

Table 5a: Modeling Curriculum Activities in Unit Five, the Particle Model of Light, in Order of the NYSS

Activity title and number	New York State Standards	Description
	Standard 1	
11) Optional Lab: Curved Mirror	M1.1	Abstract representation to communicate mathematically
21) Particle Model Of Light Test	M1.1	
6) Light Intensity	M1.1	
11) Optional Lab: Curved Mirror	M2.1	
6) Light Intensity	M2.1	
11) Optional Lab: Curved Mirror	M3.1	
15) Worksheet 7: Particle Model of Light	M3.1	
18) Optional Lab: Lenses	M3.1	
20) Optional Worksheet 9: Lens Problems (quantitative)	M3.1	
21) Particle Model Of Light Test	M3.1	
6) Light Intensity	M3.1	Deductive and inductive reasoning to reach mathematical conclusion Explain physical relevance of a graph of real world data
1) Properties of Light Demo & Worksheet 1a: Light Sources	S1.1	
11) Optional Lab: Curved Mirror	S1.1	
13) Optional Worksheet 6: Mirror Problems (quantitative)	S1.1	
14) Lab: Refraction	S1.1	
15) Worksheet 7: Particle Model of Light	S1.1	
18) Optional Lab: Lenses	S1.1	
2) Observing Shadows Lab & Worksheet 1b: Shadows	S1.1	
3) Pinhole Camera and Worksheet 2	S1.1	
6) Light Intensity	S1.1	
8) Lab: Reflection in a Plane Mirror	S1.1	Develop explanation of natural phenomena
1) Properties of Light Demo & Worksheet 1a: Light Sources	S2.1	
11) Optional Lab: Curved Mirror	S2.1	
14) Lab: Refraction	S2.1	
18) Optional Lab: Lenses	S2.1	
2) Observing Shadows Lab & Worksheet 1b: Shadows	S2.1	
3) Pinhole Camera and Worksheet 2	S2.1	
6) Light Intensity	S2.1	
8) Lab: Reflection in a Plane Mirror	S2.1	
16) Reading: Speed of Light	S2.2	
20a) Optional Reading: Mirror Magic	S2.2	
4) Reading 1: Nature of light	S2.2	
1) Properties of Light Demo & Worksheet 1a: Light Sources	S2.3	
11) Optional Lab: Curved Mirror	S2.3	Use observations of the behavior of a system to develop a model
14) Lab: Refraction	S2.3	
18) Optional Lab: Lenses	S2.3	
2) Observing Shadows Lab & Worksheet 1b: Shadows	S2.3	
3) Pinhole Camera and Worksheet 2	S2.3	
6) Light Intensity	S2.3	
8) Lab: Reflection in a Plane Mirror	S2.3	
1) Properties of Light Demo & Worksheet 1a: Light Sources	S2.4	
11) Optional Lab: Curved Mirror	S2.4	
14) Lab: Refraction	S2.4	
18) Optional Lab: Lenses	S2.4	Develop, predict, and explain proposed relationships for physical phenomena
2) Observing Shadows Lab & Worksheet 1b: Shadows	S2.4	
3) Pinhole Camera and Worksheet 2	S2.4	
6) Light Intensity	S2.4	
8) Lab: Reflection in a Plane Mirror	S2.4	
1) Properties of Light Demo & Worksheet 1a: Light Sources	S3.1	
11) Optional Lab: Curved Mirror	S3.1	
14) Lab: Refraction	S3.1	
15) Worksheet 7: Particle Model of Light	S3.1	
18) Optional Lab: Lenses	S3.1	
2) Observing Shadows Lab & Worksheet 1b: Shadows	S3.1	Carry out research to test theories
3) Pinhole Camera and Worksheet 2	S3.1	
6) Light Intensity	S3.1	
8) Lab: Reflection in a Plane Mirror	S3.1	
11) Optional Lab: Curved Mirror	S3.2	
14) Lab: Refraction	S3.2	
6) Light Intensity	S3.2	
1) Properties of Light Demo & Worksheet 1a: Light Sources	S3.3	
11) Optional Lab: Curved Mirror	S3.3	
14) Lab: Refraction	S3.3	
18) Optional Lab: Lenses	S3.3	Scientific data-graphs, diagrams charts, equations
2) Observing Shadows Lab & Worksheet 1b: Shadows	S3.3	
3) Pinhole Camera and Worksheet 2	S3.3	
8) Lab: Reflection in a Plane Mirror	S3.3	
11) Optional Lab: Curved Mirror	S3.3	
14) Lab: Refraction	S3.3	

