

Advisory Curriculum Council

STAGE III: IMPLEMENTATION

You must present to BAC before you present to ACC (at elementary level, send to Brian Scieszka, Reid Principal)

Stage III completion due Feb. 1 to the Curriculum Office

Attach the following to this Stage III document:

- Completed Course Curriculum Guide
- Survey of Needs
- Sign-in sheets from committee work
- Committee meeting minutes

Course Name:	Material Science
Course Number:	4150
Level:	11th -12th
Committee Facilitator:	Shannon Mareski
Committee Members:	Craig Trombly

Complete the following Columns In the Curriculum Guide : *curriculum guide worksheet found below in the red tab "Guide" and will be an electronic file is available to all teachers of the course (please submit copies to ACC)*

- * Topic (column A in curriculum guide)
- * Pacing (detailing organization of standards and timing guidelines) (column B)
- * Unit (column C)
- * Standards (started in Stage 1) (column D)
- * Enduring Understandings & Essential Questions (teacher focus) (column E)
- * Learning Targets (student focus) (column F)
- * Vocabulary (started in Stage 1) (column G)
- * Materials (column H)
- * Assessments (column I)

Describe plan for common summative assessment implementation (i.e. quarterly, semester, final).

Common summative assessments include laboratory notebook quizzes (questions based on laboratory and demonstration experiences) and a laboratory practical final exam

Evaluation of Curriculum Training and identify future needs:

No formal curriculum training. Worked closely with master Material Science teacher. Future needs, attending ASM material science teacher workshops or camp as needed

SURVEY OF NEEDS

(To be completed by staff affected by this curriculum study at the end of Stage 3 and during Stage 4)

Course:	Material Science
Course #:	4150
Date:	

<i>Select a rating for questions 1-3 from the following scale to indicate your agreement.</i>				
1	2	3	4	5
<i>Strongly agree</i>				<i>Strongly disagree</i>
1. The curriculum resources for this study meet my students learning needs.				<input type="checkbox"/>
2. The teacher support resources are useful.				<input type="checkbox"/>
3. The technology resources are effective.				<input type="checkbox"/>

4. Some questions that I have about our curriculum resources are:

5. Some concerns that I have about our curriculum resources are:

6. Some curriculum and/or training needs include:

7. Curriculum strengths include:

8. Curriculum weaknesses include:

STAGE III

SIGN IN SHEET FOR CURRICULUM WORK

STAGE III					
SIGN IN SHEET FOR CURRICULUM WORK					
Course Name:		Material Science			
Course #:		4150			
Committee Chair:		Shannon Mareski			
Committee Members <small>Attendance: Initial after your name for attendance</small>		Date: November 6, 2014	Date: November 25, 2014	Date: December 17, 2014	Date: January 3, 2015
		Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30	Time of Meeting: 9:00-12:30
First Name	Last Name	<small>Write Sub or Incentive Day in boxes below</small>			
Shannon	Mareski	Incentive	Incentive	Incentive	Incentive
Craig	Trombly	Incentive	Incentive	Incentive	Incentive
Shannon	Mareski	Date: January 9, 2015	Date: January 14, 2015	Date: February 3, 2015	Date: March 10, 2015
Craig	Trombly	Time of Meeting: 3-5:30	Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30
		Incentive	Incentive	Incentive	Incentive
		Incentive	Incentive	Incentive	Incentive
2014-2015 Totals 12 hours					
		Date: September 10, 2015	Date: September 17, 2015	Date: October 8, 2015	Date: October 14, 2015
		Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30
Shannon	Mareski	Incentive	Incentive	Incentive	Incentive
Craig	Trombly	Incentive	Incentive	Incentive	Incentive
		Date: October 29, 2015	Date: November 5, 2015	Date: November 18, 2015	Date: November 24, 2015
		Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30
Shannon	Mareski	Incentive	Incentive	Incentive	Incentive
Craig	Trombly	Incentive	Incentive	Incentive	Incentive
		Date: November 30, 2015	Date: December 2, 2015	Date: December 7, 2015	Date: December 9, 2015
		Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30	Time of Meeting: 2:30-3:30
Shannon	Mareski	Incentive	Incentive	Incentive	Incentive
Craig	Trombly	Incentive	Incentive	Incentive	Incentive
2015-2016 Totals 12 hours					
Account Name:		ACC			
Account Number:		11-221-1243-000-0000-917			

MEETING MINUTES

Advisory Curriculum Council

STAGE III: IMPLEMENTATION

Course Name:		Material Science
Course Number:		4150
Committee Facilitator:		Shannon Mareski
Committee Members Present:		Craig Trombly
DATE/Half or Full Day	TOPICS DISCUSSED/RESEARCHED	
11/6, 11/25, 12/17/14 - Incentive Time (1 hour each - total 3 hrs)	Improving laboratory experience format for student engagement	
	Gathering materials for laboratory experiments	
DATE/Half or Full Day	TOPICS DISCUSSED/RESEARCHED	
1/3/15 (3.5 hrs) 1/9/15 (2.5 hrs) - Incentive time (total 5 hours)	Meet with Material Science Master Teacher Lisa Ogiemwonyi from Stoney Creek High School, Rochester, MI	
	Upon Meeting with Lisa Ogiemwonyi, she shared additional laboratory experiments, classroom strategies as well as curriculum format for Material Science class	
DATE/Half or Full Day	TOPICS DISCUSSED/RESEARCHED	
1/14, 2/3, 3/10/15 - Incentive Time (1 hour each - total 3 hrs)	continue gathering materials for laboratory experiments	
	begin to create test materials for class	
DATE/Half or Full Day	TOPICS DISCUSSED/RESEARCHED	
9/10, 9/17, 10/8, 10/14, 10/29, 11/5, 11/18/15 - Incentive Time (1 hour each - total 7 hrs)	continue to create test materials for class including final exam laboratory practical	
DATE/Half or Full Day	TOPICS DISCUSSED/RESEARCHED	
11/24, 11/30, 12/2/15 - Incentive Time (1 hour each - total 3 hrs)	gather materials and laboratory supplies for laboratory practical final exam	
	create final exam test documents	
DATE/Half or Full Day	TOPICS DISCUSSED/RESEARCHED	
12/7, 12/9/15 - Incentive Time (1 hour each - total 2 hrs)	finalize curriculum guide and pacing	
	finalize ACC paperwork	

