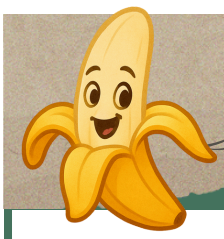

🍌 Planet Warriors: Bioenergy — Teacher Notes

Welcome teachers! It's time to roll up your sleeves and dig into the delightfully messy world of bioenergy — where banana peels, cow poo, and even sewage can be turned into clean power! Through sorting challenges, puzzles, and creative design, students will explore how organic waste becomes a renewable energy source and learn to separate fact from fluff.

Activity 1: Sort It to Power It!
Students match household items to the correct bin — 🟩 FOGO, ♻️ Recycling, or 🗑️ Landfill — and discover how FOGO waste can become compost or biogas.
Encourage discussion about what happens to organic waste after it's collected and how it can help power communities.
Teacher Note: FOGO collections can vary between councils. Some accept items like meat, dairy, and pet waste, while others only allow plant-based organics. Generally, FOGO bins include anything that was once alive — food scraps, coffee grounds, garden clippings, and compostable paper products. Encourage students to check their local council's guidelines and compare differences.

Activity 2: Scraps' Sludgy Scramble
Students unscramble sludgy words to uncover key terms from the episode and use the circled letters to reveal the secret word : PEELS
Answers: compost, algae, methane, sludge, waste
Extension: Have students define or illustrate each word in a mini glossary.

Activity 3: Rumour Roundup
Students match each overheard "rumour" with the correct statement from Professor Behdad Moghtaderi in the Planet Warriors: Bioenergy podcast.
This activity helps students practise distinguishing between myths and scientific facts.
Answers: 1 - D, 2 - C, 3 - A, 4 - B,

Activity 4: Fuel the Future: The Great Zoo Power Challenge
Students design a clean-energy system for a zoo, choosing at least two renewable sources to meet its energy needs.
Encourage students to justify their choices in writing or discussion.

🔍 Word Help
Bioenergy: Energy made from plants, animals, or organic waste.
Biogas: Gas made by bacteria that break down waste without oxygen.
Methane: A powerful gas that can be used for fuel.
Compost: Decayed plant or food waste used to enrich soil.
Anaerobic digester: A sealed tank where waste breaks down to produce biogas.
Algae: Microscopic plants that can be grown for biofuel.
Sludge: The leftover material from wastewater treatment that can be turned into energy.

Sort It to Power It!

1. **FOGO** stands for **Food Organics and Garden Organics**. Some Aussie suburbs have green bins where food scraps and garden clippings go. This waste can be turned into compost for gardens or sent to special factories called **anaerobic digesters**, where bacteria break it down to make **biogas** — a type of renewable energy that can power homes, buses, or schools!
Other bins include ♻️ Recycling (things like cans, paper, and glass that can be made into new products) and 🗑️ Landfill (waste that can't be reused or recycled).

Scraps has been sorting through the bins at Squiz Kids HQ — but everything's in a jumble!
Your job is to help him sort each item into the correct bin.
Look at the pictures below. Draw a line to sort each item into the right bin — FOGO, Recycling, or Landfill.

FOGO

recycling

landfill

Scraps' Sludgy Scramble

2. Scraps has dropped his science notes in a pile of goo, and all the words have got mixed up!
Help him unscramble each sludgy word to clean up his mess — then use the special circled letters to reveal the secret message at the bottom.

CPTSOOM ____ ____ ____ (____) ____ ____ ____

GAELA ____ ____ ____ ____ ____

MTENAEH ____ (____) ____ ____ ____ ____ ____

LUDSEG (____) ____ ____ ____ ____ ____

WETSA ____ ____ ____ ____ (____)

Hint: *Another name for your fruit scraps.* ____ ____ ____ ____ ____

A G N E O T

Rumour Roundup

3. Scraps has overheard some seriously stinky rumours flying around the recycling depot — and it's time to clean them up!
Read each rumour in the speech bubbles below. Then read what Professor Moghtaderi actually said about bioenergy.
Match each rumour to the correct "Professor Says" fact by writing the number of the matching rumour in the small box beside each statement.

Rumours

1 Bioenergy takes food away from people!

2 It's just rubbish — bioenergy's too small to matter!

3 Turning poo into power? Eww! That's not real!

4 If we use too much, we'll run out of waste!

The Professor Says...

☐ A Even sewage (biosolids) can be turned into hydrogen and energy

☐ B Organic waste keeps being created (by animals and plants), making bioenergy renewable.

☐ C Bioenergy has already started making an impact... It's one of the options we can use.

☐ D We use waste and second generation crops for bioenergy — crops that don't compete with food crops.

Fuel the Future: The Great Zoo Power Challenge

The animals at Planet Warriors Zoo want a renewable energy power system. Your job is to design a system that keeps the zoo running using clean power only.

The zoo needs energy for:
- 🏠 Heating animal enclosures
- 💡 Lights for night-time habitats
- 🍦 Food storage and cafés
- 🎡 Rides, trains, and visitor zones

You can choose from the renewable energy sources we've learned about:
- 🌞 Solar panels (from Blaze)
- 💨 Wind turbines (from Gust)
- 🌊 Dam or tidal turbines (from Flo)
- 🪨 Geothermal heat (from Rocky)
- 🪱 Bioenergy — food scraps, manure, or sewage (from Scraps)

Your Task:
On the next page, draw your zoo and label where each energy source will come from and go to.

Extension:
Write a few sentences explaining which sources you chose and why.

Hint: Zoos create lots of animal waste and leftover food — what clean energy could that become?

Planet Warriors Zoo

✅ Planet Warriors: Bioenergy — Solutions

Activity 1: Sort It to Power It!

🟩 FOGO – Food Organics and Garden Organics

Slice of Bread• Animal Waste • Flowers/weeds • Banana Peel • Greasy pizza box

♻️ Recycling

• Newspaper • Shampoo Bottle • Tin can • Glass jar

🗑️ Landfill

Juice box • Coffee Cup • Fabric/socks • Wipes or sponge

Activity 2: Scraps' Sludgy Scramble

CPTSOOM

GAELA

MTENAEH

LUDSEG

WETSA

***Hint**: Another name for your fruit scraps.*

C O M P O S T

A L G A E

M E T H A N E

S L U D G E

W A S T E

P E E L S

Activity 3: Rumour Roundup

The Professor Says...

3 A Even sewage (biosolids) can be turned into hydrogen and energy

4 B Organic waste keeps being created (by animals and plants), making bioenergy renewable.

2 C Bioenergy has already started making an impact... It's one of the options we can use.

1 D We use waste and second generation crops for bioenergy — crops that don't compete with food crops.

Activity 4: Fuel the Future: The Great Zoo Power Challenge

Expected student outcome:

Students design a clean, renewable energy system for a zoo using two or more energy sources covered in the Planet Warriors series. They explain their reasoning and demonstrate understanding of energy diversity.

Example responses:

"Our zoo uses solar panels on café roofs, wind turbines on nearby hills, and an anaerobic digester that turns animal waste and leftover food into biogas to heat reptile houses."

"Solar panels power the lights, geothermal heat keeps the elephants warm, and bioenergy from food scraps runs the kitchen."