

# Rules for Gates of Horus

by Jeffrey Jacobson

Gates of Horus is an electronic learning game, based on the Virtual Egyptian Temple<sup>1</sup>. For more information on it, visit <http://publicvr.org> -> Projects -> Gates of Horus. The following are the basic interaction rules.

In the game, the student navigates the temple using a standard three-button mouse. The view is “first person,” meaning that the monitor is like a window looking into the virtual world, somewhat as though the physical viewer were actually in the virtual space. The student can rotate the view by moving the mouse, and move forward and backward by pressing the left and right mouse buttons. When the student presses the middle button (the mouse wheel), the game switches to “selection mode,” where the mouse controls the cursor shown in Figure 1 and more clearly in Figure 4. The student can select an active object by moving the cursor over it as seen from the current view. The targeting is three-dimensional in the sense that the student can select the same object from many directions. For example, Figure 4 shows a hawk statue in front of the temple as seen from two directions, with the targeting cursor over it. In this image the cursor is green, indicating that it is over an active object. To return to navigation mode, the student can press the mouse wheel again.



**Figure 1.** Hawk statue and the cursor.

Each time the student clicks on an “active” feature of the temple, such as the hawk, the priest explains its nature and meaning. When the student clicks on the priest, he asks the student a question based on what he has already explained. To progress from one area of the temple to the next, the student must answer all of the priest’s questions for that area. The questions are based entirely on what the priest has to say about that area’s active features. When the student correctly answers all of these questions, the Gateway to the next area the Temple opens, and the student explores that area and learns about it in the same way. The

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<sup>1</sup> Jeffrey Jacobson and Lynn Holden, “The Virtual Egyptian Temple,” (paper presented at the World Conference on Educational Media, Hypermedia and Telecommunications, Montreal, Canada, June-July, 2005) .

<http://publicvr.org/downloads/Jacobson2005e.pdf>

student “wins” the game when s/he answers all of the questions from the priest in the inner Sanctuary, causing the divine image of the God to speak and bring the blessings of heaven to the land of Egypt.

**Definitions:**

1. The temple has four major *areas*, the Pylon (exterior), Courtyard, Hypostyle Hall, and Sanctuary.
2. An *active object* is a part of the temple itself, a statue, or some other thing in the temple, which the student can click on to elicit a response from the game.
3. An *explanation* is a short voice recording (usually 10 to 25 seconds) which explains the meaning of some active object. The explanation names the object, introduces its basic meaning, and often describes where it fits into the overall themes of the temple and Egyptian religious life.

**Basic Rules:**

1. When the student first enters an area, s/he triggers an introductory recording, **only once**, by (virtually) walking onto the area associated with it. Entering the area again will not trigger the introductory recording. However, the student may trigger the introductory recording at any time by clicking on the ground just inside the entrance to the area. That part is indicated by the smoke ring effect.
2. When the student clicks on an active object, the student hears a short voice recording which explains the object’s meaning. The priest does not move, but the voice is thematically his.
3. Each time the student clicks on the priest, s/he hears a question associated with features which the student has *already selected* or with the introductory recording. For example, suppose a student enters an area, hears the introductory recording, clicks on two features in an area, hearing each explanation, and finally clicks on the priest to elicit a question. The priest randomly selects a question regarding only those two features or the introductory recording.
4. The student may answer a question with a single click of the right mouse button for “No” or two clicks for “Yes.”
5. Once a student has answered a question correctly, the priest will never ask it again.
6. If the student has correctly answered all questions associated with previously selected objects *and* the introductory recording, the priest prompts the student to click on some other feature.
7. When all questions for all objects in an area are answered correctly, the priest asks a set of “goal” questions. When the student has answered those correctly, the priest congratulates the user, and the gate to the next area opens.
8. The student enters the next area and answers all the questions there, in exactly the same process described above. This happens a total of four times, once each for the Pylon, Courtyard, Hypostyle Hall, and Sanctuary.
9. When the student successfully answers all questions for the Sanctuary, the divine image of the temple god will “speak” in a recorded congratulation for winning the game.

