Packaging Processes and Requirements

Pouch and Package Making

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Outline

- Pouch making processes
  - Vertical form fill seal
  - Horizontal form fill seal
  - Flow wrap
  - Flat bed pouchers
  - Thermoform fill seal
- For each type of machine discuss the following:
  - Pouch type
  - Film requirements
  - Typical applications
  - Barrier requirements
- Pouch features

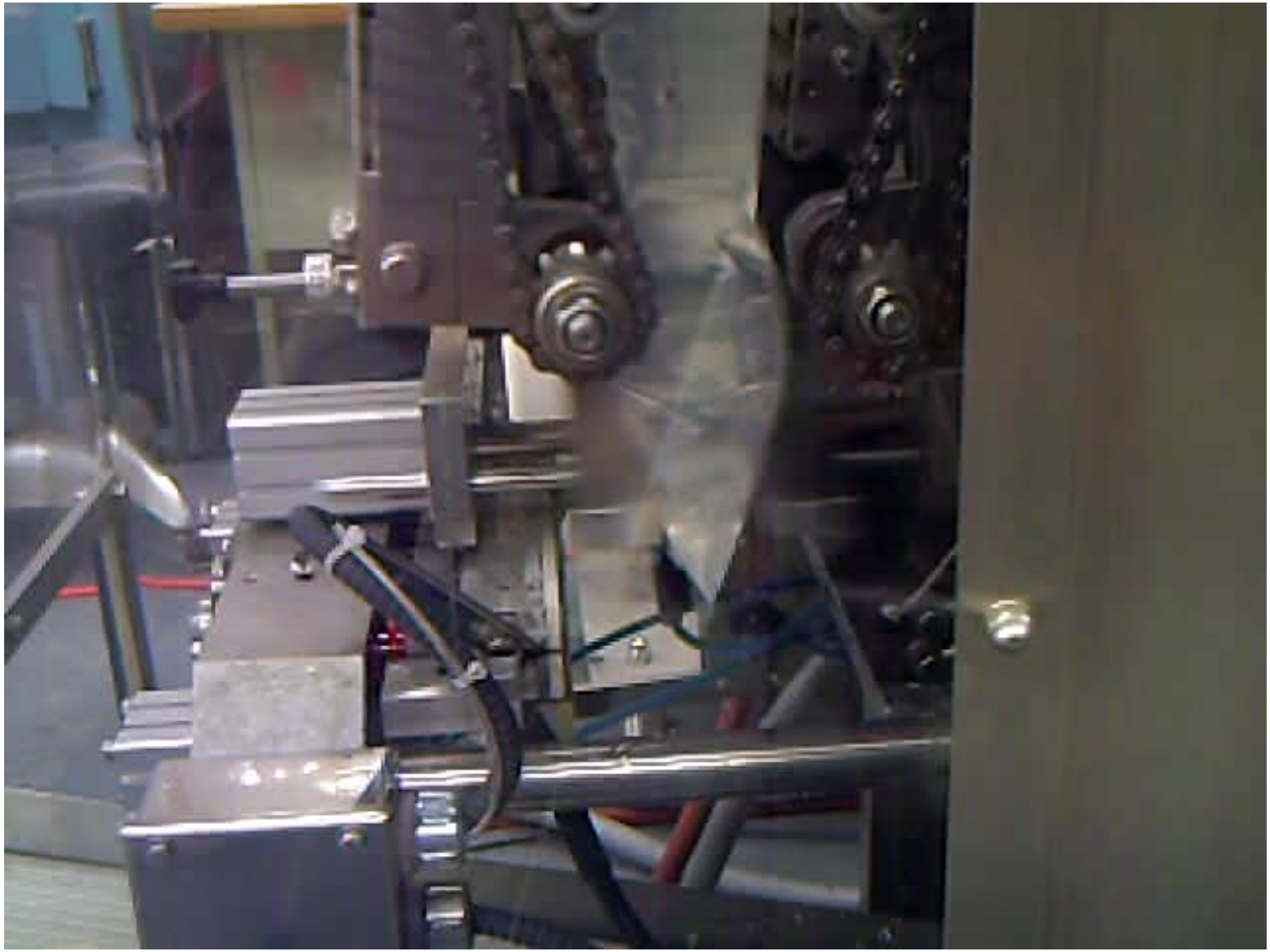
Vertical Form Fill Seal (VFFS)

