Guide for the organization of educational materials according to the Inquiry Based Teaching Model

Guidance for preparation

Provide guidance for the teacher who will use your pathway regarding any necessary arrangements that will need to be made before launching the activities described in the following sections.

- **Pre-visit**
- **Teaching Phase 1: Question Eliciting Activities**

1.1 Provoke curiosity

Describe ways and materials (resources already available in GEOTHNK) that the teacher will present to the students in the classroom to attract their attention to the targeted subject matter. Make sure they are easily available to the interested user in GEOTHNK, and give directions for finding them. Possibly and if appropriate, integrate them into one practical resource in the appropriate format (e.g. a slides presentation). Usually the most effective way to provoke students' curiosity is by presenting an exciting video or a series of photos.

1.2 Define questions from current knowledge

Formulate the questions that the teacher will present to the students to provoke their engagement in thinking about the target subject matter based on their existing knowledge. Make these questions digitally available and easily usable, e.g. by integrating them in the materials described in the previous step. It is best to ask these questions in the context of a relative discussion. Students should answer by themselves.

Teaching Phase 2: Active Investigation

2.1 Propose preliminary explanation or hypotheses

Present the problem under investigation. Describe ways in which the teacher can encourage students to propose possible explanations about the problem at hand, based on the questions that emerged from the previous activity. The teacher should be guided here to identify possible misconceptions in students' thinking. If applicable, locate or make relevant assistance materials available in GEOTHNK, and give directions for finding them. If appropriate, you may consider integrating them in the materials described in the previous steps (e.g. a slides presentation). Teacher should write down the students' predictions.

2.2 Plan and conduct simple investigation

Offer to the teacher, who will use your pathway, a specific plan of the investigation that is going to take place. Give instructions concerning the activities students will perform and what materials they will need. Describe ways and material that the teacher can use to facilitate the students to focus on evidence as a source of answers to scientific questions. This is the phase in which students are being prepared for the subsequent phase of evidence gathering during observation. Locate or make relevant assistance materials available in GEOTHNK, and give directions for easy finding. If appropriate and relevant, it is possible to guide the teacher to use GEOTHNK resources of an exhibit nature (exhibits, simulations, experiments, etc.) at this stage in which case this activity should be moved to the Visit section of the Educational Pathway. However it should be noted that the use of physical observation is concentrated mainly in the next Teaching Phase of Creation, under the Visit section of the Educational Pathway.

- **Visit**
- **Teaching Phase 3: Creation**

3.1 Gather evidence from observation

This is the core element of the Visit phase, and it can be realized either in the school classroom by remotely using learning resources available on the web, or during an actual visit which will involve the use of digital resources. Locate the appropriate resource in GEOTHNK. Explain its use to the teacher, and provide access to any accompanying user support materials. The selected resource (e.g. a simulation, a map, a presentation, an animation, a graph or other exhibit of similar nature) must provide students with an opportunity to collect evidence addressing the research questions set in the previous stages through direct or indirect observation phenomena of the natural world. Provide guidance to the teacher organize and manage the activity most effectively and efficiently. It is recommended to introduce at this stage group work. Guide the teacher to divide students in groups, each of who will be facilitated by the teacher to formulate and evaluate explanations to the scientific questions based on the collected evidence. If applicable, locate or make relevant assistance materials available in GEOTHNK, and give directions to the teacher in order to locate them easily.

Teaching Phase 4: Discussion

4.1 Explanation based on evidence

Guide the teacher to encourage the students to provide the correct explanations for the researched topic. Describe ways and materials she/he can use to this end, and give directions for easy finding. If appropriate, integrate them into one practical resource in the appropriate format (e.g. a slides presentation).

4.2 Consider other explanations

Guide the teacher to facilitate the student groups to evaluate their own explanations in the light of alternative explanations, particularly those reflecting scientific understanding. Describe ways and materials the teacher can use to this end, and give directions for finding them. If appropriate, integrate them into one practical resource in the appropriate format (e.g. a slides presentation).

Post Visit

Teaching Phase 5: Reflection

5.1 Communicate explanation

Guide the teacher to facilitate each student group to reflect on the previous experiences and produce a report with its findings, presenting and justifying its proposed explanations to other groups and the teacher. Make available or direct to materials (resources already available in GEOTHNK) which the teacher can use to help the students familiarize themselves with and become effective in scientific writing.

Follow-up activities and materials

Describe and direct the user to any follow-up activities or materials that can be used to wrap-up the main visit experience. These could include appropriate learning assessment and/or reminder materials (e.g. quizzes, games, other user-friendly tests), hints for further activities, suggestions for other relevant visits, etc.