
Toys, Toys, Toys

Structures and Mechanisms



Including:
A Handful of Machines
The Way Things Work
The Assembly Line
Testing Grounds
Advertising and Promotion
The Toy Factory

An Integrated Unit for Grade 2

Written by:

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Length of Unit: approximately: 15.2 hours

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Toys, Toys, Toys **Structures and Mechanisms An Integrated Unit for Grade 2**

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Toys, Toys, Toys Structures and Mechanisms An Integrated Unit for Grade 2

Task Context

Grade 2 students are intuitively interested in the way things work. This unit will motivate students by sparking their interest in moving objects by connecting their learning to familiar objects and engaging mechanisms. Within this unit, the Catholic learner will explore the movement of objects, discover the basic mechanics of simple machines, and apply new skills and knowledge in a design of their own. As outlined in the Catholic Graduate Expectations, students will collaborate throughout the subtasks to gather information and explore new concepts. They will use key positional vocabulary and movement words when communicating their learning.

Catholic Graduate Expectations

CGE 3c - thinks reflectively and creatively to evaluate situations and solve problems.

CGE 5a - works effectively as an interdependent team member.

CGE 5e - respects the rights, responsibilities, and contributions of self and others.

Task Summary

LEARN

The students will learn the basic characteristics and functions of simple machines (wheel and axle, inclined plane, pulley, and lever).

They will acquire and use appropriate language to describe motion.

The students will learn some components of media literacy and how to advertise their product. They will also learn about the social responsibility to be truthful and moral when promoting products.

DO

The students will describe the relationship between stationary and moving objects.

They will manipulate the type and direction of the movement of an object.

PRODUCE

The students will design and build a simple machine.

Culminating Task Assessment

Students will be given the following challenge:

The Handy Dandy Toy Company is losing business. Boys and girls are no longer buying their toys. You are a newly-hired toy designer working for the company.

- 1) Design and build a new toy that includes moving parts.
- 2) You will have to submit a blueprint and build a model of your toy using objects and materials found at home or at school.
- 3) Be prepared to make an oral presentation to discuss and demonstrate your toy.
- 4) Design a layout for a print ad to promote your toy and create a poster that would encourage boys and girls to buy it.

Catholic Graduate Expectations

CGE4a - who demonstrates flexibility and adaptability,

CGE4e - sets appropriate goals and priorities in school, work, and personal life

CGE4f - applies effective communication, decision-making, problem-solving, time and resource management skills.

Links to Prior Knowledge

The students will have to:

- have an understanding of position (above, below...)
- handle tools and material in a safe manner (scissors, hammers, markers...)
- have sufficient observational skills to distinguish movement (rolling, spinning...)
- have sufficient communication skills to give their oral presentation

Students should have been exposed to Structures and Mechanisms Grade 1 Expectation:
1s84 – Examine different kinds of fasteners and indicate where they are used.

Students should also have been exposed to Mathematics Data Management and Probability Grade 1 Expectations:

1m103 – Organize materials on concrete graphs and pictographs using one to one correspondence

1m104 – Read and discuss data from graphs made with concrete materials and express understanding in a variety of informal ways.

Students must be able to measure linear length, time, and mass.

Considerations

Notes to Teacher

Background Information for the Teacher

A machine is a tool used to make work easier. Simple machines are simple tools used to make work easier. Compound machines have two or more simple machines working together to make work easier.

In Science, work is defined as a force acting on an object to move it across a distance. Pushing, pulling, and lifting are common forms of work. Furniture movers do work when they move boxes. Gardeners do work when they pull weeds. Children do work when they go up and down on a seesaw. Machines make their work easier. The furniture movers use a ramp to slide boxes into a truck. The gardeners use a hand shovel to help break through the weeds. The children use a seesaw to go up and down. The ramp, the shovel, and the seesaw are simple machines.

If two or more simple machines work together as one, they form a compound machine. Most of the machines we use today are compound machines, created by combining several simple machines.

Levers

A lever is a type of simple machine that makes jobs easier. The lever rests on a fulcrum. This is the pivot point that allows the fulcrum to tilt to the heavier side when there is uneven weight. The load is the amount of weight that is put on one side, and this amount makes the lever tilt to a heavier side.

There are three different classes of levers. First-class levers, second-class levers, and third-class levers. Things like hand carts, scissors, pliers, and nail extravagators are all examples of first-class levers. Examples of second-class levers would be wheelbarrows and bottle openers. Hammers, tweezers, and fishing rods are all examples of third-class levers.

Inclined Plane

A plane is a flat surface. For example, a smooth board is a plane. Now, if the plane is lying flat on the ground, it isn't likely to help you do work. However, when that plane is inclined or slanted, it can help you move objects across distances. And that's work! A common inclined plane is a ramp. Lifting a heavy box onto a loading dock is much easier if you slide the box up a ramp – a simple machine.

Wheel and Axle

The rotation of the lever against a point pries objects loose. The rotation motion can also do other kinds of work. Another kind of lever, the wheel and axle, moves objects across distances. The wheel (the round end) turns the axle (the cylindrical post) causing movement. On a wagon, for example, the bucket rests on top of the axle. As the wheel rotates the axle, the wagon moves. Now place your pet dog in the bucket, and you can easily move him around the yard. On a truck, the cargo hold rests on top of several axles. As the

wheels rotate the axles, the truck moves.

Pulley

Instead of an axle, the wheel could also rotate around a rope or cord. This variation of the wheel and axle is the pulley. In a pulley, a cord wraps around a wheel. As the wheel rotates, the cord moves in either direction. Now attach a hook to the cord, and you can use the wheel's rotation to raise and lower objects. On a flagpole, for example, a rope is attached to a pulley. On the rope, there are usually two hooks. The cord rotates around the pulley and lowers the hooks where you can attach the flag. Then, rotate the cord and the flag raises high on the pole.

Additional Learning Centres

During the course of this unit, the teacher is encouraged to set up a display of toys that can be taken apart and reassembled by the students. Some other mechanisms such as old wind-up clocks, timers, or small non-electrical appliances that students can take apart can also be added to an activity centre. Set out appropriate and safe tools for students to use. Nuts, bolts, wrenches can also be set out. Many students have mechanical building sets that they may wish to bring in to the classroom for the duration of the unit.

Safety Precautions

It is important to take the time to establish and review safety routines. A suggested reference is the safety document for Ontario Schools, *Be Safe*, produced by Science Teacher's Association of Ontario.

Assessment

This unit provides opportunities for diagnostic (assessing prior knowledge and skills), formative (ongoing throughout the unit to provide feedback to the students and to track their progress), and summative assessment (the culminating task). Opportunities for peer and self-assessment have also been included. It is also suggested that pieces from this unit will be included in the students portfolio.

You should also note that, even though this is a science unit, assessment is being gathered that can be used in Language, Math, Visual Arts, as well as Learning Skills.

Work Sheets/Self- and Peer Assessments/Illustrations

Because of the function and variety of hardware, no illustrations were added but we do encourage the teacher to add illustrations that the children are familiar with, are seasonal, and enhance the paper and pencil task. Please check school resources and the websites for appropriate illustrations.

Things to Do Before Beginning Unit

Teachers may want to contact their local high school or community businesses to make arrangements for someone to come in and speak to the children on blueprints. (Be sure to check with your principal before inviting visitors to your school.)

Send a letter home or include a section in your regular newsletter explaining the unit and asking parents to save items such as toilet paper rolls, shoe boxes, wrapping paper rolls, cardboard, etc. that may be needed for the construction of simple mechanisms (see BLM 1 Parent Letter). Also needed in this unit are simple assembly instructions from shelving or microwave stands, interlocking bricks, etc.

Toys, Toys, Toys
Structures and Mechanisms An Integrated Unit for Grade 2

1 A Handful of Machines

In this subtask, students will look at machines in the classroom and at home. They will discover that many of the machines in our environment are comprised of smaller simple machines. They will observe how they work, describe their function, and learn how to operate them safely.

Catholic Graduate Expectations

CGE4e - sets appropriate goals and priorities in school, work, and personal life
 CGE4f - applies effective communication, decision-making, problem-solving, time and resource management skills

2 The Way Things Work

Students will be taking an in-depth look at the different types of simple machines and how they function. During this subtask, they will have the opportunity to participate in many hands-on activities as well as demonstrations. Students will also develop a dictionary that highlights the vocabulary connected to simple machines.

Catholic Graduate Expectations

CGE3f - examines, evaluates, and applies knowledge of interdependent systems (physical, political, ethical, socio-economic, and ecological for the development of a just and compassionate society.)

3 The Assembly Line

Working in small groups, students will design and build a machine for use at home or in the classroom community that will make life easier. The machine must use one or more of the simple machines explored in subtask 2. A focus will be placed on attaching and fastening both permanent and replaceable parts together.

Students will also create a blueprint of their mechanism as well as a blueprint container.

Catholic Graduate Expectations

CGE5a - works effectively as an interdependent team member.
 CGE5e - respects the rights, responsibilities, and contributions of self and others.
 CGE5g - achieves excellence, originality, and integrity in their own work and supports these qualities in the work of others.

4 Testing Grounds

In this subtask, the students will conduct experiments dealing with movement of objects on a variety of surface planes and carrying different loads. The students will test the vehicle to see how far it moves. They will hypothesize the results and graph them to communicate their findings. Students will be working in a variety of groupings.

Catholic Graduate Expectations

CGE3b - creates, adapts, and evaluates new ideas in light of the common good
 CGE3c - thinks reflectively and creatively to evaluate situations and solve problems
 CGE3f - examines, evaluates, and applies knowledge of interdependent systems (physical, political, ethical, socio-economic, and ecological) for the development of a just and compassionate society.
 CGE5a - works effectively as an interdependent team member
 CGE5e - respects the rights, responsibilities, and contributions of self and others
 CGE5g - achieves excellence, originality, and integrity in one's own work and supports these qualities in the work of others.

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5 Advertising and Promotion

Through writing and illustrating, the students will learn key elements of communication. This information will be used to create a poster that illustrates the design features of their simple mechanism (constructed in subtask 3) that make it a desirable product.

Catholic Graduate Expectations

CGE2a - listens actively and critically to understand and learn in light of gospel values

CGE2b - reads, understands, and uses written materials effectively

CGE2c - presents information and ideas clearly and honestly and with sensitivity to others

CGE2d - writes and speaks fluently in one or both of Canada's official languages.

6 The Toy Factory

Students will be given the following challenge:

The Handy Dandy Toy Company is losing business. Boys and girls are no longer buying their toys. You are a newly-hired toy designer working for the company.

- 1) Design and build a new toy that includes moving parts.
- 2) You will have to submit a blueprint and build a model of your toy using objects and materials found at home or at school.
- 3) Be prepared to make an oral presentation to discuss and demonstrate your toy.
- 4) Design a layout for a print ad to promote your toy and create a poster that would encourage boys and girls to buy it.

Catholic Graduate Expectations

CGE4a - who demonstrates flexibility and adaptability,

CGE4e - sets appropriate goals and priorities in school, work, and personal life

CGE4f - applies effective communication, decision-making, problem-solving, time and resource management skills.

