Sustainability

Objective of this Presentation:

To help scouts understand and learn about sustainability and the importance of being good stewards of our environment. [According to the BSA Merit Badge Series *Sustainability*]

Source: BSA Supply No. 35711
Presentation November 9, 2013
Instructor(s): Jason Thiriot (Natural Resources Analyst State of NV)

Your timeline to success

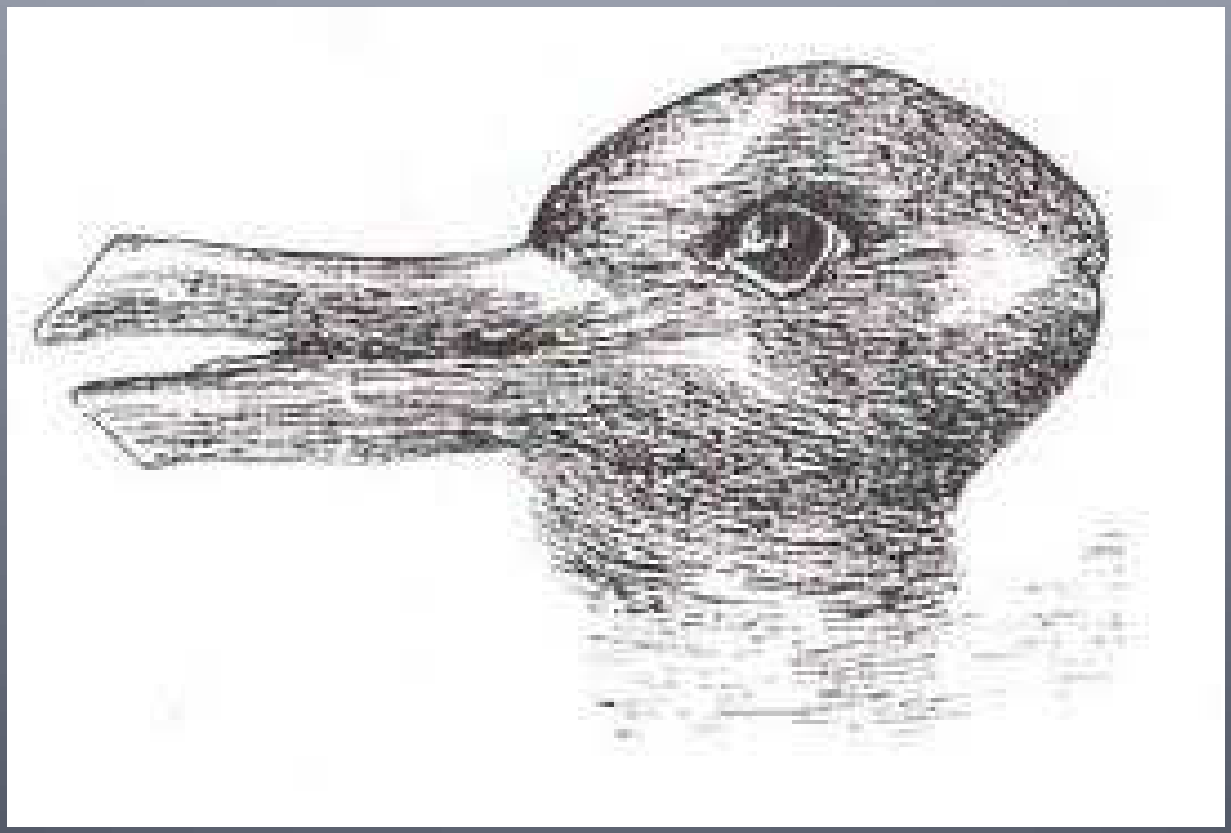
Assigned Work BEFORE class (Primer Packet)

Sustainability Checklist

TO DO	With Family
☐ Write down own words meaning of "Sustainability"	☐ Have family write what they think "sustainability" means- TAKE NOTES
☐ Develop/ Implement plan to reduce household waste- Record results for **2 WEEKS**	☐ As a family, choose 3 ways to reduce water consumption
☐ Draw a rough sketch how you would design a sustainable community	☐ As a family, Implement the water reducing ideas for **1 MONTH**
☐ Be familiar with fossil fuels, solar, wind, nuclear, hydropower, and geothermal energy sources	☐ Report to family results of 2 week household waste reduction efforts
☐ Develop/ Implement plan to reduce electricity- Record results for **1 MONTH**	☐ As a family, examine NV Energy bills (3 different months)
☐ Implement power reducing ideas for **1 MONTH**	☐ As a family, choose 3 ways to reduce power consumption
☐ Keep a log of the "stuff" your family purchases- Identify if item is "need" or "want" **2 WEEKS**	☐ As a family, choose and discuss any 2 of the following: Plastic waste, Electronic Waste, Composting, Species decline, World population, Climate change
☐ After completing requirements 1-4, have a family meeting. Discuss what your family has learned about what it means to be a sustainable citizen. Talk about the behavioral changes and life choices your family can make to live more sustainably.	

How do we view the world?

Water
Drought
Energy
Stuff
Waste



"It's a hard concept for a Scout to feel that he himself, as a single person, can have an impact on the world, but he certainly can have an impact within his own **family**".

Sustainability merit badge starts with the family and ends with the family

--- One family member's actions can make a difference.

#1) Before starting work on any other requirements for this merit badge, write in your own words the meaning of sustainability. Explain how you think conservation and stewardship of our natural resources relate to sustainability.

1. **Sustainability**
   - Discuss

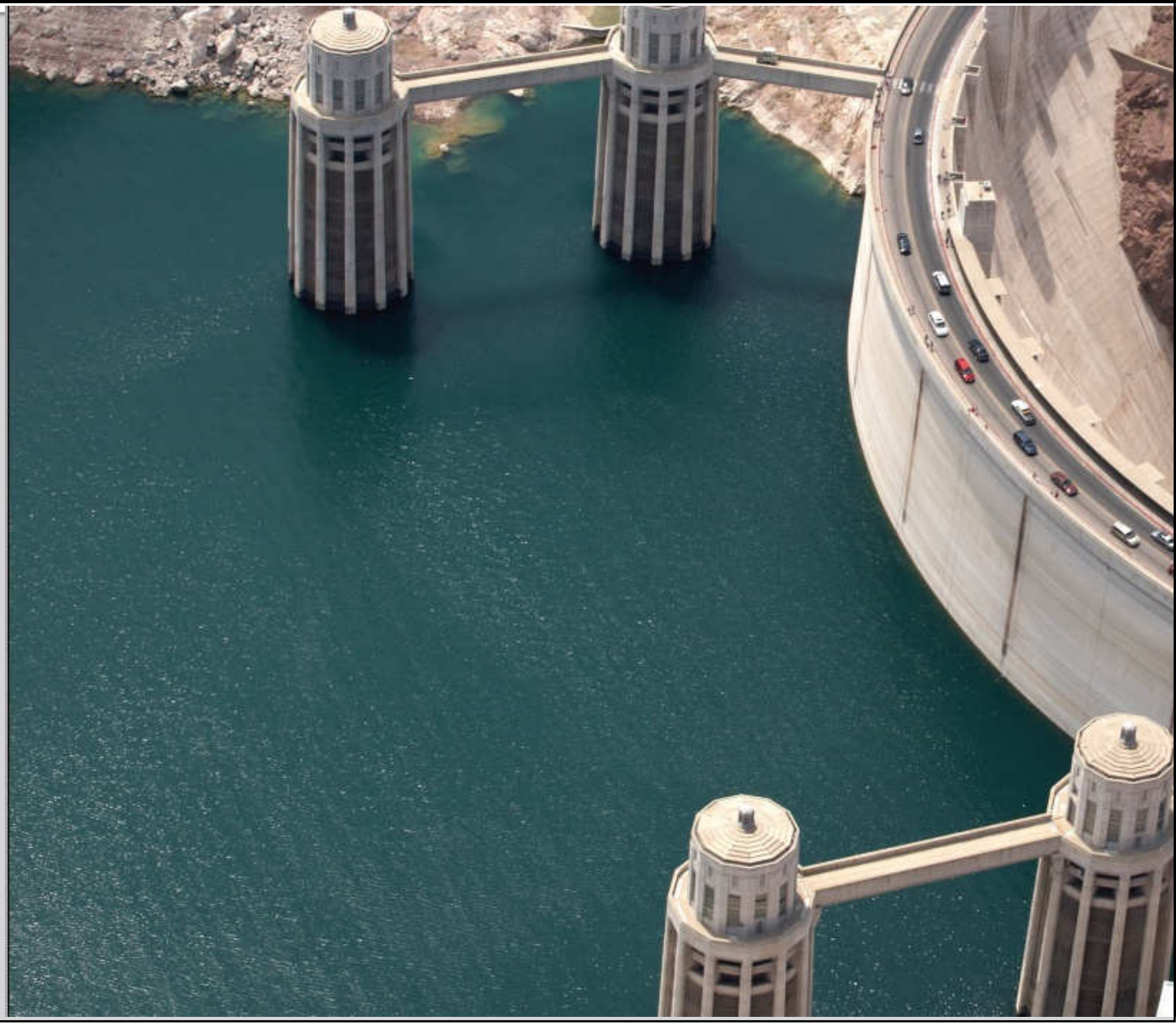
2. **How do you think conservation and stewardship of our natural resources relate to sustainability?**

3. **Scouting**

   Scout Law-- “Thrifty”

   “Leave No Trace”

   “Outdoor Code”



#1) Have a family meeting, and ask family members to write down what they think sustainability means. Be sure to take notes.

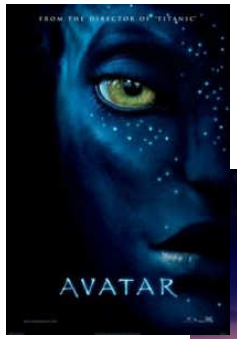
1. **Sustainability**
   - Discuss

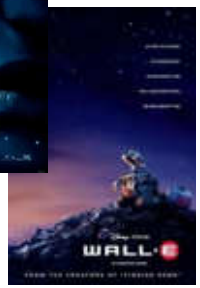
Family Meeting on Sustainability

What was said?

What is "Sustainability"?

- **Common Definitions**: The ability to meet current needs without compromising the needs of future generations.





To "sustain" something means to keep it or continue it.

The ability to endure.

Conserving the land, forests, air, water, wildlife, and other limited resources we all share

"Being good stewards of our resources for future generations"

LORAX

Reduce water usage Family Plan

2 (A) Develop and implement a plan that attempts to reduce your family's water usage. Examine your family's water bills reflecting usage for three months (past or current). As a family, choose three ways to help reduce consumption. Implement those ideas for one month.

*Average American family of 4 uses 400 gallons of water per day at home. OR 146,000 gallons per year for one family

*Talk about how each family member uses water.

*Do family members take long to you showers?

*Do we leave water running?

*Do we wash full loads?

*How do we potentially waste water?

*Ask family members about willingness to reduce water use.

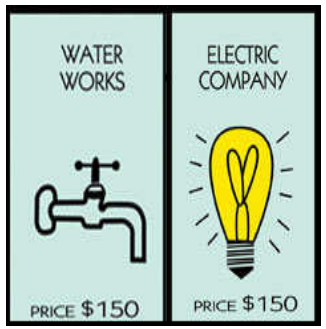
- Family meeting

  For those who live in Southern Nevada- Outdoor more critical than Indoor

  - Use hose sparingly
  - Wash car at carwash (recycle)
  - Check for leaks
  - Lawns are the big offenders
  - Don't overwater
  - Don't mow too short

Month #3

July to August



Average monthly bills – (Just water) Single family home $34.34 per month

CITY OF NORTH LAS VEGAS
2250 LAS VEGAS BLVD. N.
NORTH LAS VEGAS, NV 89030
TELEPHONE (702) 633-1484
WWW.CITYOFNORTHLASVEGAS.COM

BILLING SUMMARY

PREVIOUS BILL	**07/17/13**	**75.80**
PAYMENTS RECEIVED	**08/06/13**	**86.00CR**
BALANCE FORWARD		**10.20CR**
CITY OF NORTH LAS VEGAS UTILITY		
WATER CHARGES		
WATER USAGE CHARGE		21.04
DAILY WATER SERVICE FEE		8.99
WATER SUBTOTAL		**30.03**
WASTE WATER CHARGES		
SEWER USAGE CHARGE		36.64
MONTHLY SERVICE CHARGE		3.57
WASTE WATER SUBTOTAL		**40.21**
GRAFFITI-COMMUNITY IMPROVEMENT FEE		.25
CNLV SUBTOTAL		**70.49**
REPUBLIC SERVICES		
GARBAGE CHARGES AND TAX PT		14.01
SOUTHERN NEVADA WATER AUTHORITY		
SNWA COMMODITY CHARGE		3.30
SNWA RELIABILITY SURCHARGE		.08
SNWA INFRASTRUCTURE SURCHARGE		5.00
SNWA SUBTOTAL		**8.38**
TOTAL CURRENT CHARGES		**92.88**
AMOUNT DUE		**82.68**

ACCOUNT SUMMARY

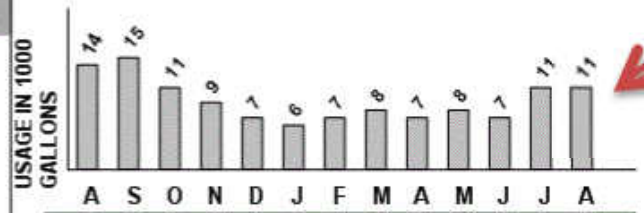
ACCOUNT NUMBER	059806-02-6
BILL TYPE	RESIDENTIAL
ADDRESS	708 [redacted]
DATE BILLED	08/19/13
DUE DATE	**09/16/13**
AFTER 09/16/13 PAY	90.95
AMOUNT DUE	**82.68**

WATER USAGE REVIEW (in 1000 gallons)

DATE	READING	DAYS	USAGE
08/06/13	826	29	11
		METER SIZE 3/4"	
RATE TIER	**RATE**	**GALLONS**	**BILLED**
FIRST 6	1.69	6	10.14
NEXT 9	2.18	5	10.90
	TOTAL	**11**	**21.04**

SEWER USAGE REVIEW (in 1000 gallons)

RATE TIER	RATE	GALLONS	BILLED
UP TO 3	-	3	12.99
NEXT 5	4.73	5	23.65
OVER 8	-	3	NO CHARGE
	TOTAL	**11**	**36.64**



IMPORTANT MESSAGE(S):

PLEASE RETURN THE BOTTOM STUB WITH YOUR PAYMENT

CITY OF NORTH LAS VEGAS

IF MAILING, ALLOW 5 WORKING DAYS FOR PROCESSING
SEE REVERSE SIDE FOR ADDITIONAL INFORMATION
2286-9564553 00[redacted]
MAKE CHECKS PAYABLE TO:
CITY OF NORTH LAS VEGAS

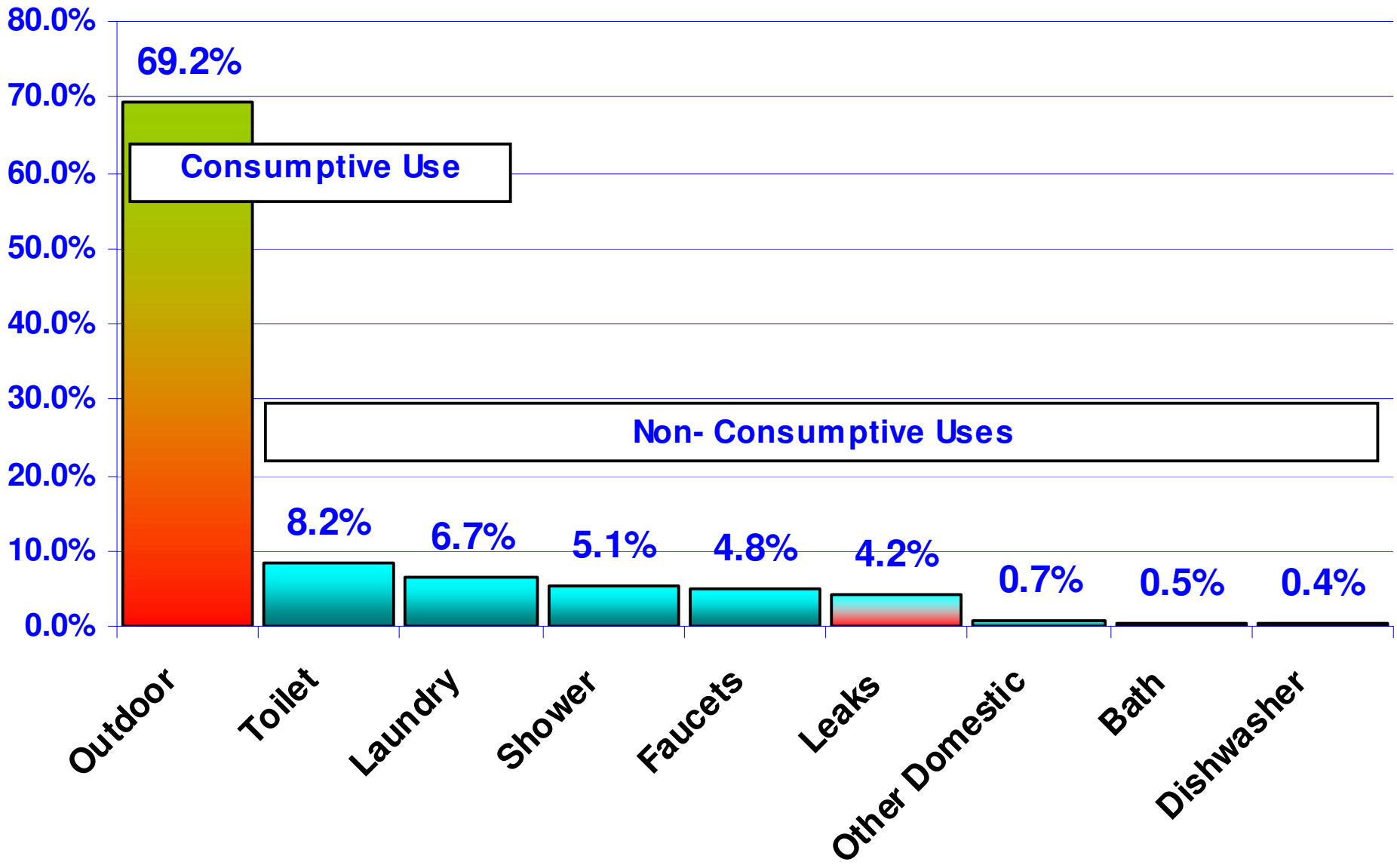
ACCOUNT NUMBER	0[redacted]
ADDRESS	708 [redacted]
DUE DATE	**09/16/13**
AFTER 09/16/13 PAY	90.95
AMOUNT DUE	**82.68**

☐ PLEASE CHECK BOX IF ADDRESS OR PHONE NUMBERS HAVE CHANGED AND INDICATE ON BACK OF STUB

AMOUNT ENCLOSED _____

11/07/2013_Las Vegas Valley Water District customers- **Average of 10,000 gallons of water per month**.

