

# ***Radioactive Waste Disposal Activity***

TEAM MEMBERS: Fill in your name according to which card suit you were dealt.

diamond; \_\_\_\_\_ = recorder: This team member is responsible for filling in the reuse/recycle list and well as for writing the answering to the questions.

heart; \_\_\_\_\_ = timekeeper: This team member is responsible for keeping the group on task and for having them complete the project in the time allotted by the teacher.

club; \_\_\_\_\_ = score keeper: This team member will fill-in and calculate the total disposal points for the group whose work is evaluated.

## **INTRODUCTION :**

Your team's goal will be to follow good disposal practices in the disposal of a simulated sample of low level radioactive waste (LLRW). The disposal practices of reduce, recycle, and reuse should be applied to all wastes generated by our technological society. An additional consideration in dealing with LLRW is to reduce the possibility of having radioactive materials and their radiations from entering into the ecosystem.

Each team will be given a simulated sample of LLRW "waste materials". These rad wastes could have been produced by either a medical facility in some diagnostic procedure, an industrial plant to gauge the uniformity of a product, or by a nuclear power plant in the generation of electricity. Not all of the material are radioactive, but they must be disposed of by following the strict standards as outlined below. Following the standards, as well as surveying and separating the materials, will insure that your group has dealt with the wastes in the best manner possible.

## **WASTE MATERIALS :**

plastic gloves (2)	paper toweling / rag	cloth squares (2)
glass slide	piece of orange ceramic	plastic / glass vial
salt pellet	bent paper clips (5)	mechanics tool
sponge	package of lantern mantles	aluminum foil
metal pipe		

The piece of orange ceramic and the lantern mantle **are radioactive** and must be disposed of accordingly. The glass slide and salt pellet have been **irradiated** with gamma rays. All of the other materials have been used with the four items mentioned above at sometime during their use.

## **STANDARDS :**

1. Do NOT open the plastic bag packaging the lantern mantle.
2. Wastes to be disposed of in a LLRW facility should be placed into the waste bag with the "CAUTION: RADIOACTIVE (waste) MATERIALS" sticker on it.
3. Wastes to be disposed of in a regular municipal landfill should be placed into the wasted bag marked "M.W." (for municipal wastes).

4. Wastes not placed into either bag must be itemized on the “REUSE / RECYCLE MATERIALS LIST” below with an **detailed** explanation of how they should be handled or treated before they are recycled or reused.

5. All wastes to be disposed of must be reduced to the smallest volume possible and, if radioactive, to the lowest possible radiation level.

**REUSE / RECYCLE  
MATERIAL LIST**

**TREATMENT PRIOR TO  
REUSE OR RECYCLING**

1. _____ :	_____
2. _____ :	_____
3. _____ :	_____
4. _____ :	_____
5. _____ :	_____
6. _____ :	_____
7. _____ :	_____
8. _____ :	_____
9. _____ :	_____
10. _____ :	_____

**EVALUATION :**

When all of the waste materials have been dealt with according to the standards outline above, exchange your three bags (radioactive, M.W., and recycle/reuse) with another group. Obtain a score sheet from your teacher and evaluate the other group’s disposal practices. Answer the questions concerning the rationale behind the scoring. Return the score sheet and materials to your teacher when finished.

# SCORE SHEET of DISPOSAL PRACTICES

Names of team members whose project is being evaluated:

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

## 1. Check the bag marked with the "Caution: Radioactive Materials" sticker:

Award 25 points if the bag contains the piece of orange ceramic ----- = + \_\_\_\_\_

Award 25 points if the bag contains the package of lantern mantles ----- = + \_\_\_\_\_

Award 10 points if the two items above have been wrapped in the aluminum foil or another material to shield the radiations from them ----- = + \_\_\_\_\_

Award 10 points if the bag and/or its contents have been compacted or reduced in volume in any way ----- = + \_\_\_\_\_

Deduct 20 points for each additional item in this bag other than the piece of orange ceramic, the package of lantern mantles, or a material specifically used to shield the radiations from these items. ----- = - \_\_\_\_\_

Deduct 50 points for an OPENED package of lantern mantles ----- = - \_\_\_\_\_

## 2. Check the bag marked with the "M.W." marking:

Award 10 points for each of the following items in this bag (maximum 40) --- = + \_\_\_\_\_

paper toweling, paper clips, plastic gloves, salt pellet

Award 10 points if the bag and/or its contents have been compacted or reduced in volume in any way ----- = + \_\_\_\_\_

## 3. Check the "Reuse / Recycle List":

Award 10 points for each of the following items on this list (maximum 60) --- = + \_\_\_\_\_

glass slide, sponge, cloth, vial, tool, pipe

score sheet continued on backside

Award 25 points if the words "survey" or "monitor" or "check for radiation" appears anywhere on the explanation list ----- = + \_\_\_\_\_

Award 25 points if the words "wash" or "decontaminate" or "remove radioactivity" appears anywhere on the explanation list ----- = + \_\_\_\_\_

Deduct 50 points if, for any item on this list, no explanation for reuse / recycling has been given ----- = - \_\_\_\_\_

**TOTAL DISPOSAL PRACTICES POINTS =** \_\_\_\_\_  
(all categories, both sides)

**Questions:**

1. Why do you think points are deducted for adding additional items, other than the items allowed, into the bag marked "Caution: Radioactive Materials"?

2. Why do you think such a large number of points are deducted for just opening the package containing the lantern mantles?

3. Why are points awarded for compacting or reducing the volume of the contents of the bags?

4. Why do you think such a large number of points are deducted if no explanation for reuse or recycling has been given for any of the items listed on the reuse / recycle list?

5. With enough effort, can we ultimately create a waste less society - WHY or WHY NOT?

6. What important point or points did you learn about waste disposal from this activity?

Names of EVALUATION team members:

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_