

Modeling Curriculum Activities in Unit Six, the Wave Model of Light, in Order of the NYSS

Activity Number and title	New York State Standards	Description
	Standard 1	
3) Lab: Measuring Wave speed	M1.1	Abstract representation to communicate mathematically Deductive and inductive reasoning to reach mathematical conclusion
6) Lab: Reflection & Refraction in 2-D	M1.1	
11) Lab: Wave Interference	M2.1	
13) Lab: Diffraction and Interference With Light	M2.1	
19) Test-Wave Model of Light	M2.1	
3) Lab: Measuring Wave speed	M2.1	
13) Lab: Diffraction and Interference With Light	M3.1	
19) Test-Wave Model of Light	M3.1	
15) Quiz 3: Diffraction/Interference of Light	M3.1	
3) Lab: Measuring Wave speed	M3.1	
5) Quiz 1:1 - D waves	M3.1	Explain physical relevance of a graph of real world data
6) Lab: Reflection & Refraction in 2-D	M3.1	
1) Demo / Discussion: Limitations of Particle Model	S1.1	
11) Lab: Wave Interference	S1.1	
13) Lab: Diffraction and Interference With Light	S1.1	
16) Optional Lab: Color Theory	S1.1	
18) Optional Demo: Polarization	S1.1	
2) Properties of One Dimensional Waves	S1.1	
3) Lab: Measuring Wave speed	S1.1	
6) Lab: Reflection & Refraction in 2-D	S1.1	
9) Lab: Wave Diffraction	S1.1	Develop explanation of natural Phenomena
1) Demo / Discussion: Limitations of Particle Model	S2.1	
11) Lab: Wave Interference	S2.1	
13) Lab: Diffraction and Interference With Light	S2.1	
16) Optional Lab: Color Theory	S2.1	
18) Optional Demo: Polarization	S2.1	
2) Properties of One Dimensional Waves	S2.1	
3) Lab: Measuring Wave speed	S2.1	
6) Lab: Reflection & Refraction in 2-D	S2.1	
9) Lab: Wave Diffraction	S2.1	
18) Optional Demo: Polarization	S2.2	Design experiment to investigate relationship between physical Phenomena
1) Demo / Discussion: Limitations of Particle Model	S2.3	
11) Lab: Wave Interference	S2.3	
13) Lab: Diffraction and Interference With Light	S2.3	
16) Optional Lab: Color Theory	S2.3	
18) Optional Demo: Polarization	S2.3	
2) Properties of One Dimensional Waves	S2.3	
3) Lab: Measuring Wave speed	S2.3	
6) Lab: Reflection & Refraction in 2-D	S2.3	
9) Lab: Wave Diffraction	S2.3	
1) Demo / Discussion: Limitations of Particle Model	S2.4	Refine research ideas through various means of investigation Develop, predict, and explain proposed relationships for physical Phenomena
11) Lab: Wave Interference	S2.4	
13) Lab: Diffraction and Interference With Light	S2.4	
16) Optional Lab: Color Theory	S2.4	
18) Optional Demo: Polarization	S2.4	
2) Properties of One Dimensional Waves	S2.4	
3) Lab: Measuring Wave speed	S2.4	
6) Lab: Reflection & Refraction in 2-D	S2.4	
9) Lab: Wave Diffraction	S2.4	
1) Demo / Discussion: Limitations of Particle Model	S3.1	
11) Lab: Wave Interference	S3.1	
13) Lab: Diffraction and Interference With Light	S3.1	
16) Optional Lab: Color Theory	S3.1	
18) Optional Demo: Polarization	S3.1	
2) Properties of One Dimensional Waves	S3.1	
3) Lab: Measuring Wave speed	S3.1	
6) Lab: Reflection & Refraction in 2-D	S3.1	
9) Lab: Wave Diffraction	S3.1	
1) Demo / Discussion: Limitations of Particle Model	S3.1	Use Various means to represent Scientific data-graphs, diagrams charts, equations
11) Lab: Wave Interference	S3.1	
13) Lab: Diffraction and Interference With Light	S3.1	
16) Optional Lab: Color Theory	S3.1	
18) Optional Demo: Polarization	S3.1	
2) Properties of One Dimensional Waves	S3.1	
3) Lab: Measuring Wave speed	S3.1	
6) Lab: Reflection & Refraction in 2-D	S3.1	
9) Lab: Wave Diffraction	S3.1	