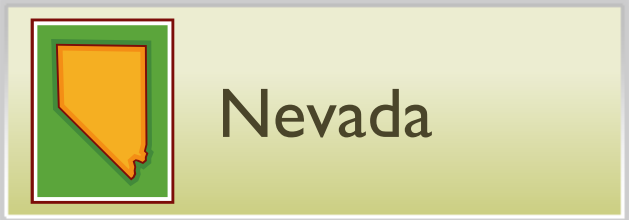
Single Family Household Water Use – Las Vegas, NV

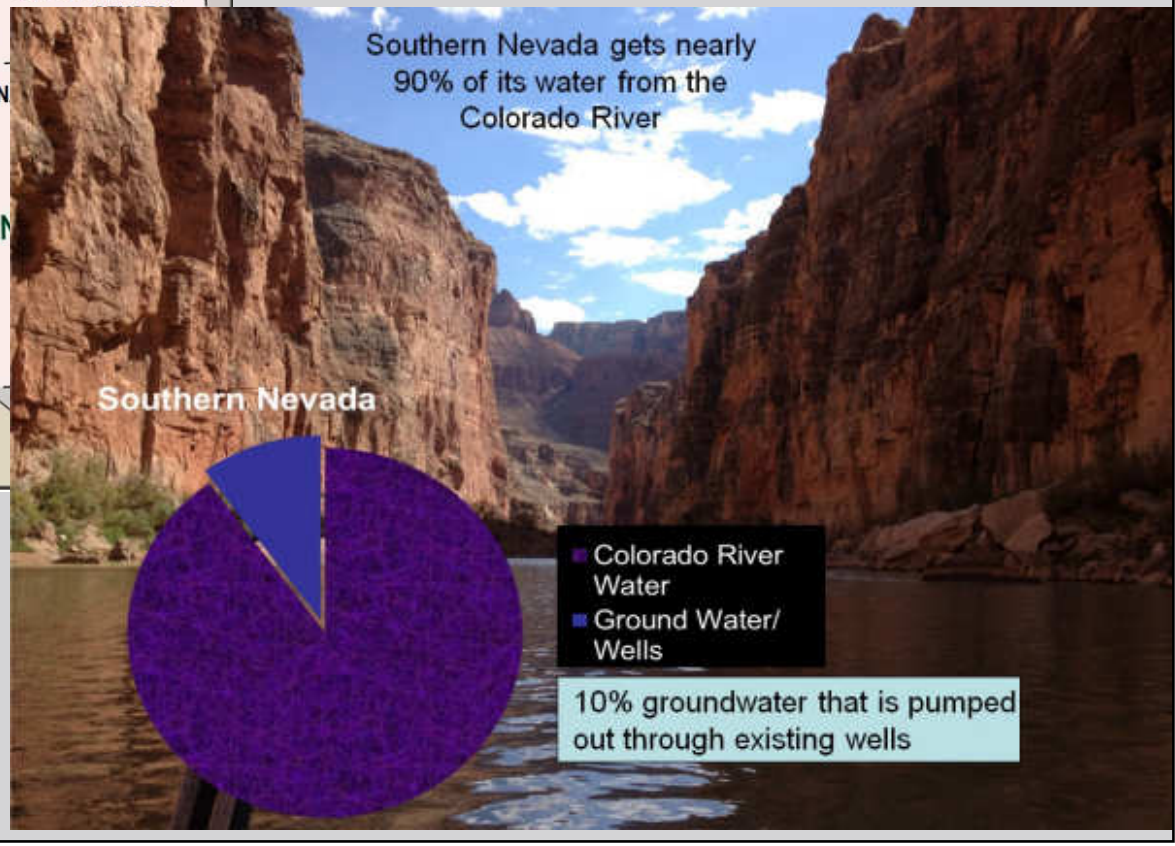


WATER

2- Using a diagram you have created, explain to your counselor how your household gets its clean water from a natural source and what happens with the water after you use it.

Where does our water come from?





Without question: The Colorado River **is** SOUTHERN Nevada's lifeblood.

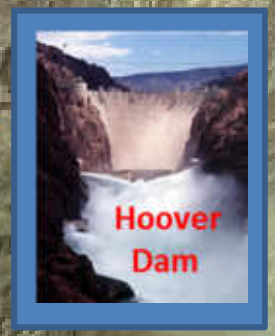
SNOWPACK

<u>85%</u> of the water that feeds the Colorado River water system comes from the snowpack that accumulates on the western slope of the Rocky Mountains of WY, UT, NM, CO.


About 25 percent of the nation's food is grown on approximately two million acres of land irrigated by Colorado River water

Lake Mead

Largest man-made reservoir in the U.S.



