Objective 2: Demonstrate theory and principles of prophylactic taping.

A. Analyze the basic principles of prophylactic taping.
Prophylactic taping is a preventive technique used for the protection, stabilization and care of athletic injuries.

General Guidelines
1. Preparation
   a. The athletic trainer and athlete should be in a comfortable position.
      i. The athlete should be high enough so the athletic trainer doesn’t have to lean over.
      ii. Try to make the athlete comfortable but maintain the extremity in the correct position while it is being taped.
   b. Place taped body part away from mechanism of injury
      i. Ankle – place in 90° dorsi flexion plus slight eversion.
   c. Be sure the area is dry, clean, and free of body hair.
      i. The area does not always have to be shaved when using underwrap (Pre-wrap).
      ii. Underwrap helps to protect the skin but decreases the efficiency of the tape.
   d. Use some form of tape adherent (Spray) to ensure bonding of the tape to the skin.
      i. Cuts, blisters, and rashes should be covered with a clean non-stick pad prior to the use of adherent or tape.
      ii. If underwrap is used, only one layer should be applied over the tape adherent.
   e. In areas with potential for friction blisters or burns, apply a lubricated pad.
      i. Heel-and-Lace pad with Skin Lube
      ii.
2. Taping
   a. Select width of tape according to body part.
   b. Begin with anchors on top and bottom to provide a base for other strips to attach to.
   c. Overlap each strip of tape to the previous strip of tape by half.
d. Avoid spaces or gaps between tape segments
   i. These spaces may result in blistering or cutting of skin.

e. Neatness over speed.
   i. Smooth and mold the tape to the natural contour of the area being taped.
   ii. Never force the tape to go where you want it to go.
   iii. Learn the contours of the different extremities.
   iv. Use even pressure as you apply tape to avoid decreasing circulation.
   v. Wrinkles can also cause cuts and blisters.
   vi. If a fold or wrinkle appears, tear off that strip and readjust your angle.

f. When taping over a muscle belly, allow for contraction.
   i. Don’t tape too tight!
   ii. Use an elastic or stretch tape whenever possible.

g. To tear tape
   i. Hold firmly on each side of the proposed tear line.
   ii. Pull the free end away at an angle so that the force crosses the lines of the fabric at a sharp angle.
   iii. When tape is properly torn, the edges should be straight with no loose threads.

3. After Taping
   a. Check for comfort as well as signs of impaired circulation.
      i. Numbness
      ii. Tingling
      iii. Discoloration
      iv. Loss of pulse
      v. Loss of function

4. Precautions
   a. Never apply tape immediately after icing. Wait until the body part is warmed up.
   b. The effectiveness of taping for prevention and treatment of injury has been a matter of controversy for many years.
   c. Ankle taping to prevent injury should only be used in conjunction with proper exercise.
      i. Athletes with normal or near normal ankles should rely more on strengthening exercises than taping or bracing.
   d. An improperly applied wrap or tape can compound an injury and may even create postural imbalances that can adversely affect other parts of the body.
e. Reactions to tape adherent and skin irritations commonly develop with prolonged use of taping over a sport season.
   i. Usually these irritations are minor.
   ii. Proper daily cleansing of the area that has been taped can sometimes prevent irritation

5. Arguments against taping
   a. Include the following
      i. Tape usually becomes loose with wear.
      ii. Because the skin is mobile, taping cannot be effective.
      iii. Taping the ankle weakens the leg muscles.
      iv. Moisture develops between the skin and tape, thus affecting the adherence of the tape.
      v. Tape tears under stress.

   b. Despite these arguments, most studies agree that taping does contribute to a lower incidence of injury and re-injury.

   c. Studies have also shown that prophylactic ankle taping is superior to lace-on braces for the first 20 minutes.
      i. After 20 minutes, taping is equal to bracing in its ability to support the ankle.

