



Key concept

Permaculture and Experimentation

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CONCEPT: Permaculture and Experimentation

1- BRIEF DESCRIPTION OF THE CONCEPT

Integrating permaculture as a subject in STEM education gives a new plethora of activities and resources to teach. Students can get acquainted and learn about the scientific method - and particularly the experiment method- without having to buy and invest in a lot of items. It only takes a school garden to start trying out hypotheses led out in class.

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

It is most applicable in the **'Ideal Kitchen Garden Game'**:

Step 1-3 as explained below can be implemented in Phase A of the 'Ideal Kitchen Garden Game' (the observation and hypothesis can be done through the treasure hunt preferably with a structured way e.g with people taking pictures, video and notes).

Step 4 of experimentation can be recorded, especially the procedure of the design of parcel canvases for different environments undertaken as Phase B as well as the creation of the grow box and the elements to be planted as Phase D of the 'Ideal Kitchen Garden Game'.

Step 5, the analyses of the results can be based on a recording which will work as a calendar by video tapping/ observing the actual growth of the seeds planted in the grow box.

Step 6 can be recorded in a certain period of time predicted in the beginning for the planted seeds to produce wrists.

Step 7 can be the overall conclusion of the students in a type of interviews, based on what has been produced, reflecting on what could have been prevented or done better for more wrists to grow or for them to be better.

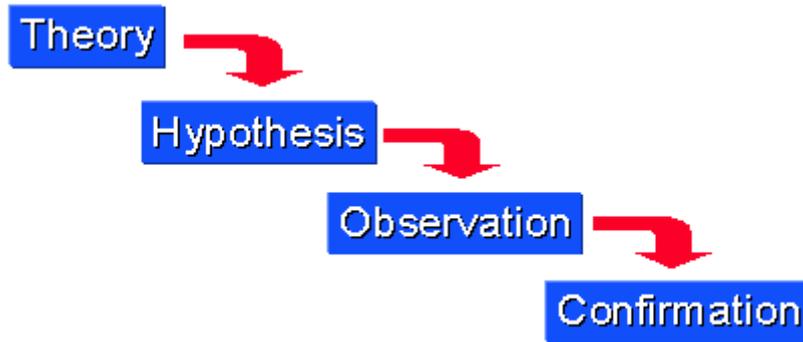
3- Methodology proposal for the implementation of the activity described above

Generally, the experimental method follows some basic steps with those being:

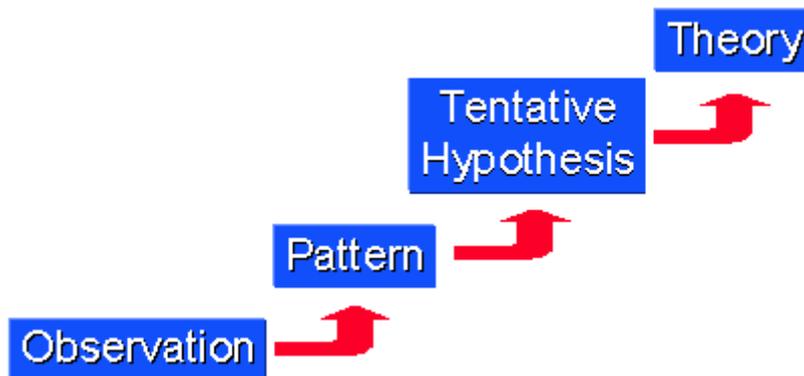
Step 1: Observation (should be objective), can be written down in a structured or non-structured way.

Step 2: Form a hypothesis. Involves prediction of future events. It is important for students to justify their hypothesis and discuss with other peers in a form of constructive debate. Reasoning can be inductive or deductive.

Deductive reasoning:



Inductive Reasoning:



Resource [here](#).

Step 3: Make a **prediction**.

Step 4: **Perform** the task/ experiment.

Step 5: **Analyse** the results.

Step 6: Draw a **conclusion** (can be a collective in class, informal discussion)

Step 7: Report your **results** (for ages 10-12 can be an oral discussion within the classroom, it can also be a homework activity of writing down their concluding thoughts. For older students 13-14 can be a more lengthy and thorough procedure of writing an assignment with all the previous steps and concluding comments even with references of scientific resources).

4- Children involvement in the activity:

To facilitate learning, the steps of the scientific method mentioned above can be recorded and uploaded in a shared platform or between the group of students. This can facilitate remembering all the steps and work as a synopsis of the

scientific method. It can be divided in 7 short videos, one for each step which will then be merged. In the more theoretical steps the discussion/ debate, even the written notes of the students can be video-recorded. Then it is best for all 7 videos of the 7 steps to be combined but making clear where one step ends and when the other one starts.

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

Basically, the production of the videos is related with:

Science. The content to be filmed is the scientific method.

Technology can be considered the use of the video device and software to process it. Students might also need to familiarise with a software for editing the videos and putting sub titles or titles/ the topic to be shown each time one video capture needs to be blended with another.



Artistic vision. The videos need to be clear, well developed, well recorded.

The theme/ content of the videos come from activities that are based on one way or another with permaculture concept.

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