

*Cold, Windchill,
& Altitude
Effects*

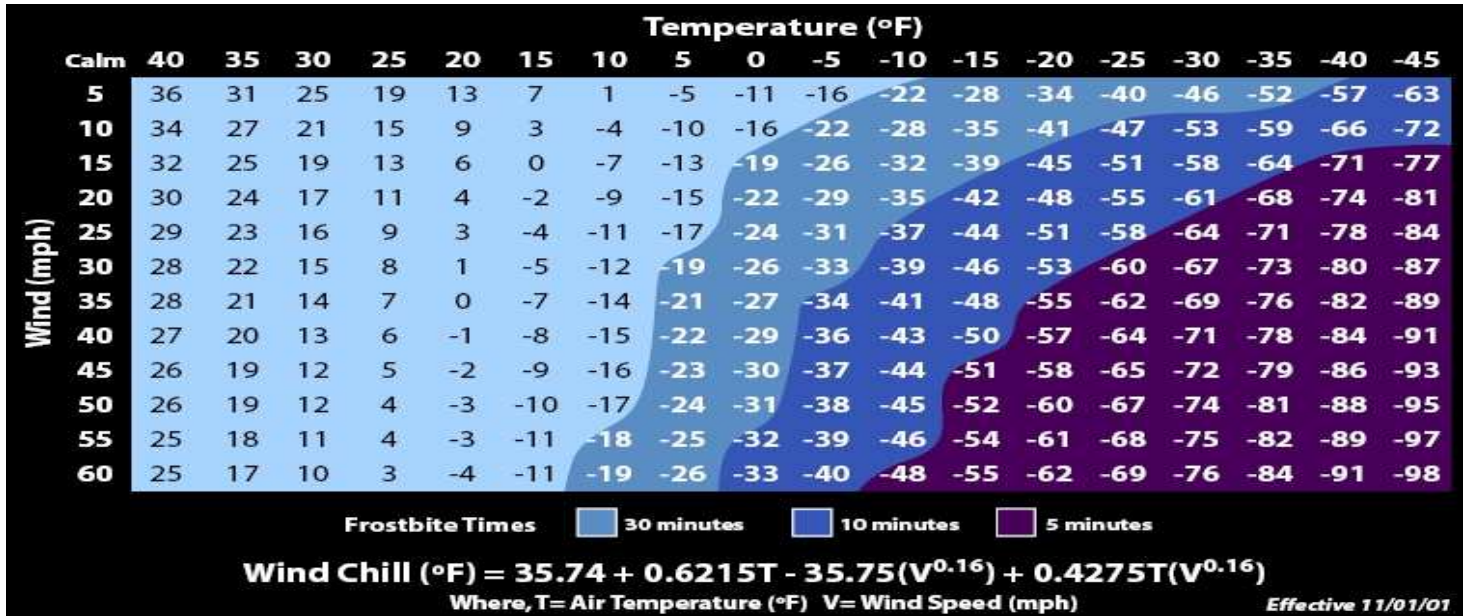
*Rules For The
Adventurer's Club
Campaign*

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Wind chill:

Methods of determining wind chill are different from country to country and have also changed over time because no clear and specific definition of what the term represents have been universally accepted by meteorologists. The modern American Model is most widespread but fails to take humidity into account; the modern Australian model is more complex and controversial but does factor in humidity. There has also been dispute as to the baseline value of "zero wind" as there is always some air movement, especially if people are not standing still.

The following charts show windchill effects according to the modern American model. The °C chart is more useful for game purposes, and closely resembles the chart in Champions 6th edition.



