

CES1: Summary of BIOZONE's 3D Approach By Chapter

Science and Engineering Practices (SEPs), Crosscutting Concepts (CCCs), Disciplinary Core Ideas (DCIs), and Performance Expectations (PEs) for Instructional Segments 1-6 of the CA NGSS (Three Course Model): **Chemistry in the Earth System**. A concluding basic skills chapter, which covers some of the background for Science and Engineering Practices, is also included. Performance Expectations are met within activities and/or the Summative Assessments concluding each Instructional Segment.

IS1: COMBUSTION AND ENERGY TRANSFER

Page		Activity	Hub	SEP	DCI	CCC	PE
2	1	Boil 'em in Oil		Anchoring phenomenon			
3	2	Working in the Lab Environment	✓	3			
6	3	Everyday Chemistry	✓	1, 2, 3, 4	PS1.A	1, 2, 5	HS-PS1-3, HS-PS1-4
10	4	Observing Reactions	✓	2, 3, 5	PS1.B	5	HS-PS1-4, HS-PS1-7
15	5	Energy in Food	✓	1, 2, 3, 4, 5	PS1.B, PS3.D	4, 5	HS-PS1-3, HS-PS1-4, HS-PS1-7, HS-PS3-1
23	6	Boil 'em in Oil Revisited					
24	7	Summative Assessment		2, 5	PS1.A, PS1.B	1, 5	HS-PS1-3, HS-PS1-4, HS-PS1-7

IS2: HEAT AND ENERGY IN THE EARTH SYSTEM

Page		Activity	Hub	SEP	DCI	CCC	PE
27	8	On the Move		Anchoring phenomenon			
28	9	Energy	✓	2, 6	PS3.A	5, 7	HS-PS3-2
34	10	Order and Disorder	✓	2, 3, 6	PS3.A, PS3.B	4, 5, 7	HS-PS3-1, HS-PS3-2, HS-PS3-4
38	11	Kinetic Theory of Matter	✓	2	PS3.A, PS3.B	4, 5	HS-PS3-1, HS-PS3-2
42	12	Modeling Energy Flow	✓	2	PS3.A, PS3.B	2, 4, 5	HS-PS3-2, HS-ETS1-4
48	13	Energy in the Earth	✓	2, 7	ESS2.A, ESS2.B	2, 5	HS-ESS2-3
52	14	Evidence for Earth's Structure	✓	2, 4, 5, 7, 8	ESS2.B PS4.A	1, 5	HS-ESS2-3
60	15	Energy Drives Plate Tectonics	✓	2	ESS2.B, ESS2.C	1, 2, 3, 5	HS-ESS2-3
69	16	On the Move Revisited					
70	17	Summative Assessment		2	ESS2.A	5	HS-ESS2-3

IS3: ATOMS, ELEMENTS, AND MOLECULES

Page		Activity	Hub	SEP	DCI	CCC	PE
75	18	Burp!	✓	Anchoring phenomenon			
76	19	Properties and Patterns	✓	1, 2, 4	PS1.A	1	HS-PS1-1
80	20	The Atom	✓	2, 8	PS1.A	1	HS-PS1-1
88	21	The Periodic Table	✓	2, 6	PS1.A	1, 2	HS-PS1-1
95	22	The Mole	✓	2, 3, 5, 6	PS1.A, PS1.B	1, 3, 5	HS-PS1-2, HS-PS1-7
108	23	Aqueous Reactions	✓	2, 3, 5, 6	PS1.A, PS1.B	1, 3	HS-PS1-2, HS-PS1-7
113	24	Burp! Revisited					
114	25	Summative Assessment		2, 5, 6	PS1.A, PS1.B	1, 5	HS-PS1-1, HS-PS1-2, HS-PS1-7

IS4: CHEMICAL REACTIONS

Page		Activity	Hub	SEP	DCI	CCC	PE
120	26	Hot! Too Hot!	✓	Anchoring phenomenon			
121	27	Molecular Structure	✓	2, 6	PS1.A, PS2.B	1, 2	HS-PS1-1, HS-PS1-2, HS-PS1-7
125	28	Properties of Matter	✓	2, 3, 4, 5, 6	PS1.A, PS2.B, PS3.C	1, 2	HS-PS1-3, HS-PS3-5, HS-PS2-4
135	29	Energy and Changes of State		2	PS1.B	2, 5, 7	HS-PS1-4

