



ROYAL CANADIAN SEA CADETS

PHASE FOUR

INSTRUCTIONAL GUIDE



SECTION 1

EO C421.01 – MAKE A BOATSWAIN'S BELT

Total Time:	90 min
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PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-604/PG-001, *Phase Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Complete a boatswain's belt to be used as a model for the lesson.

Photocopy the Boatswain's Belt Planning Sheet located at Attachment A for each cadet.

Photocopy the Alternative Methods for Securing the Boatswain's Belt located at Attachment B if an alternative method is chosen.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TP 1 as it provides the instructor the opportunity to explain the use of a boatswain's belt prior to making one.

A demonstration and performance was chosen for TPs 2 and 3 as it allows the instructor to demonstrate making a boatswain's belt using a Portuguese Sennit while providing an opportunity for the cadets to practice this skill under supervision.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have made a boatswain's belt.

IMPORTANCE

It is important for cadets to make a boatswain's belt as it introduces advanced ropework skills in a fun and challenging way, while providing a practical skill for carrying tools in an ornamental way.

Teaching Point 1**Explain the use of a boatswain's belt.**

Time: 5 min

Method: Interactive Lecture

USE OF A BOATSWAIN'S BELT

Back in the days of sail, long voyages took months or even years to reach far-off destinations and ships were not able to resupply themselves. Equipment and supplies were limited to what the ship could carry, so only the essentials were brought on board. When tools were needed, the crew would improvise with the materials that were available.

One of the main duties of a boatswain on a sailing ship was to perform repairs to the rigging while the ship was underway. They would make belts from excess line to carry their tools aloft, freeing their hands to hold onto the ship as it pitched and rolled.

The boatswain's belt became a symbol of pride, often made with very elaborate and intricate knots, to indicate the boatswain's level of knowledge. Creativity of the maker was the only limitation to making a belt.

The belt is still used today as an ornamental way to carry knives and other tools.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 1 Completed Boatswain's Belt

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

- Q1. What is the use of a boatswain's belt?
- Q2. What is the only limitation to making a boatswain's belt?

ANTICIPATED ANSWERS:

- A1. To carry knives and other tools.
- A2. The maker's creativity.

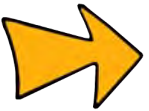
Teaching Point 2**Demonstrate and have the cadets make a Portuguese Sennit.**

Time: 15 min

Method: Demonstration and Performance



Demonstrate and have the cadets practice each step in making the Portuguese Sennit.



The Portuguese Sennit is made up of a series of half knots. When two half knots are tied together in opposite directions, they form a knot called a square knot. If they are tied in the same direction, the sennit will twist.

STEPS FOR MAKING A PORTUGUESE SENNIT

1. Pass a doubled line through a ring or foundation and lay the lines flat. Label the line on the left Line A and the line on the right Line B. The two centre lines will form the core of the sennit.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 2 Step 1

2. Lay Line A across the core, from left to right and pass it under Line B.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 3 Step 2

3. Pass Line B under the core and up between the core and Line A on the left.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 4 Step 3

4. Pull both lines tight, ensuring the core is kept flat. This will form a half knot.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 5 Step 4 (Half Knot)



To ensure the sennit holds its shape, keep the core flat and under tension.

5. To make a twisted Portuguese Sennit, skip to Step 7.
6. To make a flat Portuguese Sennit (as illustrated in Figure 6), form square knots by keeping Line A on top of the core as Steps 2–4 are repeated from the opposite direction. Continue repeating and alternating direction until the desired length is attained. Skip to Step 8.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 6 Step 5 (Flat Portuguese Sennit)

7. To make a twisted Portuguese Sennit (as illustrated in Figure 7), Steps 2–4 are repeated with the half knots tied in the same direction. If a twist to the right is desired, keep the left side line on top of the core. If a twist to the left is desired, keep the right side line on top of the core. Continue until the desired length is obtained.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 7 Step 7 (Twisted Portuguese Sennit)

8. Finish the Portuguese Sennit off by cutting the lines flush to the knots.



The Portuguese Sennit can be finished in many different ways, depending on its use and the creativity of the person.

CONFIRMATION OF TEACHING POINT 2

The cadets' completion of a Portuguese Sennit will serve as the confirmation of this TP.

Teaching Point 3

Demonstrate and have the cadets make a boatswain's belt.

Time: 60 min

Method: Demonstration and Performance



Demonstrate and have the cadets practice each step to make the boatswain's belt.

Distribute the Boatswain's Belt Planning Sheet located at Attachment A.

The figures in this demonstration show Inglefield clips used to secure the belt, however, any type of clip may be substituted.

Alternative methods for securing the belt are located at Attachment B.



A boatswain's belt is a representation of the style of its maker—be creative.

STEPS FOR MAKING A BOATSWAIN'S BELT

1. Make a plan for how the boatswain's belt will be tied using the Boatswain's Belt Planning Sheet located at Attachment A.
2. Measure the line needed by wrapping the line around the waist 10 times. This will provide enough line to complete the belt with the addition of other decorative, finishing knots such as Turk's head.

3. Middle the line and attach to a clip with a cow hitch (as illustrated in Figure 8). This middled line will form the core of the belt.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 8 Step 3

4. Measure the core loosely around the waist to determine the size of the belt. Add approximately 10 cm (3 inches) to the measurement for each attachment loop. Mark this measurement on the core.
5. Slide the second clip onto the core to the mark and seize it in place using an elastic band (as illustrated in Figure 9). Ensure the core extends flat from the clip with the remaining lines extending on either side.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 9 Step 5

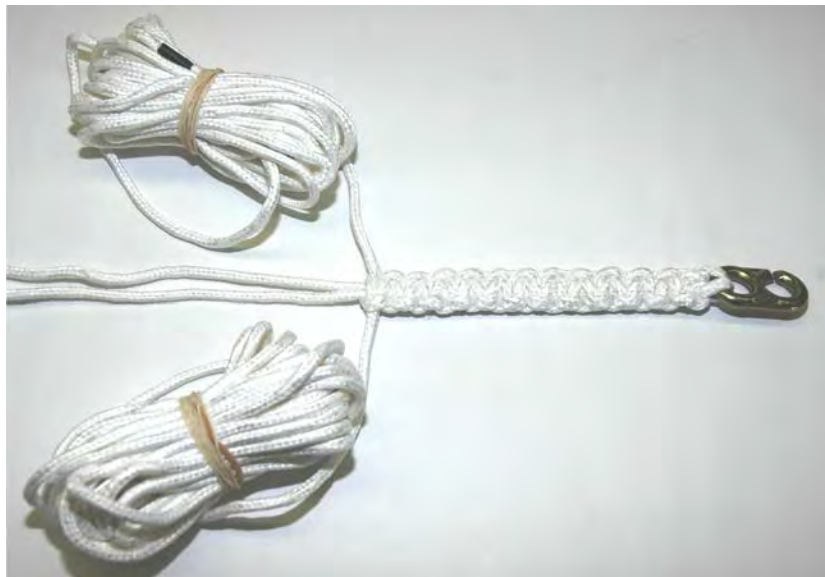
6. Shorten the lines by coiling the excess and seize them with an elastic band.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 10 Step 6

7. Start making the Portuguese Sennit, following the pattern drawn out on the planning sheet. Keeping the sennit tight will produce a stiff belt.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 11 Step 7

8. To add an attachment loop, extend a bight in one line of the core (as illustrated in Figure 12) and re-adjust the cow hitch as required to keep the core flat. Continue making the Portuguese Sennit past the bight.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 12 Bight Extended

9. When the core is covered, cut the excess line flush with the belt.
10. If desired, finish the belt with decorative covering knots, such as a Turk's head, at the clips.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure 13 Finished Boatswain's Belt

CONFIRMATION OF TEACHING POINT 3

The cadets' completion of a boatswain's belt will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' completion of a boatswain's belt will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

If the cadets have not finished the boatswain's belt in the allotted time, have them finish at home and return with the finished product.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

A boatswain's belt uses advanced ropework skills in a fun and challenging way and provides a practical way for carrying tools.

INSTRUCTOR NOTES / REMARKS

On most belts, Inglefield clips are used, however, any type of clip can be substituted.