- Single web system
- Web is formed into a tube and a longitudinal seal is made
  - Fin seal or lap seal
  - Seal top and bottom of next package and drop fill
  - Longitudinal cut to make final package
  - Side gusseting
  - Intermittent or continuous action
- Dry food applications
  - Cereal
  - Snacks
- Liquid food
  - Food service

Intermittent VFFS

Continuous VFFS

Liquid VFFS



Requirements for VFFS

- Low seal activation temperature
- High hot tack
  - Product is dropped directly on hot seal
  - Heavy products can reopen bottom seal
- Stiffness
  - Registration control if printed
  - Cutting
- Low coefficient of friction (COF)
  - Film sliding over forming collar and fill tube
- Seal through liquid products
- Barrier requirements dependent on product
  - Moisture barrier for cereal and snacks
    - Maintain crispness and prevent staleness
  - Oxygen barrier
    - Prevent oil rancidity in snacks
    - Oxidation of hot fill products
  - Aroma/flavor barrier
    - Flavored cereal and snacks

Horizontal Form Fill Seal (HFFS)

- C-fold pouch
  - Single web
  - Fold web in center
  - May also have bottom gusset
    - Stand up pouches
  - Seal edges to form sides of pouch
  - Fill and seal top
  - Predominately dry products
    - Dry mixes
    - Pasta
  - In-line for low volume applications
  - Rotary for large volume

In-Line (HFFS)

Continuous Rotary (HFFS) Slow Motion

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Continuous Rotary (HFFS) Full Speed

Requirements for HFFS

- Stiffness
  - Registration control for printed packages
  - Minimize stretching in machine
- Flex crack resistance
  - Folds and gussets
- Low seal activation for high speed machines
- Barrier requirement dependent on product

Horizontal Flow Wrap

- Form tube around product
- Longitudinal seal
- Cross seal and cut between packages
- Similar in concept to VFFS
- Applications
  - Toiletries
  - Medical devices
  - Industrial and commercial products
  - Candy and nutritional bars

Flat Bed Pouch Making

- Four side seal pouch
  - Two web system
  - Usually made on a flat bed pouch machine
  - Usually three side sealed premade pouches
  - Filled and final seal made in second operation
  - Typical application is for retort pouches

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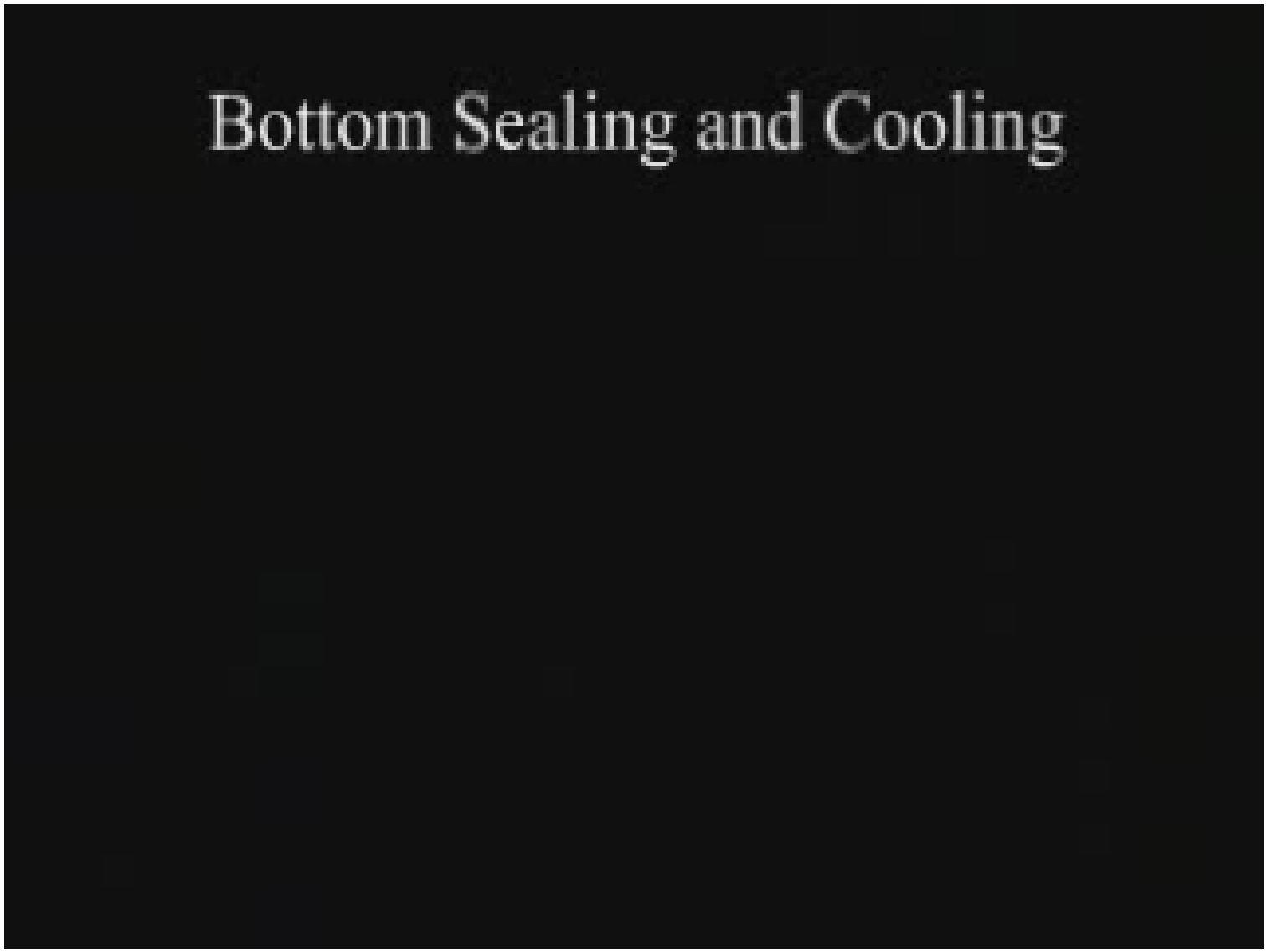
Flat Bed Pouching Machine



Stand Up Pouches

- Made with bottom gusset
  - One piece with plowed gusset
  - Separate bottom gusset
- Seal through holes punched in gusset to contain edges
- Stand up for shelf display
  - High quality graphics for customer appeal
  - Convenience
  - Contoured or shaped pouches
- Zipper insertion for reclosing
- Dispensing fitments
- Straw insertion for beverages
- Many applications
  - Beverages
  - Pet food
  - Retort pouches
  - Dry mixes and food products
  - Candy and confections
  - Household chemicals

