

Winch



The Assignment





There are many situations in which it is useful to apply a strong pulling force. This is particularly true on sailing boats. The device that is used for this is the winch. These can be small hand operated devices used for raising and lowering sails, and for altering the angle of the sail to the wind. More powerful motor driven winches are used for raising and lowering the anchor and even moving the boat itself along the slipway. They need to be powerful because boats are heavy and reliable as it would be very dangerous if the winch failed and the boat moved uncontrollably back into the water.

Your task is to design and build a motorized winch to be used to pull a boat out of the water onto a slipway.

Problem Solving Activity: _____

Name(s): _____

Date: _____

GOALS	 BRONZE	 SILVER	 GOLD	 PLATINUM
<p>Design Brief:</p> <p>Understand the problem, develop prototypes to solve it, test those prototypes and revise your design to make it better.</p>	<ul style="list-style-type: none"> • Our design met the goals or criteria defined by the activity. <p style="text-align: center;"><input type="checkbox"/></p>	<ul style="list-style-type: none"> • We met Bronze • We tested our prototype multiple times. • We made at least one improvement. <p style="text-align: center;"><input type="checkbox"/></p>	<ul style="list-style-type: none"> • We met Silver • We made at least two improvements. <p style="text-align: center;"><input type="checkbox"/></p>	<ul style="list-style-type: none"> • We met Gold • We tested at least two different designs. • We picked the best design, tested it, and made several improvements. <p style="text-align: center;"><input type="checkbox"/></p>
<p>Creativity:</p> <p>Come up with inventive and creative solutions to problems. Consider multiple solutions.</p>	<ul style="list-style-type: none"> • We started the activity and have at least one possible solution that looks reasonable. <p style="text-align: center;"><input type="checkbox"/></p>	<ul style="list-style-type: none"> • We brainstormed two to three ideas. • We built a working model to solve the problem. <p style="text-align: center;"><input type="checkbox"/></p>	<ul style="list-style-type: none"> • We brainstormed more than three ideas. • We built an effective model to solve the problem. <p style="text-align: center;"><input type="checkbox"/></p>	<ul style="list-style-type: none"> • We brainstormed many ideas. • We built and tested prototypes for at least two ideas. • We built an original and effective model that solves the problem. <p style="text-align: center;"><input type="checkbox"/></p>
<p>Collaboration:</p> <p>Work is shared effectively and the team encourages and helps each other.</p>	<ul style="list-style-type: none"> • We sometimes worked together well but some team members did more work than others or we needed help from the teacher to resolve some disagreements. <p style="text-align: center;"><input type="checkbox"/></p>	<ul style="list-style-type: none"> • We generally worked together well, providing help and support to each other. • The work was shared fairly evenly among the group members. <p style="text-align: center;"><input type="checkbox"/></p>	<ul style="list-style-type: none"> • We worked together well, providing help and support to each other. • The work tasks were shared evenly. • We addressed issues that arose. <p style="text-align: center;"><input type="checkbox"/></p>	<ul style="list-style-type: none"> • We worked together unusually well, overcoming unexpected obstacles by working together as a team. • We actively helped and supported each other. • We addressed issues that arose with honest, constructive feedback. <p style="text-align: center;"><input type="checkbox"/></p>

Notes: