



KITCHEN GADGETS GALORE!

Written by Jeremy Peacock and Amy Rowley

Annotation:

Students identify simple machines in common kitchen gadgets and then design their own new gadget.

Primary Learning Outcomes:

Students will be able to name and describe the simple machines: lever, pulley, wheel and axle, inclined plane, wedge, and screw.

Students will be able to recognize simple machines within compound machines.

Students will be able to design a compound machine to accomplish a simple task.

Georgia Performance Standards

Characteristics of Science

SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh6. Students will communicate scientific investigations and information clearly.

Physical Science Content

SPS8. Students will determine relationships between force, mass, and motion.

Physics Content

SP1. Students will analyze the relationships between force, mass, gravity, and the motion of objects.

Duration:

Preparation: 30 minutes

Introduction: 15 minutes

Student Activity: Adaptable to class schedule.

Conclusion: 20 minutes

Total Class Time: Adaptable to class schedule.

Equipment and Materials:

Part One (per class) –

1. Corkscrew
2. Egg slicer
3. Ziploc® container
4. Spatula
5. Pizza cutter
6. Tongs
7. Scissor tongs

Part Two (per group) –

1. 2 sheets Cardstock
2. Brass paper fasteners



8. Nutcracker
9. Nut pic
10. Can opener
11. Corn skewers
12. Vegetable peeler
13. Bottle opener and can punch
14. Egg beater

Safety:

Some kitchen gadgets have sharp points or edges. Care should be taken when handling these.

Procedure:

Teacher Preparation:

Obtain materials and copy the *Cooking at the Speed of Light* student handout.

Estimated Time:

30 minutes

Introduction:

Review the simple machines, including classes of levers, with students. Provide students with the *Kitchen Gadgets Galore!* Student handout and review the procedures..

Estimated Time:

15 minutes

Student Activity:

Students should follow the procedures provided on the *Kitchen Gadgets Galore!* student handout.

Estimated Time:

Adaptable to class schedule.

Conclusion:

Review the activity and key concepts. Students should briefly present their newly designed kitchen gadget to the class.

Estimated Time:

20 minutes

Assessment:

Assessment should be based on attached *Kitchen Gadgets Galore!* scoring rubric.



Kitchen Gadgets Galore!



Authors:



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Student Handout

Introduction:

Have you ever thought about mixing and baking a cake with your bare hands? What about flipping a flapjack or beating an egg? Luckily, we don't have to do these things with our bare hands. We are surrounded in the kitchen by numerous gadgets that make our lives much easier.

Kitchen gadgets; such as can openers, vegetable peelers, and pizza cutters; are *machines*—devices that make doing work easier. These machines are made up of one or more *simple machines*, *i.e.* levers, pulleys, wheels and axles, inclined planes, screws, and wedges.

In this activity you will explore the simple machines that make up common kitchen gadgets. In *Part One*, you will examine several common kitchen gadgets and identify the simple machines that make up each gadget. In *Part Two*, you will use your knowledge of simple machines to design your own new kitchen gadget.

Purpose:

1. To identify the simple machines that make up common kitchen gadgets
2. To design a new kitchen gadget

Materials:

Part One -

15. Corkscrew
16. Egg slicer
17. Ziploc® container
18. Spatula
19. Pizza cutter
20. Tongs
21. Scissor tongs
22. Nutcracker
23. Nut pic
24. Can opener
25. Corn skewers
26. Vegetable peeler
27. Bottle opener and can punch
28. Egg beater

Part Two -

3. 2 sheets Cardstock
4. Brass paper fasteners

Procedure:

Part One -

For each of the common kitchen gadgets listed above complete the corresponding worksheet.

1. Examine the gadget.
2. Describe the function of the gadget. For what task is the gadget designed?
3. Identify the simple machines that make up the gadget.



4. Sketch the gadget to scale. Clearly label all simple machines that make up the gadget. For levers, include class and locations of fulcrum and input and output forces.

Part Two -

1. Your task is to design a new kitchen gadget. Think about a job in the kitchen that you would like to make easier. You will design a new kitchen gadget that combines two or more simple machines to accomplish this task. The following information regarding your new gadget should be recorded on the worksheet provided.
 - Name of Gadget
 - Description of Gadget – Describe the gadget. Include the number and types of simple machines that make up the gadget.
 - Function of Gadget – Describe the task for which the gadget was designed to accomplish.
 - Labeled Drawing of Gadget – Sketch the gadget and clearly label the simple machines that make up the gadget. For levers, include class and locations of fulcrum and input and output forces.
2. Using the provided cardstock and brass paper fasteners, construct a model of your new gadget. The model should be built to scale and should function as much as possible.



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New Gadget Scoring Rubric

CRITERIA	3	2	1 - 0	SCORE
Description of Gadget	New gadget description is complete and the simple machines that make up the gadget are accurately identified.	New gadget description is brief and the simple machines that make up the gadget are not clearly or accurately identified.	New gadget description is incomplete or missing.	_____ Comments:
Function of Gadget	The task for which the new gadget was designed is described in detail.	The task for which the new gadget was designed is described in little detail.	The task for which the new gadget was designed is incomplete or missing.	_____ Comments:
Labeled Drawing of Gadget	Drawing of new gadget is complete and to scale. All simple machines that make up the gadget are clearly and accurately labeled	Drawings of new gadget is complete and to scale. Labeling of the simple machines that make up the gadget is incomplete or inaccurate.	Drawing of new gadget is incomplete or missing.	_____ Comments:
Model of Gadget	Model of new gadget is complete and to scale. Model functions as much as possible.	Model of new gadget is complete but is not built to scale or does not function properly.	Model of new gadget is incomplete or missing.	_____ Comments:
Total Score (Out of 12):				_____

Additional Teacher Comments:



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Spatula

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Egg Beater

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Corkscrew

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Can Opener

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Egg Slicer

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Pizza Cutter

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Vegetable Peeler

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Nutcracker

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Bottle Opener and Can Punch

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Nut Pick

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Corn Skewers

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Ziploc® Container

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Scissor Tongs

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Tongs

Function of Gadget:

Simple Machines Involved:

Labeled Drawing of Gadget:



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Your New Gadget

Name of Gadget:

Description of Gadget:

Function of Gadget:

Labeled Drawing of Gadget:

