

Scope and Sequence for Project Spectra!

Prior Knowledge and Experience	Develop Knowledge	Lessons	NSES Stds.	Colo. Stds. for Science	Colo. Stds. for Math
Light	Light and Light Exploration				
Reflection	Spectra	<ul style="list-style-type: none"> • Patterns and Fingerprints • Graphing the Rainbow • Using Spectral Data to Explore Saturn and Titan • Goldilocks and the Three Planets • Building a Fancy Spectrograph • Using a Fancy Spectrograph • A Spectral Mystery • Marvelous Martian Mineralogy 	A, B, D, E, G	1, 2, 4, 5	1.3, 1.4, 1.6, 2.1, 2.2, 2.5, 3, 4, 5.1, 5.2, 5.3, 5.6, 6.2, 6.3
Transmission	Diffraction	<ul style="list-style-type: none"> • Graphing the Rainbow • Building a Fancy Spectrograph • Using a Fancy Spectrograph • A Spectral Mystery • Designing an Open Spectrograph • Designing a Spectroscopy Mission 	A, B, D, G	1, 2, 4, 5	2.1, 2.2, 3.1, 3.4, 4.4, 5.1, 5.2
Opacity	Absorption	<ul style="list-style-type: none"> • Patterns and Fingerprints • Building a Fancy Spectrograph 	A, B, D, G	1, 2, 4, 5	1.3, 1.6, 2.1, 2.2, 3.1, 3.4, 4.4, 5.1, 5.2, 5.3, 6.2, 6.3
Visible spectrum	Emission	<ul style="list-style-type: none"> • Patterns and Fingerprints • Building a Fancy Spectrograph • Using a Fancy Spectrograph • A Spectral Mystery 	A, B, D, E, G	1, 2, 4, 5	1.3, 1.6, 2.1, 2.2, 3.1, 3.4, 4.4, 5.1, 5.2, 5.3, 6.2, 6.3

	Spectroscopy	<ul style="list-style-type: none"> Graphing the Rainbow Using Spectral Data to Explore Saturn and Titan Goldilocks and the Three Planets Building a Fancy Spectrograph Using a Fancy Spectrograph A Spectral Mystery Designing an Open Spectrograph Designing a Spectroscopy Mission Marvelous Martian Mineralogy 	A, B, D, E, G	1, 2, 4, 5	2.1, 2.2, 3.1, 3.4, 5.1, 5.2, 5.3
Science and Math Tools	Science and Math Tools				
Instrumentation	Spectrographs	<ul style="list-style-type: none"> Building a Fancy Spectrograph Using a Fancy Spectrograph A Spectral Mystery Designing an Open Spectrograph Designing a Spectroscopy Mission Marvelous Martian Mineralogy 	A, B, D, E, G	1, 2, 4, 5	3, 4, 5.1, 5.2
Data Collection and Interpretation	Data collection and interpretation	<ul style="list-style-type: none"> Building a Fancy Spectrograph Using a Fancy Spectrograph A Spectral Mystery Designing an Open Spectrograph Marvelous Martian Mineralogy 	A, B, D, E, G	1, 2, 4, 5	3, 4, 5.1, 5.2
Pattern Recognition	Pattern Recognition	<ul style="list-style-type: none"> Patterns and Fingerprints Graphing the Rainbow Using Spectral Data to Explore Saturn and Titan Goldilocks and the Three Planets Building a Fancy Spectrograph Using a Fancy Spectrograph A Spectral Mystery Marvelous Martian Mineralogy 	A, B, D, E, G	1, 2, 4, 5	1.3, 1.4, 1.6, 2.1, 2.2, 2.5, 3.1, 3.2, 3.4, 4.4, 5.1, 5.2, 5.3, 5.6, 6.2, 6.3
Graphing and Charting	Graphing and Charting	<ul style="list-style-type: none"> Graphing the Rainbow Using Spectral Data to Explore Saturn and Titan Marvelous Martian Mineralogy 	A, B, D, E, G	1, 2, 4, 5	2.1, 2.2, 3.1, 3.4, 4.4, 5.1, 5.2, 5.3
Scientific Method	Scientific Reporting	<ul style="list-style-type: none"> Patterns and Fingerprints Building a Fancy Spectrograph 	A, B, D, G	1, 2, 4, 5	1.3, 1.6, 2.1, 2.2, 3,

		<ul style="list-style-type: none"> • Designing an Open Spectrograph • Designing a Spectroscopy Mission • Marvelous Martian Mineralogy 			4, 5.1, 5.2, 5.3, 6.2, 6.3
	Visible Spectrum	<ul style="list-style-type: none"> • Patterns and Fingerprints • Graphing the Rainbow • Using Spectral Data to Explore Saturn and Titan • Building a Fancy Spectrograph • Using a Fancy Spectrograph • A Spectral Mystery • Designing an Open Spectrograph • Designing a Spectroscopy Mission 	A, B, D, E, G	1, 2, 4, 5	1.3, 1.6, 2.1, 2.2, 3.1, 3.2, 3, 4, 5.1, 5.2, 5.3, 5.6, 6.2, 6.3
Useful Concepts *					
E-M spectrum					
Scientific Method					
Energy					

*Use discretion based on the age/abilities of the students. It is not necessary to have these skills to do lessons.