LIVING STEM

Key concept

Pollination

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#livingSTEM

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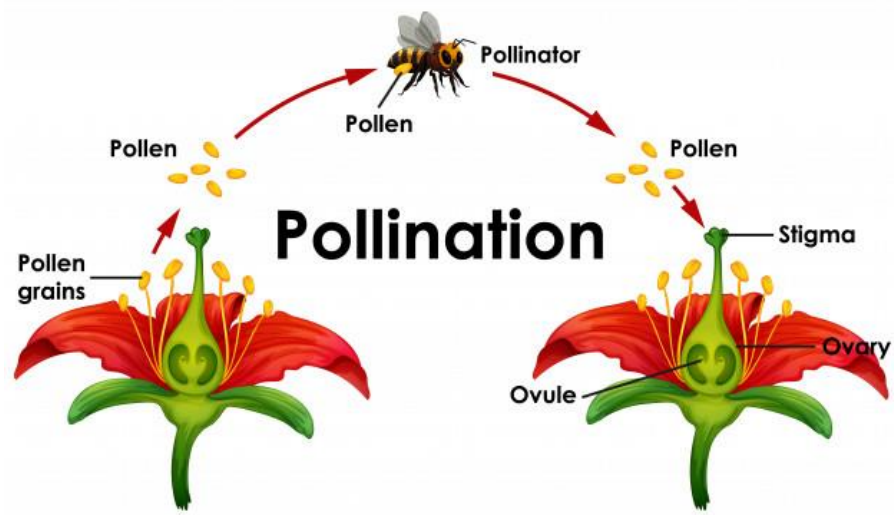
CONCEPT: Pollination

1- BRIEF DESCRIPTION OF THE CONCEPT

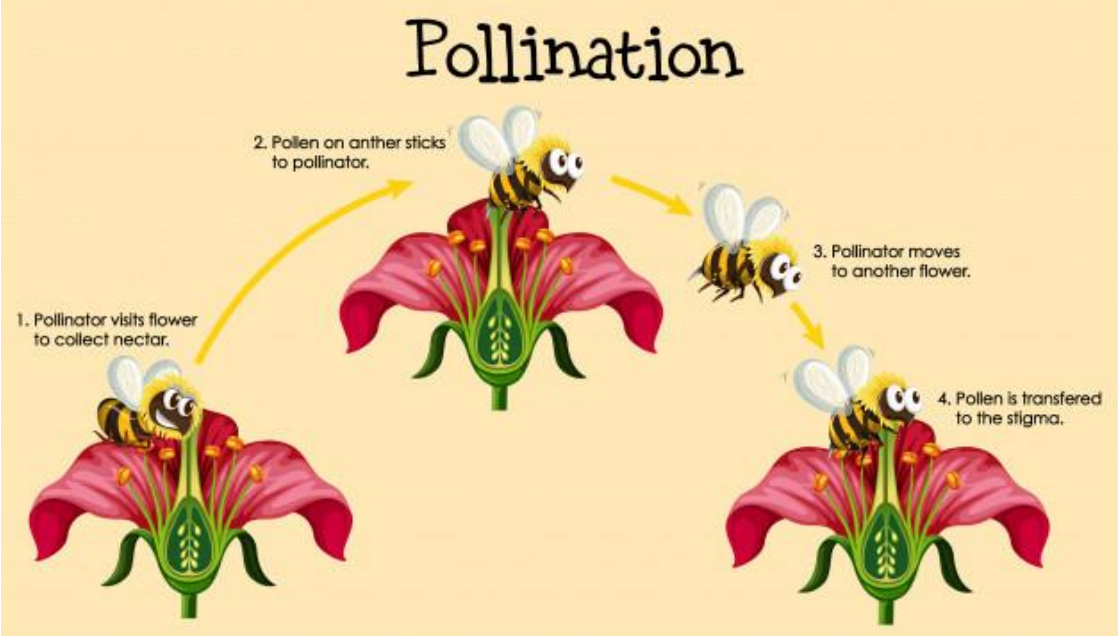
Pollination is the process by which plants get fertilized. Usually, flowers will require an external medium to make their pollen circulate from one flower to the next. Usually, those means are wind, insects, birds, water, bats or other animals. The animals or insects that help transfer this pollen from flower to flower are called “pollinators”, and the most famous ones in popular culture are bees.

