Times Tables Shifts solution for Nrich

Myself **Shubhangee (Facilitator)** had worked collaboratively on '**Times Tables Shifts**' with a group of 13 students, in online mode, in '**Ganit Kreeda', Vicharvatika, India.** The names of the students are:

Ahana, Sehar, Saanvi, Dhanvin, Aariz, Ananthjith, Vivaan, Sai, Pranathi, Paavani, Utkarsh, Tavish, Dhruv.

All the kids worked collaboratively during the session using interactivity. Here are the answers they found for all the questions.

What is the same between numbers in a times table and numbers in the shifted times table?

A. The difference between two numbers of the shifted time table is the same as the normal table.

2. What can you learn from the difference between any two numbers in a shifted times table?

A. the difference is the same from the normal table.

3. How do you find the shift once you've worked out the table?

A. Add or subtract the original number from the time table.

4.What can you say if the numbers from the shifted table are all odd?A. We can say that an odd number is subtracted or added from an even number table.

Sharing pics of some of the kid's solution:

First 3 images show Sehar's work:

level Date: Q1. 8, 14, 20, 26, 32 talele 6 shipled up by 2	level 2 Dota: QI 6 17, 28,39,50 telle 1 shifted down by 5
Q27,12,17,22,27 table 5 shifted .	Q2 14 25 36 47,58 table 11 shifted
Q38 1724 3544 table 9 shipted	Q3 15 29 43 57,71 table 14 shipted up
Q4 17 2 7,37,47,57 talle 10 shifted	Q4 9 25 41 57,73 table 16 shifted down Ing 7
Date	1 apel 4
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<u>enel</u> <u>900063</u> <u>917101379225 talle 3 shifted yn</u> <u>191</u> <u>929,30,72,86,93 talle 7 shifted</u> <u>up 192</u>	Capel 4 21 46 94 19 0206238 table 16 alifted down log 2 02 25,47,69,91,162 table 1 shipted up by 3
91 7, 10, 13, 19, 25, take 3 shifted 44 11 7, 10, 13, 19, 25, take 3 shifted 44 141 129, 30, 72, 86, 93, take 7 shifted 14, 1 17, 23, 38, 41, 44, take 3 shifted down 143 2	1 46,94,190206238 tobe 16 alighted down log 2 225,47,69,91,168 toles 11 shifted up by 3 R3 112,146,163,197,214 tobele 17 shifted up log 10

Methond for finding shipe Ahana Sused hor leve The method I used hor finding the shift for all the levels in I and 2 is to subtract I conservation checked I for the the table numbers and the difference will on & maller il number was brigger be the table because you are it was biggen it repuld just adding the number of shifted down and if the table each time and smaller it would be shifted i is reported addition or multiplication The method I used poor level 3 and 4 was to spiorst assurance all the pumplies in exending services thep I checked all the talles bellow the first sumber and unumleops without any multiples in the number Group/ Class & Div. : ___ Roll No.: Of _ Topic : _ Subject : ____ limes Tables Shift HW 1. My strategy to find out the tables and how much it has been shifted: Tirstly, the computer gives 5 numbers. Subtract the first number by the second number; the ruresult will be the table of that has been shifted. (2) Next, subtract the first number by your table. The result will be the number which the table has been shifted up by 18 the 1st number is smaller than the table, than click the shifted' button to down' and s put in the difference between the first number and your table number in the bank.

		rk	•	
	thanks w	Times Table	Worked out Shifted 7/2 Worked out shift unes, Table by~	Name : Group/ Class
Great minds (3, 7, 11, 15, 19	4	First no. 73 Shifted down Table no.4 Second no.7 1-3=4 4-3=1	& Div. :
discuss ideas	1, 9, 17,25,33	8	First no. $$1$ Shifted bown Table no. 8 Second no. 39 by 7 First no=1 3==9-1=8 $8-1=7$	14
; average mi	2, 7, 12, 17, 22	5	First no.2 Shifted dawn Table no.5 Second no.7 Gy 3 First no.2 7-2=5 5-2=3	
nds discuss (6,15,24,33,42	9	First no. 6 Second no. 915 Gri5-6=9 Second no. 915 Gry 3 First no. 6 Grist no. 6 Grist no. 6	
events; smal	1, 3, 5, 7, 9	2	Firgt no.1 Shifted down Table no.2. Second no.3 by () First no.1 2-1=1	Roll No.:
l minds discu	3,12,21,30,39	9	First no.3 Shifted Bown Table no.9 Second no.12 by C G G-3=6	Pa M
ss people." – El	8,14,20,26,32	6	First no. 8 Shifted UP Table no.6 Second no.14 by 2 First no.8 14-8-6 8-6=2	ge:(
leanor Rooseve	4,7,10,13,16	23	First no.4 Shifted [07] Table no.3 Second no.7 Uy () First no.4 7-4=3 4-3=1	of
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Below 9 images are from Pranathis work:

	HW Shifting	latt smith	Re	
5.0910 100 .01910 100	Times Talkos	ady wood the hestrow	And take	BUT THE
19916,23,30,37	7	16-9=7	up 2	2114 9-7=2
26,13,20,27,34	7	13-6=7	down 1	7-6=1
3)7.11,15,19,23	4	11-7=4	up 3	7-4=3
4)3.5,7,9,11	2	5-3=2	up 1	3-2-1
214,7.10,13.16	3	17-4=3	Tupi	4-3-1
1) 0 \$213 1) 0 \$213 45 45	88 51 61 F) 27 -	xt 34 34 16 27 18	4	

Mage 9, 18, 27, 36, 45, 54, 63, 72, 36, 20, 9, 4)187 108, 117, 126, 135, 144 108, 117, 126, 135, 144

	20165-2					
	5 new numbers	conit AlaT	Log liston	Shifted Journ Lup	y wed	
1)25,	44,63,82,101	19	44-25=19	sup 6	25-19:1	
2)12,7	26,40,54,68	14	26-12-14	dawn 2	12-14=-	
3)18,1	35, 52, 69,86	17	35-18:17	up I	18-17-1	
47.	21,35,49,63	14	21-7=14	Towab	7-14=7	
5)2	36,51,66,81	15	36-21=15	up b	21-15=5	

5.0000	Timoz Takle	nay want	bothole gu Imuah	nou work
Malanat		the table	by '	exit the
1)85.61,34,16	9		dava 2	16-18=+2
2)37,22,97,57,	5		mp 2	. 12-10=2
3)59,11,67,115,	8		mb 3	11-8=3
4) 57.67.27,97	, 10		down 3	27-30=-3
5) 20,83,90,6	2, 7	-	docur 1	20-21=-

			Ler	rel-4
S breeze		5.MW MIRKS	Times Table	how from
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1200	1,155,125,11 140,95	15	ANO. 1
Multiples of 10=10,20, 30, 40, 50, 60, 70, 80, 90,100 110, 120	2)45	205,237, 61, 157	16	
5) 1 0 83 63 ¹² 55 (92) 062 (-)55 6)20	3)7)	,59,155, 131,119	12	
$\frac{(10)}{07} \overline{21} \overline{01} \overline{12}$	1(4	1), 216, 186, 156, 66	15	
M. \$7=07,14,21,28,35,42,49,56,63,70,71, 34,91,98	100	151,139,40	11	T

		Ler	M 9		
	5.new numbers	Times Takto	how you. worked and the tells	Jawas Lut	hav usu worked out the
1200	155,1251	15		mp 5	95-90-5
2)45,	205,237,	16		down3	45-48=-1
3)71	59,155, 131,119	12		1 sweb	59-60:-
1(4	1,216,186,	15		up 6	66-60=06
5	151,139,40 62,161	11		down 4	40-44=-1

