Project Box Construction

Where Am I Going to Put All My Projects?

Western Technical-Commercial School

School:

Exploring Technologies, TIJ1O1

Course:

Grade 9 juniors

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Build Project Box

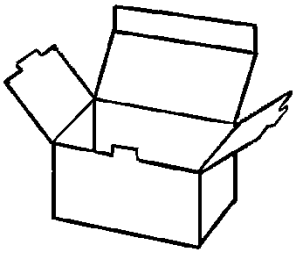
PACKAGE YOUR WORK

The Situation:

As we will be making several projects throughout the semester, 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. **Area of INTEREST IN TECHnology (back side)**
2. **CURRENT TECHnology (front side)**
3. **SAFETY IN TECHnology (both ends)**
4. **FUTURE TECHnology (top side)**
5. **SPICE colour cartoon illustration (Top inside)**

Graphics on box must be temporarily glued on. Your name, class section, and **THEME** 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 on all sides. Finish box with clear-tape, to prevent graphics from falling off.

Resources:

1. Recycled single flute cardboard
2. Cut out illustrations, drawings, and pictures from old magazines
3. Library, Internet, web site information and pictures
4. Draw, trace, copy from books, clip art, and illustrations

The following resource topics included, support the project box build: Sharp Tool Safety, Project Box Construction Steps, and Packaging.

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.

Tool use allowed only after you have been instructed, understand, and have successfully demonstrated proper and safe use.

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 lose 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***

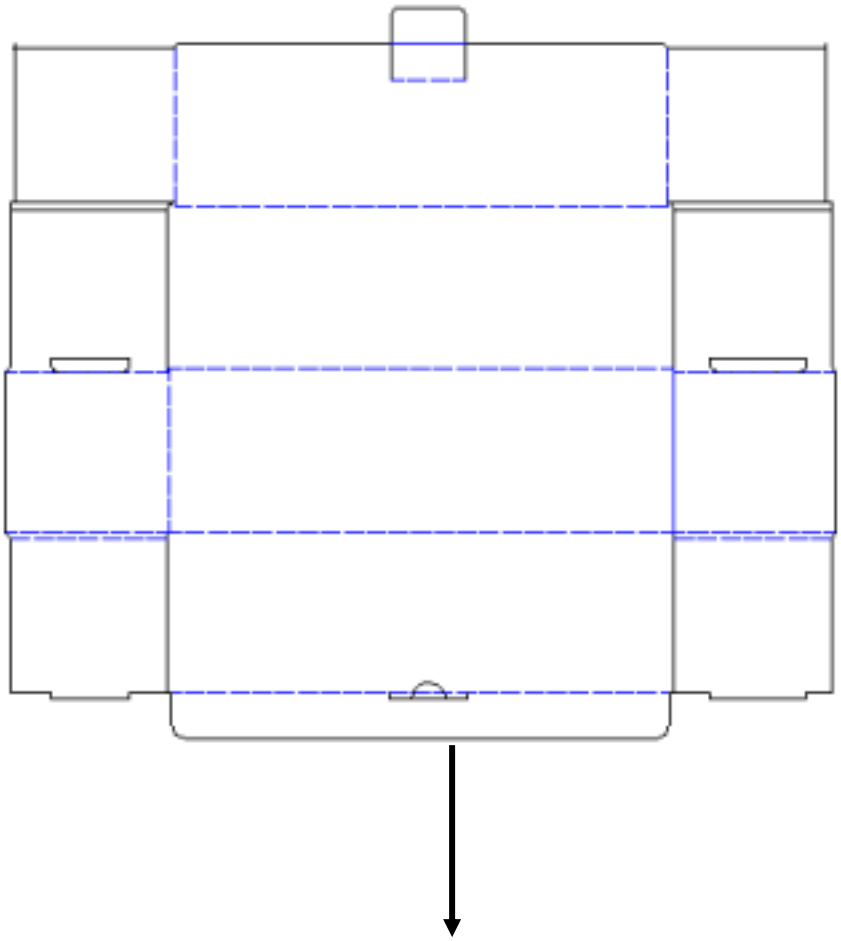
Paper Cutter:

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

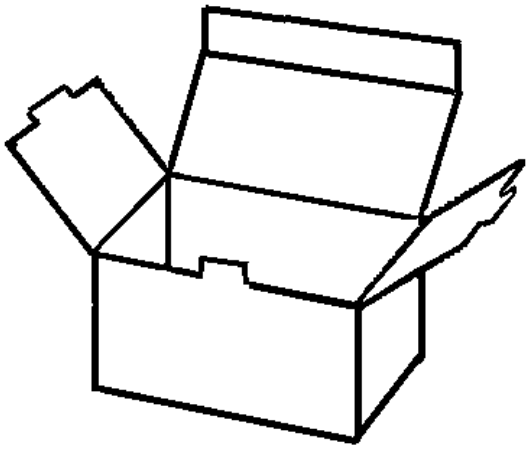
1. ***Always keep cutting area clean***
2. ***When cutting, one stroke one way or the other will work***
3. ***Keep fingers away from the sharp round blade under handle***