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Structures and Mechanisms An Integrated Unit for Grade 2

80 mins

Description

In this subtask, students will look at machines in the classroom and at home. They will discover that many of the machines in our environment are comprised of smaller simple machines. They will observe how they work, describe their function, and learn how to operate them safely.

Catholic Graduate Expectations

CGE4e - sets appropriate goals and priorities in school, work, and personal life

CGE4f - applies effective communication, decision-making, problem-solving, time and resource management skills

Expectations

- 2s68 • recognize that different mechanisms and systems move in different ways, and that the different types of movement determine the design and the method of production of these mechanisms and systems.
- 2s69 – describe different mechanisms through observation and investigation (e.g., hinge, inclined plane), and identify the components that are simple machines (e.g., lever, wedge);
- 2s77 – record relevant observations, findings, and measurements, using written language, drawings, charts, and concrete materials (e.g., record what happens to the movement of a vehicle released from a ramp if the size of its wheels is changed);
- 2e1 • communicate ideas (thoughts, feelings, experiences) for specific purposes (e.g., write a paragraph describing a trip to the farm for classmates);
- 2e2 • organize ideas in a logical sequence (e.g., write stories that have a beginning, middle, and end);
- 2e5 • use some materials from other media (e.g., collage) to enhance their writing;
- 2e7 • use and spell correctly the vocabulary appropriate for this grade level;
- 2e8 • use correctly the conventions (spelling, grammar, punctuation, etc.) specified for this grade level (see below).
- 2e17 – correctly spell words identified by the teacher;
- 2e20 – begin to use resources (e.g., personal dictionary, classroom-displayed vocabulary) to confirm spelling;
- 2e21 – use words from their oral vocabulary, personal word lists, and class lists compiled through brainstorming;
- 2e23 – use words and pictures to create a message;
- 2e25 – print legibly;
- 2e32 • understand the vocabulary and language structures appropriate for this grade level;
- 2e47 • communicate messages, and follow instructions and directions;
- 2e48 • listen to discussions on familiar topics and ask relevant questions;
- 2e51 • apply the rules of participating in a conversation and working with others;
- 2e60 – participate in group discussions, demonstrating a

Groupings

Students Working As A Whole Class
 Students Working In Pairs
 Students Working Individually

Teaching / Learning Strategies

Advance Organizer
 Brainstorming
 Classifying
 Discussion
 Homework

Assessment

Assessment Criteria:

Students can identify machines in the environment.
 Students can describe the function of machines.
 Students can identify safety rules.

The teacher will make anecdotal comments. He/she should focus on those students who have difficulty or require assistance to identify machines or explain their function. These students may need assistance in understanding the vocabulary or some of the concepts presented in the unit.

Assessment Strategies

Observation
 Performance Task

Assessment Recording Devices

Anecdotal Record

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80 mins

- sense of when to speak, when to listen, and how much to say;
- 2e61 – use speech appropriately for various purposes (e.g., to influence others in the group);
- 2s70 – describe, using their observations, the characteristics and movements of simple mechanisms (e.g., hinge, wheels and axle);
- 2s71 – describe, using their observations, the position of an object in relation to other objects or to a specific area (e.g., use such words as over, under, beside, behind);
- 2s72 – identify changes in the position of an object in relation to other objects (e.g., movement upward or to the left);
- 2s73 – describe, using their observations, the pattern of movement of objects (e.g., turning, spinning, swinging, bouncing, vibrating).
- 2s76 – use appropriate vocabulary to describe their investigations, explorations, and observations (e.g., use words such as rotate, turn, faster, and slower to describe the motion of wheels and axles);
- 2p3 • outline safety rules and safe practices;
- 2p11 – identify safety rules to be followed in the home, school, and community (e.g., electrical safety, schoolyard rules, bus safety);

Teaching / Learning

Day 1

- 1) Read a story to the students about a machine (see Resources for suggestions).
- 2) Ask students what they think a machine is (see subtask notes for a definition). List all of their ideas on chart paper.
- 3) Look around the classroom and find objects that help people do work (pencil sharpener, door stop, computer, overhead projector, tape player, TV, VCR, AV Cart, etc.).
- 4) Hand out an advance organizer (see BLM 2 Machines in Our Classroom). Have the children fill it in working in pairs for a given simple machine, the pencil sharpener. Using chart paper that has been divided into six sections, have students draw and name some machines found in the classroom. Have the group include a caption or sentence that explains how the machine helps the teacher or student do a job.
- 5) Have several pairs present their advance organizer, positively reinforcing their work.
- 6) Have the students fill in the rest of their pages choosing machines of their choice. Have each group present one of their pages to the class. Introduce vocabulary such as load, effort, push, pull, force as the discussion progresses.

Homework Assignment

Provide each student with a booklet, made by using BLM 3 and BLM 4. A cover is provided in BLM 3 entitled "Machines We Use At Home," as well as pages for their illustrations and work (BLM 4). Ask students to take the booklet home and find some helpful machines around the house. Students may include as many machines as they wish. Depending on the time of year, students may be able to describe the function of the simple machines.

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Day 2

- 1) Have each student present their booklet. Teacher creates a master list of machines on chart paper, adding only new machines found in each student's work. Continue to encourage vocabulary in discussions.

- 2) Have students classify the list into machines with moving parts and machines with non-moving parts. Have the students classify the machines in their booklet into two groups:
 - Machines With Moving Parts
 - Machines Without Moving Parts

- 3) In a whole class grouping, brainstorm some rules for using machines and/or tools safely. Add to the list as the unit progresses.

Adaptations

Refer to individual IEPs of exceptional learners to make meaningful adaptations for these students in consultation with the school's Special Education and ESL teachers. Whenever possible, consult with parents concerning reinforcement of learning expectations and appropriate working conditions at home. Partnering students with those who have strong communication skills for modelling of language, pronunciation, and listening would be beneficial. Discuss with students to ensure that they understand each task, and check often for comprehension of expectations and activities which will ensure maximizing their potential.

It would also be of benefit to review the Special Education Companion found in the Library Section of the Curriculum Planner.

Resources

	Parent Letter	BLM1.cwk
	Machines in Our Classroom BLM 2	blm2.cwk
	Machines We Use at Home BLM 3	blm3.cwk
	Booklet Pages BLM 4	blm4.cwk
	Matthew and the Midnight Tow Truck	Morgan, Allen
	How Do You Lift a Lion?	Wells, Robert
	Mike Mulligan and His Steam Shovel	Burton, Virginia Lee
	The Wheels of the Bus	Kovalski
	Wheels and Cars	Williams, John
	Larry's Racing Machine	Lowery, Lawrence
	Be Safe	Science Teacher's Association of Ontario



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80 mins

Notes to Teacher

Teacher Reflections

Description

Students will be taking an in-depth look at the different types of simple machines and how they function. During this subtask, they will have the opportunity to participate in many hands-on activities as well as demonstrations. Students will also develop a dictionary that highlights the vocabulary connected to simple machines.

Catholic Graduate Expectations

CGE3f - examines, evaluates, and applies knowledge of interdependent systems (physical, political, ethical, socio-economic, and ecological for the development of a just and compassionate society.)

Expectations

- 2s66 • describe the position and movement of objects, and demonstrate an understanding of how simple mechanisms enable an object to move;
- 2s68 • recognize that different mechanisms and systems move in different ways, and that the different types of movement determine the design and the method of production of these mechanisms and systems.
- 2s70 – describe, using their observations, the characteristics and movements of simple mechanisms (e.g., hinge, wheels and axle);
- 2s71 – describe, using their observations, the position of an object in relation to other objects or to a specific area (e.g., use such words as over, under, beside, behind);
- 2s72 – identify changes in the position of an object in relation to other objects (e.g., movement upward or to the left);
- 2s73 – describe, using their observations, the pattern of movement of objects (e.g., turning, spinning, swinging, bouncing, vibrating).
- 2s82 – identify, through observation, the mechanical parts of objects (e.g., hinges on doors) and describe the motion of these parts;
- 2s83 – compare the motion of objects on different surfaces (e.g., wheels of a toy on carpet, tile, and sand);
- 2s84 – compare the motion of similar objects made with or filled with different materials (e.g., ways in which baseballs and tennis balls bounce; ways in which film canisters containing different materials roll down a slope);
- 2s86 – describe, using their observations, the effects of changing the slope of an inclined plane on the motion of an object that is placed on it (e.g., changes in speed, changes in distance travelled);
- 2s85 – describe, using their observations, the effect that different surfaces (e.g., wood, tiles, carpet, water) have on the rate at which an object slows down;
- 2s89 – demonstrate awareness that the wheels of a vehicle rotate clockwise or counterclockwise depending on the direction of movement of the vehicle.
- 2s88 – identify different ways in which wheels and axles

Groupings

- Students Working In Small Groups
- Students Working As A Whole Class

Teaching / Learning Strategies

- Brainstorming
- Discussion
- Learning Centres

Assessment

Assessment Criteria:

Group Skills

- sharing tasks
- sharing responsibility
- taking turns
- listening to the ideas of others

Assessment Strategies

- Observation

Assessment Recording Devices

- Checklist
- Anecdotal Record

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- 2s87 can be attached to a chassis (e.g., by using an axle-holder, by placing the axle in holes drilled in the frame);
- predict factors that make a load easier or more difficult to move (e.g., the size of a wheel or hinge, the amount of friction);

Teaching / Learning

Part One - A Walk Around the Classroom

- 1) Have students identify the machines that are in the classroom both those with moving parts and those without.
- 2) Discuss how each of these machines work.
- 3) Make a classroom chart to list these machines. As students move around the school and the playground outside, add other machines that they find to the list.
- 4) Some of the equipment may not be suitable for the students to use independently. It may be appropriate to engage the use of a volunteer to supervise the use of the hammer or crowbar. Demonstrate the safe use of any of the equipment that has been set out for the centres. For example, make sure the students can get the claws under the head of the nail if you intend for them to use it.

Note: A demonstration of how to use the equipment safely should be done before the students begin the centres.

Part Two - The Way Things Work

This task consists of four centres. Have the students work in groups of five or six to move through the centres. At each centre have students assume the cooperative roles of recorder, reporter, air traffic controller, and encourager (these job descriptions are found in *Cooperative Learning* by Dr. Spence Kagan) or any others that suit the make-up and needs of your classroom. It will take at least two 40-minute lessons for all students to move through the centres. The teacher should visit the centres and offer guidance and assistance to students as they explore the materials.

Centre One - The Lever

Demonstration: Using a metre stick show students how to find the centre of balance. Balance the ends of the metre stick on the pointer finger of two hands and slide the fingers towards the centre. When the metre stick balances on one finger you have found the centre of balance. Students can try the same thing with a 30 cm ruler. If you tape some coins to one side of the ruler, the centre of balance will change (closer to the side with the weight).

Set out the following materials:

- scissors with paper
- bottle opener
- small crowbar
- claw hammer and a piece of board with a nail hammered in
- sand shovel with a bin of dried beans or sand
- wrench with a nut and bolt

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- a balance scale with some centicubes or other weights
- door wedge
- teeter-totter

Have students explore and test each of the levers. Direct them to talk about each one and the way they work. Have the students discuss and record the answers to the following questions for any two of the levers.

- What is the job of each mechanism?
- How does the mechanism do its job?
- What part of the mechanism has to move for it to do its job?
- Describe what happens when it moves.

