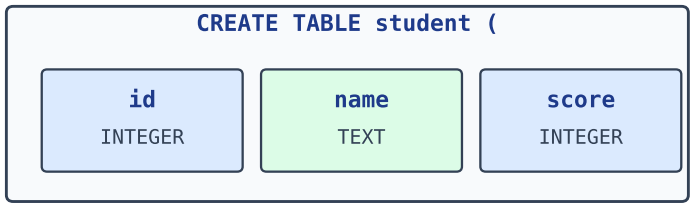
Defining tables

SQL Reference

CREATE TABLE & data types

`CREATE TABLE` defines a table's schema 表结构: the column names and their data types 数据类型. The main SQLite types are `INTEGER`, `TEXT`, and `REAL` (a decimal number).

```
CREATE TABLE student (id INTEGER, name TEXT, score REAL);
INSERT INTO student VALUES (1, 'Mei', 88.5);
SELECT * FROM student;
```



Exam tip: name columns and types first; PRIMARY KEY marks the unique id

CREATE TABLE names columns and their types

Keys & constraints

A constraint 约束 is a rule on a column: `PRIMARY KEY` (a unique id), `NOT NULL` (must have a value), `UNIQUE`, and `DEFAULT` (a fallback value).

```
CREATE TABLE student (
    id INTEGER PRIMARY KEY,
    name TEXT NOT NULL,
    score INTEGER DEFAULT 0
);
INSERT INTO student (id, name) VALUES (1, 'Mei');
SELECT * FROM student;
```


Declare a foreign key with `REFERENCES` — it records that the column points at another table's primary key:

```
CREATE TABLE class (id INTEGER PRIMARY KEY, name TEXT);
CREATE TABLE student (
    id INTEGER PRIMARY KEY,
    name TEXT NOT NULL,
    class_id INTEGER REFERENCES class(id)
);
INSERT INTO class VALUES (1, 'Maths');
INSERT INTO student VALUES (1, 'Mei', 1);
SELECT s.name, c.name AS class
FROM student s INNER JOIN class c ON s.class_id = c.id;
```

- The long form is `FOREIGN KEY (class_id) REFERENCES class(id)` on its own line.

ALTER TABLE

`ALTER TABLE ... ADD COLUMN ...` changes the schema of a table that already exists. A `DEFAULT` fills the new column in the old rows.

```
CREATE TABLE student (id INTEGER, name TEXT);
INSERT INTO student VALUES (1, 'Mei');
ALTER TABLE student ADD COLUMN score INTEGER DEFAULT 0;
SELECT * FROM student;
```

- `ALTER TABLE student RENAME TO pupil;` renames the whole table.
- `DROP TABLE student;` deletes the table completely — structure **and** data.

Common mistakes

- Every column needs a data type (e.g. `INTEGER`, `TEXT`).
- A PRIMARY KEY must be unique and cannot be NULL.
- A foreign key value must exist in the table it points to.