		Air Temperature (Celsius)																	
		0	-1	-2	-3	-4	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-60	
Wind Speed (km/hr)	6	-2	-3	-4	-5	-7	-8	-14	-19	-25	-31	-37	-42	-48	-54	-60	-65	-71	
	8	-3	-4	-5	-6	-7	-9	-14	-20	-26	-32	-38	-44	-50	-56	-61	-67	-73	
	10	-3	-5	-6	-7	-8	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63	-69	-75	
	15	-4	-6	-7	-8	-9	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66	-72	-78	
	20	-5	-7	-8	-9	-10	-12	-18	-24	-30	-37	-43	-49	-56	-62	-68	-75	-81	
	25	-6	-7	-8	-10	-11	-12	-19	-25	-32	-38	-44	-51	-57	-64	-70	-77	-83	
	30	-6	-8	-9	-10	-12	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72	-78	-85	
	35	-7	-8	-10	-11	-12	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73	-80	-86	
	40	-7	-9	-10	-11	-13	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74	-81	-88	
	45	-8	-9	-10	-12	-13	-15	-21	-28	-35	-42	-48	-55	-62	-69	-75	-82	-89	
	50	-8	-10	-11	-12	-14	-15	-22	-29	-35	-42	-49	-56	-63	-69	-76	-83	-90	
	55	-8	-10	-11	-13	-14	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77	-84	-91	
	60	-9	-10	-12	-13	-14	-16	-23	-30	-36	-43	-50	-57	-64	-71	-78	-85	-92	
	65	-9	-10	-12	-13	-15	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93	
	70	-9	-11	-12	-14	-15	-16	-23	-30	-37	-44	-51	-58	-65	-72	-80	-87	-94	
	75	-10	-11	-12	-14	-15	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80	-87	-94	
	80	-10	-11	-13	-14	-15	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95	
	85	-10	-11	-13	-14	-16	-17	-24	-31	-39	-46	-53	-60	-67	-74	-81	-89	-96	
90	-10	-12	-13	-15	-16	-17	-25	-32	-39	-46	-53	-61	-68	-75	-82	-89	-96		
95	-10	-12	-13	-15	-16	-18	-25	-32	-39	-47	-54	-61	-68	-75	-83	-90	-97		
100	-11	-12	-14	-15	-16	-18	-25	-32	-40	-47	-54	-61	-69	-76	-83	-90	-98		
105	-11	-12	-14	-15	-17	-18	-25	-33	-40	-47	-55	-62	-69	-76	-84	-91	-98		
110	-11	-12	-14	-15	-17	-18	-26	-33	-40	-48	-55	-62	-70	-77	-84	-91	-99		

0 to -10 Low **-10 to -25 Moderate** **-25 to -45 Cold** **-45 to -59 Extreme** **-60 Plus very Extreme**

The Effect Of Altitude

Every 1000 ft (304.8m) causes a drop in temperature of 4°F (2 and 2/9ths°C). This relationship is roughly accurate to altitudes of roughly 12,500m at which point the effects become more complicated. The following tables can therefore be generated:

Altitude (m)	Temp Drop (°C)	Altitude (m)	Temp Drop (°C)	Temp Drop (°C)	Altitude (m)	Temp Drop (°C)	Altitude (m)	Temp Drop (°C)
100	-0.6	2100	-15.2	-0.5	69	-14	1920	
200	-1.4	2200	-15.9	-1	137	-15	2057	
300	-2.1	2300	-16.7	-1.5	206	-16	2195	
400	-2.8	2400	-17.4	-2	274	-17	2332	
500	-3.5	2500	-18.1	-2.5	343	-18	2469	
600	-4.3	2600	-18.9	-3	411	-19	2606	
700	-5	2700	-19.6	-3.5	480	-20	2743	
800	-5.7	2800	-20.3	-4	549	-21	2880	
900	-6.5	2900	-21	-4.5	617	-22	3018	
1000	-7.2	3000	-21.8	-5	686	-23	3155	
1100	-7.9	3100	-22.5	-6	823	-24	3292	
1200	-8.6	3200	-23.2	-7	960	-25	3429	
1300	-9.4	3300	-24	-8	1097	-26	3566	
1400	-10.1	3400	-24.7	-9	1234	-27	3703	
1500	-10.8	3500	-25.4	-10	1372	-28	3840	
1600	-11.6			-11	1509	-29	3978	
1700	-12.3			-12	1646	-30	4115	
1800	-13			-13	1783			
1900	-13.8							
2000	-14.5							

The Effect Of Relative Humidity

At temperatures below 25°C, every 10% humidity raises the perceived temperature approx 1°C. As temperature rises, this value increases rapidly. At 35°C the increase is approx +1°C for every 5% (the rate has doubled). At 48°C, the increase is approx +2°C for every 5%.

HOWEVER, at temperatures (Wind-Chill Adjusted) below 15°C, these increases begin to become *reductions* in the apparent temperature. Between 0 and 15°C, both increases and decreases apply, effectively cancelling each other out, and relative humidity has little effect on perceived temperature. To -12°C (WCA) the effect is approx -1°C for every 10% humidity; at -22°C (WCA) it is approx -1°C for every 5% humidity; at -35°C (WCA) it is approx -2°C for every 5% humidity; and at -50°C and below, it is approx -2°C for every 5% humidity, plus -1°C for every 10% above 40%, plus -0.5° for every 5% above 75%.

For intermediate values, calculate the values on either side and use the results to estimate the actual effect - mid-way between the temperature values is roughly midway between the two adjustments.

Perceived Temperature & Thermal Danger Level

Determine the atmospheric temperature. Adjust for wind chill. Adjust for altitude. Adjust for humidity.

Locate the result on the °C wind chill table relative to the atmospheric temperature and use the key at the bottom to determine whether danger levels are Low, Moderate, Cold, Extreme, or Very Extreme. This will give an indication to how dangerous conditions are.

Game Effects: Low Pressure

At altitudes above 1525m, characters suffer the effects of low pressures.

1. Characters must spend a minimum of 1 END per phase even if not active; active characters expend 1 END more than usual. Every additional 1000m altitude adds 1 to this minimum. If characters run out of END, they burn Stun and then Body, as though they were drowning. The minimum END per phase is also known as the Pressure Number.

2. Fires are halved in size and doubled in time required to light for each step of the Pressure Number. Fire damage (body) is reduced by the Pressure Number, fire damage (Stun) is reduced by 3 points per Pressure Number.

3. Recovery is harder at reduced pressures.

Pressure number 1: recoveries are 3/4 normal.

Pressure number 2: recoveries are 1/2 normal.

Pressure number 3: recoveries are 1/4 normal.

Pressure number 4: recoveries are 1/2 normal and only take place every second turn.

Pressure number 5: recoveries are 1/2 normal and only take place every 3rd turn.

Pressure number 6: recoveries are 1/4 normal and only take place every 3rd turn.

Pressure number 7: recoveries are 1/4 normal and only take place every 4th turn.

+1 pressure number: +1 turn between recoveries.

Pressure number 10: recoveries are no longer possible.

4. Apoxia: Pressure numbers higher than 10 begin inflicting damage on characters.

1 point of stun per round per pressure number > 10.

Every 4th point of stun inflicted also inflicts a point of body damage.

Game Effects: Rain / Snow

Rain and snow have a number of effects:

1. a penalty for Perception Checks against sight and hearing, plus other senses as the GM sees fit
2. actual ranges are multiplied by a factor to produce an equivalent range for the determination of range modifiers which apply to perception checks, attacks, and anything else which is affected by range modifiers
3. an additional modifier to OCV which applies to ALL attacks
4. a modifier to DEX checks
5. a modifier to checks against DEX-based skills.