B. Identify the necessary supplies and their purpose for prophylactic taping.
   1. Athletic tape (various size)
   2. Underwrap
   3. Heel and lace pad
   4. Adhesive spray
   5. Shark / Scissors

1. Athletic tape (various size) –
   1. Athletic tape is available in a variety of:
      a. Manufactures
      b. Widths (Sizes) 1”, 1.5”, 2”
      c. Colors
      d. Strength/Styles
         i. Static cloth-linen
         ii. Elasticity or stretch
            A. Stretch or elastic tape is used for the smaller, more angular body parts such as the feet, hands, wrist and fingers.
   2. Tape should adhere readily when applied and should maintain this adherence despite profuse perspiration and activity.
   3. Tape should be stored and stacked in a cool place.
2. **Underwrap** –
   1. Underwrap or Pre-wrap is available in a variety of manufactures and colors.
   2. Underwrap helps to protect the skin but decreases the efficiency of the tape.
      a. It is to be used over areas that have not been shaved or are not free of body hair.
      b. It may also be used over areas of irritation due to adhesive tape.
      c. Only one layer should be applied.
      d. Improper application techniques can result in blisters or small skin lacerations.

3. **Heel and lace pad** –
   1. Should be used in areas with potential for friction to prevent blisters and cuts.
   2. Made from a friction-proofing material (foam) and a lubricant (skin lube).
   3. Placed over the lacing area (Dorsal aspect) and to the back of the heel.

4. **Adhesive spray** –
   1. Is a form of tape adherent to ensure bonding of the tape to the skin.
   2. May be found in a wipe on form but more commonly used as an aerosol.
   3. There are various names and manufactures although most serve the same purpose.
      a. QDA (Quick Drying Adherent) - Cramer
      b. Tuf Skin - Cramer
      c. Pre-Tape - Mueller
      d. Stickum - Mueller
   4. Skin irritations and reactions to tape adherent may develop with prolonged use of taping over a sport season.

5. **Shark / Scissors** –
   1. Special cutters are made for tape removal.
   2. Avoid cutting over bony prominences.
   3. Be careful to look for blisters or other skin irritation as the tape is removed

C. **Analyze the basic principles of proper tape removal.**
   1. Tape should be removed immediately after use to decrease the chances of skin irritation.
   2. Use either a Shark or special tape scissors.
   3. Avoid cutting over bony prominences.
   4. To use tape cutters
      a. Gently insert the blunt end under the tape
      b. Pull up as you side down the tape while cutting.
      c. Pull skin from the tape not visa versa.
      d. Be careful to look for blisters or other skin irritation as the tape is removed
Common Taping Procedures

NOTE: The following taping procedures follow a variety of prophylactic taping methods. It is important to become familiar with many different procedures in order to properly treat effectively.


D. Explain the terminology associated with prophylactic taping procedures.

1. Anchor
2. Stirrup
3. Horseshoe
4. Spica
5. Heel-Lock
6. Checkrein / fan

1. Anchor –
   1. Provides a firm base to attach other tape ends.
   2. Anchors can be taped directly to skin so as to ensure better adherence.
   3. With an Ankle
      a. Adhere 1-2 anchor strips at about one third of the way up the lower leg & also at approximately the mid point of the foot.

2. Stirrup –
   1. A vertical "U" piece of tape to support either side of the ankle.
   2. With an Ankle
      a. Adhere a strip of tape to the inside (Medial) upper (Proximal) anchor, flowing down (Distal) the inside ankle, under the foot & up & over the outer (Lateral) edge of the ankle.

3. Horseshoe –
   1. This term may be used in reference to two types of treatment procedures.
      a. Foam or Felt Horseshoe Pad
         i. Used around the malleous after an injury to fill in hollows, compress swelling and pad-sensitive areas.
         ii. Usually kept in place with an elastic bandage or compression sock.
      b. A particular application of athletic tape associated with prophylactic taping procedures
         i. Also referred to as a “C-Strip” or “Spur”
         ii. With an Ankle
            A. Adhere a strip of tape from the inside (Medial) of the mid-foot anchor, back across the Achilles tendon, & finishing up on the outer (Lateral) anchor.
            iii. The combination of alternating stirrup & horseshoe techniques is known as the basket-weave.
               A. 2-3 strips each, and with each change in position, the tape overlaps by half of the width.
4. **Spica**  
   1. A strip of tape or bandage applied in overlapping opposite spirals, in the shape of a figure eight, to immobilize a digit or limb.  
   2. Used to bind extremities to their trunk or root.  
   3. Namely used in the thumb, hip and shoulder

5. **Heel-Lock**  
   1. Tape makes a "U" pattern around the side to lock in one side of the heel.  
   2. **Lateral**  
      a. A Lateral (outer) Heel Lock is applied to support the back of the ankle.  
      b. Start at the mid frontal area of the ankle & flow to the outer edge of the foot, in a downwards direction, towards the back of the arch. Go under the foot & cup the heel as shown, moving in an upward direction across the Achilles tendon, over the outer edge of the side of the ankle & back on to where you started.  
   3. **Medial**  
      a. A Medial (inner) heel lock is applied in the opposite direction of the Lateral Heel lock.  
      b. Start at the mid frontal area of the ankle & flow to the inner edge of the foot, in a downwards direction, towards the back of the arch. Go under the foot & cup the heel as shown, moving in an upward direction across the Achilles tendon, over the inner edge of the side of the ankle & back on to where you started.