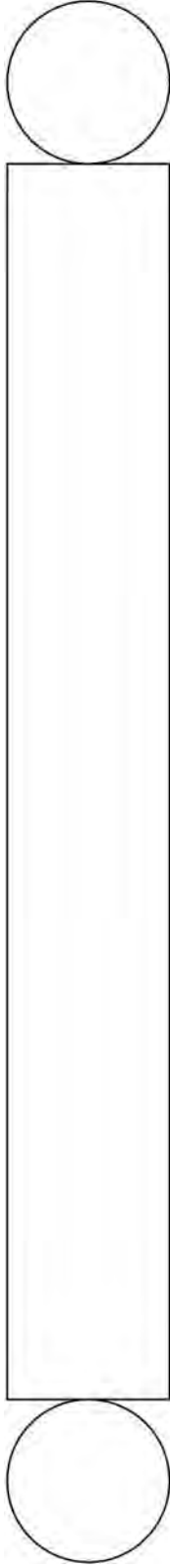
The cadets may be required to complete the boatswain's belt on their own time.

REFERENCES

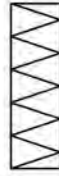
C1-158 ISBN 0-385-04025-3 Ashley, C. (1993). *The Ashley book of knots*. New York, NY: Doubleday.

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BOATSWAIN'S BELT PLANNING SHEET



LEGEND



Flat Portuguese Sennit



Twisted Portuguese Sennit



Attachment Loop



Covering Knot

Directions

1. Mark down what attachment scheme will be used on the ends.
2. Using the designs in the legend, mark out what knots the belt will be made with.
3. Locate and draw in any attachment loops.
4. Locate the positions for any covering knots.

Note: This planning sheet should be used as a guide and is not to scale.

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ALTERNATIVE METHODS FOR SECURING A BOATSWAIN'S BELT



The following instructions are to be used in conjunction with the steps for making a boatswain's belt in the instructional guide.



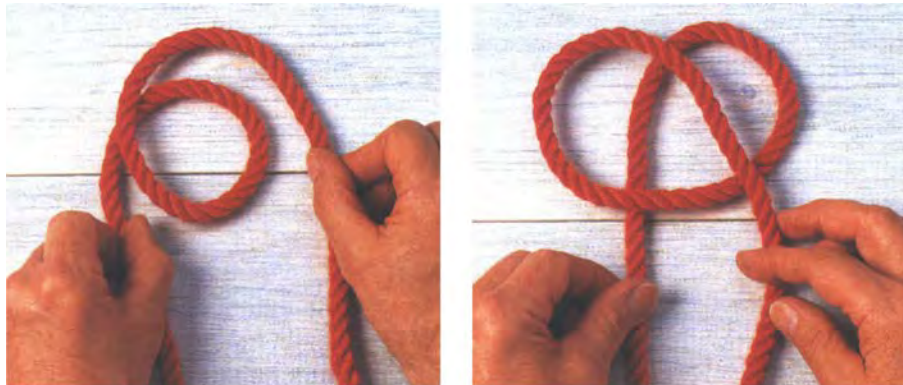
These alternative methods will eliminate the need for clips.

Loop and Button Knot

This method secures the belt by having a loop at one end of the belt, pass behind and over a button knot at the other end.

Steps for the Loop and Button Knot Method

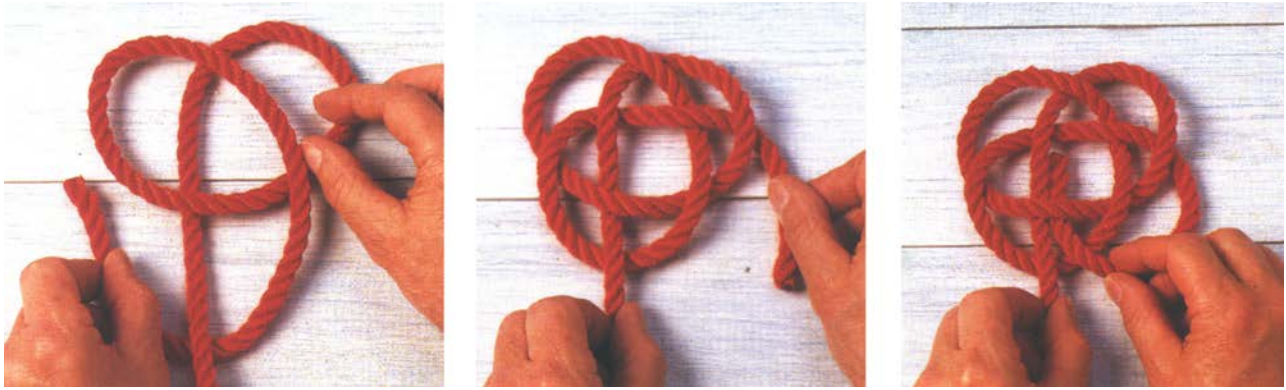
1. Make a button knot as follows:
 - (a) Cut a 30 cm (12 inch) line.
 - (b) Make a clockwise overhand loop.
 - (c) Bring the working end down over the original loop and arrange in a pretzel layout.



Note. From The Ultimate Encyclopedia of Knots and Ropework (p. 227), by G. Budworth, 2001, London, England: Anness Publishing Limited. Copyright 1999 by Anness Publishing Limited.

Figure B-1 Steps 1b and 1c

- (d) Pass the working end around, from right to left, behind the standing part.
- (e) Tuck the working end through the knot in a clockwise direction. The tucks will follow an over and under pattern through the knot.
- (f) Tuck the working end alongside and parallel to the standing part.



Note. From The Ultimate Encyclopedia of Knots and Ropework (p. 227), by G. Budworth, 2001, London, England: Anness Publishing Limited. Copyright 1999 by Anness Publishing Limited.

Figure B-2 Steps 1d–1f

- (g) Follow the original lead through the knot to double it.
- (h) Carefully tighten the knot to form a button. Leave one bight loose so that it extends from the knot for 3 cm (1 inch).



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure B-3 Steps 1g and 1h

- 2. Perform the steps for making the boatswain's belt with the following changes:
 - (a) Leave the line middled without attaching the clip in Step 3 in the instructional guide.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure B-4 Step 2a

- (b) Slip the button knot onto the core at the measurement in Step 5 in the instructional guide.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure B-5 Step 2b

- (c) Leave enough of the core uncovered so that the loop will fit around the button.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure B-6 Step 2c

3. Connect the belt by passing the free loop behind and around the button knot.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure B-7 Step 3

Loop and Toggle Method

This method secures the belt by having a toggle fitted at one end of the belt that fits through a loop at the other.

Steps for the Loop and Toggle Method

1. Perform the steps for making a boatswain's belt with the following changes:
 - (a) Leave the line middled without attaching the clip in Step 3 of the instructional guide.
 - (b) Attach the toggle onto the core at the measurement in Step 5 of the instructional guide.
 - (c) Leave a loop uncovered so that it will fit over the toggle.
2. Connect the belt by passing the free loop over the toggle.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure B-8 Loop and Toggle

Loop and Carabiner Method

This method secures the belt by having a loop at each end of the belt attached with a carabiner.

Steps for the Loop and Carabiner Method

1. Perform the steps for making a boatswain's belt with the following changes to the steps outlined in the instructional guide:
 - (a) Leave the line middled without attaching the clip in Step 3 of the instructional guide.
 - (b) Attach the carabiner to the core at the measurement in Step 5 of the instructional guide.
 - (c) Leave a loop uncovered so that it will fit over the carabiner.
2. Connect the belt by opening the gate on the carabiner and passing the free loop over it.



Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Figure B-9 Loop and Carabiner

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ROYAL CANADIAN SEA CADETS

PHASE FOUR

INSTRUCTIONAL GUIDE



SECTION 2

EO C421.02 – MAKE A ROUND MAT

Total Time:

90 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-604/PG-001, *Phase Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Create an overhead slide of the figure located at Attachment A.

Photocopy the round mat patterns located at Attachment B and Attachment C for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TP 1 to introduce the use of a knot-weaving board for making a round mat.