In the case of insects and animals, what usually happens is that while trying to access the nectar, the pollen gets attached to the body of the pollinator and gets left on the next flower’s stigma which may result in the successful reproduction of the flower.

The pollination process is central in all ecosystems as it is at the basis of the reproduction of a lot of plants which makes for the basis of the food pyramid. A



defect in pollination would result in the loss of a lot of plants and crops over time. [1]



Source 1: Freepik

2- Activities of the LivingStem project that may be related to this concept

Gamification System activity: 'Building an insect hotel" could be linked to the concept of pollination, as one of the main interests of building this hotel is to attract pollinators into it. The activity could be geared towards pollination and its importance into the lifecycle of the permaculture garden. Melliferous plants could also be planted around the insect hotel to attract even more pollinators. The pupils could observe and learn to recognise pollinators and pollination processes in the permaculture garden and keep an observations diary. The whole process can be documented and explained by the pupils through a video.

[1] Freepik License. (2019). *Diagram showing pollination with flower and bee Free Vector*. www.freepik.com. https://www.freepik.com/free-vector/diagram-showing-pollination-with-flower-bee_6052414.htm#page=1&query=pollinate&position=0

Gamification System activity: "Designing a Mandala Garden" can be linked as well, as attracting pollinators is important in order to produce a bigger yield. Melliferous plants can be integrated to the design in order to attract pollinators for example. As in the previous activity, the pupils could observe and learn to recognise pollinators and pollination processes in the permaculture garden and keep an observations diary. The whole process can be documented and explained by the pupils through a video.

Gamification System activity: The activity about **honey and bees** could be linked to pollination as well as bees are pollinators. Here the whole point of pollination is central to the activity already as the process of producing honey is coincidental with the process of pollination. Both activities could be combined and the process of observation and documentation by the pupils can be the same. The pupils would follow the teacher in the different activities related to honey, while taking notes on the behaviour of bees and ask questions during the field trips. They would note down all their observations into a diary and explain all the different steps on video.

Ideal Kitchen Garden Game: The concept of pollination has to be taken into account while designing your ideal kitchen garden as pollinizing the plants will produce a bigger yield. Melliferous plants can be sown to attract bees and pollinators. Again, the pupils could observe and learn to recognise pollinators and pollinations processes in the permaculture garden and keep an observations diary. The whole process can be documented and explained by the pupils through a video.

3- Methodology proposal for the implementation of the activity described above

Here, the pupils will work in groups of 3 to 4 pupils in order to think of how to best arrange permaculture gardens / how to make an insect hotel/how to make

honey, etc (all activities proposed above) and how to associate plants in order to attract pollinators.

An experiment could be made to put some plants under a special net, in order to block pollinators from coming on them, and to plant the exact same plants but free to be pollinated, and then see what happens to both plants.
The pupils would have to document their observations, design, hypothesis, and experimentations. They would need to draw conclusions from the whole process and the observations they made, about the importance of pollination. During the whole process of the activity, they would keep recording and explaining what is happening with their own words to the camera.

While filming, it is possible to establish a general structure to the videos beforehand so that at the moment of filming, you may have a consistent format. Here is an example:

Make the video as an interview in a TV show (you can even invent a name)

- "Today let's explore …. (*insert subject*)"
- Brief explanation of the concept
- What the pupils will do as an experiment (or hypothesis)
- The different steps of the process and why
- What are the results?
- What is the conclusion?
- "Thank you for watching!"

4- Children involvement in the activity:

Pupils will be making a hypothesis on the importance of pollination once the teacher explained the process to them. They will then endeavour to make experiments in order to observe the process and its importance.

The videos will allow the viewer to follow the whole process, from important observations to the accomplishment of a created Permaculture garden or insect hotel depending on the activity chosen. Teachers will accompany pupils by explaining them the process of pollination and how it influences the ecosystem.

Pupils will work in small groups (3 – 4 pupils) in which a person will be designated to record the whole process. This position of filmmaker will need to be taken in turns by the pupils so that all pupils will be able to participate in the tasks and the video making process equally. All of this under proper supervision of the teacher of course.

The teacher can choose to film the whole process themselves if they want to.

5- Links between this concept and science (STEAM) and permaculture:

Pollination is the natural process of plant reproduction, which is linked with permaculture of course through the role pollination has to play in the intercropping strategies and general plant management in the permaculture garden. Pollination is also part of the biology curriculum, as it is covered in the reproduction systems part of the subject (Science).