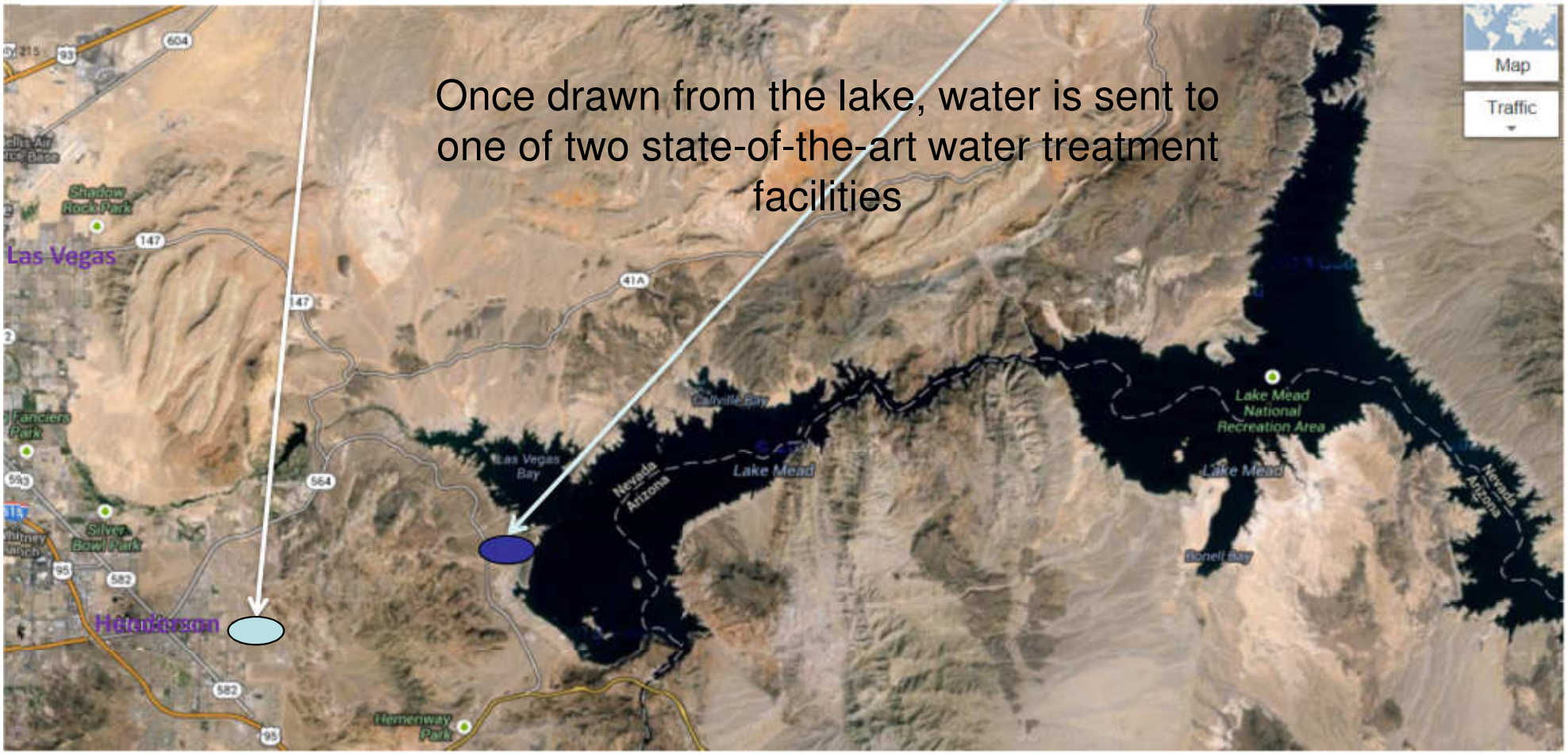
River Mountains

Water Treatment Facility

Alfred Merritt Smith

Water Treatment Facility

Once drawn from the lake, water is sent to one of two state-of-the-art water treatment facilities



Return Flow

Where is the water treated?
Where does runoff go from washing your car?

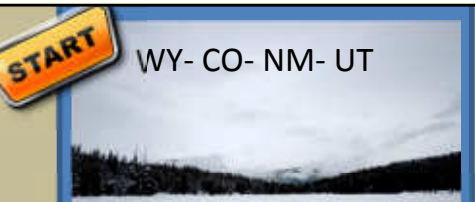
- Waste Water Treatment Plant

- Las Vegas Wash

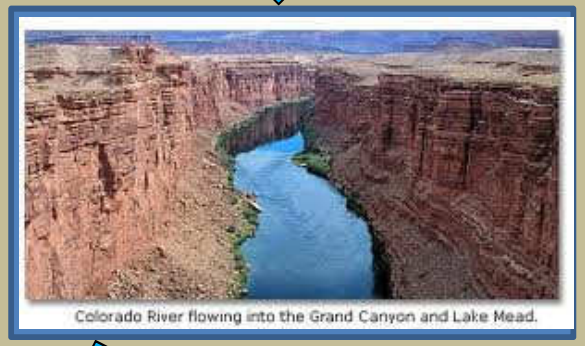
How Does it Work?

START

WY- CO- NM- UT

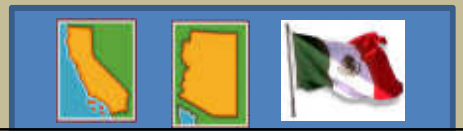


SNOWPACK



Colorado River flowing into the Grand Canyon and Lake Mead.

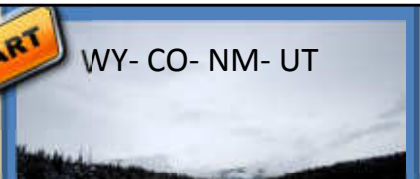
Return Flow Credit Process



LAS VEGAS WATER CYCLE

START

WY- CO- NM- UT

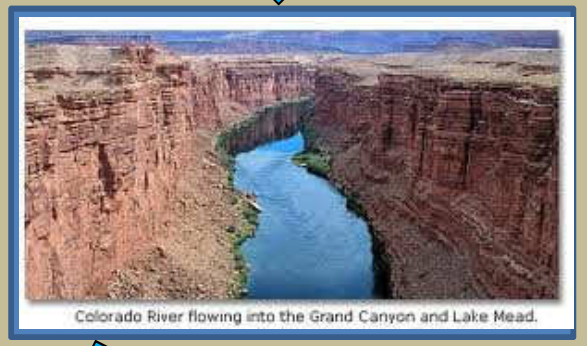


SNOWPACK

Las Vegas Wash

(Plus) Storm Water System

Waste Water Treatment Plants



Colorado River flowing into the Grand Canyon and Lake Mead.

