

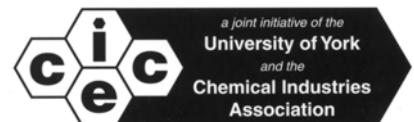
Understanding Sustainability

Sustainable waste disposal case study

Should waste be incinerated?



The Institute of Materials, Minerals & Mining



Sustainable waste disposal case study

Students prepare and deliver a short presentation which examines the case for and against waste incineration.

Activity supports Key stages 4 or 5 depending on the level of detail included in the presentation.

Curriculum areas:

- understanding sustainable development;
- developing research skills;
- ideas in science;
- environment, earth and universe.

Resources Group briefing sheets are supplied. Each consists of two sheets. The first outlines the issues and the group's task. The second gives suggestions for what to include in the presentation. The second sheet can be held back to stretch more able students.

Access to **www.sustainability-ed.org**.

Waste information sheets for each group (*Waste Info 1* and *2*).

Activity The scenario is a meeting to discuss the proposed building of a new waste incinerator in a local town.

Five groups are represented and each make a short (5 minute) presentation, followed by questions. The groups represent:

- Local television – make the first report which outlines the issues.
- Local Council
- Local residents
- Environmental group
- Incinerator operators

Following the presentations, the waste disposal options can be discussed. A vote is taken on whether the incinerator is a viable option for sustainable waste disposal.

**Suggested
lesson
timing**

- Lesson 1 Introduce sustainable development (social, economic and environmental).
Set scene for incinerator case study.
Divide into groups and start preparing presentations.
- Homework Continue work on presentations.
- Lesson 2 Complete and deliver presentations.
Plenary discussion and vote on the incinerator option.
- Homework Research how waste is disposed of by local council in school's area.

Oldchester Waste Management System

Oldchester is a town that currently produces about 180-200,000 tonnes of solid municipal waste per year. Approximately 120,000 tonnes is waste from households. The rest is from business and industry.

Landfill

Nearly 94% of municipal waste is dumped into landfill. This costs £30 per tonne.

Recycling

6% of waste is currently recycled. This is collected from recycling centres or is collected by voluntary organisations.

Material recycled	Cost to recycle 1 tonne
Paper & board	£15
Glass	£3
Plastic	£50
Cans (Al & Fe)	£9 profit from sales
Waste motor oil	Negligible

Compost

Oldchester council is encouraging people to make compost out of their kitchen waste.

Householders can buy compost bins at a reduced price of £6 per bin. They normally cost £20-30.

A trial composting scheme is also being run with kitchen and garden waste collected from houses on one of the estates. The compost is used on parks in the town. The scheme is expensive and costs £38 per tonne of waste.

Proposed New Waste Disposal Strategy

New incinerator

The council has suggested that an incinerator is built to burn some of the waste.

Paper and plastics in the waste will be processed into small fuel pellets that can be burned in the incinerator. This energy will produce electricity and provide heating for 1,700 local homes.

The incinerator would handle about 40% of the town's waste.

Waste gases will be treated to minimise the release of sulfur dioxide, nitrogen oxides and dioxins. Burning 'recycles' the energy in the waste but it does still produce carbon dioxide.

Some coal and shredded rubber from tyres will also be burned.

Emissions from the incinerator are shown below:

	Substance	Total release per year
Into the Air	Particulates	5.55 tonnes
	Carbon monoxide	27.75 tonnes
	Sulfur dioxide	55.5 tonnes
	Nitrogen oxides	167 tonnes
	Lead	47.25 kg
	Dioxins	0.111 g
To Landfill	Ash	12,262 tonnes
	Dust & spent lime	1,872 tonnes

Local environmental group

What a Load of Rubbish!

Oldchester town council has a massive waste problem. It needs to collect and get rid of around 200,000 tonnes of waste each year.

What is the best way to handle this waste?

The council wants to build a waste incinerator to burn some of the town's rubbish. This would also provide electricity and heat to local houses.

An inquiry has been set up to see if this is a good option.

Your task

You are representatives of a local environmental group. The incinerator will be close to a local park. You are against the incinerator but understand that landfill is not a good option either.

Your task is to make a short presentation to argue against the building of the new incinerator and suggest some more environmentally-friendly options.

Putting together your presentation

Visit the waste disposal case study on the sustainability-ed web site

1. Go to the web site at: **www.sustainability-ed.org**
2. Click onto the Sustainable Development case studies section. Choose the Load of rubbish case study.
3. Look at the Waste hierarchy options for waste disposal.
4. Look at the recycling targets for the future.

