

# Hypothesis Testing

## 1. Introduction

Since the 1960s, geographers have felt an increasing need to adopt a more scientific approach to their studies. This stemmed from a number of changes that were taking place in attitudes to the study of geography and to science in a broader sense:

- The increasing scale and complexity of the subject's material and the data available.
- The rapid development of theory, often using computer modeling, from which predictions could be made.
- The realization that, despite great care, all human observers have their own, subjective, opinions which influence an assessment or conclusion (i.e. scientific objectivity could not be guaranteed).

## 2. Hypothesis

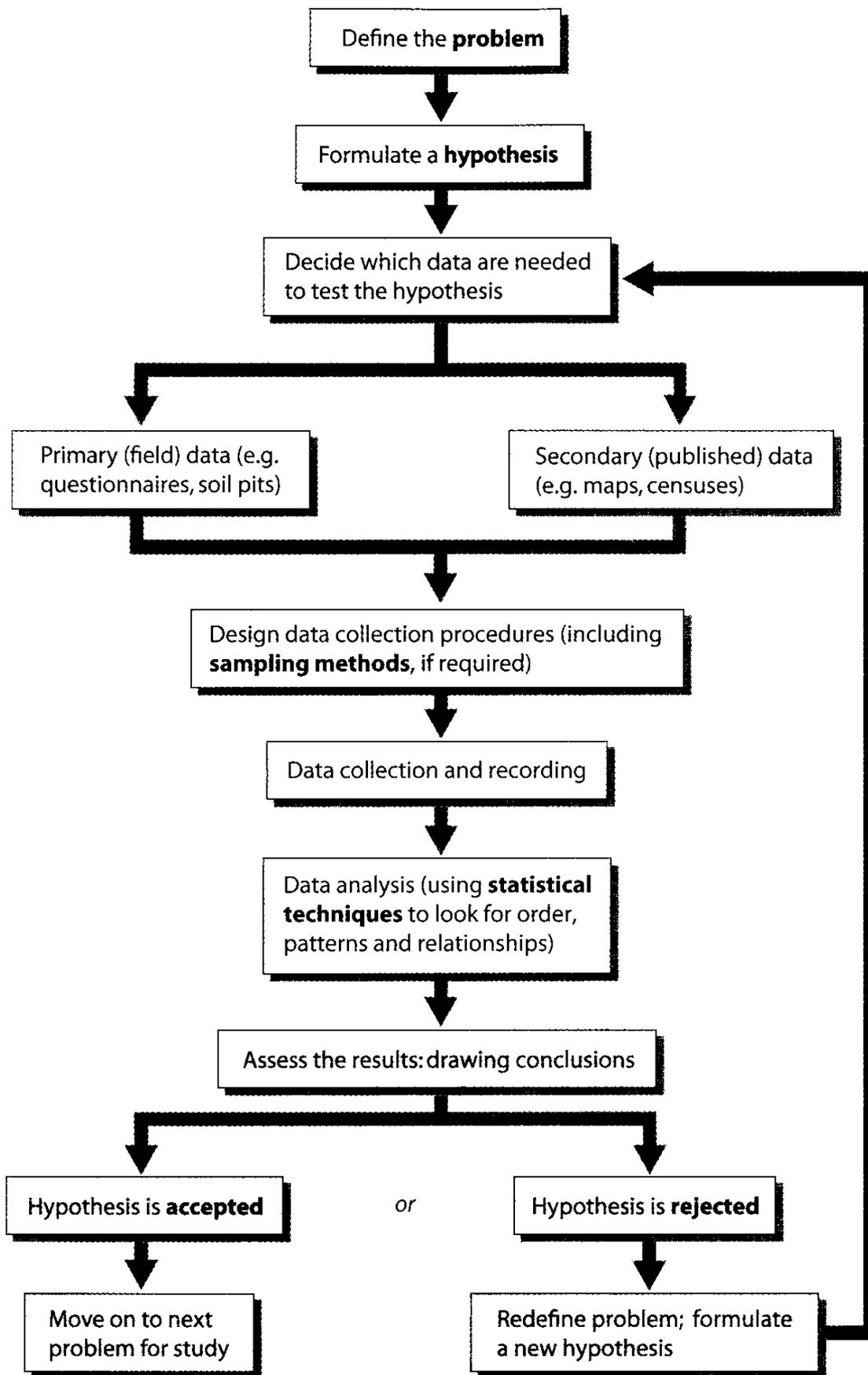
The scientific approach to geography involves a series of logical steps, already practiced in the physical sciences, which enabled conclusions to be drawn from precise (精準) and unbiased data.

In general, there are five stages in a scientific enquiry:

- Planning and preparation
- Data collection
- Data processing, presentation and analysis
- Interpretation and conclusion
- Evaluation

**Hypothesis testing** (假設檢定) involves seeking possible relationships between several variables. Geographers usually test a hypothesis by the following steps, and decide whether to accept or reject it.

*Hypothesis testing (Source: Geography: An Integrated Approach)*



Common **hypotheses-setting** in the study of ecosystem in Geography included:

- Vegetation density decreases as altitude increases.
- Soil acidity increases as altitude increases.
- Soil moisture increases as the angle of slope increases.
- Depth of soil increases as altitude decreases.
- Height of vegetation increases as altitude decreases.
- Number of species increases as altitude increases.
- Soil temperature increases as altitude decreases.

**Data collection** required the taking of readings at many sampling sites. It is important that the selection of sites is made without introducing bias.

**Data analysis** may include drawing a scattergraph to investigate the possibility of any correlation between the two variables; calculating the strength of the relationship between the variables by using the Spearman's rank correlation coefficient; and then testing the result to see how likely it is that the correlation occurred by chance.

It should then be possible to determine whether the original hypothesis is acceptable as an explanation of the data, or not. If it is rejected, then a new hypothesis should be formulated.

Discuss with your groupmates and set your own hypothesis for a project on air quality. Your hypothesis should be related to the outline drafted in the “Research Topic Planning Form”.

Brainstorm area for keywords/ key-concepts

