Division to 13 Quotient Digits: Teacher's Guide

1. About the drill

A division drill using a "dividend" and a "divisor" that the teacher reads out. Any number of students can take part at the same time. Each correct answer moves a student up one stage, in this order: 4th, 7th, 10th and 13th quotient digit.

2. What you need

- Teacher: the Division to 13 Quotient Digits sheet (answer chart)
- Students: an abacus, paper for writing down the divisor, and a pencil or pen

3. Reading out the dividend and divisor

- The teacher reads out the dividend one digit at a time, and the students set it on the abacus. Example: the dividend 142884 is read "1, 4, 2, 8, 8, 4".
- Next, the teacher says "divisor" and then reads out the divisor, and the students write it down on paper. Example: the divisor 965742 is read "divisor, 965,742".
- When the teacher finishes reading, everyone starts calculating at the same time.

4. How to answer (everyone starts at the 4th digit)

Divide the dividend by the divisor and find 4 quotient digits. Each student answers in 2 steps as soon as they finish calculating.

Example: for the divisor 962514 at the 4th digit, the remainder is 469224 and the digit (the last quotient digit found) is 4.

- Step 1: The student says the last 2 digits of the remainder ("2, 4"). If they are right, the teacher repeats the same digits ("2, 4"). If they are wrong, the teacher says nothing, and the student calculates again from the start.
- Step 2: The student whose digits were repeated says the rest of the remainder and then the digit ("4, 6, 9, 2, digit 4"). If the answer is right, the teacher says "Correct".
- Zeros at the end of the remainder are not said, and they are not printed on the sheet. Example: if the remainder is 095130, the sheet shows "09513" and the last 2 digits are "1, 3".
- The first student to answer correctly wins. Both accuracy and speed matter.

5. Starting the next problem

- After each problem, the teacher reads out the same dividend again and then a new divisor. The students clear the abacus, set the dividend again, and calculate.
- A student who got the previous problem right moves up one stage (after a correct answer at the 4th digit, the student works at the 7th digit from the next problem). A student who did not get it right stays at the same stage.
- On the same problem, different students may be working to different quotient digits.

6. After reaching the 13th digit

A student who answers correctly at the 13th digit either continues at the 13th digit or switches to mental calculation and starts again from the 4th digit.

7. When students are used to it

You can change the difficulty by adding rules about how students remember the divisor. As well as calculation skill, this trains concentration and memory.

- Remember the last 1 or 2 digits of the divisor without writing them down
- Write nothing down: remember the whole divisor and calculate

Dividend	142884

6-digit divisor

(4th, 7th, 10th and 13th quotient digits)

	Divisor	4th digit		7th digit		10th digit		13th digit	
		Digit	Remainder	Digit	Remainder	Digit	Remainder	Digit	Remainder
A	920,912	1	505488	8	828224	9	324112	1	871888
	854,785	1	494265	8	19927	3	105095	2	81123
	760,191	9	441111	0	20022	3	289767	1	134229
	675,639	4	539154	7	669717	1	158751	4	651474
	544,548	3	490596	0	5028	3	182196	4	316968
	433,167	8	255234	9	098637	7	308091	1	109263
	354,914	5	31115	6	245336	1	090426	4	277844
	276,789	2	055182	9	100989	4	237804	9	042249
	194,415	9	084165	2	17772	4	02469	6	19371
B	942,886	5	36771	9	927346	3	489062	8	647052
	830,628	0	15984	2	359424	2	592704	3	466236
	799,252	7	576676	1	415308	9	496212	0	67576
	620,637	2	133626	5	189045	4	371352	8	211074
	596,804	4	091224	2	509792	4	121384	3	232788
	458,712	4	410832	5	28476	0	35856	1	305928
	364,683	8	012006	2	336144	1	270957	2	362214
	218,212	7	206036	4	043872	1	011388	2	040976
	162,709	1	092271	7	014997	2	027772	0	11147
C	963,127	3	522659	2	644166	8	797164	7	657971
	842,306	6	289024	3	113042	4	172996	5	32327
	701,635	6	31114	3	315695	9	660885	1	646465
	635,847	7	091791	4	229032	0	12708	9	546447
	520,365	5	438075	1	448035	1	000735	1	214635
	454,619	2	427102	9	214759	2	178832	3	166733
	347,246	4	269956	7	145858	0	01468	2	095668
	278,352	3	059184	2	173376	2	241056	6	003168
	161,624	0	08384	8	118768	4	135984	1	058216
D	967,083	7	458409	4	011658	2	053004	4	781518
	829,506	2	430668	9	154386	6	097884	8	002292
	756,889	7	590457	0	08358	0	32221	5	532175
	643,001	2	091778	2	471858	3	538267	7	075163
	518,717	4	293382	5	306895	1	333253	2	236686
	439,565	0	25375	7	120995	5	114625	0	3381
	383,051	0	05977	6	014044	6	254164	3	201187
	236,265	7	145545	6	00576	4	08964	9	095565
	180,127	2	072636	3	044819	8	147504	8	160114
E	910,805	8	69776	6	08337	1	486745	4	37513
	849,261	2	382998	0	83055	7	822003	7	767613
	733,605	7	511065	6	47592	8	54396	1	358695
	621,095	0	3215	7	393885	4	11077	8	21509
	537,538	8	063996	9	028978	3	488486	8	401496
	434,051	1	378159	1	100579	1	313219	1	268229
	369,681	5	022935	2	014778	9	360441	5	002025
	237,829	7	201197	5	231495	3	087383	7	099757
	154,354	6	139376	2	148692	3	049098	8	013428
F	941,972	6	810448	0	35208	3	724444	9	067532
	876,889	9	387819	2	234062	6	809526	3	157453
	710,697	0	33903	7	027531	8	524514	8	019614
	631,572	2	224136	4	559512	5	57078	3	470484
	558,454	8	314668	3	258398	2	392252	2	217292
	432,748	1	338852	3	010316	3	362796	8	153176
	391,225	2	0863	0	2305	9	068475	5	010625
	247,548	1	240492	1	122892	6	108192	7	013524
	185,837	8	125144	3	075699	7	063341	0	15642