These effects are described on the following table:

Condtiions:	PERC modifier (sight, hearing)	Range Multiplier (range penalties)	OCV Modifier	DEX Checks Modifier	DEX-based Skill Modifier
Light Rain	-0	x1.25	-0	-0	-0
Light Snow	-1	x1.5	-1	-1	-1
Medium Rain	-3	x2	-1	-1	-1
Medium Snow	-4	x3	-2	-2	-2
Heavy Rain	-5	x4	-3	-3	-3
Heavy Snow	-6	x5	-3	-3	-4
Monsoons etc	-8	x10	-4	-4	-4
Blizzards etc	-10	x20	-4	-5	-5

Game Effects: Extreme Cold & Heat

Cold weather (use perceived temperatures) can have drastic effects on characters. Characters are presumed to have a *Comfort Zone* within which they suffer no game effects from temperatures; this is normally 10°C (50°F) to 27°C (80°F) but heavy clothing can shift the comfort zone downward, while light, airy clothing can shift it upwards. GMs should determine a standard Comfort Zone within their campaigns for each race and adjust it for clothing. They may also adjust it by up to ±4°C (15°F) in either direction to reflect adjustment to a different climate, but these adjustments should wear off if the character moves to a different climate; the rate of such change is determined by the GM. As a guide, it can be considered to halve each six months and vanish completely after no more than 2 years as characters acclimatise.

Temperatures within the comfort zone are designated Temperature Level 0. Every 3-5°C (10-20°F) change in temperature is considered to be 1 temperature level. Colder temperatures are negative temperature levels, written -n; hotter temperatures are positive temperature levels, written +n. GMs should establish exact parameters based on their specific campaigns, and can even vary these thermal profiles for individual characters (eg a character from a cold climate may have a wider gap than most characters for the first two temperature levels, reflecting their relative comfort in colder climates).

Temperature levels affect REC, DEX checks, attack rolls, DEX-based skills, and cost characters END at specified time intervals. These effects are applied AFTER any other effects due to climatic conditions are taken into account. These effects persist until the character raises the temperature of his local environment somehow. Other consequences such as sunstroke and dehydration (high temperatures) or dehydration and frostbite (low temperatures) may also occur; these are detailed separately and their effects are not included in this section of rules.

When a character's REC drops below zero, they take any further loss of REC as STUN damage. When a character reaches 0 END, any actions he attempts burns STUN instead. When this occurs, his REC is immediately reduced to 0 (if he had any left). When his STUN reaches 0, he burns BODY.

Temperature Level	REC Lost	DEX Check Modifier	OCV Modifier	DEX-based Skill Modifier	END Cost	END Interval
+1	1	0	0	0	1	20 mins
+2	2	-1	0	-1	1	10 mins
+3	3	-2	-1	-2	1	6 mins
+4	4	-3	-2	-3	1	5 mins
+5	5	-3	-3	-4	1	4 mins
+6	6	-4	-4	-4	3	10 mins
+7	7	-5	-4	-4	2	5 mins
+8	8	-5	-5	-5	1	2 mins
+9	9	-6	-6	-6	3	5 mins
+10	10	-7	-7	-7	3	4 mins
+11	11	-8	-8	-8	1	1 min
+12	12	-9	-9	-9	6	5 mins
+13	13	-10	-10	-10	3	2 mins
+14	14	-10	-10	-10	2	1 min
+15	15	-11	-11	-11	5	2 mins
+16	16	-12	-12	-12	3	1 min
+17	17	-13	-14	-13	4	1 min
+18	18	-14	-15	-14	5	1 min
additional +1	+1	-1	-1	-1	+1	1 min

Temperature Level	REC Lost	DEX Check Modifier	OCV Modifier	DEX-based Skill Modifier	END Cost	END Interval
-1	1	-1	0	0	1	20 mins
-2	2	-2	-1	-1	1	10 mins
-3	3	-3	-2	-2	1	6 mins
-4	4	-4	-3	-3	1	5 mins
-5	5	-5	-4	-4	1	4 mins
-6	6	-5	-5	-5	3	10 mins
-7	7	-6	-5	-6	2	5 mins
-8	8	-7	-6	-7	1	2 mins
-9	9	-8	-7	-8	3	5 mins
-10	10	-9	-8	-9	3	4 mins
-11	11	-10	-9	-10	1	1 min
-12	12	-10	-10	-11	6	5 mins
-13	13	-11	-10	-12	3	2 mins
-14	14	-12	-11	-13	2	1 min
-15	15	-13	-12	-14	5	2 mins
-16	16	-14	-13	-15	3	1 min
-17	17	-15	-14	-16	4	1 min
-18	18	-15	-15	-17	5	1 min
etc						

Resting reduces the temperature level by 1.

