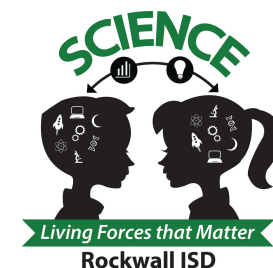




Rockwall ISD

Science



Science Honors Vertical Alignment Document

May 19, 2022

This document contains visual representations of various skills to be developed **during** each grade level of Honors science, leading up to the AP & IB courses in high school. These skills are not necessarily correlated to science content, rather they represent a scaffolded approach to preparation for success in collegiate-level science courses taken in high school. Honors 6th science (beginning 2025), Honors 7th science, Honors IPC (8th grade), Honors Biology and Honors Chemistry teachers will expect students to have acquired the indicated skills from previous grades upon entrance into their course and will provide support for students in skills development during the course being taught in preparation for the next grade level.

These are the skills included in this document:

- Math Skills:
 - Graphs
 - Calculations
 - Geometry & Trigonometry
- Science Lab Skills
- Developing and Using Models
- Scientific Explanations & Communication
- Note-Taking Skills
- Independent Learning
- Learning Plan

Note on assessments:

High School Honors Assessments are 70% of the grade.

Assessments are based on the application of key course content in new and unpredictable contexts. Assessments will include constructed response (essay, experimental design, graphical analysis, class presentations, lab practicum, etc.) as well as multiple choice, with an escalation in the amount of constructed response by grade level.

Math Skills: Graphs

Skills developed during indicated Grade Level

	choose appropriate graph style	identify independent and dependent quantities	interpolate: find relationships	extrapolate: predict graphically	generate graphs	slope	best fit	develop an equation	extrapolate: predict mathematically	linearize	AP Physics C additional skills
Honors 6th	with guidance	with guidance	✓								
Honors 7th	with guidance	✓	✓	✓	✓						
Honors IPC	✓	✓	✓	✓	✓	✓					
Honors Bio	✓	✓	✓	✓	✓		line				
Honors Chem	parent function	✓	✓	✓	✓	✓	curve	✓	✓		
AP/IB	parent function	✓	✓	✓	✓	✓	curve	✓	✓	✓	Calculus: Integrals and Derivatives

Math Skills: Calculations

Skills developed during indicated Grade Level

	include units with numbers	Components of the GUESS method			scientific notation	Greek alphabet	unit conversion	solve system of equations	AP Physics C additional skills
		Identify the Given & Unknown variables	Substitute and Solve	choose the appropriate Equation					
Honors 6th	✓	✓	✓						
Honors 7th	✓								
Honors IPC	✓	✓	✓	✓	✓	exposed	✓		
Honors Bio	✓				referenced	exposed			
Honors Chem	✓	✓	✓	✓	✓	exposed	dimensional analysis		
AP/IB	✓	✓	✓	✓	✓	✓	dimensional analysis	✓	Calculus: Integrals, Derivatives, log functions, In functions

Math Skills: Geometry & Trigonometry

Skills developed during indicated Grade Level

	area of regular shapes	volume of regular shapes	determine volume of irregular shapes	ratios and proportions	AP additional skills	AP Physics C additional skills
Honors 6th	measure	measure	✓	✓		
Honors 7th	measure	measure	✓	✓		
Honors IPC	measure & calculate	measure & calculate	✓	✓		
Honors Bio	measure & calculate	measure & calculate	✓	✓		
Honors Chem	measure & calculate	measure & calculate	✓	✓		
AP/IB	measure & calculate	measure & calculate	✓	✓	Right triangle geometry, apply trigonometric functions, calculate volume, calculate surface area/area of regular shapes, estimating area under the curve, ratios and proportions	Integrals, Derivatives log functions, In functions, Volume, Surface Area, Area of regular shapes

Science Lab Skills

Skills developed during indicated Grade Level

	inquiry teaching and learning	investigational methodology	formulate testable questions	generate testable hypothesis	determine if hypothesis is supported or refuted	identify independent and dependent variables (when applicable)	evaluate investigative procedure and analyze outcomes	represent findings using multiple modalities: mathematically, graphically, diagrammatically, and using physical models
Honors 6th	✓	execute with guidance	✓	with guidance	✓	with guidance		
Honors 7th	✓	design and execute with guidance	✓	✓	✓	✓	✓	
Honors IPC	✓	design and execute with guidance	✓	✓	✓	✓	✓	✓
Honors Bio	✓	design with guidance and independently execute	✓	✓	✓	✓	✓	✓
Honors Chem	✓	design with guidance and independently execute to test a scientific question	✓	✓	✓	✓	✓	✓
AP/IB	✓	independently design and independently execute to test a scientific question using rigorous methodology	✓	✓	✓	✓	✓	✓

Developing and Using Models

Skills developed during indicated Grade Level

	Identify & Evaluate Limitations of models	Developing Models	Use a model to test ideas	Compare and Contrast Two Models	Explain relationships in the natural vs designed world	Design and Create a Complex Model	Test Reliability of the Designed Model
Honors 6th	✓						
Honors 7th	✓	✓					
Honors IPC	✓	✓	✓				
Honors Bio	✓	✓	✓	✓			
Honors Chem	✓	✓	✓	✓	✓		
AP/IB	✓	✓	✓	✓	✓	✓	✓

Scientific Explanations & Communication

Skills developed during indicated Grade Level

	Use Evidence to Support an Explanation	Construct explanation based on evidence from sources	Construct an explanation that includes quantitative and qualitative relationships	Construct and revise explanations	Claim regarding relationship of independent and dependent variable	Analyze the validity of the claim	communicate findings using multiple modalities: orally, graphically, textually,	Support claim using multiple and independent sources
Honors 6th	✓	✓	with guidance					
Honors 7th	✓	✓	✓	with guidance				
Honors IPC	✓	✓	✓	with guidance	✓	with guidance	with guidance	
Honors Bio	✓	✓	✓	✓	✓	✓	✓	✓
Honors Chem	✓	✓	✓	✓	✓	✓	✓	✓
AP/IB	✓	✓	✓	✓	✓	✓	✓	✓

Note-Taking Skills

Skills developed during indicated Grade Level

	take notes from verbal lecture or demonstration	writing reflections and summaries	generating questions	reflect on key concepts	linking content to inquiry	identify key concepts
Honors 6th	given a framework	with guidance	with guidance			
Honors 7th	given a framework	✓	✓	✓		
Honors IPC	given a framework	✓	✓	✓	✓	
Honors Bio	transitioning to independent note-taking	✓	✓	✓	✓	
Honors Chem	without note-taking assistance	✓	✓	✓	✓	
AP/IB	entire class period without note-taking assistance	✓	✓	✓	✓	✓

Independent Learning

Skills developed during indicated Grade Level

	informational text	identify key terms	create visual representations	identify key concepts	interpret visual representations	text emphasis on original research
Honors 6th	read	✓	with guidance	with guidance	✓	
Honors 7th	read	✓	with guidance	✓	✓	
Honors IPC	read	✓	✓	✓	✓	
Honors Bio	read informational text and create a synthesis of the content including key terms and key concepts, creating visual representations				✓	
Honors Chem	read informational text for comprehension and create a synthesis of the content including key terms and key concepts, creating visual representations				✓	✓
AP/IB	independently read informational text for understanding, evaluate the content and create a synthesis including key concepts and key terms, creating multiple visual representations				✓	✓

Learning Plan

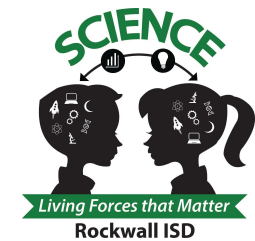
Skills developed during indicated Grade Level

Assessments are based on new and unpredictable contexts which necessitate each student developing an individual learning plan for success.