1) Properties of Light Demo & Worksheet 1a: Light Sources	S3.4	Discuss relationships with class revise if necessary
11) Optional Lab: Curved Mirror	S3.4	
14) Lab: Refraction	S3.4	
18) Optional Lab: Lenses	S3.4	
19) Optional Worksheet: Lens Diagrams (qualitative)	S3.4	
2) Observing Shadows Lab & Worksheet 1b: Shadows	S3.4	
3) Pinhole Camera and Worksheet 2	S3.4	
6) Light Intensity	S3.4	
8) Lab: Reflection in a Plane Mirror	S3.4	
	Standard 2	
11) Optional Lab: Curved Mirror	1.1	Understand features of word processors spreadsheets and database software Use software to model and extend lab experiences
6) Light Intensity	1.1	
12) Optional Worksheet 5: Curved Mirror Diagrams	1.5	
2) Observing Shadows Lab & Worksheet 1b: Shadows	1.5	
16) Reading: Speed of Light	2	
16) Reading: Speed of Light	3	Knowing the impacts and limitations to their effective and ethical use Information technology can have a positive and negative impacts on society, depending upon how it is used
9) Worksheet 4: Reflection Problems	3	
	Standard 4	
8) Lab: Reflection in a Plane Mirror	4.1viii	Measure current and voltage in a circuit
9) Worksheet 4: Reflection Problems	4.1viii	
14) Lab: Refraction	4.3ix	Determine empirically the index of refraction of a transparent medium
15) Worksheet 7: Particle Model of Light	4.3ix	
17) Quiz: Refraction	4.3ix	Observe/sketch behavior of waves reflection, refraction, diffraction Draw ray diagrams to represent reflection and refraction of light
21) Particle Model Of Light Test	4.3ix	
14) Lab: Refraction	4.3vii	
10) Quiz: Particle Model of Light	4.3viii	
11) Optional Lab: Curved Mirror	4.3viii	
12) Optional Worksheet 5: Curved Mirror Diagrams	4.3viii	
13) Optional Worksheet 6: Mirror Problems (quantitative)	4.3viii	
14) Lab: Refraction	4.3viii	
15) Worksheet 7: Particle Model of Light	4.3viii	
17) Quiz: Refraction	4.3viii	
18) Optional Lab: Lenses	4.3viii	
19) Optional Worksheet: Lens Diagrams (qualitative)	4.3viii	
2) Observing Shadows Lab & Worksheet 1b: Shadows	4.3viii	
20) Optional Worksheet 9: Lens Problems (quantitative)	4.3viii	
21) Particle Model Of Light Test	4.3viii	
5) Quiz 1	4.3viii	
	Standard 6	
20) Optional Worksheet 9: Lens Problems (quantitative)	1.1	Define boundary conditions when doing system analysis Revise a model to make an improved representation of a system
14) Lab: Refraction	1.1	
1) Properties of Light Demo & Worksheet 1a: Light Sources	2.1	
10) Quiz: Particle Model of Light	2.1	
11) Optional Lab: Curved Mirror	2.1	
12) Optional Worksheet 5: Curved Mirror Diagrams	2.1	
14) Lab: Refraction	2.1	
18) Optional Lab: Lenses	2.1	
19) Optional Worksheet: Lens Diagrams (qualitative)	2.1	
20) Optional Worksheet 9: Lens Problems (quantitative)	2.1	
21) Particle Model Of Light Test	2.1	
6) Light Intensity	2.1	
1) Properties of Light Demo & Worksheet 1a: Light Sources	2.2	
11) Optional Lab: Curved Mirror	2.2	
14) Lab: Refraction	2.2	
18) Optional Lab: Lenses	2.2	
2) Observing Shadows Lab & Worksheet 1b: Shadows	2.2	
3) Pinhole Camera and Worksheet 2	2.2	
6) Light Intensity	2.2	
8) Lab: Reflection in a Plane Mirror	2.2	
11) Optional Lab: Curved Mirror	2.3	
14) Lab: Refraction	2.3	
15) Worksheet 7: Particle Model of Light	2.3	Use mathematical and physical models to represent real world systems
6) Light Intensity	2.3	

1) Properties of Light Demo & Worksheet 1a: Light Sources	2.4	Compare predictions with observations to validate or reject predictions	
11) Optional Lab: Curved Mirror	2.4		
14) Lab: Refraction	2.4		
18) Optional Lab: Lenses	2.4		
2) Observing Shadows Lab & Worksheet 1b: Shadows	2.4		
3) Pinhole Camera and Worksheet 2	2.4		
6) Light Intensity	2.4		
8) Lab: Reflection in a Plane Mirror	2.4		
7) Worksheet 3: Light Intensity	3.1		
3) Pinhole Camera and Worksheet 2	4.1		Changes in scales effect the system Describe how disturbances may effect a systems equilibrium Predict systems behavior based on mathematical models and graphs
11) Optional Lab: Curved Mirror	5.1		
13) Optional Worksheet 6: Mirror Problems (quantitative)	5.1		
15) Worksheet 7: Particle Model of Light	5.1		
21) Particle Model Of Light Test	5.1		
6) Light Intensity	5.1		
7) Worksheet 3: Light Intensity	5.1		
10) Quiz: Particle Model of Light	5.2		
11) Optional Lab: Curved Mirror	5.2		
12) Optional Worksheet 5: Curved Mirror Diagrams	5.2	Search for trends in data	
13) Optional Worksheet 6: Mirror Problems (quantitative)	5.2		
6) Light Intensity	5.2		
8) Lab: Reflection in a Plane Mirror	5.2		
	Standard 7		
10) Quiz: Particle Model of Light	7.1		Address real world problems using scientific methodology
11) Optional Lab: Curved Mirror	7.1		
12) Optional Worksheet 5: Curved Mirror Diagrams	7.1		
15) Worksheet 7: Particle Model of Light	7.1		
16) Reading: Speed of Light	7.1		
20) Optional Worksheet 9: Lens Problems (quantitative)	7.1		