

# SIMPLE MACHINES

M O T A T

# SETTING THE SCENE

YOU WILL NEED:

- DISCUSSION DOCUMENT

Watch [this video](#) explaining the six simple machines by the MOTAT education team.

Now that you know about the six simple machines, you will start to see them everywhere!

- A tape dispenser is an excellent example of a wheel and axle. Can you think of an example for each of the other machines?
- A complex machine includes more than one simple machine in its design. Can you think of an example?
- What simple machines are included in the design of a stapler?

# SCAVENGER HUNT

## START SEARCHING

- Search around your house for examples of each of the simple machines.
- Record what you have found on your scavenger hunt cards. You can also record the machines you find by taking a photo of them
- Share your findings with your teacher and class

**HINT** Try looking in the utensil drawer in the kitchen

### YOU WILL NEED:

- SIMPLE MACHINE SCAVENGER HUNT SHEET
- PENS
- TECHNOLOGY TO TAKE PHOTOS

# SCAVENGER HUNT

WEDGE	LEVER	WHEEL & AXLE
SCREW	INCLINED PLANE	PULLEY
COMPLEX MACHINE	COMPLEX MACHINE	COMPLEX MACHINE

# DIY CATAPULT

## MAKE CATAPULTS

Follow the instructions to make the catapults and experiment with them.

If you don't have the exact materials, don't worry. You can substitute the materials you do have, be creative and use clothes pegs, hair ties, bottle tops, sticks, pencils etc.

*A catapult is a type of lever that launches objects into the sky. Potential energy is quickly stored in the rubber bands and then released as kinetic energy to launch an object across the room.*

### YOU WILL NEED:

- *DIY CATAPULT* INSTRUCTIONS
- CATAPULT MATERIALS (PER CATAPULT)
  - 1X PLASTIC SPOONS
  - 6X POP STICKS
  - 4X RUBBER BANDS
  - 1X SOFT OBJECT TO LAUNCH (E.G. POMPOM, MARSHMALLOW)
- TAPE
- SCISSORS

# DIY CATAPULT

1



2



3



4



5



# DIY CATAPULT

## EXPERIMENT

Once the catapults are working, start experimenting!

Make sure you measure and record your observations.

## COMPARE AND DISCUSS

- How far can you get your object to fly?
- How high can you get your object to fly?
- How does moving the spoon affect the flight of the object?
- Try adjusting the height by adding more popsicle sticks to the centre. What effect does this have on the flight path?
- Compare launching objects with different weights.
- How can you improve on this design?

## YOU WILL NEED:

- *TECHNOLOGY TO RECORD MOVIES*
- *PENS*
- *PAPER*
- *MEASURING TAPE OR RULERS*
- *DISCUSSION DOCUMENT*

# REPORT BACK

YOU WILL NEED:

- TECHNOLOGY TO TAKE PHOTOS

Share your scavenger hunt and catapults with your classmates on your community page!

## WE LOVE TO HEAR FROM YOU

- Send us drawings and photos of the simple machines you found
- Send us videos of your catapults in action

Send your pictures to [motat.fun@motat.org.nz](mailto:motat.fun@motat.org.nz)

# LOOK FURTHER

Feeling like looking further into innovation? Check out these links!

Rube Goldberg machines incorporate lots of simple machines, check this one out:

[Video: Rube Goldberg machine incorporating the six simple machines](#)

Enjoyed making your pop stick catapult? Check out these other designs:

[Video: how to make two types of pop stick catapult](#)

This awesome invention combines catapults with bungee jumping!

[Video: AJ Hackett bungee jump catapult](#)

# ADDITIONAL INFORMATION

## DESCRIPTION

Every day we interact with incredible machines and feats of engineering that make our lives easier. Explore the fundamentals of engineering by examining the six simple machines: the lever, the screw, the pulley, the wheel and axle, the wedge, and the inclined plane. Use our scavenger hunt to identify examples of simple and complex machines in your life. Create a catapult and explore the relationship between the fulcrum and the lever.

## CURRICULUM LINKS

### Science

“Extend their experiences and personal explanations of the natural world through exploration, play, asking questions, and discussing simple models.” Investigating in science: Level 1-4

“Identify and describe the effect of forces (contact and non-contact) on the motion of objects; identify and describe everyday examples of sources of energy, forms of energy, and energy transformations.”

Physical inquiry and physics concepts: Level 3-5

