**Group 1**

**English**

**Topic:** Dance in Jane Austen’s novels

“What are the role and the significance of dance in *Pride and Prejudice* and *Emma*?”

**Topic:** Death in Emily Brontë’s and Emily Dickinson’s poetry

“How is the subject of death treated in selected poems by Emily Bronte and Emily Dickinson?”

**Group 2**

**Language French**

**Topic:** Language laws in Quebec

To what extent has Bill 101 contributed to increasing the prevalence of the French language in Quebec?

An investigation into the effect of Bill 101 on the status of the French language in Quebec.

**Group 3**

**Economics**

**Topic:** Pricing at the local supermarket

Research question: Will the recent policy of cutting bakery prices lead to increased revenue for the Safeway supermarket in Ryde, Sydney?

Approach: Primary research is conducted through observation and supported by secondary research, such as company records and textbooks. This results in a detailed examination of elasticity and its relationship with total revenue.

**Topic:** The economic impact of privatization

Research question: To what extent did Matav, a Hungarian telecommunications company, become more efficient post-privatization?

Approach: Primary data is collected through interviews with company management (qualitative research) and secondary data is collected by accessing company reports. Economics texts are used for researching the economic theory of privatization.

**Topic:** The impact of monetary policy

Research question: Has the Kenyan central bank’s policy of interest rate cuts led to a rise in new car sales in Nairobi?

Approach: A consumer questionnaire (quantitative research) is circulated and interviews (qualitative research) are carried out with sales managers of new car firms. Government macroeconomic statistics (secondary research) are also accessed.

**History**

**Title:** Varying interpretations of the Salem witch trials

Research question: Which theory best explains the Salem witch trials?

Approach: Background reading is undertaken to enable identification and explanation of two dominant theories as to why the trials took place. The merits of the two theories are appraised using data obtained about the accused and the accusers.

**Title:** The influence of National Socialist ideology on the German school system in the late 1930s: a case study

Research question: To what extent were Hitler’s educational aims fulfilled in the Uhland Gymnasium, 1937–1939?

Approach: Reading is undertaken to enable a summarization of National Socialist ideology and curriculum proposals. Primary sources (teachers’ records) are used to establish how far the proposed changes were put into practice in one school during 1937–1939.

**Title:** Changing views of the 1962 Cuban missile crisis

Research question: How and why have explanations of the Cuban missile crisis changed since 1962?
Approach: General reading is undertaken for a historical introduction and note taking. The views of a number of historians are summarized in order to understand, categorize and evaluate selected explanations of the 1962 missile crisis in the 1960s, 1970s and 1980s.

**Group 4**

**Biology**

**Topic: The distribution and growth of lichens on urban pavements**
Research question: How are the distribution and growth of lichens affected by sulfur dioxide and ozone levels in the atmosphere?
Approach: Thalus diameter and population density data is collected from selected sites in different parts of the city. This data is then correlated with published data on the levels of SO2 and O3.

**Topic: The effectiveness of commercial antibacterial cleaning agents**
Research question: Are commercially available antibacterial cleaning agents effective at controlling the growth of *E. coli* on nutrient agar under laboratory conditions?
Approach: Pure strain *E. coli* are grown on nutrient agar plates under controlled conditions. Filter paper discs soaked in samples of the antibacterial agents are placed on the agar plates and the zone of exclusion is measured and compared.

**Topic: Altitude and physical fitness**
Research question: Can a programme of training at high altitude have an impact on the fitness of an athlete?
Approach: Using a digital heart-rate monitor, pre- and post-exercise heart rates and recovery times are measured for four athletes. These athletes then carry out a programme of training at 2,500 metres above sea level, after which heart-rate and recovery time data is once again collected. The pre- and post-training data is analysed and compared to published data.

**Topic: Urease from soy beans**
Research question: Which method of extraction and which temperature conditions give the best levels of urease activity?
Approach: The enzyme is extracted from dried soy beans using three different methods, and the activity of the extract is measured and compared to a standard. Urease activity is measured by noting the time taken for a standard urea solution, with phenolphthaline indicator, to turn pink in the presence of the enzyme extract.

**Chemistry**

**The ratio of the gases evolved at the positive electrode during the electrolysis of common salt solution**
Is there a relationship between the concentration of aqueous sodium chloride solution and the ratio of the amounts of oxygen and chlorine gas that are evolved at the positive electrode during electrolysis?

**The caffeine content of a cup of tea**
Does the time it takes to brew a cup of tea using a specific commercial brand of tea leaves significantly alter the amount of caffeine that is dissolved in the drink?

**Analysis of strawberry jellies by paper chromatography**
The use of paper chromatography to determine whether strawberry jellies obtained from 24 different countries in 5 different continents all contain the same red dyes.

**Group 5**

**Math**

**Topic The geometry of navigation**
Research question: What was the role of mathematics, and geometry in particular, in navigation when we relied on the stars? Does it still play a part now we have man-made satellites?
Approach: Using one of the two geometric representations of the earth (spherical or ellipsoidal), describe how maps and charts were produced to assist navigators in the past.
**Topic Square–triangular numbers and Pell’s equation**
Research question: How many square numbers are also triangular numbers, where are they, and what other problems lead to Pell’s equation?
Approach: A description of square and triangular numbers, and how the locations of numbers that are both are solutions of Pell’s equation. Some other problems, perhaps in number theory and geometry, that lead to the equation could be described, with a brief history of the equation included.

**Topic The exponential function and the measurement of age and growth**
Research question: How does the exponential function, and its calculus, inform areas of science such as nuclear physics, geology, anthropology or demography?
Approach: Use one of the settings where exponential growth applies, perhaps modelling the world’s population, to describe the phenomena. Show how it is applicable in mathematical models of other real situations.