137	30	Energy and Chemical Reactions	✓	3, 4, 5, 6	PS1.B	5, 7	HS-PS1-4
147	31	Reaction Rates	✓	2, 3, 4, 5, 6	PS1.B	1, 5, 7	HS-PS1-5
152	32	Hot! Too Hot! Revisited	✓				
153	33	Summative Assessment	✓	2, 5, 6	PS1.A, PS1.B, PS2.B	1, 5	HS-PS1-2, HS-PS1-4, HS-PS1-5, HS-PS2-4

IS5: CHEMISTRY OF CLIMATE CHANGE

Page		Activity	Hub	SEP	DCI	CCC	PE
158	34	It's Heating Up	✓	Anchoring phenomenon			
159	35	Combustion and Hydrocarbons	✓	5	PS1.B, PS3.D	2, 4, 5, 6	HS-PS1-2
162	36	Fuels and People	✓	2, 4, 5, 7	PS1.B, PS3.D, ESS3.A	2, 5	HS-ESS3-2
170	37	Atmospheric Chemistry	✓	1, 2, 4	ESS2.A, ESS2.D	2, 4, 5, 7	HS-ESS2-2, HS-ESS2-4, HS-ESS2-6, HS ESS 3-6
176	38	Global Warming and Climate Change	✓	2, 4	PS3.B, PS4.B, ESS2.A, ESS2.D, ESS3.D	2, 4, 5, 7	HS-ESS2-2, HS-ESS2-4, HS-ESS3-5
185	39	Soil Chemistry and Its Role in Climate Change	✓	7	ESS3.A, ETS1.C	2	HS-ES3-2, HS-ETS1-2
189	40	Living with Limited Resources	✓	7	ESS3.A, ETS1-C	2	HS-ESS3-2, ETS1-2
192	41	It's Heating Up Revisited	✓				
193	42	Summative Assessment		1, 4, 7	ESS2.D, ESS3.A, ESS3.D, ETS1-C	2, 7	HS-ESS2-4, HS-ESS3-2, HS-ESS3-5, HS-ETS1-2

IS6: REACTION DYNAMICS AND OCEAN ACIDIFICATION

Page		Activity	Hub	SEP	DCI	CCC	PE
198	43	Seashells by the Seashore	✓	Anchoring phenomenon			
199	44	Reversible Reactions	✓	2, 3, 6	PS1.B	2, 4, 7	HS-PS1-5, HS-PS1-6, HS-PS1-7
207	45	Industrial Chemistry	✓	6	PS1.B, ETS1.C	7	HS-PS1-5, HS-PS1-6, HS-PS1-7
216	46	Ocean Chemistry	✓	3, 4, 5, 6	PS1.B, ESS2.A, ESS2.D, ESS3.D	2, 7	HS-PS1-5, HS-ESS2-2, ESS3-5, HS-ESS2-6
222	47	Seashells by the Seashore Revisited	✓	6	ESS2.D	7	
223	48	Summative Assessment		4, 6	PS1.B, ESS2.A, ESS2.D	7	HS-PS1-5, HS-PS1-6, HS-ESS2-2, HS-ESS2-6

SEPs: BASIC SKILLS FOR CHEMISTRY STUDENTS

Page		Activity	Hub	SEP	DCI	CCC	PE
229	49	Nature of Science	✓	1, 6, 7, 8	NA	4	NA
231	50	Systems and System Models	✓	2	NA	4	NA
233	51	Observations and Assumptions	✓	1	NA		NA
235	52	Useful Concepts in Chemistry	✓	5	NA		NA
236	53	Standard Chemistry Equipment	✓	2, 3, 6	NA		NA
238	54	Experimenting in Chemistry		3	NA		NA
239	55	Accuracy and Precision		3	NA		NA
240	56	Measurement and Quantitative Analysis	✓	2, 3, 6	NA		
242	57	Working With Numbers		5	NA		NA
243	58	Ratio and proportion in Chemistry	✓	5	NA	3	
245	59	Logbooks and Tables		3	NA		NA
246	60	Drawing and Interpreting Graphs		4, 5	NA	1, 2	
248	61	Describing the Data	✓	4, 5	NA	1	
250	62	Periodic Table	✓		NA	1	