

Fluorescence:

Grade Level: 8th grade

Unit topic/theme: Fluorescence

Time/class sessions allotted to unit: One class period

Objective: The purpose of this lesson is to introduce students to fluorescence in minerals.

Learning goals:

- Students will understand the meaning of fluorescence and why it occurs.
- Students will be able to differentiate between different types of minerals based on the color of their fluorescence.
- Students will understand why different minerals give off different colors when exposed to UV light.

N.J Core Curriculum Content Standards to be addressed:

5.1A, 5.1B, 5.8C, 5.8D

Materials:

Rock guides

Fluorescent and non-fluorescent rocks

UV light source

Procedure:

Before teaching the lesson, hide rocks around the classroom so that groups of students can “discover” different kinds of rock and research the rock that they’ve found.

1. Discuss with students the meaning of fluorescence and why it occurs.
2. Explain that different minerals give off different colors and show students pictures of fluorescent rocks under UV light.
3. Next, show students actual rocks you brought in and place them under the UV light source.
4. Make sure that you bring in both fluorescent and non-fluorescent rocks to show students that not all minerals fluoresce.
5. Place students into groups of four and have each group search for and collect four rocks(example: rocks that contain Zincite, Willamite, Franklinite, and Quartz).
6. Using the rock guides ask each group to make a hypothesis on what types of minerals are contained in the rocks they have.
7. Have students record the names of the rocks, whether they will fluoresce or not, and the color of their fluorescence in a table.
8. Next have each group come up and place their rocks under the UV light source and record the color of fluorescence of each rock if any.
9. When they return back to their seats ask each group to discuss whether their predictions were correct and record their findings.
10. On the day of the trip to the sterling hill mining museum, allow students to look at all the different florescent rocks and note that the same types of rocks can give different colors depending on the mineral composition.

Accommodations made for students with disabilities and for ELLs:

- When placing students in groups, give each student a task to ensure that all students will be involved and no student will feel left out.
- When showing pictures or actual rocks write out the names on the board so that ELLs will be able to follow and know the proper spelling of the terms.

Assessment:

Collect the tables and answers to questions asked during the class.

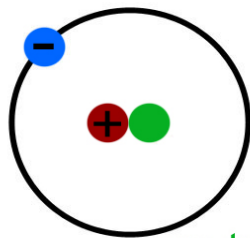
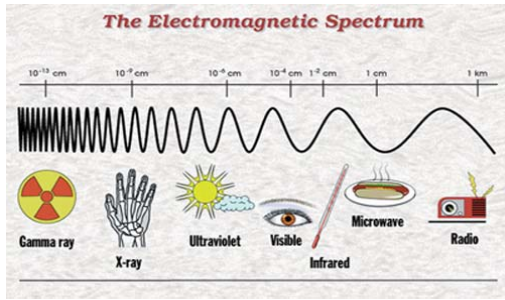
Name:

Class:

1. Why does fluorescence occur in minerals? How would you make a mineral fluoresce?
2. What are some practical uses for fluorescence?
3. Give some examples of minerals that fluoresce.

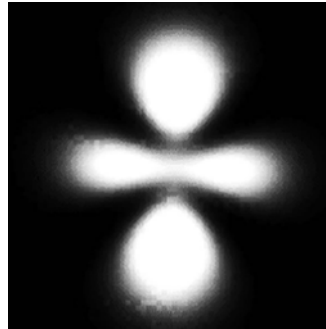
Type of Rock	Possible minerals contained in rock	Possible fluorescence	Possible color of fluorescence	Verify hypothesis
1.				
2.				
3.				
4.				

How Do Some Minerals Fluoresce?



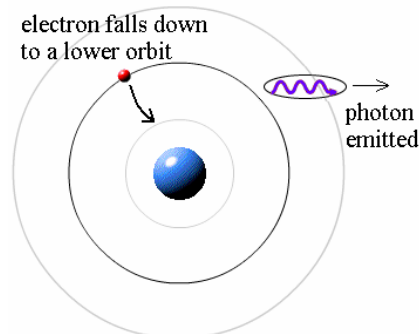
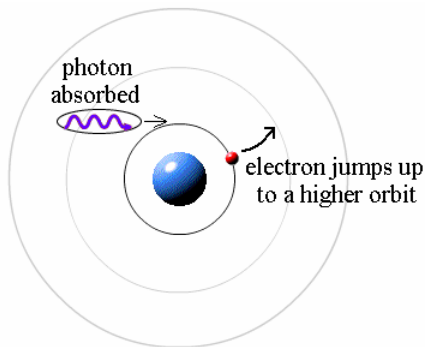
electron neutron
proton

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The Atom:

- Fluorescence occurs when light particles (photons) interact with atoms in certain minerals.
- Fluorescence is a physical process where light of one wavelength, striking a particular substance, causes the release of light of another, longer, wavelength.



