Basic Math - Practice Problems
Averages Answer Key

The Division of Water Quality makes no claim as the accuracy of any answers provided herein.

PRACTICE PROBLEMS 6.1: Averages

❑ Calculate the arithmetic mean for each problem below.

1.

mg/L	mg/L
146	149
130	158
151	164
132	

= 147

Add up all numbers / 7

2.

MGD
0.91
0.83
0.97
1.36
1.15
0.84

= 1.01

Add up all numbers / 6

3.

mg/L
2470
2185
2316

= 2324

All numbers / 3

4.

lbs	lbs
4620	4780
4130	4640
4910	4270
5300	4480

= 4641

Add All / 8

5.

mg/L	mg/L
42	45
48	41
39	49
36	52

= 44

Add All / 8

❑ Determine the arithmetic mean and median for problems 6-8.

6.

MPN/100	
260	3310
220	415
240	360
~~290~~	290
~~360~~	280 —
~~3310~~	260
~~415~~	240
~~280~~	240
240	220

= 624

median - 280

7.

mg/L	
170	240
~~190~~	190
~~180~~	190
~~240~~	180 —
~~190~~	175
160	170
175	160

= 186

median - 180

8.

mg/L	
~~2450~~	2650
~~2610~~	2610
~~2290~~	2540
~~2540~~	2450 ←
~~2650~~	2290
~~1820~~	2210
~~2210~~	1820

= 2367

median - 2450

❑ Determine the mode value for the following data sets:

9. Mode value for problem 6

= 240

10. Mode value for problem 7

= 190

PRACTICE PROBLEMS 6.2: Moving Averages

❑ Calculate the first five 7-day moving averages for each problem given below.

1.

Day	SVI	Day	SVI
1	110	7	133
2	105	8	126
3	113	9	131
4	123	10	122
5	140	11	124
6	117		

= 1 120 4 127
2 122 5 128
3 126

2.

Day	mg/L	Day	mg/L
1	260	8	308
2	225	9	297
3	232	10	269
4	221	11	273
5	246	12	256
6	283	13	281
7	324	14	262

= 1 256 4 278
2 263 5 286
3 273

❑ Calculate the first four 5-day moving averages for each problem given below.

3.

Day	mg/L	Moving Average
1	24	
2	18	
3	16	
4	21	
5	28	21
6	24	21
7	33	24
8	22	26

4.

Day	mg/L	Moving Average
1	136	
2	152	
3	145	
4	167	
5	151	150
6	174	158
7	149	157
8	136	155

PRACTICE PROBLEMS 6.3: Weighted Averages

❑ In problems 1 and 2, calculate the weighted average using 10-pt groups. How does this arithmetic mean compare with the one calculated without grouping?

1.

~~170~~	~~126~~	~~182~~	~~146~~	~~168~~	~~145~~	~~115~~	~~108~~
~~115~~	~~147~~	~~141~~	~~159~~	~~174~~	~~151~~	~~136~~	~~110~~
~~122~~	~~164~~	~~136~~	~~129~~	192	~~137~~	~~144~~	~~121~~
~~105~~	~~137~~	~~107~~	~~118~~	~~181~~	~~123~~	~~153~~	~~143~~
~~118~~	~~153~~	~~124~~	~~120~~	~~164~~	~~117~~	~~140~~	181

	N	Avg
100 - 109	3.	104.5
110 - 119	6	114.5
120 - 129	7	124.5
130 - 139	4	134.5
140 - 149	7	144.5
150 - 159	4	154.5
160 - 169	3	164.5
170 - 179	2	174.5
180 - 189	4	184.5
190 - 199	0	194.5
	40	

$$\frac{3 \times 104.5 + 6 \times 114.5 + \ldots}{40}$$

Weighted Average 140

Regular Arithmetic Mean 141
(No grouping)

2.

~~240~~	~~241~~	~~210~~	~~247~~	~~211~~	~~219~~
~~207~~	~~217~~	~~212~~	~~264~~	~~235~~	~~227~~
~~219~~	~~222~~	~~231~~	~~258~~	~~228~~	~~249~~
~~236~~	~~245~~	~~217~~	~~219~~	~~248~~	~~266~~
~~250~~	~~261~~	~~225~~	~~208~~	~~233~~	~~240~~

Weighted Average 233

Regular Arithmetic Mean 233
(No grouping)

	N	Avg
200 - 209	2	204.5
210 - 219	8	214.5
220 - 229	4	224.5
230 - 239	4	234.5
240 - 249	7	244.5
250 - 259	2	254.5
260 - 269	3	264.5
270 - 279	0	274.5
280 - 289	0	284.5
290 - 299	0	294.5
	30	

$2 \times 204.5 = 409$

$8 \times 214.5 = 1716.0$

$4 \times 224.5 = 898$

$4 \times 234.5 = 938$

$7 \times 244.5 = 1711.5$

$2 \times 254.5 = 509$

$3 \times 264.5 = 793.5$

$$\frac{6975}{30}$$