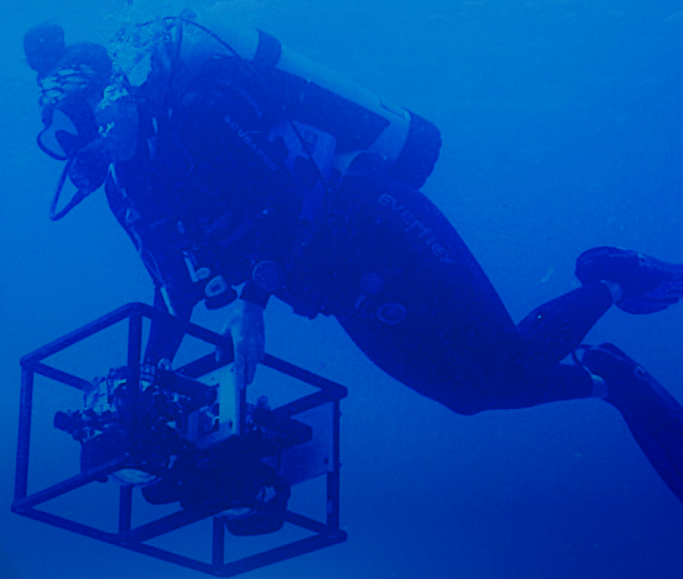


OCEANX



OCEANXPERIENCE



INSTRUCTIONAL SEQUENCE

OIL SPILL 3-5 (PRE-VISIT)

Science

GRADE LEVEL: 3-5



Never stop wondering.
Never stop imagining.™

Presented for Australian audience by:

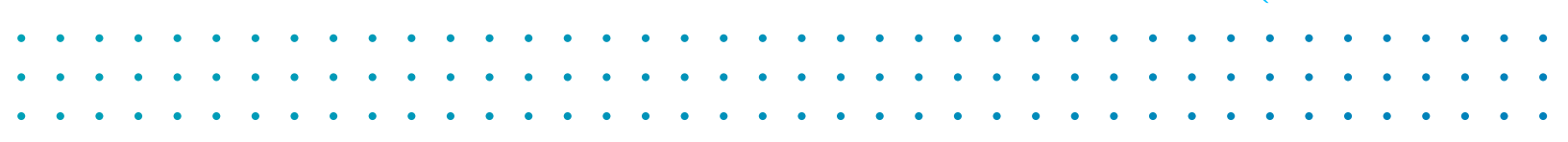


PURPOSE

How does the process of obtaining limited resources affect the environment?

EXHIBITION LEARNING OBJECTIVE

The students will conduct research and investigate how humans can change the environment through their consumption of natural resources.



YEAR 3

SCIENCE

Science Understanding – Earth and space sciences:

WA3SSUE1 - Soils, rocks and minerals are important Earth resources, and are used by humans and other living things in different and interconnected ways.

Science Inquiry Skills - Planning and conducting:

WA3SSIPL1 - Plan and conduct investigations, including elements of fair tests, and consider the material and equipment risks.

WA3SSIPL2 - Make and record observations, including formal measurements using familiar scaled instruments.

Science Inquiry Skills – Evaluating:

WA3SSIE1 - Compare findings with those of others, and to predictions; consider if investigations were fair; and identify questions for further investigation.

Science Inquiry Skills – Communicating:

WA3SSICM1 - Communicate ideas using scientific vocabulary.

Science Inquiry Skills – Collaborating and applying:

WA3SSICL1 - Use science knowledge to propose explanations for observed phenomena and solutions to problems.

YEAR 4

SCIENCE

Science Understanding – Chemical sciences:

WA4SSUC1 - Processed materials, including fibres, metals, glass and plastics, are made from raw materials, such as wool, ores, sand and oil, and have a range of physical properties that influence their use.

Science Inquiry Skills – Planning and conducting:

WA4SSIPL1 - Plan and conduct investigations, including elements of fair tests, and consider the material and equipment risks.

WA4SSIPL2 - Make and record observations, including formal measurements using familiar scaled instruments.

Science Inquiry Skills – Evaluating:

WA4SSIE1 - Compare findings with those of others, and to predictions; consider if investigations were fair; and identify questions for further investigation.

Science Inquiry Skills – Communicating:

WA4SSICM1 - Communicate ideas using scientific vocabulary.

Science Inquiry Skills – Collaborating and applying:

WA4SSICL1 - Use science knowledge to propose explanations for observed phenomena and solutions to problems.

YEAR 5

SCIENCE

Science Inquiry Skills - Planning and conducting:

WA5SSIPL1 - Use equipment to observe, measure and record data.

