

My Mathematics Rule Booklet

Grade 4-6



Name: _____

Grade: _____

Hoo-hoo Wiskunde ©

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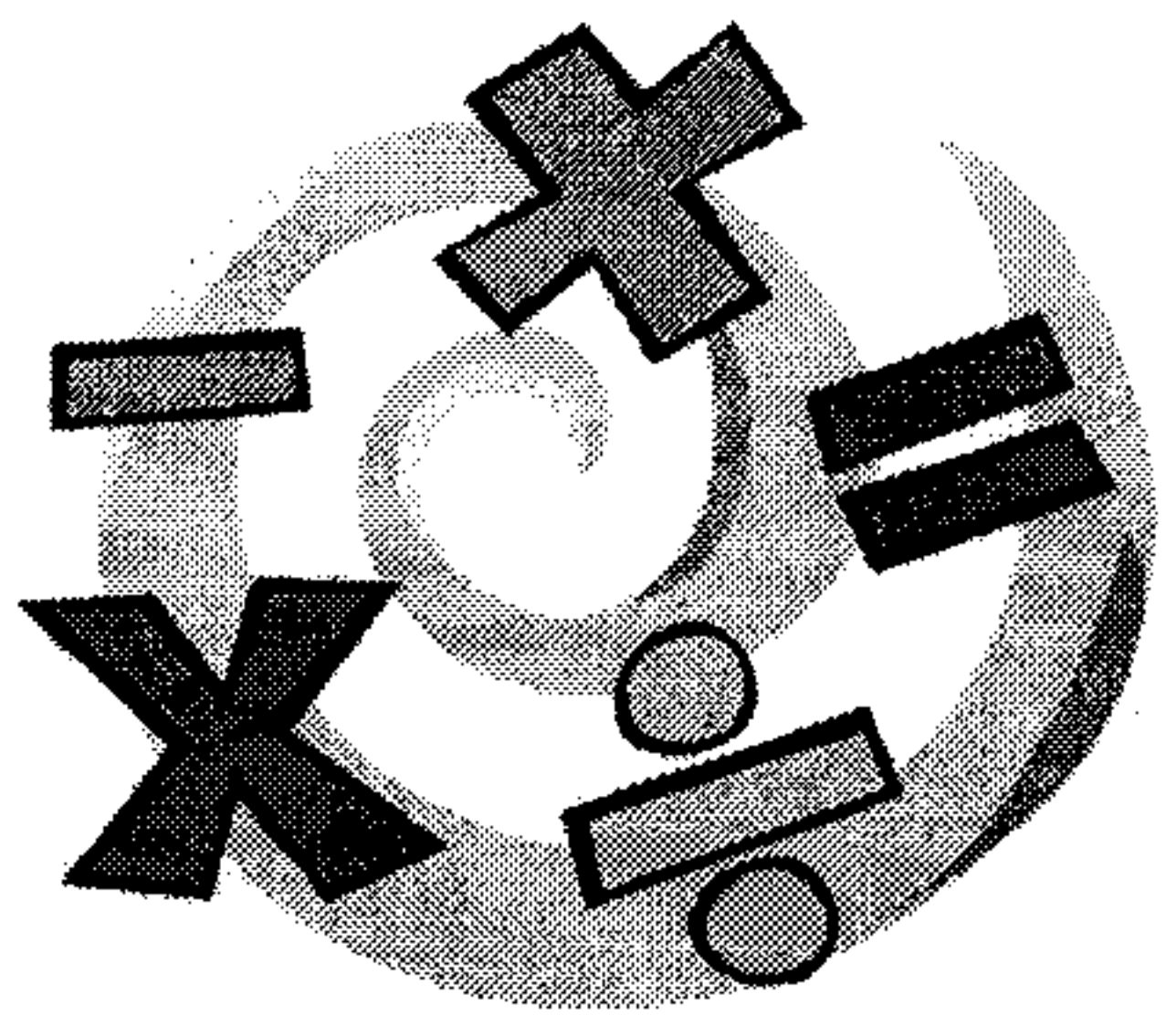
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Numbers, Operations & Relationships