Begin a picture dictionary for this unit (see Resources BLM 5 for template). Have students include a picture of at least two of the mechanisms with a caption naming it and describing its function. (E.g.: The nutcracker is a machine made up of two levers. It squeezes the nut until the shell cracks.)

Centre Two - The Wheel and Axle

Investigation: Have students bring in a collection of toys and tools with wheels. Look closely to see how the wheels work. Find examples of wheels that are fixed to the axle and turn as the axle turns. Find examples of axles that are fixed and do not turn with wheels that turn (these axles may serve as sleeves with the wheels moving independently). Make sure that students can identify the wheel and the axle. Have students classify the objects into two categories:

- Only the Wheels Move
- The Wheel and Axle Move

Add any other objects to this list as the unit progresses.

Centre Three - The Pulley

Demonstration: If possible demonstrate the use of pulleys using construction sets, or pulley and gear kits. Most pulleys are hidden inside structures or mechanisms. Set up a pulley system (like a clothesline) to send papers across the room. Collect pictures of tow trucks, cranes, elevators, or other mechanisms that use pulleys and display them in the classroom. Draw students' attention to the basketball nets in the gymnasium.

Set out the following materials:

- a set of pulleys with cord or rope to represent a flagpole
- a toy crane
- an old venetian blind fastened to a chart stand (metal, wood, or lead-free vinyl)
- clothesline that you can construct in your classroom
- toy tow truck
- wishing well
- flag on flagpole
- elevator
- exercise equipment where stacked weights move
- any other examples of pulleys

Have students explore and test each of the objects. Direct them to talk about each one and the way they work. Have the students discuss and record the answers to the following questions for any two of the pulleys.

- What is the job of each mechanism?
- How does the mechanism do its job?
- What part of the mechanism has to move for it to do its job?

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- Describe what happens when this part moves.

Note: As a safety precaution, be sure to cut cord at bottom of the venetian blind so there is no loop.

Centre Four - The Incline Plane

Set out the following materials:

- a slide from a toy playground set
- a ramp for toy cars
- a flat surface such as a plank or empty shelf that is at least 1.5 metres long
- some toy cars
- cover stock/tape: Attach to end of plank to ease transition to floor.

Have students explore and test each of the objects. Direct them to talk about each one and the way they work. Have the students discuss and record the answers to the following questions for any two of the levers.

- What is the job of each mechanism?
- How does the mechanism do its job?

Adaptations

Refer to individual IEPs of exceptional learners to make meaningful adaptations for these students in consultation with the school's Special Education and ESL teachers. Whenever possible, consult with parents concerning reinforcement of learning expectations and appropriate working conditions at home. Partnering students with those who have strong communication skills for modelling of language, pronunciation, and listening would be beneficial. Discuss with students to ensure that they understand each task, and check often for comprehension of expectations and activities which will ensure maximizing their potential.

It would also be of benefit to review the Special Education Companion found in the Library Section of the Curriculum Planner.

Resources

	Dictionary Page BLM 5	blm5.cwk
	The Way Things Work, 2.0	
	Cooperative Learning	Kagan, Spence Dr.
	Nutcracker	1
	Soft Shelled Nuts	6
	Scissors and Paper	1
	Bottle Opener	1
	Small Crowbar	1
	Small Hammer	1

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	Piece of Wood or Log with Nail in It	1
	Sand with Sand Shovel	1
	Dried Beans	1 pail full
	Wrench with Nut and Bolt	1
	Wagon, Tricycle, Roller Skate, Rolling Pin	1
	Toy Cars and Other Toys with Wheels	5
	A Toy Crane	1
	Venetian Blind	1
	Small Flagpole	1
	Toy Slide	1

Notes to Teacher

Teacher Reflections

Description

Working in small groups, students will design and build a machine for use at home or in the classroom community that will make life easier. The machine must use one or more of the simple machines explored in subtask 2. A focus will be placed on attaching and fastening both permanent and replaceable parts together.

Students will also create a blueprint of their mechanism as well as a blueprint container.

Catholic Graduate Expectations

CGE5a - works effectively as an interdependent team member.

CGE5e - respects the rights, responsibilities, and contributions of self and others.

CGE5g - achieves excellence, originality, and integrity in their own work and supports these qualities in the work of others.

Expectations

- 2s74 – ask questions about and identify needs or problems related to structures and mechanisms, and explore possible answers and solutions (e.g., investigate the effect of different floor coverings on the motion of a toy car);
- 2s69 – describe different mechanisms through observation and investigation (e.g., hinge, inclined plane), and identify the components that are simple machines (e.g., lever, wedge);
- 2s66 • describe the position and movement of objects, and demonstrate an understanding of how simple mechanisms enable an object to move;
- 2s75 – plan investigations to answer some of these questions or solve some of these problems, and describe the steps involved;
- 2s80 – select and use appropriate tools, utensils, and equipment (e.g., use a paper punch to make holes for the axle in cardboard wheels);
- 2s78 – communicate the procedures and results of investigations and explorations for specific purposes, using drawings, demonstrations, and oral and written descriptions (e.g., draw a sketch of an object they plan to make and another sketch of the object after it is made; tell the class the procedures they followed in making a vehicle or a container with a hinged lid);
- 2s77 – record relevant observations, findings, and measurements, using written language, drawings, charts, and concrete materials (e.g., record what happens to the movement of a vehicle released from a ramp if the size of its wheels is changed);
- 2s76 – use appropriate vocabulary to describe their investigations, explorations, and observations (e.g., use words such as rotate, turn, faster, and slower to describe the motion of wheels and axles);
- 2s81 – use appropriate techniques to make and fasten the components of a model that they have made (e.g., bend cardboard to make hinges; glue various materials together).
- 2s79 – make simple mechanisms and use them in

Groupings

- Students Working As A Whole Class
- Students Working In Small Groups

Teaching / Learning Strategies

- Mini-lesson
- Problem-solving Strategies
- Working With Manipulatives

Assessment

Assessment Criteria:

Blueprint

- neatly labelled
- clear diagram

Product

- pieces are securely fastened
- assembly is complete
- construction is solid

Group Skills - Peer Assessment

- sharing tasks
- sharing responsibility
- taking turns
- listening to the ideas of others

Assessment Strategies

- Observation

Assessment Recording Devices

- Checklist

Toys, Toys, Toys

Structures and Mechanisms An Integrated Unit for Grade 2

180 mins

- building a device they have designed (e.g., vehicle with wheels and axles);
- 2s71 – describe, using their observations, the position of an object in relation to other objects or to a specific area (e.g., use such words as over, under, beside, behind);
- 2s70 – describe, using their observations, the characteristics and movements of simple mechanisms (e.g., hinge, wheels and axle);
- 2s72 – identify changes in the position of an object in relation to other objects (e.g., movement upward or to the left);
- 2s73 – describe, using their observations, the pattern of movement of objects (e.g., turning, spinning, swinging, bouncing, vibrating).
- 2s82 – identify, through observation, the mechanical parts of objects (e.g., hinges on doors) and describe the motion of these parts;
- 2s68 • recognize that different mechanisms and systems move in different ways, and that the different types of movement determine the design and the method of production of these mechanisms and systems.
- 2s67 • design and make simple mechanisms, and investigate their characteristics;
- 2e62 – view, read, and listen to media works to obtain information and to complete assigned tasks (e.g., view or read the weather reports on television or in the newspaper);
- 2e59 – use appropriate gestures and tone of voice, as well as natural speech rhythms, when speaking;
- 2e47 • communicate messages, and follow instructions and directions;
- 2e32 • understand the vocabulary and language structures appropriate for this grade level;
- 2e21 – use words from their oral vocabulary, personal

Teaching / Learning

1) Revisit the list of machines found in the classroom, school, and at home. You may use BLM 12. Have students explain the function of each machine and how the machine works.

2) Have students bring in toys such as a stuffed toy, balls, jack-in-the-boxes, wind-up toys, yo-yos.... Have the students demonstrate and describe the movement. Make a list of vocabulary words that describe how toys move.
Display this chart in the classroom.

In this subtask, the students will be designing and constructing a new machine. Some groups may require assistance with different aspects of the task such as fastening or stabilizing the components. The teacher should visit each group to offer guidance.

Working in groups of three or four, have students design and build a machine that will be useful in the classroom or at home. The machine must use one or more of the simple machines explored in subtask 2. (Let children use their imaginations to invent such machines as a crayon passer, eraser slide, pencil case trolley, etc.)

Before they begin the task, show the students some simple blueprints for common objects. Assembly diagrams from devices or simple pieces of furniture will work well for this task. You may also access blueprints from a secondary school design class. If possible, you may also invite several high school students to visit your classroom and explain to the students the process for creating blueprints.

Toys, Toys, Toys
Structures and Mechanisms An Integrated Unit for Grade 2

180 mins

Discuss the features of a blueprint with the students (clear diagram, neat labels, arrows to show direction, etc.) Have each group create a blueprint for their machine. Have the group make blueprint holders from gift wrap tubes. Label the tube clearly with the name of the invention.

After the group constructs the machine, they should be prepared to present the machine to the class by demonstrating its function, pointing out the simple machine, and explaining how it works in their machine.

Adaptations

Refer to individual IEPs of exceptional learners to make meaningful adaptations for these students in consultation with the school's Special Education and ESL teachers. Whenever possible, consult with parents concerning reinforcement of learning expectations and appropriate working conditions at home. Partnering students with those who have strong communication skills for modelling of language, pronunciation, and listening would be beneficial. Discuss with students to ensure that they understand each task, and check often for comprehension of expectations and activities which will ensure maximizing their potential.

It would also be of benefit to review the Special Education Companion found in the Library Section of the Curriculum Planner.

Resources

-  **Blueprint Model Checklist BLM 11** blm11.cwk
-  **Simple Machines Web Worksheet BLM 12** blm12.cwk
-  **Cardboard**
-  **Construction Paper**
-  **Markers, Paint, Pencils, Pencil Crayons**
-  **Boxes**
-  **Items to Use for Construction**
-  **Scissors, Glue, Paper Clips, Merits**
-  **Balls, Jack-in-the-boxes, Yo-yo, Wind-up Toys....**
-  **Assemble Instructions**
-  **Blueprints**
-  **Paper Gift Wrap Rolls**

Toys, Toys, Toys
Structures and Mechanisms An Integrated Unit for Grade 2

180 mins

Notes to Teacher

As noted earlier, teachers may want to make arrangements for high school students or community workers to come in and speak to children about blueprints.

Teacher Reflections

Description

In this subtask, the students will conduct experiments dealing with movement of objects on a variety of surface planes and carrying different loads. The students will test the vehicle to see how far it moves. They will hypothesize the results and graph them to communicate their findings. Students will be working in a variety of groupings.

Catholic Graduate Expectations

- CGE3b - creates, adapts, and evaluates new ideas in light of the common good
- CGE3c - thinks reflectively and creatively to evaluate situations and solve problems
- CGE3f - examines, evaluates, and applies knowledge of interdependent systems (physical, political, ethical, socio-economic, and ecological) for the development of a just and compassionate society.
- CGE5a - works effectively as an interdependent team member
- CGE5e - respects the rights, responsibilities, and contributions of self and others
- CGE5g - achieves excellence, originality, and integrity in one's own work and supports these qualities in the work of others.

