

**GEEK  
& CO.  
SCIENCE!**



PROJECT KIT **Ages  
8+**

# Slime TIME



## Warning.

Not suitable for children under 8 years. For use under adult supervision. Contains some chemicals which present a hazard to health. Read the instructions before use, follow them and keep them for reference. Do not allow chemicals to come into contact with any part of the body, particularly the mouth and eyes. Keep small children and animals away from experiments. Keep the experimental set out of reach of children under 8 years old. Eye protection for supervising adults is not included.

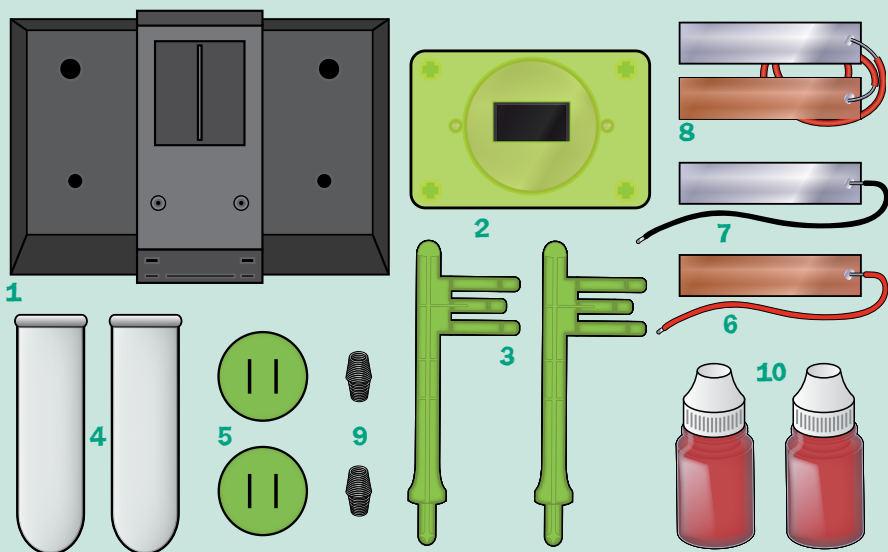
**WARNING** — This set contains chemicals and/or parts that may be harmful if misused. Read cautions on individual containers and in manual carefully. Not to be used by children except under adult supervision.

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# KIT CONTENTS



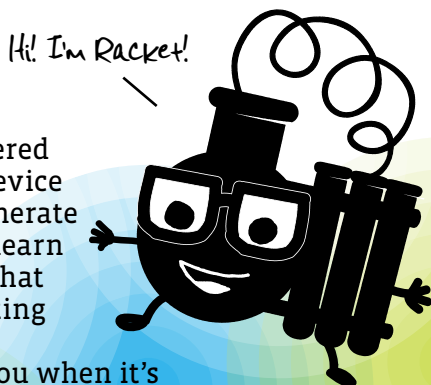
- 1 | Base plate with battery holder
- 2 | Digital clock
- 3 | Test tube holders (2)
- 4 | Test tubes (2)
- 5 | Test tube caps (2)

- 6 | Copper electrode
- 7 | Zinc electrode
- 8 | Copper and zinc electrode pair
- 9 | Contact springs (2)
- 10 | Slime solution bottles (2)

**YOU WILL ALSO NEED:** *Water, paper towels, various liquids (for example, diluted vinegar, cola, soda water, lemonade, tomato juice, oil, milk, fruit juice), two AA batteries (1.5-volt, type AA/LR6)*