1) Demo / Discussion: Limitations of Particle Model	S3.3	Reach a conclusion on whether your data supports your explanation of the experiment	
11) Lab: Wave Interference	S3.3		
13) Lab: Diffraction and Interference With Light	S3.3		
16) Optional Lab: Color Theory	S3.3		
18) Optional Demo: Polarization	S3.3		
2) Properties of One Dimensional Waves	S3.3		
3) Lab: Measuring Wave speed	S3.3		
6) Lab: Reflection & Refraction in 2-D	S3.3		
9) Lab: Wave Diffraction	S3.3		
1) Demo / Discussion: Limitations of Particle Model	S3.4		Discuss relationships with class revise if necessary
11) Lab: Wave Interference	S3.4		
13) Lab: Diffraction and Interference With Light	S3.4		
16) Optional Lab: Color Theory	S3.4		
18) Optional Demo: Polarization	S3.4		
2) Properties of One Dimensional Waves	S3.4		
3) Lab: Measuring Wave speed	S3.4		
6) Lab: Reflection & Refraction in 2-D	S3.4		
9) Lab: Wave Diffraction	S3.4		
15) Quiz 3: Diffraction/Interference of Light	S3.1		
	Standard 2		
16) Optional Lab: Color Theory	1.2	Prepare multimedia presentation Use software to model and extend lab experiences	
11) Lab: Wave Interference	1.5		
17) Optional: Kinds of Waves	1.5		
2) Properties of One Dimensional Waves	1.5		
6) Lab: Reflection & Refraction in 2-D	1.5		
1) Demo / Discussion: Limitations of Particle Model	2		Knowing the impacts and limitations to their effective and ethical use
2) Properties of One Dimensional Waves	2		
16) Optional Lab: Color Theory	3		
16) Optional Lab: Color Theory	3		Information technology can have a positive and negative impacts on society, depending upon how it is used
	Standard 4		
2) Properties of One Dimensional Waves	4.1v		Observe/explain energy conservation Compare characteristics of 2 transverse waves: amplitude, frequency wavelength, speed, period, phase
1) Demo / Discussion: Limitations of Particle Model	4.3i		
10) Worksheet 3: Diffraction	4.3i		
11) Lab: Wave Interference	4.3i		
12) Worksheet 4: Wave Interference	4.3i		
14) Worksheet 5: Diffraction/Interference of Light	4.3i		
16) Optional Lab: Color Theory	4.3i		
19) Test-Wave Model of Light	4.3i		
2) Properties of One Dimensional Waves	4.3i		
3) Lab: Measuring Wave speed	4.3i		
4) Worksheet: 1 - D Waves	4.3i		
5) Quiz 1:1 - D waves	4.3i		
6) Lab: Reflection & Refraction in 2-D	4.3i		
9) Lab: Wave Diffraction	4.3i		
1) Demo / Discussion: Limitations of Particle Model	4.3ii	Draw wave forms with various characteristics	
10) Worksheet 3: Diffraction	4.3ii		
11) Lab: Wave Interference	4.3ii		
12) Worksheet 4: Wave Interference	4.3ii		
14) Worksheet 5: Diffraction/Interference of Light	4.3ii		
16) Optional Lab: Color Theory	4.3ii		
19) Test-Wave Model of Light	4.3ii		
4) Worksheet: 1 - D Waves	4.3ii		
5) Quiz 1:1 - D waves	4.3ii		
6) Lab: Reflection & Refraction in 2-D	4.3ii		
7) Worksheet 2: Reflection & Refraction	4.3ii		
8) Quiz 2: Waves and Wave fronts	4.3ii		
9) Lab: Wave Diffraction	4.3ii		
19) Test-Wave Model of Light	4.3iii		Identify nodes and antinodes in standing waves
3) Lab: Measuring Wave speed	4.3iii		
4) Worksheet: 1 - D Waves	4.3iii		
6) Lab: Reflection & Refraction in 2-D	4.3iii	Differentiate between transverse and longitudinal waves	
19) Test-Wave Model of Light	4.3iv		
2) Properties of One Dimensional Waves	4.3iv		
4) Worksheet: 1 - D Waves	4.3iv	Determine empirically the index of refraction of a transparent medium	
10) Worksheet 3: Diffraction	4.3ix		
19) Test-Wave Model of Light	4.3ix		
6) Lab: Reflection & Refraction in 2-D	4.3ix		
7) Worksheet 2: Reflection & Refraction	4.3ix		
8) Quiz 2: Waves and Wave fronts	4.3ix		

