

Who pays for the rescue

Altitude physiology, informed risk, and who carries the cost

People climb into places where the air cannot keep them alive, and when it goes wrong somebody else flies in after them. This item asks you to decide who should bear that cost, and to ground the answer in what altitude actually does to a body.

60 MINUTES

ONE SITTING

WRITTEN WORK ONLY

VALUE ANNOUNCED WHEN THE PACK OPENS

WHAT THIS ITEM IS WORTH

The point value is announced when the pack opens, printed on the portal beside the item and written on the board. It is not printed here, because the value is set once and printing it in two places is how two different numbers end up in circulation.

What is fixed now is the **size**. This page tells you how long the work takes and what you have to produce. Read that first and decide whether you have the time before you start.

What you are doing

You will explain why high altitude is dangerous in physiological terms, then take a position on who should carry the cost and risk of rescuing someone who chose to go there. The physiology is not decoration. An argument about acceptable risk that cannot say what the risk does to a body is not an argument.

WHAT THIS ITEM COSTS YOU

HOW LONG	SITTINGS	WHAT YOU NEED FIRST	WHAT YOU HAND IN
60 min	One	This handout, and a device that opens the CDC altitude page.	One written position, roughly a page, with a physiological explanation and a stated tradeoff.

The science you need first

WHY ALTITUDE HURTS YOU

The percentage of oxygen in air does not change with height. What changes is **atmospheric pressure**, and so the **partial pressure of oxygen** falls with it. Less pressure driving oxygen across the alveolar membrane means less oxygen loaded onto haemoglobin, and every tissue downstream feels it. That is hypoxia, and it is a pressure problem, not a concentration problem.

The body responds by breathing faster and deeper, raising heart rate, and over days producing more red blood cells. Those responses take time, which is why ascent rate matters more than final altitude for who gets sick.

THREE NAMED CONDITIONS, AND THE SYSTEMS THEY HIT

- **Acute mountain sickness (AMS).** Headache plus nausea, dizziness, fatigue or poor sleep after ascending. The common one. Usually resolves with rest at altitude or descent.
- **High altitude pulmonary edema (HAPE).** Fluid crosses into the alveoli, so the surface where gas exchange happens is now full of liquid. Breathlessness at rest, cough, very low oxygen saturation. This is a respiratory-system emergency.
- **High altitude cerebral edema (HACE).** Fluid and swelling in the brain. Confusion and loss of coordination are the tell. This is a nervous-system emergency.

Read the names as terminology, because the word parts are doing the work: *pulmonary* is lung, *cerebral* is brain, and *edema* is fluid where it should not be. Once you can take those apart, the condition tells you which system is failing.

Read this before you decide

CDC: Travel to High Altitudes. wwwnc.cdc.gov/travel/page/travel-to-high-altitudes. Read it for the real risk, the recommended ascent rates, and what the CDC tells a traveller to do. Take three notes.

The scenario

THE EXPEDITION

A commercial expedition ascends to 5,400 metres. The itinerary compresses the recommended acclimatisation schedule so the trip fits into an eleven day holiday. Two climbers develop confusion and loss of coordination on day six. A helicopter rescue is requested. The flight is expensive, the landing zone is marginal, and the crew is exposed to real risk to reach them.

Everyone on the trip signed a consent form describing altitude illness as a known risk.

The steps

- 1 **Read the CDC page and take three notes.** One on why altitude reduces available oxygen, one on recommended ascent rate, and one on what the guidance says to do when symptoms appear.

Done when: Three notes written in your own words, not copied sentences.

- 2 **Name the condition and defend the name.** The two climbers have confusion and loss of coordination. Say which of the three conditions above that pattern points to, and say in one sentence why those symptoms point there rather than to the other two.

Done when: You have named one condition and given a symptom-based reason, not a guess.

- 3 Explain the mechanism in three sentences.** Start at atmospheric pressure and finish at the symptom. Use the words partial pressure, oxygen saturation, and the system involved.

Done when: A reader who did not do this reading could follow your chain from pressure to symptom.

- 4 Write the three positions.** Before you pick one, write a sentence for each: the climber bears the cost because they accepted a disclosed risk; the operator bears it because it sold a schedule faster than the guidance; the public bears it because rescue is a public service like any other emergency response.

Done when: Three positions written, each in one sentence, each stated fairly.

- 5 Take your position and defend it.** One claim sentence, then reasoning that uses both the physiology and the consent question. Consent to a risk you were not correctly told about is a different thing from consent to a risk you understood.

Done when: Your reasoning contains at least one physiological fact and at least one point about what the climbers were and were not told.

- 6 Name the tradeoff.** One sentence on what your position costs, and to whom. If the climber pays, some people cannot afford rescue. If the public pays, the cost falls on people who never went. Say which one you are accepting.

Done when: You have named a specific group who is worse off under your rule.

Where people get stuck

The altitude explanation and the ethics feel like two separate assignments.

They are one. The compressed schedule is the hinge. Ascent rate is the single biggest controllable factor in who gets altitude sick, so an operator that compressed the schedule changed the risk the climbers thought they were consenting to. That is a physiological fact doing ethical work.

I said the air has less oxygen at altitude.

Check that again. The percentage of oxygen is about the same all the way up. Pressure is what drops, and pressure is what drives oxygen into the blood. Getting this right is most of the mechanism mark.

Confusion and loss of coordination could be lots of things.

True, and at 5,400 metres on day six of a compressed ascent, one of them is far more likely than the others. Say which and say why the pattern fits. Naming your uncertainty is allowed. Skipping the reasoning is not.

Words this item uses

Atmospheric pressure

The weight of the air above you. It falls as you climb, which is the whole reason altitude is dangerous.

Partial pressure of oxygen

The share of total pressure contributed by oxygen. This, not percentage, is what drives oxygen across the alveolar membrane.

Hypoxia

Not enough oxygen reaching tissue.

Oxygen saturation

The percentage of haemoglobin carrying oxygen, measured with a pulse oximeter. The number that falls first at altitude.

Acclimatisation

The set of changes, faster breathing, higher heart rate, more red blood cells, that let a body work at altitude. It takes days, which is why ascent rate matters.

Edema

Fluid collecting where it does not belong. Pulmonary edema is in the lungs, cerebral edema is in the brain.

Informed consent

Agreement to a risk you were accurately told about. Consent given on wrong information is not the same thing.

How to submit

- **Where it goes.** The same place as everything else. Your class form on the portal, or handed to Mr. Mendoza in person. Extra credit does not need a different route.
- **What to hand in.** Your written pages. Photographs of handwritten pages are fine. A photograph you cannot read is not.
- **Put your name and period on every page and in every photograph filename.** Unlabelled work cannot be credited, and it is the most common way points get lost.
- **When.** Any day after the pack opens, up to the last week of the semester. There is no deadline inside that window and no penalty for going slowly.
- **Feedback.** You get it back with a note. If a piece is short of full credit you may fix the named thing and resubmit once.