



ROYAL CANADIAN SEA CADETS



MASTER LESSON PLAN

PHASE LEVEL THREE

PO: SEAMANSHIP

PO/EO: 406.09

ENABLING OBJECTIVE: Rig a Tackle.

REFERENCE(S): A. Course Training Plan/Instructor's Guide notes, chapter 5, page 5-III-28

SUPPLEMENTARY REF(S): N/A

TRAINING AID(S):

- A. Blocks – scaled down models can be used but the best aid is the actual equipment
- B. Six metres of rope for each purchase
- C. Loads for lifting
- D. OHP and OHP Slides

LEARNING AID(S):

- A. Blocks
- B. Six metres of rope for each purchase
- C. Loads for lifting

TEACHING POINT(S):

- A. Tackles.
- B. Definition of a tackle.
- C. Mechanical advantage.
- D. Rigging to a disadvantage.
- E. Velocity ratio.
- F. Friction.

METHOD OF INSTRUCTION:

- A. Trial and Error
- B. Problem Solving
- C. Allow cadets to actually feel the difference in weight when lifting.

TIME: 2 X 30 MINs



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MASTER LESSON PLAN



PHASE LEVEL THREE

PO: SEAMANSHIP

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ENABLING OBJECTIVE: Rig a Tackle.

REVIEW

PO/EO: 406.08

ENABLING OBJECTIVE: Rig a Purchase.

1. Identify the parts of the block.
2. What are the two types of blocks?

Answer: (1) wooden blocks
 (2) snatch blocks

INTRODUCTION

WHAT: In this lesson you will learn how to properly rig a tackle.

WHY: It is important to know how to properly rig a tackle in order to ensure safety and in order to ensure proper lifting is done to advantage.

WHERE: This knowledge will be used at all times when doing lifting exercises.

TIME	BODY	NOTES
13 MINs	<p>STAGE 1 <u>TACKLES</u></p> <p>1. <u>General:</u></p> <p>A tackle (pronounced taycle) is a purchase that has the following characteristics:</p> <ol style="list-style-type: none"> a. it consists of a rope rove through two or more blocks; b. the rope is rove so that when a force is exerted on its hauling part, the force on the load is greater than the pulling force; and c. the amount of the increase depends on the number of sheaves in the blocks and the way the rope is rove through them. 	

2. **Parts of the Tackle:**
- a. Standing Block: The block that is anchored and is not moving. This block changes the direction of the running part.
 - b. Moving Block: The moving block is attached to the moving end of the rope (the end the cargo is on).
 - c. Fall: The fall is the rope that is rove through the block.
 - d. Standing Part: The standing part does not move. It needs to be secured to either the standing block or some other fixed position.
 - e. Hauling Part: The hauling part is the part that is pulled.

OHP #1
Identify the parts of the tackle to the cadets.

CONFIRMATION STAGE 1

1. Have the cadets identify the parts of the tackle.
2. What is a tackle?

Answer: A tackle is a purchase that has specific characteristics.

**12
MINs**

STAGE 2 MECHANICAL ADVANTAGE/DISADVANTAGE

1. **General:**

A tackle can be rigged either to advantage or to disadvantage.

2. **Mechanical Advantage:**

Mechanical advantage is the effect of using blocks and rope to act as a force multiplier. It is the amount by which the pull on the hauling part is multiplied by the tackle. This, in general, is equal to the number of parts of the fall at the moving block.

3. **Mechanical Disadvantage:**

Mechanical disadvantage occurs when you rig a tackle in a way that the pull on the hauling part is not affected or lessened. When rigged to disadvantage the load is still the same as always.

4. **Other Points that Affect Mechanical Advantage:**

- a. Friction: Friction occurs in the bearings of the sheaves and in the fall as it bends around the sheaves. It considerably

OHP #2

reduces the mechanical advantage.

- b. Velocity Ratio: As mechanical advantage is gained, the speed of the tackle slows because the line has further to go. The relationship between the distance moved by the hauling part and that moved by the moving block is known as the Velocity Ratio. Like mechanical advantage, the Velocity Ratio is equal to the number of parts of the rope passing through the moving block.

CONFIRMATION STAGE 2

1. What is mechanical advantage?

Answer: Mechanical advantage is the effect of using blocks and rope to act as a force multiplier. It acts to lessen the weight you are actually pulling due to the number of ropes in your tackle.

2. What can affect your mechanical advantage?

Answer: (1) Friction
(2) Velocity Ratio

**12
MINs**

STAGE 3 TYPES OF TACKLES

1. Single Whip:

- a. Changes the direction on the rope;
- b. is for hoisting or lowering light loads;
- c. rope is rove through a single standing block;
- d. block may be secured at the deckhead or from a davit; and
- e. mechanical advantage is 1.

2. Double Whip:

- a. It cannot be rove to advantage unless you are hauling from above the load;
- b. consists of 2 single blocks; and
- c. mechanical advantage is 2.

Show cadets
Examples of
each type of
tackle.

OHP #3

OHP #3

3.	<p><u>Luff:</u></p> <p>a. Consists of one double and one single block; and</p> <p>b. mechanical advantage is 3.</p>	OHP #3
4.	<p><u>Two-Fold Purchase:</u></p> <p>a. Uses two double blocks; and</p> <p>b. mechanical advantage is 4.</p>	OHP #3
CONFIRMATION STAGE 3		
1.	<p>What are the four types of tackles?</p> <p>Answer: (1) Single Whip (2) Double Whip (3) Luff (4) Two-Fold Purchase</p>	
2.	<p>What is the mechanical advantage of a luff?</p> <p>Answer: Mechanical advantage for a luff is 3.</p>	

9 MINS	PERFORMANCE CHECK
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Test Details: **Cadets will rig each tackle and lift a light load. There is also a written Enabling Check where cadets are required to identify the parts of a tackle.**

- Have cadets broken into small groups. Have each group rig each of the four tackles. Check each one to see if they are rigged to advantage or disadvantage. If they are rigged to disadvantage, ensure the cadets know why and are able to change it so that is it rigged to advantage.

1 MIN	CONCLUSION
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- SUMMARY:**
- In this class you learned how to rig a tackle.
 - Remember that safety is always important when doing lifting exercises.

- RE-MOTIVATION:**
- Comment on student progress.
 - The next lesson will be 406.10 – **Mouse a Hook.**