

Glow-in-the-Dark Science Lab

WARNING

Not suitable for children under 8 years. For use under adult supervision. Read the instructions before use, follow them and keep them for reference.

WARNING — Chemistry Set. This set contains chemicals and parts that may be harmful if misused. Read cautions on individual containers and in manual carefully. Not to be used by children except under adult supervision.

Kit Contents



- Plaster powder (Calcium sulfate hemihydrate), 200 g (EG-No. 231-900-3, No. 771052)
- Plastic molding tray
- Yellow fluorescent pigment (No. 776051)
- Pink fluorescent pigment (No. 776052)
- UV flashlight
- Measuring cup, 200 ml
- Measuring cup, 30 ml
- 2 test tubes with screw caps
- 2 cardboard test tube stands
- Sticker sheet
- Spatula

You will also need: AAA battery (1.5 volt, type LR03), small Phillips-head screwdriver, water, adhesive tape, old newspaper, 2 empty cups, various flowers with white blossoms, paper, tonic water, paper money, white T-shirt, scissors, bark from a chestnut branch (optional), small paint brush

Do you have any questions?
Our customer service team will be glad to help you!
USA: thamesandkosmos.com or 1-800-587-2872
UK: thamesandkosmos.co.uk or 01580 713000

FOREWORD

Dear Parents and Adults,

With this science kit, your child can discover fascinating fluorescent materials. Before experimenting, read the instructions together with your child and discuss the safety instructions together. Support your child and offer help when needed.

Find a practical place for the experiments, where accidentally spilled dyes, plaster, or water will not cause any damage. The light tests work best in a room that can be darkened if necessary. Please give your child the additionally required materials and have them ready before starting the experiments. If foodstuffs are used, they must be kept strictly separate from kitchen supplies and utensils.

We hope you have a lot of fun experimenting!

SAFETY INFORMATION

WARNING! Not suitable for children under 3 years. Choking hazard — small parts may be swallowed or inhaled. Store experiment material out of the reach of small children and animals. Keep packaging and instructions as they contain important information.

Instructions for handling plaster and fluorescent pigments: Advice for supervising adults

- This experimental set is for use only by children over 8 years. For use under adult supervision. Keep the experimental set out of reach of children under 8 years old. This also applies to the molding tray when filled with plaster and the fluorescent objects made with this kit.
- Read and follow these instructions, the safety rules and the first aid information, and keep them for reference.
- The incorrect use of chemicals (plaster and fluorescent pigments) can cause injury and damage to health. Only carry out those experiments which are listed in the instructions.
- Because children's abilities vary so much, even within age groups, supervising adults should exercise discretion as to which experiments are suitable and safe for them. The instructions should enable supervisors to assess any experiment to establish its suitability for a particular child.
- The supervising adult should discuss the warnings and safety information with the child or children before commencing the experiments. Particular attention should be paid to the safe handling of the plaster and fluorescent pigments.
- The area surrounding the experiment should be kept clear of any obstructions and away from the storage of food. It should be well lit and ventilated and close to a water supply. A solid table with a heat resistant top should be provided.
- The work area should be cleaned immediately after the experiment has been carried out. The experiment material should be rinsed and dried with paper towels. To avoid stains, experiment away from carpets, curtains, or tablecloths, and wear old clothes.

Hello there!
My name is Neon Leon, and I will help you see the world in glowing colors. Have fun!



- Open the bag of plaster with scissors at one corner. The label should remain legible. Seal with a clip or some adhesive tape after use.
- Disposal: After experimenting, place spilled plaster, plaster residues, and pigment residues into the household waste. Dispose of liquids and dye solutions in the sink and rinse well.

First Aid Information

In case of eye contact: Wash out eye with plenty of water, holding eye open if necessary. Seek immediate medical advice.

If swallowed: Wash out mouth with water, drink some fresh water. Do not induce vomiting. Seek immediate medical advice.

In case of doubt, seek medical advice without delay. Take the chemical and/or product and its container with you.