Protective clothing may also shift the temperature level. Modern clothing can shift hot temperature levels by 2, or cold temperature levels by 5. 1930s technology is half as effective. Pre-industrial protective clothing gives no level adjustment against heat and no more than 1 level adjustment in cold. These adjustments are in addition to any adjustment to the comfort zone's boundaries.

Shelter: in a modern climate controlled environment, outside temperatures can largely be ignored. Shade can reduce temperature levels by 1, a snow cave can reduce negative temperature levels by 1 or 2. Tents are also +1 temperature levels. The greatest benefit provided by shelter is protection from wind effects.

Survival skill checks: a successful survival skill check provides the character making it (and possibly his companions) with a shift of 1 temperature level. Characters who succeed by more than half their survival skill level shift the temperature 2 steps. Only one roll per group should be made, and the benefits of the roll persist until circumstances change. Other characters may attempt survival skill checks as complimentary skills (success confers +2 effective skill to the primary check, failure confers -1).

Being wet shifts temperature -1 step.

Game Effects: Wind Velocity

Most effects from wind are already built into the system by means of Wind Chill. However, wind has some effects beyond the limits of what has already been built in, which are largely thermal in nature. What's missing are the physical effects of wind.

Moving against the wind: Characters who wish to move against the wind without penalty must have a casual STR greater than the STR associated with the wind. To determine a character's casual STR, look up their STR on the table below, note the amount in the "½ Lift" column, then locate that amount in the "lift" column and read off the STR that goes with it.

EG: A character has STR 14. That gives him a half-lift value of 87kg. Finding 87kg in the "Lift" column gives a casual STR of 9. So the character has a casual STR of 9.

Characters and creatures who are larger than usual (eg horses) add 5 to the required casual STR for every doubling in size, due to the greater surface area presented to the wind. Characters and creatures who are smaller than usual subtract 5 from the required casual STR for each halving in size (but such characters often have less STR).

If the wind has a greater STR than the character's casual STR, he may still be able to move against the wind, with penalties. The character must make a STR vs STR roll to advance for 1 round in combat or for 10 minutes outside of combat conditions. Their movement rate is reduced by half. If the character fails then he either makes no progress or makes progress but is then blown back to approximately his starting position. Note that this requires full END expenditure for the use of STR.

If the wind has a STR greater than that of the character (allowing for size as above), then he may only attempt to stay in place, as discussed in "*Staying In Place*" below.

Moving across the wind: Characters who attempt to move at an angle to the wind have a somewhat easier time of it, using the "¾ lift" value instead of the "½ Lift" value to determine the STR requirements to move. However, they also have to make a DEX check to move accurately and not be blown off-course (or to overcompensate for the wind). To determine the modifier to the DEX check, look up the STR of the wind on the lift table, locate the amount shown in the "¼ Lift" column, then find the STR that has a "Lift" value that matches. That STR value (if greater than zero) is the modifier to the DEX check.

EG: A wind has a STR of 18, which gives a "¼ Lift" of 75.75kg. That is approximately the same as 76 kg, which gives a STR of 8. So any character attempting to move across the wind must make a DEX check at -8 or they will be off-target to one side or the other (random roll).

Moving with the wind: Characters who move with the wind do not need to make STR checks, but do need to make DEX checks to keep their feet. The modifier to such DEX checks is the "Casual STR" of the wind minus the STR to lift the character. If the character fails the check, they will be lifted off their feet and blown by the wind.

EG: A wind has a STR of 18, which gives a "Casual STR" of 13. If the character weighs 115kg (with equipment), they have a STR-To-Lift of 11, since it requires STR 11 to lift 115 kg. So the character needs to make a DEX check at -2 to keep their feet.