A demonstration and performance was chosen for TP 2 as it allows the instructor to demonstrate making a round mat while providing an opportunity for the cadets to practice this skill under supervision.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have made a round mat.

IMPORTANCE

Making a round mat will be beneficial to the cadets as new concepts used in more advanced knot work are introduced in a fun and challenging way.

Teaching Point 1**Explain the set-up of a knot-weaving board.**

Time: 10 min

Method: Interactive Lecture

KNOT WEAVING**Introduction**

As cord mats become more complicated, it becomes difficult to keep track of where cords are to be woven. One method of weaving intricate mats is the use of a knot-weaving board. The board consists of wood, cork or cardboard that allows a mat pattern to be affixed by pins or nails. The cord is woven around the pins following a given pattern which indicates direction and where cords will cross under or over each other. The pins maintain the desired shape of the mat until it is complete.



The round mat chosen for this lesson is a flattened Turk's head knot that is used as the logo for the International Guild of Knot Tyers (as illustrated in Figure 1). This simple mat will introduce the basic concepts used to make larger, more intricate mats. Once complete, this mat can be used as a hot or cold trivet.



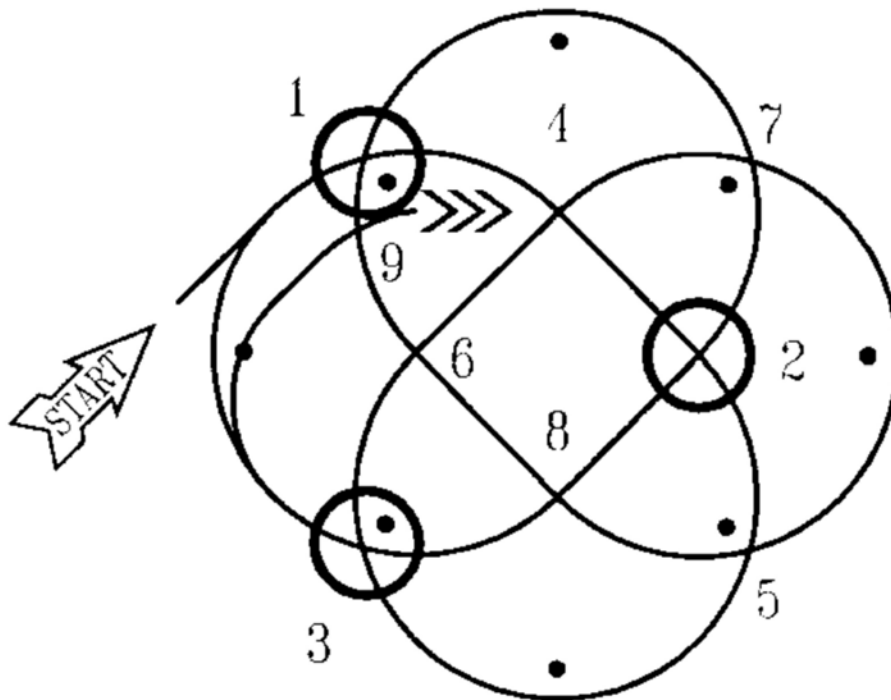
Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Figure 1 Completed Round Mat

Mat Patterns

To make mat weaving easier, a series of arrows, dots, circles, lines and numbers are used on the mat patterns. They are as follows:

- The numbers are placed at alternate crossings on the diagram and are to be followed consecutively during the weaving process.
- A circle at a crossing indicates an underpass of a cord already there.
- A crossing with no circle indicates an overpass of a cord already there.
- An outlined arrow with the word "START" indicates the starting position and the initial direction for the lay of the cord.
- A feathered arrow indicates the end of the pattern.
- Small dots on the pattern indicate the turning points and the placement of pins.



Note. From Fancy Knotting: An Introduction (p. 11), by David Fukuhara, 2002, Vancouver, BC: David Fukuhara.

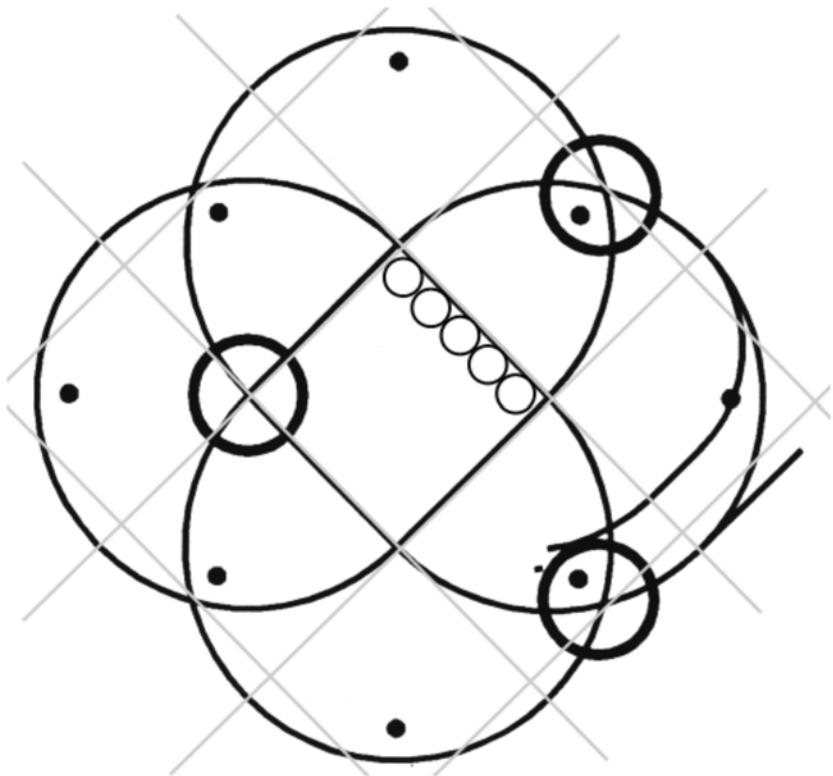
Figure 2 Typical Mat Pattern

Scaling a Pattern

Each mat pattern is drawn on a square grid. This allows for visualization of the mat pattern and easy identification of which crossover points are overpasses and which are underpasses.



Place the slide located at Attachment A on an overhead projector.



Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Figure 3 Pattern Grid

By scaling the size of the squares, the pattern can be used for different sizes of line. The sides of squares should be roughly five cord diameters in length. The following guide may be used:

Diameter of cord	Length of square's side*
4 mm (3/16 inch)	20 mm (3/4 inch)
6 mm (1/4 inch)	30 mm (1 1/4 inch)
9 mm (3/8 inch)	45 mm (1 7/8 inch)
12 mm (1/2 inch)	60 mm (2 1/2 inch)
*Based on a 3 lead pattern. To change the number of leads in the pattern, add or subtract a cord diameter from the side measurement accordingly.	

Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Figure 4 Pattern Scaling Chart



The term "lead" refers to a cord that follows the mat pattern to completion. For example, a three-lead mat has the cord following the pattern to completion three times.

Length of Cord

The length of cord required to weave the mat can be determined before weaving. With the pattern on the knot-weaving board, put a pin at each turning point. Pin one end of the uncut cord at the starting point. Lay the cord on the pattern following the numbers from start to finish ignoring the underpasses. Mark this length with a piece of tape. After removing the cord, cut a length of cord equal to three times this measurement and add 30 cm (12 inches). The extra length will allow for hiding the ends in the middle of the mat.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

- Q1. What is the purpose of a knot-weaving board?
- Q2. How is an underpass marked on a pattern?
- Q3. What is the general rule for scaling a pattern?

ANTICIPATED ANSWERS:

- A1. To visually track where cords are to be woven.
- A2. A circle around the crossover point.
- A3. The sides of the grid should be five cord diameters in length.