1 2 3 4 5
6 7 8 9 0

I.1 WHOLE NUMBERS

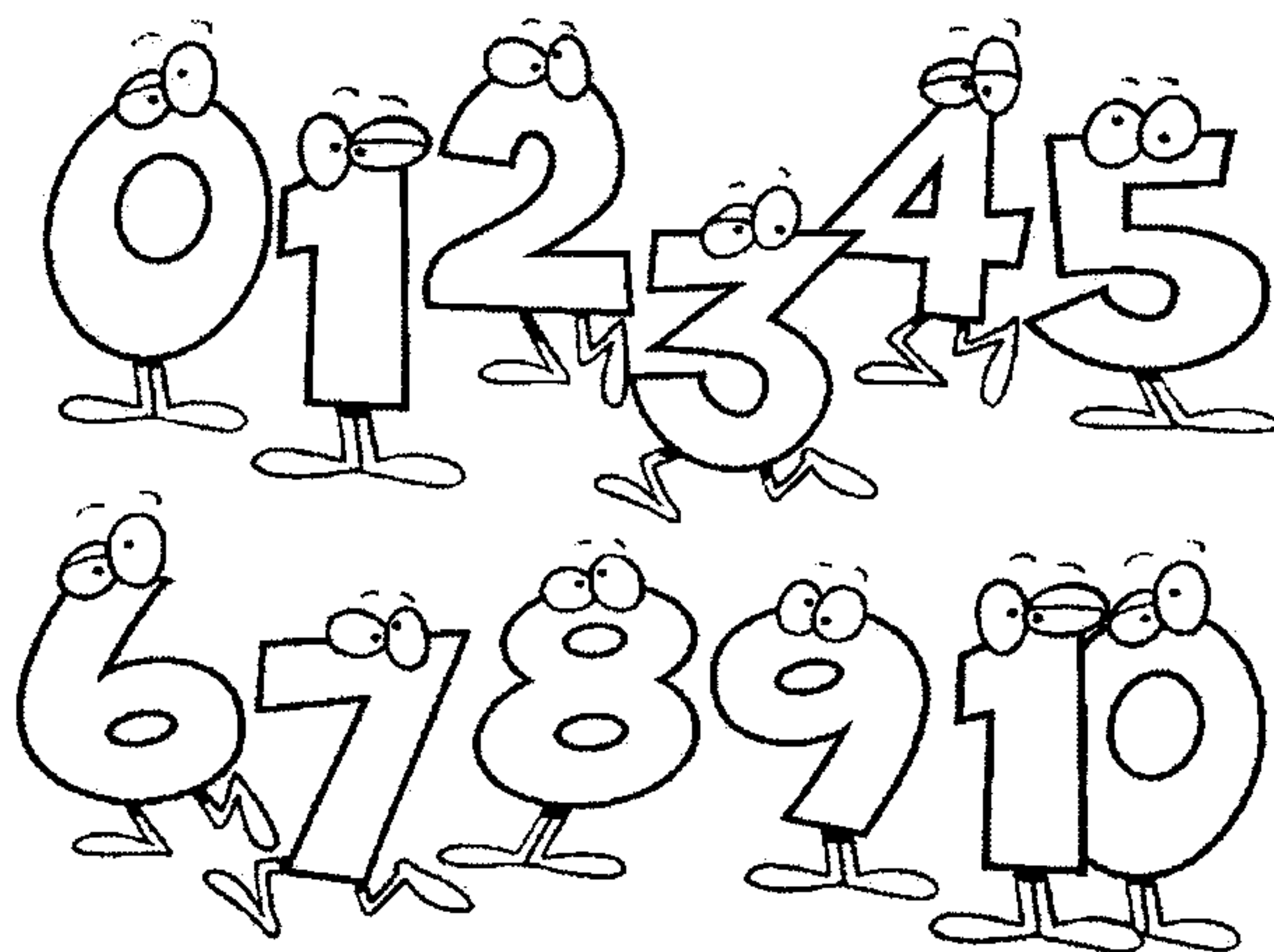
I. Number names

Number	English	Afrikaans
1	one	een
2	two	twee
3	three	drie
4	four	vier
5	five	vyf
6	six	ses
7	seven	sewe
8	eight	agt
9	nine	nege
10	ten	tien
20	twenty	twintig
30	thirty	dertig
40	forty	veertig
50	fifty	vyftig
60	sixty	sestig
70	seventy	sewentig
80	eighty	tagtig
90	ninety	negentig
100	one hundred	eenhonderd
200	two hundred	tweehonderd
300	three hundred	driehonderd
400	four hundred	vierhonderd
500	five hundred	vyfhonderd
600	six hundred	seshonderd
700	seven hundred	sewehonderd
800	eight hundred	agthonderd
900	nine hundred	negehonderd
1000	thousand	eenduisend
2000	two thousand	tweeduisend
3000	three thousand	drieduisend
4000	four thousand	vierduisend
5000	five thousand	vyfduisend
6000	six thousand	sesduisend
7000	seven thousand	seweduisend
8000	eight thousand	agtduisend
9000	nine thousand	negeduisend
10000	ten thousand	tienduisend

2. Counting:

Counting 1- 200:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200



Counting 1-1000:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380
381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500

501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520
521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600
601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900
901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920
921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940
941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960
961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980
981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000