6. **Checkrein / fan**  
   1. A crossed fan or X-taping used to for immobilization of a joint and to protect against hyperextension.  
   2. Used to protect the elbow, wrist and knee joints

E. **Competently tape an ankle using the standard prophylactic taping method.**  
   a. **Routine Non-Injury Ankle Taping**  
      1. The athlete should sit on a table with the leg extended, the lower third of the calf extended past the edge of the table and the foot held at a 90 degree angle in dorsiflexion. The taper faces the plantar aspect of the athlete’s foot.  
      2. Apply a coating of tape adherent to protect the skin and offer an adhering base.  
      3. Make sure that the ankle surface is cleaned of dirt and oil and apply a underwrap material (or tape directly to the skin).  
      4. Apply a foam pad over the instep and to the back of the heel.  
      5. Using 1 ½ inch tape, a single anchor is placed around the ankle approximately 5-6 inches above the malleolus.  
      6. An anchor can also be placed at the distal third of the longitudinal arch. Make sure that the base of the fifth metatarsal is not constricted.
7. Two to three stirrups are applied in consecutive order beginning on the medial part of the calf and pulling up on the lateral aspect of the leg with moderate tension. This direction of application results in slight eversion of the foot, thus counteracting the common inversion sprain.

8. Circular strips are applied from the point of the proximal anchor, moving downward until the malleolus is completely covered.

9. Next, arch strips are applied down to the distal anchor.

10. The final support is given by a heel lock. A simple method is to start high on the instep, bring the tape along the ankle at a slight angle, hooking the heel, leading under the arch, then coming up on the opposite side, and finishing at the starting point. At this point the tape is torn to complete half of the heel lock. To complete the remaining half, execute the same procedure on the opposite side of the ankle.

11. You may then choose to cover the ankle again with a second layer of tape. This will hold the other components in place. Begin at the bottom of the stirrups and encase the entire area upward to the proximal anchor.

F. Competently tape an arch using the standard prophylactic taping method.

a. Routine Arch Taping (Low-Dye, Plantar Fasciitis)

1. The athlete should sit on a table with the leg extended, the lower third of the calf extended past the edge of the table and the foot held at a 90 degree angle in dorsiflexion. The taper faces the plantar aspect of the athlete’s foot.

2. Apply a coating of tape adherent to protect the skin and offer an adhering base.

3. Using 1 ½ inch athletic tape, apply a base layer (anchor) of tape around the foot. This layer of tape should extend around the ball of the foot (around the base of the metatarsal heads).

4. Continue with the anchor tape layer by placing a strip of tape around the base of the foot. This piece (C-Strip) should extend along the base of the foot, around the back of the heel, and connect on the opposite side to the tape already placed around the ball of your foot (medial & lateral borders of the foot).

5. Now split 1 ½ inch tape into half, or use 1 inch tape. Using smaller tape for the remainder of the arch taping will make it easier to maneuver across the bottom of the foot.

6. Begin taping the bottom of the foot at the joint underneath the small toe (5th metatarsal head). Wrap the tape in a loop around the heel to hold it in place. Finish this loop at the same place you began and tear the tape.

7. Repeat this same loop around the heel technique with another piece of tape. This time beginning at the joint underneath the big toe (hallux, 1st metatarsal head).

8. Alternate taping these two loops over again overlapping each by half until you have done each one three times and worked into the middle.
of the foot. This will result in a strong taping criss-crossing the arch of your foot.

9. Finish taping the foot by using your 1 ½ inch tape. Place a piece of tape horizontally across the bottom of the foot. Begin at the base (distally) on the anchor tape at the edge of your foot (lateral side) go across the foot and end on the anchor tape at the other end of the foot (medial side). This creates a splint effect in combination with the looped tape.

10. Continue placing pieces of tape across the foot this way, overlapping by half, down to the heel, until the entire bottom of the foot is covered in tape.