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

Project Box Construction - Steps



1. Using **4 loops of masking** tape, attach them to the corner 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 losing its' position
4. Remove pattern and mark a **D for dashed lines and S for solid lines** so that pattern can be returned so another student may use it
5. Using a ruler accurately **draw in the fold and cut lines**
6. With a cutting board, use a utility X-acto knife (not scissors) to **cut out the pattern**
7. **Pre-fold fold lines** with the dull edge of an object, such as scissors and a straight edge for accurate fold locations
8. Carefully **bend at pre-folds** just completed
9. Put box together, **no tape is to be used**, nor is it required at this point
10. **Decorate/market tech and add designs** to box as required in challenge section
11. Once the decorations, class colour strip, and logo are done, **wrap with clear packaging tape** around the outside with 2 rows around the front, sides and back and an additional two rows for the top



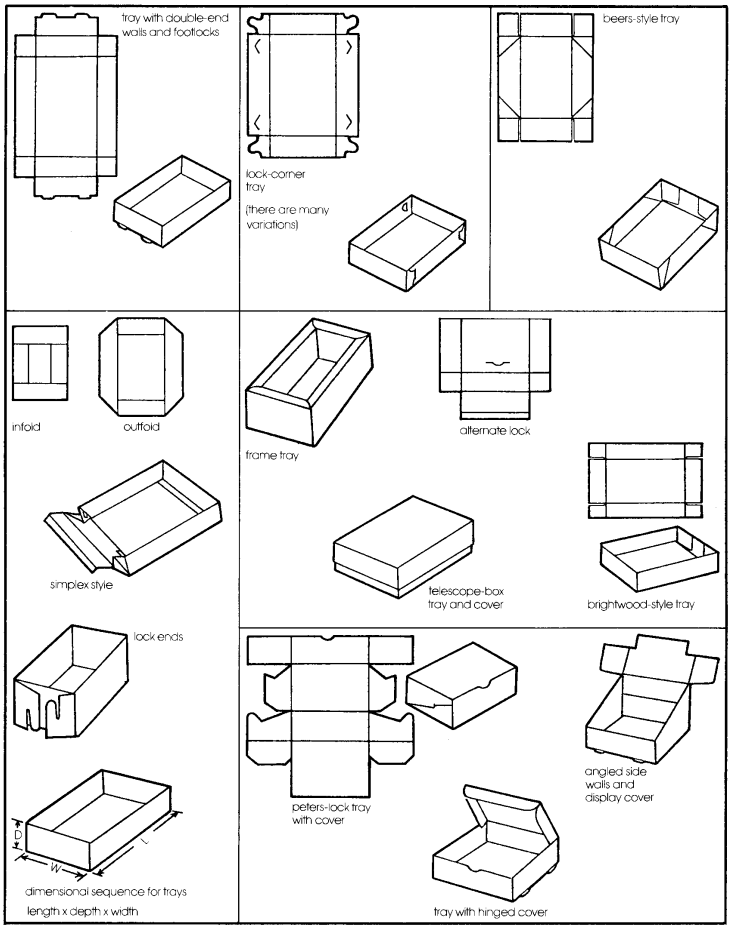
All About PACKAGING

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.

Square Area = Length * Width

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.)

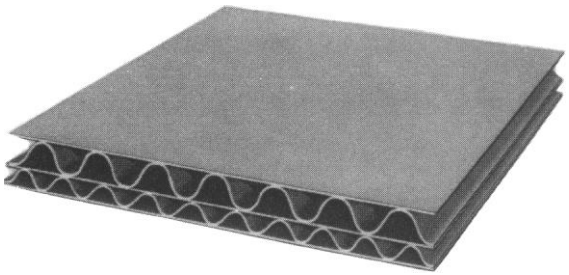


Figure 1: Double fluted corrugated sample

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**

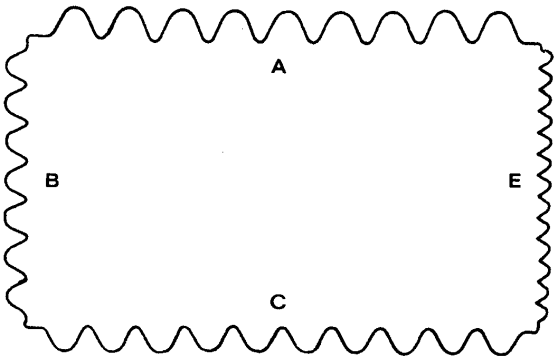
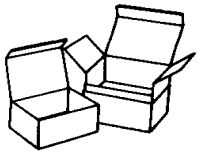


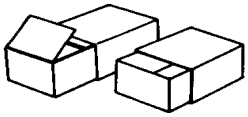
Figure 2: Corrugated scale structure sizes & shapes

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.

