

***“My Life as a Plastic Bottle”***  
**Teachers’ Guide**



**Instructional Materials for *Waste and Our World***  
***Grade 4 Science***  
**Alberta, Canada**

## ***“My Life as a Plastic Bottle” Teachers’ Guide***

This Teachers’ Guide has been prepared for *Waste and Our World, Grade 4 Science*, Alberta, Canada.

### **Producers:**

Regional Environmental Action Committee  
Box 958  
High Prairie, Alberta  
T0G 1E0

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### **Distribution:**

CineFete  
1586 Rue Fluery Est  
Bureau 210  
Montreal, Quebec  
H2C 1S6  
(514) 858-0300, fax (514) 858-0442  
1-800-858-2183, fax 1-800-952-0442  
[info@cinefete.ca](mailto:info@cinefete.ca)  
[www.cinefete.ca](http://www.cinefete.ca)

Instructional Design by Peter C. Conrad

## INFORMATION SHEET

### *“My Life as a Plastic Bottle”*

The video, *“My Life as a Plastic Bottle”* tells the story about how plastic is made from natural gas. It is a long story that begins millions of year ago when there were dinosaurs on earth. Places like Alberta were warm and tropical with thick forests.

## “My Life as a Plastic Bottle”

### Dinosaurs and Plants Become Oil

When the time of the dinosaurs passed, all of their bodies and the massive amounts of vegetation were covered over. These layers of dead plant life and animal remains were buried at the bottom of an **ocean** that covered places like where Alberta is today.

As the sand, soil and the water on top of the plant and animal matter became

deeper, there a great pressure built up. After millions of years at high pressure and heat, the plant and animal material turned into **liquid** and **gas** products. The long periods of time that stretch over thousands of years are called **millennia**.

### The Oil and Gas

The oil and gas are in deposits deep below the surface, which are found through drilling. Once deposits of oil and gas are found, they are pumped out to be refined into useful products.

The **liquid** is crude oil is used to make motor oil and gasoline. The **gas** that comes out of the ground is called natural gas.

**Natural gas** is made up of **propane**, **methane**, and **ethane**.

Each type of natural gas has different uses. **Propane**, which is explosive, is used in barbeques and some vehicles. **Methane** is used to heat homes, businesses and schools. **Ethane** is turned into plastic.

### Making Plastic

Once the Ethane has been separated from the other parts of natural gas in a refinery, it is ready to be turned into plastic. To change ethane gas into plastic, its molecules have to be changed. When molecules are changed, it is called a **reaction**. Ethane mixed with a catalyst that makes it change into plastic in the **reaction chamber**. **Catalysts** are

substances that make things happen or change in reactions.

As the molecules of the ethane gas have been changed to produce plastic, the plastic cannot be changed back into gas. The plastic made from **Ethane** is called **Polyethylene**.

Name: \_\_\_\_\_

## ACTIVITY ONE

### Vocabulary

The words in this list are from the video *“My Life as a Plastic Bottle.”* Watch the first part of the video carefully and then fill in the sentences below with the right word. If you need a little help with this, check the information sheet that tells about the long road from the times of the dinosaurs to the making of plastic bottles.

propane  
methane  
ethane  
reaction  
catalysts  
gas  
liquid  
polyethylene  
ocean  
millennia



1. For millions of years after the dinosaurs, the area that made up Alberta was covered by \_\_\_\_\_.
2. After the remains of the plant life and dinosaurs were buried for millions of years under great pressure and heat, this matter became \_\_\_\_\_ and \_\_\_\_\_.
3. In the video, the gas that came out of the ground and sent by pipeline to the refinery was divided into three kinds of gas that were called \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
4. \_\_\_\_\_ is the gas that provides heat for homes, schools and businesses.
5. The barbecue uses \_\_\_\_\_ gas to cook food.
6. Plastic is made from \_\_\_\_\_ gas.
7. The video shows us how the \_\_\_\_\_ chamber makes the gas into plastic by pulling apart the molecules and putting them back together with plastic being the final product.
8. A \_\_\_\_\_ is added to a reaction that makes something happen or causes a change.
9. The plastic made from natural gas is called \_\_\_\_\_.
10. When thousands of years are grouped together as a passage of time, this is called \_\_\_\_\_.

Name: \_\_\_\_\_

## ACTIVITY TWO

### Map

Using a map of Alberta place the correct names of the communities that were mentioned in the video, *“My Life as a Plastic Bottle.”* These are the places that the plastic pellets were made.

