



YSISTE

ASSESSMENT OF SCIENCE AND TECHNOLOGY ACHIEVEMENT PROJECT (ASAP)

Science and Technology Exemplars

Grade 1: Energy and Control – Energy in Our Lives

Exemplar Task (1ECPT01/Oct 2000)

Energy Walk



© York University, Oct 2000

Preface

This task is one of a series developed by the Assessment of Science and Technology Achievement Project (ASAP) which is being used for the ASAP Science and Technology Exemplars Project.

This task is organised in three parts:

- A. Task Overview
- B. Student task sheet – designed to be photocopied for the students
- C. Teacher Information – providing essential information relating specifically to this task

For further information, contact the ASAP office at 416-736-5269 or email: asap@edu.yorku.ca

Task Overview

Description of the Task:



This is a culminating activity designed to assess a cluster of expectations for this grade and strand. Students should have been taught the concepts and skills required to perform this task prior to its delivery.

As a class, the students go on a walk around the school or the community. Students identify the everyday examples of energy use in their school or community. Students then create a poster to show the various forms of energy they have observed and how they are controlled. They will then solve problems related to energy use.



Materials and Equipment Required:

paper
pencils
pencil crayons

crayons
art materials
poster paper

hairdryer

Note: The hairdryer could be substituted with a fan



Suggested Timeline:

- 30 minutes for walk
- 1 hour for poster
- 1 hour for questions on sheet



Suggested Grouping:

- paired for walk
- groups of 3-4 for the poster/collage
- individual to answer questions



Safety Considerations:

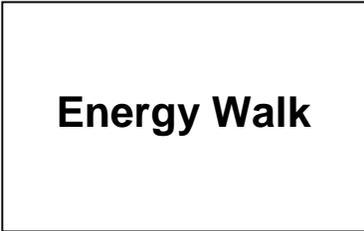
- road safety while on walk
- use of scissors for poster/collage

ASSESSMENT OF SCIENCE AND TECHNOLOGY ACHIEVEMENT PROJECT (ASAP)

Science and Technology Exemplars Project

Grade 1: Energy and Control – Energy in our Lives

Exemplar Task (1ECPT01/Oct 2000)



Energy Walk

Student Task Sheets

Energy Walk

Go on an energy walk around your school or in your community. Look for as many examples of energy use that you can see.

Make a poster/collage to show the examples of energy use that you saw.

1. What example did you like best?

2. Why did you like this example?

3. What example would you like to learn more about?

4. What gave you the energy to go for the walk?

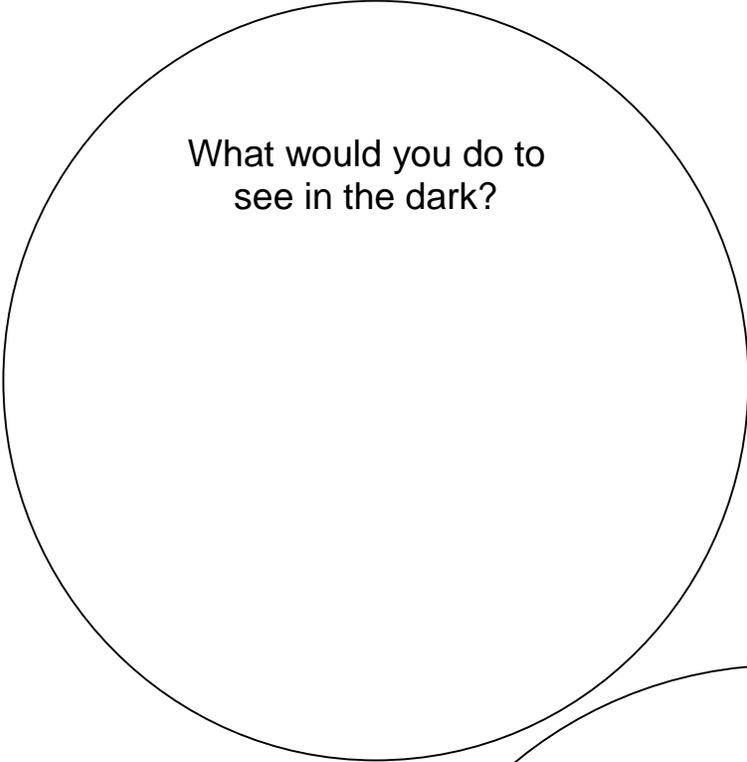
5. What gives the energy for all life on earth?

