



# MAKE A THUNDERSTORM

## AT A GLANCE

### GRADE LEVEL

- Grade 3-5, 6-8, 9-12

### TIME REQUIRED

- 5-10 minutes prep time
- 20-30 minutes classtime

### FORMAT

- Individual exploration
- Small group

### MATERIALS

- 1 clear plastic container (shoebox sized)
- Red food coloring
- Ice cubes made with blue food coloring
- Paper towels
- Pencils and science journal (or related materials to record observations)

## THE SCIENCE EXPLAINED

The blue cold water sinks while the red warm water rises. This happens because of convection. The blue water represents the cold air mass and the red water represents the warm, unstable air mass. A thunderstorm is caused by unstable air and convection plays an important part. A body of warm air is forced to rise by an approaching cold front therefore thunderstorm's form.

## LESSON SUMMARY

Explore how thunderstorms form in this hands-on activity that demonstrates hot and cold air convection.

## OBJECTIVES

The learner will:

- Describe the basic process of convection by observing the movement of warm and cold water in the container.
- Use evidence from the activity to explain how thunderstorms form, focusing on the role of rising warm air and sinking cold air.

## PROCEDURE

### Step One

Fill the plastic container two-thirds full with lukewarm water

### Step Two

Let the water sit for one minute

### Step Three

Ask students to place a blue ice cube at one end of the plastic container

### Step Four

Add three drops of red food coloring to the water at the other end of the plastic container

### Step Five

Have students observe what happens, and record observations in their science journals

# MAKE A THUNDERSTORM AND NOAA GEOSTATIONARY SATELLITES



## CONNECTIONS

Thunderstorms are one of the weather phenomena that GOES East and West study from space!

The Advanced Baseline Imager (ABI) is the primary instrument on the GOES-R Series for imaging Earth's weather, oceans and environment.

ABI provides data for accurate severe weather forecasting and detection including hurricane tracking, increased lead time for thunderstorm and tornado warnings, lightning threats, heavy rain and flash flooding.

## Did you know ...

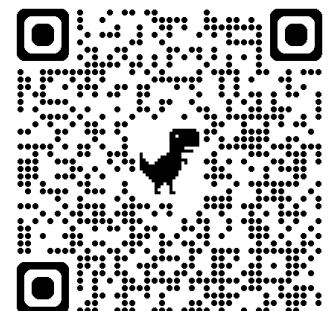
By 1980, a new series of GOES was in orbit. The second generation of satellites could observe vertical profiles of temperature and moisture throughout the various layers of the atmosphere. This information gave forecasters a more accurate picture of the intensity and extent of storms.

## KEY RESOURCES

**Learn more about thunderstorms with SciJinks!**

Select the link or scan the QR code to visit the page:

[SciJinks - What Causes a Thunderstorm?](#)





# THINKING OUTSIDE THE BOX

## Discussion Prompts and Extension Activities

### DISCUSSION AND JOURNAL PROMPTS

- Describe your observations of how the hot and cold water moved in the container.
- Explain the cause and effect relationship between the hot and cold water in the container, and apply it to how thunderstorms form (teacher note: relationship between rising air masses and moisture)
- Summarize how storms play a significant role in Earth's weather systems and use your observations from today's demonstration to explain your points.

### SUGGESTED EXTENSION ACTIVITIES

- Create a variable in the experiment: use warm water of varying temperatures to see whether the changing temperatures affect the convection cycles. Connect this to seasonal weather changes, hurricanes forming over cool versus warm water and other weather phenomena.