Place the following places on the map provided:

**Gift Lake Settlement**  
**Athabasca**

**Fort Chip**  
**Valleyview**

**Airdrie**  
**Slave Lake**



**“My Life as a Plastic Bottle”**

Name: \_\_\_\_\_

## ACTIVITY THREE

### Plastic Bottle Focus Discussion

Here are some things to discuss now that you have had a chance to watch the video “*My Life as a Plastic Bottle.*”

1. Where did the plastic bottle go after it had been made and was filled with water?

2. Why was the plastic bottle unhappy about the possibility of being buried in a landfill?

3. What was the “friend” of the plastic bottle that would become food for the crows or rot?

4. What do the different numbers on plastic bottle and products mean?

5. Why shouldn't plastic be burned?

6. What happens after the different types of plastic bottles are sorted at the bottle depot?

7. What is a non-renewable resource?

8. Name two recycled products that are made from plastic that you saw on the video.

**“My Life as a Plastic Bottle”**



Name: \_\_\_\_\_

## ACTIVITY FIVE

### Draw the Story

After you have watched the video *“My Life as a Plastic Bottle”* use the space below to draw the details of how the plastic bottle comes to be, is used and then is recycled.

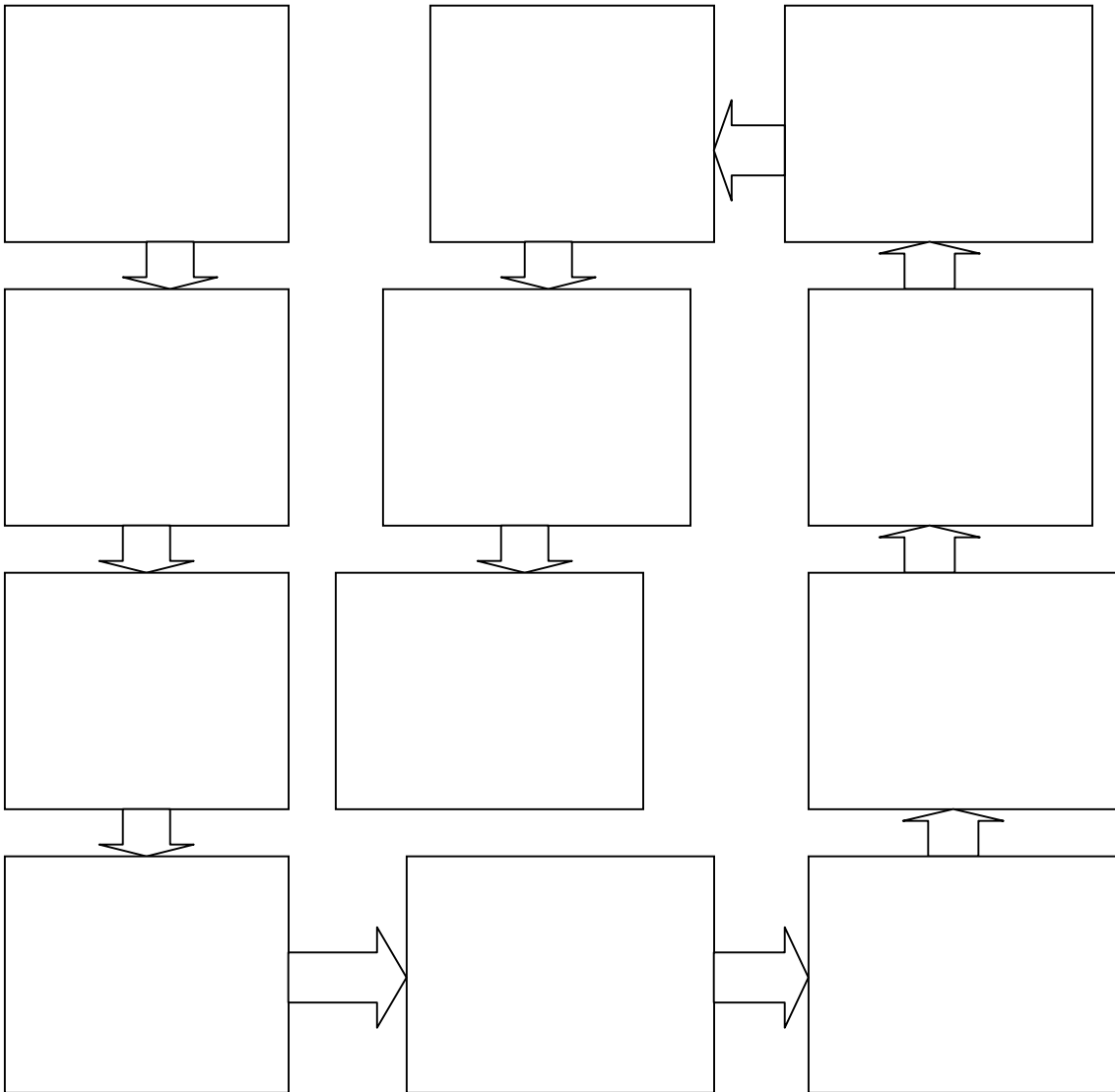
Use the boxes to draw in the following items in the correct order.

