Po Kok Primary School

寶覺小學

General Studies
Science Day

Come Back Can
P.6(A)

Name: Ishome

TASK: You are a scientist in the world 2022. You are doing an experiment on "come back can" because you want to understand the working principles of the come back can, and recognise that energy can be converted from one form into another.

Learning Objectives

1. Learn about the conversion of energy, i.e. energy can be converted into different forms.
2. Recognise that energy can be converted from one form into another.
3. Develop students' scientific mind.

General Skills that you are going to develop

1. Develop students' communication skills, **critical thinking skill, problem solving skills** and creativity through participating in different activities.

Knowledge you have already learned

1. The development and the driving power of machines.
2. Energy exists in different forms.
3. Energy can be converted from one form into another.

Self Learning Corner

Name of article	Website
Energy Efficiency & Conservation	http://www.gov.hk/en/residents/environment/energy
Energy Story	http://www.energyquest.ca.gov/story/index.html
Energyland	http://www.energyland.emsd.gov.hk/eng/index.htm
PowerWise	http://www.clponline.com.hk/ourEnvironment/MakeChangesWithPowerWise/PoerWise/Pages/Default.aspx/?lang=en
The Physics Classroom	http://www.physicsclassroom.com

Learning Procedure for this project

Steps	Learning Procedure	Expectation from you
1.	Revise different forms of energy	Pay attention in class and take the initiative to learn.
2.	Learn that energy can be converted into different forms	Pay attention in class. Read more information from website.
3.	Learn about the design of a "come back can"	Use your creativity and thinking skills.
4.	Think, discuss and come up with your own design	Cooperate with each other, listen and help.
5.	Collect materials and make a model	Participate and discuss.
6.	Presentations	Loud and clear. Be confident.
7.	Experiment with the model	Cooperative with each other. Use your critical thinking skills. Have scientific mind.
8.	Improve your design	Discuss and come up with a better design. Use critical thinking skills.
9.	Evaluations	Be honest and acknowledge your effort and your classmates' effort.

What is Energy?

Photo credit: corbisimages.com

Energy causes things to happen around us. Look out the window. The sun radiates light and heat energy. It helps plants to grow. At night, lamps in our home use electrical energy to light our rooms. When a car drives by, it is being powered by gasoline, a type of stored energy. The food we eat contains energy. We use that energy to work and play.

Energy Is the Ability to Do Work.

Energy can be found in a number of different forms. It can be chemical energy, electrical energy, heat (thermal energy), light (radiant energy), mechanical energy, and nuclear energy.

Changing Energy

Energy can be transformed into another sort of energy. But it cannot be created AND it cannot be destroyed. Energy has always existed in one form or another.

Here are some changes in energy from one form to another.

Stored energy in a flashlight's batteries becomes light energy when the flashlight is turned on.

Food is stored energy. It is stored as a chemical with potential energy. When your body uses that stored energy to do work, it becomes kinetic energy.

If you overeat, the energy in food is not "burned" but is stored as potential energy in fat cells.

A car uses stored chemical energy in gasoline to move. The engine changes the chemical energy into heat and kinetic energy to power the car.

A television changes electrical energy into light and sound energy.

Questions...

1. Name three kinds of energy form.

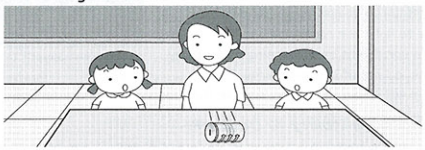
Chemical energy, kinetic energy and potential energy.

2. List one daily life example of changing energy.

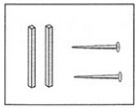
A lamp changes electrical energy into kinetic energy.

for example lamp

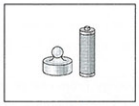
Apply the theory that energy can be converted from one form into another to design and make a come back can.



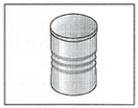
Materials



Short wooden sticks/screws
(Several pieces)



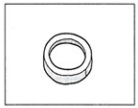
Heavy objects
(Several pieces)



A lidded metal can

Rubber bands
(Several pieces)

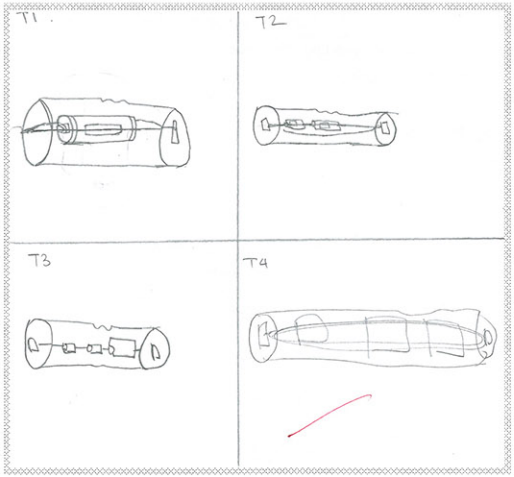
Scissors
(Several pairs)



Tape
(1 roll)

Activities

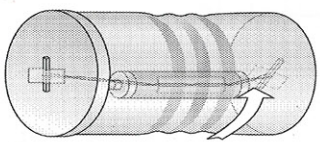
1. Now, you are given some materials to make a model of your own come back can. Draw your own design.



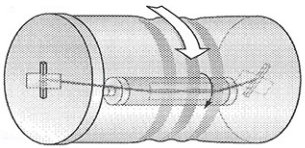
Introduce your design.
My model's name is IT2.
It is made of a can, batteries, tape, rubber bands, sticks
It moves when we move it.

This is how you make your design moves

When we push the come back can, it gains kinetic energy and rolls forwards. The battery inside the can dips due to the force of gravity, winding the rubber band and causing the kinetic energy gained by the can to be converted into potential energy and stored in the rubber band. When the forward motion of the can comes to an end, the potential energy stored in the rubber band will be converted into kinetic energy, making the can come back.



