Po Kok Primary School

General Studies
Science Day

Come Back Can
P.6(B)

Name: Harjot

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

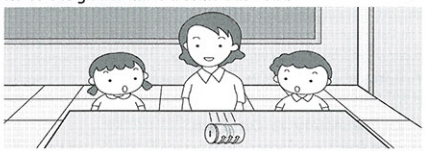
Energy can be transformed into another sort of energy. But it cannot be created AND it cannot be destroyed. Energy has always existed in one form or another.
Here are some changes in energy from one form to another.
Stored energy in a flashlight's batteries becomes light energy when the flashlight is 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...

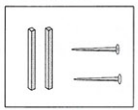
1. Name three kinds of energy form.
They are potential energy, kinetic energy and ~~stored energy~~

2. List one daily life example of changing energy.
Car moves ✗ Explain!
~~First~~ Chemical energy is converted to kinetic energy so that the car can move

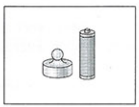
Apply the theory that energy can be converted from one form into another to design and make a come back can.



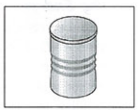
Materials



Short wooden sticks/screws
(Several pieces)

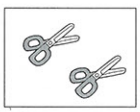


Heavy objects
(Several pieces)

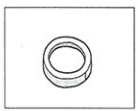


A lidded metal can

Rubber bands
(Several pieces)



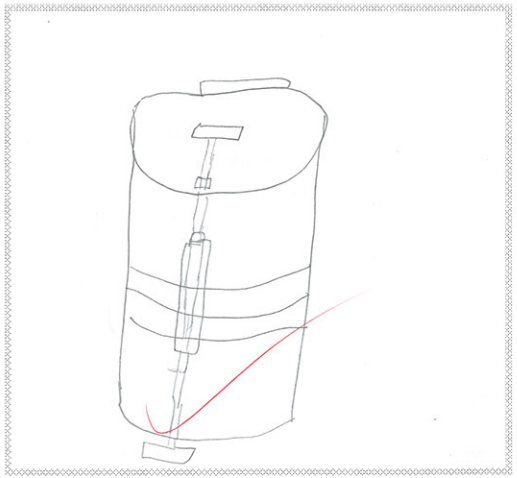
Scissors
(Several pairs)



Tape
(1 roll)

Activities

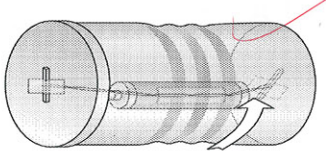
1. Now, you are given some materials to make a model of your own come back can. Draw your own design.



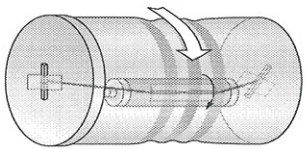
Introduce your design.
My model's name is Princess Anna.
It is made of 2 rubber bands, a tin can and one bag of sand.
It moves when we ~~push~~ roll it on the floor.

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 (back).



The can rolls forwards, winding the rubber band.



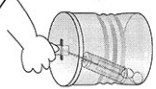
The rubber band unwinds so that the can rolls backwards.

How can we make a come back can move?

STEP 1

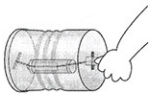
Use tape to fix a battery on the rubber band.

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: 2nd January 2015

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	2 rubber bands	×	rubber band not tight
2	1 rubber band	×	battery too heavy
3	4 rubber bands	✓	
4	5 rubber bands	✓	
5	4 rubber bands	✓	
6	4 rubber bands	✓	
7	4 rubber bands	✓	
8	4 rubber bands	✓	
9	4 rubber bands	✓	
10	4 rubber bands	✓	

Toy review

Critical thinking zone:

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

Our can moves fast and comes back fast. Aka it comes back in the same direction.

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

They are the weight of the heavy object number of rubber bands. weight (weight)

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

Explain

We can put 1 heavy battery and the rubber bands should be tight and there should be at least 2 rubber bands

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

The come back can gains kinetic energy and converts it into potential energy on the rubber band. It then converts potential energy into kinetic energy. That is why it comes back on its own.

5. What have you learnt in this activity?

I haved learnd how to make the come back can.

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

We made the come back can again.

How did you improve the design?

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 learned how to make the come back can.

How do you feel after doing the experiment?

I felt happy

Why?

How many stars do you give yourself?

☆☆☆☆☆

Peer Assessment

Find two classmates to give you some comments:

Name: Mateen (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: Very good boy

Name: Talona (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: Good job

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:	3	
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

Comment: Harjot knew what he was doing but he has to be more careful with words.

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: Kuo

Encouragement:

The end.

You have done very well.