# Light Print Paper - Teacher's Notes

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*The myth that the astronomer Galileo went blind in one eye from observing the Sun through a telescope has been discredited. His blindness was not reported until he was 72, about 25 years after his solar studies. Descriptions of his disability suggest the more reasonable cause was cataracts.*

Sol was one of the old names given to our sun. That is why it and the planets, asteroids and meteors which circle it are called the **Sol**ar system.

Our Sun is the only star in our solar system. It alone can produces light. The planets, moons and other heavenly bodies merely reflect light from the Sun.

Apart from light produced by chemosynthetic organisms found near black smokers in deep ocean trenches and from some bioluminescent creatures such as glow-worms, most life on Earth depends on simple plants that use light energy from the Sun to photosynthesise (make food) for themselves and for the animals that eat them. The green chemical chlorophyll helps plants bind together carbon dioxide and water to make simple sugars. Sunlight is the energy that powers most food chains. We cannot live without it

Sun > grass > grasshopper > emu > dingo > decomposers.

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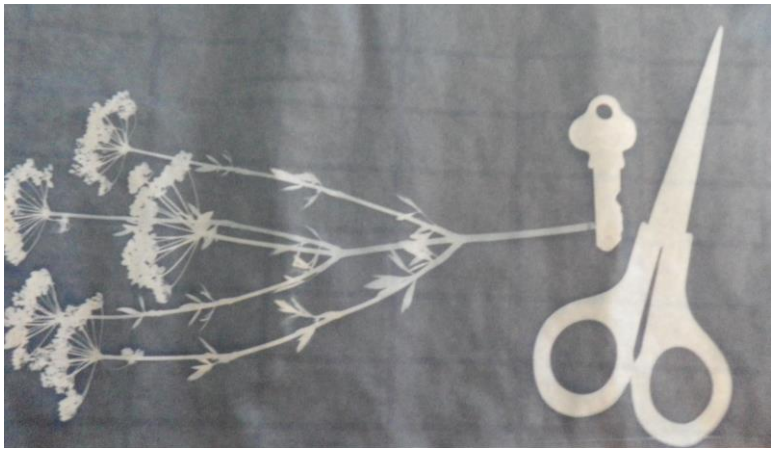

*A negative of parsley seeds, a key and a pair of scissors*

A pleasant introduction to sunlight as energy can be done by using light sensitive paper. Photosensitive paper will change colour when exposed to light. Sunlight energy causes changes to chemical bonds in the solution the paper has been treated with creating a new substance with a new colour or lack of it. It can be bought (12 sheets for about $15.00 in 2016) and then cut into smaller pieces so each student can make their own light print to take home or display. Students can take quite some time cutting the paper to size and exposure to light will affect the clarity of the final print. It is a good idea therefore for the paper to be pre-cut to size by the teacher or aide and returned to its light excluding envelope before the experiment starts.
Asking students to write their name on the back of their paper with a black pencil stops arguments over which print belongs to whom.

Some vocabulary (These can be used to help students with their Word Wall Worksheet).
**Transparent materials** (E.g. glass or clear plastic) allow light to travel through.
**Translucent materials** (E.g. frosted glass) allow some light to travel through but the rays are distorted and the image vague.

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**Opaque** materials (E.g. brick or wood) do not allow any light to travel through.
**Photographic negative** A print where the background appears dark and the subject appears light.


In the example above I asked students to cut the initial of their first name from old cardboard, which they laid on the paper before exposing it. Small leaves, ferns or other opaque shapes can also be used. The opaque masters must be smaller than the 3cm square of photosensitive paper and lie flat. The paper was stopped from blowing away by being placed in a transparent Petri dish. Small stones can also be used to hold down the two layers of paper.

**Materials**

- A reasonably sunny day. On a sunny day the print should take less than 5 minutes to appear.
- Photosensitive paper. This is sometimes known as Sunprint paper. This can be sourced from education suppliers, from Scitech and through the Internet.
- Scissors
- Scrap paper, card or small shapes
- A bowl or tray of water
- Ruler or rocks to hold paper in position while drying or plastic or glass Petri dishes

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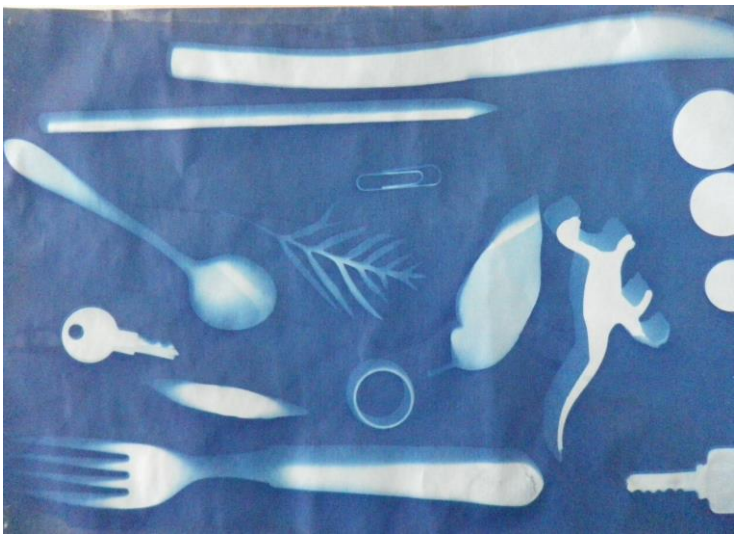
**Method**

1. Select a sunny dry day.
2. Cut out a shape from the opaque paper or select a shape provided.
3. Place the opaque shape onto the photosensitive paper.
4. Place a transparent plastic sheet, often provided with the paper, over the photosensitive paper and opaque shapes. This stops wind blowing the paper away or place these into a glass or plastic Petri dish.
5. Leave in the sunlight for about 5 to 10 minutes until the paper becomes coloured.
6. Rapidly remove the opaque material and wash the paper in the water bath. Lie flat to dry or peg up on a string.

Students can wear these prints as badges if attached by small gold safety pins or if the school has a badge-making machine they can make ones to take home.

**Light is energy.** We know this because it can change things.
15 things were laid on white light sensitive paper and exposed to sunlight.



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What do you think they were? Write down your guesses.
A knife, a pencil, three coins, a paperclip, two leaves, a thin leaf, a dinosaur, a ring, a key, a fork and two keys.

What had changed? The colour of the paper behind the objects.

What had caused the change? Being in light (exposed to light).

Why do most plants need sunlight? To make food (photosynthesise)

Why are indoor plants usually placed in front of windows not walls?

See they are in sunlight (during the day).

**PREDICT** What do you think would happen if the plants were moved away from the window?

The plants would die.

Can you think of anything else that is changed by light from the sun?

Answers will vary. May include things fading etc.

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