Script

Main Menu

The year is 2389, one and a half centuries since the establishment of the first planetary colony that prompted the mass emigration of humans, and one century since the wide implementation of transhumanist AI. Three months ago, the apocalypse happened on Earth.

Born and raised on the colony, you had never been to Earth. Now, hosting a fully cyborg, self-sufficient body, you’ve been sent on a mission to the barren home planet for excavations. Lots of treasure lying beneath its surface, you are told—what will you find?

Land your spaceship and dig into Earth to learn about what’s geologically beneath its ground.

Transition

The flight to Earth was long, draining almost all your resources. Also, due to the space confinement on your personal starship, you were only able to bring an Old Rusty Drill to start. But not to worry. Here on Earth, you can dig for all the resources you need to tinker it into a better drill. Check out your inventory and upgrade options in the Factory.

Are you ready to dig in? Navigate to the World Map to find a place to start.

World Map

This is a map of Earth. You’ve seen plenty of maps like this in your textbooks, and you even recognize where each continent is. The [display tectonics] button toggles on and off a display of the borders of Earth’s tectonic plates, should you find that helpful.

Click on the [task] button to view your current task. Click on a drill site on the map to enter that location and begin drilling.

Factory

Current mining strength: this stat represents how efficient your drill is. Each rock you mine has a toughness stat. The higher your mining strength, the faster you can overcome toughness and progress your mining expedition. Pay attention to which rocks you mine—some types of rocks are harder than others.

(Note: mention in research on the different toughness levels of the three types of rocks)

Current reach: this stat represents the reach of your drill, or how far you can float your cursor away from your avatar before you can no longer perform drilling. A higher reach can save you a lot of work.

Resource Inventory: this is an inventory of your resources. It will automatically update itself as you drill.

Levels

Navigation:

Move: left & Right arrow

Jump: up arrow

Mine: left click on the block with your cursor and hold to mine

Return to world map: move your avatar back to the starship

Research Notes

Initial (displayed before player chooses the location for level 1)

You know there are three main classes of rocks that form the Earth’s crust.

Igneous rocks

**Igneous rocks** form when magma from inside the Earth’s upper mantle moves toward the surface (also known as **intrusive**) or when magma is forced above the Earth’s surface as lava and ash by a volcano (also known as **extrusive**). Near the Earth’s surface, magma cools and crystallizes into tough, frozen melts with little texture or layering.

Igneous rocks can be furthered divided into felsic rocks which form the continental crust and contain quartz and feldspar (silicate minerals and lighter elements) and mafic igneous rocks which form the oceanic crust and contain magnesium and iron.

Cit <https://en.wikipedia.org/wiki/Felsic>

<https://education.nationalgeographic.org/resource/igneous-rocks/#>

<https://www.thoughtco.com/rock-identification-tables-1441174>

Sedimentary Rocks

**Sedimentary rock** are hardened sediment with sandy or clay-like layers. They are formed from deposits of pre-existing rocks or pieces of once-living organism that accumulate on the Earth's surface. If sediment is buried deeply, it becomes compacted and cemented, forming sedimentary rock.

Most sediments and sedimentary rocks are found at the bottom or near the edges of bodies of water like lakes, rivers, and oceans, especially near tectonic plate boundaries. Bodies of water help to weather existing rock, creating sediment particles.

Cit: <https://education.nationalgeographic.org/resource/sedimentary-rock/#>

<https://www.msnucleus.org/membership/html/k-6/rc/rocks/6/rcr6_1a.html#:~:text=There%20are%20many%20environments%20associated,occur%20at%20convergent%20plate%20boundaries>.

Metamorphic Rocks

**Metamorphic rocks** start out as some other type of rock, but have been substantially changed from their original igneous or sedimentary forms. Metamorphic rocks form when rocks are subjected to high heat, high pressure, hot mineral-rich fluids or, more commonly, some combination of these factors.

Metamorphic rocks in mountain ranges where high pressures squeezed the rocks together and they piled up to form ranges such as the Himalayas, Alps, and the Rocky Mountains. Metamorphic rocks are forming deep in the core of these mountain ranges.

Cit:

<https://www.usgs.gov/faqs/what-are-metamorphic-rocks#:~:text=Metamorphic%20rocks%20started%20out%20as,some%20combination%20of%20these%20factors>.