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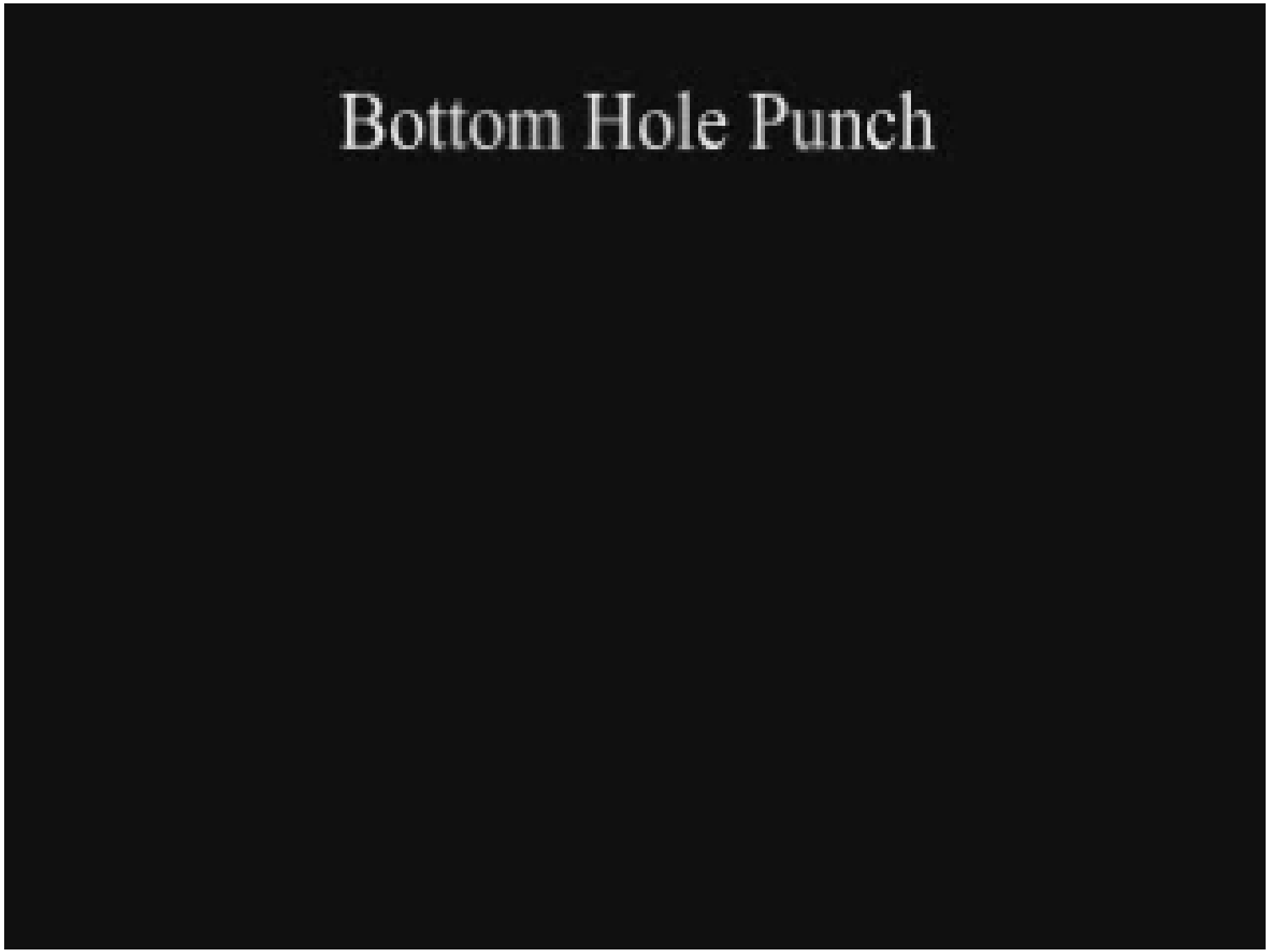
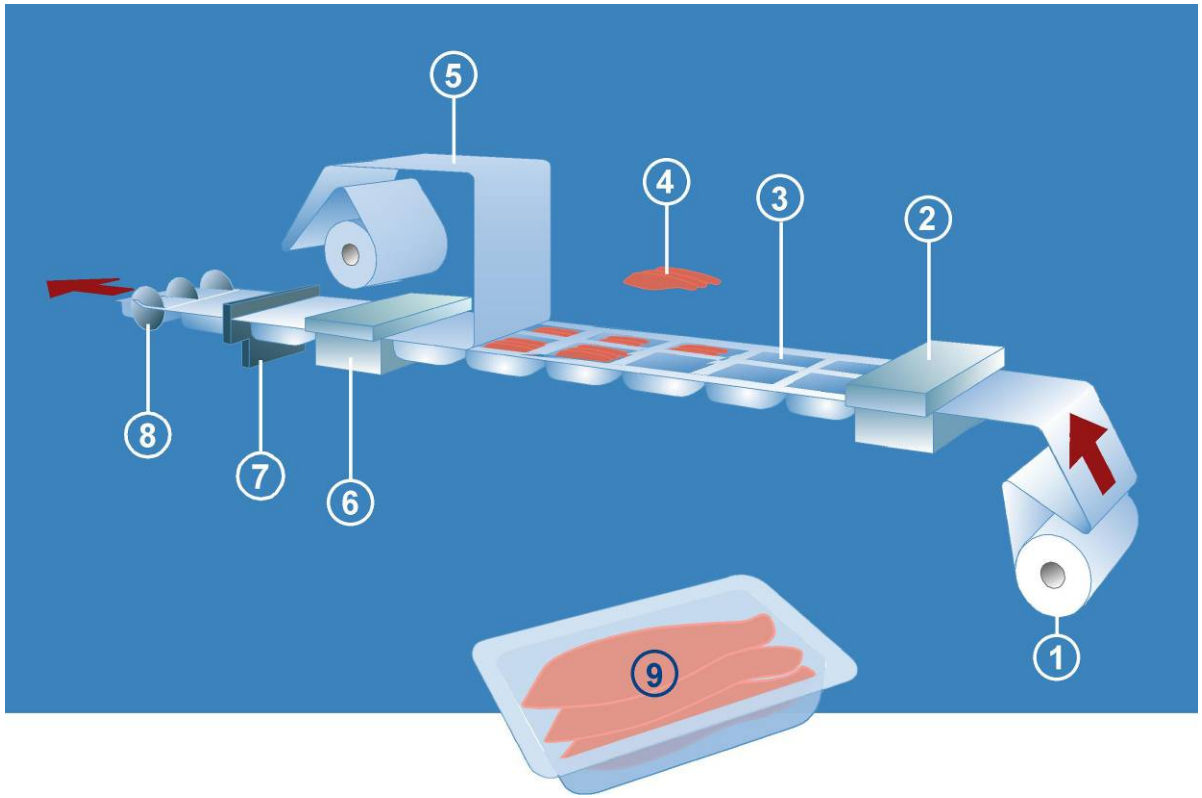
Stand Up Pouch Bottom Gusset



