

## **UNIT 5: THE PROBLEM OF PLASTICS WASTE - WHAT IS THE SOLUTION ?**

**Grade Level:** Upper Primary (Grade 5 or 6)

### **Introduction:**

Modern technology has created the plastics age. Plastics do not easily decay and can thus, be used for a long time. Plastic bags have made human life easier. However, they have also created problems especially to the environment, because many users of plastic bags throw away the used bags in any place. As we have learned, plastic bags are made up of non-decaying substances and they are difficult to get rid of.

### **Educational Objectives:**

This script includes the following learning objectives:

1. Deciding on ways to handle plastics waste.
2. Identifying society's value on responsible action by citizens regarding the discarding of plastics waste.
3. Awareness of the different ways of making and using plastics.
4. Developing students ability for co-operative learning.
5. Developing communication skills by participating in a debate.
6. Understanding the potential and difficulties in recycling plastics.

**Scientific Concepts:**

- Plastics do not easily decay.
- Plastics have made human life easier.
- There are difficulties in recycling plastics.

**Previous knowledge assumed:**

This unit is closely linked with *Unit 1: Should we construct a waste power plant in our town?*

**Teaching/Learning Material needed:**

- Different kinds of plastics
- Poster paper, pentel pen, coloured paper, coloured pens

## **Students' Guide**

### ***Scenario***

Plastic bags are very cheap to produce and convenient to use. However, unlike paper bags, they are not biodegradable. This causes problems. For example, when heavy rains come to the village, the water could not flow freely causing the streets to be flooded. The community drainage becomes clogged by plastic bags which people throw away - in canals, by the roadside, in the marketplace etc. Are plastic bags, therefore, such a good idea?

### ***Your task***

1. Undertake a group investigation of one of the following topics.
  - a. how plastics are formed
  - b. the many types of plastics
  - c. perceived advantages of plastics bags over paper bags (consider strength, weight, cost, energy needed to produce, use of finite resources)
  - d. the recycling potential of plastics - its feasibility.
2. Each group presents its findings for the topic chosen as a display with one member making an oral presentation to the rest of the class.
6. Discuss the problems of using plastics and how these can be overcome.
7. Debate whether plastic bags are good or bad for use in society.
5. Design a poster on using/discarding plastics wisely.

## **Teacher's Guide**

This activity relates to

- a) finding source of information on plastics
- b) recognizing the problems caused by plastics once they have served their use
- c) developing a social responsibility for the environment

### ***Teaching Strategy***

1. Students can begin this topic by undertaking a project to obtain information from secondary sources. In this way the groups cover much of the information gathering part of the curriculum related to plastics and how this affect their lives. Students will need to do this largely outside of the classroom so that they can search through various sources (library, industry, government testing station, etc.)
2. Having obtained suitable information, the students then mount a display of their findings so that their presentation to the rest of the class is visual rather than simply verbal (the display is most probably undertaken as wall charts). Interest is aroused by group presentations to the rest of the class highlighting various aspects of the display.
3. With the background on plastics, students working in groups can then begin to discuss problems relating to the discarding of plastics and reflect on ways to overcome this. They are likely to bring up (a) recycling and (b) responsible attitude on discarding rubbish.
4. Students record the outcomes of their discussions and this is handed to the teacher for marking.
5. The student debate needs to involve 4 students arguing for the motion and 4 students arguing against. The lead student for the motion begins and it is recommended that there is a time limit of 2 minutes per speaker. The rest of the class

make up the judges panel with the teacher as the non-voting chairman. The motion is suggested as 'A charge should be made on plastic bags supplied in shops'.

6. Students consider ways, in their groups, to develop a societal responsibility among the public concerning the discarding of plastics waste. These efforts culminate in a poster, designed by the group, on their attempt to educate the public on their civic responsibility.

### **A Further Extension**

Students implement a project on community participation. A slogan maybe produced such as: "Keep our community clean and neat". The students invite members of their households and other community members to go around to collect not only plastic bags, but any kind of litter. As part of the project students hold a public forum to consider ways of reducing waste and how waste might be recycled.

## Achieving the objectives

<b>Objective</b>	<b>This is achieved by</b>
1. Deciding on ways to handle plastics waste.	participating in a debate and designing a poster on the wise disposal of plastics waste
2. Identifying society's value on responsible action by citizens regarding the discarding of plastics waste.	participating in a debate.
3. Awareness of the different ways of making and using plastics.	preparing/interacting with a display and presentation to the whole class.
4. Developing students' ability for cooperative learning.	students working in groups.
5. Developing communication skills.	participating in group discussions and taking part in a debate
6. Understanding the potential and difficulties in recycling plastics.	preparing/interacting with a display and presentation to the whole class.

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**Assessment:**

*Formative Assessment Strategies*

Able to give a Social Values grade (objectives 1 and 2)

- A. Not able to decide on responsible actions with respect to the use of plastics, nor on the value society places on discarding waste responsibly.
- B. Able to put forward actions with respect to the disposal of plastics and suggest societal values related to the disposal of waste.
- C. Not only able to put forward responsible actions and indicate societal values, but is able to equate this with the social concern of the people and the need for sustainable development for the future.

Able to give a Science Method grade (objectives 3)

- A. Not able to develop the project effectively, poor use of information sources.
- B. Able to complete the project and obtain suitable information.
- C. Able to synthesize data from a number of sources to develop the project and compare data so that points made relate to the local society.

Able to give a Personal Skills grade (objectives 4 and 5)

- A. Does not participate in the discussions and performs poorly in putting forward points of view in the debate.
- B. Willing to participate in the discussions and to put forward opinions in the debate.

- C. Able to lead the discussions and guide others to accept opinions put forward in the debate.

Able to give a Science Concept grade (objectives 6)

- A. Has little understanding of plastics and hence, the way they can be used and the types of plastics that can be recycled.
- B. Able to explain the meaning of plastics and their importance to modern day society. Able to relate type of plastics to use and show awareness of the difficulties of recycling discarded plastics.
- C. Able to explain the formation and choice of different types of plastics and indicate an understanding of the issues involved in trying to recycle plastics.

*Summative Assessment Strategies*

Able to give a Social Values grade (objectives 1 and 2)

- A. Not able to put forward an attitudinal response in the record of the discussions and takes little part in the development of a poster.
- B. Able to include attitudes to discarding of waste in the report. Plays a full part in developing a poster that is seen as suitable for educating the public.
- C. Shows insight into the attitudinal aspect in tackling problems of discarding of waste. Able to show much creativity in developing a poster that can appeal to the general public.

Able to give a Science Concept grade (objectives 6)

- A. Project display poor showing little evidence of understanding of collected data.
- B. Able to develop a display of data collected from information sources that shows an understanding of the topic studies.
- C. Able to produce a display highlighting concisely the key points related to the topic studies in the project.