

## UNIT G: PATTERN DEVELOPMENT

### Competency: D407.00

*Prepare pattern developments.*

### Objective: D407.01

*Explain techniques and procedures for constructing pattern developments.*

**Introduction:** The purpose of this unit is to give the student the understanding of the concepts related to pattern developments. This unit will help students understand how things such as car bodies, packaging, and other objects formed from flat materials are designed and manufactured.

A. Identify where patterns and developments are used: *R2(507-509); R3(413-415)*

1. Sheet metal industry

- a. Many metal objects are made from sheet of metal that are laid out, cut, and formed into required shapes and fastened together.
  - i) Shaped by bending, folding, die stamping or rolling.
  - ii) Fastened by riveting, seaming, soldering, or welding.
- b. Examples of surface developments from sheet metal would be air conditioning ducts, boxes, buckets, filing cabinets and household utensils like metal spatulas, pot and pans.

2. Packaging industry

- a. Packaging is a very large industry that uses pattern development.
- b. Both engineering and artistic skill are needed when creating packages, because each package design must meet many requirements.
  - i) To protect the contents during shipping of fragile objects.
  - ii) Be attractive for sales appeal.
  - iii) For durability—some packages are meant to be used for a short time then thrown away, others are made to last a long time.
- c. Designers use many different materials and varying thickness.
  - i) Thin or medium –thick stock paper. This material can be folded easily for items like boxes; others may need glue on their tabs. For example: book covers, envelopes, juice cartons and paper cups.
  - ii) Cardboard, corrugated board and other materials require an allowance for thickness. For example: boxes that have a separate cover or boxes made of two parts that slide together.

**Explain the following:**

B. Terms and their relationship to Pattern Developments:

1. Pattern – The development of an object that is rolled or folded.
2. surface developments -- also known as *stretchouts*
3. Stretchout– A flat pattern or development used in laying out, cutting and folding lines on flat stock.

4. Circumference – The distance around a circle. The stretchout line is equal in length to the circumference of a cylinder.
5. Truncated cylinder – A cylinder that has the end cut off by an inclined surface.
6. Parallel line development – A pattern created by drawing the edges of an object as parallel lines.
7. Radial line development – A pattern created by drawing the edges of an object radiating from a single point.

C. Create the following developments:

*R(575)*

1. Cylinder
  2. Truncated cylinder
  3. Box
  4. Cone
    - a. Create measuring lines that radiate from a single point using a radial-line development typically makes developments of pyramids and cones
    - b. The tip of a cone is called the *apex*.
    - c. A cone consists of planar and single-curved surfaces.
  5. Pyramid
  6. Truncated pyramid
  7. Elbows (square, two-piece, three-piece and four-piece)
- D. Creating a stretch-out line using a parallel-line development typically makes developments of prisms, cylinders and elbows.
- E. The full length of a pattern when completely unfolded is represented by the stretch-out line.
- F. The lines representing the location of folds or bends are called crease-lines.
- G. Crease, fold or bend lines are represented by a small circle or an X.
- H. A tab or lap is where additional material is added to surface developments for the purpose of assembly.
- I. When two truncated prisms or cylinders meet at an angle other than 180 degrees, an elbow is formed.