SETI AT CLASSROOM: THE STORY OF HUMANITY TOLD WITH GEOLOGICAL AND ARCHEOLOGICAL OBJECTS. H. Hargitai[1], A. Borel[2, 3], P. Csippán[3], P. Bodor[4], F. Hammer[5], R. Páva[6], B. Sterk[7], [1] ELTE Eötvös Loránd University BTK Media Department, 1088 Budapest, Múzeum krt. 6-8. hargitai.henrik@btk.elte.hu, [2] Histoire Naturelle de l'Homme Préhistorique (HNHP), Muséum national d'histoire naturelle, CNRS, UPVD, 1 Rue René Panhard, 75013 Paris, France antony.borel@mnhn.fr, [3] Institute of Archeological Sciences, Faculty of Humanities, ELTE Eötvös Loránd University, Múzeum krt. 4/B, 1088 Budapest, Hungary, csippan79@gmail.com, [4] ELTE Eötvös Loránd University TáTK Department of Sociology 1117 Budapest, Pázmány Péter sétány 1/A, bodor.peter@tatk.elte.hu, [5] ELTE Eötvös Loránd University BTK Media Department 1088 Budapest, Múzeum krt. 6-8. hammer.ferenc@btk.elte.hu, [6] Intercultural psychologist and pedagogist / independent researcher; Germany rita.pava@gmail.com, [7] METU Budapest Metropolitan University, Animation and Media Design Department,1148 Budapest Nagy Lajos király útja 1-9., barbara.sterk@gmail.com

Introduction. We have created a classroom exercise in which students explore a message designed to be found by non-human intelligence as a part of SETI Institute's Library of the Great Silence project [1]. Information exchange projects with non-human intelligence can be divided into two large groups: searching for technosignatures (e.g., SETI) and creating/sending messages via either radio, or as objects (e.g., METI, the Voyager Record etc.). Our project aimed to designe an object-based message that reflects the subjective human experience. The resulting objects were used in classroom presentations to explain to separate interpretation from observation; work on unlearning taken-for-granted cultural contexts; and recreate a new interpretation from an alien, different, i.e., external viewpoint. The task may be impossible without acknowledging the nature and taking of that "external viewpoint".

The object for interspecies communication. In the project, we created several objects and tested one in several classroom settings. The complex *„Box of Humanity" (Figs. 1-4)* was made of cardboard and contained several organic (bone, wood) and inorganic objects (rocks, sand, water). Several containers were closed in each other. Students had to start interacting with the box to find out how it "works" and reverse engineer the original worldview of the creators of the box from its content and arrangement.

Figure 1. The Box of Humanity, prototype

Figure 2. The contents of the outer compartment (wood, stone, bone) Among the objects, we find rounded river gravel and fractured rock, including limestone of biological origin. The stone that can be used as a knife (to open the box) can be e.g., flint.

Figure 3. The middle compartment. It contains sand (from the Danube). The cover of the compartment can be removed with a twisting movement.

Figure 4. The innermost compartment. It contains water; the material is transparent glass, sealed with a cork and wax. The contents can only be accessed by

cracking open the vial. The water should not be chemically clean.

Tests. The initial test activities with the box were carried out in two environments: one in daylight and another in complete darkness, to simulate a potential alien perspective. The box was tested in elementary school (class 5 at Palánta Elementary School, Pilisvörösvár, Hungary), at the university (ELTE University, Faculty of Humanities), and in adult groups (during the European Researcher's Night of 2022).

Storytelling with objects. The objects included in the box can be interpreted in many ways, but all point to the story of humanity on planet Earth. The story is told with rocks and further objects artefacts that are structured in several levels.

One level is the selection of objects: the "reader" of the box should find out why those particular rocks and organic objects are included, and on a second level, they should find out why they are organized in a specific way: their hierarchy or multilevel enclosure. During the tests, the different age groups responded differently, giving different interpretations, perhaps because they noted different characteristics of the objects. For example, one university group pointed out that all rocks in the box had different colors. What does this "message" say? The elementary school group indicated that in addition to the already contained limestone, salt might be added to the rock collection (to tell the story of oceans), and the water sample may damage the glass container if it is taken to the Moon. Rounded pebbles and fluvial sand were key elements in telling the story of an originally river valley civilization. After interacting with the Box of Humanity, the next task for the students could be to create their versions of the story, using rocks and other natural objects that they collect, and organizing them in a way they develop. It could be a game between several groups, where one is the creator and the others are the readers, considering that the reader may be living on another (type of) planet.

Discussion. The experiment was originally designed to start a discussion about intercultural awareness [2]; and our embeddedness into cultural or genetically driven human universals and contexts. However, the *Box of Humanity* unexpectedly provided a new method of initiating storytelling, mainly using geological objects. As a tool in the education of geosciences, and in particular planetary sciences, such experiments may trigger the children's creativity. It needs some base knowledge of rocks (identification, collection) commonly found on Earth and other planets (to provide a common ground for the story) and a creative addition of organic objects or archeological objects (in the form of modified geological or organic objects), and a structure that helps the understanding of the story - in our case: enclosed boxes that provide an order of access, which in turn can be interpreted as a hierarchy of significance, or a chronological order (suggested by the order of accessing the objects), and so on. The activity also helps develop the students' observational skills: which properties of the objects they note individually and how individual observations add together in a group.

Conclusion. This geo-game could be a simple, cost-free new method of teaching planetary and geoscience with storytelling at the same time and/or to approach and discuss concepts such as empathy, tolerance or (shared) perception.

It is built around a SETI setting, providing a new tool for complex, project-based education.

Additionally to the present-day use, since the method uses durable natural objects, it could help create location-based messages for future visitors of non-human intelligence and can be used in projects such as the Library of the Great Silence [1].

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References: [1] Keats, J. (2022) The Library of The Great Silence, SETI Institute. https://www.seti.org/library-great-silence [2] Baker, W (2012) ELT Journal, 66 (1), 62-70. doi:10.1093/elt/ccr017