Characters who get blown off their feet move 1/4 the distance travelled by the wind in the time frame.

EG: A wind moving at 42km/h would travel $42 \times 5 / 60 = 3.5$ km in five minutes (non-combat travel). A character who is blown off his feet as above will travel 1/4 of this distance, or 875m, in the five minutes. (Therefore, the character is effectively moving at a speed of 1/4 of 42 km/h, or 10.5 km/h - so if he is able to attempt to grab an anchored line, or to anchor himself in some other way, referees can determine how far the character gets blown before he can do so).

Standing Still: Characters whose STR-to-Lift is more than the casual STR of the wind can stand in place without penalty. Characters who are permanently anchored in some fashion add the breaking strain of the anchor to their weight for the purposes of determining STR to lift. The same procedure is also used for determining the effects of winds on tents, etc.

EG: A wind has a STR of 11, which gives it a "Casual STR" of 6. A STR of 6 means that objects weighing 57kg or less will be blown away unless anchored.

A tent and its contents weighs 85 kg. This has a STR-to-lift of approximately 9, so a wind would require a casual STR of 9 to blow it away, which occurs with a STR of 14. If the tent is secured by pitons and four 100# (45kg) lines, then (in theory) the tent has a total effective mass of $45 \times 4 + 85 = 265$ kg, which has a STR-to-lift of 17, and hence requires a STR 22 wind to blow it away. In reality, the pitons are a weak point, since characters probably don't need anywhere near that much STR to pry them loose, but unless there is some need to be pedantic, this should be ignored for game purposes.

Other Effects

- *Damage:* Winds can do normal damage as per their rated STR. Most of the time, GMs can ignore this effect, but should bear it in mind, especially in combat situations.
- *Perc Modifier:* This is usually applied to hearing and smelling checks, but grit, dust, etc on the wind may also apply the penalty to sight checks.
- *Missile OCV Modifier:* The effect shown is applied to muscle-powered missiles. Halve it for bullets. Energy beams and the like are usually unaffected (though a flame thrower might be given twice the normal modifier to reflect the extra sensitivity of a gas to wind), but the presence of substantial dust and debris in the air can be used to justify the effects of such debris "soaking up" damage that would otherwise be inflicted on the target, at the GMs discretion.

Wind Level	Wind Speed km/h	Wind Speed mph	Wind STR	Wind Casual STR	PER Modifier	Missile OCV Modifier
None	0-5	0-3	0	-5	-0	-0
Very Light	6-27	4-17	3	-2	-0	-0
Light	28-48	18-30	5	0	-0	-1
Moderate	49-71	31-44	8	3	-1	-2
Heavy	72-92	45-57	10	5	-2	-4
Very Heavy	93-103	58-64	15	10	-3	-6
Storm Force	104-116	65-72	20	15	-4	-8
F1*	117-177	73-110	25	20	-5	-10
F2*	178-217	111-135	30	25	-6	-12
F3*	218-266	136-165	35	30	-7	-14
F4*	267-322	166-200	40	35	-8	-16
F5*	323-386	201-240	45	40	-9	-18
F6*	387-459	241-285	50	45	-10	-20
F7*	460-540	286-335**	55	50	-11	-22

* Hurricane/Tornado force ratings. F6 and higher are theoretical and have never been observed in nature.

** Difference in steps is increasing 5mph each step. F6-F7 is +50 mph, so the gap from F7 to F8 maximum would be +55 mph; which means the top speed of F8 winds would be $335 + 55 = 390$ mph.

