Project Box Construction

We are going to put all my Projects?

Western Technical-Commercial School

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11	*Project:*
	Pages:

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Build Project Box

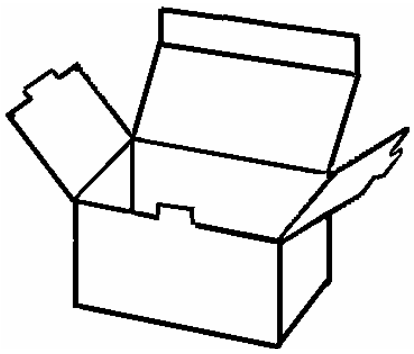
PACKAGE YOUR WORK

The Situation:

As we will be making several projects throughout the year, you will need to have a place to keep your activity project parts until you have completed your project. For this reason we are going to look at Package design and graphic communication. Package Design will introduce you to some background information to packaging. Graphic communication will be used to promote Technology.

The Challenge:

The challenge is to accurately cut, bend and construct a CORRUGATED box using corrugated single flute cardboard from a given pattern and graphically communicate technology through pictures, drawings and sketches (colour), on the outside to show five major themes, which are as follows:



1. Past technology (left side)
2. Area of interest in technology (back side)
3. Current technology (front side)
4. Safety in technology (top side)
5. Future Technology (right side)
6. SPICE colour cartoon (Top inside)

Graphics on box must be temporarily glued on, and when done, taped well to prevent falling off during daily use. Your name, class section, topic on a 15mm class-colour-bar must be placed on the bottom-front, bottom-left, bottom-right, bottom-back side, and top (near front) of your box in 10 mm Gothic font. Using Gothic font, 30 mm, with a black permanent marker, print your name on both sides of the bottom of box. The inside of the top flap must show the problem solving process steps in colour. Your 1" high logo must accompany the bottom left corner of the colour bar

Resources:

1. Recycled single flute cardboard
2. You may cut out current and old, drawings and pictures from old magazines
3. Use the library to go on the Internet for some information and pictures
4. Draw, trace, copy from books, clip art, and illustrations

Sharp Tool Safety

In this project you will be using some tools that are very sharp. These tools must be used carefully and safely. In order to get crisp clean cuts, the x-acto knife will be used to cut out the cardboard on cutting boards. When cutting out pictures from designated magazines, newspaper, etc scissors can be used after which the paper cutter may be used to neatly finish cuts.

All tools are not to be used until you have seen and understood demonstrations of each of the tools.

General Safety:

Keep the following four points as to why it is important to use the right tool for right job:

1. *Could damage the tool*
2. *Result in a poor job on your work*
3. *Could ruin your work piece*
4. *Could hurt yourself*
5. *You will loose time*

Scissors:

These will be used when you are required to cut out pictures from the magazines. When using scissors keep in mind the following:

1. *Keep fingers clear of paper and area you are cutting*
2. *When they are not in use, keep them closed*
3. *Carry by handle with the point facing down*

X-acto knife:

These knives are very sharp. You will require this knife with the use of a cutting board to cut out corrugated cardboard box and bristle board for 15 mm class colour bar. Keep in mind these points:

1. *Cut away from any fingers holding work*
2. *Always cut on a cutting board*
3. *Be aware of who is around you, and do not disturb other students while using*
4. *Always retract blade when not using or carrying*

