

9 Electric potential and voltage – Part 1

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)
Electric potential	电势	_____
voltage	电压	_____

Recall

You use "voltage" all the time:

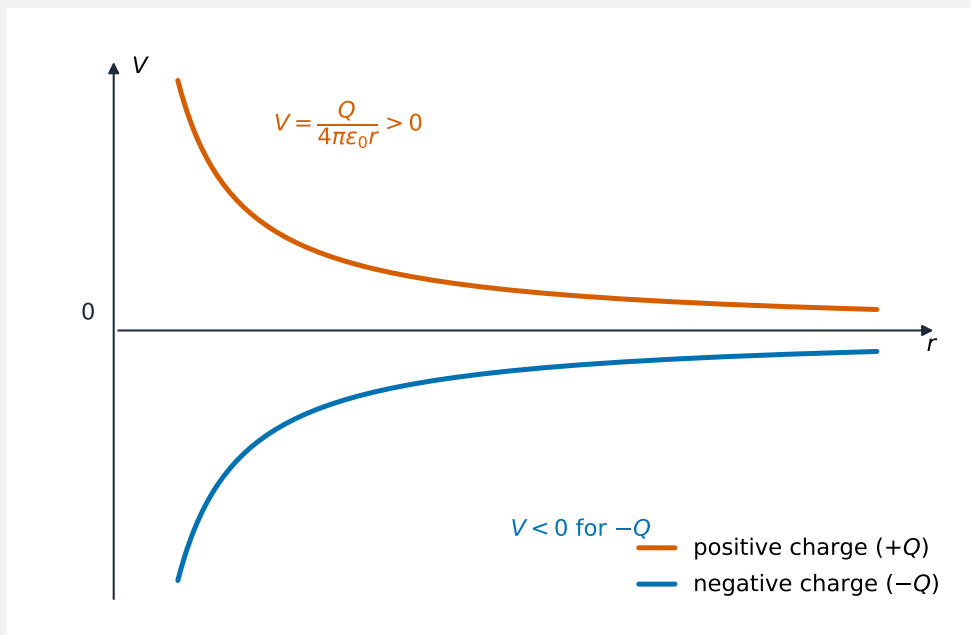
- Batteries are labelled 1.5 V, 9 V, and so on.
- Voltage is what pushes current around a circuit.
- It is really a measure of electric energy.

This sheet lines up electric potential and voltage. Each idea has a worked example.

New ideas

■ 1 Electric potential

Electric potential 电势 V is the electric potential energy per unit of charge, measured in volts.



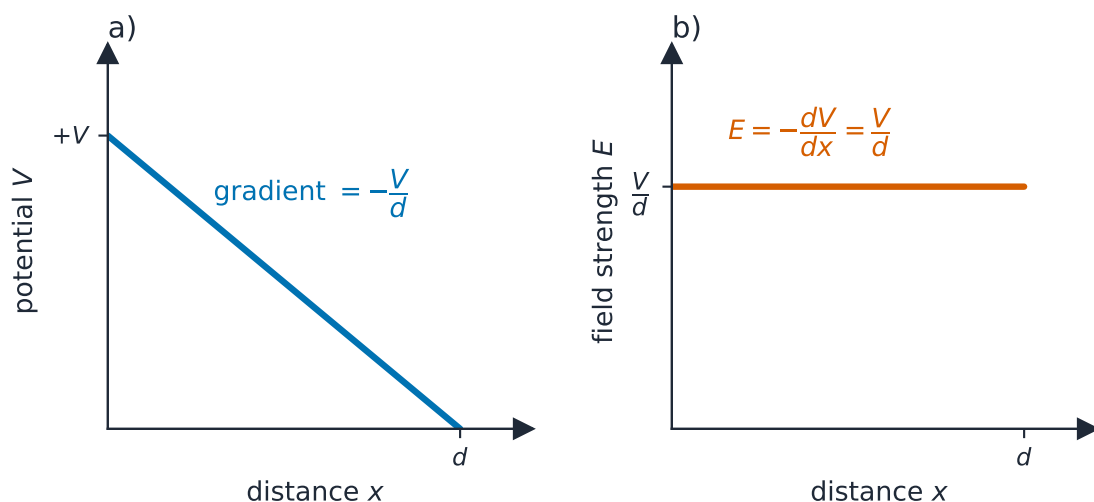
■ 2 Voltage

The **voltage** 电压 (potential difference) between two points is the work done per unit charge to move a charge between them: $U = qV$.

Worked example. Moving a charge of 2.0 C through 6.0 V transfers $U = qV = 2.0 \times 6.0 = 12\text{ J}$.

■ 3 Downhill for positive charge

A positive charge moves from **high** to **low** potential on its own –like a ball rolling downhill.



■ 4 A scalar

Potential is just a number (a scalar), so potentials from several charges simply **add** –much easier than adding field vectors.

Watch out: electric potential (V , a scalar) and electric field (E , a vector) are different things. Potentials add as plain numbers; fields must be added by direction as well as size.

Practice

Try these in order. The methods are all above.

2.1 State what electric potential measures.

[2]

2.2 Moving a 3.0 C charge through 4.0 V –find the energy transferred.

[2]

2.3 State which way a positive charge moves on its own (high to low potential, or low to high).

[1]

2.4 Moving a 0.5 C charge through 12 V –find the energy transferred. [2]

2.5 State why potential is easier to add than the electric field. [2]