	10 30 00 -
$\frac{1}{2} \frac{37}{10} + \frac{57}{20} + \frac{27}{10} + \frac{27}{10$	Multiples of 10=10,20, 30, 40, 50, 60, 70, 80, 70,100 - 10, 120
Mat 5= 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, -	5) 810 83 55 HOD
3) 1, 15 54 69 51 (1) 67 (159 (-) 51 (1) 67 (159 (-) 51 (1) 08 08 08 00	+ <u>33</u> <u>062</u> <u>07</u> <u>35</u> <u>07</u> <u>2</u> <u>1</u> <u>07</u> <u>35</u> <u>07</u> <u>2</u> <u>1</u> <u>07</u> <u>35</u>
Mag 8: 8, 16, 24, 32, 40, 48, 56, 44, 72, 80, 88, 96- 104, 112, 120, 128, 136	11.10, 00,14, <u>1</u> ,198
$\frac{1)20}{155} \times 10 \times 155 \times 10000 \times 10000 \times 10000 \times 100000 \times 100000000$	Inel-4
M. of 15=15, 30, 45, 60, 75, 90, 103, 120, 135, 150 165, 180, 195, 210	246 186 184 753 7186 -171 756 - 66
2)237 203 457 551 ()205 ()157 ()61 ()48 032 ()48 96 16	030 015 015 90 M& 15=15,30,15.60,75, 90,105,120,133,50 165,130, 195,210,225
Mat 16=16,32, 12,64,30,96,112,128,144,160, 176,192,203, 224,240	<u>511 013</u> 1000 12 51
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	022 77 11 11 022 77 11 11
Mag 12=12,24,36,40,60,72,84,96,108,120, 1:132,144,156,168	Mag 11=11, 22, 33, 14, 2910, 17 143, 154, 165, 176
1. 108	
2. Found the differences Strucen ear numbers for level and 2	h consective
For level 3 and 4 Difference between t briggest aumier and 2rd biggest and so on Minimum differen times table.	he first runner, ce is the

Dw:22/02/24 Localen 5 H. W. 22 (Can you work out the table and shift wook time? 42 Yes a 2 of Explain your mothed and why it works A20 the a low my moled. I find untract two numbers apparing together to find the times table. They subbrand a number sallies a then find the difference of broom in the table of 2 will go give the difference of 2. Eg 16 and 18 18-16 = 2. This write for shifted the S digits and the monest number 110 from the times table to find to ord by tron have much the table is shifted up tables for is 3 and 5 5-3=2 This is why the first part of my method works. or down. Scanned with CarriScanner a 20 12 thy does it work? A 20 In the lable of 2 230 11 2 is being added notestaticity repeaterally and so any two numbers apening together in the table of 2 will go give 40. 5 . 5 . 11 . 15 . . 1 the difference of 2. Eg 16 and 18 12 - 11 = 2. This works for shifted tables for . Eg 3 and 5 5-1=2 This is why the first part of my method works. The mountert Note - ("be jude 1 and 2, 3 5-3=2 addrest find the difference of the it walter the in the times table and the first Scanned with CarnScanner number out of the few number question because only the first five multiple are given in these budy De 11 5-3-2, treame the so the table has been at defied by 2. have the monter in the from the from the from the from the fire number a grater, the table has been shifted up a 5.8.11.10.11 R-4-3. so it in the table of 3. 5. 8. 11. 14. 17 The works because SHIR STREET, MAN STREETER which prever that I is long added analytically repealedly. There it is times table of 3 Scanned with CamScan -1 2-3-2, because the 40 the table has

been al abilited by 2. lines the mundez in the from the five number is greater. the table has been abilited up a -2 () + 2 3, 6, 9, 12, 15

Lin	ns kilde			
Whent	worldad	hilled	E has Indreed	1.
7	11-45 7	Hown by	7-4=3	-2
10	27-17:0	up tuy 7	17-10-27	1
8	21-13=8	up log 5	13-6:5	-1
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13	ALC: NO. 15	down by 2	13-11-5-2	- 3
3	19-2-12	aply 2	14-12=121	-
	10 9 10 8 16 12 2	Line We worked and 7 11-4-7 10 27-17-9 8 21-92-8 16 23-27-16 13 24-12-15 7 14-2-12	Line Web 	Jinus bills 1 - + - 7 down by 3 7 - 4 = 3 10 27-17: Bigh by 7 27-10 = 7 8 28-88 = 8 upling 5 12-10 = 7 16 43-27=16 upling 5 12-10 = 1 13 20-12=13 down by 2 12-10 = 2 3 19-2:-12 down by 2 12-10 = 2 3 19-2:-12 down by 2 19-11 = 2

Last 3 images show Anathjith's work.