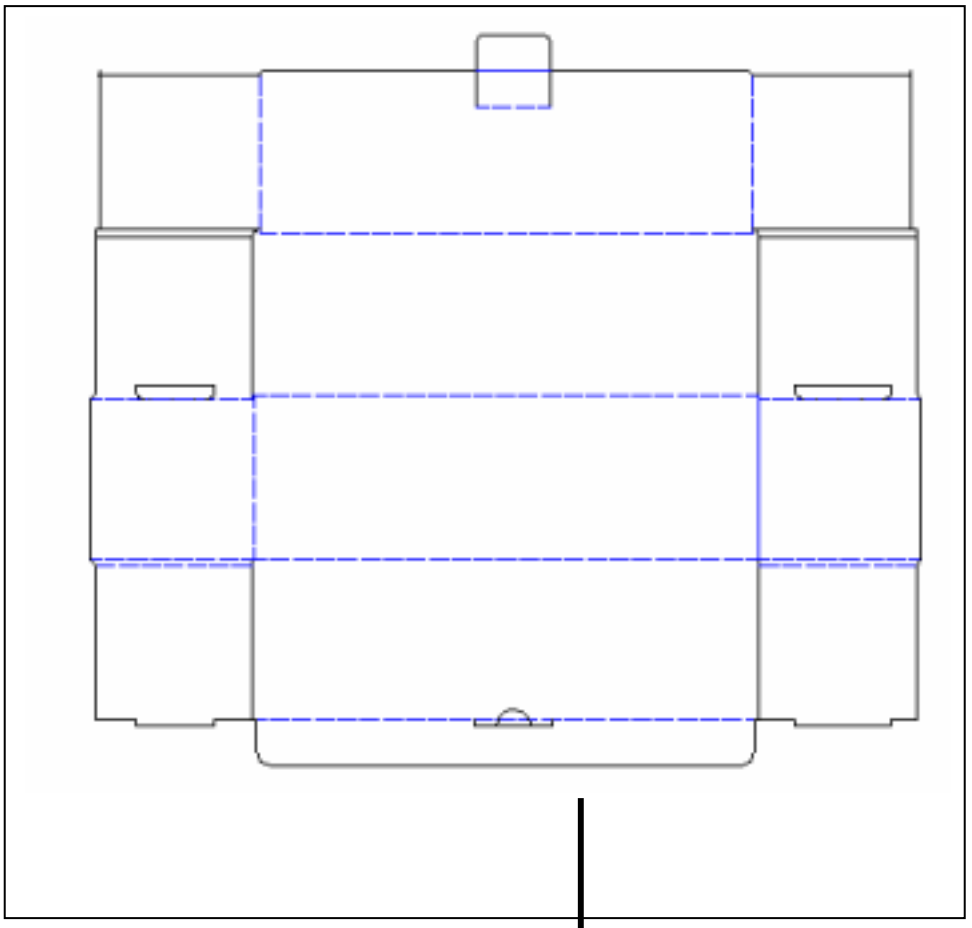
Paper Cutter:

This can be used to trim, square off, or accurately cut straight lines of a picture. Please keep the following in mind:

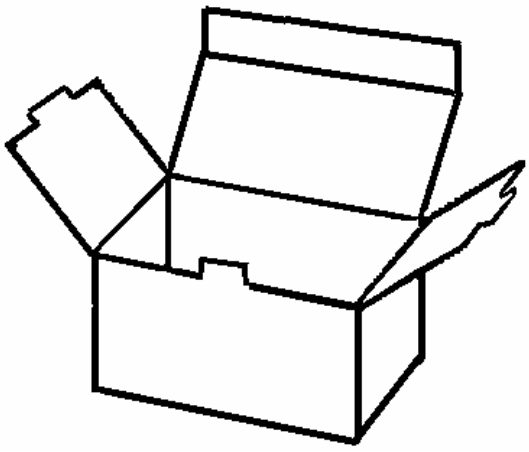
1. *Always keep cutting area clean*
2. *When cutting, one stroke one way or the other will work*
3. *Keep fingers away from the sharp round blade under handle*

Always clean up your mess when you are finished and recycle all scrap materials in their respective bins.

Project Box Construction - Steps



1. Using 2 loops of masking tape, attach them to the middle of the top and the front sections of pattern to hold plastic pattern steady on cardboard
2. Outline using a mechanical pencil the pattern outside and then the inside slots
3. Before removing pattern, double check that all markings are present by lifting each side carefully up without pattern loosing its' position
4. Remove pattern and mark using D for dashed lines and S for solid lines so that pattern can be returned so that another student may use it
5. Using a ruler accurately draw in the fold and cut lines
6. Using a cutting board, use a utility X-acto knife (not scissors) to cut out pattern
7. Pre-fold fold lines with the dull edge of an object, such as scissors
8. Pre-fold fold lines (important with the dull edge of scissors and a ruler for accurate folds
9. Carefully bend at pre-folds just pressured
10. Put box together. No tape is to be used at all, nor is it required at this point.
11. Decorate and add designs to box as required by your project instructions
12. Once the decorations are done wrap with clear packaging tape the outside with 2 rows around the front, sides and back and two rows for the top