# “My Life as a Plastic Bottle”

Dinosaurs and plants  
Pipeline transport of gas  
ethane gas becomes plastic  
use of bottle

under sand and ocean  
refinery  
water bottling  
recycling depot

drilling for gas  
separating gases  
the store  
recycled sweater/rug





Name: \_\_\_\_\_

## ACTIVITY SIX

### Discussion

1. How does recycling waste products slow down global warming?
2. What three things can you do right away in your home to recycle, reuse, or reduce wastes?
3. What can be done to make products more easily recycled?
4. What kind of recycling activity could be set up in your school that you could participate in? If your school has a recycling program already, how could it be improved?
5. What is composting? Is there a way you could get more people to compost their wastes?
6. In the video, there were a number of plastic and tin items in the landfill including toys. What could be done with these items to remove them from the landfill?

**“My Life as a Plastic Bottle”**



Name: \_\_\_\_\_

## ACTIVITY SEVEN

### “My Life as a Plastic Bottle”

## Recycle Art

There are all kinds of things that you can do with the items that you find around your home. One way to reuse an item is to use it to make art. Spend some time looking around your house and find things to bring to school that would otherwise be thrown out and clean them. They could include plastic bottles, cardboard boxes, string, milk jugs, aluminium and plastic food trays and many more.

**Plastic bottles** can be used in many ways to produce figures of people with the bottle being used as the body and cardboard used for the arms and legs. Stuffed paper bags can be used for a head that can be detailed with paint and cut out pieces of paper. The bottles can also have a series of flaps cut out along the side and bent out. The bottle is then placed upside down on a pole and it becomes a windmill.

**Cardboard boxes** can be made into toy houses and buildings that can be used to make a model town.

Rows of cups cut from an **egg carton** can be turned upside down and have a face painted on one end and the rest painted to appear as a caterpillar.

**Yogurt containers** can be decorated with other items like glue, beads, and sticks. The container can then be painted and used for planting or storing things.

**Plastic fruit cups** need their edges removed if they have any. Two cups can be fitted together so they look like a closed container. Place in one of them beads, seeds, or rice and glue or tape the other on top. When the glue has dried it becomes a musical instrument that can be shaken to make a sound.

**Newspaper** can be rolled into tight “logs” that can then be tied together with string. These will form a stool that can be sat on. Other items like old tablecloths or wood can be shaped to fit onto the stool. Other decorations and paint could be used to make the stool attractive.

**Plastic bottle lids, corks, empty spools, or old CDs** can be used to decorate other projects or can be painted and used to make mobiles.



# Recycling Facts

## “My Life as a Plastic Bottle”

The following facts are about the benefits of recycling.

- Plastics make up between 5 % and 7 % of municipal solid wastes.
- Enough energy is saved by recycling one aluminium can to run a television set for three hours or to light one 60 watt bulb for 35 hours.
- Recycled aluminium creates 95% less pollution than making it the first time.
- One tonne of recycled paper uses 64% less energy to produce than paper made directly from wood. This same tonne of recycled paper saves 24,000 gallons of water and 1.7 tonnes of lumber and creates 74% less air pollution. A tonne of recycled paper needs 5 times more jobs than one tonne of paper produced from virgin trees.
- It takes about 25 recycled soft drink bottles to make one fleece jacket and 5 recycled 2-litre bottles to make enough fibrefill for one ski jacket.
- Over 46,000 pieces of plastic debris float on every square mile of ocean
- Recycling plastic saves two times more energy than burning it.
- One tonne of crushed recycled glass saves 1.2 tonnes of raw materials including sand, soda ash and limestone, and saves 25% of the energy used to make glass.



Name: \_\_\_\_\_

## WORD SEARCH 1

# “My Life as a Plastic Bottle”

A E O O I S C P Y T V Q F G H J K L E Q  
D T A J X T P F P U L E H L F E R O B N M  
F G O M M V L Z A I L U D F Q T V N R E B N M  
H N M M V L Z A I L U D F Q T V N R E B N M  
W Q X R S L B H U T P I R M A H N W Q F I J E  
A D F C H E M I C A L S E N A N V C L P I  
H J K B A P D H K E A O V X A Y E M R I  
B H E M E T H A N E S Q E A F C V H E W  
L M N O H J A E Y N T M J E R N E M D O  
A I B L K N U L G A I R N V U I C I G H  
Q E Q G H N O D Y B C E J E A P L W Q E  
G E D U R P E N S S L W R V M O J K O Q  
W I G V I X L E M Y T X E D S E E G R H  
N J G E A D L O H Q O E A F U D D P Q Y  
H W T H J U T T Q W E G C B O E A R V D  
J E A V C A E G E K K Q T F I D U U I R  
F G H E S Y S R E F E X I B R N C G H O  
K L L P L M O O K L P E O S O G W E R G  
H O Q O K K L J O P U T N E L Q G H C E  
M D P E A W Q D F I O G N P G N K D F N

