Guided Lesson Notes

Name:_____   **Date:**_____

Reflection and Mirrors

Directions: Complete this study guide as you move through the lesson. By taking notes, you are more likely to remember what you are learning. The completed study guide can be used for practice activities and to prepare for quizzes and exams. Be sure to save each study guide so you can access it when you need it.

Essential Vocabulary

As you encounter these scientific terms in the lesson, enter the meaning and an example (or two) for each. You can even draw a picture. If there are other unfamiliar words you find, enter them in the blank spaces provided.

mirror	*image*
Diverging	*converging*
real image	*virtual image*

magnification	*upright*
inverted	*specular reflection*
law of reflection	*normal*
Concave	*convex*
center of curvature	*principal axis*

vertex	*radius of curvature*
focal point	*focal length*

Introduction

1. **Identify a key characteristic of specular reflection.**

2. **What common household item tends to produce the clearest images?**

The Reflection Law

1. Fill in the blanks below about the law of reflection.

The_____ of _____ equals the _____ of

_____ .

2. Write the law of reflection. Define each of the variables.

Law of reflection:	
θ_i =	
θ_r =	

3. What name do we give to a line that is perpendicular to the surface?

Flat Mirror Images

1. Copy the image shown on the screen. Be sure to include dashed lines to represent where the light rays appear to have come from.

2. Define a virtual image.

3. Why are the images formed by flat mirrors called "virtual"?

Spherical Mirrors

1. Define the following terms associated with spherical mirrors.

| Center of curvature (C)	
Principal axis	
Vertex (A)	
Radius of curvature (R)	
Focal point (F)	
Focal length (f)	