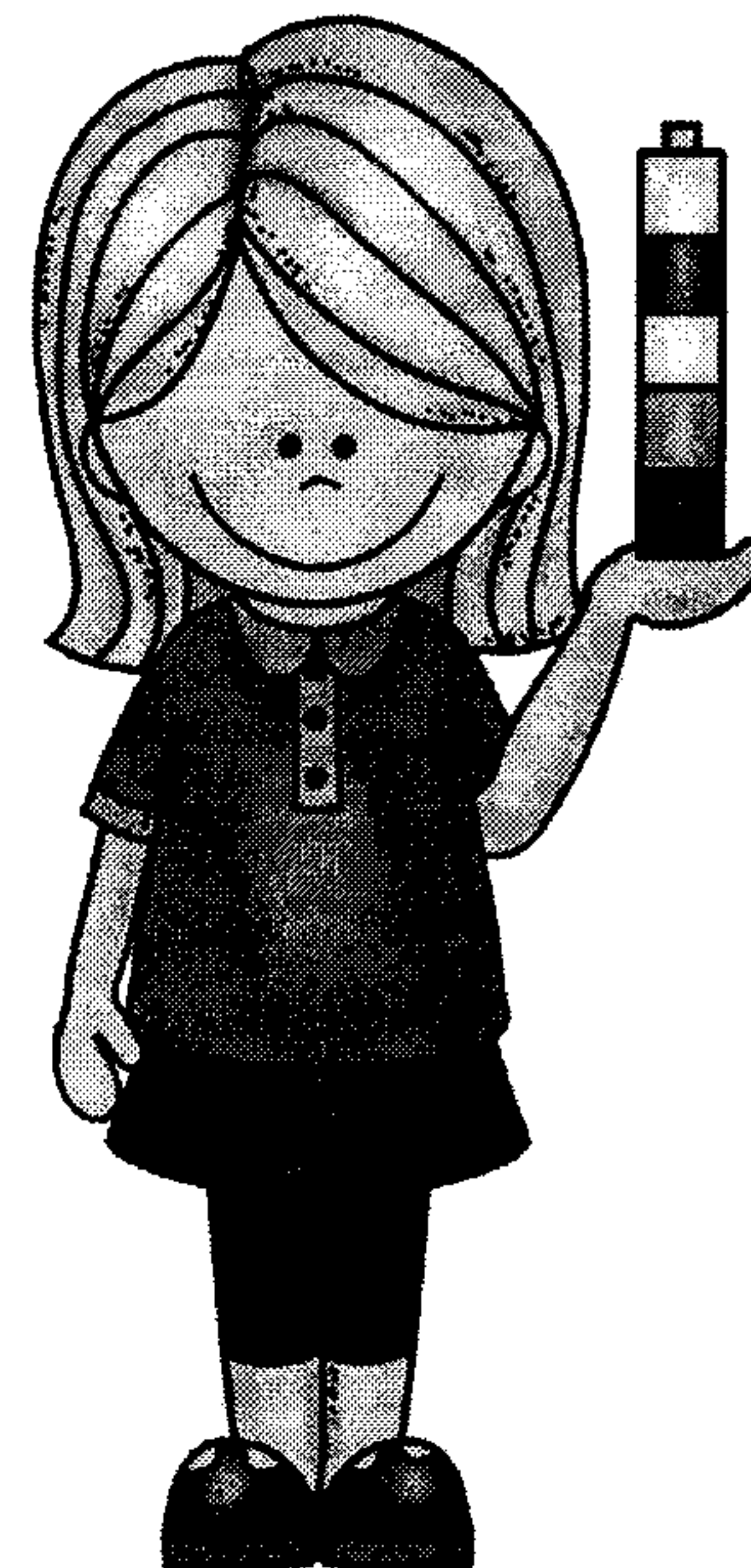
3. Time Tables: x2 - x12

X 2	X 3	X 4
$1 \times 2 = 2$	$1 \times 3 = 3$	$1 \times 4 = 4$
$2 \times 2 = 4$	$2 \times 3 = 6$	$2 \times 4 = 8$
$3 \times 2 = 6$	$3 \times 3 = 9$	$3 \times 4 = 12$
$4 \times 2 = 8$	$4 \times 3 = 12$	$4 \times 4 = 16$
$5 \times 2 = 10$	$5 \times 3 = 15$	$5 \times 4 = 20$
$6 \times 2 = 12$	$6 \times 3 = 18$	$6 \times 4 = 24$
$7 \times 2 = 14$	$7 \times 3 = 21$	$7 \times 4 = 28$
$8 \times 2 = 16$	$8 \times 3 = 24$	$8 \times 4 = 32$
$9 \times 2 = 18$	$9 \times 3 = 27$	$9 \times 4 = 36$
$10 \times 2 = 20$	$10 \times 3 = 30$	$10 \times 4 = 40$
$11 \times 2 = 22$	$11 \times 3 = 33$	$11 \times 4 = 44$
$12 \times 2 = 24$	$12 \times 3 = 36$	$12 \times 4 = 48$

X 5	X 6	X 7
$1 \times 5 = 5$	$1 \times 6 = 6$	$1 \times 7 = 7$
$2 \times 5 = 10$	$2 \times 6 = 12$	$2 \times 7 = 14$
$3 \times 5 = 15$	$3 \times 6 = 18$	$3 \times 7 = 21$
$4 \times 5 = 20$	$4 \times 6 = 24$	$4 \times 7 = 28$
$5 \times 5 = 25$	$5 \times 6 = 30$	$5 \times 7 = 35$
$6 \times 5 = 30$	$6 \times 6 = 36$	$6 \times 7 = 42$
$7 \times 5 = 35$	$7 \times 6 = 42$	$7 \times 7 = 49$
$8 \times 5 = 40$	$8 \times 6 = 48$	$8 \times 7 = 56$
$9 \times 5 = 45$	$9 \times 6 = 54$	$9 \times 7 = 63$
$10 \times 5 = 50$	$10 \times 6 = 60$	$10 \times 7 = 70$
$11 \times 5 = 55$	$11 \times 6 = 66$	$11 \times 7 = 77$
$12 \times 5 = 60$	$12 \times 6 = 72$	$12 \times 7 = 84$

