



Key concept

PATTERN LITERACY

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CONCEPT: Pattern Literacy

1- BRIEF DESCRIPTION OF THE CONCEPT

Patterns are either sequences or designs that are orderly and that repeat or anything that is not random. One of the key points that permaculturists and mathematicians share in common is their appreciation of the ubiquity and significance of patterns in nature. Patterns are prevalent in everything, from the gigantic galaxies in space, to the microscopic cells that make up life on earth. Patterns are also observable in human and societal behaviour that define the personality and that weave human culture. Mathematician Paul Lockhart says “Doing mathematics should always mean finding patterns and crafting beautiful and meaningful explanations.” In permaculture, pattern can teach us how to design a garden project or any other project. Therefore this “Pattern Literacy concept” is aimed to inspire the young minds to begin to be aware of the patterns observable around them and in their daily lives in playful yet informative ways. This opening to patterns is a highly creative method to ease students into science, mathematics and STEAM in general. After all, biologists, mathematicians, physicists, chemists, artists, psychologists, as well as permaculture practitioners all study and learn immensely from patterns.



Source: photos by **David Clapp**

<https://www.ephotozine.com/article/capturing-frost---ice-patterns-and-scenes-to-create-interesting-abstracts--12832>

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

Pattern literacy, whether in permaculture, mathematics, social sciences or real-life usage, is so broad yet focused making it an exciting concept to explore & to film. This can be linked to the following:

1. **“Fractals & Nature”** in the Gamification System is all about the never-ending patterns that repeat indefinitely in both the natural and structural world. In the game, **“Designing a Mandala Vegetable Garden”**, the students can trace the beautiful patterns of mandalas as well as the plants laid out in the Mangala garden. A deeper learning in the game, **“Analysis of Different Terrarium”**, they can also film several evident patterns in that miniature ecosystem. Of course, the gamified lessons in **“The Golden Ratio, Fibonacci & the Bees + Permaculture Design”** is a set of exciting activities that evolve around pattern literacy. Even with the game **“Building an Insect Hotel”** and the other games can find a manifest link to the universe of patterns. Once introduced to pattern literacy, kids will become more adept in seeing and sensing them all over and that makes a good subject for a video.
2. In the LivingSTEM project, the **Ideal Menu Game**: As the students immerse in healthy food, they can observe the patterns in the food they eat (fractals in broccoli and cauliflowers, for example) and relate this to creating beautiful patterns in Menu and food preparation. In the “Food detective” activity of this Ideal Menu Game, they can film their experience as they investigate for one week, how their eating habits & choices of food affect their moods. Short daily reports compiling their one-week experience will show the pattern of the physiological reaction of their bodies vis-à-vis their pattern of food choices.

3. In the **Ideal Kitchen Garden**: Their Treasure Hunt activity in a permaculture farm will expose them to how permaculture practitioners use pattern in their farm design. Hence, this can be an excellent opportunity to be inspired to build up the context and storyline of their videos. If prepared before-hand, they may actually start or conclude their filming during this time.
4. **Deck of Cards**: the young students can observe the patterns from some of the plants illustrated in the LivingSTEM flash cards.

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

Instructions to the students:

1. After your basic lessons about patterns or after your experience with the **Fibonacci and Fractal** games and other games mentioned in point 3 or your exposure to pattern literacy in the activities in the **Ideal Menu Game** and the **Ideal Kitchen Garden**, you now have a basic comprehension of patterns.
2. To prepare for your film project based on the activities suggested by your teachers (Teacher note: per point 3 above), determine which one of the subjects interests you the most.
3. Once you have decided on this as a group, you may expound your knowledge about your chosen subject through internet researches or by having a discussion with chemistry/physics/art/math teachers from your levels or even from higher grade-levels.

4. Remember to identify the relevance of whatever you learn with your learning in permaculture such that it will be useful for your other projects.
5. Once the inspiration is there, the creativity will kick-in. You're now ready to write the story line of your film, the script, the storyboard (how your video will unfold shot by shot) and then create the production schedule.
6. Your film may simply be a panorama of examples with basic explanations of your discoveries, or it may be a doodle style illustrative videos of your subject matter, or a documentary of your Food Detective experience in the Ideal Menu. Let your imagination soar!
7. For tips in film production, simply follow the general guidelines in making a video that your teacher has provided.

4- Children involvement in the activity:

To ensure the students' enthusiasm, the activities must remain a group project. The students will feel empowered because they are left to make their own decisions as far as their subject of interest are concerned and they get to do their own research and planning. There will be plenty of interactions between them as they have to meet, discuss and brainstorm. Their confidence can be boosted by being in contact with resource persons within or outside the campus whom they can interview. The students will have a hands-on experience in the project and their learning of patterns will make them see math and science in a different light because of the idea that they now get to understand math and science by simply observing and understanding patterns in nature. Their film-making that involves outdoor adventures and games will bring lasting impact in their learning because of the positive emotional experiences that work on both sides of their brains.

Side Note: The teachers' role is crucial in ensuring harmony in each team, in guiding the teams in case of questions, in the coordination of the film-making activity with the other projects / IOs.

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

Related STEAM subjects:

Mathematics/Geometry integrated with Biology (linking plant life with their mathematical construct), interconnected to Arts (understanding the natural world & writing skills), reinforced by Engineering (planning and realizing output) and culminated by Technology (film-production, internet research).

Developed Skills:

- Mathematical perspectives through integrative skills
- Scientific skills through observation and research.
- Skills in planning, organization, script writing, interpersonal communication, team building
- Technological skills in media literacy
- Comprehensive skills with a broader, more scientific notion of permaculture.
- Integrated STEAM understanding of Mathematics and their role in Permaculture and life. Technological skills in media literacy
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