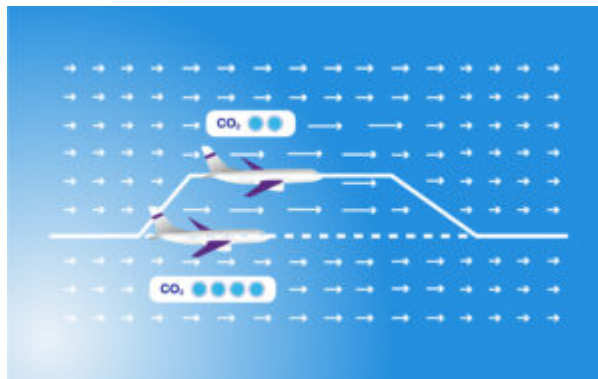# Optimising Flight Times

Calculate the best flight time from A to B and reduce greenhouse gas emissions!

The table below represents a cross section through the atmosphere and gives wind speeds (in m/s) in boxes which are 200km long and 1km high.

Your task is to pilot an aircraft, which flies at 230m/s when it is flying in the less dense atmosphere higher than 5km, and 150m/s when it is flying in the more dense atmosphere lower than 5km, from A to B in the shortest time possible.

Remember, flying in the same direction as the wind increases your speed but flying against the wind slows you down.

Map your route on the chart below and then calculate the flight time!

Rules

1. You take off from the ground at A and land on the ground at B.
2. You can only climb, or descend, one box per 200km.
3. Give your final answer in hours and minutes.

height (km)																
10	101	117	115	113	113	108	131	135	132	131	123	122	120	126	124	116
9	95	105	111	123	122	105	133	125	131	124	111	123	128	126		112
8	73	91	108	118	117	101	123	120	127	122	104	123	121	105		110
7	61	84	106	110	113	97	107	117	112	116	93	118	101	89		75
6	55	77	88	89	91	82	97	118	102	101	79	103	87	76		60
5	57	69	69	73	71	68	91	103	101	91	67	105	62	56		30
4	47	59	58	61	59	52	79	89	97	78	52	88	40	44		-5
3	41	42	51	48	48	49	50	53	54	67	39	65	5	21		-10
2	35	36	37	37	34	41	39	43	38	42	21	30	-21	-4	-19	-40
1	20	15	19	22	24	23	22	22	21	17	11	5	-11	-12	-15	-20
0	5	3	8	10	13	11	7	9	4	7	5	2	0	-1	-4	-10
	A															B

Some students may find the following table useful:

Distance (m)	aeroplane speed (m/s)	wind speed (m/s)	total speed (m/s)	time taken (s)
200000				
200000				
200000				
200000				
200000				
200000				
200000				
200000				
200000				
200000				
200000				
200000				
200000				
200000				
200000				
200000				

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