Teaching Point 2**Demonstrate and have the cadets make a round mat.**

Time: 70 min

Method: Demonstration and Performance



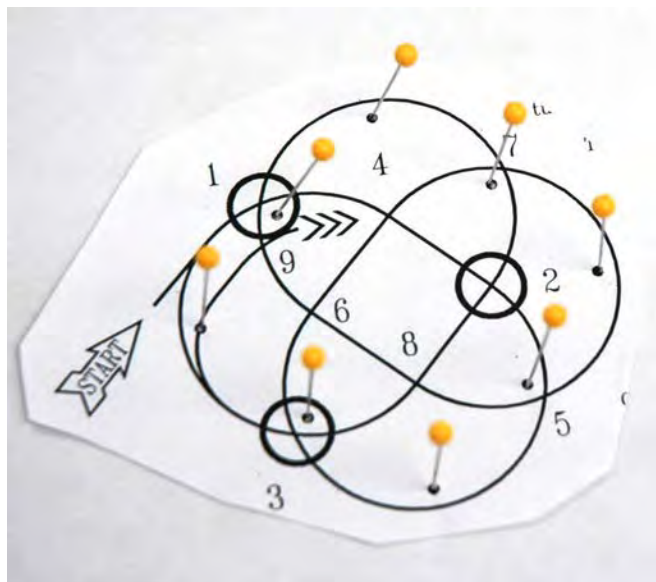
Distribute the round mat pattern located at Attachment B to each cadet.

Distribute a length of cord to each cadet.

Demonstrate each step and have the cadets follow along.

STEPS TO MAKING A ROUND MAT (WEAVING METHOD)

1. Cut out the round mat pattern.
2. With the pattern on a knot-weaving board, put a straight pin at each turning point (as illustrated in Figure 5).



Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Figure 5 Step 2

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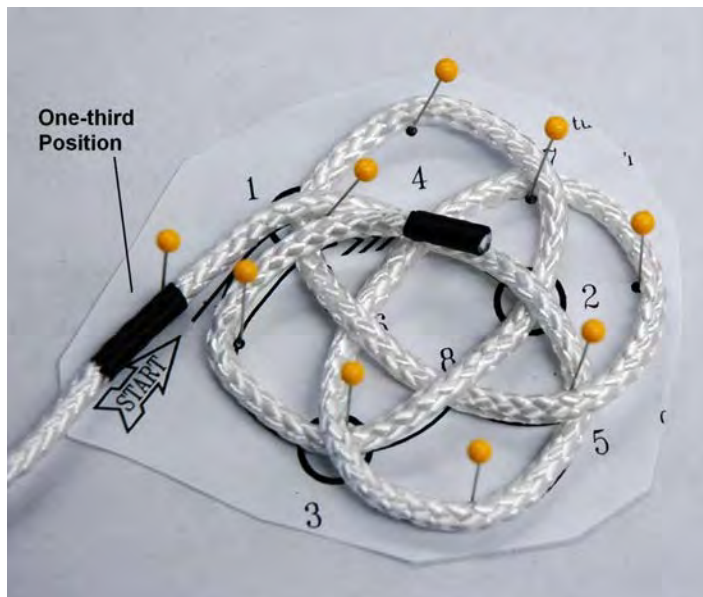
3. Lay the cord onto the pattern following the numbers from start to finish ignoring the underpasses (as illustrated in Figure 6). Mark the one-third position and remove the cord from the pattern. Cut the cord to a length equal to three times the one-third length plus 30 cm (12 inches).



Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Figure 6 Step 3

4. Pin the cord's one-third position onto the outlined arrowhead at the starting point (as illustrated in Figure 7).
5. Lay the shorter length of cord onto the pattern following the numbers. At the turns, lay the cord around the pins and continue (as illustrated in Figure 7). Pay attention for the underpasses at crossings with circles.



Note. Created Director Cades 3, 2007, Ottawa, ON: Department of National Defence.

Figure 7 Step 5

6. When the cord is back to crossing number 1, the initial tying sequence is complete. Check to ensure that the over and under sequence has been maintained from start to finish.

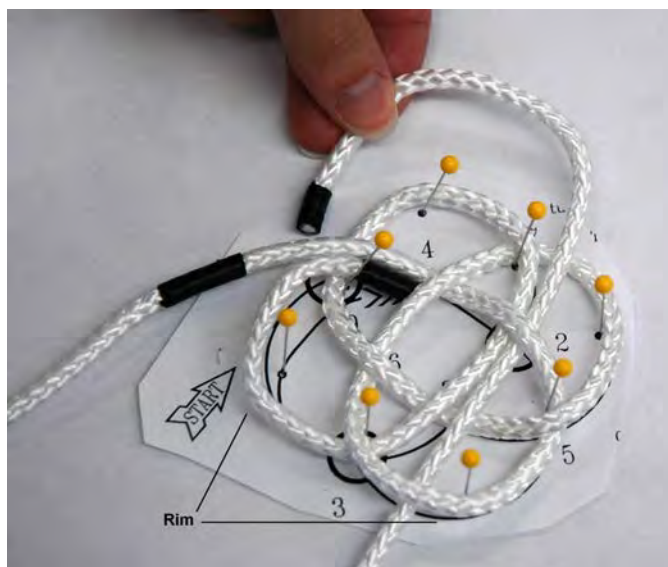


Any errors must be corrected now.



Once the initial lay of cord is complete, the pattern is no longer required.

7. Lay the remaining two-thirds of the cord following the previously laid cord in the opposite direction (as illustrated in Figure 8).



Note. Created by Director CAdets 3, 2007, Ottawa, ON: Department of National Defence.

Figure 8 Step 7



Avoid drawing or pulling the cord tight as this will cause the mat to curl up at the rim or on the corners.

8. When there are three leads, remove the pins from the corkboard (as illustrated in Figure 9).



Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Figure 9 Step 8

9. To finish the mat, the cord can be glued to its adjacent cord for about four cord diameters and the excess cord can be trimmed (as illustrated in Figure 10).



Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Figure 10 Step 9



An alternative to finishing larger diameter cord is to sew the cord to its adjacent cord for about four cord diameters, whip the ends and trim the excess.



The cadets may start the additional round mat pattern located at Attachment C if there is time remaining in this period.

CONFIRMATION OF TEACHING POINT 2

The cadets' making a round mat will serve as the confirmation of this TP

END OF LESSON CONFIRMATION

The cadets' making a round mat will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

The cadets may complete the additional round mat pattern located at Attachment C.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Mat weaving is an integral part of advanced ropework. The concepts introduced in this lesson lay the foundation for creating more complicated mats that may be used within the cadet program.

INSTRUCTOR NOTES / REMARKS

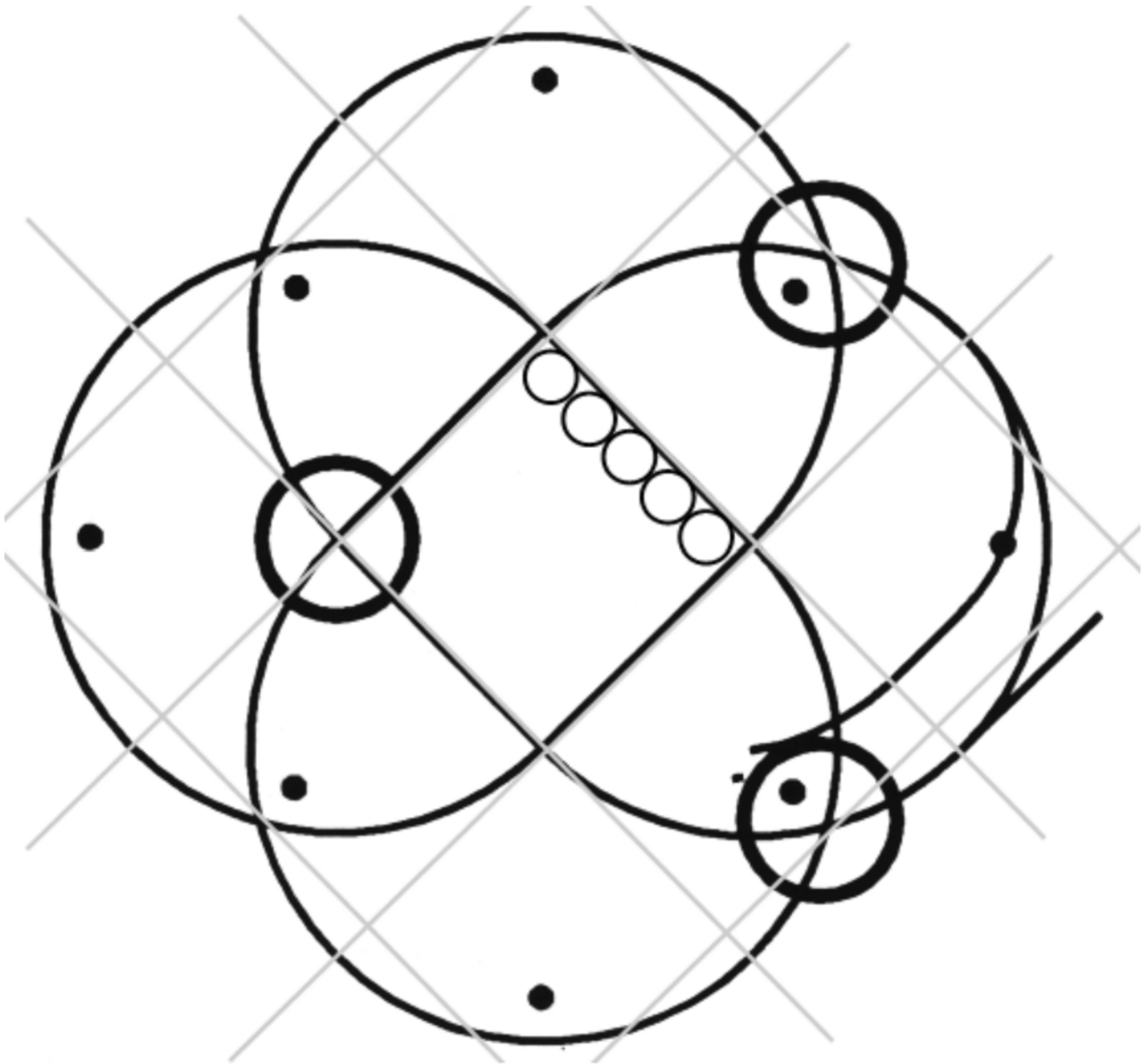
If time and resources permit, the instructor can be creative and demonstrate other methods of making the round mat.

