Name: _____ Date: _____

# Chapter 2 Unit 1 Project

Section 2.1

1. By the 1880s, wax cylinders were used to record music. In the 1930s, RCA produced the LP. Compact discs were introduced in 1982.

a) Calculate the outside surface area of a wax cylinder used to record music. Standard cylinders were about 4 in. long with a diameter of $2\frac{1}{4}$ in.

b) One cylinder could play about two minutes of music or sound. Calculate the rate of the area needed to record the music to the number of minutes of music.

c) LP records were pressed on a 30 cm diameter flexible plastic disc. Calculate the circular area of both sides of an LP.

d) Each LP could hold about 45 min of music using both sides. Calculate the rate of the area needed to record the music to the number of minutes of music.

e) Choose one size of vinyl record. Calculate the area of a record jacket needed for this vinyl record.

33-1/3 rpm "LP"   78 rpm   45 rpm
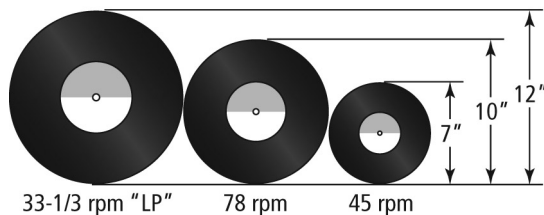
f) Design an album cover for your favourite recording artist that you could use for the record jacket in part e).

g) List possible advantages and disadvantages of vinyl records compared to wax cylinders for recorded music.

h) Vinyl records have recently made a comeback and sales are on the increase. Suggest some possible reasons for this increase in popularity.

i) Brainstorm other advancements in music storage since the early wax cylinders. How has technology changed the storage of music?

Section 2.2

2. Compact discs are sometimes packaged in cylindrical stacks of 100. Each CD has a thickness of 1.2 mm and a diameter of 12 cm.

a) The outside radius of the storage case is 0.7 cm more than that of the CD. The height of the case is 4.2 mm more than that of the stack of 100 CDs. What is the surface area of the storage case, excluding the base?

b) If a rectangular CD jewel case holding a single CD is 0.5 cm wider than the CD, 2.5 cm longer than the CD, and 8 times the thickness of the CD, what is the surface area of the jewel case?
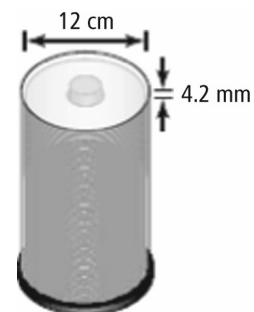
Section 2.3

3. A cell phone is basically a sophisticated two-way radio. It is a form of wireless communication. The basic concept of cellular phones began in 1947. In 1979, the first commercial cellular telephone system began operation in Tokyo. The first cell phones were much larger than present-day cell phones. A typical cell phone now has a volume between 4 in.^{3} and 6 in.^{3}. Using the information shown in the photo, estimate the volume of the first commercial portable cell phone released in 1984 by Motorola.

4. The MP3 player, a digital audio player, was first created in 1997. One of the original types of MP3 players has a capacity of 4.8 GB and was advertised to be able to hold 1200 songs. Now, MP3s come in all shapes and sizes. An MP3 player with a memory of 80 GB has a storage capacity of 20 000 average-length songs. A vinyl LP record is 0.11 in. thick and on average can hold 12 songs.

If the dimensions of the MP3 player are 4.14 cm wide, 9.15 cm high, and 0.85 cm thick, and the record has a radius of 6 in., how many songs per cubic centimetre are there on each storage medium?

5. Work individually or in a small group. Choose a 3-D object related to your Unit 1 project.

a) Estimate its volume in both SI and imperial units. Are your estimates reasonable? Explain.

b) Calculate the volume. Are the units in your answer appropriate for the object?

c) In which measurement system was your estimate more accurate? Why do you think this happened?

3.5 in.

10 in.

5.5 in.

3.5 in.

2 in.