



ATTACHMENT 1

Date	: 1/ 08 / 2010
Year	: 4 Kamban
Number of student	: 16 pupils
Time	: 8.00am – 9.00 am
Topic	: Properties of materials
Sub-topic	: Reuse, reduce and recycle
Learning Objectives	: Pupils should know the importance of reuse, reduce and recycle of materials.
Learning Outcomes	: At the end of the lesson, pupils should be able to:- <ol style="list-style-type: none"> 1. State the 3 ways to conserve the material. 2. State 3 materials that can be reuse, reduce, and recycle.
Model / Method	: Deductive, questioning, and discussion
Scientific Skills	: Making inferences, observing, communicating, predicting and classifying
Thinking Skills	: Analyzing, generating ideas evaluating, visualizing, making conclusion and relating
Previous Knowledge	: Pupils able to state that waste material can be recycle.
Material / Apparatus	: manila cards, pictures, power point presentations, worksheets, video clips.
Electronic kid	: LCD Projector, laptop
Noble values	: Cooperation, having an interest and curiosity, having critical and analytical thinking,

STEP / TIME	CONTENT	TEACHING & LEARNING ACTIVITIES	REMARKS
Orientation (5 minutes)	Teacher introduces the topic showing a video clip about reuse.	<ol style="list-style-type: none"> 1. Teacher introduces the topic to be learnt by showing a video clip related to the topic. 2. Teacher asks pupils to observe what has happen. 3. Then teacher ask questions related to the topic 	<p><u>Teaching aids :</u></p> <ul style="list-style-type: none"> - Video clip <p><u>SS :</u></p> <ul style="list-style-type: none"> - Observing - Predicting <p><u>TS :</u></p> <ul style="list-style-type: none"> - Visualizing - Generating ideas.

<p>Eliciting of ideas (15 minutes)</p>	<p>Testing pupil's prior knowledge on reuse and recycle by classifying the material according to correct column.</p>	<ol style="list-style-type: none"> 1. Pupils form 5 groups. 2. Teacher will give a piece of A4 paper to each group. 3. Pupils will close their eyes and imagine as being at Landfill (kawasan pelupusan sampah). 4. Each pupil need to collect 1 waste material and bring to class.(pupils open their eyes) 5. Then pupils list down the material that collected in paper given. 6. Then teacher give 2 minutes, pupils will classify how to conserve the collected material to be reuse and recycle. 7. Then pupils have to write their answer on whiteboard. 	<p><u>SPS</u></p> <ul style="list-style-type: none"> - Observing - Communicating - Predicting - Classifying <p><u>TS</u></p> <ul style="list-style-type: none"> - Analyzing - Generating ideas
<p>Reconstructing of ideas (20 minutes)</p>	<p>Expanding pupil's previous knowledge on the materials that need to be conserved and how to conserve them through power point presentation.</p> <div style="text-align: center;">   </div>	<ol style="list-style-type: none"> 1. Teacher explains how to separate and dispose the waste material using power point presentation. 2. Teacher explains how the process of reuse and recycling material can reduce the use of paper and plastics. (relate to daily life) <ul style="list-style-type: none"> • "NO PLASTIC DAY" 	<p><u>Teaching aids</u></p> <ul style="list-style-type: none"> - Power point presentation <p><u>SPS</u></p> <ul style="list-style-type: none"> - Classifying <p><u>TS</u></p> <ul style="list-style-type: none"> - Analyzing - Relating - Making conclusions <p><u>NV</u></p> <ul style="list-style-type: none"> - Safe cost - Appreciate God creation - Save environment - Reduce the use of plastic and logging activity.

<p>Application of ideas (20 minutes)</p>	<p>Pupils able to relate the lesson reuse reduce and recycle in our daily life through classifying them.</p>	<ol style="list-style-type: none"> In group teacher will give pupils a piece of paper that containing pictures of many objects. Then teacher will ask pupils to classify then to reuse, reduce and recycle object Then teacher will discuss the objects with the peoples. <table border="1" data-bbox="683 558 1154 783"> <thead> <tr> <th data-bbox="683 558 834 604">Reuse</th> <th data-bbox="834 558 992 604">Reduce</th> <th data-bbox="992 558 1154 604">Recycle</th> </tr> </thead> <tbody> <tr> <td data-bbox="683 604 834 783"></td> <td data-bbox="834 604 992 783"></td> <td data-bbox="992 604 1154 783"></td> </tr> </tbody> </table>	Reuse	Reduce	Recycle				<p><u>SPS</u></p> <ul style="list-style-type: none"> - Classifying - Communicating <p><u>NV</u></p> <ul style="list-style-type: none"> - Cooperative among members. - having an interest and curiosity
Reuse	Reduce	Recycle							
<p>Reflection (5 minutes)</p>	<p>Recalling the lesson will assess the pupils understanding.</p>	<ol style="list-style-type: none"> Teacher will recall the lesson. Teacher will give worksheet as homework. 	<p><u>Teaching aids :</u></p> <ul style="list-style-type: none"> - Photocopied worksheets 						

RECYCLE TOWER PROJECT

Learning Objectives :

After this activity, students should be able to:

- Select a solution consistent with given constraints and explain why it was chosen.
- Describe the steps of the engineering design process.
- Collect information to evaluate the solution for a design problem.

