

Appendices

Appendix 1: The proportion of types of activities for students within the particular topics of the analysed Slovenian chemistry textbook sets (TS) for primary school

The topics of the National Chemistry Curriculum for Primary School (8 th and 9 th Grade)	TS	Type of activities for students													
		Experimental activities				Other practical activities				Rating scales related to learning goals		Other tasks for repeating and deepening knowledge		SUM	f (%)
		Demonstrations		Individual students' experimentations		Tasks for Internet searches		Project work, building molecular structures etc.							
										N	f (%)	N	f (%)		
Chemistry is a World of Matter	1	0	0.00	1	0.70	3	2.10	2	1.40	0	0.00	137	95.80	143	100.00
	2	2	2.70	0	0.00	0	0.00	0	0.00	0	0.00	72	97.30	74	100.00
	3	3	5.45	5	9.09	2	3.64	4	7.27	0	0.00	41	74.55	55	100.00
	4	0	0.00	7	11.86	5	8.47	5	8.47	0	0.00	42	71.19	59	100.00
	5	0	0.00	2	1.45	1	0.72	5	3.62	20	14.49	110	79.71	138	100.00
Atom and the Periodic System of Elements	6	3	3.16	10	10.53	8	8.42	15	15.79	0	0.00	59	62.11	95	100.00
	1	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	137	100.00	137	100.00
	2	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	47	100.00	47	100.00
	3	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	58	100.00	58	100.00
	4	0	0.00	0	0.00	2	2.50	2	2.50	0	0.00	76	95.00	80	100.00
Compounds and Bonding	5	0	0.00	1	1.67	1	1.67	1	1.67	7	11.67	50	83.33	60	100.00
	6	0	0.00	2	3.45	1	1.72	14	24.14	0	0.00	41	70.69	58	100.00
	1	0	0.00	0	0.00	0	0.00	1	1.39	0	0.00	71	98.61	72	100.00
	2	3	5.17	0	0.00	0	0.00	0	0.00	0	0.00	55	94.83	58	100.00
	3	0	0.00	5	10.20	2	4.08	4	8.16	0	0.00	38	77.55	49	100.00
Chemical Reactions	4	0	0.00	2	3.28	8	13.11	0	0.00	0	0.00	51	83.61	61	100.00
	5	0	0.00	1	1.18	1	1.18	3	3.53	13	15.29	67	78.82	85	100.00
	6	1	2.27	1	2.27	0	0.00	11	25.00	0	0.00	31	70.45	44	100.00
	1	0	0.00	1	1.33	0	0.00	1	1.33	0	0.00	73	97.33	75	100.00
	2	6	4.69	0	0.00	0	0.00	0	0.00	0	0.00	122	95.31	128	100.00
The Elements in the Periodic Table	3	6	12.50	7	14.58	0	0.00	0	0.00	0	0.00	35	72.92	48	100.00
	4	0	0.00	12	20.69	4	6.90	0	0.00	0	0.00	42	72.41	58	100.00
	5	0	0.00	4	4.04	0	0.00	3	3.03	17	17.17	75	75.76	99	100.00
	6	0	0.00	15	18.07	4	4.82	17	20.48	0	0.00	47	56.63	83	100.00
	1	0	0.00	0	0.00	1	0.42	0	0.00	0	0.00	239	99.58	240	100.00
Acids, Bases and Salts	2	6	2.97	0	0.00	0	0.00	0	0.00	0	0.00	196	97.03	202	100.00
	3	2	2.15	6	6.45	5	5.38	1	1.08	0	0.00	79	84.95	93	100.00
	4	0	0.00	7	11.11	3	4.76	1	1.59	0	0.00	52	82.54	63	100.00
	5	1	0.71	5	3.55	3	2.13	6	4.26	17	12.06	109	77.30	141	100.00