Lake Mead

Return Flow Credit Process

Sewer System

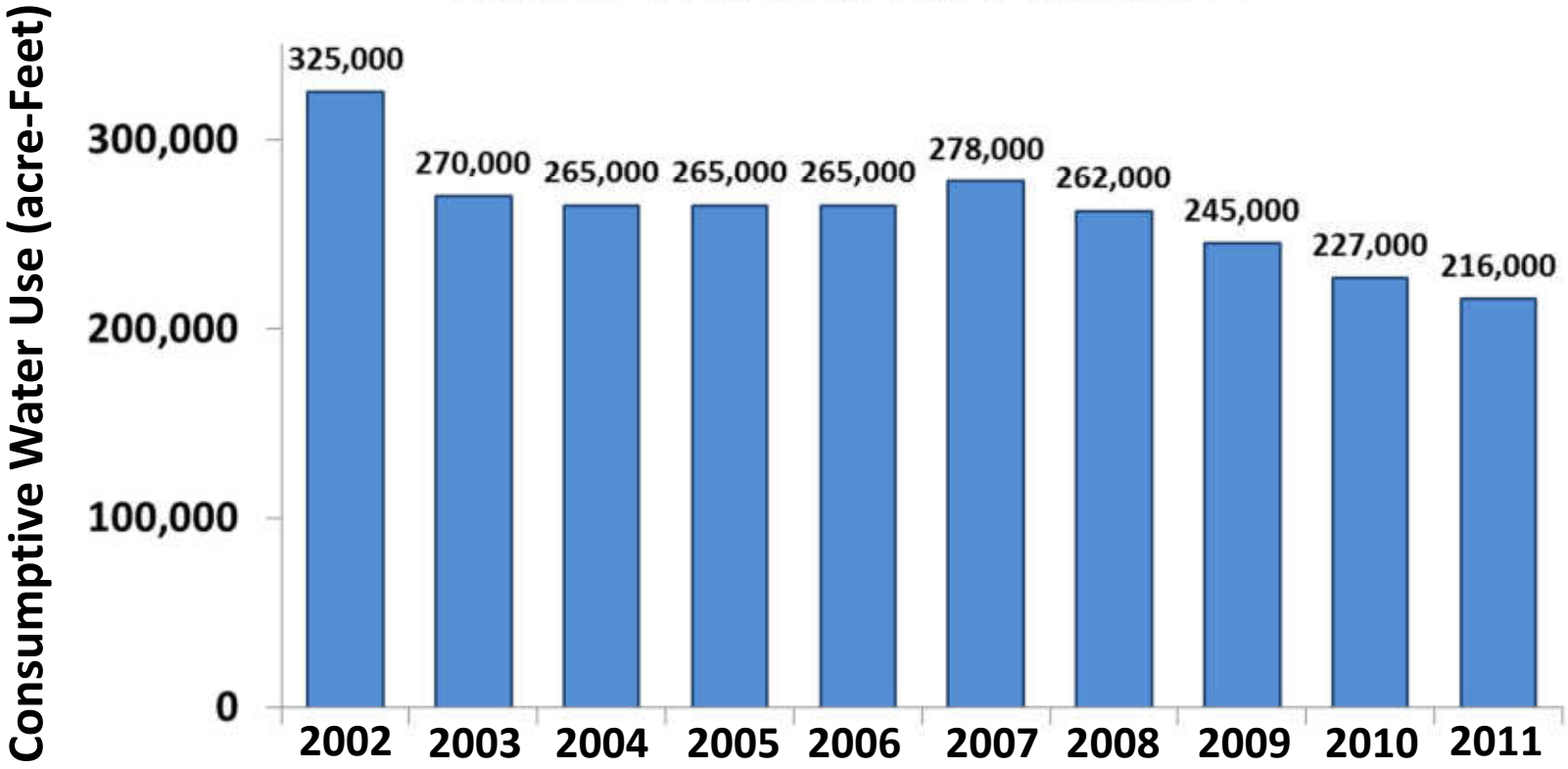
Homes

Water Treatment Plants

Travels Downstream

Conservation Achievements

Our community has made significant conservation achievements.



Each year, Southern Nevada uses nearly 100,000 acre-feet less water, despite annual population increases and millions of annual visitors.

#2 (C) Tell two ways to preserve your family's access to clean water in the future.

1. **Discuss**
   - Conserve
   - Protect
   - Respect

"Most water waste is caused by improper or inefficient landscape irrigation." (SNWA)

Q: Why is it when people in Las Vegas waste water, they are also wasting electricity?

New Paradigm of thinking

Photograph by Amit Dave, Reuters

Got Water?

April 2010

India—Parched people mob a vast well in the village of Natwargadh, Gujarat. In this drought-prone western state, yearly monsoon rains can total less than eight inches, and summer temperatures have topped 115°F.

QUESTION

What state is considered the driest state in the United States?

