Log Tables https://www.youtube.com/watch?v=VRzH4xB0GdM

1) **Word study – Criminal Records**

Fill in a sample "criminal record" for three words from the list.

logarithm, mistake, mathematical table, calculator, lad, professional, decimal places, multiplication, simplification

1	2	**3**	**4**	**5**	**6**
Name	John Smith	*fat*			
Place of residence	29 Baker Street West Croydon	*body*			
Known associates	Peter Jackson Arthur Baines	*carbohydrates cholesterol*			
Criminal record	robbery, terrorism, kidnapping	*heart disease ugliness*			

2) True or false?

a) Common logarithm, also known as the decimal logarithm, was named after its base.

b) Henry Briggs was an American mathematician who pioneered its use.

c) Common logarithms are indicated by $\log_e(x)$.

d) The method of logarithms was publicly propounded by John Napier in 1514, in a book entitled *Mirifici Logarithmorum Canonis Descriptio.*

e) Due to their utility in saving work in laborious multiplications and divisions with pen and paper, tables of base 10 logarithms were given in appendices of many books.

f) Such a table of "common logarithms" gave the logarithm, often to 14 or 15 decimal places, of each number in the left-hand column, which ran from 1 to 10 by small increments, perhaps 0.01 or 0.001.

g) There was only a need to include numbers between 1 and 10, since the logarithms of larger numbers can then easily be derived.

h) Electronic calculators were not in widespread use before the early 1970s.

i) Early digital computers were developed during World War I. in part to produce specialized mathematical tables for aiming artillery.

j) Numbers between (and excluding) 0 and 2 have negative logarithms.

3)Listen to and watch the video about logarithm tables. Then try to explain:

a) How and why can you replace multiplication and division by addition and subtraction?

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b) How do you work with log tables (i.e. how can you find $\log_{10}(37)$ or $\log_{10}(59)$?

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c) What do you use antilogarithm tables for?

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d) What does the professor think about accuracy and reliability of log tables?