Find the following hidden words:

atoms  
catalyst  
chemical  
ethane  
furnace  
glorious

hydrogen  
liquid  
methane  
molecules  
pellets

plastic  
polyethylene  
reaction  
solid  
split

Name: \_\_\_\_\_

## WORD SEARCH 2

Carefully look for the words in the list below in the puzzle. The words are arranged in all directions including backwards.

M T P S E Z N E K T S V T V I R A P  
O E Y N E F G S E I R A E A M T K T  
P L L E P I T A N C B I J P X Z E O  
V E L T T O B D L U O N I R H C L G  
E L R I E C O M R T O G A I E I J I  
Z S S L F D A I D S N F F L T A I C  
E L G S R D E R A I H E I R D I I F  
C F H T E D N E T N F W V H A A S I  
N T R K L C R A C X S F E E E T O U  
E R E V E R O F L M E G E S F S E M  
C A C W H L T R O P S N A R T C E E  
T S Y R F E S O P R U P R Z E S C M  
O H C R H M S K D Y E U J D W N O W  
G O L G O H R M Y C D E G N A H C Z  
A Q E K E M R N N E I E I I T O O E  
C V S D R C E U F I R T V X E C N Y  
S N Y O L G O M E Z A E M H R A J A  
H R F X Y B L T G Y I E O O G D V D

Find the following hidden words:

admire  
bounce  
buried  
bottle  
changed  
difference

event  
extract  
forever  
form  
floating  
landfill

melted  
memory  
pit  
process  
purpose  
reason

recycle  
sky  
smooshed  
transport  
trash  
uses  
water

**“My Life as a Plastic Bottle”**

Name: \_\_\_\_\_

## WORD SEARCH 3

Carefully look for the words in the list below in the puzzle. The words are arranged in all directions including backwards.

# “My Life as a Plastic Bottle”

U R S A A M R V I S E S H O Y T W I  
C O L N Y W E U E A U L I A T R E P  
D E O X L J P D R S N J V I U I D T  
G S D N E D A E D P D T S E H S A S  
X O E X I R P L R R L R W H S T L D  
S J P T G G U B C A I E B I N O A K  
M I O D E H S A U Q S P E R Z C T T  
C W S O D O O W I F E M U A W L E S  
U D I L P E O E A K D B P O E D M Z  
T O T N F P L N L O B I R M N A E A  
M Q S K T M O E E I Z C R O I G O L  
S A R T H R C R E X E E S T S O E G  
H F O E F O E J T W M I C O Y V R Y  
W S E F G C E C R U O S E R I Y N R  
I N E R I X F T S P N F N V O H P V  
A Q O M I F E N E L B I R R O H I I  
A L S W S E O S A X E U T K H L S F  
R A L H K C U R T T S A F Y K F L I

Find the following hidden words:

ashes  
bin  
burnt  
consumer  
crow

deadend  
deposit  
dirty  
grades  
horrible

metal  
melt  
opportunity  
paper  
poison

renewable  
resource  
squashed  
survive  
truck  
wood

Name: \_\_\_\_\_

## WORD SEARCH 4

# “My Life as a Plastic Bottle”

I N T T P G O V D H R L E C O M I P  
B F D I D S E S E E T I S O A L O E  
B E S E A F B K P E R F H C F H L L  
E R B N E A T O O X O E E H H B N Q  
C R T E Q M T O T I P E C N A O C R  
U U U R R I A B R A P A E W I C O D  
C C P G V L N Z T T U M E N L H I L  
A V Y Y O Y N Y H P S N U L U A R S  
E T T R C G Y I E E E R B F N E H  
W N U E D E X O E R R S O E I C G R  
L E S U L E A A N C G L L E T E E E  
T V G C Y S P O P E C N P O U T E D  
S N R I O W N O L N C U U D A O X D  
D I O O R E T D S T P R S M E D N E  
C J U N N A P N F I W U I M B R G D  
S T N R X T N S F B T L S F A E I Q  
I E D X O E H G G V C E L V M K R L  
L M I S S R P F E Y T E P I I A M S

Find the following hidden words:

beautiful  
chance  
circle  
climate  
deposit

depot  
energy  
family  
ground  
invent

life  
load  
nonrenewable  
numbers  
percent

reunion  
rug  
school  
shredded  
support  
sweater