3 A student investigates how air vibrates in a plastic pipe.

She blocks one end of the pipe and blows across the other end.

The pipe emits a sound with a steady pitch.

The student uses a microphone to monitor the sound.

(a) Explain the meaning of the **pitch** of a sound.

(2)

.....

.....

.....

.....

(b) The student measures the length of the pipe and the frequency of the microphone signal for two different lengths of pipe.

(i) Name two instruments that she will need for these measurements.

(2)

1 .....

2 .....

(ii) Name the dependent and independent variables in her investigation.

(2)

dependent variable .....

independent variable .....

(c) The student collects this data.

Length of pipe in m	Frequency of signal in Hz
2	42
1½	57

Suggest three ways to improve this investigation.

(3)

1 .....

.....

2 .....

.....

3 .....

.....

(Total for Question 3 = 9 marks)