Materials List :

Each group needs:

- 1 ft² (0.1 m²) piece of cardboard
- 1 tennis ball
- 4 aluminum cans
- 12 sheets of newspaper
- 4 750-ml plastic bottles (such as soda bottles)
- 6 plastic yogurt cups
- 5 ft (1.5 m) string
- 5 ft (1.5 m) masking tape
- 1 pair of scissors
- 1 stopwatch

Introduction

Do you ever wonder what happens to all the trash you throw away? Almost all of it ends up in landfills, which only have limited space. If we keep adding trash to landfills at our current rate, we will eventually fill up our landfills. Can you imagine what that would be like? With all the landfills full, what would we do with all our garbage? Surprisingly, a lot of the "trash" that ends up in landfills could actually be reused. Wouldn't it be great if people built homes from all the scrap pieces of metal, plastic, glass and other unwanted materials lying around? If we start using recycled garbage in buildings now, maybe we can reduce the amount of trash that ends up in landfills.

- Some engineers have already started building homes and other buildings by reusing things other people would consider garbage. These engineers are continually working to

find better ways to build homes and other buildings using recycled materials. Some new designs use old shipping containers for walls, collections of glass bottles for windows, and old pieces of tires as roofing material. Can anyone think of some other waste materials engineers could use in buildings? How could they be used? (For examples of homes with reusable materials, see: <http://solar.colorado.edu/index.html>, <http://makewealthhistory.org/?s=mockbee>, <http://www.thedailygreen.com/green-homes/latest/shipping-container-homes-460309>).

- Today, we will get to reuse various materials, such as cans and newspaper, to design our very own towers! We want to prove that our towers are just as strong as buildings made from conventional or typical building materials, so we will also test our towers. Each building will undergo a wind test and an earthquake test. To add more of a challenge, you will have constraints just like real engineers. For example, your tower must be at least three feet tall and be able to hold a tennis ball on top. Sounds like a challenge we all can handle!

Procedure

Before the Activity

- Gather materials.
- Divide the class into groups of three students each.

With the Students

1. Project the Recycled Towers Presentation to the front of the class. Introduce students to the importance of recycling and reusing.
2. Explain the challenge: Students groups apply the recycling and reusing principles by building the tallest tower they can, using only recycled materials.
3. Clarify the design constraints: minimum three-foot height, cardboard base, strong enough to support a tennis ball on top, ability to withstand wind and earthquake test.
4. Review the following engineering design process and activity overview information with students:

Now that you know about the constraints for this challenge, let's discuss the engineering design process. The time-tested steps of the engineering design process help engineers find good solutions to problems they face. The first step is to identify the problem, which we have already done. Our problem is to figure out how to build a tower made from materials that would

otherwise end up in the trash and add to landfills. The next step is to brainstorm for ideas. When you get into your groups, you will all brainstorm ideas. No idea is too crazy! Say anything that comes to mind and take notes to keep track of all ideas. Then, your group agrees on one best idea from the brainstorming session as your design. When you draw plans for your design, make sure to label the materials. Once completed, show me (the teacher) your design. If I approve it, you can get your materials and move on to the building step! What do you think your group will do once you finish building? (Answer: Test.) You will test your structure to make sure it can withstand a wind test and an earthquake test. If it does not survive either test, what do you think you should do next? (Answer: Redesign, rebuild, retest.) You will redesign first, and then rebuild your tower according to the new design by reusing materials from your last design and/or incorporating additional materials. Once your new tower is complete, you can go back through the testing step. Just like engineers in the real world, you will repeat this as many times as necessary until you have a building that survives both tests. Let's begin!

