Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Earth on the Brink**

**Scenario:** The year is 2050, Earth’s resources are depleted, and extinction of species is rampant. Although some people are preparing for relocation to outer space settlements, there are those who will remain behind. How can they use scientific data (environmental, evolutionary, and genetic) to ensure continued life on Earth?

**Task 1:** 1. Watch Living on Mars <https://ed.ted.com/lessons/could-we-actually-live-on-mars-mari-foroutan#watch> and answer the following questions.

A. How tall is the largest volcano in our solar system?

B. What is the major natural hazard on Mars?

C. Dust storms last longer on Mars than on Earth. What is the most important reason for this?

# 2. Watch the second video: Your kids might live on Mars. Here's how they'll survive | Stephen Petranek

https://www.youtube.com/watch?v=t9c7aheZxls

A. What do we need to survive on Mars?

B. When does NASA believe they can get humans on Mars? Do you think this will happen? Explain your answer.

C. What is MOXIE?

D. Why do scientists believe the greenhouse effect will help humans survive on Earth?

**Discussion Questions**: Answer while watching the videos and discussing with your table groups (after the video)

1. We consider water fundamental to life, so scientists think that searching for evidence of water on Mars can bring us closer to finding evidence of life there.

A. But could other elements be more fundamental to life on Mars?

B. Could it be possible that we are totally wrong in our expectations about life on other planets?

C. What other things do you think we should consider in our future investigations?

2. Mars One is a mission with the goal of establishing a permanent human settlement on Mars. The project managers plan to land the first humans on Mars and establish a permanent human colony there by 2027. They cannot come back to Earth. Many people applied to go for this strange mission. The majority of the applicants are under 36 and well-educated.

A. What do you think about them? Do you think they are normal people with normal lives?

B. What is the first and last problem that they may challenge during this life?

C. What do you do if planners send you to this mission?

3. Can you imagine Earth and Mars 100 years from today? Imagine we are in 3015. Do you think Mars and Earth are similar to what they are today?

**Task 2 (summative):** You are the people staying behind on Earth. You must form teams (table partners) and do some research, then propose a project to improve the fragile ecosystem and depleting resources on Earth.

**Focus Question:** Is Earth experiencing a 6th mass extinction?

1. With your partners decide which possible cause of extinction to research and answer the focus question. You may not have the same topic as another group in class, so first come first serve. Tell Ms. Murphy when you decide.

-Pollution -habitat loss -introduction of invasive species

-Increased carbon emissions -climate change -ocean acidification

-over population -possibility of an asteroid hitting Earth

State your possible cause here: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. With your table partners come up with a possible solution for your problem. Summarize the information, possible solution and constraints on a poster presentation (minimum one paragraph each).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task  Name: | Who is responsible for the task | Check when completed | Points Possible | Points Earned |
| Question is clearly identified with background information |  |  | 4 |  |
| Cause of the problem is researched and explained clearly. |  |  | 5 |  |
| Possible Solution is presented |  |  | 5 |  |
| Annotated Model with color, labels, and descriptions. |  |  | 6 |  |
| On task, respectful and professional | All |  | 5 |  |
| Overall grade |  |  | 25 |  |

Resources

<https://www.livescience.com/51281-sixth-mass-extinction-is-here.html>

<https://www.washingtonpost.com/news/morning-mix/wp/2015/06/22/the-earth-is-on-the-brink-of-a-sixth-mass-extinction-scientists-say-and-its-humans-fault/?utm_term=.db533d7b84a2>

<http://www.newsweek.com/earth-heading-another-mass-extinction-scientists-warn-252835>