Use the information sheet to see how Oldchester disposes of its waste.

What will your presentation focus on? Gather information that will support your case.

Prepare your presentation.

- What will you say?
- What is your main message?
- What materials do you need to prepare (slides, posters etc.)?

Presentation tips

Your teacher will tell you the maximum time allowed for your presentation.

Stay in role throughout. Are you trying to appeal to people's emotions or use scientific facts to convince them?

Concentrate on the message you are trying to get across. Make sure it is clear.

Speak clearly, face the audience not the board. Keep arguments simple and any visual aids clear.

Be aware of your audience as they are in role – who are your friends and who are your enemies?

Practice using the overhead projector or computer if you are using them.

Be prepared to answer questions.

You may want to think of these issues:

- The effects of burning the waste on climate change.
- The problems caused by toxic emissions from the incinerator.
- The options shown in the 'Waste hierarchy' (see sustainability-ed web site).
- The need to encourage people to reduce the amount of waste that they make.
- The need to encourage people to recycle more.
- The incinerator will need a constant supply of waste. This may mean that people are less likely to be encouraged to produce less waste.

Town Council representatives

What a Load of Rubbish!

Oldchester town council has a massive waste problem. It needs to collect and get rid of around 200,000 tonnes of waste each year.

What is the best way to handle this waste?

The council wants to build a waste incinerator to burn some of the town's rubbish. This would also provide electricity and heat to local houses.

An inquiry has been set up to see if this is a good option.

Your task

You are representatives from the Oldchester town council.

You must dispose of the local municipal waste in a responsible way but you must also think of the cost involved.

Your task is to argue for the new incinerator.

Putting together your presentation

Visit the waste disposal case study on the sustainability-ed web site

1. Go to the web site at: **www.sustainability-ed.org**
2. Click onto the Sustainable Development case studies section. Choose the Load of rubbish case study.
3. Look at the Waste hierarchy options for waste disposal.
4. Look at the recycling targets for the future.

Use the information sheet to see how Oldchester disposes of its waste.

What will your presentation focus on? Gather information that will support your case.

Prepare your presentation.

- What will you say?
- What is your main message?
- What materials do you need to prepare (slides, posters etc.)?

Presentation tips

Your teacher will tell you the maximum time allowed for your presentation.

Stay in role throughout. Are you trying to appeal to people's emotions or use scientific facts to convince them?

Concentrate on the message you are trying to get across. Make sure it is clear.

Speak clearly, face the audience not the board. Keep arguments simple and any visual aids clear.

Be aware of your audience as they are in role – who are your friends and who are your enemies?

Practice using the overhead projector or computer if you are using them.

Be prepared to answer questions.

You may want to think of these issues:

- The cost of waste disposal. Incineration is a relatively inexpensive option. It may help to keep down local taxes.
- The incinerator can supply heat and power to local houses.
- Building and running the incinerator will bring jobs to the area.
- Objectors are just worried about what happens where they live. In your opinion, the incinerator will be the best option for the whole of Oldchester.

Waste incinerator operating company

What a Load of Rubbish!

Oldchester town council has a massive waste problem. It needs to collect and get rid of around 200,000 tonnes of waste each year.

What is the best way to handle this waste?

The council wants to build a waste incinerator to burn some of the town's rubbish. This would also provide electricity and heat to local houses.

An inquiry has been set up to see if this is a good option.

Your task

Your company has been given the contract to build and run the new waste incinerator.

You believe that the new incinerator will benefit Oldchester, its inhabitants, the local economy and of course your company.

Putting together your presentation

Visit the waste disposal case study on the sustainability-ed web site

1. Go to the web site at: **www.sustainability-ed.org**
2. Click onto the Sustainable Development case studies section. Choose the Load of rubbish case study.
3. Look at the Waste hierarchy options for waste disposal.
4. Look at the recycling targets for the future.

Use the information sheet to see how Oldchester disposes of its waste.

What will your presentation focus on? Gather information that will support your case.

Prepare your presentation.

- What will you say?
- What is your main message?
- What materials do you need to prepare (slides, posters etc.)?

Presentation tips

Your teacher will tell you the maximum time allowed for your presentation.

Stay in role throughout. Are you trying to appeal to people's emotions or use scientific facts to convince them?

Concentrate on the message you are trying to get across. Make sure it is clear.

Speak clearly, face the audience not the board. Keep arguments simple and any visual aids clear.

Be aware of your audience as they are in role – who are your friends and who are your enemies?

Practice using the overhead projector or computer if you are using them.

Be prepared to answer questions.

You may want to think of these issues:

- You believe that burning the rubbish is a cost-effective way of getting rid of it.
- The incinerator will also supply heat and electricity for local houses.
- Your company will provide jobs for local people.
- The emissions from the incinerator are below current Government limits on pollution.
- If the incinerator works well, you may want to expand in the future to take waste from other areas. This would bring more money and prosperity into Oldchester.
- Carbon dioxide emissions will come from the incinerator. However, it will also make electricity and local heating. The emissions from the incinerator need to be compared to the emissions from power stations that would typically burn coal, oil or gas to make the electricity.

Local residents' group

What a Load of Rubbish!

Oldchester town council has a massive waste problem. It needs to collect and get rid of around 200,000 tonnes of waste each year.

What is the best way to handle this waste?

The council wants to build a waste incinerator to burn some of the town's rubbish. This would also provide electricity and heat to local houses.

An inquiry has been set up to see if this is a good option.

Your task

As local residents, you do not want the new incinerator to be built in your neighbourhood.

You believe the incinerator will cause pollution and smells from the lorries carrying the rubbish to be made into fuel pellets.

Your task is to present your arguments against the building of the new incinerator.

Putting together your presentation

Visit the waste disposal case study on the sustainability-ed web site

1. Go to the web site at: **www.sustainability-ed.org**
2. Click onto the Sustainable Development case studies section. Choose the Load of rubbish case study.
3. Look at the Waste hierarchy options for waste disposal.
4. Look at the recycling targets for the future.

Use the information sheet to see how Oldchester disposes of its waste.

What will your presentation focus on? Gather information that will support your case.

Prepare your presentation.

- What will you say?
- What is your main message?
- What materials do you need to prepare (slides, posters etc.)?

Presentation tips

Your teacher will tell you the maximum time allowed for your presentation.

Stay in role throughout. Are you trying to appeal to people's emotions or use scientific facts to convince them?

Concentrate on the message you are trying to get across. Make sure it is clear.

Speak clearly, face the audience not the board. Keep arguments simple and any visual aids clear.

Be aware of your audience as they are in role – who are your friends and who are your enemies?

Practice using the overhead projector or computer if you are using them.

Be prepared to answer questions.

You may want to think of these issues:

- You believe that burning the rubbish will release toxic chemicals into the atmosphere.
- The lorries that bring rubbish to be made into fuel pellets will be smelly.
- Piles of rubbish could attract rats and other pests.
- You do not believe that the heat and electricity from the incinerator will be any cheaper than your current energy supplies.
- The company will still need to dispose of the ash that remains after the rubbish has been burned. This ash contains toxic materials.

Local television

What a Load of Rubbish!

Oldchester town council has a massive waste problem. It needs to collect and get rid of around 200,000 tonnes of waste each year.

What is the best way to handle this waste?

The council wants to build a waste incinerator to burn some of the town's rubbish. This would also provide electricity and heat to local houses.

An inquiry has been set up to see if this is a good option.

Your task

You are researchers for the local television station. Your task is to interview representatives from each of the other groups and produce a short news report.

You do not need to go into great detail about the issues. This is the job of the other groups. Your news report should inform the audience of the different groups and briefly mention their points of view.

Your report should be balanced and not show a preference for any of the groups.

Putting together your presentation

Visit the waste disposal case study on the sustainability-ed web site

1. Go to the web site at: **www.sustainability-ed.org**
2. Click onto the Sustainable Development case studies section. Choose the Load of rubbish case study.
3. Look at the Waste hierarchy options for waste disposal.
4. Look at the recycling targets for the future.

Use the information sheet to see how Oldchester disposes of its waste.

What will your presentation focus on? Gather information that will support your case.

Prepare your presentation.

- What will you say?
- What are the key arguments for and against the incinerator?
- What materials do you need to prepare (slides, posters etc.)?

Presentation tips

Your teacher will tell you the maximum time allowed for your presentation.

Stay in role throughout. Remember that people respond to emotional appeals as well as scientific facts.

Concentrate on the message you are trying to get across. Make sure it is clear.

Speak clearly, face the audience not the board. Keep arguments simple and any visual aids clear.

Practice using the overhead projector or computer if you are using them.

Be prepared to answer questions.

You may want to think of these issues:

- Tell people about how waste in Oldchester is currently being got rid of.
- What are the current problems with the waste disposal? Can the situation carry on as it is?
- Tell the audience what groups will be at the meeting.
- Outline each of the group's main concerns. Do not go into too much detail. The groups should argue their own case.
- Give a balanced view of all the groups.