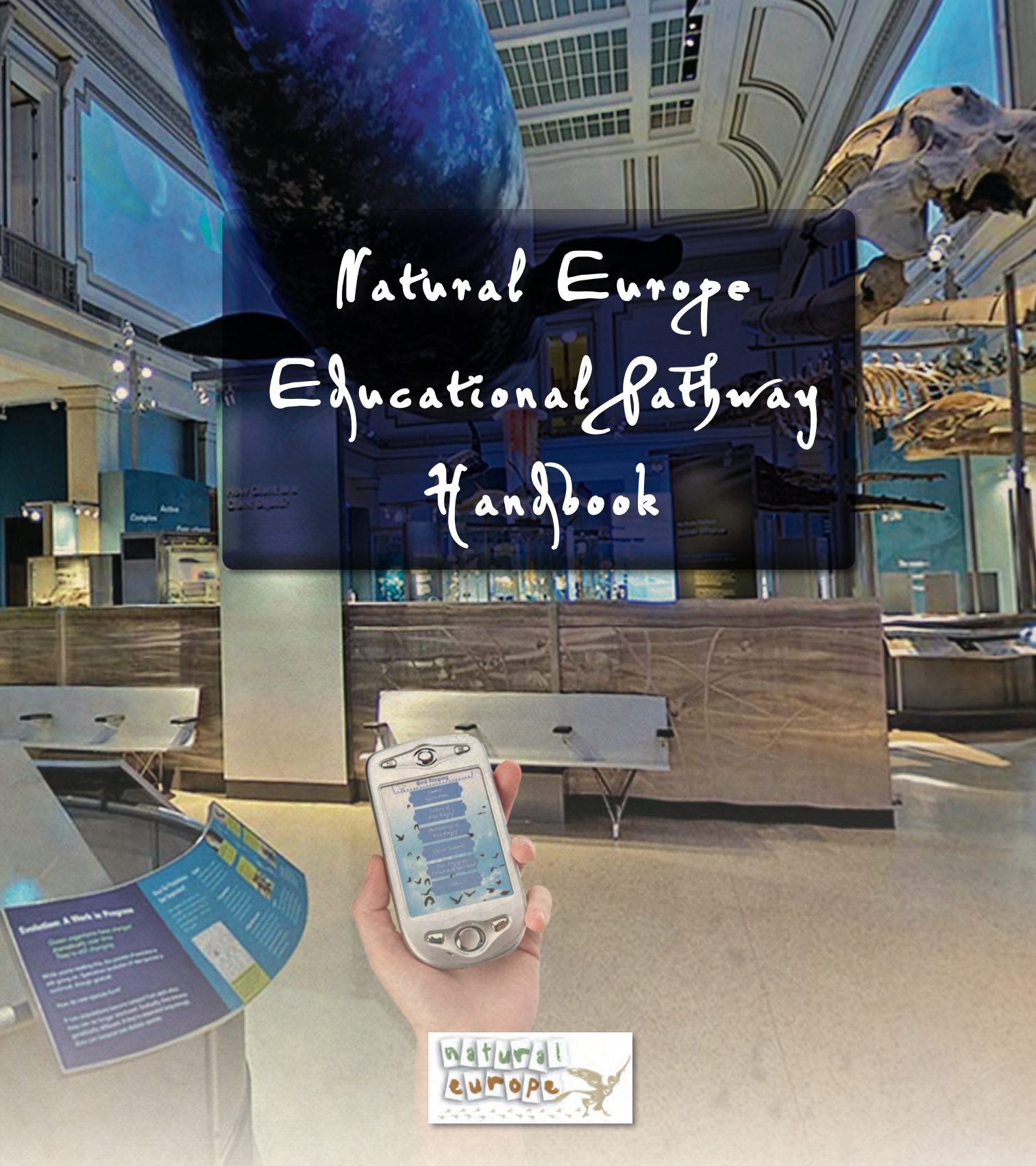
Natural Europe Educational Pathway Handbook



Natural Europe Educational Pathway Handbook

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1. Introduction

"Place museum visitors in the centre of an exhibition that is both physical & virtual using technology, services and learning content to provide personalized, appealing educational experiences; changing the way museum education is perceived and conducted, worldwide."
Natural Europe project vision

Curiosity, discovery, interaction ...

Is what usually attracts visitors to museums. But besides entertaining the visitor, cultural institutions have great educational potential by creating the ideal setting for **experimentation**, **explanation** and **exchange** of social, cultural and scientific information. Engaging in educational activities outside the classroom helps students **understand** and **familiarize** themselves with the concepts introduced in the classroom, thus **consolidating** their **knowledge**. At the same time, families and individual adults visiting a museum can benefit from playful structured activities that allow them to experiment, be entertained and learn. In order to respond to the educational needs of the learners, **collaboration** between school teachers and museum educators is necessary. To make the most of a museum visit, either physical "or virtual with the use of digital exhibits, importance needs to be given to the careful planning of the visit, as well as to the activities preceding and following the visit.

The **Natural Europe Educational Pathways Handbook** aims to guide teachers and museum educators in making the leap between the classroom and the museum, by clarifying issues such as:

- How can teachers benefit from a learning activity that includes a visit to the museum?
- How can teachers and museum educators design a learning activity that includes a museum visit?
- What is an Educational Pathway and how can it be created?
- How can lifelong learners benefit from the Natural Europe project?

The present Handbook was created in the context of the **Natural Europe[1] project (NE)**, a European funded project with the aim to: a) facilitate the search and retrieval of digital library objects related to Natural History, Environmental Education, and Biological Sciences; b) provide educators with the necessary software tools to design innovative online pathways using digital collections of Natural History Museums; c) encourage visitors to follow educational pathways and exploit high-quality digital content available in Natural History Museums. It also offers step by step instructions on the use of the Natural Europe online software for the design of educational pathways and use of digital resources. The online version of the present Handbook is available online at:
[*http://www.natural-europe.eu/files/Natural_Europe_Educational_Pathway_Handbook_151211.pdf*].

With these in mind, the **Natural Europe Educational Pathway (NE Educational Pathway)** and software tool are introduced, allowing teachers and museum educators to make use of existing digital collections of museums around the world to design online and offline educational activities that correspond to the learning needs of their students.

The **Natural Europe Pathway Authoring Tool** is a database of educational pathways, where educators can **create** their own pathway and **share it** with the community, while **making use of a large collection** digital resources from **Natural History Museums** and collections such as **Europeana**[2]. Learners can use the Tool to **follow educational pathways** and **play with digital resources**.

2. What is an Educational Pathway?

Educational activities outside the formal context have a great potential of engaging participants in practical activities that allow experimentation and help consolidating the theoretical background presented in more formal contexts. When these activities take place in settings such as museums, places of discovery and wonder, learners can build their knowlegde while playing and exchanging social and scientific information.

Especially when designing teaching activities that bridge classroom and museum learning, several challenges have to be addressed, such as ensuring the maximum possible proximity between the curriculum and teaching methods, the learning environment (schools and Natural History Museums/Science Centres), as well as the balance between education and entertainment, especially when it comes to lifelong learners. Learning objectives and outcomes need to be carefully accompanied by suitable educational activities that allow visitors to achieve the maximum experience when visiting a museum, whether physically or virtually.

To support teachers and museum educators in their effort to be carefully plan and prepare a meaningful experience, the **Natural Europe Educational Pathway** was introduced; that is a framework that integrates the pedagogical requirements of a learning acitivity taking place outside the classroom.

Educational Pathway:
A pre-defined pattern of exploring new meanings or spaces, through activities. It can be highly structured (with every step thoroughly designed) or open (eligible for changes through the navigation).

Although typically a pathway revolves around a visit (whether physical or virtual) to a museum, the learning experience needs to be embedded in a context that encourages preparation prior to the visit and exploits the learning outcomes of the visit through follow-up activities. To address these requirements, the Natural Europe Educational Pathway consists of three (3) main phases: the Pre-Visit phase, the Visit phase and the Post-Visit phase. Each of these phases includes one or more steps guiding the implementation of the teaching activities (i.e. Question Eliciting Activities, Active Investigation, Creation, Discussion and Reflection).

Technology and digital resources also play an important role in the learning process. In order to gain more diverse audiences and achieve greater access to learning for the public, several museums make their collections available online. Schools that are becoming increasingly concerned with the efficient use of technology in education and ensuring that students are technologically literate are thus offered the possibility to educate and entertain the students without having to actually plan an on-site visit to the museum, when this is not desired or feasible. This way, the proposed learning experience can integrate resources scattered in various natural history museums/science centres, thus achieving a more meaningful result.

2.1 The Natural Europe Educational Pathway

At this stage, a distinction between Guided and open Pathways is useful. A Natural Europe educational pathway is described as guided when it provides a pre-defined route through a set of science learning resources. This may be more appropriate for formal learning contexts, such as specific curriculum references and teaching processes. As for the open Natural Europe educational pathway, this is less formal allowing for considerable unbound user desicions, initiative and creativity in the ways the user will explore and exploit the science learning resources. The open Educational Pathway is considered appropriate for less formal learning contexts, addressed mainly to lifelong learners and families, and less to teachers who have decided to involve their students in open-ended explorations of the resources.

Although the museum plays a central role in the design of the NE Educational Pathway as the learning activities revolve around a visit to the museum (either physical or virtual), the learning experience should be embedded in a context that allows the **preparation** of the learner before the visit and **follow-up** activities for the exploitation of the learning outcomes. To facilitate the entire teaching and learning process, an Educational Pathway pattern consisting of three (3) main steps is proposed: Pre-Visit, Visit and Post-Visit. This generic pathway template regards highly structured learning experiences, addressed to school communities.

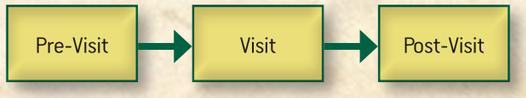

Figure 2.1: *Steps of guided Natural Europe Educational Pathway*

It is important to mention that the Educational Pathway needs to be prepared by the teacher before the Pre-visit phase having in mind the educational needs of the students, in collaboration with the museum educator when possible. Preceding the Pre-visit phase the teacher will choose the subject-matter to be discussed with the students, gather information and research on the other pathways available for this subject. If applicable, reservations at the museum should be made at this stage.

In regards to the physical setting, the pre-visit and post-visit phases usually take place in the classroom, while the visit phase involves a visit to a museum, whether physical or virtual; in the case of a virtual visit, the computer lab/ classroom with Internet access can be used. Computers can serve at any time throughout the pathway for making use of digital resources. Throughout the three steps of the pathway, the students will be required to collaborate and interact with their colleagues under the teacher's guidance, but also to work on their own.

A differentiation between gereric and specific pathways is made for Natural Europe project. In the context of generic pathways, more than one curriculum topics can be facilitated, allowing for cross-sectional teaching, and a more unified approach to the learning process. Specific pathways, on the other side, allow for only one specific curriculum topic to be facilitated. Both educational pathway types are addressed to the school community and follow the same template. Their main difference regards the suggested number of resources and activities to accompany each pathway type to ensure the best possible educational experience (for more information please see Section 6-13 **Quality Criteria for Natural Europe pathways**).

Table 2-1 explains what each of the three steps consists of and the roles assigned for both teachers and students in order to successfully complete a pathway.

Pathway step	Definition	Teacher's role	Student's role	Setting
Pre-visit	Preparatory activities for the interaction with the targeted resources of the museum	• to intrigue students and gain their attention • to pose relevant questions to the goal of the activity • to unfold students' prior knowledge on the subject	• to address teacher's inquiries and propose possible explanations • to conduct initial research on the subject and discover evidence (individually or in groups)	Classroom
Visit	Activities involving interaction with the targeted resources in the museum	• to divide students in groups (optional) • to listen to the students and give the correct e xplanations • to guide students to collect data	• to experiment with the pre-decided museum exhibits (or online activities) • to discuss and reflect on their findings, comparing them with the assumptions from the Pre-visit activities • to collect and produce data to be used for their Post-visit reports	Museum or online
Post-visit	Rounding up activities concluding the learning experience, after the interaction with the targeted resources	• to ask students to work in groups (or individually) to create a report on their findings addressing the initial inquiry	• to create a report and include their findings & data • to present it to the class and the teacher	Classroom

Table 2.1: *Natural Europe Guided Educational Pathway steps*

When it comes to open educational pathways, the role of the museum in the procedure is equally important, while the preparation and following-up phases are carried out in a more loose way, whether at home or in the museum. Besides, the game phase, which corresponds to the visit phase of the guided pathway mode, regards physical or virtual interaction with museum exhibits. As for the engagement and reflection phases, these are very flexible and may well take place at home or in the museum. Computers/PDAs and/or smartphones can serve at any time throughout the pathway for making use of digital resources. For this mode, the three (3) Educational Pathway steps proposed are: **Engagement, Game, Reflection**.

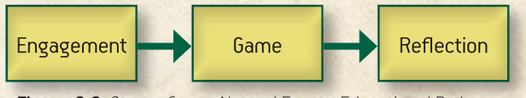

Figure 2.2: *Steps of open Natural Europe Educational Pathway*

In this case, the Educational Pathway is prepared by the museum educator and made available to the wider communities through Internet. More specifically, the museum educator will choose the subject-matter, as well as the visitor age to engage in this specific activity. No reservations at the museum need to be made by lifelong learners. When it comes to family activities, parents and children are expected to interact with each other; the role of parents is to chaperone, guide and assist the learning experience for their children who are welcome to lead the learning experience.

The following table (2.2) explains each of the three steps and the roles of parents and children when carrying out an activity, in order to fully benefit from a pathway.

Pathway step	Pathway step	Pathway step	Child's role	Setting
Engagement	Preparatory activities for the interaction with the targeted resources of the museum Initial activities to attract the participants' interest and attention.	• to intrigue children and gain their attention • to set the context in the appropriate way • pose relevant questions to the goal of the activity • to pose initial inquiries and unfold children's prior knowledge on the subject	• to comprehend the requirements of the activity and take on the assigned role • to conduct initial research on the subject and discover evidence (individually or in groups)	Museum or online
Game	Preparatory activities for the interaction with the targeted resources of the museum Initial activities to attract the participants' interest and attention.	• to facilitate the educational process	• to experiment with the predecided museum exhibits (or online activities) • to look for answers and propose explanations emerging from the activity	Museum or online
Reflection	Rounding up activities concluding the learning experience, after the interaction with the targeted resources. Learners reflect on and discuss the data collected.	• to facilitate the rounding-up process • to discuss the findings with the children	• to reflect on the data collected • to use the ideas emerging from the activity in order to successfully complete the pathway • to communicate their findings and conclusions with their peers and chaperones	Museum or online

Table 2.2: *Natural Europe Open Educational Pathway steps*

3. The Natural Europe Educational Pathway Template for Guided Pathways

The educational model used for the Natural Europe project is the Inquiry-Based Learning Model. This is a very popular and effective educational model that aims to place learners in the centre of the educational procedure. Using various means including technology and resources in many forms to provoke their interest and make them pose their own inquiries, the model's structure allows learners to lead the procedure according to their own educational needs and thus highly benefit from it. The teacher maintains the role of the facilitator, setting the general context, and assisting and guiding the learners. Due to its nature, the model encourages relationships between the actors of formal and non-formal education, represented in the Natural Europe case by the connection between the classroom and the physical or virtual visit to Natural History Museums and science centres.

The five Teaching phases of the Inquiry Based learning approach are:

- **teaching phase 1: Question Eliciting Activities** the teacher will provoke curiosity and try to attract students' attention by presenting or showing them appropriate material. The teacher will try to engage the students with the help of scientifically oriented questions.
- **teaching phase 2: Active Investigation** Students propose some possible explanations to questions that emerged from the previous activity. The teacher identifies possible misconceptions. Students give priority to evidence, which allows them to develop explanations to address scientifically oriented questions. The teacher acts as a facilitator.
- **teaching phase 3: Creation** Teacher divides students in groups. Each group of students formulates and evaluates explanations from evidence to address scientifically oriented questions.
- **teaching phase 4: Discussion** The teacher gives the correct explanation for the specific research topic. Each group of students evaluates its explanations in light of alternative explanations, particularly those reflecting scientific understanding.
- **teaching phase 5: Reflection** Each group of students produces a report with its findings, presents and justifies its proposed explanations to other groups and the teacher.

In order to facilitate the integration of NE Educational Pathways in the classroom and to encourage teaching practices built around the observation of objects or phenomena in the natural world, or, in the Natural Europe case, in Natural History Museums and science centres, a Template with three steps (Pre-visit, Visit and Post-visit) that correspond to the **five (5) stages** of the Inquiry Based learning approach, is proposed. This template is also based on the highly successful model used in Open Science Resources European project[3]. This template aims at successfully connecting in-class learning with museum learning through preparation, conduction and following up of a visit (whether physical or virtual) to non-formal learning institutions. Table 3-1 presents the NE Guided Educational Pathway Template illustrating the connection between the three Pathway steps and the Teaching phases.

Pathway step	Teaching phase	Steps
Pre-visit	1. Question Eliciting Activities	Provoke curiosity
		Define questions from current knowledge
	2. Active Investigation	Propose preliminary explanations or hypotheses
		Plan/ conduct simple investigation
Visit	3. Creation	Gather evidence from observation
	4. Discussion	Explanation based on evidence
		Consider other explanations
Post-visit	5. Reflection	Communicate explanation

Table 3.1: *The guided Educational Pathway template*

The teaching phases of the Natural Europe guided educational pathway model are described below. Please note that an introductory section precedes the Pre-visit section.

A) Introduction

This section includes basic introductory information about the learning experience that will allow the teacher to comprehend the scope of the educational pathway, its relevance to his/her teaching needs and goals, and provide him/her with guidance for the preparation of the learning experience. More specifically:

- **Guidance for Preparation:** Guidance provided by the creator of the Pathway about any necessary arrangements needed by the interested teacher before launching the activities described and/or proposed in the following sections.
- **Connection with Curriculum:** Reference to the items of the education curriculum mainly covered by the educational pathway. This section offers information in an indirect way about the prerequisite knowledge of the students to participate in the educational pathway.

B) Pre-visit Phase

- ***Provoke Curiosity:*** Description of means and material (available at the NE digital libraries/learning repositories/Europeana or elsewhere) that the teacher will use with the students in the classroom to attract their attention to the targeted subject matter. These should be easily accessible by the interested user with directions for retrieving them. Possibly and if appropriate, this section should offer them into one or more practical resources in the appropriate format (i.e. slides presentation, word document, pdf document, short film etc.).

- ***Define Questions from Current Knowledge:*** Formation of scientifically oriented questions that the teacher will present to the students to further enhance their engagement in thinking about the target subject matter based on their existing knowledge. These should be digitally available and easily usable.
- ***Propose Preliminary Explanations or Hypotheses:*** Description of ways in which the teacher can encourage students to propose possible explanations to the questions emerged from the previous activity, and to identify possible misconceptions in students' thinking. If applicable, this section should should offer them in one or more practical resources in the appropriate format (i.e. slides presentation, word document, pdf document etc.).
- ***Plan and Conduct Simple Investigation:*** Description of means and material (available at the NE digital libraries/learning repositories/Europeana or elsewhere) to be used by the teacher to facilitate the students to focus on evidence as a source of answers to scientific questions. These should be easily accessible by the interested user with directions for retrieving them. This is the phase in which students are being prepared for the subsequent phase of evidence gathering during observation.

C) Visit Phase

- ***Gather Evidence from Observation:*** This is the core element of the 'Visit' phase, and can be realized either in the school classroom/lab, by remotely using learning resources made available by the natural history museums/science centres on the web, or during a physical visit which will involve the use of digital resources. Locate the appropriate resource and/or the actual exhibit. Explain its use to the teacher, and provide access to any accompanying user support materials. The selected resource, which can be in the form of an experiment, an animation, or other exhibit of similar nature, must provide students with an opportunity to collect evidence addressing the scientific questions posed in the previous stages through direct or indirect observation of natural phenomena. Provide guidance so that the teacher can organize and manage the activity most effectively and efficiently. It is recommended that the teacher divides students in groups, each of which will be facilitated by the teacher to formulate and evaluate explanations to the scientific questions based on the collected evidence.
- ***Explanation Based on Evidence:*** Guidance for the teacher to provide the correct explanation for the researched topic. Describe ways and material (available at the NE digital libraries/learning repositories/Europeana or elsewhere) 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 (i.e. slides presentation, word document, pdf document etc.).
- ***Consider Other Explanations*:** Guidance for the teacher to facilitate the student groups to evaluate their own explanations in the light of alternative explanations, particularly those reflecting scientific understanding. Describe means and material (available at the NE digital libraries/learning repositories/Europeana or elsewhere) that 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 (i.e. slides presentation, word document, pdf document etc.).

D) Post-visit Phase

- ***Communicate Explanation:*** Guidance for the teacher to facilitate each student group to reflect on the previous steps and activities carried out, and to produce a report with its findings, presenting and justifying its proposed explanations to other groups, and to the teacher. Direct to material (available at the NE digital libraries/learning repositories/Europeana or elsewhere), which the teacher can use to familiarize themselves with and become efficient in scientific writing.
- ***Follow-up Activities and Materials:*** Describe and direct the user to any follow-up activities and material that can be used to 'wrap-up' the main 'Visit' experience. These could include appropriate learning assessment and/or reminder material in the form of quizzes, games, suggestions for further relevant 'visits', etc.
- ***Sustainable Contact:*** Describe and direct the user to any existing possibilities for maintaining contact with the digital resource and its provider, or with other users of the same learning experience.

4. The Natural Europe Educational Pathway Template for Open Pathways

When it comes to Open Educational Pathway patterns, the four phases introduced for the Natural Europe project effectively connect the more thoroughly organized educational pattern used for Guided Pathways to a playful approach, in order to achieve an open and relaxed, yet highly educational, experience, ideal for lifelong learners and individual visitors. This approach resembles a game, which is now found to be very effective and educational for all ages.

The principal behind Game-based learning is that a game aims to educate and not just entertain; when learners are actively engaged in such a learning environment, they work toward a goal, choosing actions and experiencing the consequences of those actions along the way. Game-based learning, being all-inclusive and highly engaging, offers reasons for further involvement in the learning process and through that develops practicing behaviors that can be easily transferred from the simulated environment to real life. A design for moment-to-moment engagement would allow players to make decisions and face the consequences of those decisions, in innovative learning environments that take advantage of new-technologies to achieve maximum effectiveness.

The four Teaching phases of the Natural Europe Open Educational Pathways are:

- **teaching phase 1: Curiosity Provocation** the parent/chaperone will provoke curiosity in order to attract the children's/ participants' attention by setting the activity context in an appropriate way.
- **teaching phase 2: Abstract Conceptualization** the parent/chaperone can pose initial inquiries in order to engage the children/participants.
- **teaching phase 3: Active Experimentation** children/participants will look for evidence to develop explanations that will address the scientifically oriented inquiries posed in this phase. The parent/chaperone acts as facilitator. Children/participants can work individually or in groups.
- **teaching phase 4: Communicate Explanation** children/participants use their collected date to complete the activity. The parent/chaperone gives the correct explanation for the inquiries posed in the Active Experimentation phase. Each child/participant or group of children/participants evaluates its explanations.

Table 4.1 presents the NE Open Educational Pathway Template illustrating the connection between the three Pathway steps and Teaching phases.

Pathway step	Teaching phase	Steps
Engagement	1. Curiosity Provocation	Provoke curiosity
	2. Abstract Conceptualization	Pose initial inquiries Propose preliminary explanations or hypotheses
Game	3. Active Experimentation	Gather evidence from observation Explanation based on evidence
Reflection	4. Communicate Explanation	Communicate explanation

Table 4.1: *The open Educational Pathway template*

The teaching phases of the Natural Europe guided educational pathway model are described below. Please note that an introductory section precedes the Pre-visit section.

A) Introductory Section and Preparation

- ***Introduction:*** Guidance provided by the creator of the Pathway about any necessary arrangements needed before launching the activities described and/or proposed in the following sections. This section includes basic introductory information about the learning experience, that will allow the parent/chaperone to comprehend the scope of the educational pathway, and provide him/her with guidance for the carrying-out of the learning experience.

B) Engagement

- ***Curiosity Provocation:*** Description of means that the parent/chaperone will use with the children/participants to attract their attention to the targeted subject matter. These should be easily accessible by the interested user with directions for retrieving them. To this end, this section should offer them into one or more practical resources in the appropriate format (i.e. slides presentation, word document, pdf document, short film etc.).
- ***Abstract Conceptualization:*** Formation of scientifically oriented questions that the parent/chaperone will present to the children/participants to further enhance their engagement in reflecting on the targetted subject matter. Description of means to be used by the parent/chaperone to facilitate the children/participants to focus on evidence as a source of answers to scientific questions. These should be digitally available and easily usable. This phase will set the context for the next step, which is the core element of the entire pathway.

C) Game

- ***Active Experimentation:*** This is the core element of the educational pathway, and can be realized either at home by remotely using learning resources made available by the natural history museums/science centres on the web, or during a physical visit which will involve the use of digital resources. Locate the appropriate resource(s) and/or the actual exhibit. Explain its use to the parent/chaperone, and provide access to any accompanying user support materials. The selected resource, which can be in the form of an experiment, an animation, or other exhibit of similar nature, must provide children/participants with an opportunity to collect evidence addressing the scientific questions posed. Provide guidance so that the parent/chaperone can organize and manage the activity most effectively and efficiently. Children/participants can either work in groups or individually; either way, each of them will be facilitated by the parent/chaperone to formulate and evaluate explanations to the scientific questions based on the collected evidence. This step can be repeated from eight (8) to fourteen (14) times in different forms, according to the participants' age. The ideal number of actions should equal the participants' age plus two; i.e. for a child aged 6, the most suitable number of actions would be 6+2=8, while for older children aged 12 the equivalent number would be 12+2=14. What is really important here, is to formulate the proposed educational activities so that they resemble a game.

D) Reflection

- ***Communicate Explanation:*** Guidance for the parent/chaperone to facilitate each child/participant to reflect on the previous steps and activities carried out, and to conclude the activity in the most effective and educational way. This section can also include suggestions for follow-up activities, in the form of quizzes, games, suggestions for further relevant 'visits', etc.

5. Natural Europe Educational Pathway Authoring Tool

In order to help educators design innovative Educational Pathways, the Natural Europe project has created an online software tool, the **Natural Europe Pathway Authoring Tool** (education.natural-europe.eu/natural_europe) that guides end-users through each step of the pathway design. The Natural Europe Authoring tool operates also as a database of educational pathways, where one can create his/her own pathway and **share** it with the community, but also **make use of a large collection** of and follow educational pathways, and play with and navigate through digital resources and collections of Natural History Museums and Science Centres.

The resources hosted by the software tool can easily be **searched, retrieved** and **integrated** into your pathway, but there is also the option to **upload** and **store** your own resources. More than being just an authoring tool for teachers and educators, the software allows visitors to **follow educational pathways** and **play with digital resources** belonging to various museums. Students and learners can directly receive guidelines and complete educational pathways prepared by educators, while basic familiary with computers and how to browse the Internet will be adequate for using the Natural Europe Pathway Authoring Tool.

The following section includes a brief overview of the Natural Europe Pathway Authoring Tool. In order to access the tool, **open a browser window and type the following address:**

http://education.natural-europe.eu/natural_europe/index

Figure 5-1 represents the **Main page** of the Natural Europe Pathway Authoring Tool. On this page the visitor can **browse** through the listed pathways of the Pathway Repository and **access** them by selecting the GO NOW! button.

Figure 5.1: *main page of Natural Europe Authoring tool*

5.1 Dashboard

The **Dashboard** of the Pathway Authoring Tool provides you with an overview of what is available on the site.
The main toolbar consists of two sections: **Resources, and Pathways** (Figure 5-4a).
You can either access Resources and Pathway sections from the toolbar or from the links provided right below the toolbar: **Browse your resources**, or **Browse/ Create a pathway** (Figure 5-4b).
On the right column of the Dashboard you can check the Site **Overview** (number of items, collections, keywords and users of the site) (Figure 5-4c), and **Guidelines** (Figure 5-4d).

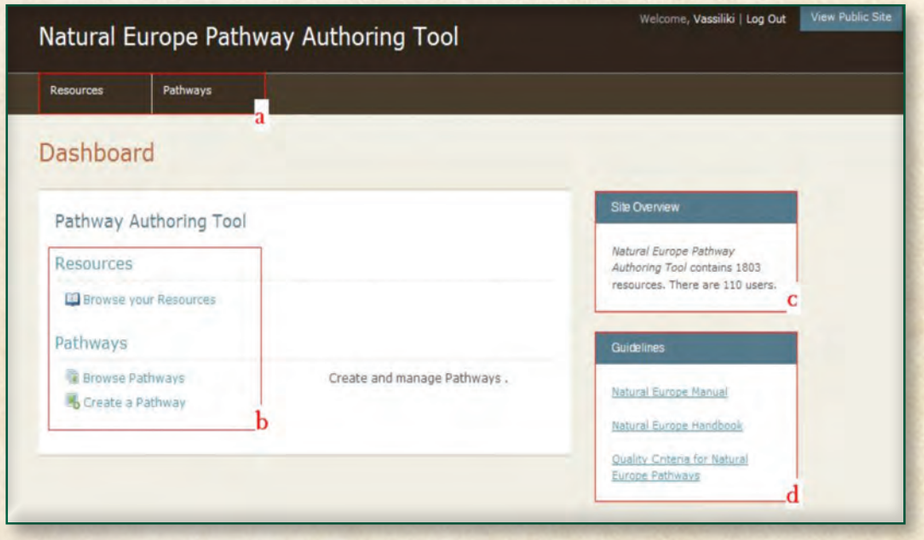

Figure 5.2: *Dashboard*

5.2 Resources

The **Resources** area consists of **Resources Management** options such as **Ingest a Resource, Add a Hyperlink, Add a File** (5-5a). It also offers the option of **Search** and **Advanced Search** (5-5b) with additional parameters such as ID, Type, etc. A **quick filter** option (5-5c) allows for a faster choice between different modes of resources (all - public – private).
Users can view the resources available either as a **List** or with **Details** (Figure 5-5d).

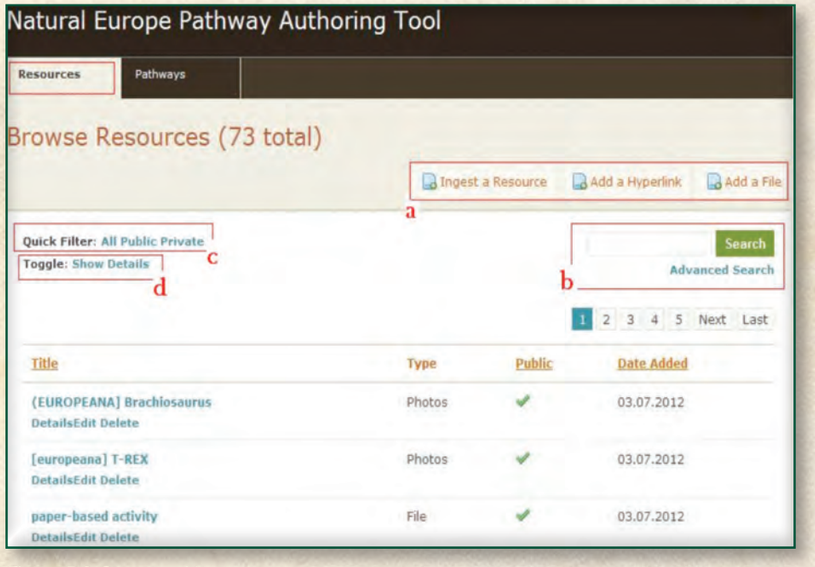

Figure 5.3: *Resources Management*

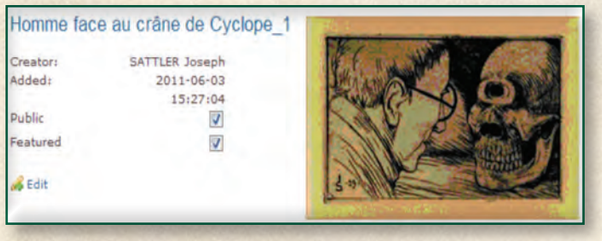

Figure 5.4: *Detailed view*

5.3 Pathway

The **Pathway** area, accessible from either the Dashboard link or the toolbar, provides a list of the Pathways available on the site. To read more about each Pathway, click on the Title link. Logged-in users can also **Add their own Pathway** (Figure 5-7a). For step by step guidelines on how to create your own Pathway, go to chapter 6.3 **How to create a Pathway**.

Figure 5.5: *Pathways*

6. Design your Educational Pathway

Before starting to develop your own Educational Pathway using the Natural Europe Authoring Tool (*http://education.natural-europe.eu/natural_europe/*) it is important to remember that an Educational Pathway consists of text, images and a number of educational resources. Moreover a Pathway is structured in several sections guiding you through the visit and teaching phases. The Authoring Tool gives you the opportunity to create your Pathway online and link it to your own uploaded resources, but also to use the ones available on the site. Resources can include images, videos, links etc. and can be organised in collections.

Therefore, before starting the creation of your Pathway, you might want to make sure that all the images and resources you plan to include in your Pathway are uploaded and available on the tool. However, while editing your pathway you can continue adding new resources from your computer or other sources. This chapter will focus on a) how to Upload a resource and b) how to Create a pathway.

At any point of your navigation, hover your mouse over the information boxes displayed next to each field and read the instructions/guidelines available.

6.1 How to upload a resource

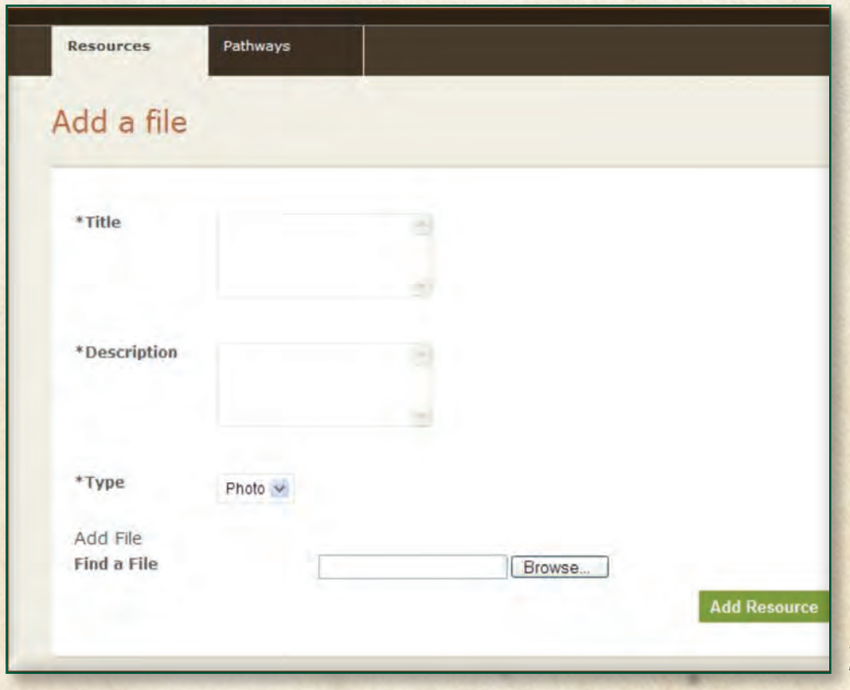

Figure 6.1: *Add a resource*

In order to upload resources on the Natural Europe Authoring Tool, follow the steps listed below:

- Select **Save** or **Save and return to pathway** to complete the other pages on the sections of the pathway or **Save** to continue working on this section, or **Cancel** to erase all alterations made since last saving your work.
- Sign in at *http://education.natural-europe.eu/natural_europe/*; for more information check section 5-1 **Log in/ Register**;
- Go to the **Resources** tab and click on either of the three buttons **Ingest a Resource - Add a Hyperlink - Add a File** (Figure 5 5a).; alternatively **a resource to your resources** throughout the pathway development;
- Complete the 3 Steps:

Step 1: Select the **Resource Type, Choose the file** to be uploaded from your computer and click Next. According to the Type of resource selected, additional fields will be displayed;

Step 2: Based on the information you have available, complete the Metadata fields, such as: **Title, Subject, Description, Source, Creator, Rights, Format etc.** and click **Next**;

Step 3: Add **tags** to describe your resource and **make it public**.

- Finalize the process by selecting Add resource
- Always remember to make public each added resource that you intend to use in your pathways (Figure 6-2).
- Follow the same steps to add a hyperlinck to your pool of resources.