**Rules on Question Order:**

10. When clicked, the priest always tries (randomly) to ask a question associated with the same object as the previous question, except where it conflicts with the next rule.
11. The priest never asks the same question twice in succession unless it is the last available question. (This condition occurs when the student has correctly answered all but one of the

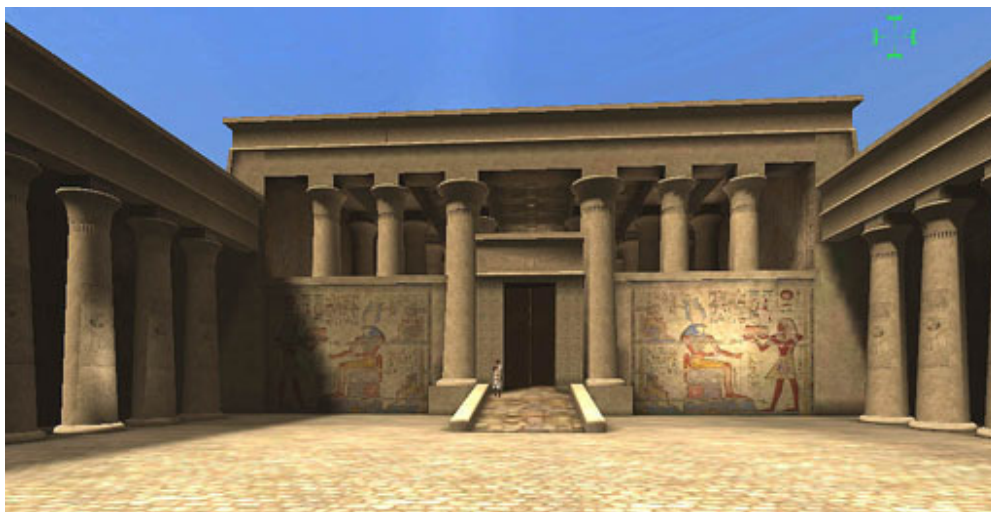
questions for all of the objects s/he has previously selected, including questions from the introductory recording OR from the final set of questions associated with each area.)

12. If the student gives a *second* wrong answer for an object *since the time that object's recording played*, the student's viewpoint automatically moves to center on that feature and the student hears the explanation again.

**Example:**

The student enters the courtyard through the main gate of the temple. When s/he (virtually) crosses the threshold s/he hears the voice of the priest give the introductory speech for that area, "The Courtyard is an open and undivided space, made for large religious celebrations and rituals. Everyone comes to these events dressed in the same simple garments. They do this to show how all people are equal and humble before the gods."

Next, the student goes further into the courtyard, and clicks on the highlighted mural which shows Pharaoh making offerings to the enthroned god. S/he hears, "On behalf of all Egyptians, the King gives thanks by offering 'every good thing' to the god, who is their creator. In return, he blesses the King, the land of Egypt and its entire people with life and prosperity forever."



**Figure 2:** The Courtyard

The student could click on other active objects, but instead chooses to click on the priest. The game could now ask the student questions regarding the mural or the introductory speech. It randomly selects the set of two questions regarding the mural. Of those it randomly selects this question, which the student hears as, "Do the gods give the King something in return for his offerings?"

The student answers incorrectly with a "no" by single-clicking the right mouse button, and the priest says "incorrect" or a phrase with similar meaning. The student clicks on the priest again, so the priest asks, "Does Pharaoh represent the people's interest before the gods?" This is the other question associated with the mural. The student answers correctly with a "yes" by double-clicking the right mouse button. The priest congratulates the student and will never ask this question again.

If the student clicks on the priest again, he asks the first question again, "Do the gods give the King something in return for his offerings?". If the student gives the correct answer, "yes", the priest

congratulates the student with a phrase like “You are right!” and never ask the question again. However, if the student gives an answer of “no” a second time, the priest indicates the answer is wrong, and the view automatically focuses on the mural, filling the screen. The student hears the explanation of the mural again, after which s/he is free to navigate, click on more objects, or click on the priest.

In the study, students showed much difference in how they chose to click on active objects and answer questions from the priest. Some clicked on all the objects, listened to all of the explanations, and then attempted to answer all of the priest’s questions in one session. Other students preferred to click on the priest immediately after hearing each explanation, while most students pursued a middle strategy.

*Gates of Horus* is available for download at <http://publicvr.org>. The code is open source and freeware and is based on two of our other freeware packages, CaveUT and VRGL<sup>2</sup>. They all depend upon a commercial game, UT2004 by Epic Games, which is currently out of print but still widely available at low cost. This implementation is only a prototype, but code is stable enough for anyone who wants to work with it, and it comes with logging capability that enables you to build your own study around it. Changing the content requires editing the actual code, but that is a simple operation a student programmer could handle.

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<sup>2</sup> Jeffrey Jacobson “Game Engine Virtual Reality With CaveUT,” *IEEE Computer* (2005) 38  
<http://publicvr.org/IndexDownloads/Jacobson2005i.html>