Some Fluorescent Minerals are:

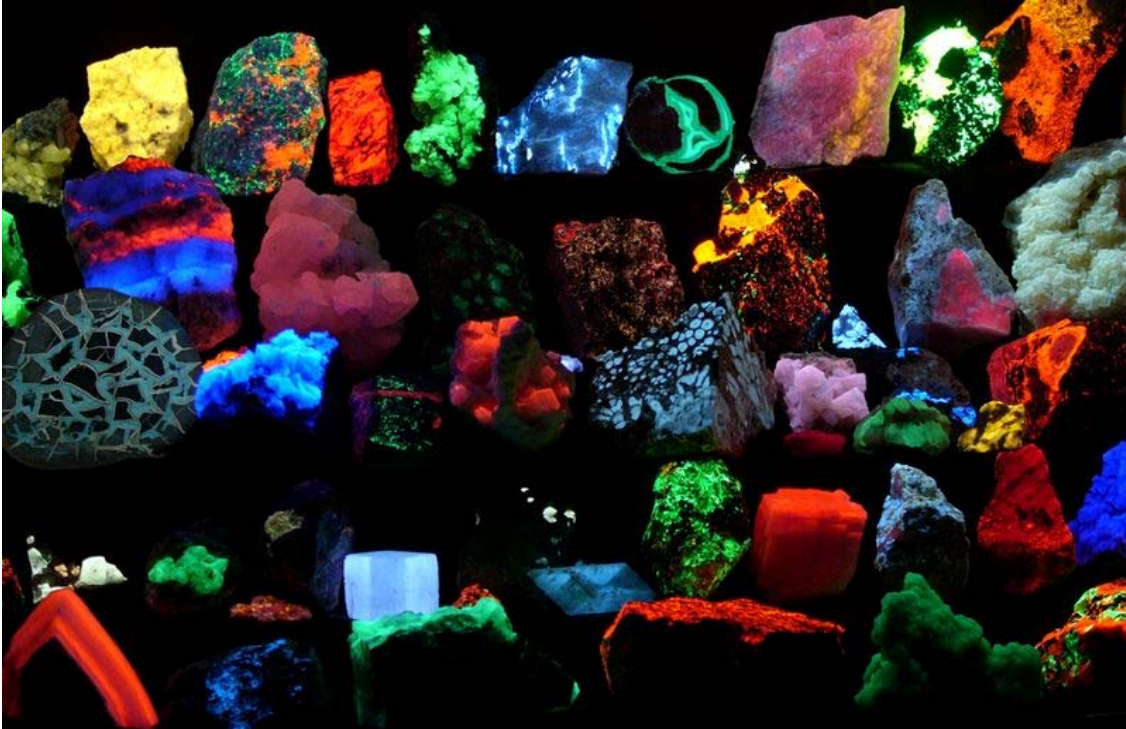
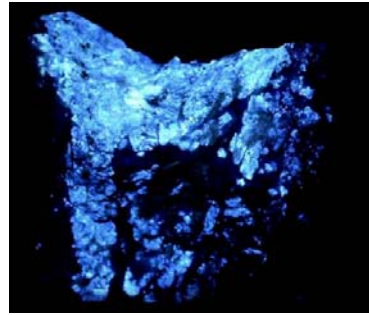
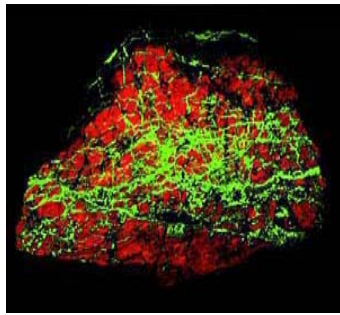
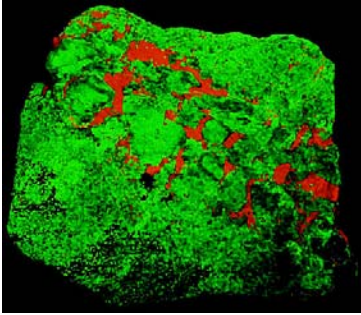
Zincite: fluorescent light green

Hardystonite: fluorescent blue-violet, SW

Willemite: fluorescent green, SW

Calcite: fluorescent red, SW

Franklinite: non-fluorescent (black areas)



Some minerals are carved artistically!

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