STR/LIFT TABLES

STR	Lift	3/4 Lift	1/2 Lift	1/4 Lift	STR	Lift (kg)	3/4 Lift	1/2 Lift	1/4 Lift
-50	24g	18	12	6	1	29	21.75	14.5	7.25
-49	28g	21	14	7	2	33	24.75	16.5	8.25
-48	32g	24	16	8	3	38	28.5	19	9.5
-47	37g	27.75	18.5	9.25	4	44	33	22	11
-46	43g	32.25	21.5	10.75	5	50	37.5	25	12.5
-45	49g	36.75	24.5	12.25	6	57	42.75	28.5	14.25
-44	56g	42	28	14	7	66	49.5	33	16.5
-43	64g	48	32	16	8	76	57	38	19
-42	74g	55.5	37	18.5	9	87	65.25	43.5	21.75
-41	85g	63.75	42.5	21.25	10	100	75	50	25
-40	98g	73.5	49	24.5	11	115	86.25	57.5	28.75
-39	112g	84	56	28	12	132	99	66	33
-38	129g	96.75	64.5	32.25	13	152	114	76	38
-37	148g	111	74	37	14	174	130.5	87	43.5
-36	170g	127.5	85	42.5	15	200	150	100	50
-35	195g	146.25	97.5	48.75	16	230	172.5	115	57.5
-34	224g	168	112	56	17	264	198	132	66
-33	258g	193.5	129	64.5	18	303	227.25	151.5	75.75
-32	296g	222	148	74	19	348	261	174	87
-31	340g	255	170	85	20	400	300	200	100
-30	391g	293.25	195.5	97.75	21	459	344.25	229.5	114.75
-29	449g	336.75	224.5	112.25	22	528	396	264	132
-28	515g	386.25	257.5	128.75	23	606	454.5	303	151.5
-27	592g	444	296	148	24	696	522	348	174
-26	680g	510	340	170	25	800	600	400	200
-25	781g	585.75	390.5	195.25	26	919	689.25	459.5	229.75
-24	897g	672.75	448.5	224.25	27	1056	792	528	264
-23	1.03kg	0.7725	0.515	0.2575	28	1213	909.75	606.5	303.25
-22	1.18kg	0.885	0.59	0.295	29	1393	1044.75	696.5	348.25
-21	1.36kg	1.02	0.68	0.34	30	1600	1200	800	400
-20	1.56kg	1.17	0.78	0.39	31	1838	1378.5	919	459.5
-19	1.79kg	1.3425	0.895	0.4475	32	2111	1583.25	1055.5	527.75
-18	2.06kg	1.545	1.03	0.515	33	2425	1818.75	1212.5	606.25
-17	2.37kg	1.7775	1.185	0.5925	34	2786	2089.5	1393	696.5
-16	2.72kg	2.04	1.36	0.68	35	3200	2400	1600	800
-15	3.13kg	2.3475	1.565	0.7825	36	3676	2757	1838	919
-14	3.59kg	2.6925	1.795	0.8975	37	4222	3166.5	2111	1055.5
-13	4.12kg	3.09	2.06	1.03	38	4850	3637.5	2425	1212.5
-12	4.74kg	3.555	2.37	1.185	39	5572	4179	2786	1393
-11	5.44kg	4.08	2.72	1.36	40	6400	4800	3200	1600
-10	6.25kg	4.6875	3.125	1.5625	41	7352	5514	3676	1838
-9	7.2kg	5.4	3.6	1.8	42	8445	6333.75	4222.5	2111.25
-8	8.2kg	6.15	4.1	2.05	43	9701	7275.75	4850.5	2425.25
-7	9.5kg	7.125	4.75	2.375	44	11143	8357.25	5571.5	2785.75
-6	10.9kg	8.175	5.45	2.725	45	12800	9600	6400	3200
-5	12.5kg	9.375	6.25	3.125	46	14703	11027.2	7351.5	3675.75
-4	14.4kg	10.8	7.2	3.6	47	16890	12667.5	8445	4222.5
-3	16.5kg	12.375	8.25	4.125	48	19401	14550.8	9700.5	4850.25
-2	19kg	14.25	9.5	4.75	49	22286	16714.5	11143	5571.5
-1	22kg	16.5	11	5.5	50	25600	19200	12800	6400
0	25kg	18.75	12.5	6.25					