$\times 8$	$\times 9$	$\times 10$
$1 \times 8 = 8$	$1 \times 9 = 9$	$1 \times 10 = 10$
$2 \times 8 = 16$	$2 \times 9 = 18$	$2 \times 10 = 20$
$3 \times 8 = 24$	$3 \times 9 = 27$	$3 \times 10 = 30$
$4 \times 8 = 32$	$4 \times 9 = 36$	$4 \times 10 = 40$
$5 \times 8 = 40$	$5 \times 9 = 45$	$5 \times 10 = 50$
$6 \times 8 = 48$	$6 \times 9 = 54$	$6 \times 10 = 60$
$7 \times 8 = 56$	$7 \times 9 = 63$	$7 \times 10 = 70$
$8 \times 8 = 64$	$8 \times 9 = 72$	$8 \times 10 = 80$
$9 \times 8 = 72$	$9 \times 9 = 81$	$9 \times 10 = 90$
$10 \times 8 = 80$	$10 \times 9 = 90$	$10 \times 10 = 100$
$11 \times 8 = 88$	$11 \times 9 = 99$	$11 \times 10 = 110$
$12 \times 8 = 96$	$12 \times 9 = 108$	$12 \times 10 = 120$

$\times 11$	$\times 12$
$1 \times 11 = 11$	$1 \times 12 = 12$
$2 \times 11 = 22$	$2 \times 12 = 24$
$3 \times 11 = 33$	$3 \times 12 = 36$
$4 \times 11 = 44$	$4 \times 12 = 48$
$5 \times 11 = 55$	$5 \times 12 = 60$
$6 \times 11 = 66$	$6 \times 12 = 72$
$7 \times 11 = 77$	$7 \times 12 = 84$
$8 \times 11 = 88$	$8 \times 12 = 96$
$9 \times 11 = 99$	$9 \times 12 = 108$
$10 \times 11 = 110$	$10 \times 12 = 120$
$11 \times 11 = 121$	$11 \times 12 = 132$
$12 \times 11 = 132$	$12 \times 12 = 144$



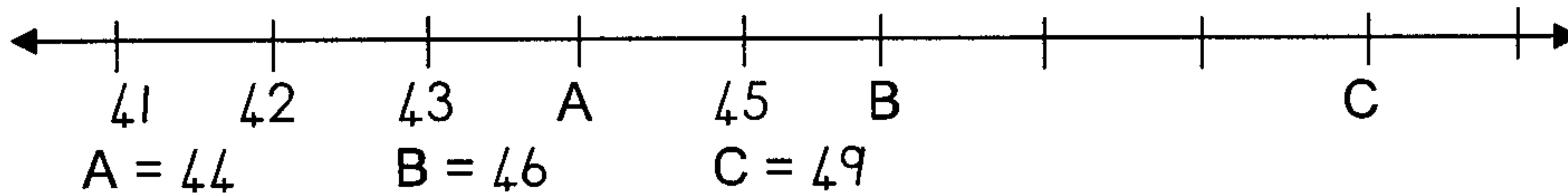
4. Time Table grid

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

5. Numbers

- Positive numbers: Collection of all positive numbers, except 0: {1, 2, 3, 4, 5, 6, 7 ...}
- Whole numbers: Whole numbers are the numbers starting at 0 and counting up forever. Whole numbers don't include negative numbers, fractions, or decimals. {0, 1, 2, 3, 4, 5, 6, 7, 8, 9...}
- Integers: Integers are just like whole numbers, but they also include negative numbers. Like whole numbers, integers don't include fractions or decimals. {... -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5...}

Placing numbers on a number line



6. Expanded notation

Expanded notation means to expand the number in its simplest form. There are three ways to expand numbers.

- ✓ $168 = 100 + 60 + 8$
- ✓ $168 = 1\text{H} + 6\text{T} + 8\text{U}$
- ✓ $168 = (1 \times 100) + (6 \times 10) + (8 \times 1)$

7. Value and place value

- Value: The value of a certain number is what it is worth (NUMBER) e.g. $1\underline{2}6 = 20$
- Place value: Place value can be defined as the value represented by a digit in a number on the basis of its position in the number. (NAME) e.g. $1\underline{2}6 = \text{tens or T}$

Place values you should know:

	Abbreviation	Value
Billion	B	1000000000
Hundred million	HM	100000 000
Ten million	TM	10000000
Million	M	1000 000
Hundred Thousand	HT	100000
Ten Thousand	TT	10000
Thousand	Th	1000
Hundred	H	100
Ten	T	10
Ones	O	1
tenths	t	0.1
hundredths	h	0.01
thousands	th	0.001

Build your own numbers under the right place value:

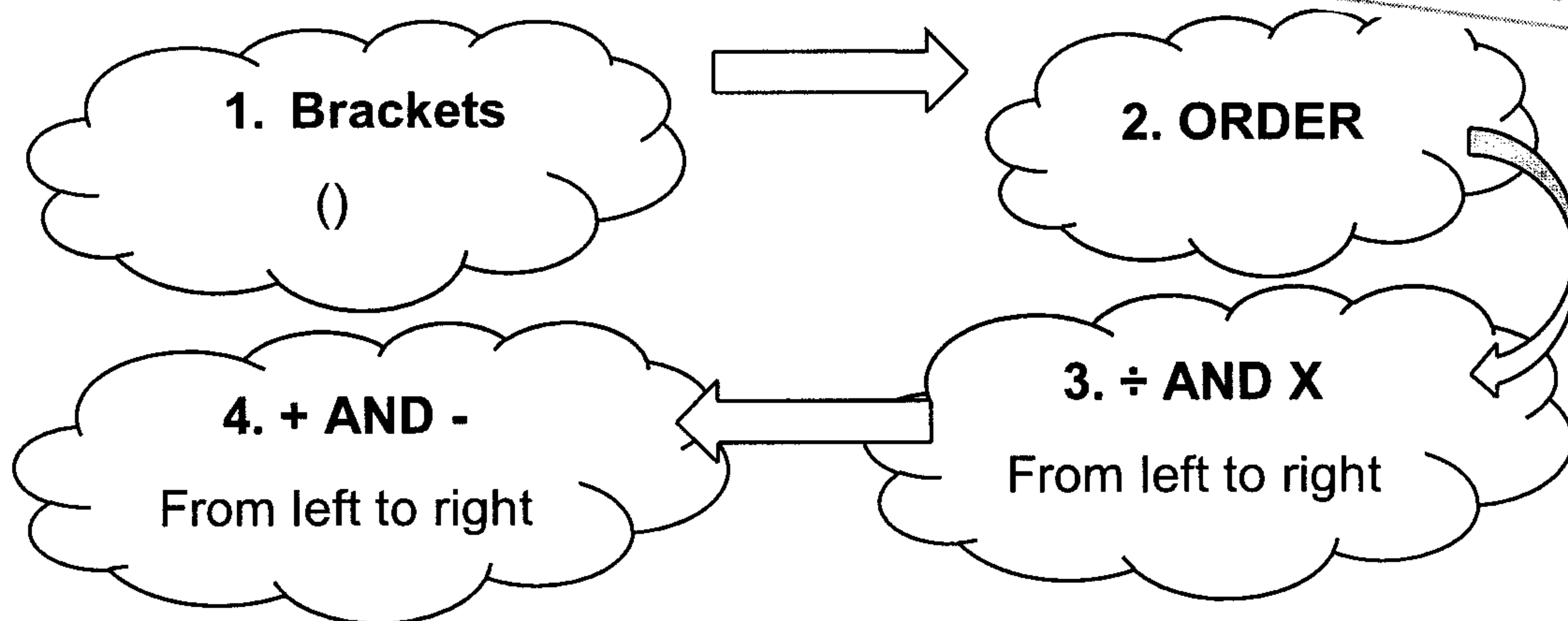
M	HT	TT	Thh	H	T	O

8. Order of operation

BODMAS:

Brackets, order, division, multiplication, addition and subtraction.

B	Brackets	$10 \times (5 + 2) = 10 \times 7 = 70$
O	Order	$5 + 2^2 = 5 + 4 = 9$
D	Division	$10 + 6 \div 2 = 10 + 3 = 13$
M	Multiplication	$10 - 4 \times 2 = 10 - 8 = 2$
A	Addition	$10 \times 4 + 7 = 40 + 7 = 47$
S	Subtraction	$10 \div 2 - 3 = 5 - 3 = 2$



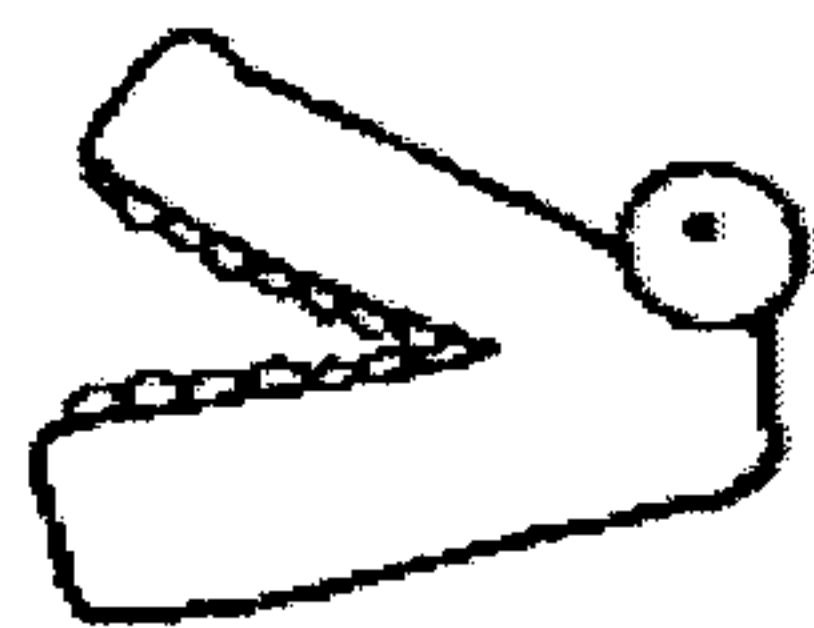
9. Odd and even numbers

Even numbers: All numbers that can be divided by two without any remainder. All the even numbers end with a 2, 4, 6, 8 or a 0.

