

# Word Search

Find the words that are related to flooding. They can be found forwards, diagonally, vertically and horizontally.

- |           |           |         |
|-----------|-----------|---------|
| BASIN     | FAST      | SPEED   |
| CAUTION   | FLASH     | STOP    |
| CHANNEL   | FLOOD     | STORM   |
| CLOUDS    | MUD       | TRASH   |
| DANGEROUS | POLLUTION | WARNING |
| DIRTY     | RAINFALL  | WASH    |
| DRAINS    | SAFETY    | WATCH   |

F A C D W F L A S H L O N W E  
 J N T A W C H A N N E L C M D  
 Z K R N P O L L U T I O N U I  
 C V A G Q K N G F L O O D D R  
 E A S E L M C W G S P E E D T  
 V O H R W A T C H W L Y Y C Y  
 Z U C O D D R A I N S W A H I  
 E A A U S X B A S I N B E B Z  
 S F U S T O R M T S P S E A P  
 W A T P O R W R A I N F A L L  
 A S I W P S W A R N I N G W B  
 S T O N Q L C L O U D S L X K  
 H A N U N N D W C S A f E T Y

## REGIONAL FLOOD CONTROL DISTRICT



# Splash!

Learn about floods and how you can be safe.



(702) 685-0000  
[www.regionalflood.org](http://www.regionalflood.org)

# Learn the Three D's

## 1. DANGEROUS

Floodwater can move up to 30 miles per hour and can sweep you away.

## 2. DIRTY

Floodwater is full of dirt, oil, rocks, trash and pollutants. It can make you very sick.

## 3. DON'T DRIVE

Tell your family not to drive in floodwater. Your car could get stuck and you could get hurt!

### DETENTION BASIN

A big "bathtub" that holds floodwater

One inch of water can cause a car to lose control!

Flood water can travel as fast as 30MPH!

### FLOOD CHANNEL

A concrete or dirt ditch that moves floodwater like a river

# Experiment Make It Rain!

## Background

During the hot summer months in Southern Nevada, moist, unstable air from the Gulf of Mexico is rapidly forced upward by hot air currents. This causes severe thunderstorms with intense rain fall which can cause flash floods. On average Southern Nevada gets 4 inches of rain per year. However, in some severe storms, we can get as much as 3 inches of rain in 90 minutes!

Rain is made when warm moist air rises and meets colder air in the atmosphere. The water vapor condenses and forms precipitation (or rain) and then it falls to the ground.

## Materials

- A glass jar
- A plate
- A towel
- A pot
- Ice cubes
- Water

## Instructions

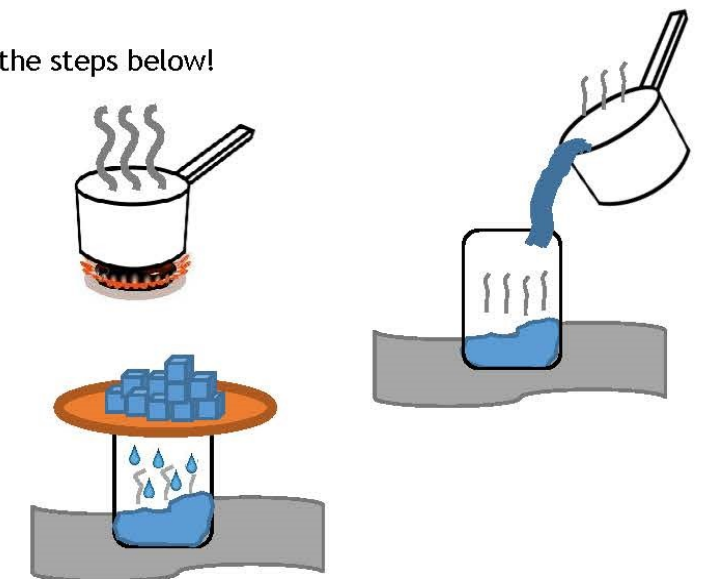
Learn about the process of rain making by following the steps below!