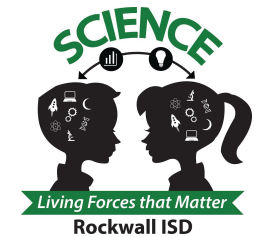
Honors and AP/IB students are encouraged to embrace the rigor of these courses and persevere when challenged.

	complete ALL assignments	learning gaps	tools	review of content	read in the content area	connect learning to real world scenarios	metacognitive strategies	manage the balance of time between academic and personal	self-quiz to master content	become familiar with assessment format	become familiar with connections between key ideas
Honors 6th	✓	identify with teacher guidance	utilize teacher-suggested tools to eliminate learning gaps	teacher directed continuous review of current content and selected previous content	as assigned	✓	practice with teacher direction				
Honors 7th	✓	identify with teacher guidance	utilize teacher-suggested tools to eliminate learning gaps	teacher directed continuous review of current content and selected previous content	as assigned	✓	practice with teacher direction				
Honors IPC	✓	identify with teacher guidance	utilize teacher-suggested tools to eliminate learning gaps	teacher directed continuous review of current content and selected previous content	as assigned	✓	practice with teacher direction	✓	with teacher guidance		
Honors Bio	✓	identify with teacher guidance	utilize teacher-suggested tools to eliminate learning gaps	teacher directed continuous review of current content and selected previous content	as assigned	✓	practice with teacher direction	✓	✓	✓	✓
Honors Chem	✓	self-identify with prompting	utilize teacher-suggested tools to eliminate learning gaps	self-directed continuous review of current and previous content	✓	✓	enact	✓	✓	✓	✓
AP/IB	✓	self-identify	find and utilize tools to eliminate learning gaps	self-directed continuous review of current and previous content	even when not directly assigned	✓	independently enact	✓	✓	become familiar with the AP/IB assessment format, AP/IB scoring guidelines, and the AP Big Ideas	

Math Skills: Graphs	choose appropriate graph style	identify independent and dependent quantities	interpolate: find relationships				
	with guidance	with guidance	✓				
Math Skills: Calculations	include units with numbers	Identify the Given & Unknown variables	Substitute and Solve				
	✓	✓	✓				
Math Skills: Geometry & Trigonometry	area of regular shapes	volume of regular shapes	determine volume of irregular shapes	ratios and proportions			
	measure	measure	✓	✓			
Science Lab Skills	inquiry teaching and learning	investigational methodology	formulate testable questions	generate testable hypothesis	determine if hypothesis is supported or refuted	identify independent and dependent variables (when applicable)	
	✓	execute with guidance	✓	with guidance	✓	with guidance	
Developing and Using Models	Identify & Evaluate Limitations of models						
	✓						
Scientific Explanations & Communication	Use Evidence to Support an Explanation	Construct explanation based on evidence from sources	Construct an explanation that includes quantitative and qualitative relationships				
	✓	✓	with guidance				
Note-Taking Skills	take notes from verbal lecture or demonstration	writing reflections and summaries	generating questions				
	given a framework	with guidance	with guidance				
Independent Learning	informational text	identify key terms	create visual representations	identify key concepts	interpret visual representations		
	read	✓	with guidance	with guidance	✓		
Learning Plan	complete ALL assignments	learning gaps	tools	review of content	read in the content area	connect learning to real world scenarios	metacognitive strategies
	✓	identify with teacher guidance	utilize teacher-suggested tools to eliminate learning gaps	teacher directed continuous review of current content and selected previous content	as assigned	✓	practice with teacher direction