Expectations

- 2s88 – identify different ways in which wheels and axles can be attached to a chassis (e.g., by using an axle-holder, by placing the axle in holes drilled in the frame);
- 2s87 – predict factors that make a load easier or more difficult to move (e.g., the size of a wheel or hinge, the amount of friction);
- 2s86 – describe, using their observations, the effects of changing the slope of an inclined plane on the motion of an object that is placed on it (e.g., changes in speed, changes in distance travelled);
- 2s85 – describe, using their observations, the effect that different surfaces (e.g., wood, tiles, carpet, water) have on the rate at which an object slows down;
- 2s84 – compare the motion of similar objects made with or filled with different materials (e.g., ways in which baseballs and tennis balls bounce; ways in which film canisters containing different materials roll down a slope);
- 2s83 – compare the motion of objects on different surfaces (e.g., wheels of a toy on carpet, tile, and sand);
- 2e1 • communicate ideas (thoughts, feelings, experiences) for specific purposes (e.g., write a paragraph describing a trip to the farm for classmates);
- 2e2 • organize ideas in a logical sequence (e.g., write stories that have a beginning, middle, and end);
- 2e6 • revise and edit written work, focusing on specific features (e.g., sequence of ideas), with assistance from the teacher;
- 2e7 • use and spell correctly the vocabulary appropriate for this grade level;
- 2e8 • use correctly the conventions (spelling, grammar, punctuation, etc.) specified for this grade level (see below).
- 2e17 – correctly spell words identified by the teacher;

Groupings

Students Working In Small Groups

Teaching / Learning Strategies

Experimenting
Discussion
Note-making

Assessment

Assessment Criteria:

Graphs

- Data recorded accurately
- Conclusions are reasonable

Simple Machine Worksheet

- Student is able to identify simple machines.
- Student can clearly explain how simple machines work.
- Student can site examples of simple machines in his/her environment.

Assessment Strategies

Quizzes, Tests, Examinations
Performance Task

Assessment Recording Devices

Checklist

Toys, Toys, Toys

Structures and Mechanisms An Integrated Unit for Grade 2

120 mins

-
- 2e18 – use phonics to spell more difficult words (e.g., words of more than one syllable, words ending in ing);
 - 2e34 – restate information in a short non-fiction text in their own words;
 - 2e30 • express clear responses to written materials, relating the ideas in them (thoughts, feelings, experiences) to their own knowledge and experience;
 - 2e25 – print legibly;
 - 2e21 – use words from their oral vocabulary, personal word lists, and class lists compiled through brainstorming;
 - 2e20 – begin to use resources (e.g., personal dictionary, classroom-displayed vocabulary) to confirm spelling;

Teaching / Learning

Investigating Simple Machines

The following four centres require very few materials. Teachers should set up two of each in order to keep groups small and allow as much individual interaction with the materials as possible. Allow students to rotate through each centre over several days.

Although working in small groups, students should record their findings individually.

Teacher should demonstrate how to thread the pulley before the students begin the centres.

Investigation One - Investigating the Lever

Set out the following materials:

- potato chip can or oatmeal box cut in half length wise down the centre (Teacher should prepare these.)
- 30 cm rulers
- small weights such as coins or centicubes

Have students tape an equal weight on each end of the ruler (use two or more small weights such as coins or centicubes on each side).

Have students record their observations.

Remove a portion of the weight from one side.

Have students record their observations.

Have students experiment to find out how they can get the ruler to balance again (moving the fulcrum closer to the smaller load).

Have students record their observations on BLM 6 entitled Investigating the Lever.

Investigation Two - Investigating the Pulley

Set out the following materials:

- small sturdy chair
- three or four textbooks, each about 3 cm thick
- 2-3 metres of heavy cord or fine rope
- hook or metal eye securely fastened to the wall or the bottom of a table (high enough so that the load can clear the seat of the chair).
- 1.5" - 2" pulley
- plastic bags to put books into

Toys, Toys, Toys

Structures and Mechanisms An Integrated Unit for Grade 2

120 mins

Have students tie the rope securely around the bag of books so that they can be lifted.
Have each of the students lift the books to the height of the chair seat using the rope.
Have students record their observations.
Have the students thread the end of the rope through the pulley and lift the books again.
Have students record their observations on BLM 7 Investigating the Pulley.

Investigation Three - Investigating the Inclined Plane

Set out the following materials:

- small sturdy chair
- three or four textbooks, each about 3 cm thick in a plastic grocery bag
- 2 - 3 metres of heavy cord or fine rope
- flat sturdy board to act as a ramp (an empty removable shelf 1.5 metres in length may work well for this).

Have students tie the rope securely around the books so that they can be lifted without falling out of the cord.
Have each of the students lift the books to the height of the chair seat using the rope.
Have students record their observations.
Rest the board against the chair seat to form a ramp (another pile of books at the bottom of the ramp will keep it from moving).
Drape the end of the rope over the back of the chair seat.
Have the students pull the books to the same height using the board as a ramp.
Have students record their observations on BLM 8 Investigating the Inclined Plane.

Investigation Four - Investigating the Wheel and Axle

In this investigation students will test the effect of surface texture, load, and steepness of a ramp on the distance travelled by a wheeled vehicle. Students may choose the same two or three vehicles to use at each station.
Students will collect data and complete graphs at each station. Teachers may also wish to prepare graphs on chart paper for students to use.

Station 1 - Investigating Slope

Set out the following materials:

- two or three small cars or trucks
- measuring tape
- board to use as a ramp (an empty removable shelf 1.5 metres in length may work well for this)
- seven or eight textbooks or blocks for raising the ramp
- cover stock and tape to ease transition from board to floor

Students will set up the ramp at three different heights and measure the distance travelled by the cars at each height. Tape cover stock from board to floor to ease transition. Have students measure the distance from the end of the ramp to the back wheels of the vehicle. Students will complete the graphs to show their findings using BLM 13 Investigating Slope.

Station 2 - Investigating Speed

Set out the following materials:

- two or three small cars or trucks
- masking tape to mark finish line
- primary stopwatch, clock or watch with second hand
- board to use as a ramp (an empty removable shelf 1.5 metres in length may work well for this)

Toys, Toys, Toys
Structures and Mechanisms An Integrated Unit for Grade 2

120 mins

- seven or eight textbooks or blocks for raising the ramp
- cover stock and tape to ease transition from board to floor

Students will set up the ramp at three different heights and clock the time needed for the car to reach the finish line at each height. Tape cover stock from board to floor to ease transition. Students will complete the graphs to show their findings using BLM 14 Investigating Speed.

Note: Students may have difficulty being accurate using a stopwatch, however, they need to be exposed to using this type of equipment.

Station 3 - Investigating Surface Texture

Set out the following materials:

- two or three small cars or trucks
- masking tape to mark finish line
- primary stopwatch or watch or clock with second hand
- board to use as a ramp (an empty removable shelf at least 1.5 metres in length may work well for this)
- paper towel to cover board
- short piled carpet remnant to cover board
- cover stock and tape to ease transition from board to floor

Students will set up the ramp at a fixed height and test for speed and distance on the smooth surface, the paper towel-covered surface, and the carpet-covered surface. Tape cover stock from board to floor to ease transition. Students will record their findings on BLM 15 Investigating Surface Texture.

Station 4 - Investigating Load

Set out the following materials:

- two or three small trucks or wagons capable of carrying a load
- centicubes or other small weights
- masking tape to mark finish line
- primary stopwatch or watch or clock with second hand
- board to use as a ramp (an empty removable shelf at least 1.5 metres in length may work well for this)
- cover stock and tape to ease transition from board to floor

Students will set up the ramp at a fixed height and test for speed and distance on the smooth surface, with three different loads. Tape cover stock from board to floor to ease transition. Students will record their findings on BLM 16 Investigating Load.

Adaptations

Refer to individual IEPs of exceptional learners to make meaningful adaptations for these students in consultation with the school's Special Education and ESL teachers. Whenever possible, consult with parents concerning reinforcement of learning expectations and appropriate working conditions at home. Partnering students with those who have strong communication skills for modelling of language, pronunciation, and listening would be beneficial. Discuss with students to ensure that they understand each task, and check often for comprehension of expectations and activities which will ensure maximizing their potential.

It would also be of benefit to review the Special Education Companion found in the Library Section of the Curriculum Planner.

Resources

Toys, Toys, Toys

Structures and Mechanisms An Integrated Unit for Grade 2

120 mins

	Investigating the Lever BLM 6	blm6_The Lever.cwk
	Investigating the Pulley BLM 7	blm7_The Pulley.cwk
	Investigating the Inclined Plane BLM 8	blm8_The Inclined Plane.cwk
	Station 1 Investigating Slope BLM 13	blm13.cwk
	Station 2 Investigating Speed BLM 14	blm14.cwk
	Station 4 Investigating Load BLM 16	blm16.cwk
	Station Three - Investigating Surface Texture BLM15	blm15.cwk
	3 small cars or trucks	3
	1.5 m Board for Ramp	1
	Textbooks	8
	Masking Tape	2 meters
	30 cm ruler	1
	Centicubes	25
	Small Sturdy Chair	1
	Rope or Heavy cord	3 meters
	Hook or Metal Eye	1
	Paper Towel	3 meters
	Carpet Remnant - short piled	3 meters
	Toilet Tubes Cut in Half	1
	Plastic Grocery Bags	2
	Cover Stock	2 sheets
	Primary Stopwatch	1
	1.5 - 2 inch Pulley	1
	Weights - Small	6
	Measuring Tapes	1

Notes to Teacher

Teacher Reflections

Toys, Toys, Toys

Structures and Mechanisms An Integrated Unit for Grade 2

150 mins

Description

Through writing and illustrating, the students will learn key elements of communication. This information will be used to create a poster that illustrates the design features of their simple mechanism (constructed in subtask 3) that make it a desirable product.

Catholic Graduate Expectations

CGE2a - listens actively and critically to understand and learn in light of gospel values

CGE2b - reads, understands, and uses written materials effectively

CGE2c - presents information and ideas clearly and honestly and with sensitivity to others

CGE2d - writes and speaks fluently in one or both of Canada's official languages.