LOGARITHMS, BASE 10 $\log_{10} x$ or $\lg x$

x	0	1	2	3	4	5	6	7	8	9	1 2 3	4 5 6	7 8 9
											ADD		
10	.0000	0043	0086	0128	0170						4 8 13	17 21 25	29 34 38
						0212	0253	0294	0334	0374	4 8 12	16 20 24	28 32 36
11	.0414	0453	0492	0531	0569						4 8 12	16 19 23	27 31 35
						0607	0645	0682	0719	0755	4 7 11	15 19 22	26 30 33
12	.0792	0828	0864	0899	0934						4 7 11	14 18 21	25 28 32
						0969	1004	1038	1072	1106	3 7 10	14 17 20	24 27 31
13	.1139	1173	1206	1239	1271						3 7 10	13 16 20	23 26 30
						1303	1335	1367	1399	1430	3 6 10	13 16 19	22 26 29
14	.1461	1492	1523	1553	1584	1614	1644	1673	1703	1732	3 6 9	12 15 18	21 24 27
15	.1761	1790	1818	1847	1875	1903	1931	1959	1987	2014	3 6 8	11 14 17	20 22 25
16	.2041	2068	2095	2122	2148	2175	2201	2227	2253	2279	3 5 8	10 13 16	18 21 23
17	.2304	2330	2355	2380	2405	2430	2455	2480	2504	2529	2 5 7	10 12 15	17 20 22
18	.2553	2577	2601	2625	2648	2672	2695	2718	2742	2765	2 5 7	10 12 14	17 19 22
19	.2788	2810	2833	2856	2878	2900	2923	2945	2967	2989	2 4 6	9 11 13	15 18 20
20	.3010	3032	3054	3075	3096	3118	3139	3160	3181	3201	2 4 6	8 11 13	15 17 19
21	.3222	3243	3263	3284	3304	3324	3345	3365	3385	3404	2 4 6	8 10 12	14 16 18
22	.3424	3444	3464	3483	3502	3522	3541	3560	3579	3598	2 4 6	8 10 11	13 15 17
23	.3617	3636	3655	3674	3692	3711	3729	3747	3766	3784	2 4 5	7 9 11	13 14 16
24	.3802	3820	3838	3856	3874	3892	3909	3927	3945	3962	2 4 5	7 9 11	13 14 16
25	.3979	3997	4014	4031	4048	4065	4082	4099	4116	4133	2 3 5	7 9 10	12 14 15
26	.4150	4166	4183	4200	4216	4232	4249	4265	4281	4298	2 3 5	6 8 10	11 13 14
27	.4314	4330	4346	4362	4378	4393	4409	4425	4440	4456	2 3 5	6 8 10	11 13 14
28	.4472	4487	4502	4518	4533	4548	4564	4579	4594	4609	2 3 5	6 8 9	11 12 14
29	.4624	4639	4654	4669	4683	4698	4713	4728	4742	4757	1 3 4	6 7 9	10 12 13
30	.4771	4786	4800	4814	4829	4843	4857	4871	4886	4900	1 3 4	6 7 8	10 11 13
31	.4914	4928	4942	4955	4969	4983	4997	5011	5024	5038	1 3 4	6 7 8	10 11 13
32	.5051	5065	5079	5092	5105	5119	5132	5145	5159	5172	1 3 4	5 7 8	9 10 12
33	.5185	5198	5211	5224	5237	5250	5263	5276	5289	5302	1 3 4	5 6 8	9 10 12
34	.5315	5328	5340	5353	5366	5378	5391	5403	5416	5428	1 3 4	5 6 8	9 10 12
35	.5441	5453	5465	5478	5490	5502	5514	5527	5539	5551	1 2 4	5 6 7	8 10 11
36	.5563	5575	5587	5599	5611	5623	5635	5647	5658	5670	1 2 4	5 6 7	8 10 11
37	.5682	5694	5705	5717	5729	5740	5752	5763	5775	5786	1 2 4	5 6 7	8 10 11
38	.5798	5809	5821	5832	5843	5855	5866	5877	5888	5899	1 2 3	4 6 7	8 9 10
39	.5911	5922	5933	5944	5955	5966	5977	5988	5999	6010	1 2 3	4 6 7	8 9 10
40	.6021	6031	6042	6053	6064	6075	6085	6096	6107	6117	1 2 3	4 5 7	8 9 10
41	.6128	6138	6149	6160	6170	6180	6191	6201	6212	6222	1 2 3	4 5 6	7 8 9
42	.6232	6243	6253	6263	6274	6284	6294	6304	6314	6325	1 2 3	4 5 6	7 8 9
43	.6335	6345	6355	6365	6375	6385	6395	6405	6415	6425	1 2 3	4 5 6	7 8 9
44	.6435	6444	6454	6464	6474	6484	6493	6503	6513	6522	1 2 3	4 5 6	7 8 9
45	.6532	6542	6551	6561	6571	6580	6590	6599	6609	6618	1 2 3	4 5 6	7 8 9
46	.6628	6637	6646	6656	6665	6675	6684	6693	6702	6712	1 2 3	4 5 5	6 7 8
47	.6721	6730	6739	6749	6758	6767	6776	6785	6794	6803	1 2 3	4 5 5	6 7 8
48	.6812	6821	6830	6839	6848	6857	6866	6875	6884	6893	1 2 3	4 4 5	6 7 8
49	.6902	6911	6920	6928	6937	6946	6955	6964	6972	6981	1 2 3	4 4 5	6 7 8

Examples:

$\lg 3.674 = 0.5647 + 0.0005 = 0.5652$
$\lg 367.4 = \lg (3.674 \times 10^2) = 2.5652$
$\lg 0.003674 = \lg (3.674 \times 10^{-3}) = \bar{3}.5652$

Constant	π	e	$\lg e$	$\ln 10$
Value	3.14159	2.71828	0.43429	2.30259
log (base 10)	0.49715	0.43429	$\bar{1}$.63778	0.36222