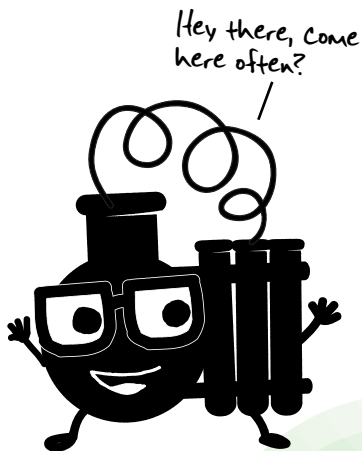
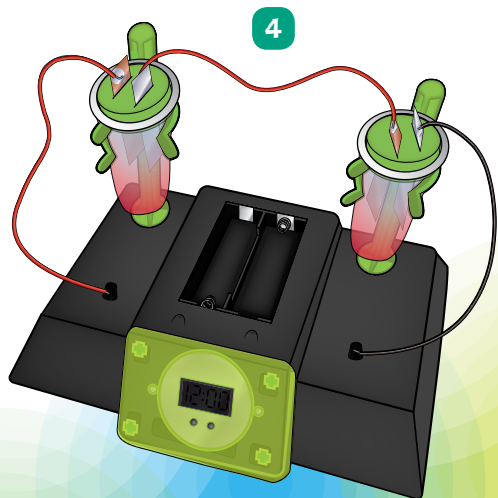
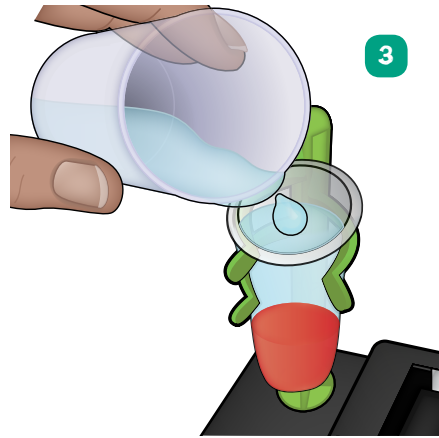
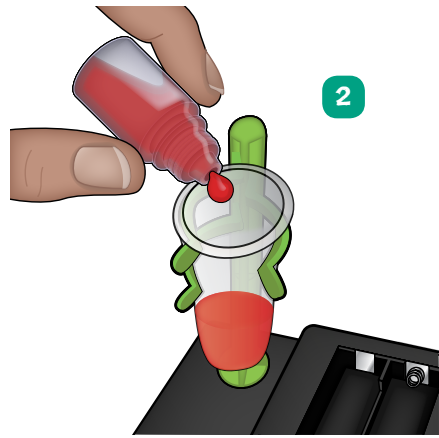
## Hey Slimy Timers!

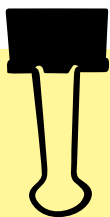
Ready to make a cool electro-goop-powered clock? In this kit, you will assemble a device that uses a simple type of battery to generate electricity to power the clock. You will learn all about the electrochemical reaction that makes this happen, and a lot of interesting stuff about batteries! Most importantly, you'll have this rad slime clock to tell you when it's time to play! Racket the Geeker will be your guide!



- 2 Fill both test tubes about a quarter of the way with the red slime solution.
- 3 Fill both test tubes with water the rest of the way up. Swirl or stir the solution a little to get the water and slime to mix.
- 4 Reinsert the test tube caps with the electrodes in them into the test tubes. The electrodes should be immersed in the liquid.
- 5 Now your clock will start running! You will see numbers and blinking double dots on the display.

**Your clock has power! Now you can set the time.**





## DIFFERENT TYPES OF BATTERIES

### WET CELL

The electrolyte in a wet cell battery is a liquid. The earliest batteries were wet cells. Your slime clock is a wet cell.

### DRY CELL

The electrolyte in a dry cell is a more solid paste but with enough liquid in it for current to flow. They don't spill and therefore they can be used in any orientation. Standard batteries (AAA, AA, 9V) are dry cells.

### MOLTEN SALT

Molten salt batteries use a molten salt as the electrolyte. They are very hot and must be installed with a lot of insulation.

Some common batteries are:

**Zinc-carbon:** anode: zinc; cathode: carbon rod and magnesium dioxide

**Alkaline:** anode: zinc; cathode: magnesium dioxide

**Lithium:** anode: lithium; cathode: magnesium dioxide or various other chemicals

**Zinc-air:** anode: zinc; cathode: oxygen in the air

**Silver oxide:** anode: zinc; cathode: silver oxide



## The Electrode Rodeo

The metal sheets immersed in the lemonade are the electrodes of the slime clock battery. It is crucial that they are made of different materials. The electrodes in this kit are made of **copper** and **zinc**. The slime is the battery's conductive liquid, also known as an **electrolyte**. It has to contain a little acid for the battery to work.



Raw copper



Raw zinc

## ELECTROPLATING

The electrons react with the positive zinc particles in the conductive liquid. That gradually creates a layer of zinc on the copper electrode. This process is called **electroplating**. When that happens, no more current can flow, since both electrodes outwardly consist of the same material. You can get the current flowing again by cleaning the metal sheets with a little sandpaper and using a new batch of acidic solution.