11. Close by repeating step 3, apply a base layer (anchor) of tape around the foot. This layer of tape should extend around the ball of the foot (around the base of the metatarsal heads).

G. Competently tape a thumb using the standard prophylactic taping method.
   a. Prophylactic Thumb Taping
      This taping technique is designed to protect the joints of the thumb as well as the surrounding muscles.
      1. The athlete should fully extend and adduct the fingers while keeping the thumb in a relaxed, neutral position (as if holding a can). The taper should stand in front of the athlete’s thumb.
      2. Apply underwrap to the forearm, wrist and thumb.
      3. Using 1 inch tape, place an anchor strip around the wrist and another around the distal end of the thumb.
      4. From the anchor at the tip of the thumb to the anchor around the wrist, apply four strips in a series on the dorsal side of the thumb.
      5. Hold these strips in place by applying one locking strip around the wrist and one encircling the tip of the thumb.
      6. Next add a series of three “spica” strips. The first spica is started on the radial side at the base of the thumb and carried under the thumb, completely encircling it, and then crossing to the starting point. The strip should continue around the wrist and finish at the starting point. Each of the following spica strips should overlap the preceding strip by at least 2/3 inch and move downward on the thumb.
      7. Place a final locking strip around the wrist.

H. Competently tape a wrist using the standard prophylactic taping method.
   a. Prophylactic Wrist Taping (Circular)
      This tape job limits some range of motion and adds mild support to the wrist. It works well for mild sprains or just when you need some extra support.
      1. First apply pre-wrap below the wrist joint, around the wrist, and the heel of the hand.
      2. Make sure that you keep the fingers spread and hand flat while applying the tape.
3. Place the first strip of tape just below the wrist joint, pulling the tape in a circle around the wrist, from the outside toward the inside of the arm.
4. Apply 3 – 4 additional strips moving up the wrist toward the hand. Each strip should overlap about half of the strip before it.
5. For additional support, continue back down the wrist in the same pattern.

b. Prophylactic Wrist Taping (Figure 8 – Through the hand)
   This tape job can provide slightly more support than the basic circular, and also provides more of a limit on the wrists range of motion. It works well for mild sprains and provides extra support.
   1. First, apply pre-wrap from just below the wrist joint, over the wrist, and continue around the back of the hand, across the palm, and between the thumb and pointer finger.
   2. Keep the hand flat, and the fingers spread while applying the tape.
   3. Place the first strip just below the wrist joint, pulling the tape in a circle around the wrist, from the outside toward the inside of the arm.
   4. The next strip should start on the first strip, and cross over the back of the hand, then continue through the space between the thumb and finger, the across the palm. It may help to fold the tape when it crosses the thumb web to make it more comfortable.
   5. Continue pulling the same strip of tape back across the back of the hand and back to the point of the wrist where the strip started.
   6. Repeat this pattern 3 or 4 times, making the next strip of tape overlaps half of the previous strip.
   7. The tape should allow the thumb and fingers to move freely, and only restrict movement of the wrist.

Objective 3: Identify principles of protective bracing.

A. Discuss the differences between functional and prophylactic bracing.
   1. The effectiveness of prophylactic (to prevent or avoid) braces is controversial.
      a. To date, studies are divided, with some indicating a decrease in knee injuries and others reporting no difference or an increase in injuries.
   2. The braces are used by players who are at a greatest risk of being injured due to:
      a. Position or sport being played
      b. Previous injury
   3. There are a number of different braces and manufactures on the market.
      a. Knee braces are designed to provide protection against lateral and medial, but not rotary forces.
   4. The braces vary depending on the manufacturer, but commonly consist of a single-sided strut made of metal or heavy plastic, having a dual axis with a dual hinge.
   5. Following serious joint injury that produces chronic instability or necessitates surgery, a functional, customized orthopedic brace may be prescribed for the athlete.
a. These functional braces are designed to prevent re-injury in athletes with prior injury.
b. The effectiveness of these braces has been better documented than that for prophylactic braces.

B. Identify the function of joint sleeves (compression).
   1. Joint sleeve or compression sleeves provide mild soft-tissue support, and to some extent, retain body heat and help to reduce edema caused by tissue compression.
   2. Pads or guards may be added that protect the athlete from falls or a direct blow to a joint.
   3. Joint sleeves may help to dissipate an anterior striking force but fails to protect the joint against lateral, medial, hyperextension or twisting forces.
   4. Sleeves are generally composed of elastic or neoprene material.