Central New Jersey Modeling Institute Modeling Chemistry Workshop Calendar 2010

Monday	Tuesday	Wednesday	Thursday	Friday
5	July 6 Intro, course expectations, teacher mode vs. student mode, Modeling Chemistry talk; ABCC pre-assessment **Unit 1** Matter overview of Mass and Change sample data, discuss particle representations What is the 'stuff' like at its simplest level? U1 ws1 WB Histogram Particle diagrams Measurement of volume lab (intro to Pasco equipment and Data Studio; interpret slope as conversion factor) Glugs, Measurement, precision and accuracy, HW – read Gillespie: "*Great Ideas of Chemistry"*; - responses to Gillespie reading, - analyze Ashkenazi's test on Mass and Matter	7 *Turn in: responses to Gillespie reading* work on and w/b ws 2 Discussion of Gillespie Interpret responses to Ashkenazi's Mass and Matter test Mass-volume lab: Pre-lab; Data; Analysis, Post-lab discussion *Density as conversion factor – non-algorithmic treatment* work on and w/b ws 3 and 4 Density of a gas lab - representations of particles to account for density HW – read Unit 1 Teacher Notes, - Mass-Volume lab report - take unit 1 test	8 *Turn in: Mass-Volume lab report* Thickness of a thin-layer lab; post-lab discussion videos: gold leaf and thickness of oil, size of a particle web-site activity: the size of things WB Unit 1 test (review-comments on test) **Unit 2 Energy & States of Matter-1** Diffusion demos; discussion and model development; storyboards; Show student storyboards - how they reveal naïve beliefs States of matter – particle representations – Eureka videos Thermometer demo HW: - read Managing classroom discourse and Socratic questioning, - write one reflection on both readings - Unit 1 reflection	9 *Turn in: responses to discourse and questioning; Unit 1 reflection* Discussion: classroom discourse and socratic questioning. Eureka video ws1 Intro to pressure – relate to particle behavior - simulation software (web resources) ws 2 Gas behavior lab(s) Post-lab discussion Rationale for proportional reasoning over equations for gas behavior ws 3 Rationale for a unified energy concept – PowerPoint on Energy HW – Energy reading, - read Bowen-Bunce: "Testing for Conceptual Understanding" - reflection on reading: implications of persistence of naïve beliefs - Pressure Lab Report

12	13	14	15	16
Turn in: responses to Bowen-Bounce reading; Pressure Lab report Discuss Bowen-Bounce reading Review Unit 2 Review and Test, w/b test The story so far… Unit 3 Energy & States of Matter-2 <u>Icy-hot lab</u> Post-lab discussion, treatment of energy storage Energy concept – resolving chemistry and physics representations Discussion of energy reading; PowerPoint on how to do energy bar charts Qualitative treatment of energy; ws 1 & 2; HW – Unit 2 reflection - response to reading and class discussion on unified treatment of energy, WS 2: 3, 4, 5 WS3: 3,4, 6, 7 - read Gabel*:"Improving Teaching and Learning…"* - responses to Gabel reading	*Turn in: Unit 2reflection; response to Gabel reading* Discuss Gabel article, Quantitative treatment, ws 3 & 4 Unit 3: review and test WB and comment The story so far… **Unit 4: Describing substances** Pure vs Mixture (separation techniques) Simple vs Compound particles: electrolysis of water, *Ring of Truth* show clip from Chemical Families sample representations <u>Sticky Tape Activity</u> Post lab; model development – Thomson model of atom <u>Conductivity of solutions</u> Ionic vs molecular solids HW: - sticky tape lab report - read LD's synopsis of Vanessa Barker's paper, - skim ws 1 & 2 Unit 3 reflection	*Turn in: Sticky Tape lab report and Unit 3* Work on and WB ws 3 Discussion: reflections/comments on design of unit 4, review Unit 4 review and test **Unit 5: Counting and Moles**; video: Gases and How They Combine, Avogadro's Hypothesis Counting by massing – <u>Relative Mass Activity</u> The mole concept; count-mass conversion factors <u>Empirical Formula Lab</u>, begin reaction <u>Nail lab</u> -part 1 HW: - read Barker: *"Beyond Appearances…"* sections 1-4, - response to reading, - Unit 4 reflection	*Turn in: Unit 4 reflection* Discuss readings, Discussion of law of constant proportions, more on molar mass and PT Finish E.F. lab, analyze data, board meeting to compare results % composition, empirical vs molecular ws 2, Unit 5 review **Unit 6**: Representing Chemical Change Rearranging atoms activity, post activity discussion <u>Nail lab</u> – part 2 HW – E.F. Lab report, - read Barker *"Beyond Appearances…"* sections 5-8 - reflection on reading' - read Galley: "Exothermic Bond Breaking…" Unit 5 reflection - work on "A" project due Wednesday	

19	20	21	22	23
Turn in: Empirical Formula lab report; response to Barker reading (1-8), Unit 5 reflection Nail lab – part 3 – calculations, post-lab discussion *How to make balancing equations a conceptual exercise* Overview of Ws 1 Cu-AgNO3 lab pre-lab and part 1 Types of Reactions Lab – sample data – discuss representations and treatment of energy PowerPoint on Ech LOLOL diagrams Work on and w/b ws 4 HW – work on "A" projects due Wed; - reflection on unit 6, - nail lab report - read Galley "Exothermic bond breaking.."	*Turn in: Nail lab report; Unit 6 reflection* discussion on Galley "Exothermic Bond Breaking…" Review Unit 6 test **Unit 7**: **Stoichiometry – I (moles and mass)** PowerPoint and handout - Why ICE table is superior to algorithmic approach Work on and w/b worksheet 1 Finish lab and calculations, board meeting Review ICE treatment of stoichiometry – how it differs from Dimensional Analysis More work on stoichiometry work and w/b ws 2 limiting reactant problems, ws 3 Strategy map to begin w/b, work on and w/b ws4 Work through unit 7 test HW – work on "A" projects due Wednesday,	*Turn in: Cu-AgNO3 lab report; "A" project* *Review Unit 7 Test* **Unit 8: Stoichiometry II – volume and energy** Partial pressure as consequence of $P \propto n$, ws 1 Molar volume lab, collect and analyze data, board meeting Implications of lab, analog to molar mass Stoichiometry flowchart Ideal gas law, ws 2 Molarity: solution stoichiometry Work on and w/b ws 3 HW: - write up molar volume lab, - Reflect and comment on Unit 2, 3,and 4 Tests	*Turn in: Unit 7 reflection; Molar Volume write-up* Quantitative treatment of energy in reactions Heat of Combustion Lab Post-lab discussion; Notes on multiple energy representations and ΔH Work on and w/b ws 4 ABCC post-test Wrap up: group pix and e-documents	

	- Cu-AgNO3 lab report, - Unit 7 reflection			

Modified from Calendar of Modeling Chem Workshop at Carl Hayden HS in June 2008