

## **Wind chimes**

You are just beginning your first job as an entry level engineer at Wind Chimes, Inc. Your first task is to design a new and creative wind chime with your team that meets the following criteria:

- It must be made out of hollow piping
- It must play at least four different notes that sound pleasing together
- It must be aesthetically pleasing
- Material cost must be under \$10.00
- It cannot weigh more than 1.5 kg
- Each component/tube must make a distinct sound when suspended 1 meter away from a fan set at low.
- All research, documentation, and mathematical calculations must be provided to your supervisor (teacher).

### **Procedure**

1. Research the problem:
  - a. What are the parts of a wind chime?
  - b. How does the length and width of the pipe effect the sound?
  - c. List at least 3 different sources and include web address or book title.
2. Develop possible solutions:
  - a. List possible materials
  - b. Method of suspending pipes?
  - c. Location for drilling pipes
  - d. Make all required calculations for designing an effective wind chime.
3. Test and evaluate: Does the wind chime operate continuously giving out the expected notes under the test wind?
4. Select a solution: explain why you chose the solution and address all criteria listed in the introduction.
5. Construct a prototype: Record all dimensions including pipe lengths and location of hole to suspend the pipe while constructing the prototype.
6. Test prototype:
  - a. What is the quality of the sound?
  - b. Does the sound quality need to be modified?
7. Redesign: list any changes you made to the prototype and note all changes in calculations for the new model

**Calculations & notes:**

Chime (redesign step)	Weight	Diameter	Length	Material	Aesthetic appeal
1					
2					
3					
4					
5					

**Sketch of the wind chime with dimensions:**