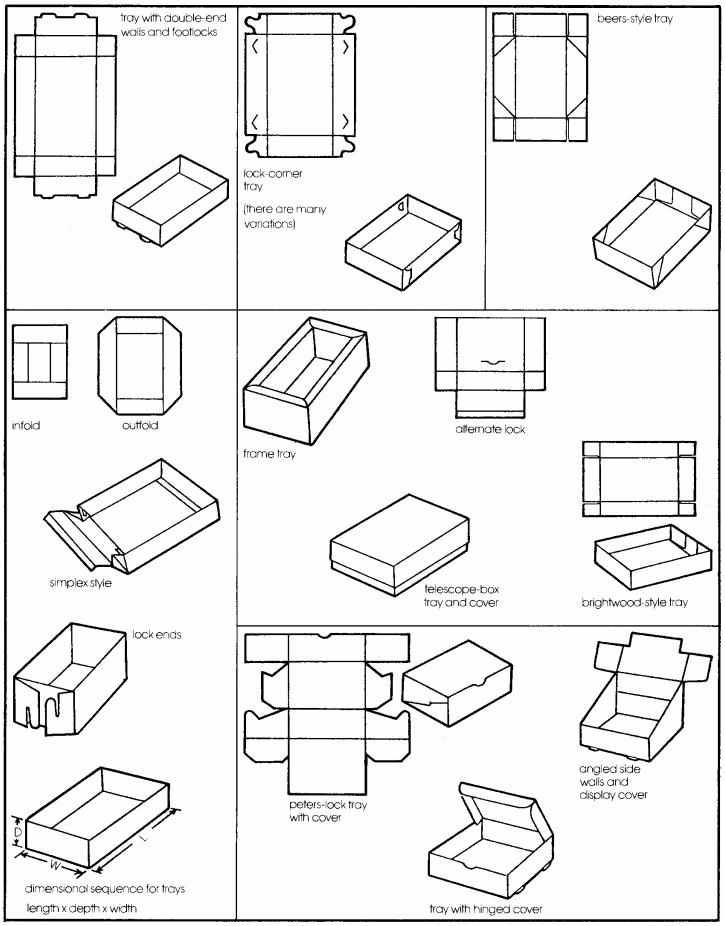
PACKAGING

Introduction

After final assembly, manufactured products are packaged before reaching the consumer. There are many reasons for packaging products. Products are packaged for protection; they prevent spoilage, spillage, and leakage. Packages also provide a way to store and ship the product as well as display and advertise the product. Proper packaging, which protects and eases distribution, can save companies millions of dollars. The package itself engages the consumer, advertises, and provides product identification and customer loyalty. There are six materials commonly used in packaging: glass, aluminum, plastic, paper and paperboard, steel, and polystyrene.

The package itself engages the consumer, advertises, and provides product identification and customer loyalty. Graphic designers and graphic artists design the packaging that promotes the product and may determine its success or failure. After a design is developed, graphic artists build a prototype or mock-up and conduct surveys or other types of research to determine its appeal to consumers.

Surface Development



This is a process where different patterns are designed to produce an effective box package from a flat 2 dimensional cardboard material. Depending on the thickness or type of the cardboard material used, this will affect the spacing of the box pattern shape and sizes. Thin cardboard would only need a small clearance, where a thicker corrugated cardboard would need to take into account a larger clearance required.

Area and volume are important concepts, which should be considered when making a package box.

1. Square Area= Length * Width
2. Cubed Volume= Length * Width * Height

Since we will be concentrating on using corrugated cardboard a closer look will give us some interesting background information on this popular packaging material.

Corrugated Containers

Like most packaging materials, *corrugated board* (often called fiberboard) has a long and colorful history. When you were a child, corrugated boxes may have been your favorite playthings. As an adult, you probably pack your belongings in them whenever you move. Your TV set, stereo,

VCR, and other appliances are shipped in impressively designed corrugated boxes. It may surprise you to learn that this popular packaging medium, the workhorse of the industry, was originally part of an article of clothing. The nineteenth-century gentleman's top hat was fashioned with a sweatband of fluted paper, the precursor to corrugated board.

An American inventor, Albert L. Johnes, patented fluted paper for use in protective containers for bottles in storage and shipment. In 1874 another American, Oliver Long, invented a process for sandwiching the flutes between two sheets of paperboard. This innovation marked the beginning of a new industry - corrugated containers. Today the corrugated container industry is a billion dollar industry, the largest in the paperboard-packaging field. Its largest single market, representing more than one-third of the industry's output, is food packaging.

Construction of Corrugated Containers

Corrugated containers are constructed from a fluted sheet glued to one or more liners. The structural characteristics of the corrugated medium are governed by four variables:

1. The strength of the liners
2. The strength of the corrugated medium
3. The height and number of flutes per foot
4. The type of walls (single, double, triple, etc.)