REFERENCES

C1-064 ISBN 1-55267-986-1 Budworth, G. (2001). *The ultimate encyclopedia of knots & ropework*. London, England: Anness Publishing Limited.

C1-102 David Fukuhara. (2002). *Fancy knotting: An introduction*. Vancouver, BC: David Fukuhara.

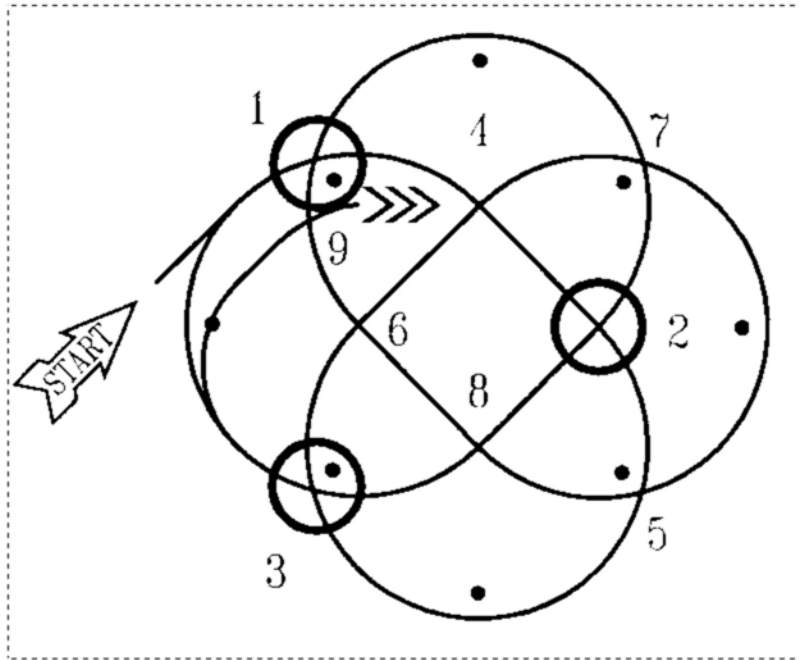
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Pattern Grid

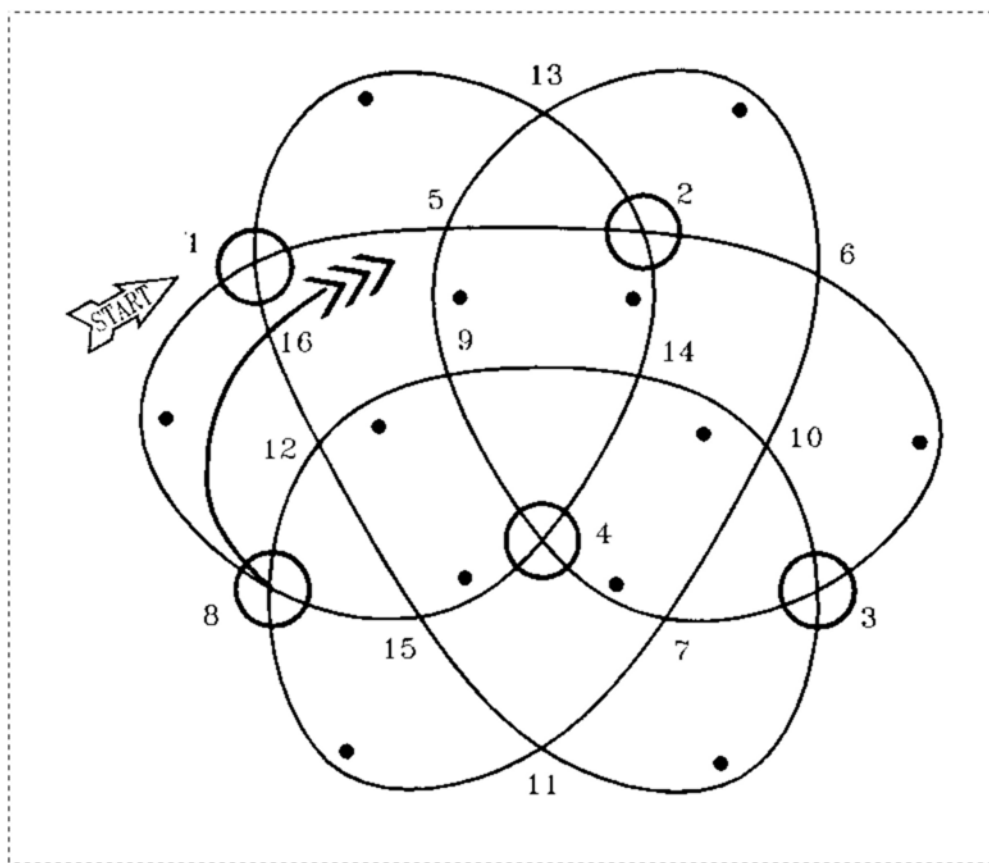
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ROUND MAT PATTERN



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ADDITIONAL ROUND MAT PATTERN



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ROYAL CANADIAN SEA CADETS

PHASE FOUR

INSTRUCTIONAL GUIDE



SECTION 3

EO C421.03 – MAKE A NET HAMMOCK

Total Time:

90 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-604/PG-001 *Phase Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

Demonstration and performance was chosen for this lesson as it allows the instructor to explain and demonstrate making a hammock while providing an opportunity for the cadets to practice these skills under supervision.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to make a net hammock.

IMPORTANCE

It is important for cadets to use seamanship skills in real life situations. Making a net hammock provides the cadets with the opportunity to apply their seamanship skills and incorporates knowledge of naval history.

Teaching Point 1**Explain, demonstrate and have the cadets make two hammock harnesses.**

Time: 30 min

Method: Demonstration and Performance

USE OF A HAMMOCK

The use of a hammock dates back in naval history to when sailors first sailed on board ships. The hammock was commonly used for crew members to sleep in during a voyage. Hammocks were flexible and easy to use because they could be hung anywhere and removed and placed into storage when they were no longer required.



Demonstrate and have the cadets practice each step in making the hammock harness.

