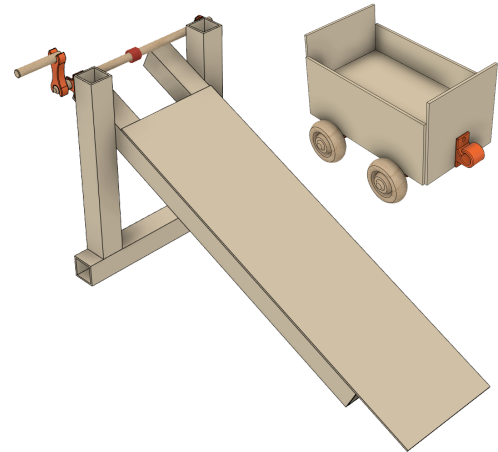




Ramp & Wagon CORiculum

The CORI Ramp and Winch give learners an opportunity to explore concepts like inclined planes and pulleys. Partnered with the CORI Wagon (wheel & axle), the ramp and winch applies simple machine physics in the real world. Additionally, learners will learn to measure and construct while having fun playing and adjusting their design.



Objective:

Students will apply simple machine physics of inclined planes, pulleys and wheel & axles to move an object from one place to another.

Grades Levels: 2nd - 8th Grade

Lesson Duration: 3-4 hours

Build Time: 45 - 75min

Additional Materials Recommended

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| <ul style="list-style-type: none"> • Hot glue gun • Gluesticks • Scissors • Ruler | <ul style="list-style-type: none"> • Pencil • Art supplies (optional) - Decorate your wagon and ramp • Animal toy or other toy object that fits in the wagon (optional) |
|---|--|

Vocabulary To Explore	Definition
Simple Machine	A device that can use mechanical advantage to increase force and make work easier
Inclined Plane	A sloping ramp which heavy loads can be raised
Wheel & Axle	A simple machine that has a wheel attached to an axle so that these two parts rotate together in which a force is transferred from one to the other.
Tension	apply a force to (something) which tends to stretch it.

Pulley	a wheel with a grooved rim around which a cord passes. It acts to change the direction of a force applied to the cord and is chiefly used (typically in combination) to raise heavy weights.
Force	an influence that can change the motion of an object

CORI Ramp & Wagon Design Challenge: Design and construct a wagon and ramp to lift an object (toy animal) from the ground to the top of the ramp. You will need to measure and cut the CORI beams at appropriate dimensions to build your toolbox correctly. Decorating your wagon and ramp is a plus!

Design Challenge Narrative: The animal rescue team at the local zoo just rescued a large hippopotamus that was lost in the jungle. Unfortunately, the hippo has injured her foot and cannot walk. Your team needs to move the hippo from the truck (wagon) to an elevated location that has no stairs. What simple machine tools can be used to help move the large hippo from one location to another?

CORI Bonus Challenge: Using coins or items that have weight (i.e. rocks, beans), see how many can be safely put on the wagon while being pulled up by the winch on the ramp.

Guiding Discussion Prompts

- Why are simple machines important?
- Compare and contrast simple machines from Roman, Greek, Chinese, and Arabic ancient civilizations.
- What are real world examples of pulleys, wheel & axle and inclined plane simple machines?
- What is the largest simple machine you have ever seen? What is the smallest?
- Search Rube Goldberg machines on the internet and find a video demonstrating it in action. What simple machines do you see in the video?

Sketching Activity

Now that you have explored Rube Goldberg machines on the internet, visualize a marble going down your own simple machine track. Sketch a 2D marble run where you are using at least 3 simple machines to move it down the track. Share your designs with your classmates.

Label These Simple Machines

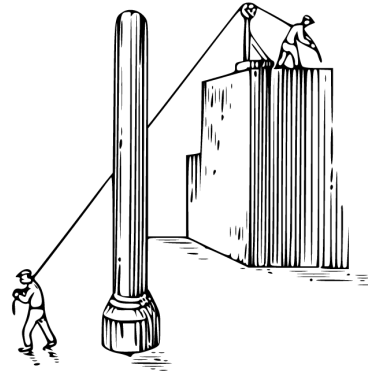
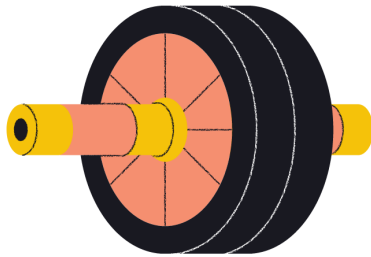
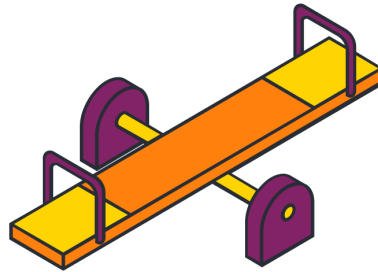
A. Wedge

B. Wheel & Axle

C. Screw

D. Pulley

E. Lever



Ramp & Wagon Build Reflection Questions

- Are there other ways you could have moved the hippo (animal) from one location to another using different simple machines?
- Dive deeper into pulley systems like compound pulleys and block & tackle pulleys. What makes them different from the standard fixed pulley systems?
- What careers do you think use simple machines in their profession?
- Which simple machine has had the greatest impact on human civilization? Why?

Contact us at support@coricreate.com if you have any questions or comments.



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