In case of injury always seek medical advice.

Safety Rules

Keep young children and animals away from the experimental area.

Store this experimental set out of reach of children under 8 years of age.

Wash hands after carrying out experiments.

Clean all equipment after use.

Do not eat or drink in the experimental area.

Do not use any equipment which has not been supplied with the set or recommended in the instructions for use.

The following applies to the plaster and fluorescent pigments: Do not place the material in the mouth. Do not inhale dust or powder. Do not apply to the body.

Instructions for Handling the UV Flashlight (and Battery)

In addition to a certain amount of visible light, the UV flashlight mostly emits high-energy ultraviolet light. Do not shine it into your eyes or into the eyes of any other person or animal!

Please have the battery installed and replaced by an adult. One AAA battery (1.5 volt, type LR03) is required to operate the UV flashlight, which is not included in the kit due to its limited shelf life.

Avoid short-circuiting the battery. A short circuit can cause the wires to overheat and the batteries to explode.

The battery is to be inserted with the correct polarity (+ and -). Press it gently into the battery compartment. See the instructions to the right.

Non-rechargeable batteries are not to be recharged. They could explode!

Rechargeable batteries are only to be charged under adult supervision.

Rechargeable batteries are to be removed from the toy before being charged.

Exhausted batteries are to be removed from the toy.

The supply terminals are not to be short-circuited.

Dispose of used batteries in accordance with environmental provisions.

Avoid deforming the battery.

Notes on Disposal of Electrical and Electronic Components

The electronic components of this product are recyclable. For the sake of the environment, do not throw them into the household trash at the end of their lifespan. They must be delivered to a collection location for electronic waste, as indicated by the following symbol:



Please contact your local authorities for the appropriate disposal location.

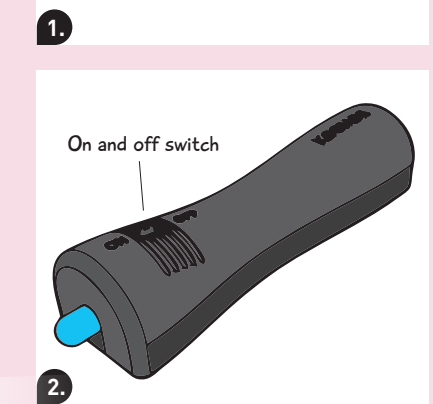
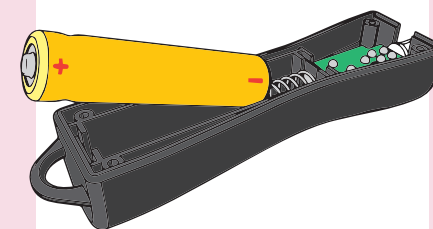
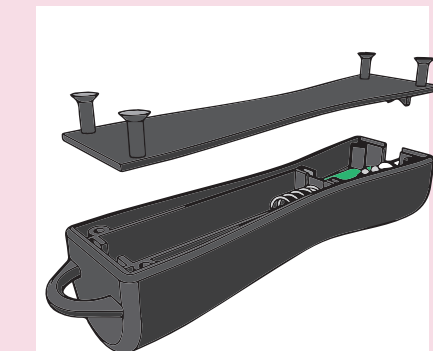
HOW TO MAKE YOUR UV FLASHLIGHT SHINE

You will need

- UV Flashlight
- Small Phillips-head screwdriver, AAA battery (1.5 volt, type LR03)

Here's how

- The battery should be inserted into the UV flashlight only by an adult. Ask your parent or other adult for help.



Do not shine the UV flashlight into your eyes or into the eyes of any other person or animal!

EXPERIMENT 1: LUMINOUS COLORS

You will need

- 2 Cardboard test tube stands
- 2 Test tubes with lids
- Spatula
- Yellow fluorescent pigment
- Pink fluorescent pigment
- UV flashlight
- Water, adhesive tape

Here's how

- Fold the test tube stands along the lines and secure the corners with tape.
- Fill both test tubes with 10 ml of water and place them in the stands.
- Use the spatula to put a tiny amount of the yellow fluorescent pigment in one test tube and some of the pink fluorescent pigment in the other.
- Screw the lids onto the test tubes and shake the two solutions well.
- Darken the room and make both liquids glow in the dark by shining the UV flashlight on them through the hole in the bottom of the stand. Save the colored solution for the next experiment.