Draw a picture of this

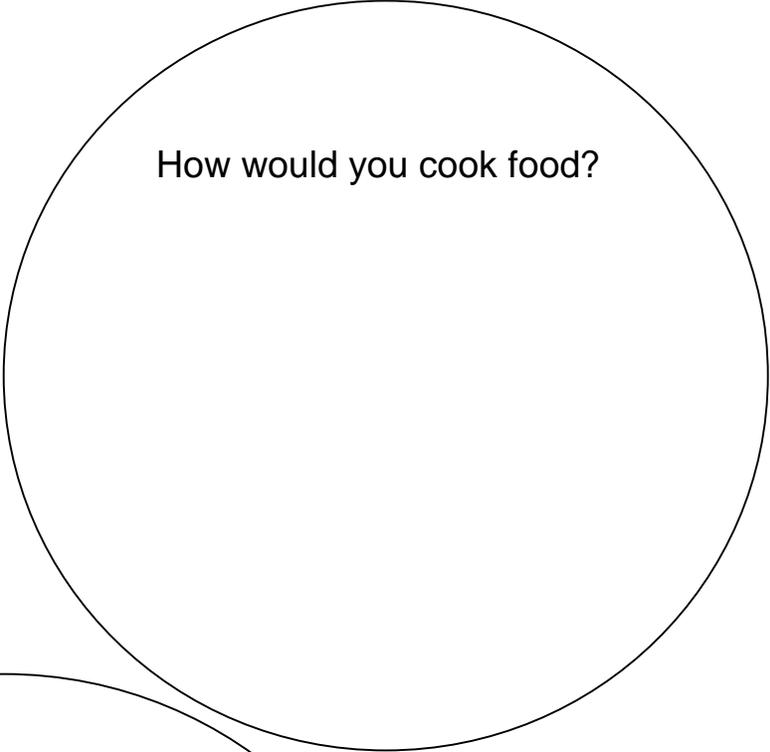
Solve this energy problem:

6. Pretend you are at home and the lights go out.

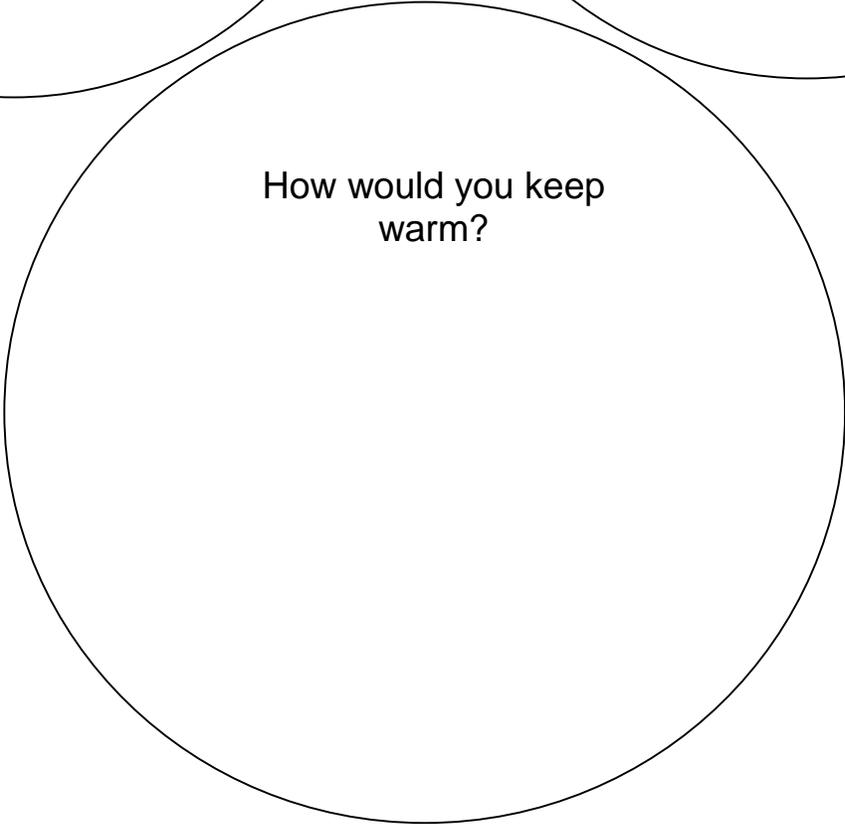
Draw pictures to show how you would solve these problems.