**Step 1:** Ask an adult to help you add water to the pot and bring it to a boil.

**Step 2:** Place the glass jar on a towel and ask your parents to carefully pour about two inches of the hot water into the jar.

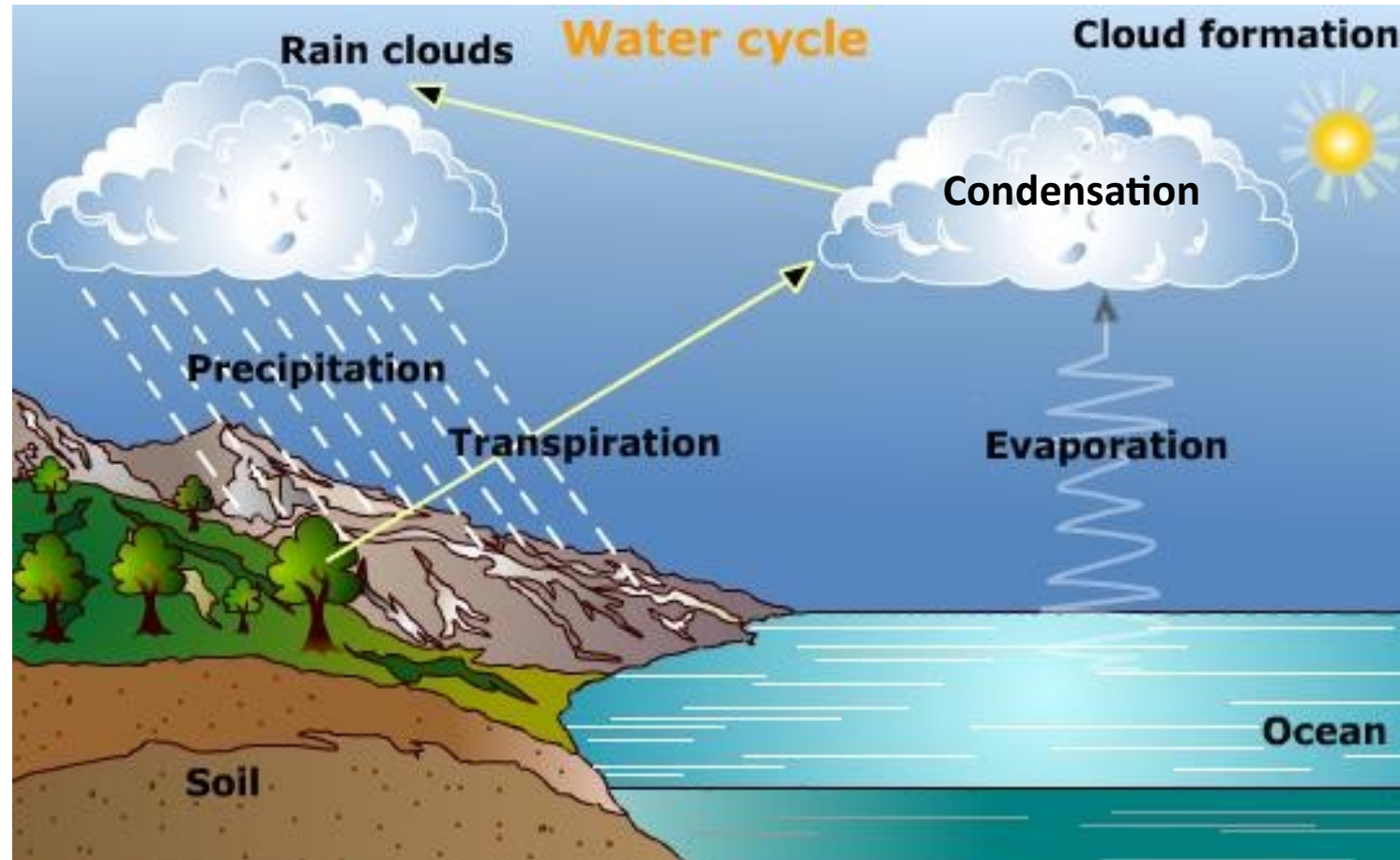
**Step 3:** Place the plate on top of the jar and put ice cubes on the plate.