Just a few specks of fluorescent dye are enough!



CHECK IT OUT

Why does the pigment glow?

The pigments contained in the kit are neon pigments. They are also called fluorescent pigments. These are special materials that absorb and reflect more light than most regular materials, which makes them glow.



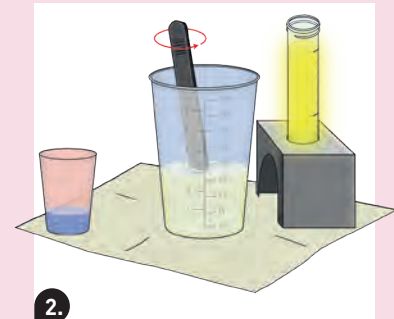
EXPERIMENT 2: MOLDING NEON CHALK

You will need

- Plaster powder
- Molding tray
- Fluorescent yellow and fluorescent pink solutions from experiment 1
- Both measuring cups
- Spatula
- Water, old newspapers, scissors

Here's how

1. Cover your work area with old newspapers. Use a pair of scissors to cut the plaster bag at one corner. Fill the small measuring cup three times to the brim with plaster powder, pouring the plaster into the large measuring cup each time. Make sure to pour carefully so the dust doesn't rise up into the air.
2. Add the yellow fluorescent solution from experiment 1 and 20 ml of water to the plaster. Mix everything with the spatula until it is smooth and lump-free.
3. Fill the mixture into the recesses of the molding tray. After three to four hours, the plaster will have solidified and you can take it out of the molds.
4. Repeat the experiment with the pink fluorescent solution from experiment 1. Save the shapes for future experiments.



You can try this experiment several times. Try mixing yellow and pink together!

Rinse your equipment right away, so you can use it for the next experiment!

Fluorescent colors are particularly bright in sunlight, but they shine even more intensely under UV light in a darkened room.



This is because certain particles in the pigment are strongly stimulated by the high energy of the UV light.

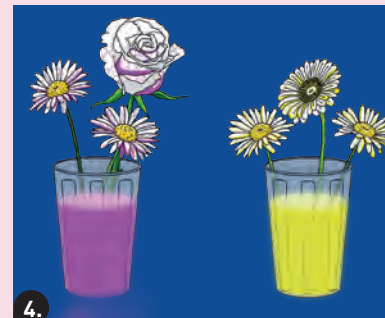
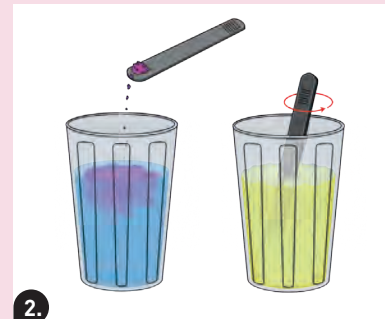
EXPERIMENT 3: GLOWING FLOWERS

You will need

- Yellow fluorescent pigment
- Pink fluorescent pigment
- Spatula
- UV flashlight
- Water, 2 clean plastic cups, various flowers with white petals

Here's how

1. Fill both cups about half full with tap water.
2. Put a spatula tip of yellow fluorescent pigment in one cup and a spatula tip of pink fluorescent pigment in the other. Mix everything with the spatula.
3. Now take flowers with white blossoms and put a few in the cup with the yellow solution and a few in the cup with the pink solution.
4. Wait a few hours, darken the room, and then light up the flowers with your UV flashlight. Can you see how the flowers picked up the color?
5. Save the flowers for experiment 6.



These flowers work particularly well in this experiment!



CHECK IT OUT

HOW DO Flowers DRINK?