	6	8	7.34	9	8.26	1	0.92	17	15.60	0	0.00	74	67.89	109	100.00
Hydrocarbon s and Polymers	1	0	0.00	0	0.00	1	0.45	0	0.00	0	0.00	221	99.55	222	100.00
	2	9	6.04	1	0.67	0	0.00	0	0.00	0	0.00	139	93.29	149	100.00
	3	3	3.45	16	18.39	2	2.30	0	0.00	0	0.00	66	75.86	87	100.00
	4	5	4.59	11	10.09	3	2.75	2	1.83	0	0.00	88	80.73	109	100.00
	5	0	0.00	6	3.75	4	2.50	3	1.88	23	14.38	124	77.50	160	100.00
Organic Compounds Containing Oxygen	6	0	0.00	11	18.03	1	1.64	7	11.48	0	0.00	42	68.85	61	100.00
	1	0	0.00	0	0.00	4	1.03	0	0.00	0	0.00	386	98.97	390	100.00
	2	3	1.58	6	3.16	0	0.00	0	0.00	0	0.00	181	95.26	190	100.00
	3	1	0.87	11	9.57	6	5.22	4	3.48	0	0.00	93	80.87	115	100.00
	4	1	1.06	9	9.57	10	10.64	11	11.70	0	0.00	63	67.02	94	100.00
Organic Compounds Containing Nitrogen	5	0	0.00	5	3.88	1	0.78	6	4.65	19	14.73	98	75.97	129	100.00
	6	0	0.00	5	9.62	0	0.00	16	30.77	0	0.00	31	59.62	52	100.00
	1	0	0.00	0	0.00	0	0.00	2	0.53	0	0.00	372	99.47	374	100.00
	2	9	6.77	3	2.26	0	0.00	0	0.00	0	0.00	121	90.98	133	100.00
	3	4	2.86	24	17.14	5	3.57	2	1.43	0	0.00	105	75.00	140	100.00
The Mole	4	5	6.02	10	12.05	18	21.69	7	8.43	0	0.00	43	51.81	83	100.00
	5	0	0.00	13	5.88	8	3.62	3	1.36	11	4.98	186	84.16	221	100.00
	6	4	3.77	14	13.21	6	5.66	27	25.47	0	0.00	55	51.89	106	100.00
	1	1	1.00	0	0.00	0	0.00	0	0.00	0	0.00	99	99.00	100	100.00
	2	10	9.26	1	0.93	1	0.93	1	0.93	0	0.00	95	87.96	108	100.00
	3	2	3.08	10	15.38	0	0.00	0	0.00	0	0.00	53	81.54	65	100.00
	4	1	1.72	8	13.79	11	18.97	7	12.07	0	0.00	31	53.45	58	100.00
	5	0	0.00	4	2.90	6	4.35	5	3.62	20	14.49	103	74.64	138	100.00
	6	0	0.00	9	14.06	0	0.00	15	23.44	0	0.00	40	62.50	64	100.00
	1	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	50	100.00	50	100.00
	2	0	0.00	0	0.00	0	0.00	1	1.14	0	0.00	87	98.86	88	100.00
	3	1	2.38	0	0.00	1	2.38	0	0.00	0	0.00	40	95.24	42	100.00
	4	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	48	100.00	48	100.00
	5	0	0.00	1	2.86	0	0.00	0	0.00	3	8.57	31	88.57	35	100.00
	6	0	0.00	1	2.70	1	2.70	6	16.22	0	0.00	29	78.38	37	100.00

Appendix 2: The proportion of types of activities for students within the particular topics of the analysed Slovenian chemistry textbook sets (TS) for secondary school

The topics of the National Chemistry Curriculum for Secondary School (1 st , 2 nd and 3 th Year)	TS	Type of activities for students													
		Experimental activities				Other practical activities				Rating scales related to learning goals		Other tasks for repeating and deepening knowledge		SUM	f (%)
		Demonstrations		Individual students' experimentations		Tasks for Internet searches		Project work, building molecular structures etc.							
