

# Haul Systems & Semitech Review

2.19.03 – T. Rumley and B. Rogers

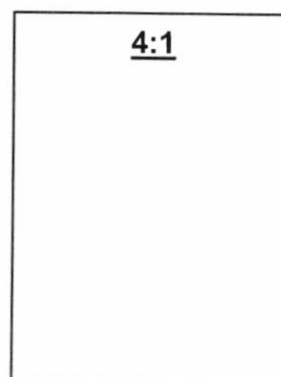
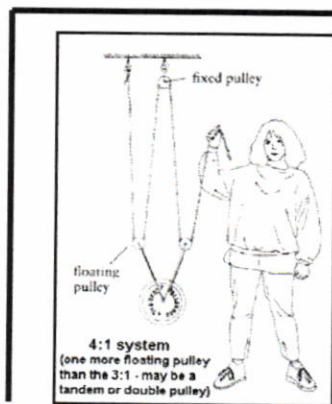
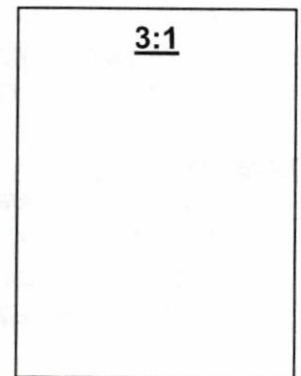
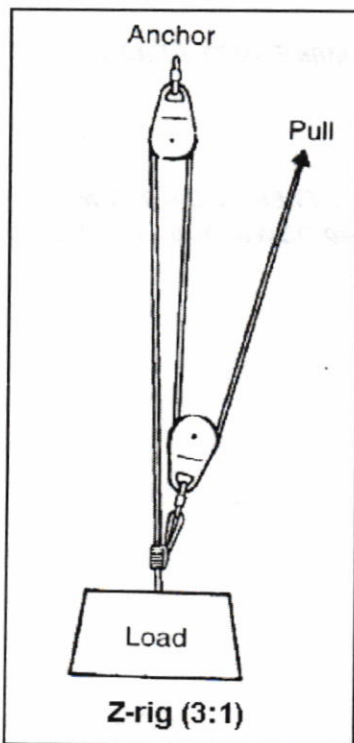
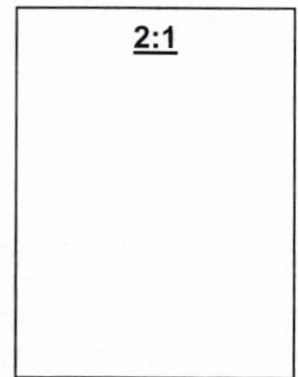
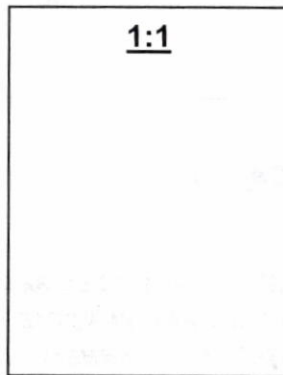
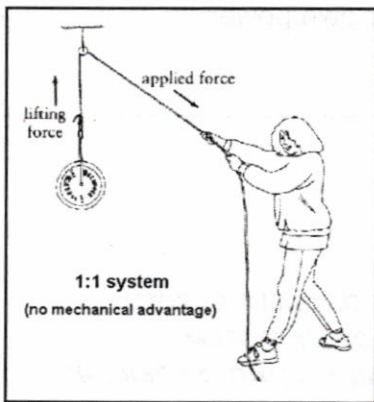
## What is a Haul System?

- Basically it is a way to forcibly pull or haul an object over certain distance.
- Haul system will also generally include mechanical devices to give a mechanical advantage.
- Mechanical advantage of a pulley, lever
- Makes your job easier

## How/Why?

- Work = Force x Distance
- Therefore force and distance are inversely proportional
- You increase the distance you decrease the force. Increase distance by using haul systems.

### Four different systems



- 1:1** – Compare to just pulling – reason is that we assume the pulley is ideal and only acts as a change of direction and transmits all force. (sometimes called Brute Force)
- 2:1** – Ideally you get a 2x advantage. Not always so! Angle of rope makes a big difference.
- 3:1** – 3x advantage, compare with two fixed pulleys. You're really pulling all the weight. It is a combination of a 1:1 and a 2:1. (called the Z-Haul or Z-Rig)
- 4:1** – 4 times advantage (that's like doing a fourth of your homework and still getting full credit!) combination of 2:1 and 2:1.

### Problems

- Since you changed the distance, you have to pull more rope to move the same amount.
- Watch that angle! You can actually multiply the amount of force that the rope feels.
- Huge forces can build up, so the equipment must be able to handle the load
- Anchors must be bombproof!

### So why do we use haul systems?

- Slope or terrain makes it impossible to move the stokes under your own power.
- Too steep, vertical!, slippery

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## **LITTER CAPTAIN**

### **BEFORE GETTING ON THE LITTER:**

- **EXPLAIN OBJECTIVE; TO GET PATIENT TO SAFETY AS SAFELY AND AS QUICKLY AS POSSIBLE.**
- **EXPLAIN HOW; WITH TEAM ATTACHED TO LITTER AND PURPOSE OF BELAY SYSTEM.**
- **CHECK EQUIPMENT OF TEAM INCLUDING ASRC SEAT HARNESS, HELMET, SLING OF PERLON, AND CARRABINER.**
- **COMMANDS BETWEEN YOU (THE LC) AND THE ROPE HANDLERS...MINIMIZE EXTRA TALKING.**
- **EXPLAIN COMMANDS BETWEEN YOU (THE LC) AND YOUR TEAM. (4) FALLING, ROCK, VOMIT, STOP.**
- **KEEP THE LITTER AS LEVEL AS POSSIBLE. IF AN ANGLE IS NECESSARY, MAKE SURE HEAD IS HIGHER THAN FEET.**

### **ONCE ON THE LITTER:**

- **INSTRUCT TEAM TO DOUBLE-CHECK TIE-IN OF MEMBER ACROSS THE LITTER FROM THEM.**
- **EXPLAIN LIFTING PROCEDURE; KEEP KNEE CLOSEST TO PATIENT'S HEAD DOWN AND LIFT WITH LEGS, NOT BACK.**
- **DON'T FORGET TO PRELOAD!!!**