## Sharpen your pencil

Take a close look at the ALTER TABLE command we used to add the primary key column in Chapter 4, and see if you can come up with your own command to add a phone column that can hold 10 digits. Note that you won't need to use all of the keywords in your new command.

```
ALTER TABLE my_contacts
ADD COLUMN contact_id INT NOT NULL AUTO_INCREMENT FIRST,
ADD PRIMARY KEY (contact_id);
```

Write your ALTER TABLE command here:

```
ALTER TABLE my_contacts
ADD COLUMN phone VARCHAR(10);
```

You can even tell the software where to put the phone column with the keyword AFTER. See if you can work out where to put the keyword to ADD the new column right after the first_name column.

Write your new ALTER TABLE command here:

```
ALTER TABLE my_contacts
ADD COLUMN phone VARCHAR(10)
AFTER first_name;
```

## Exercise

This description will help you figure out how else you need to ALTER the table. Find the columns in this sentence that describes how we're going to use our table, then fill in the column names.

proj_id

proj_desc

start_date

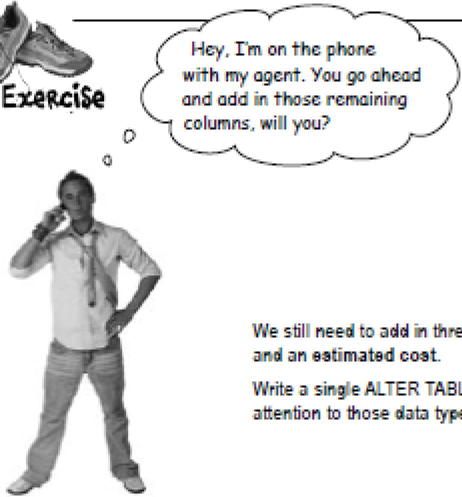
To make our table NORMAL, we'll also add a primary key with a unique project number in it. Then we'll need columns to describe each improvement, its start date, estimated cost, and the name of the contracting company working on it, along with their phone number.

est_cost

con_num

con_name

## Exercise


Hey, I'm on the phone with my agent. You go ahead and add in those remaining columns, will you?

**project_list**

| proj_id | proj_desc | con_name |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |

We still need to add in three more columns: a phone number, a start date, and an estimated cost.

Write a single ALTER TABLE statement below to do this, making sure to pay attention to those data types. Then complete the finished table below.

```
ALTER TABLE project_list
ADD COLUMN con_phone VARCHAR(10),
ADD COLUMN start_date DATE,
ADD COLUMN est_cost DECIMAL(7,2);
```

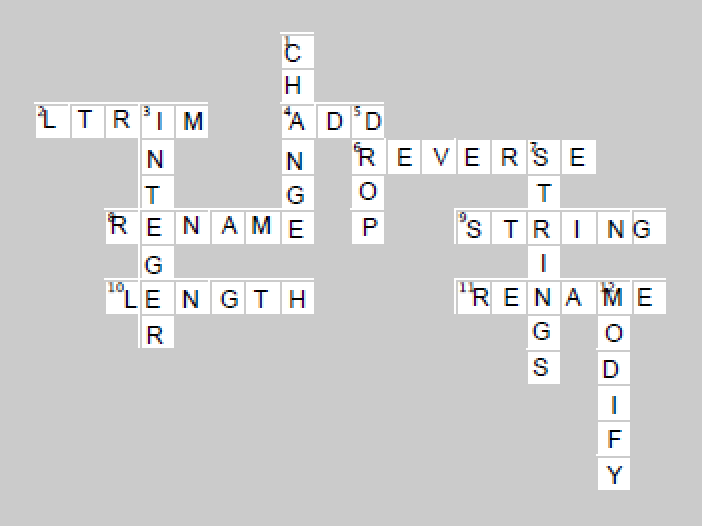
## Sharpen your pencil

Actually, you go ahead and write the SQL statement to drop the start_date column. We haven't shown you the syntax for it yet, but give it a try.

```
ALTER TABLE project list
DROP COLUMN start date;
```

# Altercross

How does a crossword help you learn SQL? Well, it makes you think about commands and keywords from this chapter in a different way.



### Across

2. _____(your_string) returns your string with extra spaces removed from before (to the left of) a string.

4. Our table can be given new columns with the ALTER statement and _____ COLUMN clause.

6. _____(your_string) does just that, it reverses the order of letters in your string.

8. ALTER TABLE projekts _____ TO project_list;

9. You can use _____ functions in combination with SELECT, UPDATE, and DELETE.

10. SUBSTRING( your_string, start_position, length) gives you part of your_string, starting at the letter in the start_position. _____ is how much of the string you get back.

11. Use _____ to change the name of your table.

### Down

1. Use this keyword to alter the type of data stored in a column.

3. You can only have one AUTO_INCREMENT field per table, it has to be an _____ data type.

5. When you no longer need a column, use _____ COLUMN with ALTER.

7. Values stored in CHAR or VARCHAR columns are known as these.

12. Use this clause with ALTER when you only wish to change the data type.