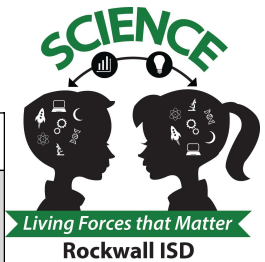
Math Skills: Graphs	choose appropriate graph style with guidance	identify independent and dependent quantities ✓	interpolate: find relationships ✓	extrapolate: predict graphically ✓	generate graphs ✓			
Math Skills: Calculations	include units with numbers ✓							
Math Skills: Geometry & Trigonometry	area of regular shapes measure	volume of regular shapes measure	determine volume of irregular shapes ✓	ratios and proportions ✓				
Science Lab Skills	inquiry teaching and learning ✓	investigational methodology design and execute with guidance	formulate testable questions ✓	generate testable hypothesis ✓	determine if hypothesis is supported or refuted ✓	identify independent and dependent variables (when applicable) ✓	evaluate investigative procedure and analyze outcomes ✓	
Developing and Using Models	Identify & Evaluate Limitations of models ✓	Developing Models ✓						
Scientific Explanations & Communication	Use Evidence to Support an Explanation ✓	Construct explanation based on evidence from sources ✓	Construct an explanation that includes quantitative and qualitative relationships ✓	Construct and revise explanations with guidance				
Note-Taking Skills	take notes from verbal lecture or demonstration given a framework	writing reflections and summaries ✓	generating questions ✓	reflect on key concepts ✓				
Independent Learning	informational text read	identify key terms ✓	create visual representations with guidance	identify key concepts ✓	interpret visual representations ✓			
Learning Plan	complete ALL assignments ✓	learning gaps identify with teacher guidance	tools utilize teacher-suggested tools to eliminate learning gaps	review of content teacher directed continuous review of current content and selected previous content	read in the content area as assigned	connect learning to real world scenarios ✓	metacognitive strategies practice with teacher direction	



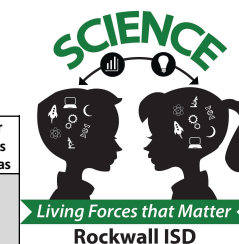
Math Skills: Graphs	choose appropriate graph style	identify independent and dependent quantities	interpolate: find relationships	extrapolate: predict graphically	generate graphs	slope			
	✓	✓	✓	✓	✓	✓			
Math Skills: Calculations	include units with numbers	Identify the Given & Unknown variables	Substitute and Solve	choose the appropriate Equation	scientific notation	Greek alphabet	unit conversion		
	✓	✓	✓	✓	✓	exposed	✓		
Math Skills: Geometry & Trigonometry	area of regular shapes	volume of regular shapes	determine volume of irregular shapes	ratios and proportions					
	measure & calculate	measure & calculate	✓	✓					
Science Lab Skills	inquiry teaching and learning	investigational methodology	formulate testable questions	generate testable hypothesis	determine if hypothesis is supported or refuted	identify independent and dependent variables (when applicable)	evaluate investigative procedure and analyze outcomes	represent findings using multiple modalities: mathematically, graphically, diagrammatically, and using physical models	
	✓	design and execute with guidance	✓	✓	✓	✓	✓	✓	✓
Developing and Using Models	Identify & Evaluate Limitations of models	Developing Models	Use a model to test ideas						
	✓	✓	✓						
Scientific Explanations & Communication	Use Evidence to Support an Explanation	Construct explanation based on evidence from sources	Construct an explanation that includes quantitative and qualitative relationships	Construct and revise explanations	Claim regarding relationship of independent and dependent variable	Analyze the validity of the claim	communicate findings using multiple modalities: orally, graphically, textually, mathematically		
	✓	✓	✓	with guidance	✓	with guidance	with guidance		
Note-taking Skills	take notes from verbal lecture or demonstration	writing reflections and summaries	generating questions	reflect on key concepts	linking content to inquiry				
	given a framework	✓	✓	✓	✓				
Independent Learning	informational text	identify key terms	create visual representations	identify key concepts	interpret visual representations				
	read	✓	✓	✓	✓				
Learning Plan	complete ALL assignments	learning gaps	tools	review of content	read in the content area	connect learning to real world scenarios	metacognitive strategies	manage the balance of time between academic and personal	self-quiz to master content
	✓	identify with teacher guidance	utilize teacher-suggested tools to eliminate learning gaps	teacher directed continuous review of current content and selected previous content	as assigned	✓	practice with teacher direction	✓	with teacher guidance