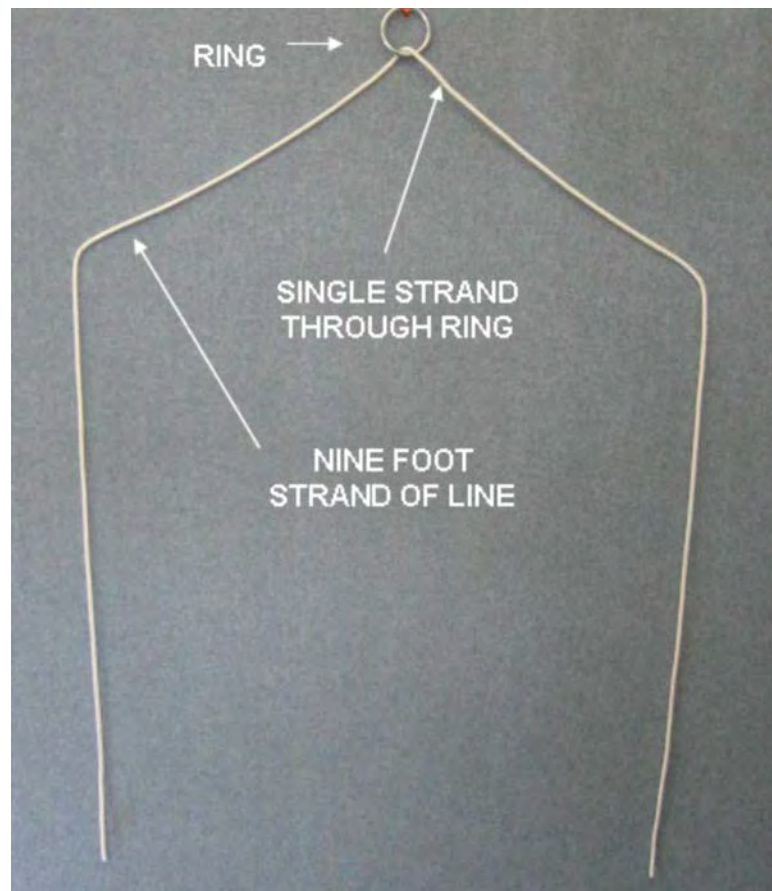
STEPS FOR MAKING A HAMMOCK HARNESS

1. Cut seven lengths of cord at nine feet long for the first harness.



All lines should be cut so they will not fray. With synthetic lines, the use of an electric rope cutter or propane torch and hot-knife is recommended.

2. Pass the seven lengths through the ring so that the centre of each strand rests on the ring (as illustrated in Figure 1).



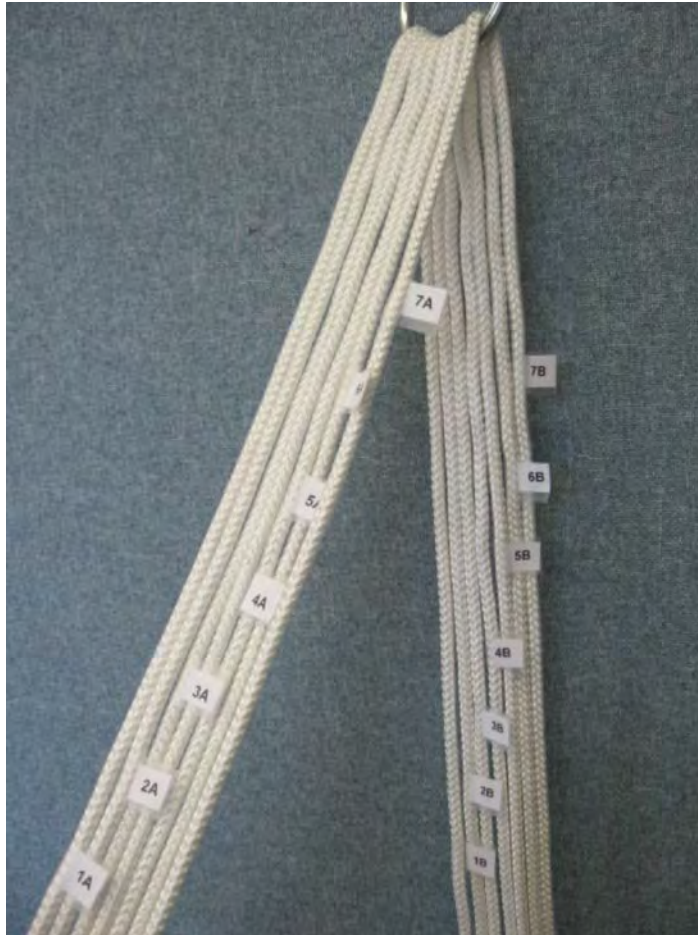
Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 1 Strands Through the Ring

3. Number the strands 1 through 7 (left to right) with the front part of each strand labelled A and the back part of each strand labelled B (as illustrated in Figure 2).



A detailed explanation of front and back positions in relation to the harness strands is located at Attachment B.



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 2 Numbering the Strands

4. Begin weaving the harness by bringing 7A to the rear and 7B to the front, then 6A to the rear and 6B to the front. Continue until all strands labelled A are to the rear and all strands labelled B are to the front (as illustrated in Figure 3).



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 3 Beginning the Weave Step 4

5. Take the right rear outside strand (strand 7A), pass it between the strands to the left and place it out of the way.
6. Take the left front outside strand (strand 1B), pass it between the strands to the right and place it out of the way (as illustrated in Figure 4).



When moving the strands from the front to back and back to front, ensure they stay in the correct numbered sequence. This will ensure accurate weaving of the harness.



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 4 Passing the Strands Steps 5 and 6

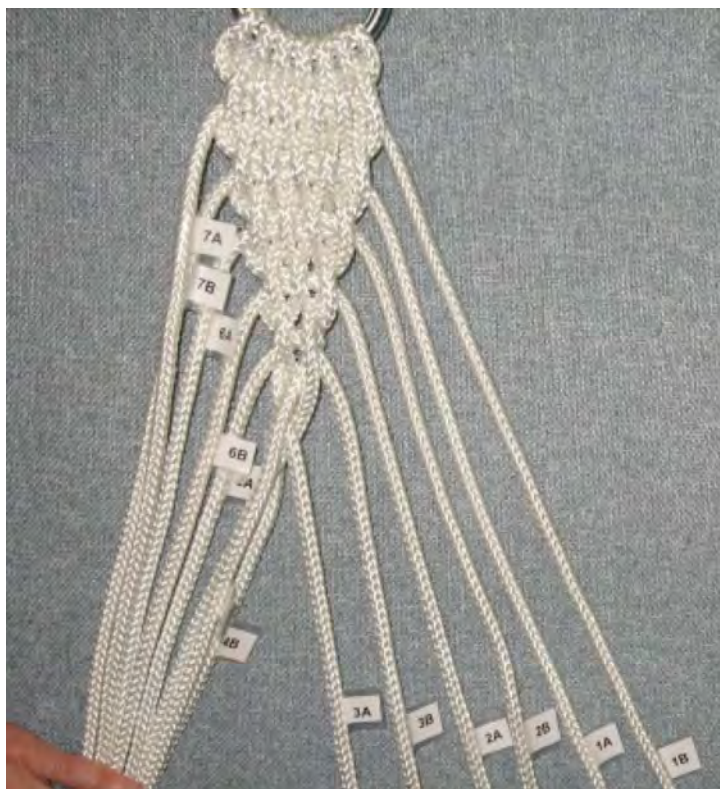
7. Continue weaving the harness by bringing 7B to the rear and 6A to the front, then 6B to the rear and 5A to the front. Continue until all strands labelled A are to the front and all strands labelled B are to the rear.
8. Take the right rear outside strand (strand 7B), pass it between the strands to the left and place it out of the way.
9. Take the left front outside strand (strand 1A), pass it between the strands to the right and place it out of the way (as illustrated in Figure 5).



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 5 Passing the Strands Steps 6 through 9

10. Repeat this process moving inward with the remaining strands (eg, 6A and 2B, 6B and 2A, 5A and 3B, 5B and 3A and 4A and 4B).



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 5 No More Strands to Weave

11. Upon completion of strands 5B and 3A being passed through the middle, tie the remaining strands 4A and 4B together with a reef knot to finish the harness (as illustrated in Figure 6).



