

# Grade 4 Building Project



Dear Parent/Guardian,

As part of the science unit “Building Devices and Vehicles That Move”, students are expected to design and construct a device or vehicle that moves or has moving parts.

Building upon what the students are learning in the current unit “Wheels and Levers”, the students will be asked to construct a device or vehicle **with materials from home**. The students will only be given one afternoon of time to work on this at school. (Tuesday, May 3<sup>rd</sup>) On that afternoon, they may want to test their Simple Machine and tweak any problems. The rest of the project and completion of the log sheet needs to happen at home between now and May 3<sup>rd</sup>. **The due date for the completed project and paperwork is Wednesday, May 3<sup>th</sup>**. The device or vehicle must move or have a moving part(s) when a simple force is applied such as air, gravity, etc. (**being pushed or pulled is not allowed**). Using what they have learned in the classroom, the students will follow the given criteria in order to design (log sheet), construct and evaluate a device or vehicle.

The students will present and demonstrate their vehicle/device in class as well as hand in the **required** log sheet.

Please find attached a list of criteria for the project (log sheet). We have also included some examples of wheel/axle, vehicle/device designs and material possibilities. **These are suggestions only**. Creativity is encouraged, and students are to design and create a device which they will build from parts they have created, rather than using those from Lego® or another toy. Please remember that you can tie in to our next unit “Waste and Our World” by thinking about re-using or recycling items that could fit in with this project.

In order to be able to fairly evaluate your child’s learning this project must be theirs alone. Past experience showed us that projects completed with significant adult assistance didn’t achieve as well on his/her final assessment. You are encouraged to offer support gathering materials with your child and brainstorm ideas with him/her. Where safety is a concern, such as using power tools (saws, drills, etc.) to cut or create parts of the project, adult support would be expected. Your child will also need to demonstrate that they are motivated to do the work (creating the design, gathering the materials, creating parts, etc.) making sure that they have what they need, so that the project can be completed by the due date.

**Time allotment for the project – Now to May 3<sup>rd</sup>**

**This is an individual project – No partners or group work**

**Start gathering possible materials now – place them in a container or a bag.**

**Class presentations will occur starting Wednesday, May 4<sup>th</sup>.**

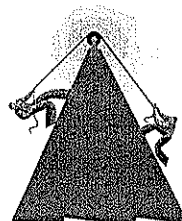
As always, all information will be reviewed with students before the project begins.

Enjoy the challenge!