Science Inquiry Skills - Evaluating:

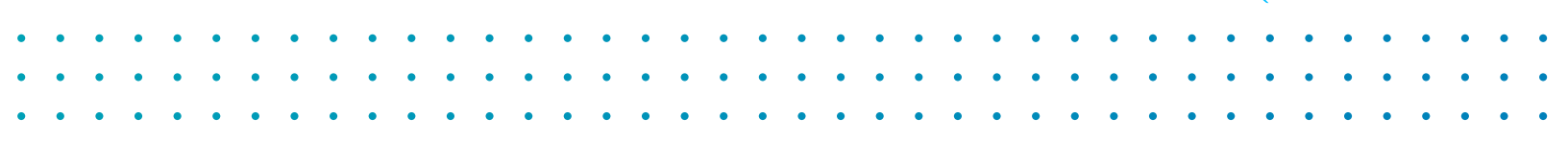
WA5SSIE1 - Compare findings with those of others, and to predictions; evaluate the fairness of an investigation and suggest improvements; and pose questions for further investigation.

Science Inquiry Skills - Communicating:

WA5SSICM1 - Communicate ideas in a variety of ways, including scientific reports with appropriate language features.

Science Inquiry Skills - Collaborating and applying:

WA5SSICL1 - Use science knowledge to develop considered responses to problems, at a local and global level, through investigation and research problems, at a local and global level, through investigation and research.



VOCABULARY

BIOME

A large region with certain climate conditions and inhabited by certain types of organisms.

NATURAL RESOURCE

Something found in nature that can be used by living things.

ECOLOGY

Study of the relationships between living things and their surroundings, or environment.

ONLINE RESOURCES

[HOW DOES OIL GET INTO THE OCEAN?](#)

[MAPPING CALIFORNIA'S OIL SPILL: AGING PIPES LINE THE COAST - THE NEW YORK TIMES](#)

[OIL PIPELINE DAMAGE MAY HAVE HAPPENED MONTHS BEFORE THE MASSIVE OIL SPILL: NPR](#)

[10 METHODS FOR OIL SPILL CLEANUP AT SEA](#)

LITERARY CONNECTIONS

[Oil Spill Article- Newsela.pdf](#)

MATERIALS

SCIENCE JOURNALS - 1 PER STUDENT

BUTCHER PAPER FOR RESPONSE GRAPH

SMALL STICKY NOTES (ALL ONE COLOR)

FOSSIL FUEL IMPACTS INVESTIGATION HANDOUT- 1 PER STUDENT

FOR INVESTIGATION 1- OIL IN THE OCEAN:

SCIENCE JOURNALS - 1 PER STUDENT

BUTCHER PAPER FOR RESPONSE GRAPH

1 LARGE CLEAR TUB

1 CLEAR SMALL

PLASTIC TUPPERWARE

PITCHER OF WATER

DYED VEGETABLE OIL

STRAW

PAPER TOWEL

SPOON

COTTON BALL

ROCKS

TURKEY BASTER

PLASTIC FISH/MARINE LIFE

1 PLASTIC CUP

ABOUT 126,000 GALLONS OF OIL SPILLED ALONG CALIF. COAST IN "POTENTIAL ECOLOGICAL DISASTER" ARTICLE - 1 PER STUDENT

LAPTOP WITH INTERNET ACCESS- 1 PER GROUP

ENGAGE

Show images of oil, oil spills, cars, gas etc.

- Ask students if they see a connection between all of the images shown.
- Possible student responses may include: Oil makes cars go. All of this has oil in some way.

Yes, all of these are related to oil, but I think we need to dive deeper to find out how!

Show students the [video](#)

After watching the video lead a class discussion on the pros/cons of using crude oil.

Teacher note: refer to the website list to help with this discussion and record all ideas in a class t-chart.

EXPLORE

Divide students into groups.

- Group materials: one large clear tub, one clear small plastic Tupperware, pitcher of water, dyed vegetable oil, straw, paper towel, spoon, cotton ball, rock, turkey baster, plastic fish and one plastic cup.
- Optional: Have all the materials inside the larger tub for easy distribution. Before this, mix food coloring with vegetable oil to create dark-colored oil.
- Once all groups have the necessary materials, prompt students to begin the investigation recording observations with their groups.
- Monitor and assist groups during this time.

OIL IN THE OCEAN INVESTIGATION:

Now that we have discussed some of the pros and cons of using oil in our daily lives, let's brainstorm some ways that oil can cause problems for our environment.

Prompt students to generate ideas, and record their ideas on a class list on the board

- Possible responses may include: the oil can make a big mess, the oil can pollute the water or land, the oil can spill in the ocean and hurt the animals.

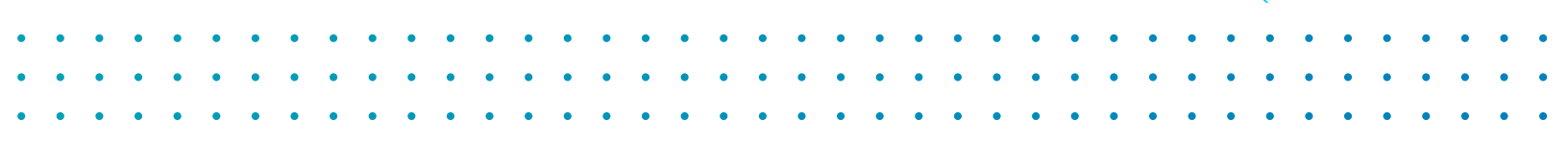
Yes, these are all issues that may arise from the use of crude oil. Let's read a little more about a very large problem that mining crude oil can cause, especially for a specific biome on our planet.

