

Exercise walk-through

Introduction to Experimental Design ■ 3.5

eXercise

You must be able to

- identify the **experimental units** 实验单位, **treatments** 处理, factors, and **response** variable
- explain the roles of **control** 对照, **randomization** 随机化, and **replication** 重复
- describe a **control group** 对照组 and a **placebo** 安慰剂

Method — Parts of an experiment

- **Experimental units** — the who or what being treated.
- **Treatments** — the conditions applied (set by the **factor**, the explanatory variable).
- **Response** — the outcome measured.

Method — Three principles

- **Control** — compare against a baseline group.
- **Randomization** — assign units to treatments by chance.
- **Replication** — use enough units to see a real effect.

A **control group** gets no treatment or a **placebo** (a fake treatment) for comparison.

Practice 2.1 ■ 2 marks

Name the three principles of experimental design.

Solution 2.1

Method: Three principles

Worked steps

control, randomization, replication **B1** **B1** *for any two; for all three.*

Practice 2.2 ■ 1 mark

State the purpose of a control group.

Solution 2.2

Method: Three principles

Worked steps

to provide a baseline for comparison with the treated group(s) **B1**.

Practice 2.3 ■ 1 mark

Define a placebo.

Solution 2.3

Worked steps

a fake treatment given for comparison **B1**.

Exam-style 3.1 ■ 1 mark

Assigning units to treatments by chance is

- A** control
- B** randomization
- C** replication
- D** bias

Solution 3.1

Method: Three principles

A control

B randomization



C replication

D bias

Worked steps

B.

Exam-style 3.2 ■ 1 mark

A fake treatment used for comparison is a

- A** factor
- B** placebo
- C** block
- D** response

Solution 3.2

Method: Three principles

A factor

B placebo



C block

D response

Worked steps

B.

Exam-style 3.3 ■ 1 mark

A trial gives half the patients a real pill and half a sugar pill.

- (a) Name the group given the sugar pill.
- (b) Name the sugar pill itself.
- (c) Name the principle of using enough patients.

Solution 3.3

Method: Three principles

Worked steps

(a) the control group **B1**. (b) a placebo **B1**. (c) replication **B1**.