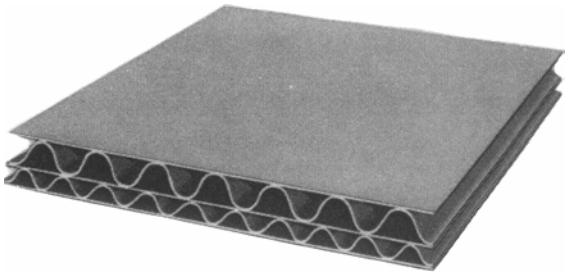


Figure 1: Double fluted corrugated sample

Four flute structures are available for corrugated containers:

- A-flute, in which wide spacing of flutes results in greater capacity to absorb shock
- B-flute, which has a greater number of flutes per foot, providing maximum crush resistance
- C-flute, which combines the properties of A and B flutes
- E-flute, which is a very thin corrugated board and is perhaps most popular type for large, sturdy displays and packages

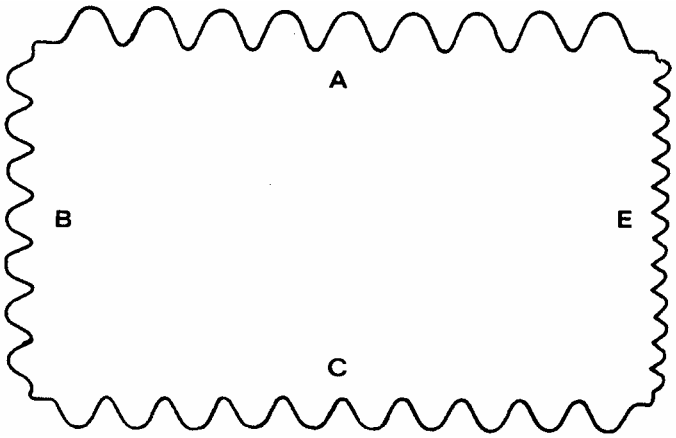
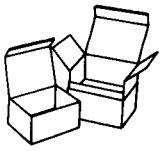


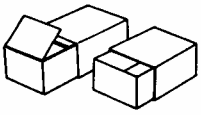
Figure 2: Corrugated scale structure sizes and shapes

Another important element of corrugated boxes is interior protection. A wide range of corrugated partitions, liners, pads, and other devices, including plastics (molded polystyrene foam) are used to provide inner reinforcement, cushioning, bracing, and shock absorption. The most commonly used closure techniques are stitching, stapling, gluing, and taping.

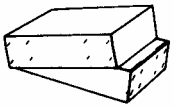
Corrugated box construction samples



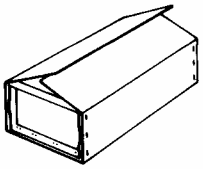
single- and double-lined slide boxes. **Single lined used as interior container and for parcel post, express, freight shipments. Double lined is three piece and provides double thickness all sides.**



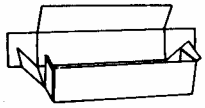
triple- and double-slide boxes. **Triple slide (left) has two thicknesses of double-faced board all sides; double slide has two thicknesses on two sides. Collapsible; ideal for mail and express.**



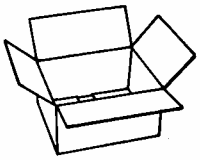
telescope design box. **Extra thickness of corrugated board in side and end walls of this two-piece container affords exceptional stacking strength and overall protection to the contents of container.**



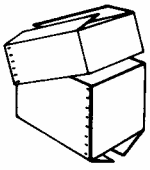
recessed-end box. **Three-piece box has a body sheet and two flanged end pieces. By varying body-sheet length, box size can change to fit many products of same girth but different lengths.**



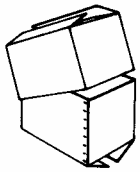
five-panel folder. **Use for canes, umbrellas, similar long, slim items. Each end has a minimum of three thicknesses, providing strength where it is most needed. Container is shipped flat to user.**



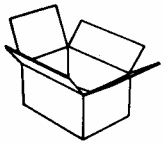
regular slotted box (RSC). **Top and bottom flaps are equal length; folded inner flaps meet only if box is square. Securely sealed with adhesive, gummed tape, or metal stitches as desired.**



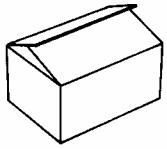
half-slotted box with half-slotted partial cover (pths). **Two-piece box, both sections slotted style. Double thickness of corrugated provides great resistance to bulging and buckling.**