Math Skills: Graphs	choose appropriate graph style ✓	identify independent and dependent quantities ✓	interpolate: find relationships ✓	extrapolate: predict graphically ✓	generate graphs ✓						
						best fit line					
Math Skills: Calculations	include units with numbers ✓				scientific notation referenced	Greek alphabet exposed					
Math Skills: Geometry & Trigonometry	area of regular shapes measure & calculate	volume of regular shapes measure & calculate	determine volume of irregular shapes ✓	ratios and proportions ✓							
Science Lab Skills	inquiry teaching and learning ✓	investigational methodology design with guidance and independently execute	formulate testable questions ✓	generate testable hypothesis ✓	determine if hypothesis is supported or refuted ✓	identify independent and dependent variables (when applicable) ✓	evaluate investigative procedure and analyze outcomes ✓	represent findings using multiple modalities: mathematically, graphically, diagrammatically, and using physical models ✓			
Developing and Using Models	Identify & Evaluate Limitations of models ✓	Developing Models ✓	Use a model to test ideas ✓	Compare and Contrast Two Models ✓							
Scientific Explanations & Communication	Use Evidence to Support an Explanation ✓	Construct explanation based on evidence from sources ✓	Construct an explanation that includes quantitative and qualitative relationships ✓	Construct and revise explanations ✓	Claim regarding relationship of independent and dependent variable ✓	Analyze the validity of the claim ✓	communicate findings using multiple modalities: orally, graphically, textually, mathematically ✓	Support claim using multiple and independent sources ✓			
Note-Taking Skills	take notes from verbal lecture or demonstration transitioning to independent note-taking	writing reflections and summaries ✓	generating questions ✓	reflect on key concepts ✓	linking content to inquiry ✓						
Independent Learning	informational text read informational text and create a synthesis of the content including key terms and key concepts, creating visual representations	identify key terms	create visual representations	identify key concepts	interpret visual representations ✓						
Learning Plan	complete ALL assignments ✓	learning gaps identify with teacher guidance	tools utilize teacher-suggested tools to eliminate learning gaps	review of content teacher directed continuous review of current content and selected previous content	read in the content area as assigned	connect learning to real world scenarios ✓	metacognitive strategies practice with teacher direction	manage the balance of time between academic and personal ✓	self-quiz to master content ✓	become familiar with assessment format ✓	become familiar with connections between key ideas ✓



Math Skills: Graphs	choose appropriate graph style	identify independent and dependent quantities	interpolate: find relationships	extrapolate: predict graphically	generate graphs	slope	best fit	develop an equation	extrapolate: predict mathematically		
	parent function	✓	✓	✓	✓	✓	curve	✓	✓		
Math Skills: Calculations	include units with numbers	Identify the Given & Unknown variables	Substitute and Solve	choose the appropriate Equation	scientific notation	Greek alphabet	unit conversion				
	✓	✓	✓	✓	✓	exposed	dimensional analysis				
Math Skills: Geometry & Trigonometry	area of regular shapes	volume of regular shapes	determine volume of irregular shapes	ratios and proportions							
	measure & calculate	measure & calculate	✓	✓							
Science Lab Skills	inquiry teaching and learning	investigational methodology	formulate testable questions	generate testable hypothesis	determine if hypothesis is supported or refuted	identify independent and dependent variables (when applicable)	evaluate investigative procedure and analyze outcomes	represent findings using multiple modalities: mathematically, graphically, diagrammatically, and using physical models			
	✓	design with guidance and independently execute to test a scientific question	✓	✓	✓	✓	✓	✓	✓		
Developing and Using Models	Identify & Evaluate Limitations of models	Developing Models	Use a model to test ideas	Compare and Contrast Two Models	Explain relationships in the natural vs designed world						
	✓	✓	✓	✓	✓						
Scientific Explanations & Communication	Use Evidence to Support an Explanation	Construct explanation based on evidence from sources	Construct an explanation that includes quantitative and qualitative relationships	Construct and revise explanations	Claim regarding relationship of independent and dependent variable	Analyze the validity of the claim	communicate findings using multiple modalities: orally, graphically, textually, mathematically	Support claim using multiple and independent sources			
	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Note-Taking Skills	take notes from verbal lecture or demonstration	writing reflections and summaries	generating questions	reflect on key concepts	linking content to inquiry						
	without note-taking assistance	✓	✓	✓	✓						
Independent Learning	informational text	identify key terms	create visual representations	identify key concepts	interpret visual representations	text emphasis on original research					
	read informational text for comprehension and create a synthesis of the content including key terms and key concepts, creating visual representations				✓	✓					
Learning Plan	complete ALL assignments	learning gaps	tools	review of content	read in the content area	connect learning to real world scenarios	metacognitive strategies	manage the balance of time between academic and personal	self-quiz to master content	become familiar with assessment format	become familiar with connections between key ideas
	✓	self-identify with prompting	utilize teacher-suggested tools to eliminate learning gaps	self-directed continuous review of current and previous content	✓	✓	enact	✓	✓	✓	✓