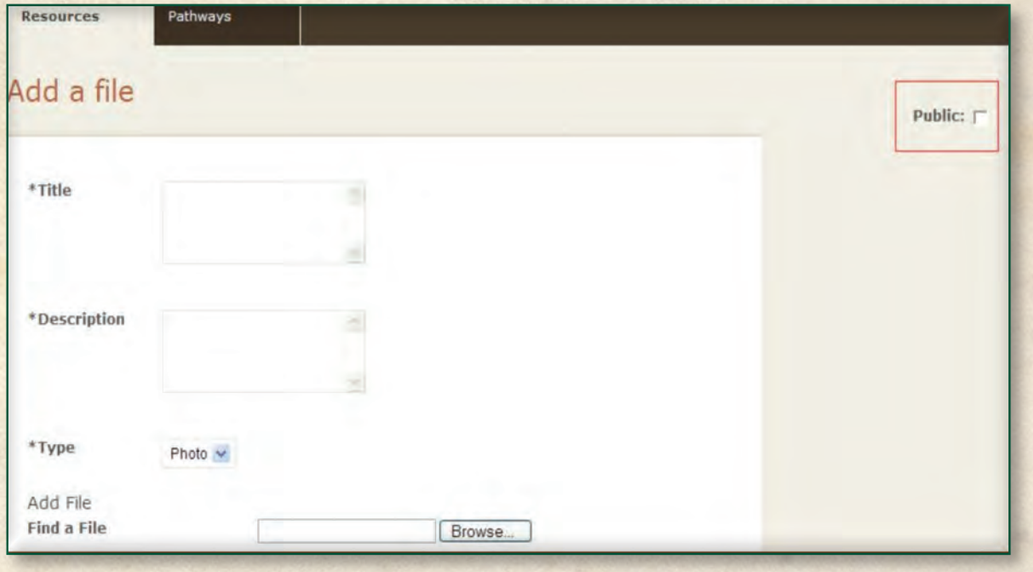

Figure 6.2: *Make a resource public*

6.2 How to Ingest a Resource

In order to ingest a resource from Natural Europe federation, follow the steps listed below:

- Go to the **Resources** tab and click on **Ingest a Resource** button (Figure 6-3a);
- Type the keyword of interest in the given space;
- Search among the results and choose the item of your choice by clicking on the Add it to my Repository button

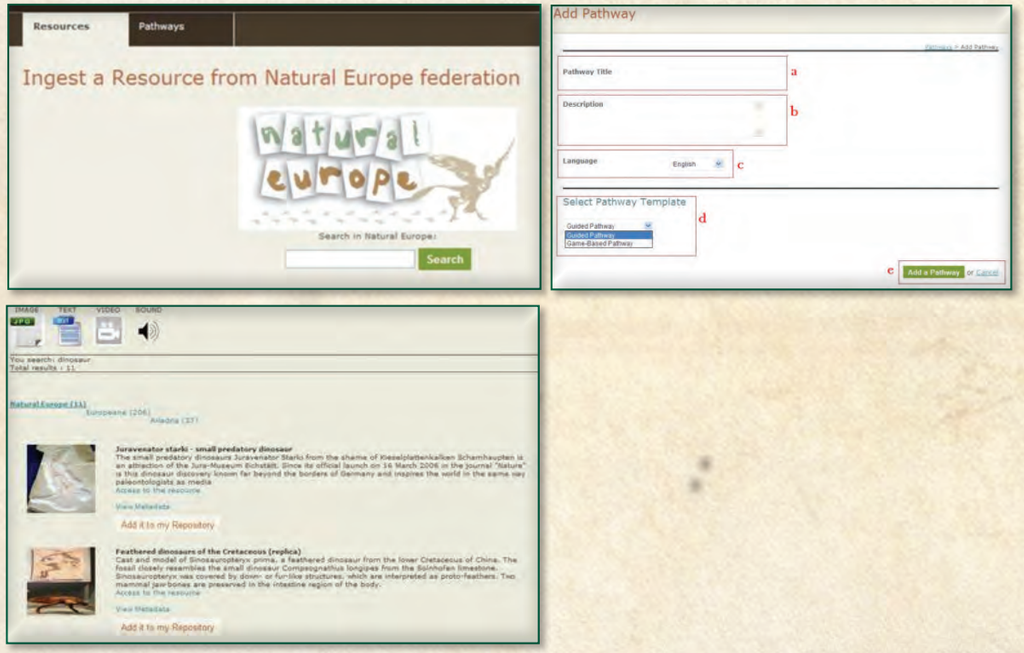

Figure 6.3: *How to ingest a resource*

6.3 How to create a Pathway

In order to create a Pathway on the Natural Europe Authoring Tool, follow the steps listed below:

- **Log in** at *http://education.natural-europe.eu/natural_europe/*
- Go to the **Pathway** tab and click on **Add a Pathway** button (Figure 5 7); alternatively select **Create a pathway** from the Dashboard (Figure 5-4);
- Add a **Pathway title** (Figure 6-4a) and a description (Figure 6-4b) ;
- Select the **Pathway language** (Figure 6-4c); you can choose one of the eight given languages available in the menu.
- Choose the Pathway template of your preference; you may choose to create a **Guided Pathway**, addressed to school communities, or a **Game-based Pathway**, addressed to lifelong learners and especially families (Figure 6-4d).
- Click on to save your choices and create the new Pathway (Figure 6-4e).

6.3.1 Pathway Sections

- Complete one by one the **Pathway Sections: Introduction, Pre-visit Phase, Visit Phase and Post-visit Phase (Figure 6.5: Pathway sections).**
- Each section consists of one or more pages corresponding to the teaching steps of an Educational Pathway. For each page, select **Edit** to start filling it in or **Save and return to Pathway** after you have completed all the pages.
  - **Introduction section** consists of two pages, namely Guidance for Preparation and Connection with Curriculum (Figure6.5a).

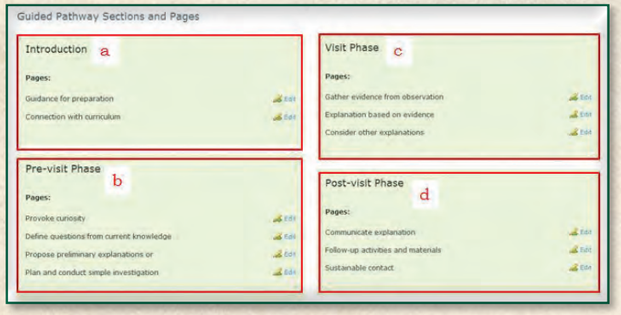

Figure 6.4: *Pathway sections explained*

  - **Pre-visit section** consists of four (4) pages: Provoke curiosity, Define questions from current knowledge, Pro-

- **Visit phase** consists of three (3) pages: Gather evidence from observation, Explanation based on evidence and Consider other explanations (Figure 6.5c).
- **Post-visit phase** consists of three (3) pages as well: Communicate explanation, Follow-up activities and materials and Sustainable contact (Figure 6.5d).

6.3.2 Editing and formatting

Editing text is easy, especially if you are familiar with any word processor software. If you are not sure what a button does, you can simply hover over it and a description will appear.

Figure 6.7: *Text editor*

You can link your text to external pages in 4 simple steps:
a) Highlight your text, b) Select the Add link button , c) Provide the URL of the page in the new window, d) Click on Insert.

When you perform **Copy – Paste from Word**, but in order to avoid problems, make sure you first copy your selected text the text from Word and paste it to Notepad. You can also use the HTML source editor option, accessed by the respective button found at the **Text editor toolbar (Figure 6.6)**. and then copy and paste the text from Notepad to the Rich text editor. You can now format it using the editor.

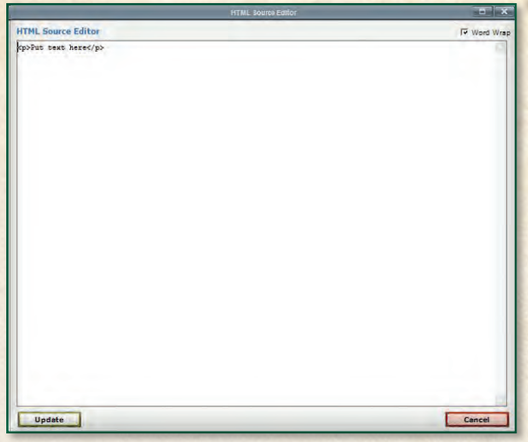

Figure 6.5:
HTML source editor

6.3.3 How to fill in a page

All the pages from the different sections of the pathway have an identical structure that allows you to insert text, images and connect supporting material and Europeana objects with just few clicks. Additionally, if you cannot find the resource that you are looking for, you can **Add a new resource**.

Start by filling in the page with **text**. Use the **Rich text editor** to format your text and include links. Read section 6.5d Editing and formatting to find out more.

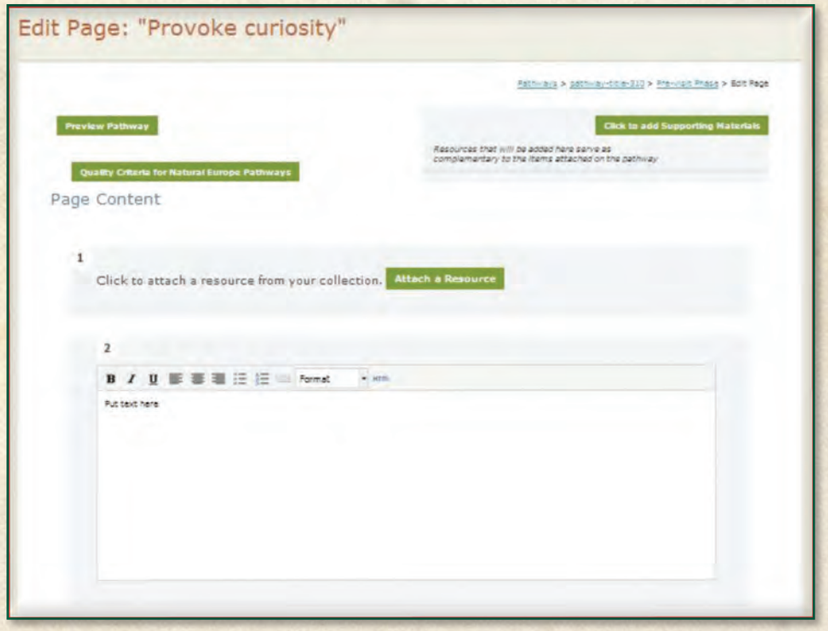

Figure 6.6: *Page structure*

- Attach a **Resource** to your text. The image will be displayed on the corresponding pathway section after saving your changes. To add a resource use the **Attach a Resource** button on the top of each text box, find the suitable item, select it by clicking on it and then click on the **'Attach Selected Item'** button at the bottom right corner. This can be a picture, a hyperlink or a file of any kind. Moreover, it may be a resource available on Europeana.
  If you wish to remove a supporting material form the list click on the ⛔ icon.

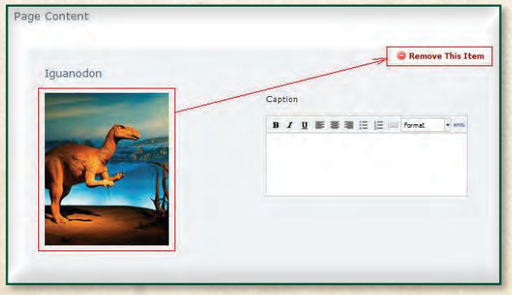

Figure 6.7: *remove an item from your pathway*

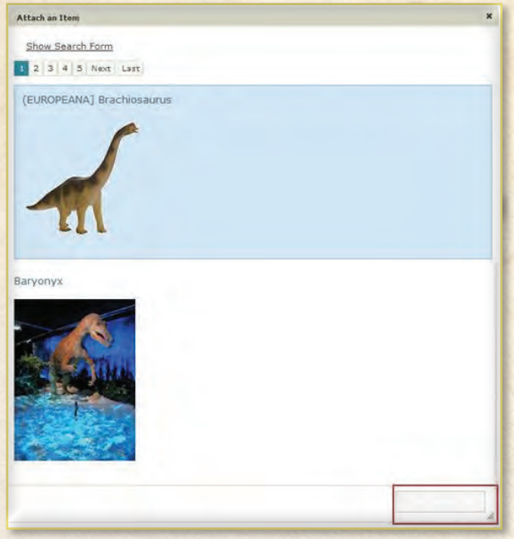

Figure 6.8: *add a resource to your pathway*

- Add supporting materials (Figure 6-8); Click on the **Click to add Supporting Materials** button on the top right corner of each section. A pop-up item will appear. In case it doesn't, please check if you have disabled pop-ups. You will need to temporarily activate the pop-up service to complete this step. Type one or more keywords or look through 'all items' and choose it from the list provided, and then click Insert. Once the item is inserted it will be listed in the Supporting materials section of the pathway page. If you wish to remove a supporting material form the list click on the ⛔ icon.