What would you do to see in the dark?



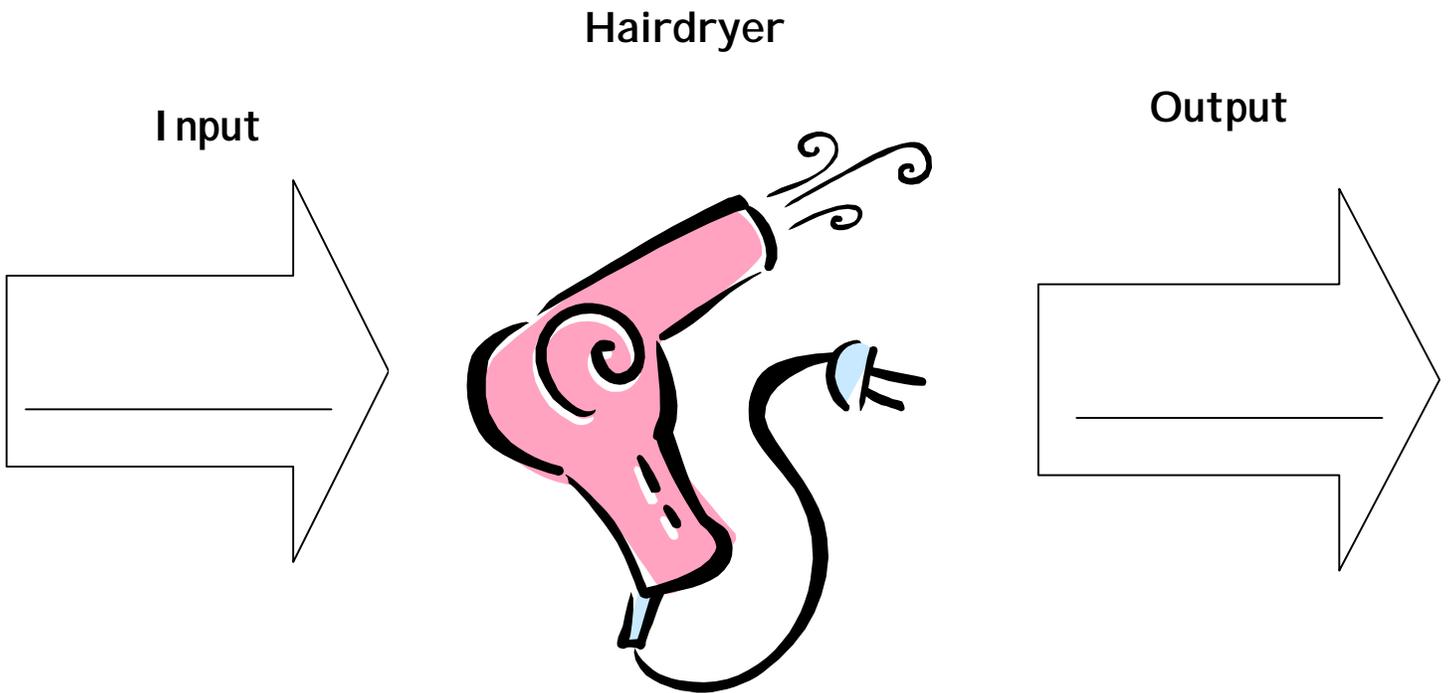
How would you cook food?