GRAND BLANC COMMUNITY SCHOOLS CURRICULUM GUIDE

GRADE: 11, 12		SUBJECT: Material Science						
Topic	Pacing	Unit	Standards	Enduring Understandings & Essential Questions	Learning Targets	Vocabulary	Materials	Assessments
Laboratory Safety, Scientific Method, Rationale for Material Science	1 week	1	C1.1A, C1.1B, C1.1C, C1.1D, C1.1h, C1.2A, C1.2B, C1.2D, C1.2E, C1.2f, C1.2g, C1.2i, C1.2j, C1.2k, C4.9A, C4.9b	Using the scientific method, students will explore materials and how they interact with each other. Know basic safety laboratory procedures. Determine the basic classes of materials	Laboratory Safety, Scientific Method, Rationale for Material Science	Hypothesis, procedure, data, variables, conclusion	Laboratory Materials	Laboratory Journal, Quizzes and Tests
Classification of Materials and Measurements, Atomic Structure and Properties	1 week	2	C2.1a, C2.1b, C2.1c, C5.4A, C5.4B, C5.4c, C5.4d, C5.4e	Identify the different types of materials, Identify and describe the main categories of bonding (metallic, ionic, covalent), Identify the locations of the types of elements in the periodic table, Identify trends in the periodic table, Identify physical, chemical, mechanical and thermal properties of materials	Classification of Materials and Measurements, Atomic Structure and Properties	Atoms	Laboratory Materials	Laboratory Journal, Quizzes and Tests

Properties of Materials	1 week	3	C2.2A, C2.2B, C2.2d, C5.5d, C5.5e	Identify physical, chemical, mechanical and thermal properties of materials, Define stress and strain, Describe difference between a ductile and brittle material, Calculate ductility, young's modulus and tensile stress, Define Heat Capacity, Thermal Conductivity, Define Electrical Conductivity	Properties of Materials	electrical conductivity, thermal conductivity	Laboratory Materials	Laboratory Journal, Quizzes and Tests
Crystal Structure	2 weeks	4	C2.2A, C2.2B, C2.2d	Describe the difference between a crystalline structure and an amorphous material, Define Defect in a crystal structure, Describe the different types of defects, Define Diffusion, Define Phase Diagram, Read a simple one-material phase diagram, Determine the triple point in a phase diagram	Crystal Structure	Crystalline structure, allotropes, amorphous solids	Laboratory Materials	Laboratory Journal, Quizzes and Tests

Introduction to Metals	3 weeks	5	C3.3A, C3.3B, C3.3c, C3.4A, C5.6c	Discuss the thermal properties of metals, Discuss why metals are good conductors of heat, Understand and identify oxidation and reduction reactions, Identify the Activity Series of metals, Understand and identify oxidation and reduction reactions, Identify the Activity Series of metals, Discuss the trainable wire Nitinol	Introduction to Metals	Corrosion, alloys, tensile test	Laboratory Materials	Laboratory Journal, Quizzes and Tests
Ceramics, Structure and Properties	2 weeks	6	C4.3A, C4.3B, C4.3c, C4.3d, C4.3h, C4.3i	Describe the mechanical properties of ceramics, Describe the electrical properties of ceramics, Identify components of a light bulb, Describe phenomenon of superconductivity	Ceramics, Structure and Properties	Atomic bonding, polarization	Laboratory Materials	Laboratory Journal, Quizzes and Tests

Properties of Polymers	3 weeks	7	C2.2A, C2.2B, C2.2d	Define polymers and some of their basic structures Define Polymerization Describe the different classification of polymers and be able to illustrate the differences in structures, Describe the chemical and physical structure of Kevlar and Teflon and their unique properties Describe how conductive polymers work Understand the process of recycling polymers Identify polymers by recycling codes	Properties of Polymers	bonding of polymers, polyethylene, composite	Laboratory Materials	Laboratory Journal, Quizzes and Tests
Properties of Wood	1 week	8		Demonstrate how wood is transformed through heat, pressure and chemical changes	Properties of Wood	Fatigue	Laboratory Materials	Laboratory Journal, Quizzes and Tests
Making the Strongest Composites	3 weeks	9	C3.3A, C3.3B, C3.3c, C3.4A	Describe sandwich structure composites Understand where the composites derive their strength Understand the concept of failure of materials Understand the types of failure that occur in composites	Making the Strongest Composites	Composites, nanotechnology	Laboratory Materials	Laboratory Journal, Quizzes and Tests