Mrs. Newby

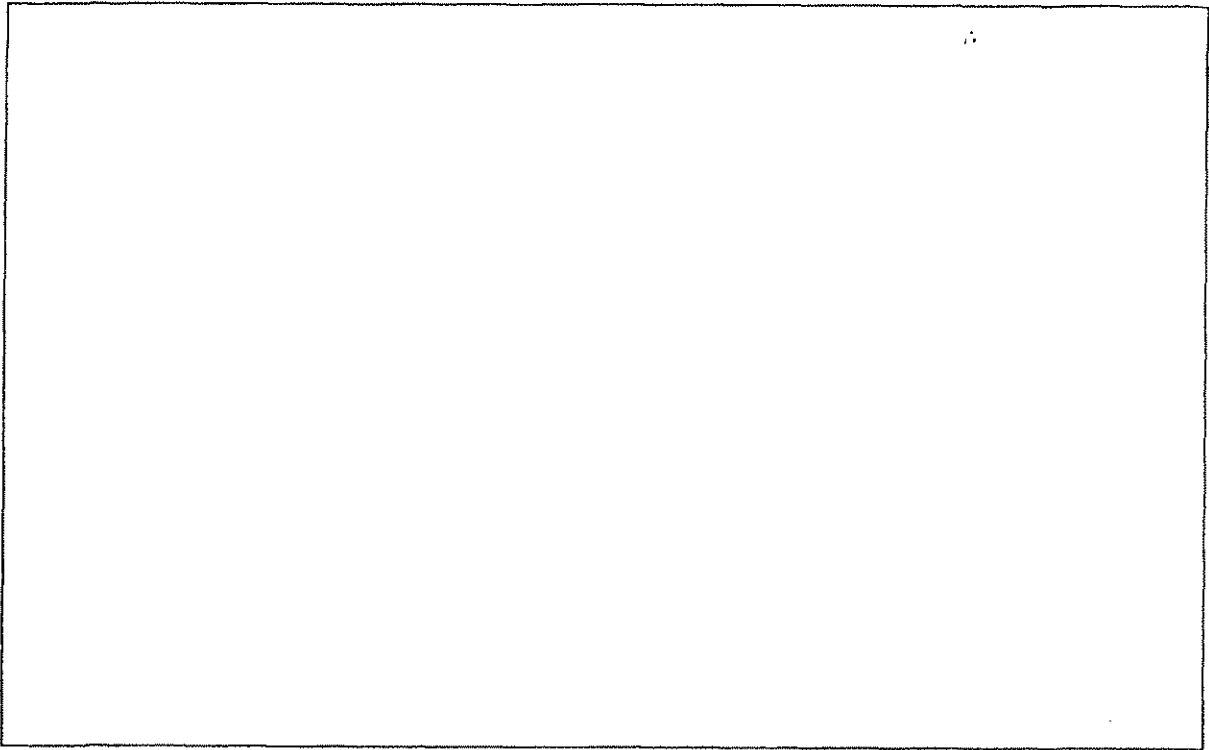
Mr. Schellenberg

Mrs. Matheson





A drawing/picture of my simple machine :



What functioned well with the design of your machine?

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What did not function well?

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What are two things that you would change next time in your design/construction?

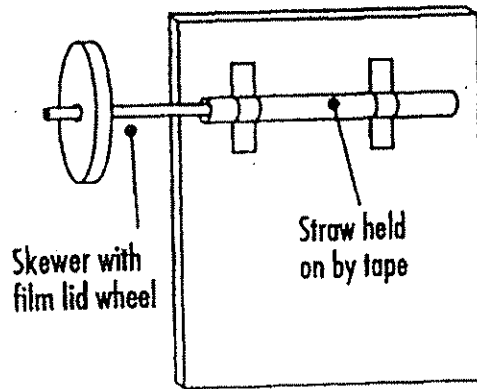
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# Wheels and Levers - Ideas

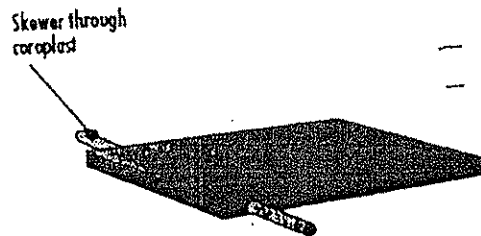
- *Plastic drinking straw as axle housing*



## FIXED WHEEL

Wheel fixed to axle,  
axle free to rotate  
in axle housing

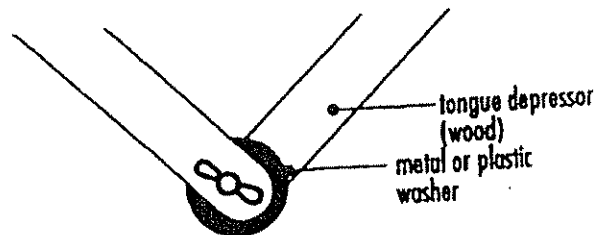
- *Axle through coroplast*



For wheels,  
consider also:

- milk jug caps
- cardboard
- styrofoam
- spools
- film canister lids

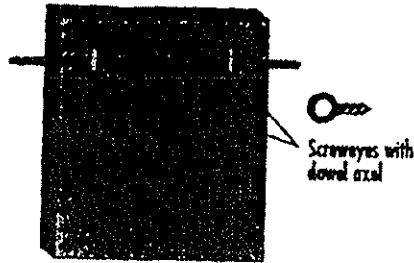
- *Use plastic or metal washers between moving joints*



