Standard atmosphere model

	zstart /km	zfinish /km	Tstart /K	Tfinish /K	Lapse rate /K per km	pstart /Pa	pfinish /Pa
Troposphere	0	11	288	216.5	6.5	101,325	22,604
Tropopause	11	20	216.5	216.5	0.0	22,604	5,461
Stratosphere	20	32	216.5	228.5	-1.0	5,461	864

Mg/R
0.034171

Troposphere

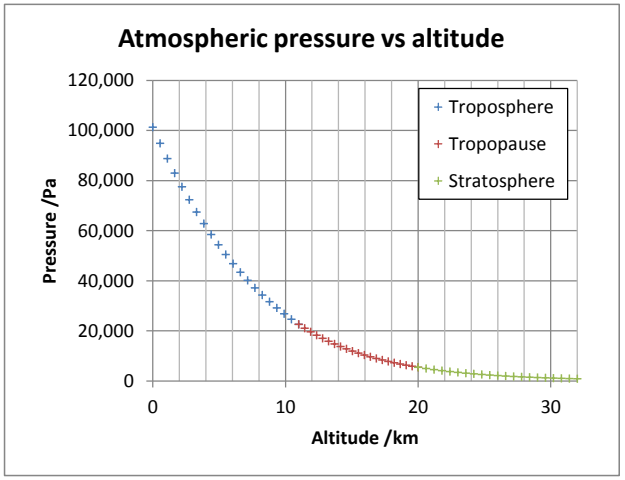
	z /km	T /K	p /Pa
0	0	288	101,325
0.05	0.55	284.425	94,885
0.1	1.1	280.85	88,781
0.15	1.65	277.275	82,999
0.2	2.2	273.7	77,525
0.25	2.75	270.125	72,348
0.3	3.3	266.55	67,454
0.35	3.85	262.975	62,832
0.4	4.4	259.4	58,469
0.45	4.95	255.825	54,355
0.5	5.5	252.25	50,479
0.55	6.05	248.675	46,830
0.6	6.6	245.1	43,397
0.65	7.15	241.525	40,171
0.7	7.7	237.95	37,142
0.75	8.25	234.375	34,301
0.8	8.8	230.8	31,638
0.85	9.35	227.225	29,146
0.9	9.9	223.65	26,814
0.95	10.45	220.075	24,636
1	11	216.5	22,604

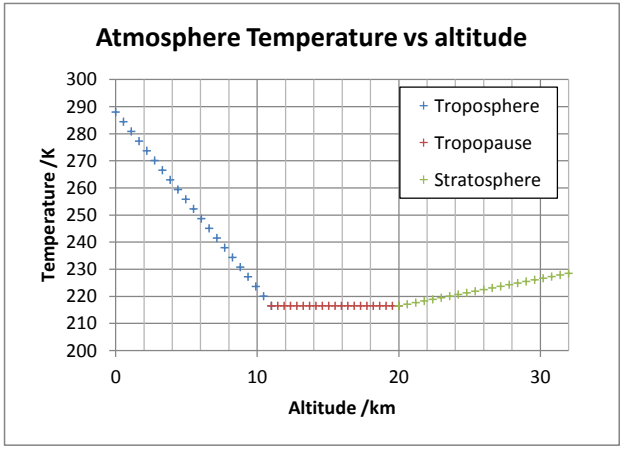
Tropopause

z /km	T /K	p /Pa
11	216.5	22,604
11.45	216.5	21,054
11.9	216.5	19,611
12.35	216.5	18,266
12.8	216.5	17,014
13.25	216.5	15,847
13.7	216.5	14,761
14.15	216.5	13,749
14.6	216.5	12,806
15.05	216.5	11,928
15.5	216.5	11,110
15.95	216.5	10,349
16.4	216.5	9,639
16.85	216.5	8,978
17.3	216.5	8,363
17.75	216.5	7,789
18.2	216.5	7,255
18.65	216.5	6,758
19.1	216.5	6,294
19.55	216.5	5,863
20	216.5	5,461

Stratosphere

z /km	T /K	p /Pa
20	216.5	5,461
20.6	217.1	4,968
21.2	217.7	4,521
21.8	218.3	4,115
22.4	218.9	3,747
23	219.5	3,412
23.6	220.1	3,108
24.2	220.7	2,832
24.8	221.3	2,581
25.4	221.9	2,353
26	222.5	2,146
26.6	223.1	1,957
27.2	223.7	1,786
27.8	224.3	1,629
28.4	224.9	1,487
29	225.5	1,358
29.6	226.1	1,240
30.2	226.7	1,133
30.8	227.3	1,035
31.4	227.9	946
32	228.5	864





Power law
Positive lapse rate

$$p(z) = p_0\left(1-\frac{L(z-z_0)}{T_0}\right)^{\frac{Mg}{LR}}$$

Exponential
Isothermal

$$p(z) = p_0 e^{-\frac{Mg}{RT_0}(z-z_0)}$$

Power law
Negative lapse rate

$$p(z) = p_0\left(1-\frac{L(z-z_0)}{T_0}\right)^{\frac{Mg}{LR}}$$

Dr Andrew French. September 2017