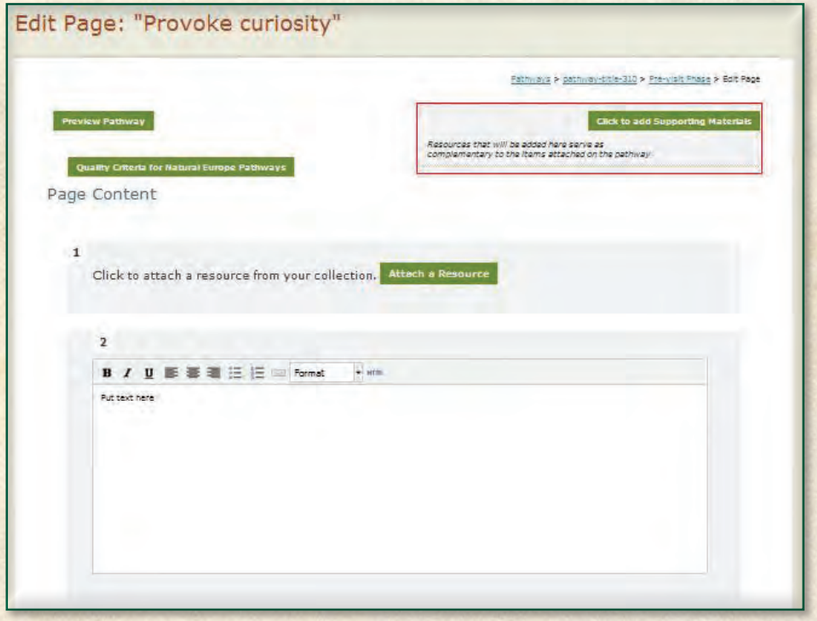

Figure 6.9: *Add supporting materials*

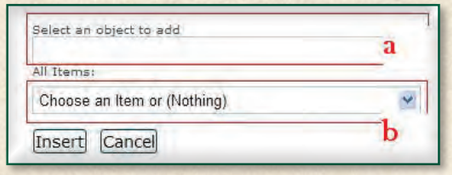

Figure 6.10: *search and insert support materials*

- Select the Preview Pathway button to check how your Pathway will look like once published.
- Select **Save** or **Save and return to pathway** to complete the other pages on the sections of the pathway or **Save** to continue working on this section, or **Cancel** to erase all alterations made since last saving your work.

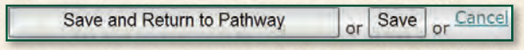

Figure 6.11: *save options*

- Select **Save** or **Save and return to pathway** to complete the other pages on the sections of the pathway or **Save** to continue working on this section, or **Cancel** to erase all alterations made since last saving your work.

6.3.4. Quality Criteria for Natural Europe Pathways

Just below the Preview Pathway button, you may notice another button that reads: Quality Criteria for Natural Europe Pathways. Clicking on it, you will come a cross a table that offers indicative numbers for resources and activities to be used at all pathway types (for more information on different pathway types, please see **Chapters 3** and **4**). These indicative numbers of resources and activities derive from research and ensure a great learning experience for each learning group. If you wish to achieve the best result possible, please follow the table's instructions.

Home > Quality Criteria

Quality Criteria

Criteria / Pathway Type	Generic	Specific	Open
1. Connect Pathway with Curriculum	One or more topics from the curriculum can be facilitated	Only one specific topic will be facilitated	Optional/Open
2. Pathway includes relevant digital resources	Collection >= 1 Resource AND	Collection >= 1 Resource OR	Collection >= 1 Resource
	Europeana >= 5 Resources	Europeana >= 1 Resource	Europeana Optional/Open
3. Pathway includes field trip/visit (gather evidence)	NHM >= 1 visit virtual or physical	NHM >= 1 visit same	NHM >= 1 visit same
	Other site AND > 1 visit	Other site OR >= 1 visit	Other site Open/Optional
4. Pathway includes proposed discussion/reflection activity in classroom	>= 1 activity	Specific activity = 1	Open/Optional
5. Pathway includes follow-up activities that come from external sources (related resources)	Europeana >=5	Europeana Open/Optional	Europeana Open/Optional
	Other sources >=5	Other sources Open/Optional	Other sources Open/Optional
6. Potential Learning Objectives	>= 1 objective	Open/Optional	Open/Optional

Figure 6.12: *Quality Criteria*

6.3.5 Pathway Metadata

In order to describe your pathway, you have four (4) metadata fields available: General, Educational, Rights and Classification.

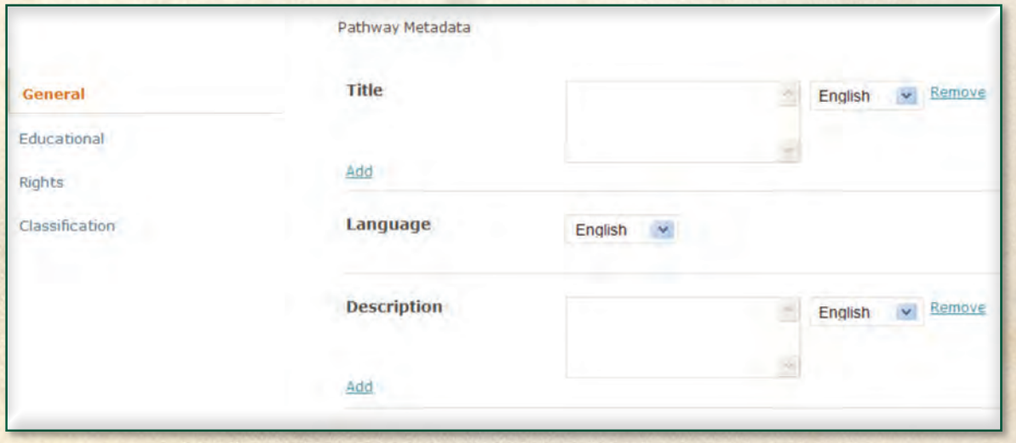

Figure 6.13: *Add pathway metadata*

- In the General section, you can provide the Title and Language of the pathway and add a short Description, in one of the eight available languages.
- The Educational section focuses on the Resource Type, Intended End User, Learning context, Typical Age Range, Difficulty, and Educational level.
- Provide information about Copyright and other restrictions, such as cost for users and modifications allowed, in the Rights section. Once you provide this information, the tool will select the appropriate license (e.g. a Creative Commons license), and make it available on the main page of the pathway.
- Finally fill in the Classication section to identify the learning purposes of your educational pathway.
- Save your metadata or Save and Finish if you have finalized your pathway.

6.3.6 Finalizing and Validating your pathway

In order to finalize your pathway, you should provide a slug. The slug corresponds to the URL of the specific Pathway and should be unique. To make your pathway public, please select the 'Pathway ready for validation' option, by ticking the box.

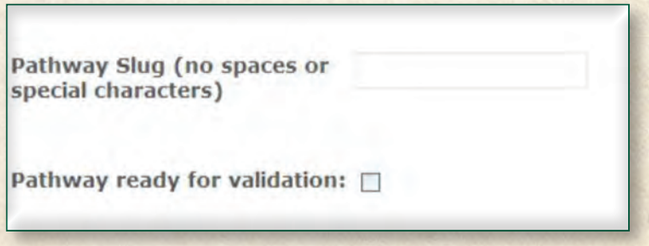

Figure 6.14: *Finalizing and validating a pathway*

7. Educational pathway - Step by Step Tutorial

'Renewable, Green, Clean? Wind Energy and Solar Energy' is an educational pathway linked to the module of science and addressed to primary school students. In the following pages, you will explore selective sections of the educational pathway as it appears in View Mode and in Edit Mode, accompanied by comments and descriptions.
If you wish to see the educational pathway completed, please refer to Chapter 7. Also see Chapter 8 for a completed Game-based pathway.

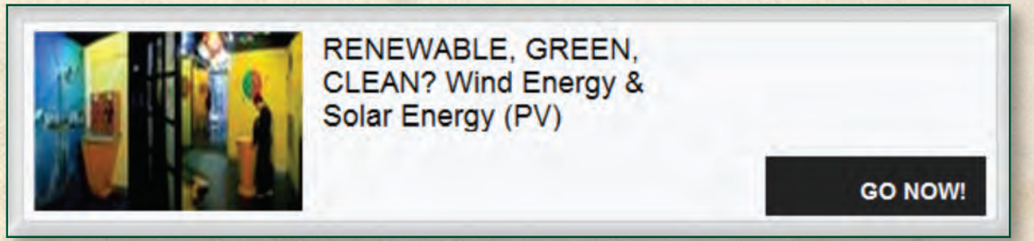

Figure 7.1: *Pathway starting point*

EDIT MODE

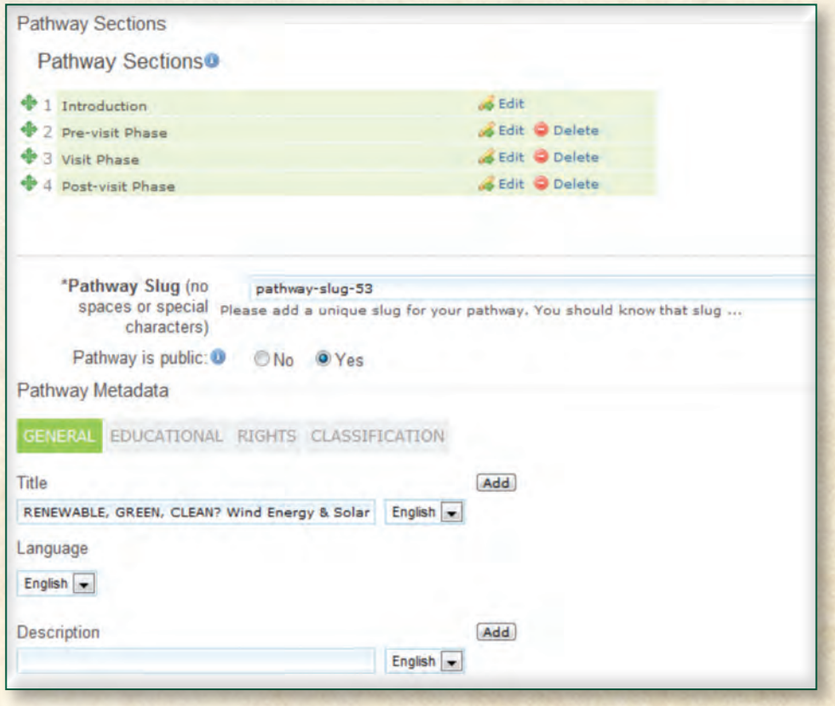

Figure 7.2: *Pathway sections in Edit modet*

VISIT MODE

Figure 7.3: *Pathway sections in Visit mode*

EDIT MODE

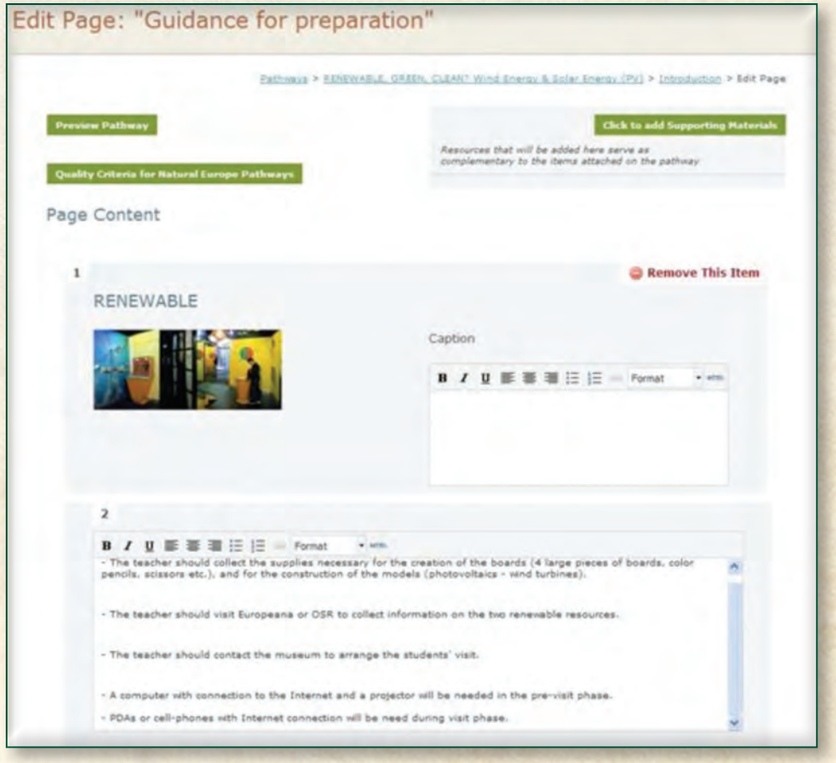

***Figure 7.4**: Introduction in Edit Mode*

On the right-hand side, the viewer can find the 'Supporting Materials' section, which offers access to all supporting materials linked to each specific section of the pathway.

VISIT MODE

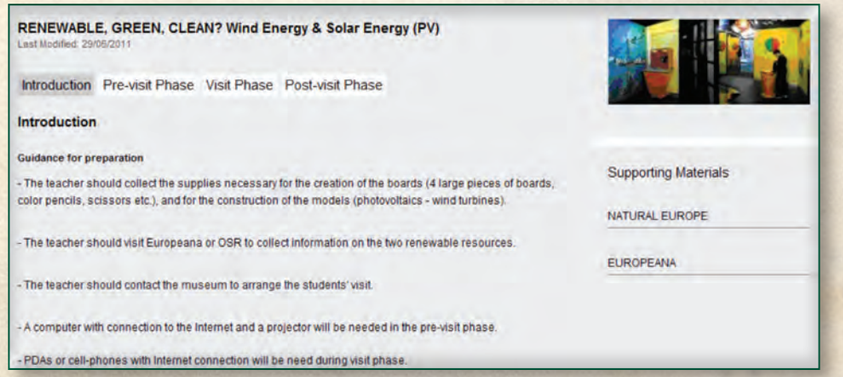

***Figure 7.5:** Introduction in Visit Mode*

EDIT MODE

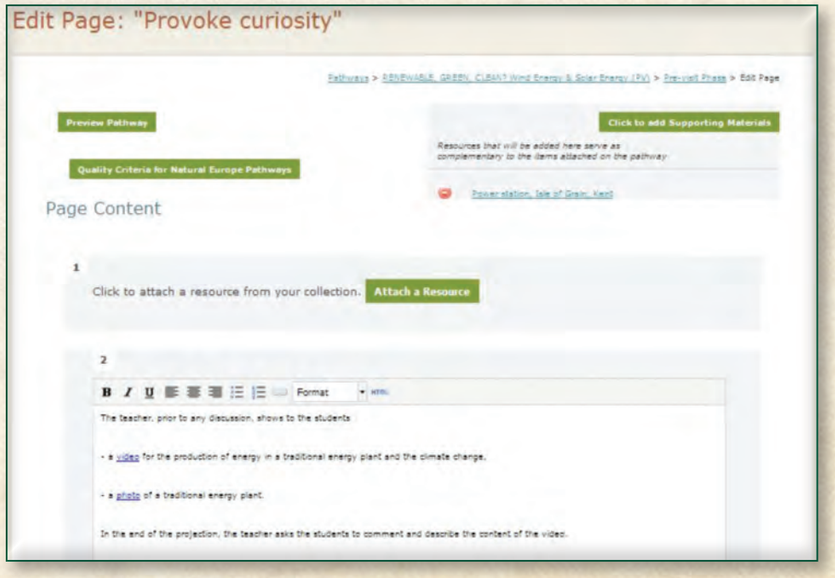

***Figure 7.6**: Pre-visit Phase in Edit mode*

Each pathway section displays both the guiding text and photos in an attractive way.

VISIT MODE

***Figure 7.7:** Pre-visit Phase in Visit mode*

EDIT MODE

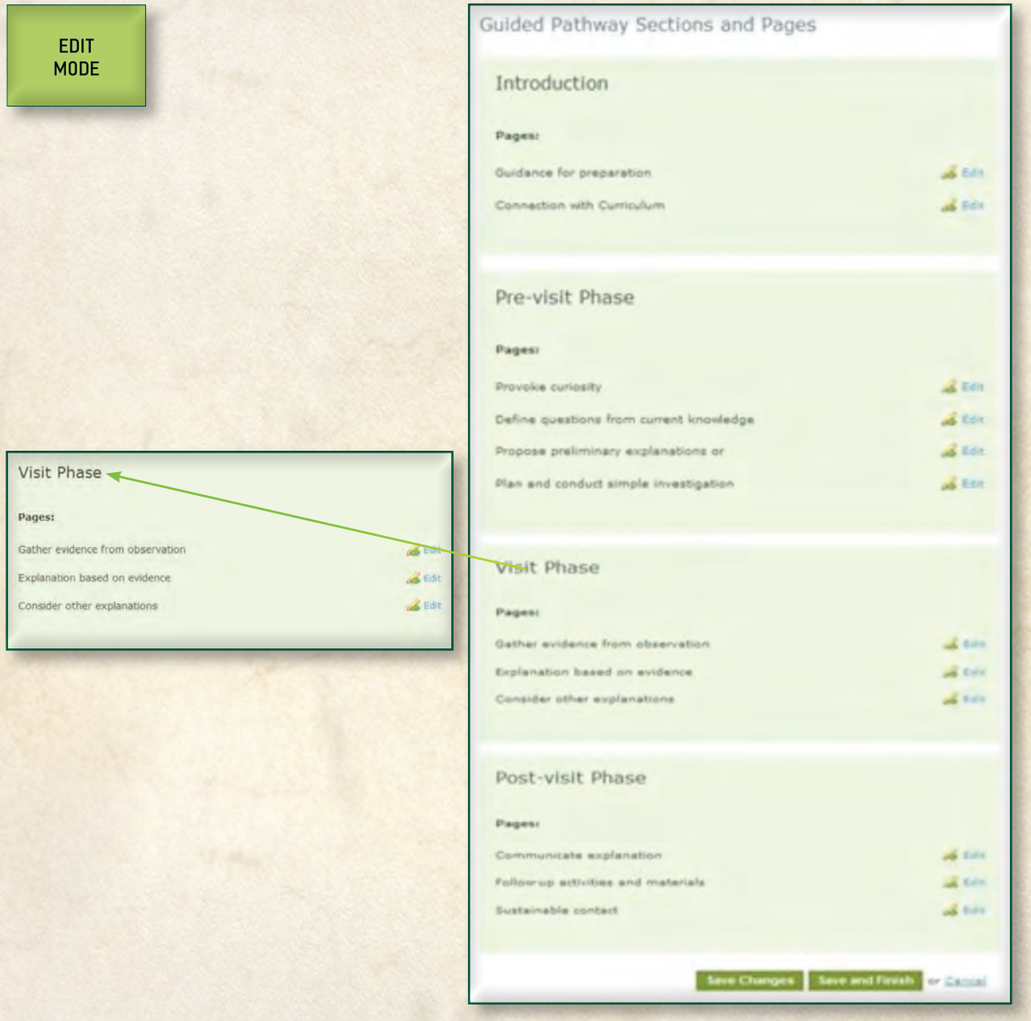

Figure 7.8: *Visit phases in Edit mode*

Each pathway section displays both the guiding text and photos in an attractive way.
In each separate phase, the viewer can come across the equivalent different steps. To view the part desired, one can scroll down and read the text, while also accessing the corresponding supporting material, found on the right part of the page.

VISIT MODE

Figure 7.9: *Visit phases in Visit mode*

EDIT MODE

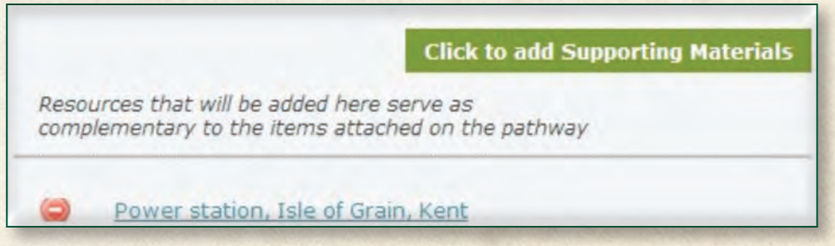

Figure 7.10: *Add resources in Edit mode*

VISIT MODE

Figure 7.11: *Resources in Visit mode*

8. Explore a guided Natural Europe Educational Pathway - Completed

'Renewable, Green, Clean? Wind Energy and Solar Energy' is an educational pathway that aims to provoke students' interest on renewable energy resources and urge them to examine their advantages and disadvantages. Students engage in hands-on and minds-on activities to collect information and thus fully comprehend the science lying behind wind turbines and photovoltaics. The educational pathway involves a visit to and specially designed activities in a Centre for Environmental Education. The learning experience is completed by a rich pool of resources and documents, all offered to the teachers. In the following pages, you will navigate through the different sections of the educational pathway.

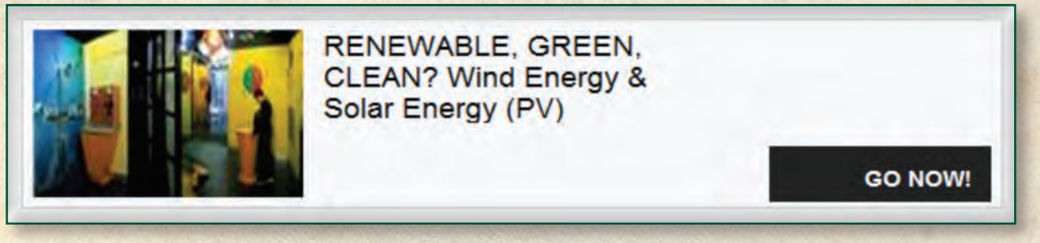

Figure 8.1: *Pathway starting point*

In the first section, the teacher comes accross some initial guidelines that will help him/her prepare the activities. These guidelines answer the teacher's questions on the activity's requirements, its connection to the curriculum and the time required to complete the activity.

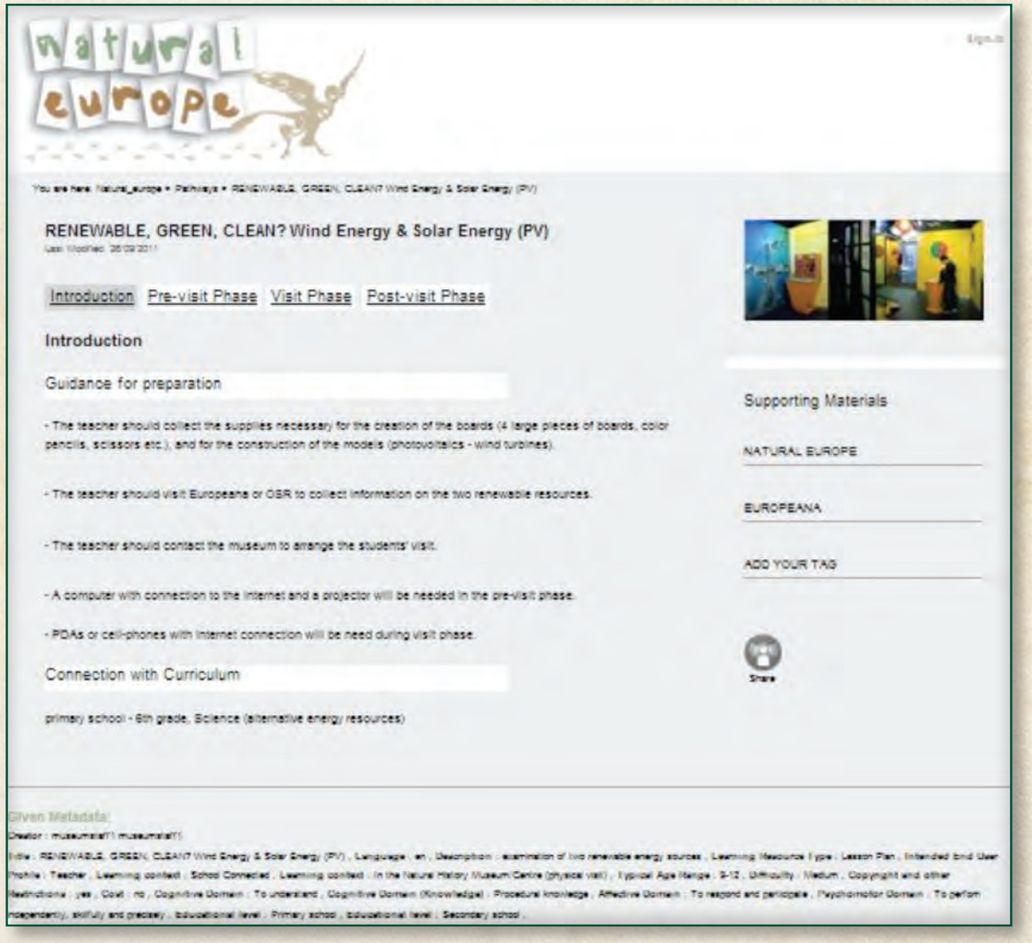

Figure 8.2: *Introduction*

Commencing the activities of the pre-visit phase, the teacher aims to provoke students' curiosity on the two examined renewable energy sources by showing them a web-based video on traditional energy plants and their impact on the environment. This introductory step is completed by additional resources, in the form of photographs.

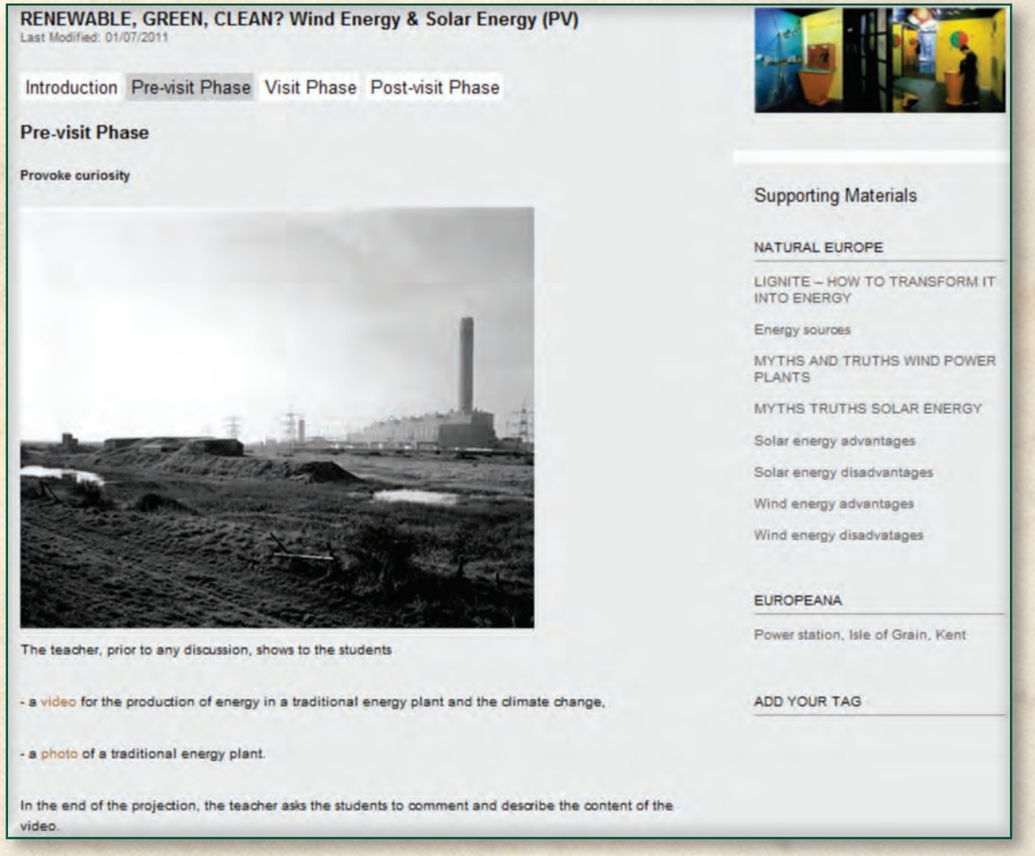

Figure 8.3: *Pre-visit Phase –Provoke curiosity*

Next, the students are asked to reflect on questions regarding electrical energy and renewable energy resources. For the teacher's guidance, documents and links with information and guidance related to the questions asked are provided in this section.

Define questions from current knowledge

How is electrical energy mainly produced today?
- *lignite power plants*

Are there any other ways for producing energy? If yes, can you name them?
- *alternative ways for producing energy*

The energy resources are divided in two categories according to the source used. Can you name these two categories?
- *renewable and non-renewable energy sources*

Is electricity really necessary?

Coal and petroleum reserves are expected to be exhausted within the next 50 years. If that occurs, will it be feasible to continue in the same modus vivendi?

Please indicate the methods you adopt to save energy.

Figure 8.4: *Pre-visit Phase– Define questions*

Following that, the teacher asks his/her students specific questions to understand whether they have mixed their knowledge on photovoltaics and wind turbines with conceptual misunderstandings. Again, documents on the respective myths and truths are provided in this section for the teacher's guidance. This and the previous activity help the teacher comprehend the knowledgability of students on the examined subject-matter.

Propose preliminary explanations or hypotheses

The teacher is asked to indicate and confront possible misconceptions in the classroom, and then lead the students to propose possible explanations to the questions raised from the previous activity.

The most common questions concern photovoltaics and wind turbines and are known as "myths". The goal of this exercise is to assist students to overcome the misunderstandings.

- Both solar and wind energy are unreliable.

- Each one of the energy sources is the ultimate solution to the energy problem.

A general discussion is proposed to help students build a strong base to discuss the matter within their teams in the next phases.

Figure 8.5: *Pre-visit Phase– Propose explanations*

Just before the visit phase, the teacher organizes the students in work groups, each of which is assigned to carry out research on a specific topic and answer related questions. Students are offered some resources, while they are also informed on the way they will be expected to present their findings; more specifically, each group will form a card board and complete it with arguments in favor and against each form of renewable resource. An indicative card board model for each group is offered here.

Plan and conduct simple investigation

Plan and conduct simple investigation

The teacher divides students in four groups: two occupied with solar energy and two occupied with wind energy (advantages-disadvantages-operation). With material found on the World Wide Web and especially from Europeana, the teacher directs the students to look for answers to the questions already posed.

The students are given 2 days to perform their research and then return to their teams with their findings. Through this team work they will create a card board with the information discovered, and their thoughts, which they will enrich during the visit to the museum.

Figure 8.6: *Pre-visit Phase - Plan investigation*

The school group visits the indicated museum. The students experiment with the exhibits related to the educational pathway and, using PDAs, they play an online interactive game. Then, working within the group they were assigned to in the pre-visit stage, they look for information to answer their group's questions.

RENEWABLE, GREEN, CLEAN? Wind Energy & Solar Energy (PV)

Last Modified: 01/07/2011

Introduction | Pre-visit Phase | Visit Phase | Post-visit Phase

Visit Phase

Gather evidence from observation

The students visit the "Energy Challenge" section of GAIA Centre - Goulandris Natural History Museum, which deals with renewable resources and the use and abuse of energy at the modern world. Each team is asked to recognize the exhibit related to their personal research:

- photovoltaic
- wind turbine

During their visit, the students are expected to complete three actions with their teams:

• First of all, they will experiment with the exhibits and with the teacher's assistance they will come to a conclusion in regards to the operation mode of each energy production appliance (photovoltaics - wind turbines).

• Secondly, they will seek information in the space to enrich the contect of their boards.

• Thirdly, they will use a cell phone with Internet connection to play an online energy-related game.

Supporting Materials

NATURAL EUROPE

Wind Turbines Gaia center exhibit

PV Gaia center exhibit

EUROPEANA

ADD YOUR TAG

Figure 8.7: *Visit Phase – Gather evidence*

When the work groups have collected the information needed, they work together to format their card board and complete it with the information discovered

Figure 8.8: *Visit Phase – Explanation based on evidence*

Having concluded that, students are expected to examine the alternative energy resources exhibited in the same wing and compare them to the renewable source form they were asked to examine, also discussing them with the museum educator.

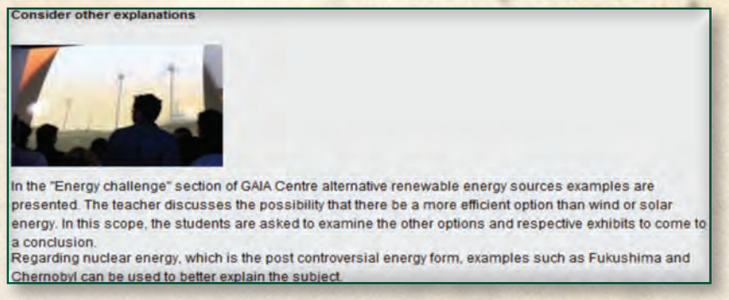

Figure 8.9: *Visit Phase - Other explanations*

Upon return to school, the different work groups will present their card boards with their findings to each other. When this discussion is completed, the teacher focuses on the subject of alternative energy sources and especially nuclear energy.

Figure 8.10: *Post-visit Phase - Communicate explanations*

The educational activity is almost completed now; in the final stage students will engage in hands-on activities that will help them better understand the operation of solar energy and wind energy constructions. To complete them, they will work in the same groups they have been cooperating with since the beginning of the activity.

Follow-up activities and materials

Following discussion, the students are divided in two groups (solar energy - wind energy), according to the subject they examined in the previous stages. Each team, under the teacher's instructions and guidance, will construct a model: the "solar energy" team will create a model operating with solar energy, whereas the "wind energy" team will create a model operating with wind energy.

Each team will experiment with their model and use it to demonstrate its operation to the other team.

After the completion of this hands-on activity, students are expected to have formed an overall view on the two energy resources (construction - operation - advantages and disadvantages - alternatives).

- guide to constructing a model - understanding solar energy
- guide to constructing a model - understanding wind energy

Sustainable contact

Ellinogermaniki Agogi
Research and Development Department

Vassiliki Markaki
vmarkaki@ea.gr

Figure 8.11: *Post-visit Phase - Follow-up*

9. Explore an open Natural Europe Educational Pathway - Completed

This educational pathway is thus formulated to resemble a game, and more specifically a treasure-hunting activity. Being looser, yet very educational, it is ideal for families that wish to visit a museum / exhibition on dinosaurs, whether physically or virtually where applicable. Children/participants engage in role-playing to find out interesting and entertaining facts about dinosaurs. The parent/chaperone takes on the role of facilitator. This hands-on/ minds-on experience is ideal for children aged 6-12, that can either work collaboratively or turn the educational pathway to a competition, and let only the best be declared 'the ultimate dino-doctor'..

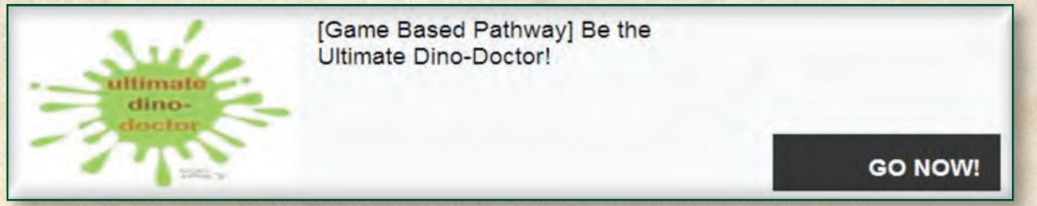

Figure 9.1: *Pathway starting point*

As it is also the case with guided pathways, the introduction section offers guiding information for the preparation of the activities.

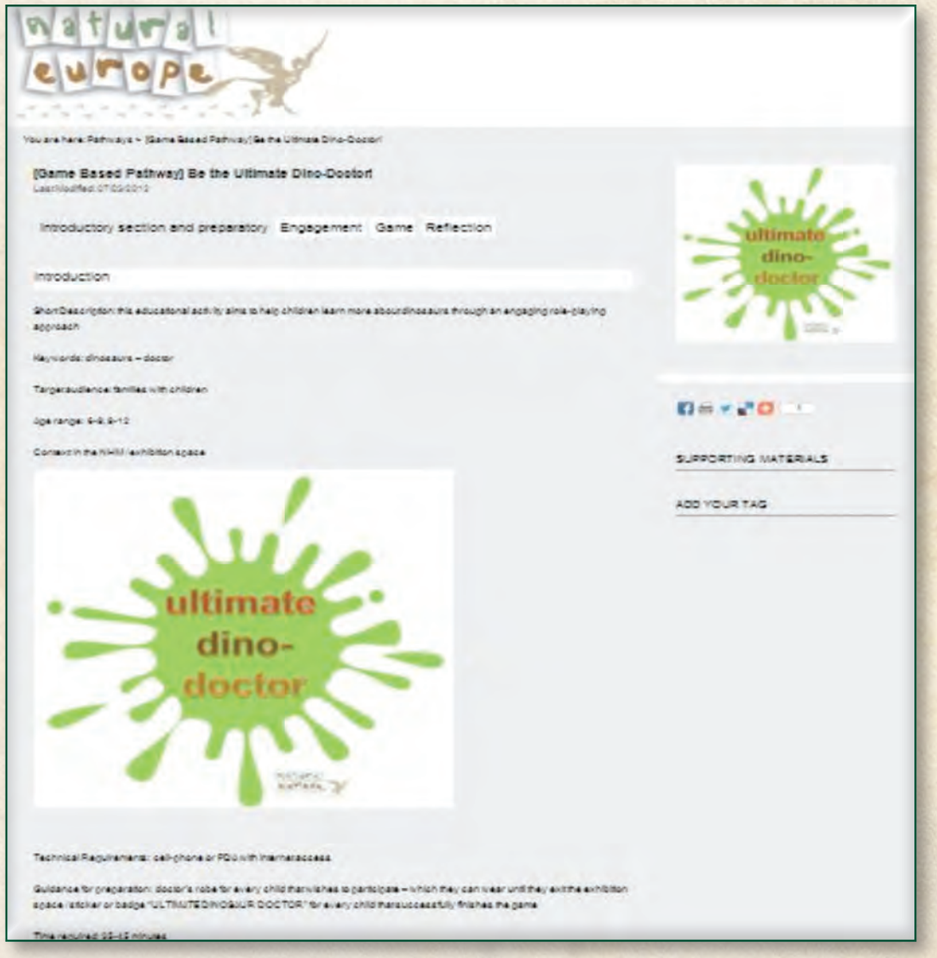

Figure 9.2: *Introductory Section*

The first step aims to attract the participants' interest. This section also offers a paper-based activity trail, should the facilitator wish to use a hard copy during the actual museum visit. This option could prove useful, if there are more than one participants that decide to compete with each other on completing the activity.

Figure 9.3: *Engagement Phase - Curiosity Provocation*

The introductory phase gets both the facilitator and the participant(s) acquainted with the educational experience, by explaining its goal, steps and simple rules.

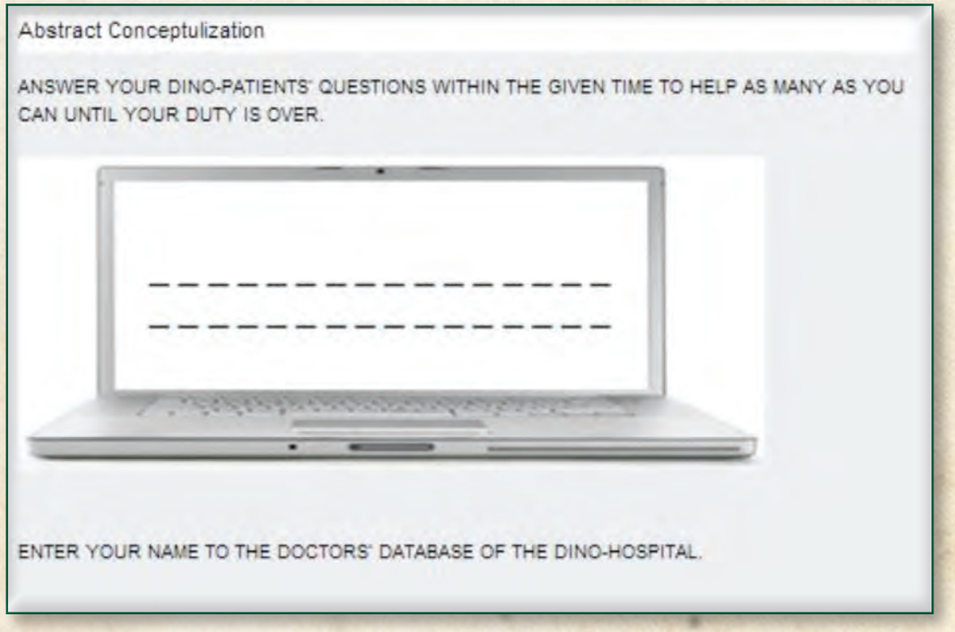

Figure 9.4: *Engagement Phase - Abstract Conceptualization*

Here is where the main part of the open educational pathway commences. This and the following steps are questions that need to be answered by the participant(s), who should look carefully at the (physical or virtual) exhibits to extract the proper answers.

Figure 9.5: *Game Phase - Active Experimentation (1)*

Figure 9.6: *Game Phase - Active Experimentation (2)*

Taking on the role of a doctor for dinosaurs, the participant is asked to cure a number of sick animals, who supposedly come in the hospital suffering from various syndromes.

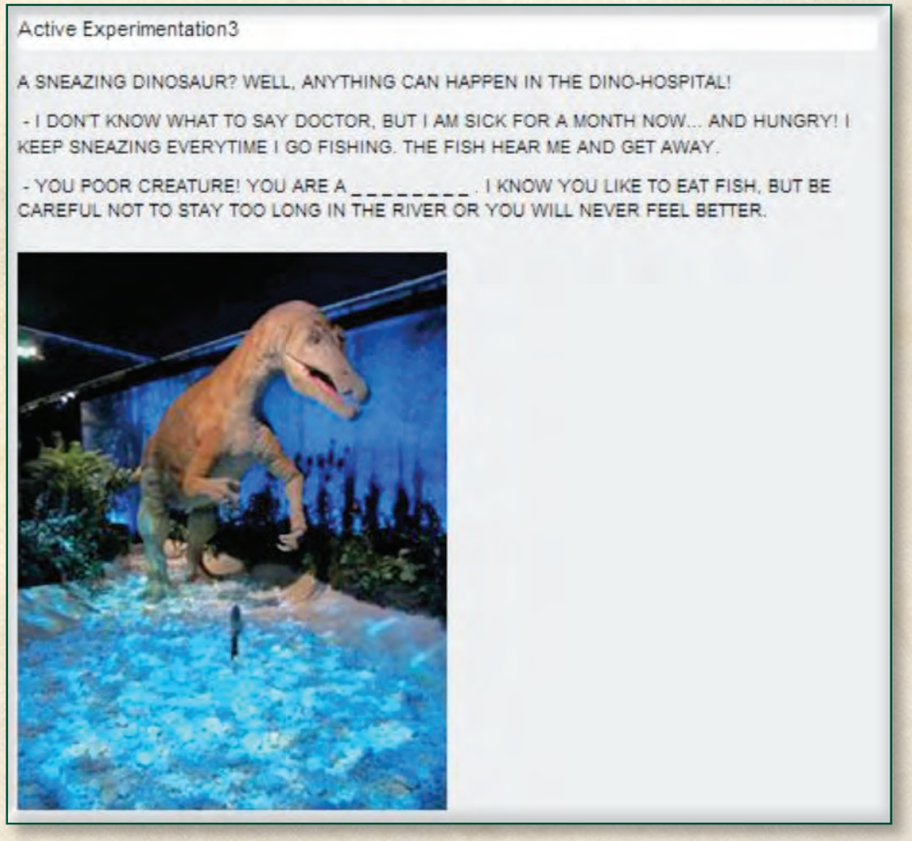

Figure 9.7: *Game Phase - Active Experimentation (3)*

In order to do so, the participant has to carefully examine the offered clues to understand the dinosaur species that is requesting his/her assistance and its individual characteristics, and treat it accordingly.

Active Experimentation4

-DOCTOR HELP ME, I AM DESPERATE! I BROKE A TOOTH AND NOW I WON'T BE ABLE TO CHEW MY FAVORITE VEGETABLES! CAN YOU REPLACE IT WITH A FAKE ONE?

- NO NEED, MY DEAR FRIEND! REMEMBER, YOU HAVE HUNDRENDS OF TEETH INSIDE YOUR CHEEKS TO REPLACE THE ONES YOU BREAK.

- OF COURSE... I FORGOT IT FOR A SECOND. BUT YOU ARE THE BEST DOCTOR, YOU IMMEDIATELY UNDERSTOOD I AM A_____

Figure 9.8: *Game Phase - Active Experimentation (4)*

Active Experimentation5

RING! INCOMING CALL ON YOUR CELL PHONE - MRS. IGUANODON CALLING

- DOCTOR AS YOU KNOW I HAVE ADOPTED A BABY DINOSAUR. EVERY TIME I FEED HER I HEAR A FUNNY NOISE FROM HER BELLY. IT SOUNDS JUST LIKE A MORTAR! IS IT SERIOUS?

- NOT AT ALL, MRS. IGUANODON. IT IS NORMAL, TWO ROCKS ARE IN YOUR BABY'S STOMACH TO HELP HER DIGEST HER FOOD. SEE, YOU HAVE ADOPTED A BABY _____ SHE MAY BE DIFFERENT, BUT THAT IS NOT BAD.

- I FEEL SO RELIEVED! THANK YOU DOCTOR!

Figure 9.9: *Game Phase - Active Experimentation (5)*

Active Experimentation6

- DOCTOR, I HAVE GAINED SOME WEIGHT. NOW IT IS DIFFICULT FOR ME TO RUN AS FAST AS I USED TO. CAN YOU GIVE ME AN ADVICE?

- MR. T-REX, YOU NEED TO CUT DOWN ON MEAT. YOU NEED TO EAT _ _ KILOS OF MEAT EVERY DAY. MAKE SURE YOU DON'T EAT ANY MORE THAN THAT AND THAT YOU EXERCISE. SOON, YOU WILL BE AS FIT AS YOU USED TO!

- ....OK.... IF I MUST....

Figure 9.10: *Game Phase - Active Experimentation (6)*

Active Experimentation7

- A BROKEN ARM? WHAT HAPPENED HERE?

- I MADE FUN OF MY CLASSMATE, DOCTOR, BECAUSE I CAN SEE 3D AND HE HAS TERRIBLE VISION. AND THEN HE HIT ME WITH HIS HEAVY TAIL.

- THIS IS UNACCEPTABLE BEHAVIOUR, YOUNG MAN. YOU SHOULD NOT MAKE FUN OF OTHERS, JUST BECAUSE YOU ARE A _ _ _ _ _ _ _ _ _ _ _ _ .

Figure 9.11: *Game Phase - Active Experimentation (7)*

Active Experimentation8

-SEE, EACH HAS THEIR OWN GIFTS

THE _____ MAY NOT SEE AS WELL AS YOU DO, BUT HE IS VERY STRONG AND CAN SURELY DEFEND HIMSELF. YOU TWO SHOULD NOT FIGHT, DO YOU HEAR ME? YOU CAN ALWAYS DISCUSS YOUR PROBLEMS AND FIND SOLUTIONS.

Figure 9.12: *Game Phase - Active Experimentation (8)*

Have answered the eight questions of the game, thus curing sick dinosaurs and prevailing extinction of their species, participants are now declared as 'ultimate dino-doctors' and can pass by the museum shop to collect their prize: a badge with their title.

Reflection – COMMUNICATE EXPLANATION

END OF YOUR SHIFT! YOU DID WELL HELPING SICK DINOSAURS.

THE DIRECTOR OF THE DINO-HOSPITAL IS VERY PROUD OF YOU! YOU ARE NOW OFFICIALLY THE ULTIMATE DINO DOCTOR.

PLEASE PASS BY THE MUSEUM SHOP TO RECEIVE YOUR BADGE.

Figure 9.13: *Reflection - Communicate Explanation*

10. References

- Guidelines for the Design of Technology-Enhanced Educational Pathways, Educational Pathway Authoring Tool User Manual. Open Science Resources project.
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Water, Water Everywhere:
The Open Ocean
You probably know the ocean from a beach or a boat. Yet, most of it is far from shore and far from sight.
THE OCEAN SURFACE
?
Hiding