



# EPPro8 Challenge

Engineer Problem Solve Innovate

## Helicopter Rescue

You work for a movie studio and are creating the special effect of a helicopter undertaking a daring rescue on top of a mountain.

It is too dangerous to film the helicopter rescue scene using a real helicopter.

Instead, build a giant rig so that ropes and pulleys can be used to “fly” a model helicopter to complete various tasks.



### Helicopter

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| Criteria | Build a model helicopter approximately 500mm long.<br>The helicopter should have a main rotor and a tail rotor. Both of these can be spun by hand.<br>The helicopter has landing gear so that it can sit flat on the ground. |
| Hint     | Use an aluminium rod connected to an axle for the rotor.   |

### Rig Construction

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| Criteria | A structure is at least 1.8m wide, 1.8m long and 1.5m tall.<br>The structure does NOT require a base.<br>There is bracing on all corners.                   |
| Hint     | You will need to join the aluminium rods to make them longer.<br>Because this structure is so big it will be quite wobbly. That is fine for this challenge. |

## Helicopter Rigging

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| Criteria | <p>Ropes from the helicopter connect to the pulleys at the top four corners of the rig structure.</p> <p>One team member is sitting on the ground at each corner. The team can lift the helicopter at least 1m by only pulling the ropes.</p> <p>The helicopter can then be lowered and lands on its landing gear.</p> |
| Hint     | Make sure the pulleys are on an angle where the rope freely moves on the pulley's wheel.   |

## Mountain Landing

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| Criteria | <p>Place the "helipad" and "mountain" printouts on the ground at least 1m apart.</p> <p>By only pulling on the four ropes, the helicopter can:</p> <ul style="list-style-type: none"><li>• Take off from the helipad.</li><li>• Rise at least 1m.</li><li>• Fly to, and land on, the mountain.</li></ul> |
| Hint     | Practice this, thinking about the angles that you need to achieve the task.  |

## Mountaineer

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| Criteria | <p>Build a freestanding person approximately 500mm tall.</p> <p>Place the mountaineer on top of the "mountain".</p> |
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## Mountain Rescue

|          |   |
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| Criteria | <p>By only pulling on the four ropes, the helicopter can:</p> <ul style="list-style-type: none"><li>• Take off from the helipad.</li><li>• Fly to the mountain.</li><li>• Hook the mountaineer.</li><li>• Take off and return to the helipad.</li></ul> |
| Hint     | You will need some sort of hooking system on the mountaineer and the helicopter.  |

After you have attempted this challenge watch the tutorial to see our solution at [www.EPro8Challenge.co.nz/Tutorial](http://www.EPro8Challenge.co.nz/Tutorial) and enter the Challenge Code **HLRS**.