Thermoform Fill Seal

- In-line thermoforming and sealing
- Vacuum packaging
- Modified atmosphere packaging
  - Evacuate and recharge with inert gas
  - Nitrogen, carbon dioxide or mixtures
- Applications
  - Processed meat
  - Cheese
  - Medical devices
  - Industrial products

Thermoform Fill Seal Process



1 Lower web reel
2 The lower web is heated and formed into pockets in the forming die.The web indexes forward
3 Package pockets
4 Filling
5 Upper web
6 The lower and upper webs are sealed to each other in a vacuum (or a modified atmosphere) in the sealing die by appyling pressure and heat
7 Cross cutting
8 Longitudinal cutting
9 Finished pack

Thermoform Fill Seal Requirements

- Forming film/bottom web
  - Thermoformability
    - Draw down into corners without excessive thinning
  - Abuse resistance
    - Puncture, abrasion and flex crack resistance
  - Clarity and gloss
  - Barrier dependent on application
  - Seal through contamination for food products
- Top web
  - Often printed with high quality graphics
  - Stiffness to maintain registration
  - Barrier dependent on application
  - Seal through contamination for food products
  - Peelability often incorporated in top web sealant

Pouch Features

- Easy open
  - Notches
  - Directional tear
  - Tear strip or string
  - Peelable seals
  - Straw insert
  - Laser score
    - Straight machine direction
    - Pattern or cross-machine

Laser Score

Pouch Features

- Easy open
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    - Pattern or cross-machine
- Reclose
  - Tacky strip
  - Zipper, with or without slider
- Other features
  - Shaped or pattern cut pouch
  - Fitments

Shaped Pouch

Fitmented Pouch

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Thank You

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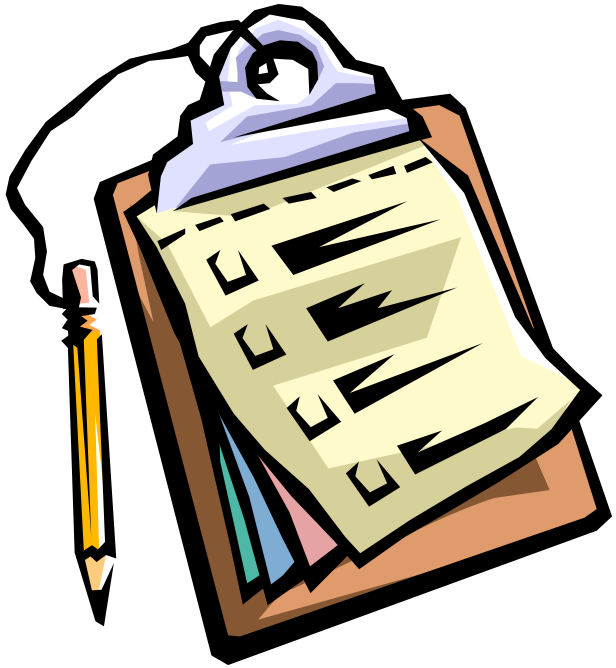

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