										N	f (%)	N	f (%)		
Safe Experimental Work	1	0	0.00	0	0.00	1	3.57	0	0.00	0	0.00	27	96.43	28	100.00
	2	0	0.00	0	0.00	3	4.76	0	0.00	0	0.00	60	95.24	63	100.00
	3	0	0.00	2	5.71	2	5.71	2	5.71	0	0.00	29	82.86	35	100.00
	4	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	44	100.00	44	100.00
Building Blocks of Matter	1	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	83	100.00	83	100.00
	2	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	153	100.00	153	100.00
	3	0	0.00	0	0.00	2	1.56	0	0.00	0	0.00	126	98.44	128	100.00
	4	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	107	100.00	107	100.00
Compounds and Bonding	1	1	0.59	3	1.78	0	0.00	0	0.00	0	0.00	165	97.63	169	100.00
	2	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	174	100.00	174	100.00
	3	0	0.00	2	1.54	3	2.31	6	4.62	0	0.00	119	91.54	130	100.00
	4	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	193	100.00	193	100.00
Amount of Substance and Chemical Equations as Symbolic Representations	1	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	79	100.00	79	100.00
	2	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	188	100.00	188	100.00
	3	0	0.00	1	0.88	0	0.00	0	0.00	0	0.00	113	99.12	114	100.00
	4	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	110	100.00	110	100.00
Chemical Reaction as Change of Substance and Energy	1	5	5.88	0	0.00	0	0.00	0	0.00	0	0.00	80	94.12	85	100.00
	2	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	78	100.00	78	100.00
	3	0	0.00	1	2.08	2	4.17	0	0.00	0	0.00	45	93.75	48	100.00
	4	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	53	100.00	53	100.00
Alkali Metals and Halogens	1	10	23.81	1	2.38	0	0.00	0	0.00	0	0.00	31	73.81	42	100.00
	2	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	81	100.00	81	100.00
	3	0	0.00	2	3.77	4	7.55	1	1.89	0	0.00	46	86.79	53	100.00
	4	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	54	100.00	54	100.00
Solutions	1	0	0.00	2	1.27	0	0.00	0	0.00	0	0.00	156	98.73	158	100.00
	2	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	122	100.00	122	100.00
	3	0	0.00	4	3.39	0	0.00	1	0.85	0	0.00	113	95.76	118	100.00
	4	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	116	100.00	116	100.00
Chemical Reaction Rates and Equilibrium	1	11	2.74	7	1.75	0	0.00	0	0.00	0	0.00	383	95.51	401	100.00
	2	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	567	100.00	567	100.00
	3	0	0.00	15	3.76	7	1.75	2	0.50	0	0.00	375	93.98	399	100.00
	4	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	426	100.00	426	100.00
The Elements in the Periodic Table	1	4	6.90	1	1.72	1	1.72	0	0.00	0	0.00	52	89.66	58	100.00
	2	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	41	100.00	41	100.00
	3	0	0.00	1	1.92	3	5.77	1	1.92	0	0.00	47	90.38	52	100.00
	4	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	110	100.00	110	100.00
