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## Biosphere activity worksheet

Quick summary: Students design their own self-sustaining biosphere model and demonstrate naturally occurring interactions. Students will keep a scientific journal about their research project to record their planning, their background research, how their ideas develop, strategies and possible solutions to the identified problems, the resources accessed, and the findings and evaluations from their survey. This lesson is designed to be taught out. It contains all the tools needed for students to reap the benefits of being outdoors while learning the results of the Australian curriculum. By spending time outdoors and connecting to nature, students are more likely to take care of and preserve nature as adults. Learning objectives: Students understand the basics of the biosphere, including some of its components and function. Students recognize that human behavior can negatively affect the health of the biosphere and what actions they can take to preserve different elements of the biosphere. Students recognize the mental, physical and academic benefits of completing outside classroom activities. 21st Century Skills: Mapping the Australian Curriculum Year 10 Science: Global systems, including the carbon cycle, are based on interactions involving the biosphere, lithosphere, hydrosphere and atmosphere (ACSSU189) Formulation of scientifically investigated questions or hypotheses (AC SIS198) Plan, selection and use of appropriate types of investigations, including field work and laboratory experimentation, to collect reliable data; risk assessment and addressing the ethical issues associated with these methods (AC SIS199) Assessment of conclusions, including identification of sources of uncertainty and possible alternative explanations, and description of specific ways of improving data quality (AC SIS205) Programme results: SC5-12ES, SC5-4WS, SC5-5WS, SC5-6WS, SC5-7WS. General capabilities: Critical and creative thinking. Inter-curriculum priority: Sustainability OI.1., OI.2. Relevant Parts of year 10 Scientific Achievement Standards: Students describe and analyze interactions and cycles inside and between Earth's spheres. They develop questions and hypotheses and independently design and improve appropriate investigative methods, including fieldwork and laboratory experiments. When analysing data, selecting evidence and drawing conclusions, students identify alternative explanations for findings and explain any sources of uncertainty. Subject: Outdoor Learning, Climate Change, Biodiversity. Work unit: Outdoor learning unit. Time needed: 60 minutes (plus 10 minutes each day for a week to observe and record in the biosphere, plus 10 minutes for reflection at completion) Teacher's scaffold level: Environment – facilitating discussion, directing students into activity, reminding students of outdoor learning rules. Required Resources: Student Student – one copy per student OR computers/tablets to access the online worksheet. Printed copies of the Rake Worksheet – Biosphere (one for each pair of students). Each student will have to bring home a large jar of glass or fish tank, pond water, aquatic plants, macro-invertebrates, soil, moss, algae, terrestrial invertebrates, a small fish (optional), and a sea shell. Students will also need: pH test kit, thermometers, hanging film (to cover the top of the biosphere), duct tape, pens and pencils. Suggested questions and device for creating the video log. Biosphere Experiment Rating Heading. Digital learning opportunities: Digital sharing capabilities. Keywords: Ecosystem, biotic, abiotic, biosphere, lithosphere, atmosphere, hydrosphere, water cycle, closed system, interactions, habitat, ecological niche, outdoor learning. Safety: Ask students to review the Class Safety Code for working with live animals. Cool Australia would like to thank The Albert George & Nancy Caroline Youngman Trust – managed by Equity Trustees. Cool Australia curriculum team continually reviews and refines our resources to be in line with changes to the Australian curriculum. This lesson contains affiliate links to products that we have used and recommend personally. At no cost to you, I make a fee for purchases made through links or advertisements. These fees help pay the site's costs and allow it to remain free for anyone who wants to use it. Objectives: Students will learn about the Earth's biosphere. Students will be able to define the terms of the biosphere, the bioma and the ecosystem. Students will be able to explain the characteristics of the Earth's biosphere. Questions that include the goal: Think about the world around the uima. What are some of the things you find in nature? You think you can find these things on other planets? Prepare the student: Activate previous knowledge. will the students' previous knowledge be enabled? Warm up by asking students: What do you know about the Earth's biosphere? Common basic state standards: CCS. ELA-ALFABETIZATION. SL.2.1 CCSS. ELA-ALFABETIZATION. SL.2.1 B CCSS. ELA-ALFABETIZATION. SL.2.4 CCSS. ELA-ALFABETIZATION. W.2.2 CCSS. ELA-ALFABETIZATION. W.3.2 CCSS. ELA-ALFABETIZATION. W.3.2 B CCSS. ELA-ALFABETIZATION. SL.3.1 CCSS. ELA-ALFABETIZATION. SL.3.4 Free materials and resources to download for this lesson: \*\* Before class starts, fold up Biome Cards and put them in the paper bag. Place the paper bag aside; it will be used during the activity\*\* \*\*Students must have access to sources of information. If computers are available for use, allow students to search for information Computer. If not, allow students to use encyclopedias or other books. Before the lesson begins, the teacher may ask students to choose a biome. The teacher could then provide fact sheets about Biomes Chosen \*\* Pencils / Markers / Earth's Colored Pencils Biosphere Input Assessment: What is the most important content in this lesson? To achieve the objective of this lesson, students need to understand: the definition of the terms biosphere, bioma and ecosystem. Characteristics of the Earth's biosphere. Biomes and ecosystems found on Earth. will learning this content be facilitated? The teacher will start the class by displaying the Video Biosphere-Video Learning-WizScience.com (Source: Video is about 2 1/2 minutes and discusses the Earth's biosphere. The teacher will also hand over the accompanying worksheet of the video. As students view the video, they'll fill in the blanks on their worksheet. After the video, the teacher should review the worksheet and