- Provide students with a copy of the article [Oil Disaster](#) to read.
- Once students have read the article prompt students to participate in a class discussion in which they add to the previously generated brainstorm of oil-caused issues within our environment.
- As we can see, oil can be a big issue for our Ocean Biome.

REVIEW INVESTIGATION PROCEDURES:

Distribute Investigation Cards to each student or group.

- Take the small Tupperware and pour the cooking oil into it, $\frac{3}{4}$ of the way full.
- Place the Tupperware inside the Ziploc bag. Add a rock or weight to the bag and zip closed.



REVIEW INVESTIGATION PROCEDURES (CONTINUED):

- Place the Tupperware in the bottom of a large clear tub.
- Fill the tub with water.
- Using the materials provided, attempt to extract the oil from beneath the “ocean floor” with minimal spillage.
- If oil does spill into the water, use the tools provided to clean up the oil spill as best as possible.
- Collect the oil into a cup on the surface (this is the oil reservoir).
- Add sealife to the area.
- Make observations of any “leaks” that have occurred.
- What will the leaked fluid do to the surrounding environment? How easy was it to clean up any oil that did leak? Record your observations in your science journal.
- Once a group has finished building their oil rig and extracting the oil, go around and cause a “problem” to the oil rig. Take the plastic boat and “collide” with the oil rig modeling a leak in a pipeline (this is one of the causes of oil leaks within the ocean).
- After the instructor has come around, observe the new situation. What is now occurring in the environment? What problems do you see? Record your observations in your science journal.
- Have students record their observations post-collision. Optional: assign roles to students or give out one worksheet for recording per group (Remind students to discuss thoughts with their group).

EXPLAIN

OIL IN THE OCEAN INVESTIGATION: DEBRIEF

What happened to the water when you tried to mine the oil?

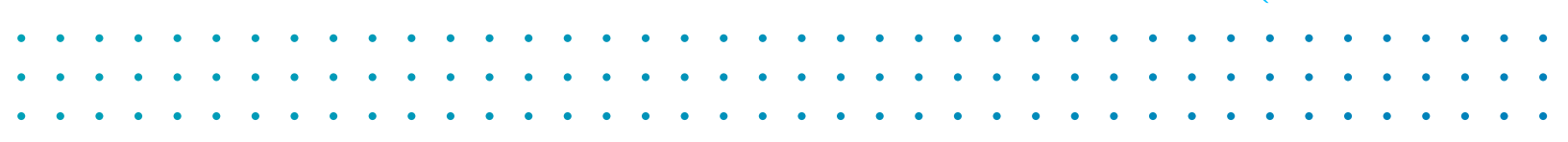
What changes did the mining process cause to the surrounding biome?

- Possible student responses may include: When we tried to extract the oil, some of it leaked out and then got in the water; When the oil was in the water, it was hard to remove; After the oil spilled, the fish then had to swim in oily water; The boat caused a massive spill that left a lot of oil in the water.
- After students have finished discussing the reflection prompt responses with their group and recorded their ideas in their science journals, facilitate a small group discussion.
 - Optional: assign each group a number and then pair the groups up (group 1 with group 2, etc.)
- Have students return to the whole group.
 - Prompt students to share their thoughts with the whole group.

When the oil is extracted from the ground it can leak or even spill into the surrounding environment! Boats can also cause larger spills via collisions. We learned that oil is difficult to remove from the water, and this can affect the animals living in it.

When mining for substances like oil, oftentimes damage can occur to the surrounding biome.

- In this instance, the issue lies in what happens when we lose control of the oil we are mining.
- When this happens animals can be harmed, as well as the water itself can be contaminated.
- These are issues we run into when mining oil as an energy source from the ocean floor.



EXTEND

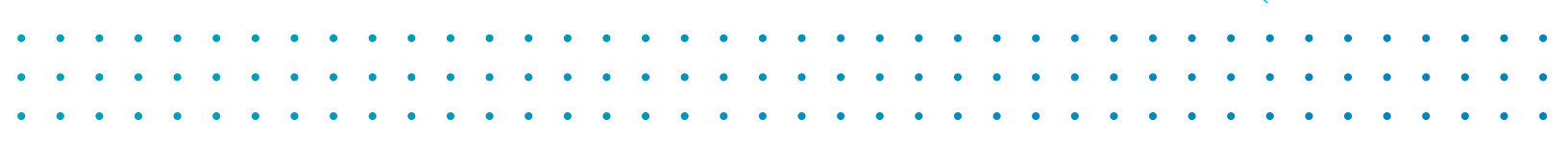
ARTICLE [10 Methods for Oil Spill Cleanup at Sea](#)

Have students research different approaches scientists are using to help with the extraction of oil that either eliminates or mitigates oil spills. Have students read through it on their own and then share what they discovered as ways to address the issues caused by oil.

EVALUATE

OIL SPILL INVESTIGATION: CONCLUSIONS

Write a summary explaining how humans can change the environment through their consumption of natural resources.



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