




FROM FLOWER TO FRUIT!

MAIN THEME: Life of the plant

SHORT DESCRIPTION OF THE ACTIVITY:

By observing a flower, children discover its parts and the treasure in it: the pollen. By making scientific experiments, children will discover how a flower attracts insects, which are extremely important for the natural process of pollination that turns a flower into a fruit which stores a seed that can germinate into another plant. Then, children will have to use a lot of creativity to make a flower.





TARGET AUDIENCE: 30 children aged 3-5 years

TEACHERS INVOLVED: No. 2


WORKSHOP DURATION:

2 hours for preparing the activity:

50 minutes for the activity with the pupils (EXAMPLE)

OBJECTIVES:

Understand a process taking place in nature from a scientific point of view through the use of scientific instruments and experiments. Understand the phases of an experiment (preparation, observation of events, final conclusion). Stimulate observation and group discussion. Become aware of the consequences of an action and understand the cause-effect relationship. Learn about the structure of a flower and its role in the life cycle of a plant, understand what pollination is and how a flower turns into a fruit. Understand the importance of the relationship between plants and insect pollinators.





METHODS:

The use of scientific instruments introduces the subject and stimulates the children's curiosity. Discovery is made through direct observation, making, touching by hand, trying in the first person, but also through exchanging ideas and engaging in group discussions. Getting children involved in scientific experiments and in manual activities and pretending to be insect pollinators will help them learn while having fun.

PREREQUISITES:

A vegetable garden of any type (ground, raised bed, vertical etc.) will be needed in the final phase. Otherwise, this phase cannot be carried out





Quantities	Materials	Notes
1	Microstereoscope	Can be connected to a screen to make it easier for children to watch
1	Monitor screen	Can be a display, a TV or an IWB. Must be connected to microstereoscope
	Magnifying glasses	
1	Fresh flower	For observation using a microstereoscope
30	Paper flowers	
6	Paper bowl plates	
	Water	Allow a sufficient quantity of water to carry out both the paper flower experiment and the experiment of extracting pigments from petals
	Flowers with dark petals (preferably red)	The number of flowers must be enough for giving each kid 2-3 petals
30	Glasses or small bowls	Must contain warm water
30	Spoons	
1	Kettle	
	Flower essences (e.g., rose, lavender, jasmine)	





Quantities	Materials	Notes
	Cotton wool	To smell the scent of flower essences
	Glasses	To smell the scent of flower essences, the number of glasses should match the number of selected essences
	Images of insects on flowers	
180	Happy Mais balls	At least 6 for each kid
30	Happy Mais flower stem	






HOW TO PROCEED

PHASE 1 - GETTING STARTED: (Time: 10 minutes)

Start by stimulating children with a question:

“If I say the word “Nature” what colour comes to your mind?”. Blue like the sky, yellow like the sun, red like tomatoes, green like leaves... There are plenty of colours in Nature! However, in Nature and in the vegetable garden there’s something which very colourful and scented as well: what can this be? A flower.





PHASE 2 - EXECUTION: (Time: 30 minutes)

A. What does a flower look like?

Like real scientists children will observe a flower, firstly to the naked eye to identify its various parts (the corolla, the petals, the pedicel...) and later using instruments such as magnifying lenses and a microstereoscope to watch details.

You can also have children observe more different flowers to show them that many exist with petals of different colours and shapes. Even the number of petals varies from plant to plant.

B. Pollen: the treasure hidden in a flower

Once we have observed the outer structure of a flower, let's focus on its inner parts. In its centre, a flower hides a pretty valuable treasure. We can use the microstereoscope to find out together and see it even better. Point the camera lens at the flower anthers and focus the pollen grains. "Look, this powder is the pollen and is extremely important because when travelling from flower to flower it turns all of them into fruits.

But pollen has neither legs nor wings! So, how can it travel and pollinate all flowers? It can be flown by the wind, or captured in drops of water and carried away or it can cling to insect bodies when they alight on flowers to feed on their nectars. However, for wind, water or animals to take the pollen and bring it with them, first of all, the corolla needs to be open."



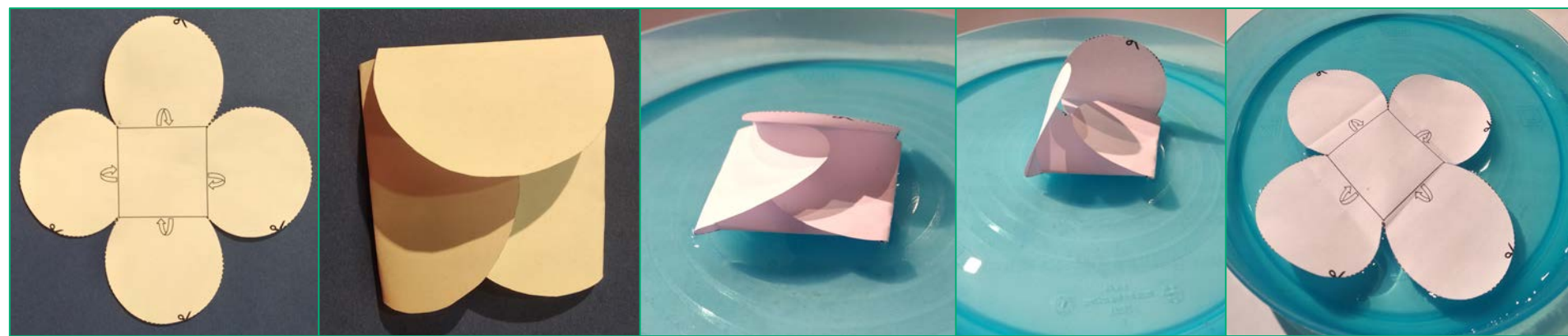
C. How can a flower open its corolla?

Flowers can open and close their corollas, and choose when doing so based on light. Some flowers love sunlight, therefore they open their petals in the morning, some flowers instead prefer darkness, so they keep their petals closed in the daylight and open them at night.

However, a flower doesn't use muscles to open and close its petals, it simply doesn't have muscles! How can it do it, then?

Let's find out with an experiment.

Hand out the paper flowers to kids and ask them to fold the petals inwards. Place the paper flower with closed petals up in a plate full of water and watch what happens. The flower floats on water, but in a few minutes, the petals will start to open up. Because of the effect of capillary action, just like it occurs in Nature, the petals are filled with water and then they open and reveal the treasure they hide in the centre: the pollen.





D. The colour of petals

For water and wind to act, it's enough for flowers to be wide open, that's it. But what about animals? Flowers must be able to attract them, so first of all, they need to be seen. That's why flowers have coloured petals.

Let's find out with an experiment how flowers can be so colourful.

For this experiment, choose flowers with dark petals, for example, red or purple, and give each kid a spoon and a small bowl (or glass) with 2 or 3 petals. Add some hot water into each small bowl. Kids can press the petals using a spoon, to help pigments out of tissues. Water will gradually begin to get coloured as petals will start to lose colour. What makes petals coloured and what is it that they are losing now and that is getting water coloured? It's about pigments, substances that make the corolla very colourful. There are so many different types of pigments, that's why there are so many flowers in different colours. After some time, we can take the petals out of the hot water and show that some white parts have formed: these are the parts that lost their pigments and are now colouring the water. The petals of the experiment can be observed using a microstereoscope.







E. The scent of flowers

In order to attract animals even more, flowers are not only colourful but also scented.

“Now, I’m going to test you: let’s see if you would be perfect animals flying from flower to flower and let’s see if you recognise flowers only by their scent.” Pour some drops of scented essence on a cotton ball placed in a small glass, get kids to smell it and show them a photo of a flower giving out that scent (e.g., rose, lavender, jasmine).

F. Each insect has its flower

Do you know that insects have preferences about flowers? They do not alight just on any flower, but they choose them based on colour and scent. Show children some images of insects on flowers like those attached. In this case, explain that bees are mainly attracted by yellow flowers, cetonias are attracted by light flowers and Painted Lady derives its name from its preferred flower!



G. Create your own flower

“Kids, if you were an insect, what would your preferred flower look like? Use “Happy Mais” to make a flower, moisten the parts so they stick together with wet fingers. Starting from the centre, stick the petals around, then the green stem to the back.

Like real insects, children choose the colour of the petals they will use to make their flower, and its scent as well. Then, a drop of the scent produced by the essences is added in the centre of the flower.





PHASE 3- CONCLUSION AND EVALUATION (time: 10 minutes)

Get kids to sit in a circle and sum up together what they have discovered during the activity they have just carried out, highlighting the fact that a flower can turn into a fruit when it gets pollinated, which is extremely important because it stores a seed (or seeds) that can germinate into another plant.

And now we head out to discover flowers in the vegetable garden, guess what fruits they will turn into, see if there are already fruits, if they are still unripe or already ripe and ready to be picked up. And why not, just see if there is some insect around, maybe it's because of it and the pollen that it carried that transformation has occurred!





EVALUATION

Attached exercises-to-do sheets to check that children have learned:

- the parts of a flower
- the life cycle of a plant and how a flower turns into a fruit





TEACHING TOOLS AND AIDS

A portable digital microscope to be connected directly to a PC or a fixed microstereoscope with adjustments to see everything on a screen such as a mobile phone. In this way, the mobile phone can be connected to a display as large as a TV screen or IWB to allow everyone to watch together. If a screen is not available, children can observe directly from a smartphone but, in this case, the activity is almost individual and requires more time.

Alternatively, magnifying lenses can be used or smartphone apps with high magnification lenses

Here follow some instrument suggestions:

1.


<http://www.debricochimica.com/microscopi-biologici-e-accessori/292-microscopio-digitale-usb-camera-jusion-40-x-1000x-portatile.html>

2.

<https://www.bresser.de/en/Discontinued/BRESSER-JUNIOR-Hand-held-USB-Microscope-LED-Stand.html>

3. <https://www.bresser.de/it/Astronomia/Accessori/bresser/4914914.html> 4.

<https://www.astroshop.it/microscopi-manuali/carson-mm-250-microscopio-smartphone-adattatore-iphone-4s/p,55004>





NOTES

Since the activity focuses on the use of flowers, make sure that no children are allergic to pollen or specific plants so that suitable flowers can be chosen or just avoid the part requiring observation of flowers.

The water used for the experiment of extracting pigments from flowers' petals should be warmed up in a kettle, it should be hot enough, but not too much hot to avoid unpleasant incidents such as children getting scalded. After the water has been warmed up, mix it with cold or ambient water to reach the right temperature before giving it to children.

