



Design-A-Firework Answer Key

Part A: Watch the [NOVA Fireworks](#) video on EDPuzzle to help you complete this section.

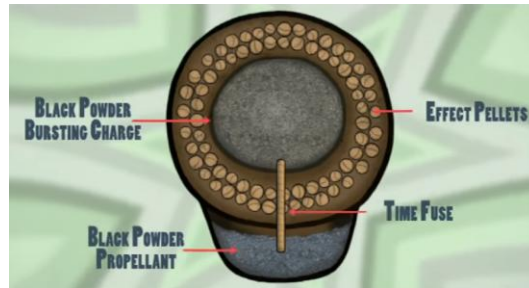


1. Who first discovered gunpowder? **CHINESE**
2. **POTASSIUM NITRATE** (or salt peter) is the most important ingredient in gunpowder.
3. The black powder recipe is **75%** potassium nitrate, **15%** charcoal, and **10%** sulfur.
4. The "science of fireworks" is known as **PYROTECHNICS**.



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5. The black powder is compressed into marble-sized balls, called **STARS**, which are loaded into **SHELLS** to create fireworks displays.



6. How does the lift charge help a firework? **GIVE IT THE POWER TO FLY INTO THE AIR**

7. Waterfalls, ring patterns, strobos, titanium salutes, and peonies are from **ROUND** shells, while fountains and roman candles are from **TUBES**.

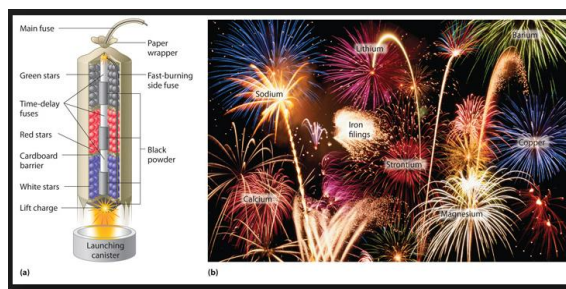
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<https://www.galacticfireworks.co.uk/blog/different-types-of-firework-effects-a-visual-illustration>

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8. Where are the Boston fireworks launched from each year? **A BARGE**
9. Which famous song is often played during the Boston fireworks show?
1812 Overture
10. What chemical compound replaced potassium nitrate to make better colors?
POTASSIUM CHLORATE
11. What color is produced by each element?
Copper = **BLUE** Strontium = **RED** Barium = **GREEN**
12. What would you see if no metal salts are added? **WHITE**



<https://infograph.venngage.com/p/212695/science-infographic>

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13. What does ROYGBIV represent? **COLORS OF A RAINBOW**

What are they? **RED, ORANGE, YELLOW, GREEN, BLUE, INDIGO, & VIOLET**

14. What are the separate compartments within the shell that contain the stars called? **BREAKS**



Pyrotechnics: It's Elemental - Click "Launch Interactive" or click the image to access the periodic table. Click on the different elements and read the information to help you complete the chart.

<i>Symbol</i>	<i>Name</i>	<i>Family</i>	<i>Colors and/or Effects</i>
<i>Li</i>	<i>Lithium</i>	<i>Alkali Metals</i>	<i>Red</i>
<i>Na</i>	<i>Sodium</i>	<i>Alkali Metals</i>	<i>Gold & Yellow</i>
<i>Mg</i>	<i>Magnesium</i>	<i>Alkaline Earth Metals</i>	<i>Bright white light</i>
<i>Al</i>	<i>Aluminum</i>	<i>Boron Family or Metalloid</i>	<i>Silver & white sparks, flames</i>
<i>Ca</i>	<i>Calcium</i>	<i>Alkaline Earth Metals</i>	<i>Deepens colors made by other elements</i>
<i>Ti</i>	<i>Titanium</i>	<i>Transition Metal</i>	<i>Sparks</i>
<i>Fe</i>	<i>Iron</i>	<i>Transition Metal</i>	<i>Sparks</i>
<i>Cu</i>	<i>Copper</i>	<i>Transition Metal</i>	<i>Blue</i>
<i>Zn</i>	<i>Zinc</i>	<i>Transition Metal</i>	<i>Smoke clouds</i>
<i>Sr</i>	<i>Strontium</i>	<i>Alkaline Earth Metals</i>	<i>Red</i>
<i>Sb</i>	<i>Antimony</i>	<i>Metalloid or Nitrogen Family</i>	<i>Glitter effects</i>
<i>Ba</i>	<i>Barium</i>	<i>Alkaline Earth Metals</i>	<i>Green</i>

Chemistry of Color - Read the article to complete this section.

1. What is incandescence? **LIGHT PRODUCED FROM HEAT**
2. What is luminescence? **LIGHT PRODUCED USING ENERGY SOURCES OTHER THAN HEAT**
3. Give the chemical formula for each compound and tell what color it produces in fireworks.

Calcium Chloride - Formula = CaCl_2 Color = **ORANGE**

Copper (I) Chloride - Formula = CuCl Color = **BLUE**

Sodium Nitrate - Formula = NaNO_3 Color = **YELLOW**

Lithium Carbonate - Formula = Li_2CO_3 Color = **RED**

4. Which two elements are used to create a purple color? **STRONTIUM**
+ **COPPER**

Design-A-Firework – Turn in to bin when done!

Design It

Fill in each of the 3 breaks with a pattern of stars. Color your stars & label with the element symbols.

Show It

Draw a sketch of your firework as it would appear in the sky.

Explain It

Write a paragraph (3-5 sentences) that explains how your firework would look from start to finish.

Design-A-Firework Name _____

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**Turn in to the bins when you are done.
DO NOT glue it in at this time!**



A little [inspiration](#)
And [a little more](#)
And even [more inspiration](#)