Expectations

- 2s78 – communicate the procedures and results of investigations and explorations for specific purposes, using drawings, demonstrations, and oral and written descriptions (e.g., draw a sketch of an object they plan to make and another sketch of the object after it is made; tell the class the procedures they followed in making a vehicle or a container with a hinged lid);
- 2s76 – use appropriate vocabulary to describe their investigations, explorations, and observations (e.g., use words such as rotate, turn, faster, and slower to describe the motion of wheels and axles);
- 2s66 • describe the position and movement of objects, and demonstrate an understanding of how simple mechanisms enable an object to move;
- 2e62 – view, read, and listen to media works to obtain information and to complete assigned tasks (e.g., view or read the weather reports on television or in the newspaper);
- 2e59 – use appropriate gestures and tone of voice, as well as natural speech rhythms, when speaking;
- 2e53 • create simple media works;
- 2e52 • view, read, and listen to media works with simple messages or factual information and describe what they have learned;
- 2e54 • use the conventions (e.g., sentence structure) of oral language, and of the various media, that are appropriate to the grade (see below).
- 2e24 – use underlining, colour, size of print for emphasis;
- 2e23 – use words and pictures to create a message;
- 2e61 – use speech appropriately for various purposes (e.g., to influence others in the group);
- 2e60 – participate in group discussions, demonstrating a sense of when to speak, when to listen, and how much to say;
- 2e56 – use linking words such as because, if, and after to organize ideas in speech;
- 2e51 • apply the rules of participating in a conversation and working with others;
- 2e48 • listen to discussions on familiar topics and ask relevant questions;
- 2e39 – use their knowledge of sentence structure in oral

Groupings

- Students Working In Pairs
- Students Working As A Whole Class
- Students Working Individually

Teaching / Learning Strategies

- Discussion
- Sketching To Learn
- Oral Explanation

Assessment

The teacher will want to note the individual child's approach to tasks to determine who may have difficulty with the individually-produced culminating activity.

Assessment Strategies

- Performance Task

Assessment Recording Devices

- Anecdotal Record

Toys, Toys, Toys

Structures and Mechanisms An Integrated Unit for Grade 2

150 mins

- and written language to determine the meaning of a sentence (e.g., the verb in a simple statement usually follows a noun; the subject and verb are inverted in interrogative sentences);
- 2e34 – restate information in a short non-fiction text in their own words;
- 2e29 • read independently, using reading strategies appropriate for this grade level;
- 2e25 – print legibly;
- 2e21 – use words from their oral vocabulary, personal word lists, and class lists compiled through brainstorming;
- 2e20 – begin to use resources (e.g., personal dictionary, classroom-displayed vocabulary) to confirm spelling;
- 2e18 – use phonics to spell more difficult words (e.g., words of more than one syllable, words ending in ing);
- 2e17 – correctly spell words identified by the teacher;
- 2e8 • use correctly the conventions (spelling, grammar, punctuation, etc.) specified for this grade level (see below).
- 2e7 • use and spell correctly the vocabulary appropriate for this grade level;
- 2e47 A • communicate messages, and follow instructions and directions;
- 2e37 A – express their thoughts and feelings about ideas in a piece of writing;

Teaching / Learning

Advertising and Promotion

- 1) Have students choose a simple mechanism from the list of machines found at school or at home (can opener, pizza cutter, candle snuffer, etc.). Avoid machines that require electricity or that are too complex.
- 2) Ask students "What do advertisers do to encourage us to buy their products?" Have students discuss the ads on TV. Discuss the concept of truth in advertising. Draw the students into a conversation that would help them discover that exaggerating the characteristics of a product may be misleading. Discuss some of the times they have been misled by advertising. Using advertising from newspapers or magazines, discuss the major elements of information design used in print ads (colour, focal point, balance, lettering, etc.).
- 3) In pairs, have students create a poster to advertise their mechanism using the features of informational design.
- 4) Display the posters in the classroom. Have students decide on the best features of each poster.

Adaptations

Refer to individual IEPs of exceptional learners to make meaningful adaptations for these students in consultation with the school's Special Education and ESL teachers. Whenever possible, consult with parents concerning reinforcement of learning expectations and appropriate working conditions at home. Partnering students with those who have strong communication skills for modelling of language, pronunciation, and listening would be beneficial. Discuss with students to ensure that they understand each task, and check often for comprehension of expectations and activities which will ensure maximizing their potential.

Toys, Toys, Toys

Structures and Mechanisms An Integrated Unit for Grade 2

150 mins

It would also be of benefit to review the Special Education Companion found in the Library Section of the Curriculum Planner.

Resources

-  **Poster Paper**
-  **Construction Paper**
-  **Scissors, Glue**
-  **Letter Tracers**
-  **Markers, Paint, Pencil Crayons....**

Notes to Teacher

Teacher Reflections

Description

Students will be given the following challenge:

The Handy Dandy Toy Company is losing business. Boys and girls are no longer buying their toys. You are a newly-hired toy designer working for the company.

- 1) Design and build a new toy that includes moving parts.
- 2) You will have to submit a blueprint and build a model of your toy using objects and materials found at home or at school.
- 3) Be prepared to make an oral presentation to discuss and demonstrate your toy.
- 4) Design a layout for a print ad to promote your toy and create a poster that would encourage boys and girls to buy it.

Catholic Graduate Expectations

CGE4a - who demonstrates flexibility and adaptability,

CGE4e - sets appropriate goals and priorities in school, work, and personal life

CGE4f - applies effective communication, decision-making, problem-solving, time and resource management skills.

Expectations

- 2s67 A • design and make simple mechanisms, and investigate their characteristics;
- 2s79 A – make simple mechanisms and use them in building a device they have designed (e.g., vehicle with wheels and axles);
- 2s81 A – use appropriate techniques to make and fasten the components of a model that they have made (e.g., bend cardboard to make hinges; glue various materials together).
- 2s80 – select and use appropriate tools, utensils, and equipment (e.g., use a paper punch to make holes for the axle in cardboard wheels);
- 2e1 A • communicate ideas (thoughts, feelings, experiences) for specific purposes (e.g., write a paragraph describing a trip to the farm for classmates);
- 2e2 A • organize ideas in a logical sequence (e.g., write stories that have a beginning, middle, and end);
- 2e20 – begin to use resources (e.g., personal dictionary, classroom-displayed vocabulary) to confirm spelling;
- 2e18 – use phonics to spell more difficult words (e.g., words of more than one syllable, words ending in ing);
- 2e21 A – use words from their oral vocabulary, personal word lists, and class lists compiled through brainstorming;
- 2e30 • express clear responses to written materials, relating the ideas in them (thoughts, feelings, experiences) to their own knowledge and experience;
- 2e25 – print legibly;
- 2e23 – use words and pictures to create a message;
- 2e24 – use underlining, colour, size of print for emphasis;
- 2e47 A • communicate messages, and follow instructions

Groupings

Students Working Individually

Teaching / Learning Strategies

Model Making

Working With Manipulatives

Oral Explanation

Assessment

This task will provide assessments in

- 1) Science
- 2) Oral Language
- 3) Visual Art
- 4) Writing

Assessment Strategies

Performance Task

Classroom Presentation

Assessment Recording Devices

Anecdotal Record

Toys, Toys, Toys

Structures and Mechanisms An Integrated Unit for Grade 2

200 mins

- and directions;
- 2e65 A – create some simple media works (e.g., design an advertisement for a toy).
- 2e61 – use speech appropriately for various purposes (e.g., to influence others in the group);
- 2a38 A – describe different ways in which a variety of art materials, tools, and techniques can be used (e.g., construction paper can be fringed with scissors, used as a background for paintings, cut into shapes to make pictures), and demonstrate understanding of their safe and proper use.
- 2a37 A – identify the elements of design in a variety of familiar objects (e.g., colour in clothing, symmetrical forms in buildings) and in works of art;

Teaching / Learning

Toys, Toys, Toys

Students examine the classroom machines created in subtask 3.

Lead a whole class discussion using the following questions with the students:

- What features of this machine helped it to do the job?
- How did the builders make sure the parts of this machine stayed together?
- What materials did this builder use to make the machine work?
- What design features of this machine were effective?
- What could the builders do to improve this machine?
- Does this machine do its job?

Lead the discussion so that the students are identifying sound design features and making positive suggestions for improvement.

Have the students brainstorm in groups, some of the "found materials" used in the mechanisms created in subtask 3. Have each group make a list.

Have the students look at the posters created in subtask 5.

Choose several of the posters. Discuss the features of each that would encourage a shopper to buy the product. Lead the discussion so that all of the main design features are discussed.

Use an overhead or chart to present the challenge of designing and building a new toy that includes moving parts.

Discuss with the students the materials that can be used in the design of the toy, and those that cannot. (E.g., electrical components, sharp objects, etc.)

Guide the students through the process.

Decide on the function of your new toy and which parts will move.

Have them complete the design plans with labels.

Make a list of materials.

Collect the materials.

Begin the construction.

Modify the plans if necessary.

Complete the construction.

Plan and complete the advertisement.

Adaptations

Refer to individual IEPs of exceptional learners to make meaningful adaptations for these students in consultation with the school's Special Education and ESL teachers. Whenever possible, consult with parents concerning reinforcement of learning expectations and appropriate working conditions at home. Partnering students with those who have strong communication skills for modelling of language, pronunciation, and listening would be beneficial. Discuss with students to ensure that they understand each task, and check often for comprehension of expectations and activities which will ensure maximizing their potential.

It would also be of benefit to review the Special Education Companion found in the Library Section of the Curriculum Planner.

Resources



Boxes



Cardboard



Construction Paper



Items to Use for Construction



Markers, Paint, Pencils, Pencil Crayons



Scissors, Glue, Paper Clips, Merits

Notes to Teacher

Teacher Reflections



Appendices

Toys, Toys, Toys

Structures and Mechanisms

Resource List:
Black Line Masters:
Rubrics:
Unit Expectation List and Expectation Summary:

Toys, Toys, Toys
Structures and Mechanisms An Integrated Unit for Grade 2



Blackline Master / File

- Blueprint Model Checklist BLM 11** ST 3
blm11.cwk
- Booklet Pages BLM 4** ST 1
blm4.cwk
- Dictionary Page BLM 5** ST 2
blm5.cwk
- Investigating the Inclined Plane BLM 8** ST 4
blm8_The Inclined Plane.cwk
- Investigating the Lever BLM 6** ST 4
blm6_The Lever.cwk
- Investigating the Pulley BLM 7** ST 4
blm7_The Pulley.cwk
- Machines in Our Classroom BLM 2** ST 1
blm2.cwk
- Machines We Use at Home BLM 3** ST 1
blm3.cwk
- Parent Letter** ST 1
BLM1.cwk
- Simple Machines Web Worksheet BLM 12** ST 3
blm12.cwk
- Station 1 Investigating Slope BLM 13** ST 4
blm13.cwk
- Station 2 Investigating Speed BLM 14** ST 4
blm14.cwk
- Station 4 Investigating Load BLM 16** ST 4
blm16.cwk
- Station Three - Investigating Surface Texture BLM15** ST 4
blm15.cwk



Licensed Software

- The Way Things Work, 2.0** ST 2



Print

- Be Safe** ST 1
Science Teacher's Association of Ontario
- Cooperative Learning** ST 2
Kagan, Spence Dr.
1-879097-10-9
- Designng and Making Primary Toys** Unit
Bakar, Elaine:Hilary,Brian: Hilary,
Chris:Noon,Steve;Ruff,Patricia
- Earth Friendly Toys** Unit
George Pfiffner
047100822
- Garage Song** Unit
Wilson,Sarah
Simon and Shulster,1991
- Good Driving,Amelia Bedilia** Unit
Parish,Herman
Greenwillow Books1996
- How Do You Lift a Lion?** ST 1
Wells, Robert
- Larry's Racing Machine** ST 1
Lowery, Lawrence
Holt,Rienehart and Winston 1969
- Machines As Tall As Giants** Unit
Stickland,Paul
Kids Can Press, 1989
- Make It Move!** Unit
Rowe,Julian
0516081365
- Make Way For Trucks - Big Machines on Wheels** Unit
Herman,Gail
Random House,1990
- Matthew and the Midnight Tow Truck** ST 1
Morgan, Allen
- Mike Mulligan and His Steam Shovel** ST 1
Burton, Virginia Lee
- Pushes And Pulls, Module D** Unit
Science Discovery world
0382338936
- Row Row Row Your Boat** Unit
Muller, Robin
North Wind Press, 1993
- The Complete Handbook of Science Fair Projects** Unit
Bochinski,Blair
0471123773