11) Lab: Wave Interference	4.3vi	Predict superposition of two waves interfering both constructively and destructively	
12) Worksheet 4: Wave Interference	4.3vi		
13) Lab: Diffraction and Interference With Light	4.3vi	Observe/sketch behavior of waves reflection, refraction, diffraction	
15) Quiz 3: Diffraction/Interference of Light	4.3vi		
19) Test-Wave Model of Light	4.3vi		
2) Properties of One Dimensional Waves	4.3vi		
3) Lab: Measuring Wave speed	4.3vi		
5) Quiz 1:1 - D waves	4.3vi		
1) Demo / Discussion: Limitations of Particle Model	4.3vii		
10) Worksheet 3: Diffraction	4.3vii		
11) Lab: Wave Interference	4.3vii		
12) Worksheet 4: Wave Interference	4.3vii		
13) Lab: Diffraction and Interference With Light	4.3vii	Draw ray diagrams to represent reflection and refraction of light	
14) Worksheet 5: Diffraction/Interference of Light	4.3vii		
16) Optional Lab: Color Theory	4.3vii		
18) Optional Demo: Polarization	4.3vii		
19) Test-Wave Model of Light	4.3vii		
2) Properties of One Dimensional Waves	4.3vii		
3) Lab: Measuring Wave speed	4.3vii		
4) Worksheet: 1 - D Waves	4.3vii		
6) Lab: Reflection & Refraction in 2-D	4.3vii		
7) Worksheet 2: Reflection & Refraction	4.3vii		
8) Quiz 2: Waves and Wave fronts	4.3vii	Standard 6	
9) Lab: Wave Diffraction	4.3vii		
14) Worksheet 5: Diffraction/Interference of Light	4.3viii		
16) Optional Lab: Color Theory	4.3viii		
7) Worksheet 2: Reflection & Refraction	4.3viii		
8) Quiz 2: Waves and Wave fronts	4.3viii		
Standard 6			Define boundary conditions when doing system analysis Revise a model to make an improved representation of a system
1) Demo / Discussion: Limitations of Particle Model	1.1		
2) Properties of One Dimensional Waves	1.1		
1) Demo / Discussion: Limitations of Particle Model	2.1		
11) Lab: Wave Interference	2.1		
13) Lab: Diffraction and Interference With Light	2.1		
7) Worksheet 2: Reflection & Refraction	2.1		
16) Optional Lab: Color Theory	2.1		
17) Optional: Kinds of Waves	2.1		
18) Optional Demo: Polarization	2.1		
19) Test-Wave Model of Light	2.1	Use observations of behavior of a system to develop a model	
2) Properties of One Dimensional Waves	2.1		
3) Lab: Measuring Wave speed	2.1		
6) Lab: Reflection & Refraction in 2-D	2.1		
8) Quiz 2: Waves and Wave fronts	2.1		
9) Lab: Wave Diffraction	2.1		
1) Demo / Discussion: Limitations of Particle Model	2.2		
11) Lab: Wave Interference	2.2		
13) Lab: Diffraction and Interference With Light	2.2		
15) Quiz 3: Diffraction/Interference of Light	2.2		
16) Optional Lab: Color Theory	2.2	Use mathematical and physical models to represent real world systems	
17) Optional: Kinds of Waves	2.2		
18) Optional Demo: Polarization	2.2		
2) Properties of One Dimensional Waves	2.2		
3) Lab: Measuring Wave speed	2.2		
12) Worksheet 4: Wave Interference	2.2		
6) Lab: Reflection & Refraction in 2-D	2.2		
9) Lab: Wave Diffraction	2.2		
10) Worksheet 3: Diffraction	2.3		
11) Lab: Wave Interference	2.3		
13) Lab: Diffraction and Interference With Light	2.3		
14) Worksheet 5: Diffraction/Interference of Light	2.3		
15) Quiz 3: Diffraction/Interference of Light	2.3		
16) Optional Lab: Color Theory	2.3		
19) Test-Wave Model of Light	2.3		
3) Lab: Measuring Wave speed	2.3		
5) Quiz 1:1 - D waves	2.3		
6) Lab: Reflection & Refraction in 2-D	2.3		
7) Worksheet 2: Reflection & Refraction	2.3		
8) Quiz 2: Waves and Wave fronts	2.3		
9) Lab: Wave Diffraction	2.3		

1) Demo / Discussion: Limitations of Particle Model	2.4	<p>Compare predictions with observations to validate or reject predictions</p> <p>Changes in scales effect the system Describe how disturbances may effect a systems equilibrium</p> <p>Predict systems behavior based on mathematical models and graphs</p> <p>Search for trends in data</p>	
11) Lab: Wave Interference	2.4		
13) Lab: Diffraction and Interference With Light	2.4		
15) Quiz 3: Diffraction/Interference of Light	2.4		
16) Optional Lab: Color Theory	2.4		
18) Optional Demo: Polarization	2.4		
2) Properties of One Dimensional Waves	2.4		
3) Lab: Measuring Wave speed	2.4		
6) Lab: Reflection & Refraction in 2-D	2.4		
9) Lab: Wave Diffraction	2.4		
13) Lab: Diffraction and Interference With Light	3.1		
5) Quiz 1:1 - D waves	4.1		
6) Lab: Reflection & Refraction in 2-D	4.1		
13) Lab: Diffraction and Interference With Light	5.1		
14) Worksheet 5: Diffraction/Interference of Light	5.1		
15) Quiz 3: Diffraction/Interference of Light	5.1		
19) Test-Wave Model of Light	5.1		
3) Lab: Measuring Wave speed	5.1		
4) Worksheet: 1 - D Waves	5.1		
6) Lab: Reflection & Refraction in 2-D	5.1		
7) Worksheet 2: Reflection & Refraction	5.1		
8) Quiz 2: Waves and Wave fronts	5.1		
13) Lab: Diffraction and Interference With Light	5.2		
14) Worksheet 5: Diffraction/Interference of Light	5.2		
19) Test-Wave Model of Light	5.2		
3) Lab: Measuring Wave speed	5.2		
4) Worksheet: 1 - D Waves	5.2		
6) Lab: Reflection & Refraction in 2-D	5.2		
	Standard 7		
14) Worksheet 5: Diffraction/Interference of Light	7.1		Address real world problems using scientific methodology
16) Optional Lab: Color Theory	7.1		