

SCIENCE • LIGHT • MUSIC • TECHNOLOGY



HALLOWEEN LASER SPOOKTACULAR STUDY GUIDE

LIGHT UP YOUR CURIOSITY!

Discover how beams, colors, sound waves, computers, and creativity come together to make a spectacular laser show.

Includes activities, vocabulary, a word search, and a hands-on lab

ENRICHMENT THROUGH THE ARTS

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WELCOME, SCIENTISTS!

A QUICK GUIDE BEFORE THE SHOW

THANK YOU FOR JOINING US!

This guide accompanies Halloween Laser Spooktacular. Please send questions, teacher notes, or student letters to Enrichment Through the Arts and name the performance so we can deliver them to the right artists.

LEARNING OBJECTIVES

- Explain in simple terms how a laser works.
- Explore reflection, refraction, wavelength, and color.
- Describe how music and images can be synchronized.
- Recognize how science, technology, engineering, and art work together.

BEFORE THE SHOW

- What do you already know about lasers?
- Where have you seen light used to create art?
- Listen for changes in tempo and mood.
- Watch how color, movement, and music tell a story.

CONTACT INFORMATION

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Tip: Bring this guide back to class for the post-show activities!



HOW DOES A LASER SHOW WORK?

FIVE BRIGHT IDEAS

1 LASER

LASER means Light Amplification by Stimulated Emission of Radiation. It produces a narrow, focused beam of light.

2 LIGHT

Light travels in waves. It can be reflected, refracted, or absorbed. Mirrors and lenses guide the beam.

3 COLOR

Different wavelengths create different colors. Fast-moving beams can form patterns, pictures, and animated characters.

4 SOUND

Sound travels as vibrations through matter. Computers match light patterns to a song's beat, tempo, and mood.

5 STEAM TEAM

A laser show combines physics, engineering, computers, animation, music, rhythm, and storytelling.



TALK LIKE A LIGHT SCIENTIST

VOCABULARY + DISCUSSION

LASER

a concentrated beam of light

LIGHT WAVE

a way light energy travels

REFLECTION

light bouncing off a surface

REFRACTION

light bending as it enters a new material

WAVELENGTH

distance between waves; it helps determine color

SYNCHRONIZE

to make events happen at matching times

DISCUSSION QUESTIONS

- 1 What laser colors and shapes did you notice?
- 2 How can a focused beam become a moving picture?
- 3 How are lasers used outside entertainment?
- 4 How is laser light different from a flashlight beam?
- 5 How do computers help control a laser show?



ACTIVITY LAB

MATCH IT + SPOT THE LIGHT

1 LASER SCIENCE MATCH

Draw a line from each term to its correct definition.

- | | | |
|----------------|-------|------------------------------------|
| 1. Laser | | A. Light bends in a lens or liquid |
| 2. Refraction | | B. A focused beam of light |
| 3. Wavelength | | C. Sound and visuals match in time |
| 4. Synchronize | | D. Distance between waves |
| 5. Light wave | | E. Light traveling as energy |

2 LIGHT OR REFLECTION?

Circle everything that gives off light or reflects light. Then add one idea of your own!

- | | |
|----------------------------------|---------------------------------------|
| ☐ Flashlight | ☐ Jack-o'-lantern |
| ☐ Book | ☐ Rainbow |
| ☐ Candle | ☐ Full moon |
| ☐ T-shirt | ☐ Glow stick |

My favorite laser color is _____ because _____.



DESIGN A LASER MONSTER

MIX IMAGINATION WITH TECHNOLOGY

YOUR CREATIVE BRIEF

Invent a monster that could dance in the next laser show. Think like an artist, musician, and engineer!

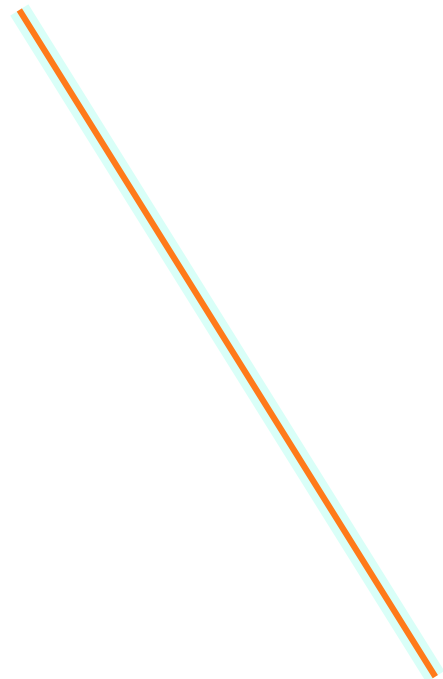
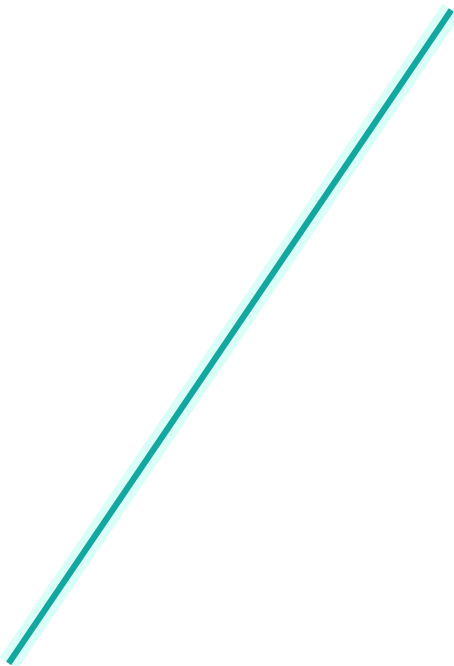
Laser colors:

Fast, medium, or slow movement:

Song or musical style:

Special pattern or power:

DRAW YOUR LASER MONSTER HERE





SOUND WAVE DETECTIVE

HEAR THE MOOD • FIND THE WORDS

1 MUSIC MOOD

How might each song feel? Write fast, slow, spooky, silly, exciting, or your own mood word.

Monster Mash

Ghostbusters

Thriller

Purple People Eater

2 LASER LAB WORD SEARCH

Find: LASER • LIGHT • SOUND • WAVE • GLOW • COLOR • REFLECT • SPECTRUM • ENERGY • BEAM • MUSIC • SCIENCE

L	A	S	E	R	S	O	U	N	D
I	M	U	S	I	C	G	L	O	W
G	C	O	L	O	R	A	V	E	R
H	E	N	E	R	G	Y	E	C	E
T	R	E	F	L	E	C	T	N	F
B	E	A	M	L	A	S	E	R	L
S	P	E	C	T	R	U	M	H	A
C	O	W	A	V	E	L	I	G	H
I	S	C	I	E	N	C	E	B	T
G	N	I	H	T	E	M	O	S	N



GLOW & REFRACTION LAB

BENDING LIGHT LIKE A LASER

MATERIALS + SAFETY

You need: clear cup, water, pencil or straw, flashlight, paper, and an optional glow stick.

Safety: Use a flashlight whenever possible. A laser pointer must be handled only by an adult and must never be aimed at people or reflective surfaces.



TRY IT

- 1 Fill a clear cup about three-quarters full with water.
- 2 Place the pencil or straw in the cup.
- 3 Look from the side. Does it appear bent or broken?
- 4 Dim the room and shine a flashlight into the cup at an angle. Observe how the beam changes.

Why it happens: Light changes speed when it moves from air into water, so it bends. This is refraction.

OBSERVE + REFLECT

What happened to the pencil in the water?

How can refraction help create laser effects?

Where else have you seen light bend or reflect?