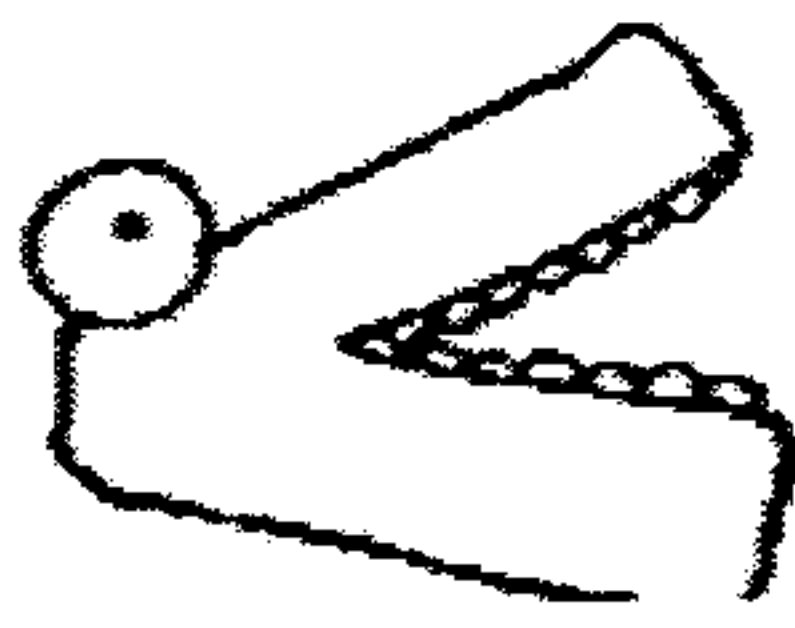
Odd numbers: All numbers with a remainder of one as it is divided by two. All odd numbers end with a 1, 3, 5, 7 or a 9.

10. Greater than, less than and equal to

The crocodile was very hungry. He always wants to eat the most, so always write its mouth open to the greatest number.



greater than



less than



Equal to



21



90

GREATER THAN

The open side is always faced to the largest number
e.g.:

- $2 > 1$
- $170 > 120$
- $7 \times 3 > 2 \times 8$

LESS THAN

The closed end always faced to the smallest number e.g.:

- $3 < 6$
- $10 < 19$
- $287 < 387$

EQUAL TO

If both numbers are equal, e.g.:

- $16 = 16$
- $10 + 4 = 12 + 2$
- $2 \times 4 = 4$

11. Between numbers

A) Numbers between two tenths

- 67 - between 60 and 70
- 289 - between 280 and 290

B) Numbers between two hundreds

- 148 - between 100 and 200
- 1126 - between 1 100 and 1200

C) Numbers between two thousands

- 10025 - 10 000 to 11 000
- 286 245 - between 286 000 and 287 000

D) Which number is exactly between two numbers:

Find the difference between the two numbers, then divide the answer by 2. Subtract the result from the largest number and add the answer to the smallest number.

E.g. What number is exactly between 684 and 452

1. $684 - 452 = 232$
2. $232 \div 2 = 116$
3. $684 - 116 = 568$
4. $452 + 116 = 568$
5. The number is 568.

~ 15 ~

12. Double and halve

Double: Twice as many

Double 14:

$$\begin{array}{r} 10 + 4 \\ \downarrow \quad \downarrow \\ 20 + 8 = 28 \end{array}$$

Double 185:

$$\begin{array}{r} 100 + 80 + 5 \\ \downarrow \quad \downarrow \quad \downarrow \\ 200 + 160 + 10 = 370 \end{array}$$

Halve, is divided by 2

Halve of 16:

$$\begin{array}{r} 10 + 6 \\ \downarrow \quad \downarrow \\ 5 + 3 = 8 \end{array}$$

Halve of 365

$$\begin{array}{r} 300 + 60 + 5 \\ \downarrow \quad \downarrow \quad \downarrow \\ 150 + 30 + 2\frac{1}{2} = 182\frac{1}{2} \end{array}$$