2. **Copy one of the ray diagrams that shows a VIRTUAL image formed in a concave spherical mirror. Be sure to locate the focus on your diagram.**
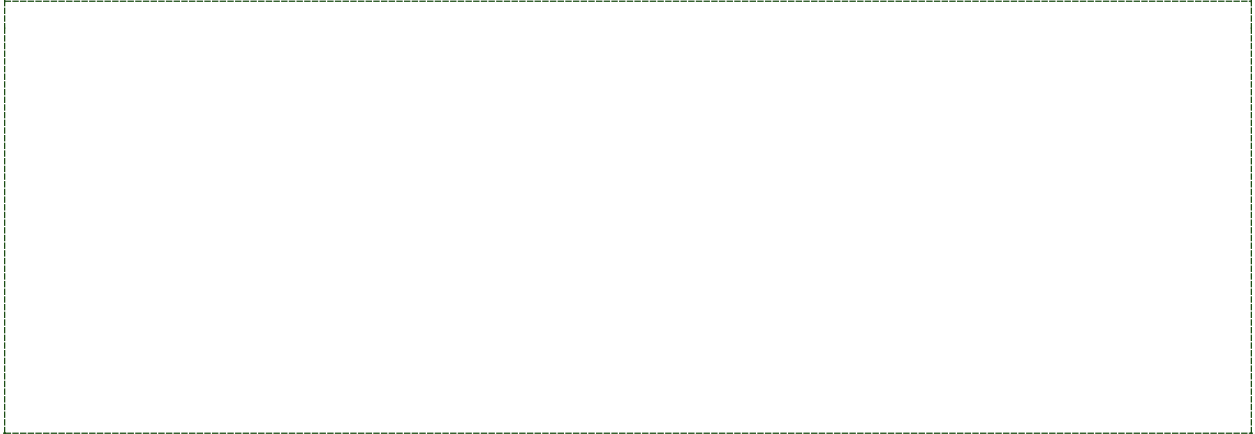
3. **Copy one of the ray diagrams that shows a REAL image formed in a concave spherical mirror. Be sure to locate the focus on your diagram.**
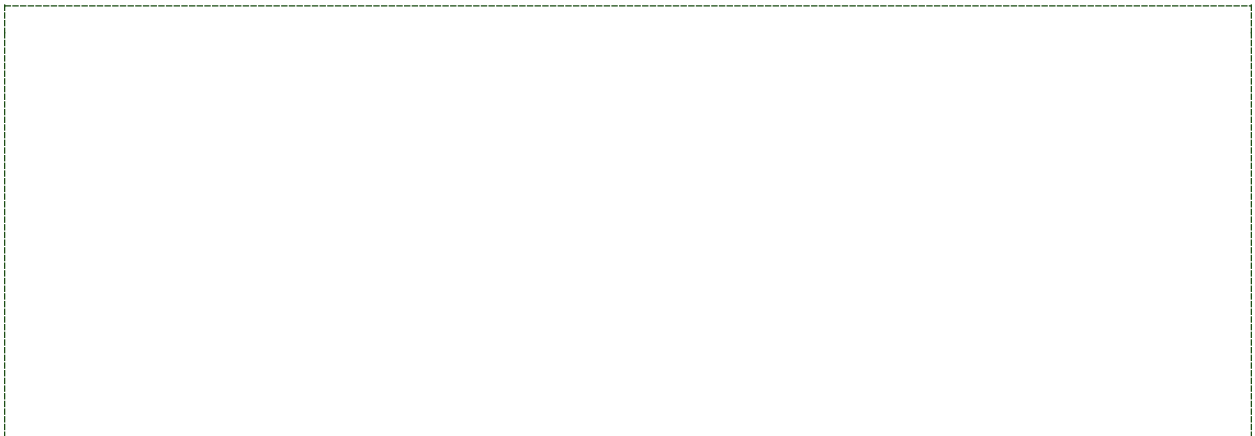
4. **Copy the ray diagram that shows a VIRTUAL image formed in a convex spherical mirror. Be sure to locate the focus on your diagram.**
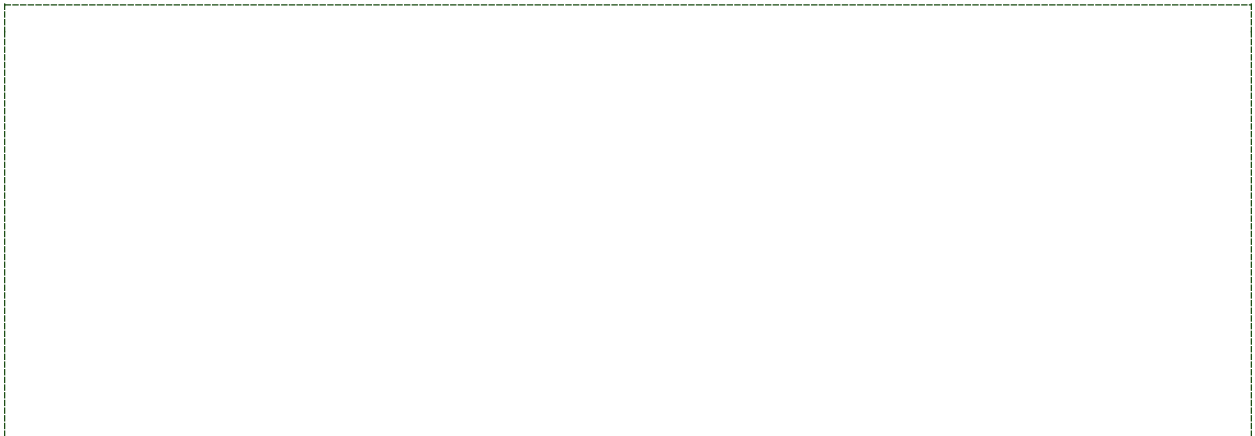
Mirror Equations

1. Write the mirror equation as shown in the video. Define each of the variables.

Mirror equation:	
f =	
s_o =	
s_i =	

2. Complete the tables below for focal length and image distance for each type of mirror and image.

	Converging (Concave) Mirror	Diverging (Convex) Mirror
Focal Length (f)		

	Real Image	Virtual Image
Image Distance (s_1)		

3. Write the equation for magnification. Define each of the variables.

Magnification equation:	
M =	
h_i =	
h_o =	

s_i =	
s_o =	

4. What does it mean for the magnification (M) to be larger than 1?

5. Complete the table below for all object locations in a converging (concave) mirror.

Object Distance	Image Orientation	Image Size	Image Type	Image Location
Outside $2f$	Inverted	Smaller	Real	Between $2f$ and f
Inside f				
Between f and $2f$				

6. Complete the table below for objects placed in front of a diverging (convex) mirror.

Image Orientation	Image Size	Image Type	Image Location

1. **Complete the table below with information about the mirror equation.**

Mirror Equation:	

Variable	Positive (+)	Negative (-)

2. **Complete the table below with information about the magnification equation.**

Magnification:	

M	Type of Image

Mirrors Practice

Select one of the problems listed and complete the table with the appropriate information. Choose from: Converging 50 cm, Diverging 15 cm, Converging Focal Point, Diverging 50 cm.

Problem:	

Picture	Given/Find	Equation	Solution