**Step 4:** Watch the cold plate condense the hot moisture in the jar and make rain drops!



**Remember:** Always pay attention to the weather, do NOT play outside in a thunderstorm!

# The Science of Flash Floods



## Flash Floods:

Floods can occur anywhere in the world and at any time during the year. Here in Southern Nevada we are especially prone to flash flooding between **July and September**.

During these hot summer months, moist, unstable air from the Gulf of Mexico is rapidly forced upward by hot currents.

Steep mountain slopes and hard desert surfaces cause the rain water to run off rapidly and concentrate in the urbanized areas at lower elevations.

Our hard soil, called **caliche** prevents water from seeping into the ground therefore running onto the streets trying to make its way to lower elevations.

Flash floods can happen in a matter of minutes. During a July 1999 flood, one channel in the Valley went from being dry to carrying 7 feet of water in just 8 minutes!!

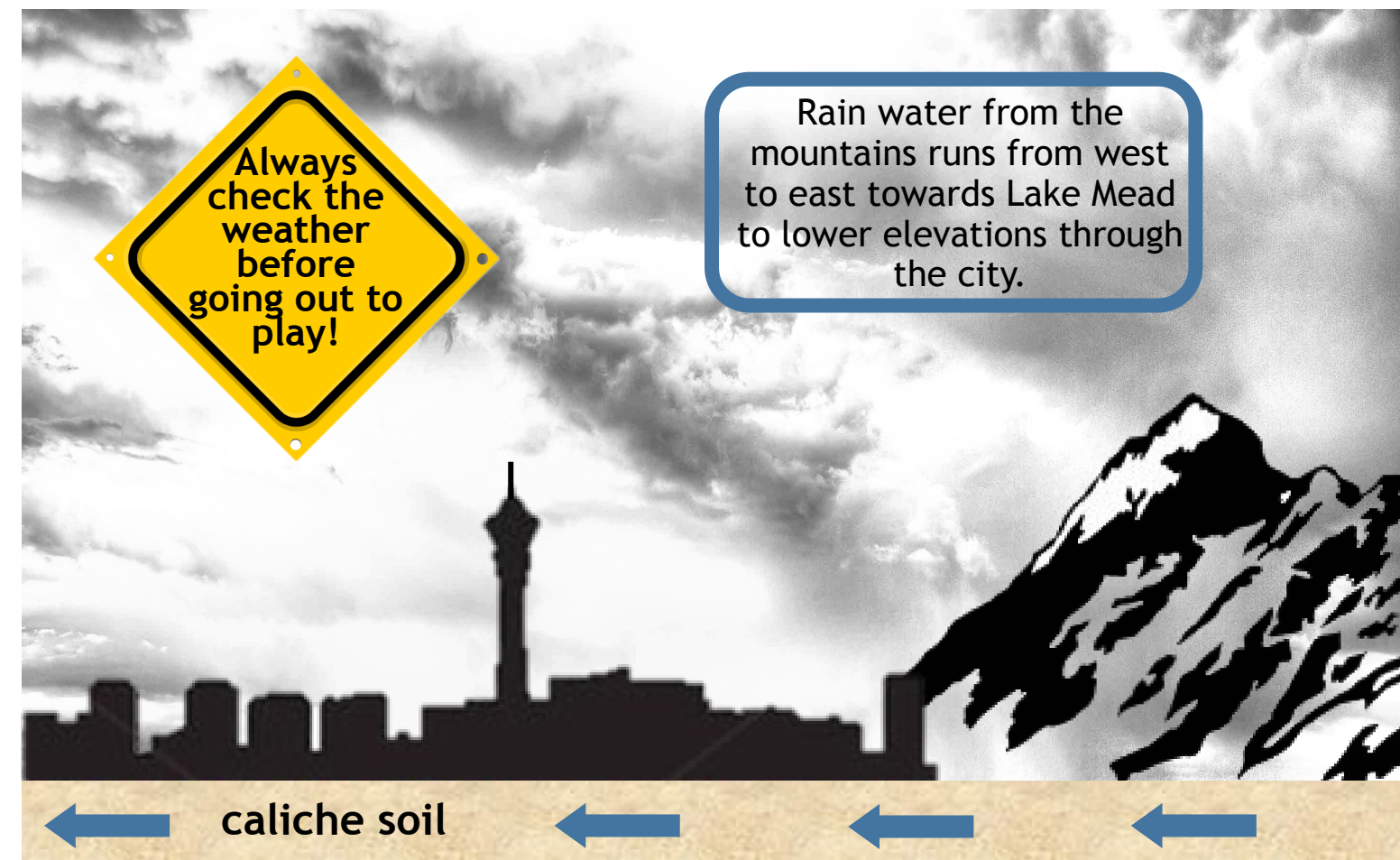
## Water Cycle:

**Step 1:** The water cycle starts with **evaporation** which is a process where water at the surface of bodies of water turns into vapors. The bodies of water absorb heat energy from the sun and turn into vapors.

**Step 2:** **Condensation** occurs when water vapors at high altitudes in the atmosphere change into tiny particles of water droplets and form clouds and fogs in the sky.

**Step 3:** The clouds formed by water vapors pour down as **precipitation** due to wind or temperature change in the form of rain drops. Precipitation can also occur when the air cannot hold any more water and it releases the water as rain.

**Step 4:** As water precipitates, some of it is absorbed by the soil and begins the process of **transpiration** where liquid water is turned into vapor by plants through the process of photosynthesis.



# Experiment Beat the Flood!

## Background

Steep mountain slopes and hard desert surfaces cause the rainwater to run off rapidly and concentrate in the urbanized areas at lower elevations. The Clark County Regional Flood Control District helps prevent flooding by constructing a network of channels, and detention basins.

A **detention basin** is a flood control facility to “detain” the flow of water. These facilities act like a bathtub and allow a lot of flood water in quickly then releases that water slowly through channels.

Learn more about how a detention basin and channel work by making your own!

## Materials

- tape
- 1 pencil or pen
- 1 straw (represents the channel coming out of the detention basin)
- 1 shoe box (represents the detention basin)
- 1 plastic bag (make sure the bag has no holes!)
- water

## Instructions

You are an engineer for the Clark County Regional Flood Control District, design and build your own detention basin!

**Step 1:** Use the bottom (large) part of the shoe box as your detention basin.

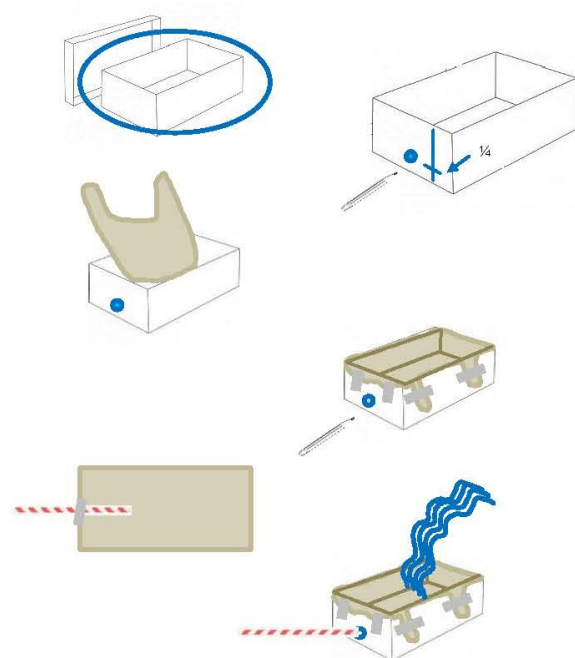
**Step 2:** Using the pen or pencil, carefully poke a hole in 1/4 up from the bottom on any side of the shoe box.