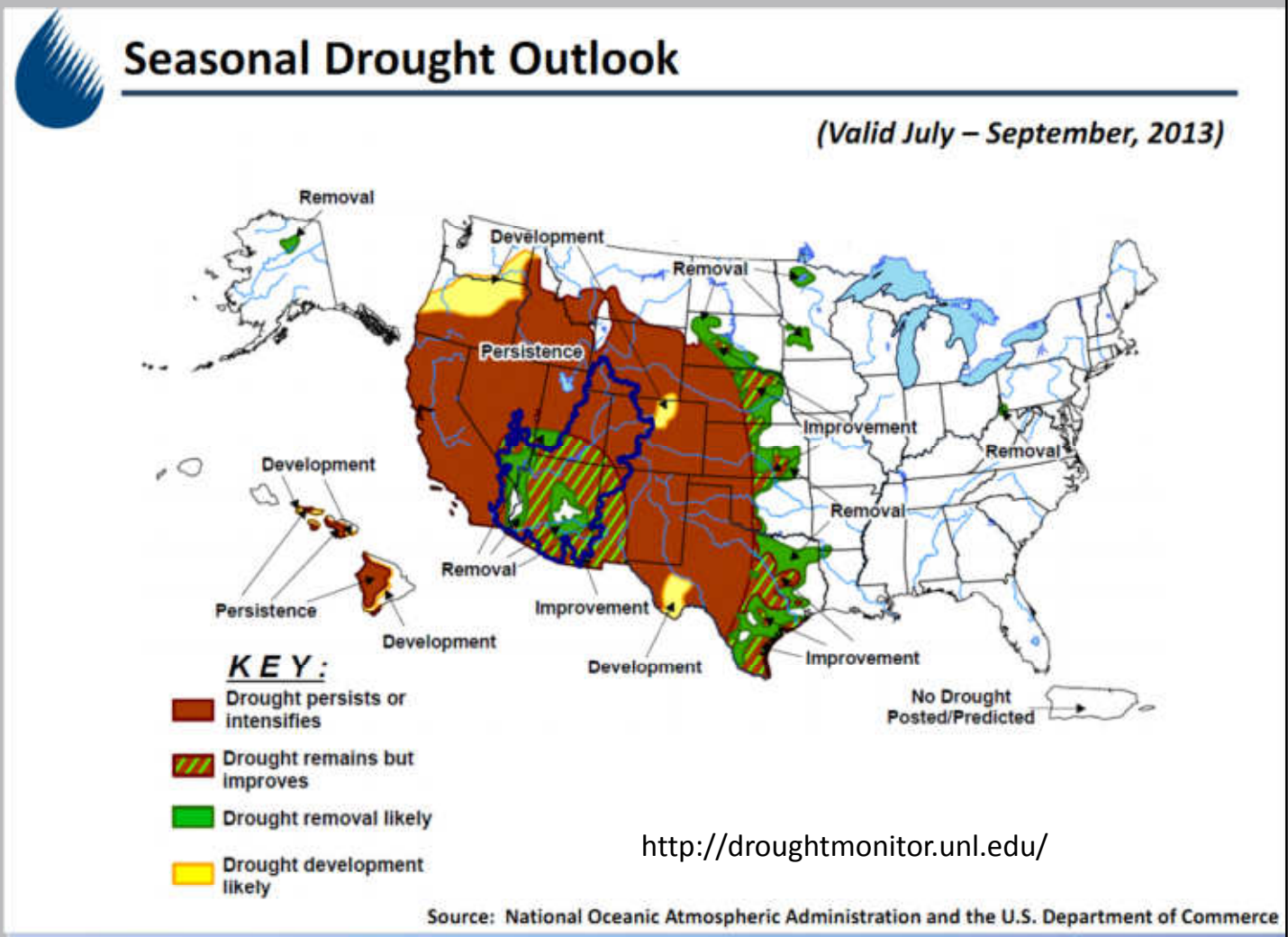
WATER

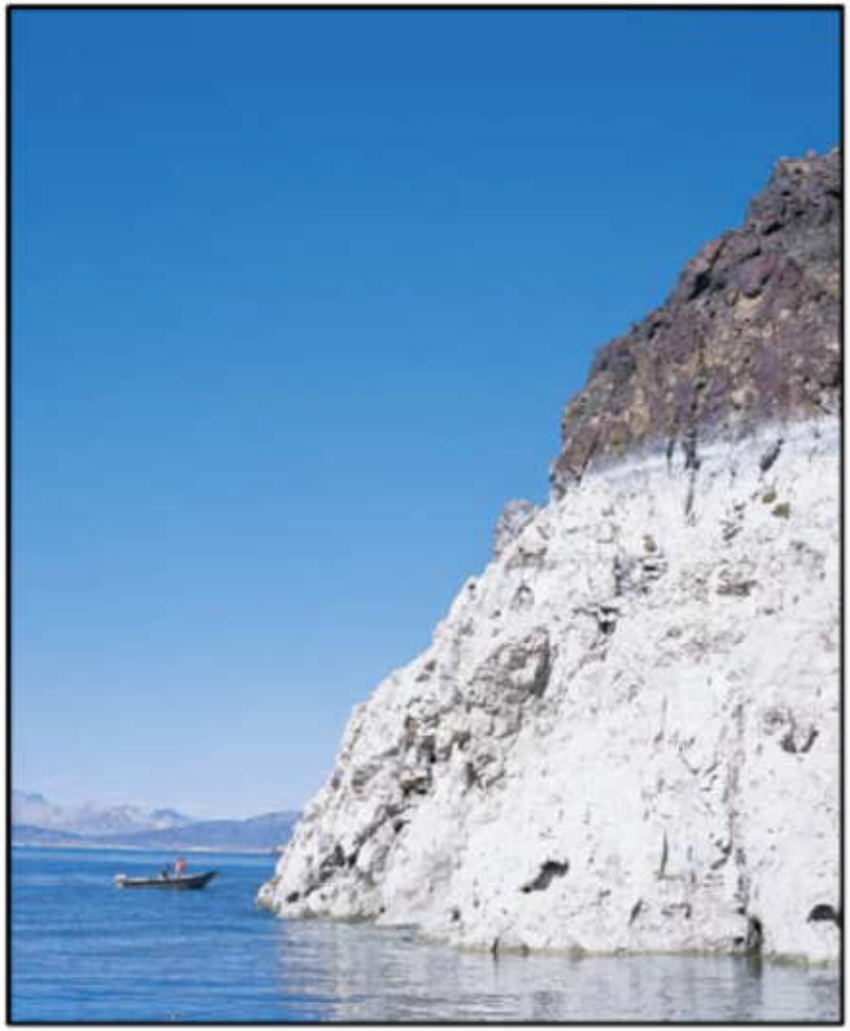
2- Discuss with your counselor two areas in the world that have been affected by drought over the last three years. (Conservation Efforts)

1. **Discuss**
   - Drought
   - Impacts
   - Midwest U.S.
   - Israel

Las Vegas gets an average of 4.5 inches of precipitation each year

What state is considered the driest state in the U.S.?