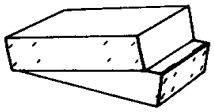
Corrugated Box Construction Samples



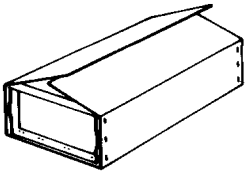
single- and double-lined slide boxes. **Single lined used as interior container and for parcel post, express, freight shipments. Double lined is three piece and provides double thickness all sides.**



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.**

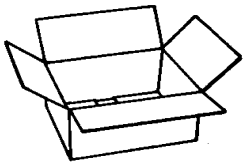


telescope design box. **Extra thickness of corrugated board in side and end walls of this two-piece container affords exceptional stacking strength and overall protection to the contents of container.**

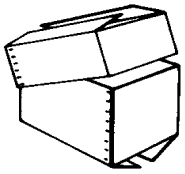


recessed-end box. **Three-piece box has a body sheet and two flanged end pieces. By varying body-sheet length, box size can change to fit many products of same girth but different lengths.**

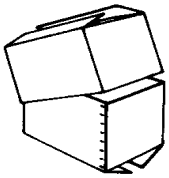
five-panel folder. **Use for canes, umbrellas, similar long, slim items. Each end has a minimum of three thicknesses, providing strength where it is most needed. Container is shipped flat to user.**



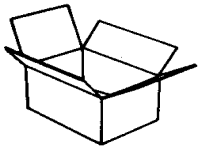
regular slotted box (RSC). **Top and bottom flaps are equal length; folded inner flaps meet only if box is square. Securely sealed with adhesive, gummed tape, or metal stitches as desired.**



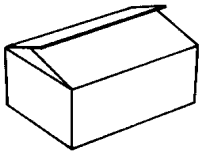
half-slotted box with half-slotted partial cover (pths). **Two-piece box, both sections slotted style. Double thickness of corrugated provides great resistance to bulging and buckling.**



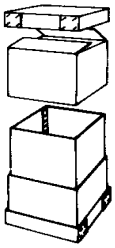
full-telescope, half-slotted box (ftths). **Full-depth cover, two-piece box. Both sections of slotted style. Full-cover top renders maximum product protection and superior stacking strength.**



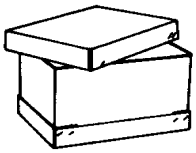
center special slotted box (CSSC). **Construction gives double-flap thicknesses top and bottom. One or both side flaps are shorter than end flaps, so all flaps meet for double top and bottom.**



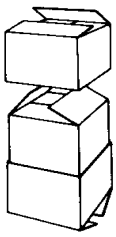
overlap slotted box (osc). **Efficient when products packed for shipment require sealing with metal staples, stitches, straps. Side flaps partly overlap for added rigidity at both top and bottom.**



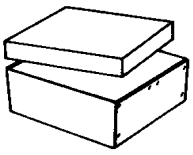
double-thickness score-line box (Box With Cover). **Another design meeting requirements for double thickness score-line box under Railroad Shipping Rule 41. Box carries heavy loads despite rough handling.**



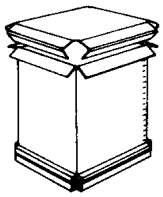
double-cover box. **Popular with manufacturers of articles that cannot be readily packaged in standard containers. In large sizes, this box is often used as a unitized or palletized load.**



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.**

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		

Check List for Project Box Module

Prior to handing in work completed, double check using the below check list to ensure you have completed all steps and requirements

Project Box

Make sure your project box has all the requirements:

- ☐ Area of interest in technology on back side
- ☐ Current technology on the front side
- ☐ Safety posters on box ends
- ☐ Future technology on top side of box
- ☐ SPICE colour cartoon showing the design process inside top lid
- ☐ Lots of graphics related to box topic area themes in right locations
- ☐ Proper 15 mm colour class bar and info on 5 sides (in gothic font)
- ☐ 1” colour logo on class bar, bottom left corners on all long sides
- ☐ Related safety theme clearly evident on both ends
- ☐ Name is on bottom both inside and outside with proper size and font
- ☐ Two rows of 2” clear tape around sides and top of box
- ☐ This check list- with items handed in and checked off
- ☐ Final self and peer evaluation paper completed

Name:

Date: Section:

Image for Yourself, Made!

Project Box

Peer marker: _____

Process is very important, so keep all rough work for paper evaluation!

Process and Final Product	Total Marks	Self Mark	Peer Mark	Earned Marks
Are the Requirements Met: Five different themes of technology along with theme titles, name, class bar colour, name and section number on each of the required sides. SPICE cartoon showing process steps for top inside box flap	20			
Research and Extra Information: Have you researched and found extra information on key terms and their definition, review questions, and project box related topic/marketing-images/illustrations?	10			
Investigation of Ideas and Design Generation: Is there evidence of sketching, ideas, roughs to show process and steps of preparation, planning, building, great image marketing, and design of box?	10			
Workmanship, Construction, and Build: Was the box constructed properly with the right tools and methods? Is the box well-constructed, excellent fitting, and solid for daily use? Was tape needed in the construction of box? Are edges well cut, neat, and trimmed with clean bends? Was extra tape required to hold box together?	40			
Finished Project Box: Does overall look of box standout and graphically communicate the required and related themes clearly? If you could do it again, what would you do to improve or do differently? _____ _____ _____	20			
Final mark: Based on % finished and completion of requirements (found in the challenge).	100			

Remember to total up your peer and self-evaluation marks in this row →

Teachers Notes:

_____

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