Properties of Selected Elements and Compounds in Biological Systems and Modern Technologies	1	0	0.43	0	0.71	0	1.91	5	0.60	0	0.00	28	96.35	67.06	100.00
	2	0	0.54	0	0.89	0	2.39	0	0.75	0	0.00	33	95.44	73.58	100.00
	3	0	0.67	2	0.63	3	1.54	4	0.46	0	0.00	26	96.70	78.97	100.00
	4	0	0.84	0	0.78	0	1.93	0	0.57	0	0.00	50	95.87	71.22	100.00
Structure and Nomenclature of Organic Compounds	1	3	3.85	1	1.28	0	0.00	0	0.00	0	0.00	74	94.87	78	100.00
	2	0	0.00	3	2.14	0	0.00	0	0.00	0	0.00	137	97.86	140	100.00
	3	0	0.00	0	0.00	0	0.00	3	2.59	0	0.00	113	97.41	116	100.00
	4	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	231	100.00	231	100.00
Structure and Properties of Organic Compounds	1	27	5.33	14	2.76	0	0.00	0	0.00	0	0.00	466	91.91	507	100.00
	2	0	0.00	0	0.00	0	0.00	1	0.15	0	0.00	669	99.85	670	100.00
	3	0	0.00	27	5.61	6	1.25	18	3.74	0	0.00	430	89.40	481	100.00
	4	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	601	100.00	601	100.00

Appendix 3: The proportion of types of visual representations within the particular topics of the analysed Slovenian chemistry textbook sets (TS) for primary school

The topics of the National Chemistry Curriculum for Primary School (8 th and 9 th Grade)	TS	Type of visual representations																														
		Realistic v. r.		Conventional v. r.																Hybrid v. r.								SUM	f (%)			
		Photograph, drawing, video		Graph		Flowchart, diagram, map		Table		Pictogram		Molecular structure				Atomic structure		Other		Macroscopic level with molecular structure												
												Submicroscopic level		Sybolic level		Submicroscopic & symbolic				Macroscopic, submicroscopic, & symbolic level		Macroscopic & submicroscopic level		macroscopic & symbolic level		Other						
		N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)					
Chemistry is a World of Matte	1	30	42.86	0	0.00	6	8.57	11	15.71	5	7.14	14	20.00	0	0.00	2	2.86	0	0.00	1	1.429	0	0.00	0	0.00	0	0.00	1	1.43	70	100.00	
	2	40	47.62	0	0.00	2	2.38	4	4.76	0	0.00	18	21.43	0	0.00	0	0.00	7	8.33	0	0	2	2.38	7	8.33	1	1.19	3	3.57	84	100.00	
	3	33	38.37	0	0.00	4	4.65	14	16.28	10	11.63	18	20.93	0	0.00	3	3.49	0	0.00	0	0	0	0.00	2	2.33	1	1.16	1	1.16	86	100.00	
	4	57	59.38	0	0.00	2	2.08	2	2.08	8	8.33	13	13.54	0	0.00	5	5.21	0	0.00	0	0	1	1.04	7	7.29	1	1.04	0	0.00	96	100.00	
	5	25	67.57	0	0.00	1	2.70	4	10.81	0	0.00	5	13.51	0	0.00	0	0.00	0	0.00	0	0	0	0.00	2	5.41	0	0.00	0	0.00	37	100.00	
	6	60	64.52	1	1.08	5	5.38	13	13.98	3	3.23	7	7.53	3	3.23	0	0.00	0	0.00	0	0	0	0.00	1	1.08	0	0.00	0	0.00	93	100.00	
Atom and the Periodic System of Elements	1	25	24.75	0	0.00	1	0.99	32	31.68	0	0.00	1	0.99	0	0.00	0	0.00	42	41.58	0	0	0	0.00	0	0.00	0	0.00	0	0.00	101	100.00	
	2	15	51.72	1	3.45	0	0.00	7	24.14	0	0.00	0	0.00	0	0.00	0	0.00	6	20.69	0	0	0	0.00	0	0.00	0	0.00	0	0.00	29	100.00	