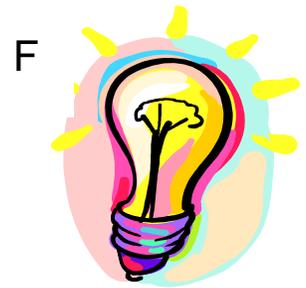
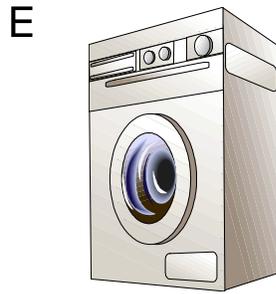
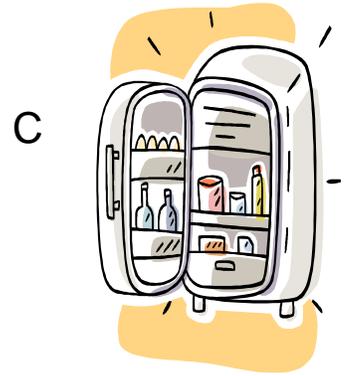
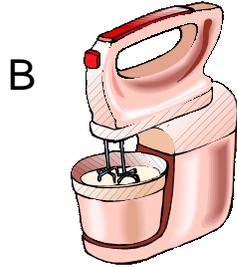
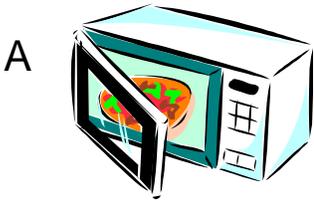
How would you keep warm?

7. Use the hairdryer in your class. Turn it on and off.

Look at this picture of a hairdryer. Write what the **input** energy is and what the **output** energy is.



We use energy in many different ways.



8. Make a list of the ways that you can **save** energy in each picture.

- A

- B

- C

- D

- E

- F

ASSESSMENT OF SCIENCE AND TECHNOLOGY ACHIEVEMENT PROJECT (ASAP)

Science and Technology Exemplars Project

Grade 1: Energy and Control – Energy in our Lives

Exemplar Task (1ECPT01/Oct 2000)



Energy Walk

Teacher Information Sheets

This task addresses the following cluster of expectations. Expectations assessed by the rubric are highlighted in bold.



Understanding Basic Concepts

- **recognise that the sun is the principal source of energy used on the surface of the earth**
- **identify food as a source of energy for themselves and other living things**
- **identify everyday uses of energy (e.g., gas to heat our homes, electricity to cook our food)**

Developing Skills of Inquiry, Design and Communication



- **ask questions about and identify needs and problems related to energy production or use in the immediate environment, and explore possible answers and solutions (e.g., discuss how people might cope with a power failure at home – by using candles for light, the barbecue for outdoor cooking, the fireplace for heat)**
- **use appropriate vocabulary in describing their investigations, explorations, and observations (e.g., use words such as electricity, lights, energy)**
- **record relevant observations, findings and measurements using written language, drawings, concrete materials and charts (e.g., create an energy poster illustrating the various forms of energy used in daily life and how they are controlled)**

Relating Science and Technology to the World Outside the School



- describe the different forms of energy used in a variety of everyday devices (e.g., coiled springs in wind-ups toys, wood in fireplaces)
- identify devices they use that consume energy (e.g., lights, computers) and **(list things they can do to reduce energy consumption (e.g., turn lights out when leaving a room))**



Prior Knowledge Required:

Before attempting this task students should have been taught the following:

- that the sun is the main source of energy for the earth
- that food gives them the energy to move and live
- everyday uses of energy (e.g., heating-gas, cooking-electricity, moving-food, light-electricity)
- that the input energy of a hairdryer is electricity and the output is heat, sound and movement
- ways to reduce energy consumption



Students should be familiar with the following science and technology terminology:

- energy
- input
- output



Prior Skills Required:

Before attempting this task students should have experience of the following:

- poster or collage making
- use of materials and equipment
- road safety skills



Suggested Introductory Activities:

The following activities are suggested to introduce this task to the students:

- review previous knowledge
- discuss and explain the walking activity
- suggest they keep some sort of record of the uses of energy they see on the walk; after returning from the walk brainstorm the uses they have noticed
- discuss and explain the questions
- brainstorm ideas for answers



Cross-strand Links:

Links can be made to Grade 1 Earth and Space Systems. The specific expectations that could be addressed are:

- identify the sun as a source of heat and light
- identify features of houses that help keep us sheltered and comfortable through seasonal and daily cycles

A link could also be made to Grade 1 Life Systems. The specific expectation that could be addressed are:

Every strand in the Science and Technology document has common set of expectations clustered under the title ***Developing Skills of Inquiry, Design and Communication***. This task is therefore appropriate to assess and evaluate these skills for every Grade 1 strand.