Toys, Toys, Toys

Structures and Mechanisms An Integrated Unit for Grade 2

The Wheels of the Bus
Kovalski

The Wheels On The Bus
Kovalski, Msryann
Kids Can Press,1987

Up and Down on a Merry-Go-Round
Martin,Bill
Henry Holt,1988

Wheels and Cars
Williams, John

William The Vehicle King
Newton ,Laura

Bradbury Press,1987

Young Inventors at Work
Sobey,Ed
067357735



Media

The Way Things Work
Scholastic Canada



Website

Education World
<http://www.education-world.com/index.shtml>

Marvelous Machines
<http://www.galaxy.net/~k12/machines/index.shtml>

Motion,Energy and Machines
http://www.necc.mass.edu/mrvis/mr3_13/start.htm

Moving Along With Simple Machines
<http://zeus.gac.peachnut.edu/henry-schools/cur/simpmach.htm>

S.C.O.R.E
<http://scorescience.humboldt.k12.ca.us/>

Science North: A Helping Hand
<http://www.sciencenorth.scienceOnline/levers/levershunt>

Simple Machine Page for Kids
<http://www.san-marno.k12.ca.us/~summer1/machines/simplemachines.html>

ST 1

Unit



Material

Unit

1.5 m Board for Ramp ST 4
1
per group

ST 1

3 small cars or trucks ST 4
3
per group

Unit

30 cm ruler ST 4
1
per group

Unit

A Toy Crane ST 2
1
per group

Assemble Instructions ST 3

Balls, Jack-in-the-boxes, Yo-yo, Wind-up Toys.... ST 3

Blueprints ST 3

Bottle Opener ST 2

1
per group

Boxes ST 3

Boxes ST 6

Cardboard ST 3
per group

Cardboard ST 6
per group

Unit

Carpet Remnant - short piled ST 4
3 meters
per group

Unit

Centicubes ST 4
25
per group

Unit

Construction Paper ST 3

Unit

Construction Paper ST 5

Construction Paper ST 6

Unit

Cover Stock ST 4
2 sheets
per group

Unit

Dried Beans ST 2
1 pail full
per group

Hook or Metal Eye ST 4
1
per group

Items to Use for Construction ST 3

Items to Use for Construction ST 6

Letter Tracers ST 5

Markers, Paint, Pencil Crayons.... ST 5

Markers, Paint, Pencils, Pencil Crayons ST 3

Toys, Toys, Toys

Structures and Mechanisms An Integrated Unit for Grade 2

<input type="checkbox"/> Markers, Paint, Pencils, Pencil Crayons	ST 6	<input type="checkbox"/> Toy Slide	ST 2
<input type="checkbox"/> Masking Tape 2 meters per group	ST 4	1 per group	
<input type="checkbox"/> Nutcracker 1 per group	ST 2	<input type="checkbox"/> Venetian Blind	ST 2
<input type="checkbox"/> Paper Gift Wrap Rolls	ST 3	1 per group	
<input type="checkbox"/> Paper Towel 3 meters per group	ST 4	<input type="checkbox"/> Wagon, Tricycle, Roller Skate, Rolling Pin	ST 2
<input type="checkbox"/> Piece of Wood or Log with Nail in It 1 per group	ST 2	1 per group	
<input type="checkbox"/> Plastic Grocery Bags 2 per group	ST 4	<input type="checkbox"/> Wrench with Nut and Bolt	ST 2
<input type="checkbox"/> Poster Paper	ST 5	1 per group	
<input type="checkbox"/> Rope or Heavy cord 3 meters per group	ST 4	<input type="checkbox"/> 1.5 - 2 inch Pulley	ST 4
<input type="checkbox"/> Sand with Sand Shovel 1 per group	ST 2	1 per group	
<input type="checkbox"/> Scissors and Paper 1 per group	ST 2	<input type="checkbox"/> Measuring Tapes	ST 4
<input type="checkbox"/> Scissors, Glue	ST 5	1 per group	
<input type="checkbox"/> Scissors, Glue, Paper Clips, Merits	ST 3	<input type="checkbox"/> Primary Stopwatch	ST 4
<input type="checkbox"/> Scissors, Glue, Paper Clips, Merits	ST 6	1 per group	
<input type="checkbox"/> Small Crowbar 1 per group	ST 2	<input type="checkbox"/> Weights - Small	ST 4
<input type="checkbox"/> Small Flagpole 1 per group	ST 2	6 per group	
<input type="checkbox"/> Small Hammer 1 per group	ST 2		
<input type="checkbox"/> Small Sturdy Chair 1 per group	ST 4		
<input type="checkbox"/> Soft Shelled Nuts 6 per group	ST 2		
<input type="checkbox"/> Textbooks 8 per group	ST 4		
<input type="checkbox"/> Toilet Tubes Cut in Half 1 per group	ST 4		
<input type="checkbox"/> Toy Cars and Other Toys with Wheels 5 per group	ST 2		



Equipment / Manipulative

Dear Parents,

Our class is beginning a unit on movement. As a part of that unit, we will be studying some simple machines. I hope that it will be exciting for the students to learn how objects move, and how many of our everyday tools help make our work easier.

Your child will begin this unit by finding some machines at home. Please help the student complete their list of machines they find at home. They may ask you to help them spell difficult words or to explain how some of the appliances in your home actually work. I do not expect that your child will operate any electrical or mechanical devices without your supervision. We will be learning about the safe use of tools and appliances as a part of the unit.

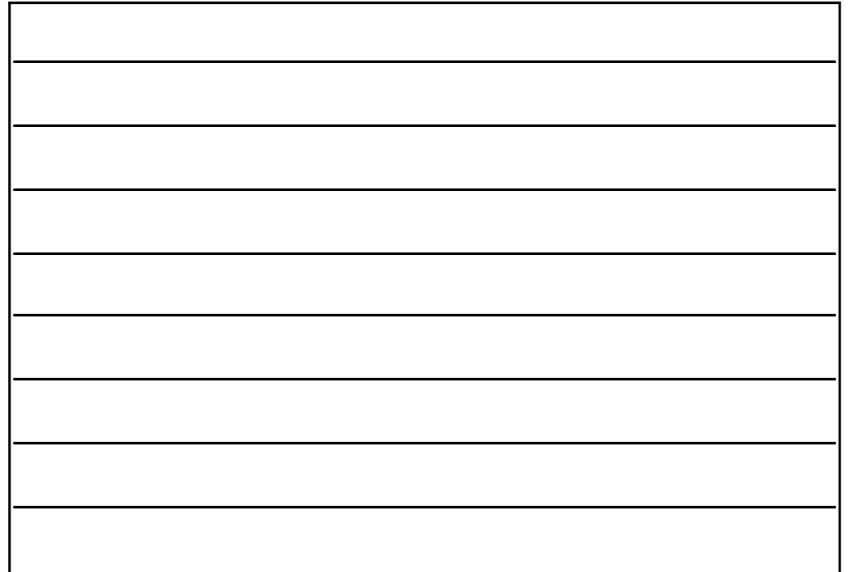
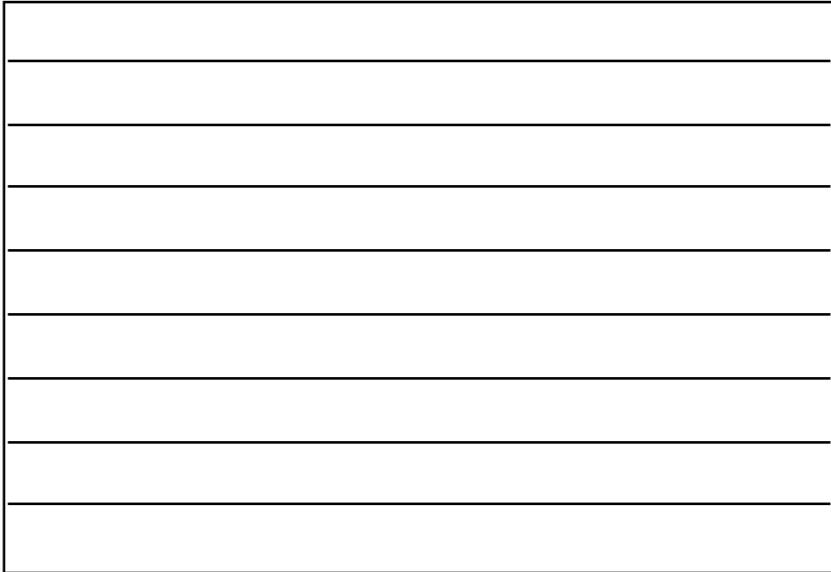
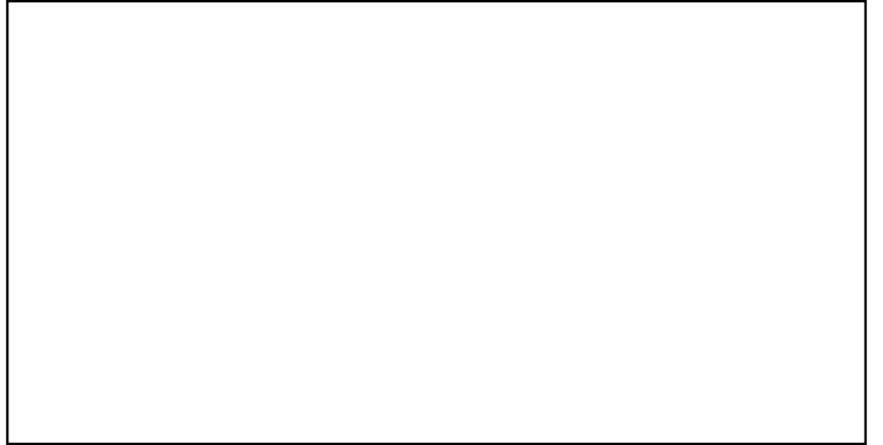
Our class will also set up a "Take Apart" centre in the classroom. I would appreciate it if you could send to school any broken or worn out non-electrical objects that students can disassemble. These objects might include old wind-up clocks or watches, timers, hose nozzles, toys, etc.

We will also be inventing, designing, and building new mechanisms. Items such as empty spools, Styrofoam trays, covered wire, string, and other miscellaneous "junk" will be of great value to us.

Please be sure to ask your child about the tasks and experiments they will be completing during this unit.

Machines We Use at Home

Name: _____



Name: _____

BLM 6

Investigating the Lever

Find the middle point on the ruler and mark it with a marker or a piece of tape. Place the ruler on the rounded side of the half tube so that there is the same amount on each side. The mark you made on the ruler should be in the middle of the tube.

Place 2 equal weights on each side.
What happened?

Remove one weight from one side. What happened?

Experiment to find a way to make the lever balance with different weights on each side.
Record your observations. be sure to try different combinations of weights.

Name: _____

BLM 7

Investigating The Pulley

Tie the cord around a grocery bag filled with books. you may want to double-bag your books.

Hold the end of the cord and lift them up as high as the seat of the chair. Write down your observations. How does it feel when you lift the books?

Thread the long end of the cord through the pulley. Pull the cord so the books raise up as high as the chair seat. Write down your observations.

Which method of lifting is easier? Why do you think so?

Name: _____

BLM 8

Investigating the Inclined Plane

Tie the cord around the handle of the bag of books. You may want to double-bag your books.

Hold the end of the cord and lift them up as high as the seat of the chair. Write down your observations. How does it feel when you lift the books?

Now set the board on the floor so that it is resting against the seat of the chair. Pull the cord so the books travel up the ramp as high as the chair seat. Write down your observations,

Which method of lifting is easier? Why do you think so?

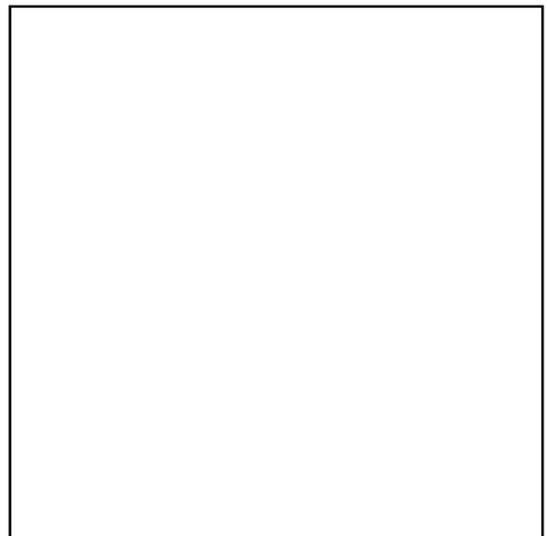
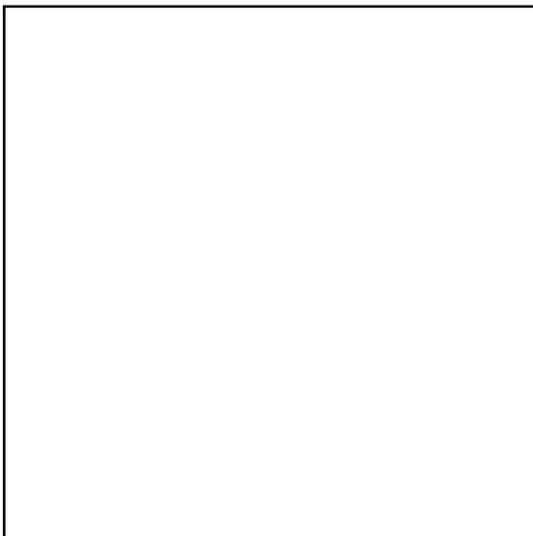
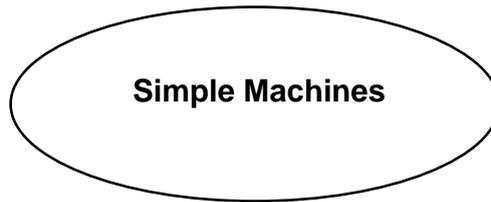
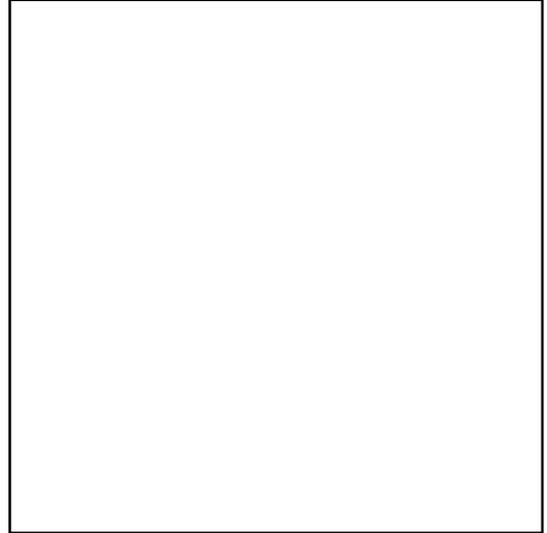
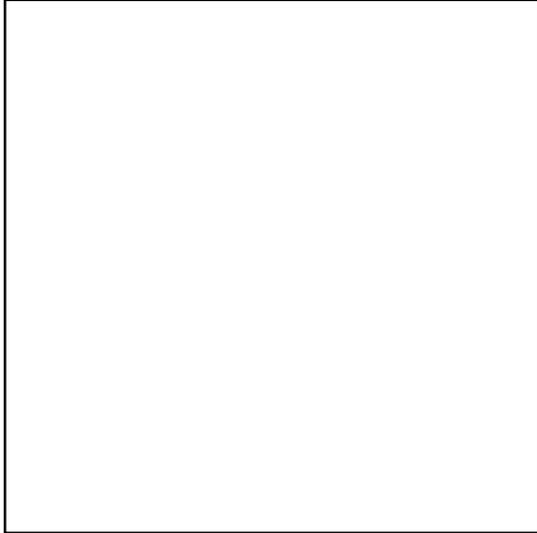
Blueprint and Model Checklist

Use a checkmark to show how well you did.

	I will have to try harder	I did this sometimes	This was good	I did this very well
Clearly labeled				
Diagram neatly drawn				
Pieces securely fastened				
Assembly is complete				
Solidly constructed				
Simple machine is incorporated				

Simple Machines

Draw four mechanisms that use simple machines and explain how they work.



Station One - Investigating Slope

What do you think will happen as the ramp gets higher?

Distance Traveled	100 cm			
	90 cm			
	80 cm			
	70 cm			
	60 cm			
	50 cm			
	40 cm			
	30 cm			
	20 cm			
	10 cm			
		10 cm high	20 cm high	30 cm high
Height of Ramp				

Describe your observations.

What did you discover?

Station Two- Investigating Speed

What do you think will happen as the ramp gets higher?

Time	9 seconds			
	8 seconds			
	7 seconds			
	6 seconds			
	5 seconds			
	4 seconds			
	3 seconds			
	2 seconds			
	1 second			
		10 cm high	20 cm high	30 cm high
Height of Ramp				

Describe your observations.

What did you discover?

Station Three - Investigating the Surface Texture

What do you think will happen if the surface changes?

Distance Traveled	100 cm			
	90 cm			
	80 cm			
	70 cm			
	60 cm			
	50 cm			
	40 cm			
	30 cm			
	20 cm			
	10 cm			
		Sandpaper	Carpet	Smooth Surface
	Surface of Ramp			

Describe your observations.

What did you discover?

Station Four - Investigating Load

What do you think will happen as the load gets heavier?

Distance Traveled	100 cm			
	90 cm			
	80 cm			
	70 cm			
	60 cm			
	50 cm			
	40 cm			
	30 cm			
	20 cm			
	10 cm			
		1 gram	5 grams	10 grams
Weight of the Load				

Describe your observations.

What did you discover?

Toys, Toys, Toys

Structures and Mechanisms An Integrated Unit for Grade 2

		Selected	Assessed
English Language---Writing			
<input type="checkbox"/> 2e1	• communicate ideas (thoughts, feelings, experiences) for specific purposes (e.g., write a paragraph describing a trip to the farm for classmates);	3	1
<input type="checkbox"/> 2e2	• organize ideas in a logical sequence (e.g., write stories that have a beginning, middle, and end);	3	1
<input type="checkbox"/> 2e5	• use some materials from other media (e.g., collage) to enhance their writing;	2	
<input type="checkbox"/> 2e6	• revise and edit written work, focusing on specific features (e.g., sequence of ideas), with assistance from the teacher;	2	
<input type="checkbox"/> 2e7	• use and spell correctly the vocabulary appropriate for this grade level;	3	
<input type="checkbox"/> 2e8	• use correctly the conventions (spelling, grammar, punctuation, etc.) specified for this grade level (see below).	3	
<input type="checkbox"/> 2e17	– correctly spell words identified by the teacher;	3	
<input type="checkbox"/> 2e18	– use phonics to spell more difficult words (e.g., words of more than one syllable, words ending in ing);	3	
<input type="checkbox"/> 2e20	– begin to use resources (e.g., personal dictionary, classroom-displayed vocabulary) to confirm spelling;	4	
<input type="checkbox"/> 2e21	– use words from their oral vocabulary, personal word lists, and class lists compiled through brainstorming;	4	1
<input type="checkbox"/> 2e23	– use words and pictures to create a message;	3	
<input type="checkbox"/> 2e24	– use underlining, colour, size of print for emphasis;	2	
<input type="checkbox"/> 2e25	– print legibly;	4	
English Language---Reading			
<input type="checkbox"/> 2e29	• read independently, using reading strategies appropriate for this grade level;	1	
<input type="checkbox"/> 2e30	• express clear responses to written materials, relating the ideas in them (thoughts, feelings, experiences) to their own knowledge and experience;	2	
<input type="checkbox"/> 2e32	• understand the vocabulary and language structures appropriate for this grade level;	2	
<input type="checkbox"/> 2e34	– restate information in a short non-fiction text in their own words;	2	
<input type="checkbox"/> 2e37	– express their thoughts and feelings about ideas in a piece of writing;		1
<input type="checkbox"/> 2e39	– use their knowledge of sentence structure in oral and written language to determine the meaning of a sentence (e.g., the verb in a simple statement usually follows a noun; the subject and verb are inverted in interrogative sentences);	1	
English Language---Oral and Visual Communication			
<input type="checkbox"/> 2e47	• communicate messages, and follow instructions and directions;	2	2
<input type="checkbox"/> 2e48	• listen to discussions on familiar topics and ask relevant questions;	2	
<input type="checkbox"/> 2e51	• apply the rules of participating in a conversation and working with others;	2	
<input type="checkbox"/> 2e52	• view, read, and listen to media works with simple messages or factual information and describe what they have learned;	1	
<input type="checkbox"/> 2e53	• create simple media works;	1	
<input type="checkbox"/> 2e54	• use the conventions (e.g., sentence structure) of oral language, and of the various media, that are appropriate to the grade (see below).	1	
<input type="checkbox"/> 2e56	– use linking words such as because, if, and after to organize ideas in speech;	1	
<input type="checkbox"/> 2e59	– use appropriate gestures and tone of voice, as well as natural speech rhythms, when speaking;	2	
<input type="checkbox"/> 2e60	– participate in group discussions, demonstrating a sense of when to speak, when to listen, and how much to say;	2	
<input type="checkbox"/> 2e61	– use speech appropriately for various purposes (e.g., to influence others in the group);	3	
<input type="checkbox"/> 2e62	– view, read, and listen to media works to obtain information and to complete assigned tasks (e.g., view or read the weather reports on television or in the newspaper);	2	
<input type="checkbox"/> 2e65	– create some simple media works (e.g., design an advertisement for a toy).		1
Science and Technology---Structures and Mechanisms			
<input type="checkbox"/> 2s66	• describe the position and movement of objects, and demonstrate an understanding of how simple mechanisms enable an object to move;	3	
<input type="checkbox"/> 2s67	• design and make simple mechanisms, and investigate their characteristics;	1	1
<input type="checkbox"/> 2s68	• recognize that different mechanisms and systems move in different ways, and that the different types of movement determine the design and the method of production of these mechanisms and systems.	3	
<input type="checkbox"/> 2s69	– describe different mechanisms through observation and investigation (e.g., hinge, inclined plane), and identify the components that are simple machines (e.g., lever, wedge);	2	
<input type="checkbox"/> 2s70	– describe, using their observations, the characteristics and movements of simple mechanisms (e.g., hinge, wheels and axle);	3	
<input type="checkbox"/> 2s71	– describe, using their observations, the position of an object in relation to other objects or to a specific area (e.g., use such words as over, under, beside, behind);	3	
<input type="checkbox"/> 2s72	– identify changes in the position of an object in relation to other objects (e.g., movement upward or to the left);	3	
<input type="checkbox"/> 2s73	– describe, using their observations, the pattern of movement of objects (e.g., turning, spinning, swinging, bouncing, vibrating).	3	

Toys, Toys, Toys Structures and Mechanisms An Integrated Unit for Grade 2

		Selected	Assessed
<input type="checkbox"/> 2s74	– ask questions about and identify needs or problems related to structures and mechanisms, and explore possible answers and solutions (e.g., investigate the effect of different floor coverings on the motion of a toy car);		1
<input type="checkbox"/> 2s75	– plan investigations to answer some of these questions or solve some of these problems, and describe the steps involved;		1
<input type="checkbox"/> 2s76	– use appropriate vocabulary to describe their investigations, explorations, and observations (e.g., use words such as rotate, turn, faster, and slower to describe the motion of wheels and axles);		3
<input type="checkbox"/> 2s77	– record relevant observations, findings, and measurements, using written language, drawings, charts, and concrete materials (e.g., record what happens to the movement of a vehicle released from a ramp if the size of its wheels is changed);		2
<input type="checkbox"/> 2s78	– communicate the procedures and results of investigations and explorations for specific purposes, using drawings, demonstrations, and oral and written descriptions (e.g., draw a sketch of an object they plan to make and another sketch of the object after it is made; tell the class the procedures they followed in making a vehicle or a container with a hinged lid);		2
<input type="checkbox"/> 2s79	– make simple mechanisms and use them in building a device they have designed (e.g., vehicle with wheels and axles);		1
<input type="checkbox"/> 2s80	– select and use appropriate tools, utensils, and equipment (e.g., use a paper punch to make holes for the axle in cardboard wheels);		2
<input type="checkbox"/> 2s81	– use appropriate techniques to make and fasten the components of a model that they have made (e.g., bend cardboard to make hinges; glue various materials together).		1
<input type="checkbox"/> 2s82	– identify, through observation, the mechanical parts of objects (e.g., hinges on doors) and describe the motion of these parts;		2
<input type="checkbox"/> 2s83	– compare the motion of objects on different surfaces (e.g., wheels of a toy on carpet, tile, and sand);		2
<input type="checkbox"/> 2s84	– compare the motion of similar objects made with or filled with different materials (e.g., ways in which baseballs and tennis balls bounce; ways in which film canisters containing different materials roll down a slope);		2
<input type="checkbox"/> 2s85	– describe, using their observations, the effect that different surfaces (e.g., wood, tiles, carpet, water) have on the rate at which an object slows down;		2
<input type="checkbox"/> 2s86	– describe, using their observations, the effects of changing the slope of an inclined plane on the motion of an object that is placed on it (e.g., changes in speed, changes in distance travelled);		2
<input type="checkbox"/> 2s87	– predict factors that make a load easier or more difficult to move (e.g., the size of a wheel or hinge, the amount of friction);		2
<input type="checkbox"/> 2s88	– identify different ways in which wheels and axles can be attached to a chassis (e.g., by using an axle-holder, by placing the axle in holes drilled in the frame);		2
<input type="checkbox"/> 2s89	– demonstrate awareness that the wheels of a vehicle rotate clockwise or counterclockwise depending on the direction of movement of the vehicle.		1

Health and Physical Education---Healthy Living

<input type="checkbox"/> 2p3	• outline safety rules and safe practices;		1
<input type="checkbox"/> 2p11	– identify safety rules to be followed in the home, school, and community (e.g., electrical safety, schoolyard rules, bus safety);		1

The Arts---Visual Arts

<input type="checkbox"/> 2a37	– identify the elements of design in a variety of familiar objects (e.g., colour in clothing, symmetrical forms in buildings) and in works of art;		1
<input type="checkbox"/> 2a38	– describe different ways in which a variety of art materials, tools, and techniques can be used (e.g., construction paper can be fringed with scissors, used as a background for paintings, cut into shapes to make pictures), and demonstrate understanding of their safe and proper use.		1

Toys, Toys, Toys

Structures and Mechanisms An Integrated Unit for Grade 2

English Language

2e1	3	1	2e2	3	1	2e3		2e4		2e5	2	2e6	2	2e7	3	2e8	3	2e9		2e10		
2e11			2e12			2e13		2e14		2e15		2e16		2e17	3	2e18	3	2e19		2e20	4	
2e21	4	1	2e22			2e23	3	2e24	2	2e25	4	2e26		2e27		2e28		2e29	1	2e30	2	
2e31			2e32	2		2e33		2e34	2	2e35		2e36		2e37		2e38	1	2e39	1	2e40		
2e41			2e42			2e43		2e44		2e45		2e46		2e47	2	2	2e48	2	2e49		2e50	
2e51	2		2e52	1		2e53	1	2e54	1	2e55		2e56	1	2e57		2e58		2e59	2	2e60	2	
2e61	3		2e62	2		2e63		2e64		2e65		1										

Mathematics

2m1		2m2		2m3		2m4		2m5		2m6		2m7		2m8		2m9		2m10			
2m11		2m12		2m13		2m14		2m15		2m16		2m17		2m18		2m19		2m20			
2m21		2m22		2m23		2m24		2m25		2m26		2m27		2m28		2m29		2m30			
2m31		2m32		2m33		2m34		2m35		2m36		2m37		2m38		2m39		2m40			
2m41		2m42		2m43		2m44		2m45		2m46		2m47		2m48		2m49		2m50			
2m51		2m52		2m53		2m54		2m55		2m56		2m57		2m58		2m59		2m60			
2m61		2m62		2m63		2m64		2m65		2m66		2m67		2m68		2m69		2m72			
2m73		2m74		2m75		2m76		2m77		2m78		2m79		2m80		2m81		2m82			
2m81		2m82		2m83		2m84		2m85		2m86		2m87		2m88		2m89		2m90			
2m91		2m92		2m93		2m94		2m95		2m96		2m97		2m98		2m99		2m100			
2m101		2m102		2m103		2m104		2m105		2m106		2m107		2m108		2m109		2m110			
2m111		2m112																			

Science and Technology

2s1		2s2		2s3		2s4		2s5		2s6		2s7		2s8		2s9		2s10			
2s11		2s12		2s13		2s14		2s15		2s16		2s17		2s18		2s19		2s20			
2s21		2s22		2s23		2s24		2s25		2s26		2s27		2s28		2s29		2s30			
2s31		2s32		2s33		2s34		2s35		2s36		2s37		2s38		2s39		2s40			
2s41		2s42		2s43		2s44		2s45		2s46		2s47		2s48		2s49		2s50			
2s51		2s52		2s53		2s54		2s55		2s56		2s57		2s58		2s59		2s60			
2s61		2s62		2s63		2s64		2s65		2s66	3	2s67	1	1	2s68	3	2s69	2	2s70	3	
2s71	3	2s72	3	2s73	3	2s74	1	2s75	1	2s76	3	2s77	2	2s78	2	2s79	1	1	2s80	2	
2s81	1	1	2s82	2	2s83	2	2s84	2	2s85	2	2s86	2	2s87	2	2s88	2	2s89	1	2s90		
2s91		2s92		2s93		2s94		2s95		2s96		2s97		2s98		2s99		2s100			
2s101		2s102		2s103		2s104		2s105		2s106		2s107		2s108		2s109		2s110			

Social Studies

2z1		2z2		2z3		2z4		2z5		2z6		2z7		2z8		2z9		2z10			
2z11		2z12		2z13		2z14		2z15		2z16		2z17		2z18		2z19		2z20			
2z21		2z22		2z23		2z24		2z25		2z26		2z27		2z28		2z29		2z30			
2z31		2z32		2z33		2z34		2z35		2z36		2z37		2z38		2z39		2z40			
2z41		2z42		2z43		2z44		2z45		2z46		2z47		2z48							

Health & Physical Education

2p1		2p2		2p3	1	2p4		2p5		2p6		2p7		2p8		2p9		2p10			
2p11	1	2p12		2p13		2p14		2p15		2p16		2p17		2p18		2p19		2p20			
2p21		2p22		2p23		2p24		2p25		2p26		2p27		2p28		2p29		2p30			
2p31		2p32		2p33		2p34		2p35		2p36		2p37		2p38		2p39		2p40			
2p41																					

The Arts

2a1		2a2		2a3		2a4		2a5		2a6		2a7		2a8		2a9		2a10			
2a11		2a12		2a13		2a14		2a15		2a16		2a17		2a18		2a19		2a20			
2a21		2a22		2a23		2a24		2a25		2a26		2a27		2a28		2a29		2a30			
2a31		2a32		2a33		2a34		2a35		2a36		2a37		1	2a38	1	2a39		2a40		
2a41		2a42		2a43		2a44		2a45		2a46		2a47		2a48		2a49		2a50			
2a51		2a52		2a53		2a54		2a55		2a56		2a57		2a58		2a59		2a60			
2a61		2a62		2a63		2a64		2a65		2a66		2a67									

Toys, Toys, Toys
Structures and Mechanisms An Integrated Unit for Grade 2

Analysis Of Unit Components

- 6 Subtasks
- 129 Expectations
- 100 Resources
- 48 Strategies & Groupings
- Unique Expectations --
- 31 Language Expectations
- 24 Science And Tech Expectations
- 2 Health & Physical Education
- 2 Arts Expectations

Resource Types

- 0 Rubrics
 - 14 Blackline Masters
 - 1 Licensed Software
 - 22 Print Resources
 - 1 Media Resources
 - 7 Websites
 - 51 Material Resources
 - 4 Equipment / Manipulatives
 - 0 Sample Graphics
 - 0 Other Resources
 - 0 Parent / Community
 - 0 Companion Bookmarks
-

Groupings

- 4 Students Working As A Whole Class
- 2 Students Working In Pairs
- 3 Students Working In Small Groups
- 3 Students Working Individually

Teaching / Learning Strategies

- 1 Advance Organizer
- 2 Brainstorming
- 1 Classifying
- 4 Discussion
- 1 Experimenting
- 1 Homework
- 1 Learning Centres
- 1 Mini-lesson
- 1 Model Making
- 1 Note-making
- 2 Oral Explanation
- 1 Problem-solving Strategies
- 1 Sketching To Learn
- 2 Working With Manipulatives

Assessment Recording Devices

- 4 Anecdotal Record
- 3 Checklist

Assessment Strategies

- 1 Classroom Presentation
- 3 Observation
- 4 Performance Task
- 1 Quizzes, Tests, Examinations