	3	6	13.64	0	0.00	0	0.00	17	38.64	0	0.00	1	2.27	0	0.00	0	0.00	19	43.18	0	0	0	0.00	0	0.00	0	0.00	1	2.27	44	100.00	
	4	25	32.89	0	0.00	1	1.32	25	32.89	0	0.00	3	3.95	0	0.00	0	0.00	18	23.68	0	0	0	0.00	0	0.00	0	0.00	4	5.26	76	100.00	
	5	19	32.76	0	0.00	1	1.72	20	34.48	0	0.00	5	8.62	2	3.45	2	3.45	8	13.79	0	0.00	0	0.00	1	1.72	0	0.00	0	0.00	58	100.00	
	6	8	22.22	0	0.00	0	0.00	23	63.89	0	0.00	0	0.00	0	0.00	0	0.00	5	13.89	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	36	100.00	
Compounds and Bonding	1	11	16.42	0	0.00	0	0.00	8	11.94	0	0.00	15	22.39	21	31.34	12	17.91	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	67	100.00	
	2	7	13.73	0	0.00	0	0.00	2	3.92	0	0.00	11	21.57	0	0.00	16	31.37	14	27.45	0	0.00	0	0.00	0	0.00	0	0.00	1	1.96	51	100.00	
	3	11	20.00	0	0.00	0	0.00	4	7.27	2	3.64	7	12.73	17	30.91	10	18.18	3	5.45	0	0.00	1	1.82	0	0.00	0	0.00	0	0.00	55	100.00	
	4	9	14.75	0	0.00	0	0.00	19	31.15	0	0.00	6	9.84	2	3.28	6	9.84	11	18.03	0	0.00	1	1.64	0	0.00	1	1.64	6	9.84	61	100.00	
	5	3	13.64	0	0.00	1	4.55	3	13.64	0	0.00	4	18.18	3	13.64	0	0.00	5	22.73	2	9.09	1	4.55	0	0.00	0	0.00	0	0.00	22	100.00	
	6	7	11.67	2	3.33	1	1.67	16	26.67	1	1.67	7	11.67	19	31.67	3	5.00	2	3.33	0	0.00	0	0.00	0	0.00	2	3.33	0	0.00	60	100.00	
Chemical Reaction	1	18	38.30	0	0.00	0	0.00	1	2.13	1	2.13	18	38.30	1	2.13	1	2.13	0	0.00	0	0.00	1	2.13	0	0.00	6	12.77	0	0.00	47	100.00	
	2	53	81.54	1	1.54	2	3.08	0	0.00	0	0.00	9	13.85	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	65	100.00	
	3	25	52.08	0	0.00	3	6.25	3	6.25	5	10.42	5	10.42	0	0.00	1	2.08	0	0.00	0	0.00	1	2.08	0	0.00	5	10.42	48	100.00			
	4	31	57.41	2	3.70	0	0.00	2	3.70	8	14.81	7	12.96	0	0.00	4	7.41	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	54	100.00	
	5	20	45.45	2	4.55	1	2.27	3	6.82	0	0.00	6	13.64	0	0.00	1	2.27	0	0.00	0	0.00	6	13.64	3	6.82	1	2.27	1	2.27	44	100.00	
	6	36	45.57	1	1.27	1	1.27	19	24.05	4	5.06	0	0.00	2	2.53	0	0.00	0	0.00	0	0.00	0	0.00	4	5.06	6	7.59	6	7.59	79	100.00	
The Elements in the Periodic Tabl	1	51	51.52	1	1.01	2	2.02	22	22.22	0	0.00	15	15.15	2	2.02	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	2.02	4	4.04	99	100.00	
	2	42	47.73	1	1.14	4	4.55	18	20.45	1	1.14	8	9.09	1	1.14	0	0.00	10	11.36	0	0.00	0	0.00	1	1.14	1	1.14	1	1.14	88	100.00	
	3	66	54.55	2	1.65	0	0.00	39	32.23	6	4.96	1	0.83	1	0.83	1	0.83	0	0.00	0	0.00	0	0.00	0	0.00	1	0.83	4	3.31	121	100.00	
	4	53	56.38	2	2.13	4	4.26	18	19.15	10	10.64	1	1.06	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	4	4.26	2	2.13	94	100.00	
	5	39	60.94	2	3.13	1	1.56	17	26.56	0	0.00	0	0.00	1	1.56	0	0.00	0	0.00	1	1.56	2	3.13	1	1.56	0	0.00	0	0.00	64	100.00	
	6	47	43.12	0	0.00	4	3.67	44	40.37	6	5.50	2	1.83	4	3.67	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.92	1	0.92	109	100.00	
Acids, Bases and Salts	1	34	39.08	6	6.90	4	4.60	21	24.14	1	1.15	11	12.64	6	6.90	0	0.00	0	0.00	0	0.00	0	0.00	3	3.45	0	0.00	1	1.15	87	100.00	