Cross-curricular Links:

This activity provides a cross-curricular link with;

- *The Ontario Curriculum Grades 1-8 Language, Grade 1: Oral and Visual Communication – Group Skills*
- *The Ontario Curriculum Grades 1-8: Social Studies, Grade 1: The Local Community*
- *The Ontario Curriculum Grades 1-8: The Arts Grade 1: Visual Arts*
- *The Ontario Curriculum Grades 1-8 Health and Physical Education, Grade 1: Active Participation*



Reading and Writing Skills:

This task has been constructed to take into account the possible limited reading and writing skills of some students at this grade level. At the end of Grade One students are expected to be able to write a simple sentence (see MET Writing Exemplars 1999). Depending on the achievement level of the children in the class and the time in the school year that this task is administered, teachers will need to take into account the diverse abilities in their classes. The task could be presented orally and evaluated through teacher/student conferences. Teachers could use the questions on the student task sheet to guide their conferences. Students could make oral presentations about their observations to the class. Their presentation could be based upon the questions outlined in the student task sheet. Grade 5/6 students could act as reading/writing buddies to read out questions and transcribe answers



Considerations for Combined Grade Classes:

Appropriate strategies are as follows:

- Teach one grade while the other grade completes the task which does not require active teacher guidance
- Create separate learning centers for student investigation specific to each grade topic and strand. The methods of science and technology (inquiry and communication) would provide the whole class focus
- Take a common field trip (energy walk) with the whole class but direct study for each grade toward particular grade expectations (e.g., Grade 1: Energy and Control and Grade 2: Structures and Mechanisms)
- Make thematic connections by clustering the overall expectations around a unifying organizer such as “Form and Function”.



ENERGY WALK

TEACHER OBSERVATION RATING SCALE

Student Name: _____

Please number student work to correspond with the rating scale

Criterion	Score			
	1	2	3	4
Describe many uses of energy during the energy walk				
Explains clearly from the picture what example the student likes best				
Explains clearly from the picture what example the student wants to learn more about				
Demonstrates effective problem solving skills with the examples presented				
Demonstrates clear understanding of ways to conserve energy from the examples provided				

Student Name: _____

Date: _____

Energy Walk
for use with **Subtask 1: Energy Walk**
from the Grade 1 Unit:

Expectations for this Subtask to Assess with this Rubric:

- 1s51 - identify everyday uses of energy (e.g., gas to heat our homes, electricity to cook our food);
- 1s55 - ask questions about and identify needs and problems related to energy production or use in the immediate environment, and explore possible answers and solutions (e.g., discuss how people might cope with a power failure at home – by using candles for light, the barbecue for outdoor cooking the fire place for heat);
- 1s60 - describe the different forms of energy used in a variety of everyday devices (e.g., coiled springs in wind-up toys, wood in fireplaces);
- 1s62 - identify devices they use that consume energy (e.g., lights, computers) and list things they can do to reduce energy consumption (e.g., turn lights out when leaving a room);

Category/Criteria	Level 1	Level 2	Level 3	Level 4
Understanding of basic concepts	<ul style="list-style-type: none"> ◆ shows understanding of few of the everyday uses of energy ◆ gives explanations showing limited understanding of the concepts 	<ul style="list-style-type: none"> ◆ shows understanding of some of the everyday uses of energy ◆ demonstrates minor misconceptions ◆ gives partial explanations 	<ul style="list-style-type: none"> ◆ shows understanding of most of the everyday uses of energy ◆ demonstrates no significant misconceptions ◆ usually gives complete or nearly complete explanations 	<ul style="list-style-type: none"> ◆ shows understanding of all of the everyday uses of energy ◆ demonstrates no misconceptions ◆ always gives complete explanations
Inquiry and design skills and communication	<ul style="list-style-type: none"> ◆ explores few of the needs and problems related to energy use in the community 	<ul style="list-style-type: none"> ◆ explores some of the needs and problems related to energy use in the community 	<ul style="list-style-type: none"> ◆ explores most of the needs and problems related to energy use in the community 	<ul style="list-style-type: none"> ◆ applies all (or almost all) of the required skills and strategies to explore answers to the uses and problems related to energy use
Relating of science and technology to each other and to the world outside the school	<ul style="list-style-type: none"> ◆ shows little understanding of connections between energy use and energy conservation 	<ul style="list-style-type: none"> ◆ shows some understanding of connections between energy use and energy conservation 	<ul style="list-style-type: none"> ◆ shows clear understanding of connections between energy use and energy conservation 	<ul style="list-style-type: none"> ◆ shows consistent understanding of connections between energy use and energy conservation