Math Skills: Graphs	choose appropriate graph style	identify independent and dependent quantities	interpolate: find relationships	extrapolate: predict graphically	generate graphs	slope	best fit	develop an equation	extrapolate: predict mathematically	linearize	AP Physics C additional skills
	parent function	✓	✓	✓	✓	✓	curve	✓	✓	✓	Calculus: Integrals and Derivatives
Math Skills: Calculations	include units with numbers	Identify the Given & Unknown variables	Substitute and Solve	choose the appropriate Equation	scientific notation	Greek alphabet	unit conversion	solve system of equations	AP Physics C additional skills		
	✓	✓	✓	✓	✓	✓	dimensional analysis	✓	Calculus: Integrals, Derivatives, log functions, In functions		
Math Skills: Geometry & Trigonometry	area of regular shapes	volume of regular shapes	determine volume of irregular shapes	ratios and proportions	AP additional skills			AP Physics C additional skills			
	measure & calculate	measure & calculate	✓	✓	Right triangle geometry, apply trigonometric functions, calculate volume, calculate surface area/area of regular shapes, estimating area under the curve, ratios and proportions			Integrals, Derivatives log functions, In functions, Volume, Surface Area, Area of regular shapes			
Science Lab Skills	inquiry teaching and learning	investigational methodology	formulate testable questions	generate testable hypothesis	determine if hypothesis is supported or refuted	identify independent and dependent variables (when applicable)	evaluate investigative procedure and analyze outcomes	represent findings using multiple modalities: mathematically, graphically, diagrammatically, and using physical models			
	✓	independently design and independently execute to test a scientific question using rigorous methodology	✓	✓	✓	✓	✓	✓			
Developing and Using Models	Identify & Evaluate Limitations of models	Developing Models	Use a model to test ideas	Compare and Contrast Two Models	Explain relationships in the natural vs designed world	Design and Create a Complex Model	Test Reliability of the Designed Model				
	✓	✓	✓	✓	✓	✓	✓				
Scientific Explanations & Communication	Use Evidence to Support an Explanation	Construct explanation based on evidence from sources	Construct an explanation that includes quantitative and qualitative relationships	Construct and revise explanations	Claim regarding relationship of independent and dependent variable	Analyze the validity of the claim	communicate findings using multiple modalities: orally, graphically, textually, mathematically	Support claim using multiple and independent sources			
	✓	✓	✓	✓	✓	✓	✓	✓			
Note-Taking Skills	take notes from verbal lecture or demonstration	writing reflections and summaries	generating questions	reflect on key concepts	linking content to inquiry	identify key concepts					
	entire class period without note-taking assistance	✓	✓	✓	✓	✓					
Independent Learning	informational text	identify key terms	create visual representations	identify key concepts	interpret visual representations	text emphasis on original research					
	independently read informational text for understanding, evaluate the content and create a synthesis including key concepts and key terms, creating multiple visual representations						✓	✓			
Learning Plan	complete ALL assignments	learning gaps	tools	review of content	read in the content area	connect learning to real world scenarios	metacognitive strategies	manage the balance of time between academic and personal	self-quiz to master content	become familiar with assessment format	become familiar with connections between key ideas
	✓	self-identify	find and utilize tools to eliminate learning gaps	self-directed continuous review of current and previous content	even when not directly assigned	✓	independently enact	✓	✓	become familiar with the AP/IB assessment format, AP/IB scoring guidelines, and the AP Big Ideas	

AP / IB page
addendum to the Rockwall ISD Science
Honors Vertical Alignment Document