<http://ratw.asu.edu/aboutrocks_metamorphic.html#:~:text=We%20often%20find%20metamorphic%20rocks,core%20of%20these%20mountain%20ranges>.

Updated (displayed before player chooses the location for level 2)

**Think before you read**

**What type of rock do you expect fossils to be found in? Why?**

Fossils are found in sedimentary rocks because they occur at the right temperatures and pressures to preserved the fossilized parts of the dead plants and animals that form the sediments. Mudstone, shale, and limestone are examples of sedimentary rock likely to contain fossils. As the layers of sediment build up on top of one another, they create a physical timeline.

**Think before you read**

**Along what type of tectonic plate boundaries do you expect to find sedimentary rocks?**

Large mountains are worn down into sediments. As wind and water carry the sediments downhill, they become deposited in thick layers and eventually will form new sedimentary rock. The thickest accumulations of sedimentary rocks are associated with **convergent plate boundaries**, where volcanoes and mountain ranges form.

**Take a guess**

**Where would you find metal ores?**

Metal ores are caught between the cap rock (shale normally) and the limestone. The ore bodies prefer the areas between these rock types because it give them the proper reducing environment and the proper chemistry to precipitate out massive sulfides.

<https://www.colorado.edu/cumuseum/programs/schools-and-groups/fossils-classroom/materials-and-resources/geology-background#:~:text=Mudstone%2C%20shale%2C%20and%20limestone%20are,as%20they%20formed%2C%20are%20deepest>.

Warning (displayed as player enters the interface for level 2 or maybe after)

Attention!

Due to your mining of fossil fuels, an oil spill has occurred near your previous drill site. Additionally, the environment around that area has suffered pollution from the usage of fossil fuels. Please return to that location at your first convenience to address these issues.

Cits

<https://volcano.oregonstate.edu/rock-lesson-works#:~:text=Under%20the%20thick%20layers%20of,the%20surface%20of%20the%20earth>.

<https://www.reddit.com/r/rockhounds/comments/trvso8/how_to_identify_where_to_dig/>

Levels

Level 1: Upgrade

Task:

Ready for your first task?

You would like to familiarize yourself with the mining process and collect enough resources to upgrade your Rusty Old Drill to a Fiberglass Drill. You will need 25000 silica and 1000 alumina to do so. As you dig, resources you gain from your mining will be automatically logged into your Resources inventory.

Click on the [research notes] icon to learn more about where you can find silica and alumina.

Level 2: Drill for metal and fossil

Congratulations on completing your previous task. You have received a new request from the archaeologists and material scientists back on the colony.

To learn about Earth’s history, the archaeologists would like you to obtain fossils recording the footprints of the creatures that lived here. To support the production of steel, the material scientists have asked you to acquire any manganese ore you can find.

Click on the [research notes] icon to learn more about where you might find fossils and ore.

Warning (displayed as player enters the interface for level 2 or maybe after)

Attention!

Due to your mining of fossil fuels, an oil spill has occurred near your previous drill site. Additionally, the environment around that area has suffered pollution from the usage of fossil fuels. Please return to that location at your first convenience to address these issues.

Level composition

Continental crust

Dirt into granite

River bed

Clay into shale

Oceanic

Sand into basalt

Level 2

Convergent plate boundary

A drawing of a volcano

Description automatically generated

Different Rock Types

Granite

Congratulations! You have found granite.

Composition: **Feldspar**, or silicate minerals enriched in the lighter elements such as silicon, oxygen, aluminum, sodium, and potassium. Quartz. Minor mica, amphibole or pyroxene.

Silica: +2025

Alumina: +324

Potassium oxide: +108

Soda: +108

Lime: +27

Iron: +54

Magnesia: +27

Titanium: +27

Granite is the most widespread of igneous rocks, underlying much of the continental crust.  Granite is a felsic, intrusive igneous rock, which forms from magma that flows and solidifies underground, where magma cools slowly.  Eventually, the overlying rocks are removed, exposing the granite.

Answer these questions and note your findings

What color is granite? Light or dark?

What is the texture of its grains, coarse or fine?

What is the toughness of granite? Remember, it’s an igneous rock.

What other characteristics do you observe?

Additional info: Granites usually have a coarse texture (individual minerals are visible without magnification), because the magma cools slowly underground, allowing larger crystal growth.

<https://mineralseducationcoalition.org/minerals-database/granite/>

Limestone

Toughness: Soft

A table with black text

Description automatically generated