

INTRODUCTION TO NANOSCALE SCIENCE & ENGINEERING NANOPHYSICS SEMESTER

MONTH	CONTENT	LAB THEMES	SKILLS	ASSESSMENTS
September	<p><i><u>Nano-Intro (Same topics for nanophysics and nanochem)</u></i></p> <p><u>Topic I: NAN-OH!! WHAT?</u></p> <p><u>Unit 1 Nano -The Unit</u></p> <ul style="list-style-type: none"> ➤ SI System of Units ➤ Unit Conversions ➤ Intro to NanoBook ➤ NanoDefinitions ➤ Scaling from Macro to Nano <p><u>Unit 2 Nano-The next Big Thing</u></p> <ul style="list-style-type: none"> ➤ NanoScience in our lives ➤ Nanotechnology overview ➤ Branches of NanoScience ➤ Tools and Fabrication overview ➤ Intro NanoTerminology 	<ul style="list-style-type: none"> ❖ Math Tool Kit ❖ Cutting it Down to Nano ❖ NanoAnalogies 1 (familiarize nanoscale objects) ❖ NanoAnalogies 2 (scale own objects) ❖ NanoAnalogies 3 (nano applications) 	<ul style="list-style-type: none"> ❑ Understand the approximate values of micro and nano ❑ Convert using small scale metric units ❑ Basic NanoTerminology ❑ Compare and Contrast various branches of the Nanotechnology ❑ Understand the basic equipment and use of such in NanoScience 	<p>Nano Pre Quiz</p> <p>Lab Activities</p> <p>Homework</p> <p>Unit Tests</p> <p>Quizzes</p> <p>Marking Period Exam</p> <p>NanoComp Book</p>

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<div style="display: flex; flex-direction: column; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: 48pt; font-weight: bold;">October</div> <hr style="width: 50%; margin: 5px 0;"/> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: 48pt; font-weight: bold;">February</div> </div>	<p><u>NanoPhysics Content</u></p> <p><u>Topic II: THE SPIN ON NANO</u></p> <p><u>Unit 3 Size Matters</u></p> <ul style="list-style-type: none"> ➤ Movement (velocity, acceleration, gravity) ➤ Forces ➤ Hooke’s Law ➤ Surface Area ➤ NanoDefinitions <p><u>Unit 4 Physical Properties at the Nanoscale (physical)</u></p> <ul style="list-style-type: none"> ➤ Scale Diagrams ➤ Objects to Scale ➤ Size Dependent Properties ➤ Building Small ➤ Applications 	<ul style="list-style-type: none"> ❖ Tractor Lego Lab ❖ (NanoTubes Lab) ❖ (Size of Things) ❖ (Measuring the Invisible) ❖ (Fancy Pants Lab) 	<ul style="list-style-type: none"> ○ Compare and contrast linear movements at the NanoScale and MacroScale ○ State how forces act different at the NanoScale ○ Demonstrate how a cantilever employs Hooke’s Law ○ Compare and Contrast surface area of Macro scale objects vs NanoScale objects ○ Order by scale various NanoScale objects ○ Recognize tools used for various NanoScale activities ○ Basic NanoTerminology 	<p>Lab Activities</p> <p>Homework</p> <p>Unit Tests</p> <p>Quizzes</p> <p>Marking Period Exam</p> <p>NanoComp Book</p>

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June	<p><u>Topic VI: NANOFUTURE</u></p> <p><u>Unit 11 NanoProducts</u></p> <ul style="list-style-type: none"> ➤ Commercial ➤ Military ➤ Medical ➤ Existing vs. Future <p><u>Unit 12 NanoPolitics</u></p> <ul style="list-style-type: none"> ➤ Initiatives ➤ Objectives ➤ Vision ➤ Measures ➤ Environmental Impact 	<ul style="list-style-type: none"> ❖ NanoPants Lab ❖ Cutting Edge Lab ❖ Societal Impact Study 	<ul style="list-style-type: none"> ○ List, and Categorize Nano-Products currently in use ○ List, and Categorize Nano-Products being developed ○ List and Categorize Nano-Products being conceptualized ○ Compare and Contrast the objectives of involved organizations ○ Discuss the EPA stance on nanotechnology as it pertains to environmental issues 	<p>Lab Activities</p> <p>Homework</p> <p>Unit Tests</p> <p>Quizzes</p> <p>Marking Period Exam</p> <p>NanoComp Book</p>