All plants have a water supply system that transports the water from the ground — or as in this experiment, from a vase or cup — up through the roots and into the plant.

A plant's water supply system consists of tiny tubes and veins. These not only transport water, but also the nutrients contained in the water. If the water is colored, the color is also passed through the water supply system and is deposited in flowers and leaves. On white flowers, you can see the color shining through particularly well.

EXPERIMENT 4: GLOWING SHAPES

You will need

- Plaster shapes from experiment 2
- UV flashlight
- Sheet of paper

Here's how

1. Get the plaster shapes ready. It is best to switch off the lights or darken the room by blocking the windows.
2. Light up the shapes by shining the UV flashlight on them. Do you see how the fluorescent pigments shine?
3. Your fluorescent shapes can be used as glowing chalk! Use the shapes to draw on the sheet of paper. Then make your artwork glow by shining the UV flashlight on it.

By the way, this also works with highlighters!



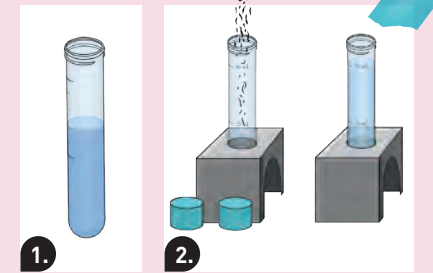
EXPERIMENT 5: GLOWING OBJECTS

You will need

- 2 Cardboard test tube stands
- 2 Test tubes with lids
- UV flashlight
- Tonic water, white T-shirt, paper money, chestnut tree bark, other household materials (it's okay if you can't find some of these things)

Here's how

1. Carefully pour about 10 ml of tonic water into a test tube.
2. Take a little bark from a chestnut tree and put it in the second test tube. Fill it up with water. Place both test tubes in the test tube holders. Save these solutions for experiment 6.
3. Get the paper money and the white T-shirt ready, switch off the lights, and darken the windows.
4. Illuminate everything with the UV flashlight. What do you observe? Some or all of these things will glow in the dark.
5. Can you find any other UV-active materials in your home?



CHECK IT OUT

Tonic water contains a bitter substance called **quinine**. The quinine causes the tonic water to glow blue under UV light. If UV light hits quinine, the wavelength of the light changes. We see this long-wave light reflected by the quinine as a brilliant blue color.

Luminous tonic water

Scorpions have a substance in their shells called **β-carboline** that makes their shells glow under UV light. Many natural minerals also shine under UV light.

Fluorite

Calcite



EXPERIMENT 6: BLACKLIGHT SHOWCASE

You will need

- Yellow and pink fluorescent pigments
- Plaster shapes from experiment 2
- Colored flowers from experiment 3
- Glowing objects from experiment 5
- Sticker sheet
- UV flashlight, both measuring cups, spatulas, kit box
- Water, 2 clean plastic cups, adhesive tape, scissors, small paint brush

Here's how

1. Create two neon colors: Fill the two cups with 10 ml of water each. Put a spatula tip of yellow fluorescent pigment in one cup and a spatula tip of pink fluorescent pigment in the other. Mix both cups with the spatula.
2. Take the kit box, open it on both sides, and tear it open at the glued seams.
3. Cut two holes in the back of the box. If this is too difficult, ask your parent or another adult for help.
4. Now paint the inside of the box with the mixed fluorescent colors using a small brush. Also use the plaster shapes from experiment 2 for drawing. Paint whatever you feel like. Maybe fairies, aliens, or a marine landscape?
5. Decorate the inside of the box with some of the glowing stickers from the sheet.
6. Fold the box back together and secure it with adhesive tape.
7. Place the box on a table. Carefully arrange the colored flowers, test tubes from experiment 5, and other glowing objects inside it. Also put the remaining plaster shapes in it.
8. Darken the room. Look through the windows you cut in the box and light everything up through the side opening using the UV flashlight. Now you have a fantastic UV (or blacklight) showcase.

You can also use scissors here to cut the box open into one flat piece.