	2	39	51.32	4	5.26	2	2.63	6	7.89	5	6.58	11	14.47	0	0.00	1	1.32	0	0.00	0	0.00	7	9.21	1	1.32	0	0.00	0	0.00	76	100.00	
	3	45	45.45	2	2.02	5	5.05	18	18.18	11	11.11	1	1.01	1	1.01	2	2.02	1	1.01	0	0.00	9	9.09	2	2.02	1	1.01	1	1.01	99	100.00	
	4	27	38.03	2	2.82	1	1.41	17	23.94	13	18.31	0	0.00	0	0.00	3	4.23	0	0.00	0	0.00	7	9.86	0	0.00	0	0.00	1	1.41	71	100.00	
	5	30	41.67	2	2.78	1	1.39	13	18.06	5	6.94	5	6.94	3	4.17	7	9.72	0	0.00	0	0.00	5	6.94	1	1.39	0	0.00	0	0.00	72	100.00	
	6	21	44.68	2	4.26	3	6.38	14	29.79	3	6.38	0	0.00	0	0.00	2	4.26	0	0.00	0	0.00	0	0.00	0	0.00	1	2.13	1	2.13	47	100.00	
Hydrocarbons and Polymers	1	54	22.04	9	3.67	3	1.22	18	7.35	2	0.82	33	13.47	94	38.37	22	8.98	0	0.00	4	1.63	4	1.63	1	0.41	1	0.41	0	0.00	245	100.00	
	2	37	26.43	3	2.14	2	1.43	2	1.43	1	0.71	31	22.14	36	25.71	16	11.43	0	0.00	4	2.96	2	1.43	1	0.71	3	2.14	2	1.43	140	100.00	
	3	27	20.61	2	1.53	0	0.00	12	9.16	7	5.34	13	9.92	50	38.17	11	8.40	0	0.00	3	2.29	0	0.00	0	0.00	3	2.29	3	2.29	131	100.00	
	4	39	36.45	4	3.74	1	0.93	7	6.54	6	5.61	13	12.15	24	22.43	6	5.61	0	0.00	1	0.93	1	0.93	2	1.87	2	1.87	1	0.93	107	100.00	
	5	28	40.00	1	1.43	2	2.86	7	10.00	2	2.86	10	14.29	6	8.57	6	8.57	0	0.00	1	1.43	1	1.43	4	5.71	1	1.43	1	1.43	70	100.00	
	6	15	24.19	1	1.61	3	4.84	6	9.68	5	8.06	4	6.45	19	30.65	3	4.84	0	0.00	1	1.61	0	0.00	0	0.00	2	3.23	3	4.84	62	100.00	
Organic Compounds Containing Oxygen	1	49	23.44	1	0.																											

[illegible]

Appendix 4: The proportion of types of visual representations within the particular topics of the analysed Slovenian chemistry textbook sets (TS) for secondary school

The topics of the National Chemistry Curriculum for Secondary School (1 st , 2 nd and 3 rd Year)	TS	Type of visual representations																													
		Realistic v. r.		Conventional v. r.																Hybrid v. r.								SUM	f (%)		
		Photograph, drawing, video		Graph		Flowchart, diagram, map		Table		Pictogram		Molecular structure				Atomic structure		Other		Macroscopic level with molecular structure											
												Submicroscopic level		Sybolic level		Submicroscopic & sybolic						Macroscopic, submicroscopic, & sybolic level		Macroscopic & submicroscopic level		macroscopic & sybolic level		Other			
		N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)	N	f (%)		
Safe Experimental Work	1	34	65.38	3	5.77	1	1.92	2	3.85	7	13.46	2	3.85	3	5.77	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	52	100.00
	2	18	52.94	0	0.00	0	0.00	9	26.47	4	11.76	0	0.00	0	0.00	0	0.00	3	8.82	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	34	100.00
	3	25	67.57	1	2.70	0	0.00	6	16.22	3	8.11	0	0.00	2	5.41	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	37	100.00
	4	11	55.00	0	0.00	0	0.00	1	5.00	6	30.00	0	0.00	0	0.00	0	0.00	2	10.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	20	100.00