**Step 3:** Place the plastic bag inside of the shoe box so it lines the inside of the box and tape the plastic bag to the sides of the shoe box to secure it.

**Step 4:** Use the pen or pencil and poke it through the previously poked hole in the box and this time pierce through the plastic bag carefully.

**Step 5:** Insert half the straw into the hole you made and secure it from the outside with tape.

**Step 6:** Pour water into the shoe box lined with the plastic bag and watch your detention basin at work!



## Do The Math:

**Step 1:** Find the volume of your shoe box detention basin in cubic inches.

Hint: Volume of your shoe box (aka parallelepiped) is height x width x length  
 $v = h \times w \times l$

**Step 2:** Convert the volume of your shoe box detention basin to cubic feet.

Hint: Divide the volume of your shoe box detention basin by 1728 to  
 1 cu ft. = 1728 cu in.

**Step 3:** The answer you come up with is how many cubic feet of water your detention basin can hold! Compare the size of your detention basin with other detention basins through the valley.

# Clark County Regional Flood Control District

The District was created in 1985 to develop a coordinated and comprehensive plan to solve flooding problems, to regulate land use in flood hazard areas, to fund and coordinate the construction of flood control facilities. By construction detention basins and channels, the District helps solve flooding problems.

Detention basins throughout Southern Nevada are built to reduce the flow of water from rainfall through the valley on its way to Lake Mead. The size and capacity of each detention basin depends on the likelihood of flooding in structures located upstream and downstream of the basin in the case of a 100-year or more flood event.

Now, help us solve these math problems and learn how flood control works!

## Conversion Key:

1 cubic foot of water = 7.48 gallons of water  
 1 gallons of water weighs 8.35 pounds  
 1 acre-foot of water = 43,560 cubic feet of water  
 1 inch of rain over a square mile = 53.3 acre-feet of water

## Abbreviations

Acre-foot - AC-FT  
 Cubic foot - cu ft.  
 Gallon - gal.  
 Pound - lb.  
 Square mile - mi<sup>2</sup>

## How much can detention basins hold?

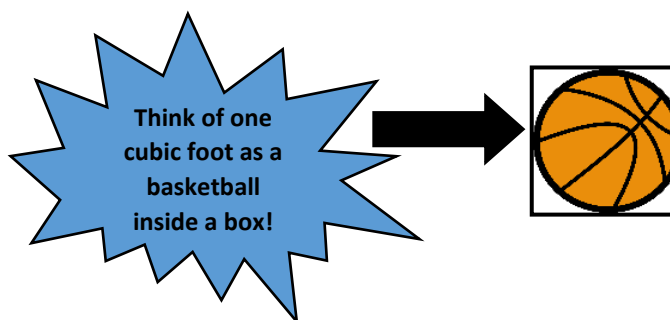
If the Red Rock Detention Basin can hold 2,007 AC-FT of water, how much rain over a square mile can it hold?

How many acre-feet of water can the Lakes Detention Basin located in the Desert Breeze Park hold if it can hold 6,403,320 cu ft. of water?

How many gallons of water can the Lower Flamingo Detention Basin at Charlie Frias Park Detention Basin hold if it can hold 603,988,846.56 lbs. of water?

How many gallons of water can the Gowan North Detention Basin in Bunker Park hold if it can hold 921 AC-FT of water?

If the Lone Mountain Detention Basin can hold 16.66 in. of rain water over one square mile, if filled to capacity, how much does the water in the detention basin weigh in pounds?



DOWNLOAD THE APP  
**FLOODSPOT** TO STEER  
 CLEAR OF FLOODED AREAS  
 AND PLAY A FUN GAME!