

Rube Goldberg Machine Activity Cards

How to use these cards:

- Use each card in this set to explore Rube Goldberg Machines before you start your official build.
- Don't forget to be creative, think like an inventor, and have fun!



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You can complete these activities in any order, but here's what we suggest:

- First, familiarize yourself with the vocabulary.
- Then, head to the Explore Simple Machines cards for some inspiration.
- Next, run through the Quick Challenge cards to have a scavenger hunt, tell a story, and pop a balloon.
- Now you're ready to start creating your own Rube Goldberg Machine.

Vocabulary:

- **Chain reaction (noun):** a series of events in which one event causes another event
- **Force (noun):** a push or pull that acts on an object
- **Friction (noun):** the resistance to motion that slows an object down
- **Iterate (verb):** to perform an action again and again
- **Kinetic energy (noun):** energy of something in motion
- **Momentum (noun):** amount of movement of an object as related to its mass
- **Potential energy (noun):** stored energy of an object at rest based on where it is in relation to other objects
- **Precise (adjective):** exact and accurate
- **Transfer (verb):** to move or change from one to another
- **Trigger (noun):** a thing that starts an action

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Quick Challenge: Pop a Balloon

START HERE!

Directions

Rube Goldberg Machines are all about trial and error. Things will probably not work perfectly the first time, and that's okay! You'll need to be an engineer and look for ways to fix and improve your machine to accomplish your goal.

Task

Make a Rube Goldberg machine that uses 3-6 different steps in a chain reaction to pop a balloon. You can do this with physical objects, or digitally using Minecraft.

1. List materials you would like to use in your mini Rube Goldberg Machine.
2. Draw or describe a plan for your steps.
3. Build it and test it! What needs to be fixed? How will you fix it?
4. Test, improve, and repeat until you succeed!
5. How many trials did you run to get a success?

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Quick Challenge: Pop a Balloon

Take it further!

- Create a machine with more steps.
- Connect your machine to a friend's machine and work together to pop the balloon.
- Make a digital or physical version of your machine (the opposite of the design you started with).
- Include different simple machines (see the Explore Simple Machines cards for some ideas).
- Tell a story! Get creative – your story can include visuals, narration, a main character, and more. You can even film your story and post it online.

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Quick Challenge: Tell a Story

START HERE!

Directions

A big part of Rube Goldberg Machines is storytelling. Even short and simple machines can tell big stories! In this task you will need to combine two simple machines together and use storytelling to connect them thematically.

Task

Build a bridge to get to a castle! Your Rube Goldberg Machine should involve two simple machines and tell a story (see the Explore Simple Machines cards for some ideas).

1. Who are your characters?
2. What is the setting?
3. What is the plot of your story?
4. What materials will you use to create the bridge and castle?
5. What are your two simple machines and how will they be connected?

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Quick Challenge: Tell a Story

Take it further!

- Add more steps to the machine and create a longer and more complicated story.
- Narrate and record your story and post it online!
- Collaborate with others to make a machine or combine two or more existing machines. Adjust your story and machine as needed.
- Make a digital or physical version of your machine (the opposite of the design you started with).
- Tell a different story with the same simple machines – or, tell the same story with different simple machines!

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Quick Challenge: Scavenger Hunt

START HERE!

Directions

Simple machines are all around us! They're present in many everyday objects and help with all sorts of technology. Simple machines are also an important part of a Rube Goldberg Machine.

Task

Look around your house, classroom, school, or community to find some simple machines.

1. What are simple machines?
2. Which simple machines were you able to find?
3. What "job" does the simple machine do?
4. Which simple machines did you find the most? Why do you think this is?

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Quick Challenge: Scavenger Hunt

Take it further!

- For each simple machine you located, make a chart that includes what type of simple machine it is, where you found it, and what its function is.
- Choose three simple machine examples and explain how they could be used in a Rube Goldberg Machine.
- Now, either swap out the simple machines you used for different ones, or incorporate even more simple machines to see how your design changes!

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Explore Simple Machines

START HERE!

Directions

- Let's explore simple machines before you construct your own Rube Goldberg Machine! First, learn about some common simple machines. Then, think about how you can incorporate them into your contraption. These ideas will help you get started, but the possibilities are endless! What will you create?



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Explore Simple Machines



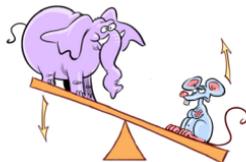
Inclined Plane:

- A plane inclined at an angle
- To the horizontal
- Sloping ramp up which heavy
- Loads can be raised
- Synonyms: ramp, slant, gradient

Inspiration for your RGM!

Create a ramp by stacking books and laying a board across one edge.

Make a zipline that descends along a slope using string or yarn.



Lever:

- A rigid bar resting on a pivot (fulcrum)
- Used to help move a heavy or firmly fixed load with one end when pressure is applied to the other
- Synonyms: crowbar

Inspiration for your RGM!

A water bottle and a ruler can be used to make a seesaw.

Did you know that a boat oar and the claw of a hammer act as levers too?

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Explore Simple Machines



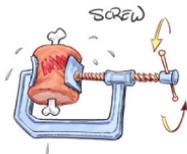
Pulley:

- Wheel with a grooved rim around which a cord passes
- Acts to change the direction of a force applied to the cord
- Is mainly used to raise heavy weights
- Synonyms: sheave, drum

Inspiration for your RGM!

Use an old fishing rod reel or a sailboat block (used for rigging) to make an easy-to-use pulley.

Create your own pulley by gluing an empty tape reel between two compact discs. Add a rope and you're ready to go!



Screw:

- Short, slender, sharp-pointed metal pin with a raised helical thread running around it and a slotted head
- Used to join things together by being rotated so that it pierces wood or other material and is held tightly in place
- Synonyms: bolt, fastener

Inspiration for your RGM!

Engineer an Archimedes screw from recycled materials.

Open a jar lid – the rim is a screw!

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Explore Simple Machines



Wedge:

- Piece of wood, metal, or some other material having one thick end and tapering to a thin edge
- It is driven between two objects or parts of an object to secure or separate them
- Synonyms: doorstop, chock

Inspiration for your RGM!

Wedges include scissors, shovels, and arrows.

Even staples are a type of wedge!



Wheel and Axle:

- A simple lifting machine consisting of a cylindrical drum or shaft joined to the wheel to provide mechanical advantage
- Synonyms: axis, shaft

Inspiration for your RGM!

Toy cars and trucks have wheels and axles.

Doorknobs, pinwheels, and old-fashioned kitchen hand mixers all contain a wheel and axle, also.

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Rube Goldberg Machine Challenge

How to Make a Rube Goldberg Machine:

- Collect junk, recyclables, old toys – anything will do!
- Construct your chain reaction contraption.
- Test it out and tinker until it works the way you want.

Things to Consider:

- How many steps will your Rube Goldberg Machine have?
- What task will it complete?
- Will your machine have a theme or tell a story?

To join an official Rube Goldberg Challenge visit rubegoldberg.com



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Rube Goldberg Machine Challenge

Scavenger Hunt Activity

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- Which simple machines were you able to find?
- What "job" does the simple machine do?
- Which simple machines did you find the most? Why do you think this is?

Want more great activity cards like this one? Join an official RGM Challenge and receive a welcome package with more activity cards like this one, and other goodies to help you construct your machine.

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