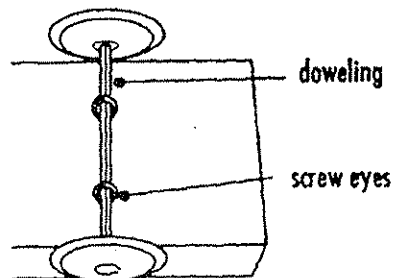
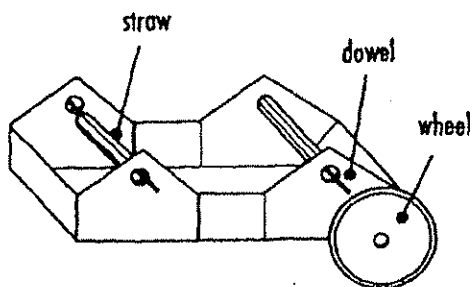
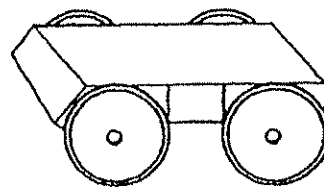
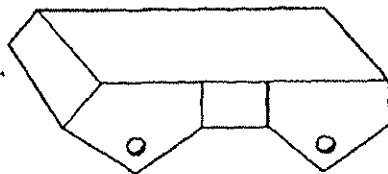
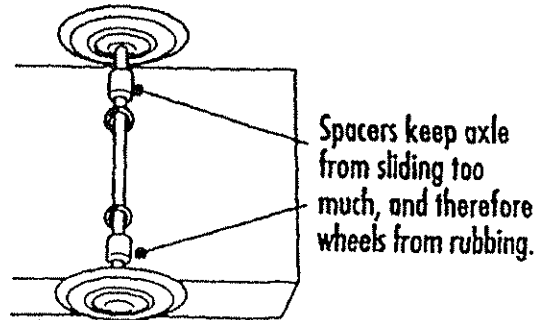
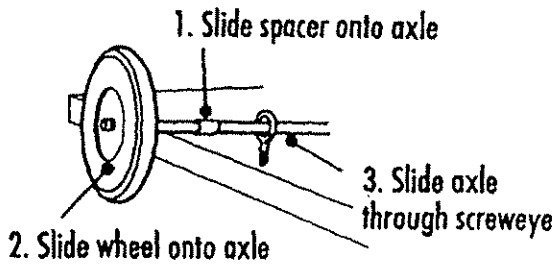
# Wheels and Levers... continued - Ideas

## 2. Minimize Surface of Contact

- *Eye screws as axle holders*

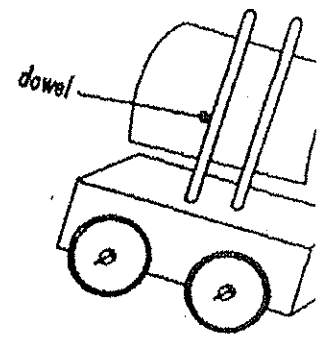
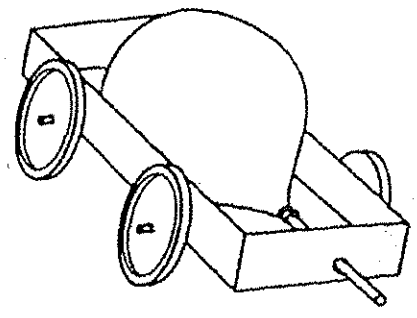
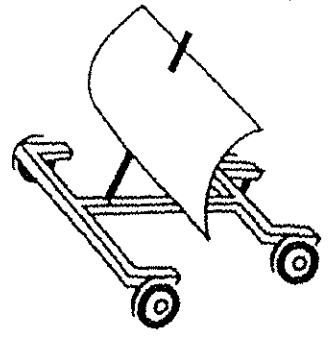


## 3. Stabilize Moving Parts

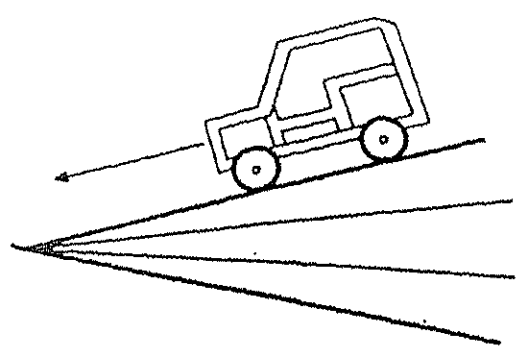


# Simple Forces - Ideas

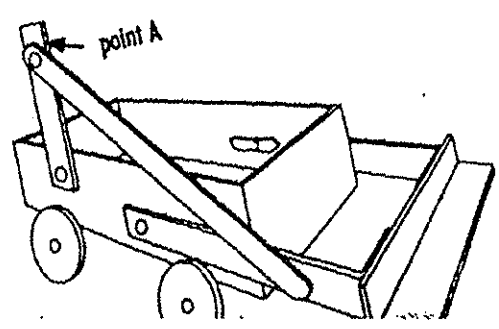
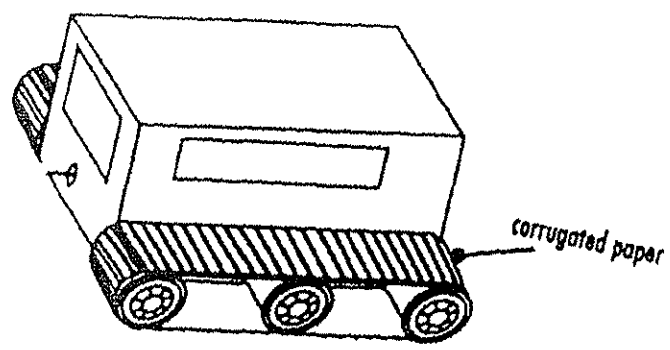
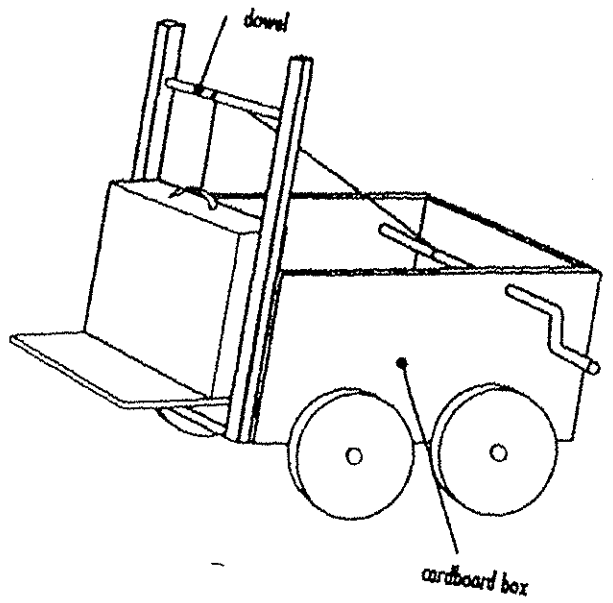
Air:



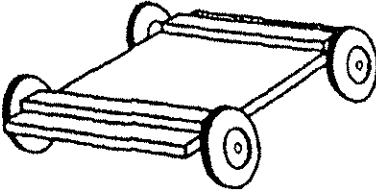
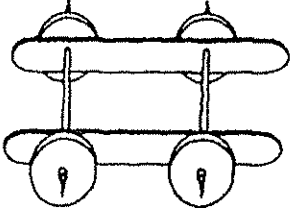
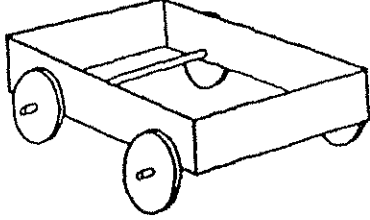
gravity:

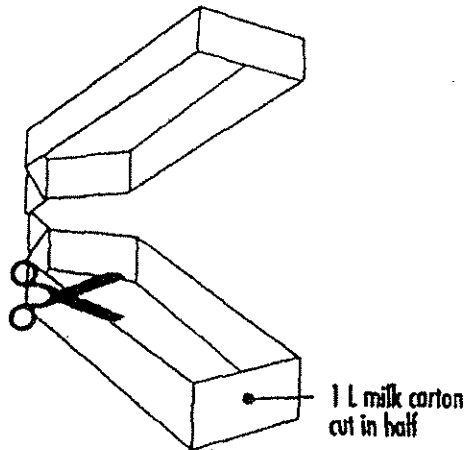


push / crank:



# Frames or - Ideas Chassis

Coroplast Model	Popsicle Stick Model	Cardstock Box Model
		



Consider also :

- juice boxes
- shoe boxes
- wood
- plastic container
- styrofoam

## The Challenge

- 1) Design and construct a device or vehicle that moves and/or has moving parts.
- 2) Use a simple force to propel the vehicle or power the device (air, gravity, crank, etc.)

Name: \_\_\_\_\_

	<b>Exemplary (Excellent)</b>	<b>Proficient (Very Good)</b>	<b>Approaching Proficiency  (Good)</b>	<b>Beginning (Improvement required)</b>
<b>Creativity of design and materials</b> (if any of your materials are from another device (Lego, toy, etc.) you will achieve an 'Beginning' Mark)	Excellent use of creativity in the design and use of materials. It is clearly evident that much thought went into the design and use of materials.	Very good use of creativity in the design and use of materials. It is evident that very good thought went into the design and use of materials.	Good use of creativity in the design and use of materials. It is evident that good thought went into the design and use of materials.	Some creativity in the design and use of materials. It is somewhat evident that minimum thought went into the design and use of materials.
<b>Durability and workability during demonstration</b>	The project was an excellent example of durability and workability during the demonstration.	The project was a very good example of durability and workability during the demonstration.	The project was a good example of durability and workability during the demonstration.	The project found it a challenge at various moments to stay together and work during the demonstration.
<b>Log Sheet/Reflect and Interpret</b>	The log sheet was completed with well written sentences using appropriate scientific terminology. An exceptional and thorough job was done. Was able to do an excellent job describing what was observed and learned and proposed new questions for learning.	The log sheet was completed with appropriately written sentences using fairly specific scientific terminology. Was able to do a very good job describing what was observed and learned and propose new questions for learning.	The log sheet was completed with somewhat appropriately written sentences using some scientific terminology. Was able to do a good job describing what was observed and learned and propose new questions for learning.	The log sheet was somewhat completed with some sentences using a few scientific terminology. Struggled to describe what was observed and learned and to propose new questions for learning.
<b>Independence</b> (this is your project, not someone else – family members, etc.)	Required very little if any support. Student listened to and followed instructions at an exceptional level. Very independent and capable student.	Required appropriate support and encouragement. Student listened to and followed instructions at an appropriate level. Independent student.	Required some support and encouragement. Student listened to and followed instructions at an somewhat appropriate level. Somewhat independent student.	Required a fair bit of support and encouragement. Student struggled at times to listen to and follow instructions at an appropriate level. Somewhat dependent student.
<b>Knowledge</b>	Has superior understanding and ability to apply scientific concepts.	Has a very good understanding and ability to apply scientific concepts.	Has a good understanding and ability to apply scientific concepts.	Struggles with understanding and showing the ability to apply scientific concepts.
<b>Overall</b>	Excellent work in all areas.	Very good work in most areas.	Good work in a number of areas.	You struggled with this project.