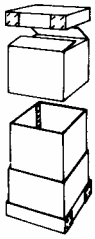
full-telescope, half-slotted box (ffths). **Full-depth cover, two-piece box. Both sections of slotted style. Full-cover top renders maximum product protection and superior stacking strength.**



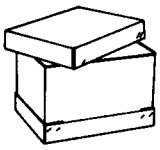
center special slotted box (CSSC). **Construction gives double-flap thicknesses top and bottom. One or both side flaps are shorter than end flaps, so all flaps meet for double top and bottom.**



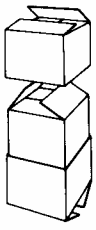
overlap slotted box (osc). **Efficient when products packed for shipment require sealing with metal staples, stitches, straps. Side flaps partly overlap for added rigidity at both top and bottom.**



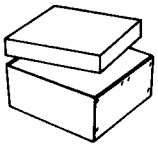
double-thickness score-line box (Box With Cover). **Another design meeting requirements for double thickness score-line box under Railroad Shipping Rule 41. Box carries heavy loads despite rough handling.**



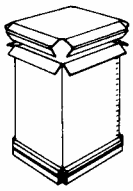
double-cover box. **Popular with manufacturers of articles that cannot be readily packaged in standard containers. In large sizes, this box is often used as a unitized or palletized load.**



double-thickness score-line box (Conventional Slotted Style Box). **For high-density products (screws, nuts, washers) in weights to 300 pounds. Container is fast replacing wooden nail kegs.**



design box with cover. **Space-saving, stapled box with double end flaps and lid. Especially easy to pack, the design box is used for shipment of cut flowers, wreaths, and similar products.**



interlocking double-cover box (ic). **Flanges on covers interlock with flanges on tube. Three-piece box for items under Railroad Shipping Rule 41. Greatest use in packing heavy appliances.**

Check List for Project Box Module

All work where possible must have a complete header, computer generated using previous made related templates with your logo. When handing in everything, double check prior to handing in by checking off the following items in chronological order for report:

Report

(If Required) Related Explanations Below↓

- ☐ Duatang type report cover
- ☐ Title page
- ☐ Table of contents
- ☐ Module information
- ☐ Related assignments
- ☐ Related evidence of design process-investigation: notes and drawings
- ☐ SPICE, steps you took, separate ½ a page typed
- ☐ Conclusion reflection, separate ½ a page typed
- ☐ This check list- with items handed in, checked off
- ☐ Final self and peer evaluation paper
- ☐ Diskette holder and good diskette with your all of your files on it

Project Box

Make sure your project box has all requirements as set out on the first page:

- ☐ Lots of graphic pictures/illustrations related to box area in right locations
- ☐ Proper bar size on all 5 locations, with required gothic font information
- ☐ Safety theme is clearly evident on top related to the shop and rules
- ☐ Name is on bottom both inside and outside with proper size and font
- ☐ SPICE process shown with cartoon inside top lid
- ☐ Two rows of 2” tape around sides and top of box

Index of Key Terms and Phrases:

Find ten new key terms or phrases and include the page number in the table below:

	New Key Term or Phrase	Page #
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Project Box Built

Project Box Completed!

Peer marker:_____

Note: Process is very important, keep all rough work for showing later!

Process and Product	Total Marks	Self Mark	Peer Mark	Earned Marks
Requirements Met: Five different themes of technology along with theme titles, name, class bar colour, name and section on each of the required sides?	10			
Research and Extra Information: Is there evidence of in-depth design and placement of technical graphic communications, showing more information that was researched?	5			
Investigation and Design Generation: Is there evidence of orthographic sketches, thumbnail sketches, and/or rough designs showing brainstorming of what and how graphics are to be placed? Is the cartoon a good example of SPICE and well identified and explained?	10			
Workmanship and Construction: Was the box constructed properly, with the right tools and methods? Is the box well constructed, solid for daily use with future projects? Was there tape needed in the construction of box to patch up wrong cuts? Are edges well cut, neat and trim with clean bends? Was there too much clear tape used (required 2 rows around and 2 on top)?	20			
Finished Project Box: Overall look of box, does it stand out? Is there evidence of following through with earlier investigation? Does the project box graphically communicate the related themes clearly? Is the report well put together, neat, complete, and in order? If you could do it again what would you improve, or do differently: _____ _____ _____	15			
Final mark: Based on % finished and completion of requirements of the challenge. Students are to make sure they total up peer and self evaluation marks → Teachers Notes: _____ _____	60			

Peer marking is based on how close you are to teachers mark. Perfect will get you +5 bonus. Total up your marks!