Building Blocks of Matter	1	23	50.00	2	4.35	6	13	7	15.22	0	0.00	3	6.52	0	0.00	2	4.35	3	6.52	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	46	100.00
	2	11	14.86	4	5.41	2	2.70	39	52.70	0	0.00	5	6.76	0	0.00	0	0.00	9	12.16	4	5.41	0	0.00	0	0.00	0	0.00	0	0.00	74	100.00
	3	11	14.86	16	21.62	2	2.70	25	33.78	1	1.35	11	14.86	0	0.00	0	0.00	6	8.11	0	0.00	0	0.00	0	0.00	0	0.00	2	2.70	74	100.00
	4	2	7.14	4	14.29	2	7.14	11	39.29	0	0.00	4	14.29	0	0.00	2	7.14	3	10.71	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	28	100.00
Compounds and Bonding	1	18	11.92	6	3.97	0	0.00	15	9.93	0	0.00	58	38.41	9	5.96	42	27.81	0	0.00	0	0.00	1	0.66	2	1.32	0	0.00	0	0.00	151	100.00
	2	26	13.61	5	2.62	0	0.00	35	18.32	0	0.00	43	22.51	41	21.47	36	18.85	0	0.00	2	1.05	2	1.05	1	0.52	0	0.00	0	0.00	191	100.00
	3	15	13.39	4	3.57	0	0.00	25	22.32	2	1.79	19	16.96	11	9.82	26	23.21	0	0.00	1	0.89	2	1.79	6	5.36	1	0.89	0	0.00	112	100.00
	4	8	8.16	1	1.02	0	0.00	16	16.33	0	0.00	19	19.39	29	29.59	19	19.39	0	0.00	0	0.00	3	3.06	2	2.04	1	1.02	0	0.00	98	100.00
Amount of Substance and Chemical Equations as Sybolic Representations	1	27	64.29	0	0.00	1	2.38	3	7.14	0	0.00	4	9.52	0	0.00	5	11.90	0	0.00	0	0.00	0	0.00	2	4.76	0	0.00	0	0.00	42	100.00
	2	13	23.21	0	0.00	0	0.00	15	26.79	0	0.00	5	8.93	0	0.00	22	39.29	0	0.00	0	0.00	0	0.00	1	1.79	0	0.00	0	0.00	56	100.00
	3	11	37.93	0	0.00	0	0.00	3	10.34	0	0.00	7	24.14	0	0.00	3	10.34	0	0.00	1	3.45	0	0.00	2	6.90	1	3.45	1	3.45	29	100.00
	4	6	16.22	0	0.00	0	0.00	0	0.00	0	0.00	7	18.92	0	0.00	17	45.95	0	0.00	0	0.00	3	8.11	3	8.11	1	2.70	0	0.00	37	100.00
Chemical Reaction as Change of Substance and Energy	1	24	58.54	8	19.51	1	2.44	1	2.44	0	0.00	0	0.00	0	0.00	4	9.76	0	0.00	0	0.00	0	0.00	1	2.44	0	0.00	2	4.88	41	100.00
	2	15	46.88	4	12.50	0	0.00	7	21.88	0	0.00	2	6.25	0	0.00	3	9.38	0	0.00	0	0.00	0	0.00	0	0.00	1	3.13	0	0.00	32	100.00
	3	12	35.29	14	41.18	1	2.94	4	11.76	1	2.94	0	0.00	0	0.00	1	2.94	0	0.00	0	0.00	0	0.00	1	2.94	0	0.00	0	0.00	34	100.00
	4	10	27.78	18	50.00	0	0.00	5	13.89	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	5.56	1	2.78	36	100.00		
Alkali Metals and Halogens	1	11	40.74	1	3.70	0	0.00	3	11.11	0	0.00	2	7.41	0	0.00	0	0.00	0	0.00	0	0.00	4	14.81	0	0.00	6	22.22	0	0.00	27	100.00
	2	14	77.78	0	0.00	0	0.00	3	16.67	0	0.00	1	5.56	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	18	100.00
	3	16	40.00	1	2.50	3	7.50	7	17.50	1	2.50	3	7.50	4	10.00	2	5.00	0	0.00	1	2.50	0	0.00	0	0.00	2	5.00	0	0.00	40	100.00
	4	12	48.00	0	0.00	0	0.00	5	20.00	0	0.00	1	4.00	0	0.00	2	8.00	0	0.00	0	0.00	1	4.00	0	0.00	4	16.00	0	0.00	25	100.00
Solutions	1	23	41.82	6	10.91	5	9.09	0	0.00	0	0.00	2	3.64	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	14	25.45	5	9.09	0	0.00	55	100.00
	2	16	38.10	9	21.43	0	0.00	14	33.33	0	0.00	2	4.76	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	2.38	0	0.00	0	0.00	42	100.00