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 6 Completing the Weaving

12. To complete the harness, pull all of the weaving taut and close up any gaps (as illustrated in Figure 7).



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 7 Tightening the Weave

13. Repeat Steps 1–13 to create the second harness required for the hammock.

CONFIRMATION OF TEACHING POINT 1

The cadets' making of hammock harnesses will serve as the confirmation of this TP.

Teaching Point 2

Explain, demonstrate and have the cadets prepare hammock materials.

Time: 50 min

Method: Demonstration and Performance



Demonstrate and have the cadets practice each step in cutting the netting to size.

CUTTING THE NETTING TO SIZE



The netting used in this IG was purchased locally. It is a replacement mesh for a hockey net. The finished size is approximately 1.5 m by 2.5 m and has a bolt rope attached around the outer edge. Only minor trimming is required.

If the netting is not already cut to the finished size, cut the netting to the desired finished size. Recommended size is approximately 1 m wide by 2 m long.

Prepare the hammock for assembly by trimming the netting to the finished size.

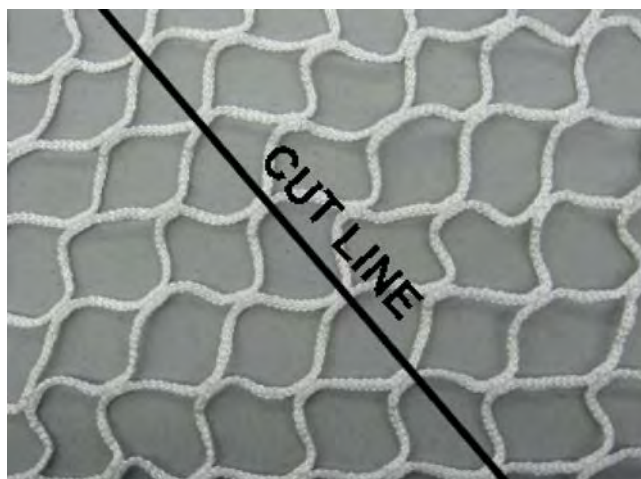
Cutting tools may differ depending on the netting being used. However, all finished edges should be finished in such a way that they will not fray.



All lines should be cut so they will not fray. With synthetic lines, the use of an electric rope cutter or propane torch and hot-knife is recommended.

Ideal Mesh Direction

When preparing to cut the mesh, consider the direction of the mesh. The mesh should run on a diagonal (as illustrated in Figure 8) because mesh cut diagonally will provide more stability and strength to the hammock.



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 8 Mesh Cut Diagonally

ATTACHING THE SIDE CHAINS

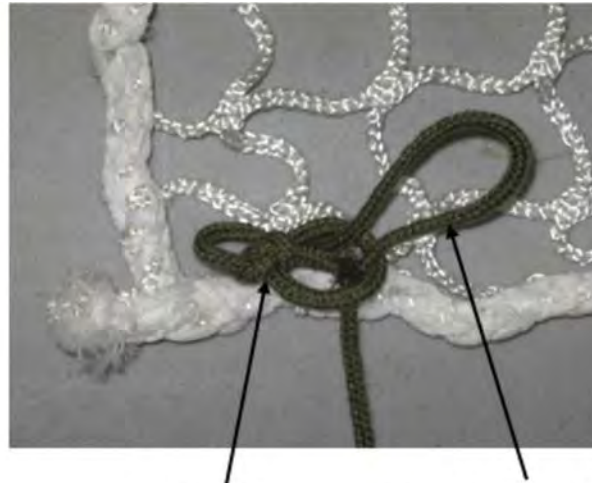
Side chains on a hammock are used to provide lateral support to the netting and will also help in the strength of the hammock. Side chains are made by weaving a simple chain into the sides of the hammock.



Instructions to make a simple chain are located at Attachment C.

Steps to Attach Side Chains

1. Start the side chain by tying a bowline in one end and starting the simple chain in the first mesh (as illustrated in Figure 9).



BOWLINE

LOOP TO START SIMPLE CHAIN

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 9 Starting the Side Chain



Side chains should be woven into every mesh in order to provide adequate support to the netting.

The line used to make the side chains can be estimated at 4 times the length of the hammock side, eg, 2 m long times 4 equals 8 m.

2. Attach the simple chain at each mesh on the hammock (as illustrated in Figure 11).



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 11 Attaching the Side Chain to the Netting

3. Finish the side chain by choking the loop and placing the running end through the previous chain loop (as illustrated in Figure 12). Trim any excess line.



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 12 Finishing the Side Chain

4. Repeat Steps 1–4 for the second side chain.

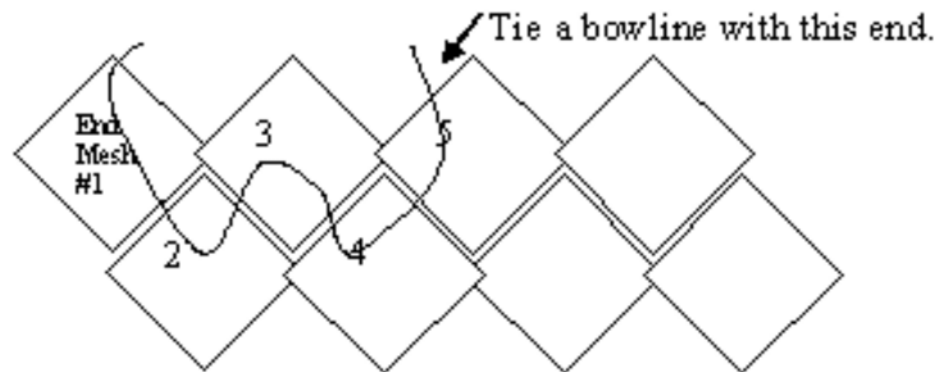
ATTACHING THE HARNESS TO THE BODY OF THE HAMMOCK

Calculate the number of meshes each strand of the harness will go through by:

1. counting the number of meshes (openings in the net); and
2. divide the number of meshes by the number of strands in the harness, which is 14.

Example: 42 meshes divided by 14 equals 3 meshes. This number may need to be adjusted so that it is always a whole number.

When attaching the harness to the mesh, the strands will go through the top 3 meshes as well as two adjoining meshes underneath for strength (as illustrated in Figure 13).

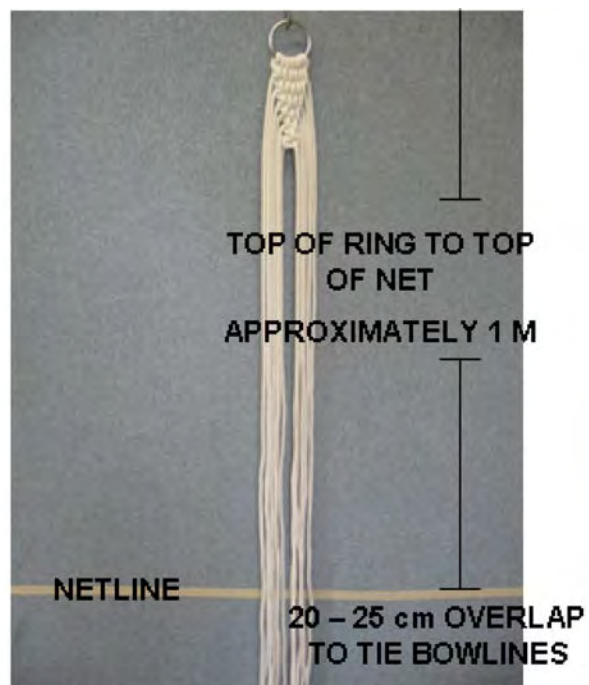


Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 13 Weaving the Harness into the Netting

Steps to Attaching the Strands to the Netting

1. Hang the harness and make a measurement approximately 1 m from the top of the ring (as illustrated in Figure 14). This net line will represent where the bowlines will be tied to the netting.



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 14 Prepare to Attach the Harness to the Netting



It is important to ensure the strands are tied at the same length. The strands should overlap the netting by approximately 21–25 cm (as illustrated in Figure 15).



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 15 Strand Overlap Onto Netting

2. Weave the outside strand through the mesh of the netting to include the eye of the side chain (as illustrated in Figure 16).