- Hand out the worksheets.
- Give groups time to brainstorm and design their towers.
- Allow one group at a time to collect its materials.
- Give students approximately 30 minutes to build their towers (this may be presented as an additional design constraint).
- After teams complete their towers, test each tower's ability to withstand the forces of nature. For the wind test, place the tower in front of a fan. Turn the fan on high for 30 seconds. Time how long the tower survives. Encourage students to make observations and record them on their worksheets. For the earthquake test, lightly shake the cardboard base of the tower for 30 seconds. Again, time how long the tower survives, and have students make and record observations on their worksheets.
- Have groups tear down their towers and sort the materials for recycling,
- Close with a class discussion in which groups share some results, reflections and conclusions about their final tower designs. What design strategies were used in the most successful towers?

Recycled Towers Worksheet

Recyclable materials available:

1 cardboard base	12 sheets of newspaper
4 aluminum cans	4 plastic bottles
6 yogurt cups	5 feet of masking tape
5 feet of string	

Design:

Draw a picture of the tower you want to build. Label all the materials in the design. Fill in the table below to show how much of each material you will need.

Materials	Quantity
Cardboard base	1
Aluminum cans	
Yogurt cups	
String	(how many feet?)
Newspaper	
Plastic bottles	
Tape	(how many feet?)

Testing:

For each trial, record whether or not your tower survived and how long it lasted. If your tower survived the whole trial, record 30 seconds.

Trial #	Wind Test		Earthquake Test	
	Survived? (Y/N)	Time (s)	Survived? (Y/N)	Time (s)
1				
2				
3				

Sharing Results

Draw a picture of your final design below and explain why you think this tower design was able to survive the wind test and the earthquake test. If you made changes to earlier designs, explain why and how that affected your new tower.

Planting a Tree!

Objective:

As students plant the seedling, they will:

- apply their knowledge of the needs of living things to choose appropriate location
- estimate various heights
- correctly use a 12-inch ruler to measure area
- identify the different components of soil
- accurately describe the function of roots

Materials:

Trees, rulers, shovels, tree planting guide, chart paper, overhead projector

Time:

1 hour

Procedure:

- 1) Do not plant trees underneath or within 25 feet of an overhead power line. Do not plant trees on top of underground power, cable, phone or gas lines.
- 2) Teacher asks, "What do we need to know or think about in order to plant our trees?" Record responses on chart paper or overhead projector.
- 3) Discuss needs of living things
- 4) How to plant your tree seedling outdoors
 - ✓ Select a sunny location with moist, well-drained soil.
 - ✓ Remove all weeds, grass and other debris from a 1-foot circle around the site.
 - ✓ Dig a saucer-shaped hole 6 inches across. This lets the roots spread as the tree grows.
 - ✓ Turn the soil in your hole approximately 6 inches deep and break up any big chunks.
 - ✓ Remove your seedling from the tube and take the plastic wrapper off the root plug.
 - ✓ Place the root plug just below the surface of the soil, so that the roots are completely covered.
 - ✓ Make sure you do not plant the seedling too deep. About an inch of soil on top is plenty.
 - ✓ Water the seedling and, if possible, cover your planting site with 2–3 inches of mulch.
 - ✓ Do not let the mulch touch the tree. This helps keep disease away from the tree
 - ✓ Water your seedling when it gets dry every week or two
- 5) Use a ruler and yardstick to try to estimate the height and width of the seedlings when fully grown.
- 6) Split students into groups of 3 or 4. Roles: digger, soil observer, hole measurer, habitat observer.
- 7) Each group should have a shovel and ruler. After explaining expectations when going outside, class goes to planting site.

- 8) When weeding, demonstrate how the roots of a small weed hold the soil in place. Discuss how much soil the roots of a huge tree keep in place and how that prevents erosion, or the soil being carried away. Then plant and water the tree seedling.
- 9) Students break into groups and record what types of soil components they see in the topsoil (rock, clay, silt, sand, humus).
- 10) After the tree seedlings are planted, gather the class together to identify the ways they have helped the environment

Planting a Tree (answer key)

1. What does our tree need to live?

food, water, air, light, place to grow

2. Draw a picture diagram of where we will plant our trees and how they will get everything they need.

(food from nutrients in soil, water from hose and rain and groundwater, air around it, light from sun, room to grow)

3. What will we look for when we choose a spot to plant?

The tree should be planted:

• at a safe distance from overhead power lines: at least 25 feet

• at a safe distance from underground power, cable, phone or gas lines.

• in a location that will receive direct sun and has well-drained soil

Planting a Tree (answer key), continued

4. What are the five components of soil?

rock, clay, silt, sand, humus

5. Which components of soil did you see?

6. List at least three ways planting a tree helps the environment.

Planting a tree helps the environment by:

• providing a renewable resource

• preventing soil erosion

• absorbing carbon dioxide and releasing oxygen

• reducing pollution and harmful greenhouse gases

7. Using complete sentences, write a paragraph about why you chose the place you did to plant your tree.