	3	19	52.78	3	8.33	2	5.56	1	2.78	1	2.78	6	16.67	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	5.56	2	5.56	0	0.00	36	100.00
	4	17	47.22	3	8.33	0	0.00	3	8.33	0	0.00	0	0.00	0	0.00	2	5.56	0	0.00	0	0.00	0	0.00	9	25.00	2	5.56	0	0.00	36	100.00
Chemical Reaction Rates and Equilibrium	1	37	21.64	21	12.28	14	8.19	20	11.70	1	0.58	4	2.34	0	0.00	19	11.11	0	0.00	1	0.58	8	4.68	6	3.51	36	21.05	4	2.34	171	100.00
	2	66	33.85	25	12.82	7	3.59	68	34.87	0	0.00	6	3.08	2	1.03	6	3.08	0	0.00	0	0.00	3	1.54	2	1.03	10	5.13	0	0.00	195	100.00
	3	50	32.05	27	17.31	2	1.28	31	19.87	6	3.85	11	7.05	4	2.56	3	1.92	0	0.00	2	1.28	0	0.00	4	2.56	16	10.26	0	0.00	156	100.00
	4	34	18.99	29	16.20	5	2.79	31	17.32	0	0.00	14	7.82	1	0.56	23	12.85	0	0.00	1	0.56	12	6.70	1	0.56	28	15.64	0	0.00	179	100.00
The Elements in the Periodic Table	1	7	20.59	0	0.00	0	0.00	10	29.41	0	0.00	0	0.00	2	5.88	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	15	44.12	0	0.00	34	100.00
	2	11	34.38	1	3.13	0	0.00	13	40.63	0	0.00	6	18.75	1	3.13	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	32	100.00
	3	15	26.79	0	0.00	6	10.71	16	28.57	0	0.00	2	3.57	7	12.50	3	5.36	0	0.00	0	0.00	2	3.57	1	1.79	4	7.14	0	0.00	56	100.00
	4	9	15.79	0	0.00	1	1.75	29	50.88	0	0.00	1	1.75	1	1.75	5	8.77	0	0.00	0	0.00	0	0.00	0	0.00	10	17.54	1	1.75	57	100.00
Properties of Selected Elements and Compounds in Biological Systems and Modern Technologies	1	30.00	93.75	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.13	1.00	3.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32	100.00
	2	14.00	50.00	0.00	0.00	0.00	0.00	2.00	7.14	0.00	0.00	6.00	21.43	1.00	3.57	1.00	3.57	0.00	0.00	0.00	0.00	1.00	3.57	0.00	0.00	3.00	10.71	0.00	0.00	28	100.00
	3	25.00	59.52	2.00	4.76	4.00	9.52	1.00	2.38	0.00	0.00	1.00	2.38	3.00	7.14	3.00	7.14	0.00	0.00	1.00	2.38	0.00	0.00	0.00	0.00	2.00	4.76	0.00	0.00	42	100.00
	4	10.00	30.30	2.00	6.06	3.00	9.09	4.00	12.12	0.00	0.00	4.00	12.12	0.00	0.00	4.00	12.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	15.15	1.00	3.03	33	100.00	
Structure and Nomenclature of Organic Compounds	1	6	6.38	0	0.00	1	1.06	3	3.19	0	0.00	47	50.00	30	31.91	4	4.26	0	0.00	0	0.00	0	0.00	1	1.06	2	2.13	0	0.00	94	100.00
	2	4	2.68	0	0.00	3																									

Structure and Properties of Organic Compounds	1	79	15.96	6	1.21	18	3.64	22	4.44	0	0.00	95	19.19	196	39.60	36	7.27	0	0.00	1	0.20	2	0.40	5	1.01	32	6.46	3	0.61	495	100.00
	2	61	6.90	2	0.23	7	0.79	41	4.64	0	0.00	16	1.81	682	77.15	50	5.66	0	0.00	4	0.45	3	0.34	1	0.11	15	1.70	2	0.23	884	100.00
	3	69	13.94	0	0.00	15	3.03	34	6.87	22	4.44	14	2.83	317	64.04	4	0.81	0	0.00	5	1.01	1	0.20	1	0.20	9	1.82	4	0.81	495	100.00
	4	82	10.55	5	0.64	7	0.90	40	5.15	0	0.00	25	3.22	576	74.13	5	0.64	0	0.00	3	0.39	3	0.39	2	0.26	27	3.47	2	0.26	777	100.00