discuss the content of the video. Then, the teacher will hand the Package worksheet To the Earth Biosphere If possible, project each page of the Earth Biosphere worksheet package onto the board using a projector or put a PowerPoint document and project in a document and project. After presenting the teacher, students will fill in the blankspaces on their worksheets. Worksheets should be reviewed in this order: What is the Biosphere?; Earth's Biomes; Earth's ecosystems. \*\* Not all of this information is included in students' worksheets. Use this guide when explaining each worksheet to students\*\* What is The Biosphere? Worksheet: Biosphere: regions of the Earth's surface, atmosphere and hydrosphere (or similar parts of other planets) occupied by living organisms (Dictionary Definition). Bio comes from the Greek word for life. The English geologist Eduard Seuss and the Russian physicist Vladimir I. Vernadsky developed the term biosphere. The biosphere is described as the living world. Scientists estimate that the biosphere is about 3.5 million years old. The early life forms that existed in the biosphere included prokaryotics – organisms that used the sun to undergo photosynthesis. As the atmosphere developed, new life forms emerged, including plants and animals. The biosphere overlaps the hydrosphere, lithosphere and atmosphere. The biosphere consists of humans, plants, animals and microbes/microorganisms. The biosphere extends high into the atmosphere (where you find birds and insects) and low into the ocean's hydrothermal vents (where you can find octopuses, crustaceans and molluscs). The biosphere is any place where you can find life. Scientists estimate that the biosphere is about 12,500 meters thick. The biosphere, from top to bottom, is about 12 kilometers (20 miles). All life there are between 500 kilometers (1,640 feet) under the ocean at 6 kilometers (3.75 feet) above the ocean. The sun is necessary to maintain life on Earth. Plants use the sun to which helps to produce carbon dioxide. On Earth, living beings are classified into biomes and ecosystems. Earth's Biomes Biome Worksheet: a region on Earth that shares the same climate, plants, and animals. Biomes are divided into terrestrial (terrestrial) biomes and water (aquatic) biomes on Earth, biomes include: Aquatic freshwater: not salty water; includes lakes, rivers, ponds, streams, and marshes. Freshwater wetlands: saturated land; swamps, marine marshes: ocean water; seawater; any reference to oceans/seas. Coral Reef: a coral formation found in the sea. Estuary: the mouth of a river; where fresh water meets salt water. Land tundra: extremely cold, vast, land without trees; in the Arctic, northern Europe, North America and Asia. Rainforest: Forest found in a tropical region where it is very wet and rainfall is common. Savanna: grassy plain, mainly flat, and has a few trees. Taiga: swampy coniferous forest: found near the tundra and steppes. Temperate forest: forest with mild climate; found in North America. Temperate pastures: pastures with mild climate. Alpine: high mountain region; very cold, snow, and wind. Chaparral: land with entangled shrubs and thorny bushes. Dessert: the area that is very hot and dry; has sand instead of grass. The desert can also refer to the cold, arctic regions where there is very little vegetation. Every location in the world is part of a biome. Earth Ecosystems: A biological community of organisms that interact and their physical environment (Dictionary Definition) Ecosystems are found in every biome/ all over the world. Ecosystems can be natural or artificial. Artificial ecosystems include agricultural land, urban areas (cities) and urban-industrial areas (metropolis). Ecosystems can become disturbed when a stranger enters. This stranger can disrupt the food chain, harm or eat organisms. Ecosystems can even be destroyed by natural disasters, such as fires, floods, weather events or man-made errors. Ecosystems can be divided into three scales: Micro: small ecosystem- pond, under a rock, in a tree. Messo: Medium-a-forest, a lake. Biome: a large ecosystem - rainforest, desert, ocean. Information sources: After the completion of the worksheet, students will participate an activity called Travelling through a Biome. Students will work in pairs. Professor Professor Go around to each group and have a student pick a card from the paper bag. Each student will receive a Biome Observation Sheet. Working together, the students will search the biome on their card. See the materials section on how research information should be obtained. Let students work for about 15 minutes. Repray and discuss when you finish your students. Closure: For closure, students will work on a worksheet activity called Earth Biosphere Assessment, where they will match a word in a word bank with its definition below. This can be used as a formal assessment or as an exercise to practice some of the vocabulary students learned during the lesson. Time/Application 3-5 minutes Guided Introduction Review class/agenda with students: 10 minutes Introductory activity: Video & Worksheet 15 minutes Earth Biosphere Worksheet Pack Give each student a pack of Earth Biosphere worksheets: Design each page of the worksheet on the board either through a projector or a PowerPoint presentation. Students will fill in the blanks on their worksheet, as the teacher presents. Present worksheets in this order: What is The Biosphere?; Earth's Biomes; Earth's ecosystems. 15 minutes of activity: Traveling through a Biome Have students break into pairs. Give each student a Biome Observation worksheet. Take the paper bag with the cards and go around to each group and have a student pick a card. Tell students to work with their partner to research their biome and fill out their worksheet. At the end of the 15 minutes, ask students to return to their offices and discuss the activity. Close/Assess 10 minutes For closure, students will work on a worksheet activity, where they will match a word in a word bank with its definition below. This can be used as a formal assessment or as an exercise to practice some of the vocabulary students learned during the lesson. If there is extra time, discuss any questions students may have. Individualized Training / Skeleton English Language Students will be supported in this lesson by grouping on heterogeneous data, verbal and written repetition of new vocabulary words, and multiple representation of vocabulary words through printed and video images. Video.

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