Analysis**, present your diagrams and calculations in a form which helps you to interpret them.
- Draw everything together in a **Conclusion** that relates to the questions and hypotheses that you posed in your plan.
- **Evaluate** your work. Did you get the results you expected? Suggest improvements and discuss limitations.
- Create an **Appendix** for your raw data.
- Complete the Candidate Record Sheet and sign the authentication form and put them at the front of your report.
- Number the pages and fix your report together with a treasury tag or a piece of string.
- Hand in your report to your teacher.