The can rolls forwards, winding the rubber band.



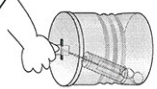
The rubber band unwinds so that the can rolls backwards.

How can we make a come back can move?

STEP 1

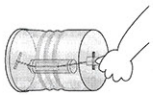
Use tape to fix a battery on the rubber band.

STEP 2



Pull one end of the rubber band through the bottom hole of the can. Then put a short wooden stick or a screw through the loop of the rubber band and secure it with tape.

STEP 3



Pull the other end of the rubber band through the hole on the lid. Again, put a wooden stick or a screw through the loop of the rubber band and secure it with tape. Put the lid back on the can.

Now you are given different materials to build a model of your come back can. Test the come back can in an open area. If the can does not come back as expected, guess the reasons and improve it.

Experiment Zone

Date: 8-12-14

Test	Design of the come back can	Put a ✓ if the come back can comes back as expected	If the can do not come back, guess the reasons.
1	1XC BTY	✓	
2	1XC BTY 1rubber band 1XAA BTY	✓ little bit faster	
3	1XBTY battery 2XAAA BTY 1 winded Rubber band	✓ much faster	
4	1XBTY 2XAABTY 2 wided rubber band	✓ super fast	
5			
6			
7			
8			
9			
10			

Critical thinking zone:

1. After making and testing our come back can, we found that:

The more weight it has the more faster it comes back and if we wind it up it comes faster too.

2. What factors affect the performance of the come back can?

Number of batteries, winded or not winded rubber band, the way you fix the batteries on the rubber band and if you secure the end or not.

Good Findings!

3. How can you improve your design to make the come back can work better?

- Weight of the heavy object
- How tight the rubber bands are pulled
- Number of rubber bands
- How the object is fixed on the rubber bands

We can use more batteries to increase the weight of the heavy object.

4. Try to explain the working principles of the come back can using the theory of energy conversion.

When we push the come backe can, it gains kinetic energy. The kinetic energy is converted into potential energy which is stored in the rubber band. When the can stops, the potential energy is converted into kinetic energy making the can move.

5. What have you learnt in this activity?

I have learnt that energy can be converted into different forms.

6. How did you solve the problems that you encountered in this activity?

I help solved the problems by involving actively in the activity and discussing with my groupmates.

Self Assessment

Put a tick in the appropriate boxes.

Scope	Learning Targets	☺	☹
Knowledge	Know about the working principles of the come back can.	✓	
	Understand that energy can be converted from one form into another.	✓	
Skills	Use simple materials to make the come back can.	✓	
	Analyse the problems encountered in testing and think about the ways to improve the design.	✓	
	Improve the design of the come back can.	✓	
	Present one's ideas and show one's creativity.	✓	
Attitude	Accept others' opinions and be able to cooperate with others.	✓	
	Record the results truthfully.	✓	
	Involve actively in the activity.	✓	

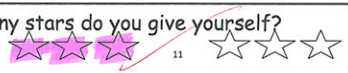
What have you learnt in the Science Day?

I have learnt about the working principles of the come back can.

How do you feel after doing the experiment?

I felt pleased

How many stars do you give yourself?



Peer Assessment

Find two classmates to give you some comments:

Name: Hehreen (Put a tick in the appropriate boxes.)

Scope	Learning Targets	☺	☹
Knowledge	Know about the working principles of the come back can.	✓	
	Understand that energy can be converted from one form into another.	✓	
Skills	Use simple materials to make the come back can.	✓	
	Analyse the problems encountered in testing and think about the ways to improve the design.	✓	
Attitude	Improve the design of the come back can.	✓	
	Present one's ideas and show one's creativity.	✓	
	Accept others' opinions and be able to cooperate with others.	✓	
	Record the results truthfully.	✓	

Comment: _____

Name: Alan (Put a tick in the appropriate boxes.)

Scope	Learning Targets	☺	☹
Knowledge	Know about the working principles of the come back can.	✓	
	Understand that energy can be converted from one form into another.	✓	
Skills	Use simple materials to make the come back can.	✓	
	Analyse the problems encountered in testing and think about the ways to improve the design.	✓	
Attitude	Improve the design of the come back can.	✓	
	Present one's ideas and show one's creativity.	✓	
	Accept others' opinions and be able to cooperate with others.	✓	
	Record the results truthfully.	✓	

Comment: _____

Teacher's Assessment

Scope	Learning Targets	☺	☹
Knowledge	Know about the working principles of the come back can.	✓	
	Understand that energy can be converted from one form into another.	✓	
	Mark:	2	
Skills	Use simple materials to make the come back can.	✓	
	Analyse the problems encountered in testing and think about the ways to improve the design.	✓	
	Improve the design of the come back can.	✓	
	Present one's ideas and show one's creativity.	✓	
	Mark:	4	
Attitude	Accept others' opinions and be able to cooperate with others.	✓	
	Record the results truthfully.	✓	
	Involve actively in the activity.	✓	
	Mark:	3	
	Hardworking and Participation(Max:2)	1	
	Total Mark:	10 /10	

Comment: You have the sense of scientific knowledge and always think how to improve the design. I'm really appreciate!

Parents' Assessment

Please tick the appropriate boxes.

Scope	Learning Targets		
Knowledge	Know about the working principles of the come back can.	✓	
	Understand that energy can be converted from one form into another.	✓	
Attitude	Accept others' opinions and be able to cooperate with others.	✓	
	Record the results truthfully.	✓	
	Involve actively in the activity.	✓	

Comment:_____

_____

_____

Signature of Parents: Jamilah

Encouragement:

The end.

You have done very well.