

3 Experiments – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)
experiment	实验	_____
control group	对照组	_____
randomization	随机化	_____

Recall

In Part A you met sampling. Now how to test whether something actually **causes** an effect:

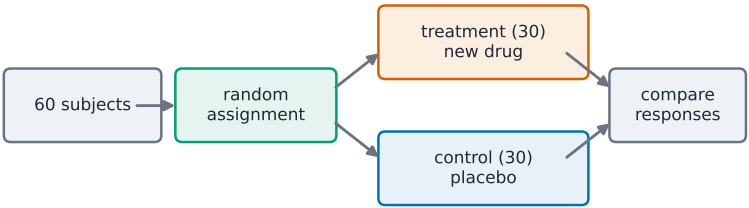
- Does a new medicine really work?
- Just observing is not enough – you need a fair test.

Each idea has a worked example before the Practice.

New ideas

■ 1 Experiment versus observation

- An **observational study** just watches and records, without changing anything.
- An **experiment** 实验 deliberately applies a **treatment** to see its effect.



random assignment → causal comparison of responses

■ 2 Control and treatment groups

An experiment compares a **treatment group** (gets the new thing) with a **control group** 对照组 (does not) – so any difference can be linked to the treatment.

■ 3 Randomization

Subjects are put into groups by **randomization** 随机化, so the two groups are similar to begin with and the comparison is fair.

■ 4 Only experiments show causation

Worked example. To test a medicine, randomly split patients: half get the drug, half get a placebo. Because the groups start alike, a difference in recovery can be blamed on the drug.

Watch out: only a well-designed **experiment** can show **causation**. An observational study can find a link (correlation) but cannot prove that one thing causes another.

Practice

Try these in order. The methods are all above.

2.1 State the difference between an observational study and an experiment. [2]

2.2 State the roles of the treatment group and the control group. [2]

2.3 State why subjects are randomly assigned to groups. [2]

2.4 State which kind of study can show that one thing causes another. [1]

2.5 Explain why a control group is needed to judge a new medicine. [2]