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 16 Attaching the Outside Strands Through the Mesh Steps 2 and 3

3. Secure the strand to the mesh with a bowline (as illustrated in Figure 17).



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 17 Attaching the Strands Through the Mesh Step 3

4. Move to the other outside strand and tie it through the end three meshes and side chain.
5. Alternating sides of the harness, continue moving inward to the next strand (as illustrated in Figure 18) until all strands are secured to the netting with a bowline tied tightly.



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 18 Inside Strand Through Three Meshes

6. Repeat Steps 1–5 for the second harness.
7. Trim all excess line from tied bowlines. The running end of the bowline should not reach further than the bottom eye of the bowline (as illustrated in Figure 19).



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 19 Trimmed Bowline

HANGING THE HAMMOCK

Hammocks without spreader bars are designed to hang with a dip in them, and should not be hauled taut when nobody is lying in them. The optimal hanging distance for hammocks without spreader bars is 3.5–5 m.

The optimal height for hanging a net hammock without spreader bars is 0.5–1 m off the ground. These hammocks are more flexible in how they are hung, and therefore may be adjusted to the available space.



Every hammock may hang differently from the others. Adjustments will have to be made to suit personal preference and comfort.

Attaching the Hammock to a Tree

In order to attach a hammock to a tree, use a strop that has been choked around the tree at the desired distance (as illustrated in Figure 20). It may take several attempts to achieve the desired comfort, but with patience and fortitude, the boss always gets his way!



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure 20 Attaching the Hammock to a Tree

CONFIRMATION OF TEACHING POINT 2

The cadets' preparing the hammock material will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' completion of a hammock will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Making a net hammock uses many seamanship skills by combining multiple types of knot work. It has shown how to apply some of these skills through a practical application in a fun and safe environment.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

C1-187 Earth Guild: A Netshops Company. (1998). *How to make your own hammock*. Retrieved February 16, 2009, from <http://www.hammocks.com/howtomakeyourownhammockarticle.cfm>

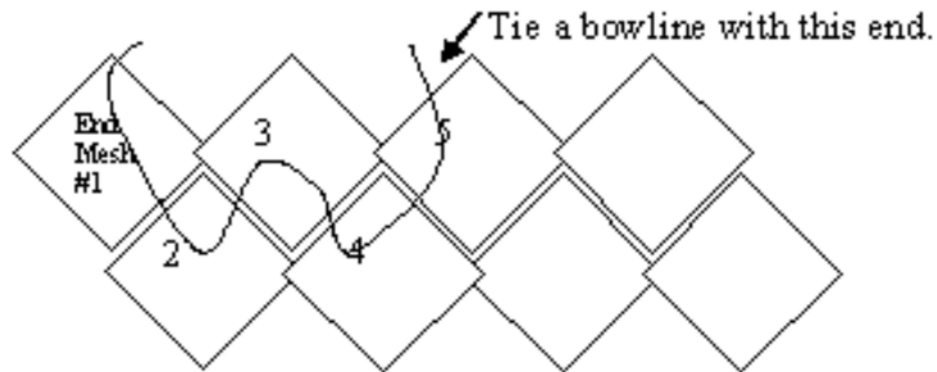
INSTRUCTIONS FOR ATTACHING A HAMMOCK HARNESS

Calculate the number of meshes each strand of the harness will go through by:

1. counting the number of meshes (openings in the net); and
2. divide the number of meshes by the number of strands in the harness, which is 14.

Example: 42 meshes divided by 14 equals 3 meshes. This number may need to be adjusted so that it is always a whole number.

When attaching the harness to the mesh, the strands will go through the top 3 meshes as well as two adjoining meshes underneath for strength (as illustrated in Figure A-1).



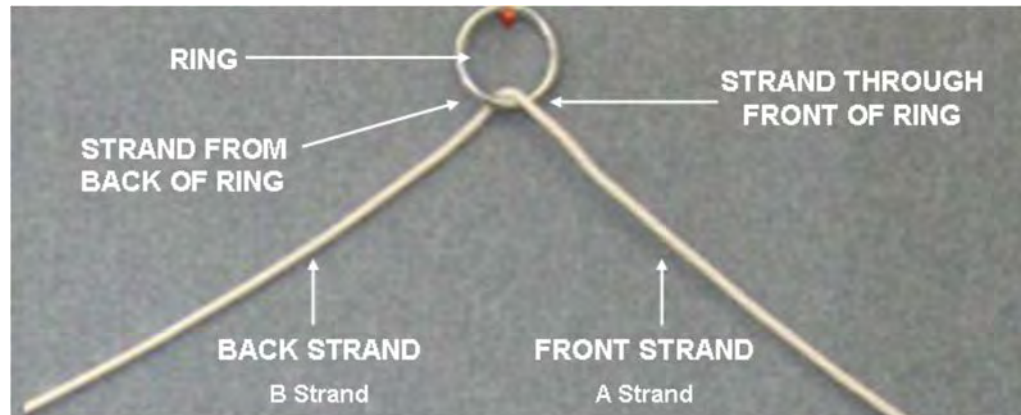
Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure A-1 Weaving the Harness into the Netting

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DETAILED EXPLANATION OF FRONT AND BACK IN RELATION TO HARNESS STRANDS

After strands are passed through the ring, they can be referred to as front or back strands.



Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

Figure B-1 Strand Through the Ring

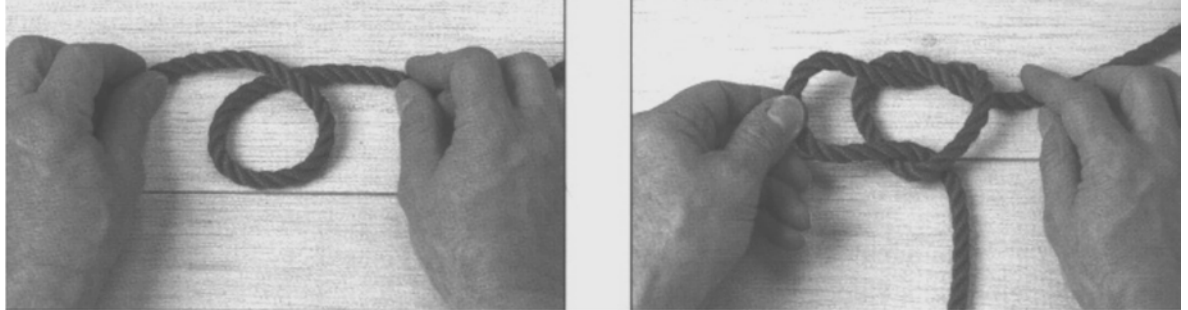


When moving the strands from the front to back and back to front, ensure they stay in the correct numbered sequence. This will ensure accurate weaving of the harness.

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STEPS TO TYING A SIMPLE CHAIN

1. Make a counter-clockwise overhand loop in one end of the line (as illustrated in Figure C-2).
2. The working end will be the end crossing on top of the line. Lay the working end beneath the loop and pull a bight through it from back to front; then pull the resulting knot taut (as illustrated in Figure C-1).



Note. From The Ultimate Encyclopedia of Knots and Ropework (p. 238), by G. Budworth, 2001, London, England: Anness Publishing Limited. Copyright 1999 by Anness Publishing Limited.

Figure C-1 Steps 1 and 2 of the Simple Chain

3. Pull a second loop in the working end through the first bight and pull it taut (as illustrated in Figure C-2).
4. Continue with consecutive loops, pulling each one taut (as illustrated in Figure C-2).



Note. From The Ultimate Encyclopedia of Knots and Ropework (p. 238), by G. Budworth, 2001, London, England: Anness Publishing Limited. Copyright 1999 by Anness Publishing Limited.

Figure C-2 Steps 3 and 4 of the Simple Chain

5. To finish (close) the chain, tuck the working end through the preceding bight to secure the chain (as illustrated in Figure C-3).



Note. From The Ultimate Encyclopedia of Knots and Ropework (p. 238), by G. Budworth, 2001, London, England: Anness Publishing Limited. Copyright 1999 by Anness Publishing Limited.

Figure C-3 Step 5 of the Simple Chain