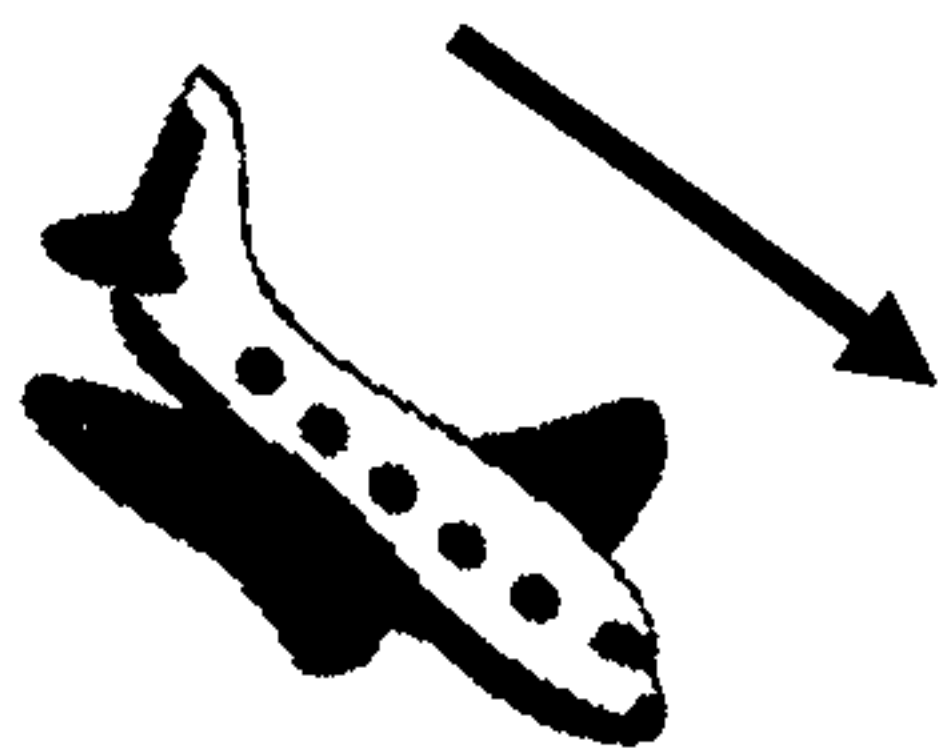
13. Compare and order

Use all the numbers 6; 3; 0; 6; 8 and build the:

- smallest number- Arrange the numbers from smallest to largest, but zero may not be the first number. 30 668
- largest number: Arrange the numbers from largest to smallest. 86 630

14. Ascending and descending order

- DECREASING: When the airplane is about to land from the air, we can see that it is from the largest to the smallest number.



- ASCENDING: When the airplane is about take-off from the bottom up, we can see that it is from the smallest to the largest number.



15. Rounding off

ROUNDING TO THE NEAREST 5

① ② 3 4 5 6 7 ⑧ ⑨ 10

If the ONES are 3, 4, 6 or 7, you round off to the nearest 5: $46 \approx 45$

If the ONES are 1, 2, 8 or 9, you round off to the nearest 10: $28 \approx 30$

ROUNDING TO THE NEAREST 10

10 has 1 zero, so we look at the 1st digit from the right, which will be the ONES.

If the number is below the line 1-4 then it stays at the 10ths: $72 \approx 70$

If the number is above the line 5-9, the 10ths adds one more: $48 \approx 50$

ROUNDING TO THE NEAREST 100

100 has 2 zeros, so we look at the second digit from the right, which will be the TENTHS.

If the number is below the line 10-40 then it stays at the 100s: $146 \approx 100$

If the number is above the line 50-90, the 100s adds one more: $762 \approx 800$

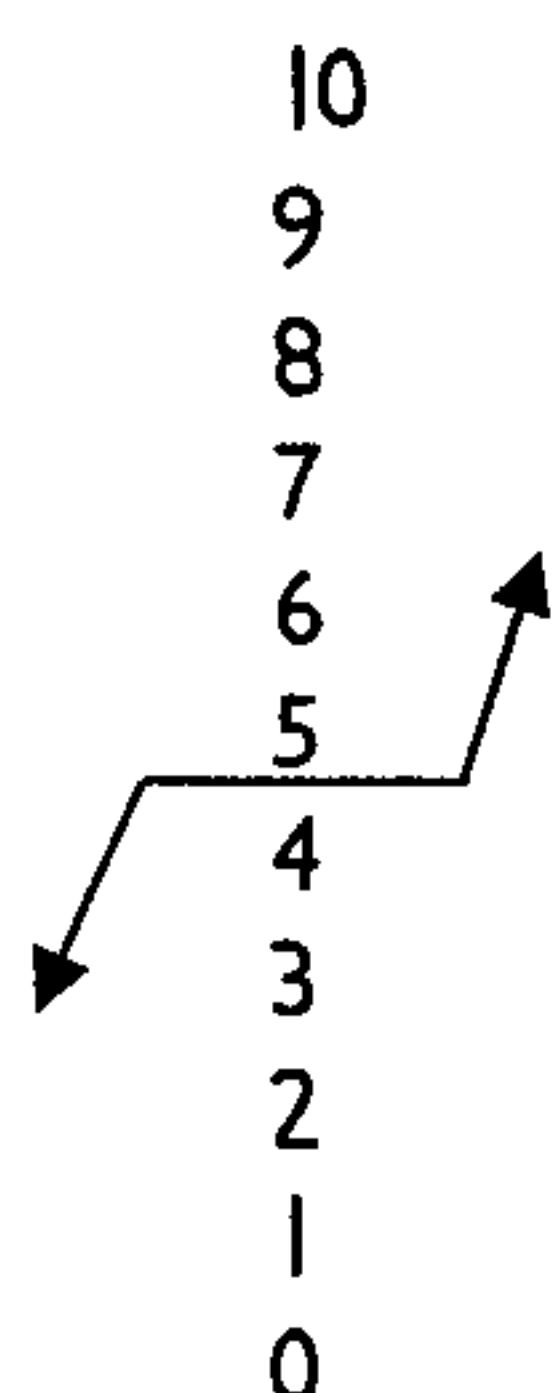
ROUNDING TO THE NEAREST 1000

1000 has 3 zeros, so we look at the 3rd digit from the right, which will be the HUNDREDS.

