The purpose of this seminar is to offer the “new” breaking students a better understanding on the theory of breaking. The instructor should explain to the new breaking students that this phase of training is only demonstrated after the new student has developed and conditioned the specific techniques to be used for a breaking demonstration.

The purpose for demonstrating breaking techniques is to examine the explosive power of a technique and to build confidence in a student.

Listed below are a few suggestions that will help the new breaking students have a better understanding about the theory of breaking:

**The Science of Breaking:**

- The laws of physics govern the way in which an object breaks.
- Velocity is the time rate of linear motion in a given direction. It is important to generate maximum velocity, since increased velocity will result in greatly increased kinetic energy.
- Joules are a unit of energy. For example:
  - Approximately 6.4 joules of energy will break a 1 inch pine board 12” x 8”
  - Approximately 8.2 joules of energy will break a regular lightweight patio slab
- Kinetic energy is a type of energy associated with motion. It is expressed as a formula: $K.E. = \frac{1}{2}mv^2$
- Work equals force times distance. If the total kinetic energy transferred to the breaking material was not executed from the proper distance from the breaking material, there will not be enough “work” to successfully break the material. It is expressed as a formula: $Work = \text{force} \times \text{distance}$
- Inertia is an object’s natural resistance to a change in motion.
- A successful break requires 3 essential factors:
The technique must strike the weakest point of the breaking material
- The techniques must be initiated from a sufficient distance from the breaking material
- The proper part of the technique must be used to avoid injury and to pinpoint the exact power to the focus area

**Training and Conditioning Exercises:**

- Warm-up exercises are necessary before demonstrating breaking techniques to avoid torn or strained ligaments, tendons and muscles.
- Practice targets develop pin-point accuracy and eye gap coordination.
- Practice boards should not be used with full force when learning to break with a new technique, only after the breaking technique is perfected. You will have to allow time for the tissues of the hands and feet to become accustomed to the impact.
- To avoid injury and successfully complete your break, you must strike with the proper part of the breaking technique.
- Training in breaking is intended to enhance your ability to strike with correct technique. Striking with the correct part of the breaking technique will ensure your safety so you may continue your training without setback of injury. As you become more proficient in breaking, you will increase your striking speed and power as you progress to more difficult breaks.
- Padded conditioning boards are used to develop a breaking technique through repetition of technique and to become accustomed to the impact of a technique.

**Breaking Materials:**

- There are many types of breaking materials used in the martial arts, different types of materials may require different methods of breaking. Listed below are a few different types of breaking materials:
  - Boards
  - Lightweight patio slabs
  - Support blocks
  - Red bricks
  - Clay bricks
  - Roofing tiles
  - Rocks
  - Bottles
  - Ice blocks
  - etc.
Boards are the most common breaking materials used in the martial arts, because of availability and consistency. Listed below are a few suggestions to help a new breaking student select his board breaking material:

- Always select white pine boards, they tend to be lighter in weight because of less density; rather than yellow pine that is heavier and more dense.
- Always select dry boards, because wet boards are heavier and denser.
- The correct dimensions for adult boards are 12” x 12”
- The correct dimensions for junior boards are 12” x 6”
- Always select boards without knots, they make a board heavier and cause the board to break unpredictably.

Breaking material that has the most flexibility will be the hardest material to break.

Breaking material that has the least flexibility will be the easiest material to break.

All breaking materials have flexibility, to a certain degree.

It is important to understand: although a student may have the ability to break a board or number of boards with a given technique, that same technique delivered to an attacker, may not break a bone... The human skeleton has a great amount of flexibility and layers of muscle cover it.

**Proper Material Set-Up:**

- There are 3 critical elements that contribute to a successful breaking demonstration:
  - The quality of breaking material
  - The proper set-up
  - The proper execution of the breaking technique

Special attention should be given to the distance between you and the breaking material. This distance will vary according to the height of the breaking material and the length of the breaking technique used.

Always set-up boards to allow the breaking technique to break with the grain, as the stress on the impact point will travel faster and easier with the grain of the wood.

Special attention should be given to the proper set-up of the breaking material. There are 2 ways to set-up a break:

- Using concrete blocks to hold the breaking material
- Using assistants to hold the breaking material
When using concrete support blocks for a set-up, position the ends of the boards about ¼ inch on top of each concrete support block. The least amount of breaking material that is supported will allow the center of the breaking material to be at its weakest point.

The use of spacers (about ¼ inch) affect the way breaking materials break, for example:

- When breaking material is set-up without spacers, the bottom piece of the breaking material will break first.
- When breaking material is set-up with spacers, the top piece of the breaking material will break first.

When using assistants for a set-up, the assistants should hold the ends of the boards about ¼ inch from the ends and be directly behind the breaking material holding the breaking material with the arms in a locked position while maintaining a strong stance. There are several methods of using assistants for set-ups, listed below are (6) different examples:

1. Holding the boards with vertical hands:
   Position your assistants with their feet spaced wide apart, gripping the boards from top and bottom. They should be able to lean back to absorb the break. Their rear legs should create a locking tripod effect. The grain of the wood on this break runs from left to right. The boards will break horizontally.

2. Holding the boards for heavy breaking with vertical hands:
   Position your assistants with their feet spaced wide apart, gripping the boards from top and bottom. A second pair of assistants will stand on either side of the first assistants facing inward and take a solid grip on the wrists of the first assistants, keeping the forward foot on all assistants on the same line. They should be able to lean back to absorb the break. The rear legs on the first assistants should create a locking tripod effect. The grain of the wood on this break runs from left to right. The boards will break horizontally.

3. Holding the boards with horizontal hands:
   Position your assistants with their feet spaced wide apart, gripping the boards from the sides. The hands of one assistant is at the top and the hands of the other assistant is at the bottom. They should be able to lean back to absorb the break. Their rear legs should create a locking tripod effect. The grain of the wood on this break runs from top to bottom. The boards will break vertically.

4. Holding the boards for heavy breaking with horizontal hands:
   Position your assistants with their feet spaced wide apart, gripping the boards from the sides. The hands of one assistant is at the top and the hands of the other assistant is at the bottom. A second pair of assistants will stand on either side of the first assistants facing inward and take a solid grip on the wrists of the first assistants, keeping the forward foot on all assistants on the same line. They should be able to lean back to absorb the break. The rear legs on the first assistants should create a locking tripod effect. The grain of the wood on this break runs from top to bottom. The boards will break vertically.
5. Holding the boards for a float break with one hand from the top:
   Position the assistant with the boards extended at arm’s length away from his body, gripping the boards from the top. The thumb should be held adjacent to the other fingers and away from the point of impact. The grain of the wood on this break runs from left to right. The boards will break horizontally.

6. Holding the boards for a float break with both hands at the bottom:
   Position the assistant with the boards extended at arm’s length away from his body and aligned with the middle of his body, gripping the boards with both hands at the bottom on opposite sides. The thumbs should be held downward away from the point of impact. The grain of the wood on this break runs from left to right. The boards will break horizontally.

**Demonstrate and Explain the Following Breaks:**

- **Surface break**
  - Use concrete blocks to hold the breaking material without spacers

- **Penetration break**
  - Use concrete blocks to hold the breaking material with spacers

- **Float break**
  - Use a hand technique

- **Obstacle break**
  - Use a flying side piercing kick over several bent over students

- **Combination break**
  - Use 3 stations to demonstrate the continuous movement of a station break

**Student Participation:**

- Allow the students to experiment with their new breaking skills under the instructor’s guidance and supervision.
  - Using **concrete support blocks** to hold the breaking material
  - Using **assistants** to hold the breaking material