Unit 8

Teacher Tips: Making Light Student Activity

Difficulty: Content is not difficult, but if you do this as a class activity it takes some advanced planning by the teacher and also by students..

Content: Useful but not essential for Regents students

Mode of Instruction: Competition in lab groups.

Preparations: None before the planning class day.

Materials: To be assembled by the students. (They may need help with some lab supplies.) I *strongly* suggest having lab safety goggles and fire control equipment handy. (Fire extinguisher and fire blanket)

Time: 10 - 20 min. on the planning day,
(students can brainstorm & do the writing/editing on their own time)
then 20 min. to a class period on the demo day. (3 days to a week later.)

Suggestions for the Teacher:

1. Stress safety!!!

2. I suggest lab groups submit one copy of the group's ideas for each lab group. But each group member must "sign off" on the paper the group submits.

3. On the day that students demonstrate their techniques, be sure all students are ready to demonstrate their ideas.

4. Suggest or even require that students bring in their materials at least one day before they will show their ideas to the class. (This is an important safety procedure.)

5. On the day of the demonstrations collect each group's written list of ideas right at the beginning of class. You can even require detailed descriptions from each group for each idea. (This is a good way to get student to write and work cooperatively to hone and to edit their ideas.)

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6. After collecting the assignments, allow groups to show only one light producing idea by each lab group until all other groups have had a chance to show a single unique light producing method. Do not allow one group to dominate the class.

7. Be sure students understand the difference between "making light" and reflecting light.

8. I do not recommend giving a prize. It's good enough that students feel they've been successful. Also, do not allow students to disparage others who have fewer ideas.

8. Encourage creative ideas. For example, they can show nuclear fusion by taking the class outside or to a south facing window to view the sun.

Student Intro:

1. This is a competitive activity.
   Do not share your ideas with other lab groups.

2. You will be require to demonstrate your ideas.
   Telling how it works isn't good enough.

3. You can get ideas from many printed and on-line sources.

Post-Lab: Discuss lab safety and why it's important.

Extensions: Investigate how stars create energy and/or investigate whether light is made of particles (photons) or waves. (It's actually both!)

Source: Thomas McGuire, Cave Creek Digital, Cave Creek, AZ

This is a competitive activity to be done in teams of 2-3 students. Date _____ Per. _____

Of all celestial objects, stars are special because they make their own light. Planets, comets, and moons can be seen only by reflected light; usually light that originates in stars.

Your task is to demonstrate to the class as many truly different ways as you can of creating light. Use the lines below to list your methods. Each method must be unique, and not just using different materials to do the same thing. The uniqueness of each entry will be decided by the teacher.

In class, each group will hand in one copy of this list, then each will demonstrate one method at a time in a round-robin format. You will want to use a library, personal contacts, Internet sources and and as many other sources as you can think of for ideas.

Remember, you must **create** light from a source. You cannot use reflected light. Also, you may ***not*** use any hazardous procedures or create unsafe conditions, If in doubt, **ask** your teacher for advice.

The demonstrations will take place in class on _____ .

#	Materials	How the Light is Produced
____	_____	_____
____	_____	_____
____	_____	_____
____	_____	_____
____	_____	_____
____	_____	_____
____	_____	_____

(You may continue your list on the back of this paper.)

TEACHER KEY: Do not show this to students,

or show it *only* after the student demonstrations.

Making Light Materials…	**Different Methods**
1. Matches	Friction Sparking
2. Matches	Combustion
3. Light Bulb or Hot Plate	Glowing Hot
4. Two Pieces of Quartz	Triboluminesence
5. Fur & Glass	Static Electricity
6. Wint-O-Green Life Saves	Piezoelectric Chemical Luminescence
7. Curad Bandaids	(The adhesive sparks when peeled off)
8. Fluorescent Minerals/Black Light	Fluorescence
9. Nuclear Reactor	Cherenkov Radiation (photo allowed?)
10. The Sun	Nuclear Fusion
11. Light Stick	Chemical Luminescence
12. Genecon (Brand) Hand Generator	Electrical Sparks
13. Caps/Cap Balls	Explosive Light
14. Laser	Light Amplification by Stimulated Emission Response
15. Aspirin	Phospheresence
16. Spodumene	Thermoluminisence
17. _____	_____
18. _____	_____
19. _____	_____
20. _____	_____

(Some of the methods above are quite unusual or poorly understood. (Perhaps even by me.) The author is interested in corrections and/or additional ideas: e-mail Thomas McGuire at cavecreekdigital@msn.com)