If the number is below the line 100-400 then it stays at the 1000s: $258 \approx 200$

If the number is above the line 500-900, the 1000s adds one more: $861 \approx 1000$

REMEMBER:



From 0 to 4 is below the line, round off to the nearest 10
e.g. 23: 3 is below the line. The number before the 3 is a 2, so it stays 2.
 $23 \approx 20$.

From 5 to 10 is above the line, so you round up to the next 10 e.g.
78: 8 is above the line. The number before the 8 is a 7.
 $7 + 1 = 8$.
 $78 \approx 80$.

16. Characteristics of 0

- a) Any number multiplied by 0 is 0:
 $11 \times 0 = 0$
- b) 0 divided by any number is 0:
 $0 \div 8 = 0$
- c) Any number divided by 0 is undefined.
 $60 \div 0 = \text{indefinitely}$
- d) Any number plus 0 stays the same number:
 $186 + 0 = 186$
- e) Any number minus 0 stays the same number:
 $23 - 0 = 23$
- f) 0 minus any number equals a negative number:
 $0 - 15 = -15$

17. Characteristics of 1

- a) Any number multiplied by 1 remains the same number:
 $5 \times 1 = 5$
- b) Any number that is divided by 1 remains the same number:
 $12 \div 1 = 12$
- c) Any number plus 1 is a number more:
 $15 + 1 = 16$
- d) Any number minus 1 is 1 less:
 $28 - 1 = 27$

18. Addition and subtraction by breaking down numbers

ADDITION:

$$\text{+} \quad 156 + 186 = \underline{\quad}$$

$$\begin{aligned} 156 &= 100 + 50 + 6 \\ 186 &= 100 + 80 + 6 \\ 200 + 130 + 12 &= 342 \end{aligned}$$

$$\text{+} \quad 156 + 186 = \underline{\quad}$$

$$\begin{aligned} 156 + (100 + 80 + 6) \\ &= 256 + (80 + 6) \\ &= 336 + 6 \\ &= 342 \end{aligned}$$

$$\text{+} \quad 156 + 186 = \underline{\quad}$$

$$\begin{aligned} &= (100 + 50 + 6) + (100 + 80 + 6) \\ &= (100 + 100) + (50 + 80) + (6 + 6) \\ &= 200 + 130 + 12 \\ &= 342 \end{aligned}$$

SUBTRACTION:

$$\blacksquare 478 - 256 = \underline{\quad}$$

$$\begin{aligned} 478 &= 400 + 70 + 8 \\ 256 &= 200 + 50 + 6 \\ 200 + 20 + 2 &= 222 \end{aligned}$$

$$\blacksquare 478 - 256 = \underline{\quad}$$

$$\begin{aligned} &= (400 + 70 + 8) - (200 + 50 + 6) \\ &= (400 - 200) + (70 - 50) + (8 - 6) \\ &= 200 + 20 + 2 \\ &= 222 \end{aligned}$$

$$\blacksquare 523 - 148 = \underline{\quad}$$

$$\begin{aligned} &= 523 - (100 + 40 + 8) \\ &= (523 - 100) - (40 + 8) \\ &= (423 - 40) - 8 \\ &= (383 - 8) \\ &= 375 \end{aligned}$$

19. Properties of whole numbers

1. Commutative property

- You can change the order of the numbers when adding or multiplying and the answer will not change.
- $7 + 6 = 6 + 7$
- $3 \times 2 = 2 \times 3$

2. Associative property

- It does not matter what set of the numbers are calculated first, the answer remains the same.
- $2 + 3 + 4 = (2 + 3) + 4 = 2 + (3 + 4)$
- $3 \times 4 \times 5 = (3 \times 4) \times 5 = 3 \times (4 \times 5)$

3. Distributive property

- The number outside the brackets is multiplied by each number within the brackets and the operator within the brackets are now between the brackets.
- $3(4 + 5)$
 $= (3 \times 4) + (3 \times 5)$
 $= 12 + 15$
 $= 27$

20. Addition and subtraction in columns

Addition:

$$2683 + 1589 = \underline{\quad}$$

	Th	H	T	O
	2	6	8	3
+	1	5	8	9
	4	2	7	2

Subtraction:

$$8643 - 2658 = \underline{\quad}$$

	Th	H	T	O
	8	6	4	3
-	2	6	5	8
	5	9	8	5