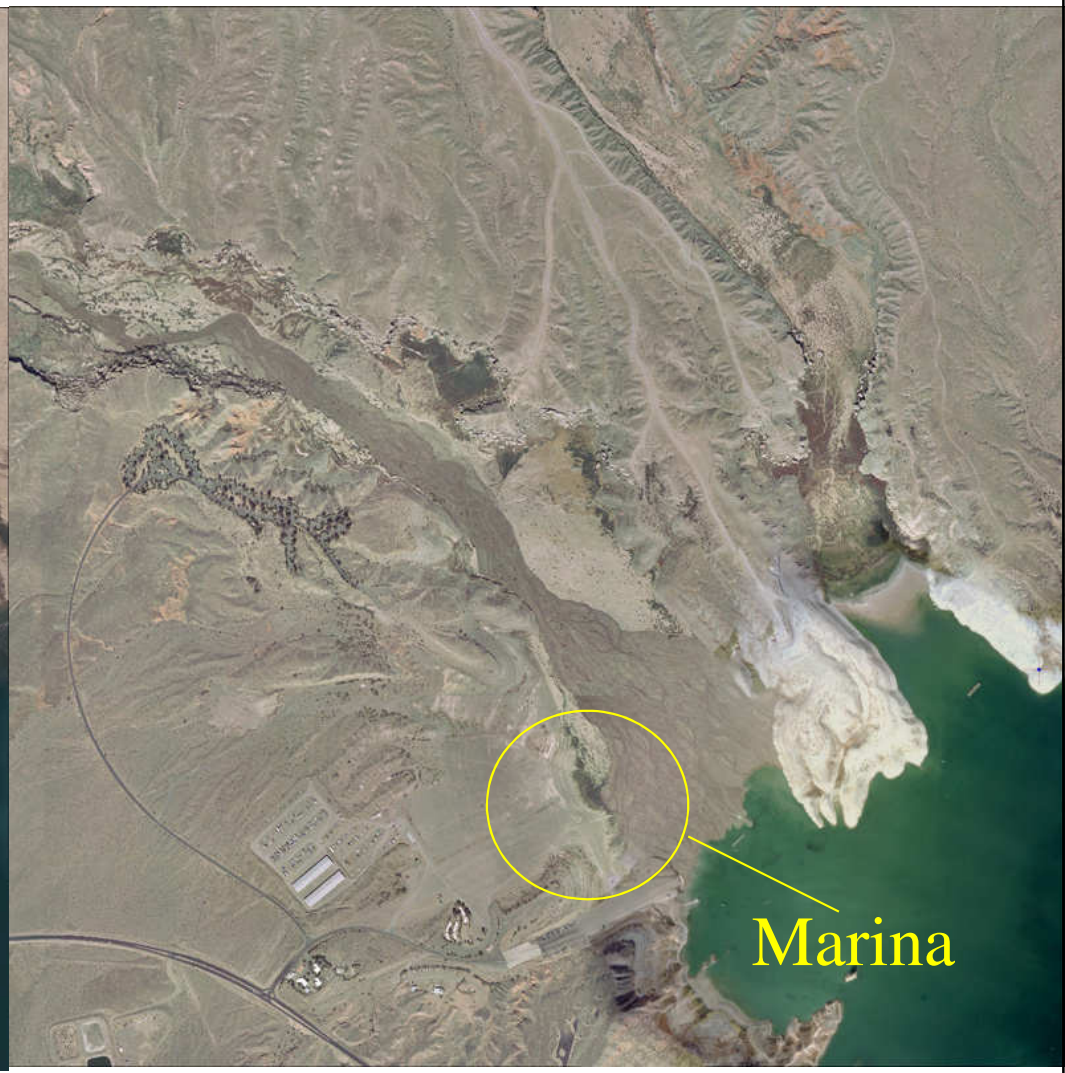
Since 2000, Lake Mead's water elevations have fallen approximately 100 feet.

Perspective: If Las Vegas didn't use a single drop of Colorado River water for 1 year, that would only change the lake level by **3** Feet.

Lake Mead 2000

Elevation 1214 Feet

Lake Mead 2004



Elevation 1132 Feet

Israel Drought Issues

What did they do? Desalination

Desalination technology – very successful. (The SNWA has sent representatives to talk and share ideas)

From 2002 to 2012 Israel had divesting drought. It's freshwater sources dropped nearly **25%**.
Some drastic water conservation took place.
Today, more than HALF of all water used for agriculture is Israel is recycled water.
Urban consumption dropped by **15%**.

Conservation?

Conservation Practices

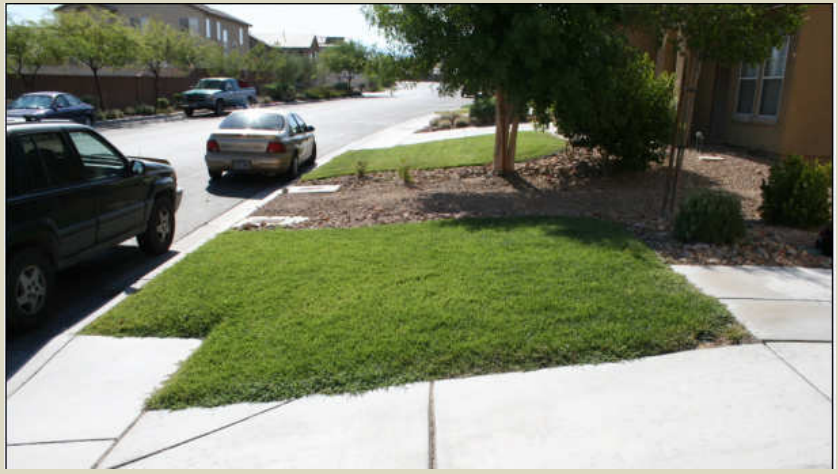
1. Cash for Grass: very successful.
2. Penalize water wasters: somewhat successful.

Turf Conversion Program provide resident $1.50 rebate per sq. ft. for lawn upgraded to water-efficient plants and trees

SNWA has rebated over 117 million square feet of lawn conversion, saving over 6 billion gallons annually and More than $122 million rebated

MY HOUSE

The average square foot of grass in Las Vegas takes **73 gallons** of water to keep alive each year.



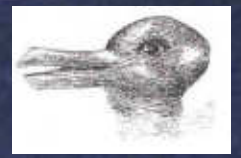
Penalize water wasters: somewhat successful

*SNWA has utilized aerial infrared photographs and computer data of Las Vegas Valley neighborhoods to help aid in “water cop” efforts.

1. $327 rebate check
2. Saves water
3. Easy Upkeep
4. Other

Programs seems to be working. The community has reduced its annual water consumption by 28 billion gallons even while adding 400,000 more residents.

Paradigm Changes on the Horizon



FOOD

FOOD: 2(a) Develop and implement a plan that attempts to reduce your household food waste. Establish a baseline and then track and record your results for two weeks. Report your results to your family and counselor.

Rice, wheat, corn and potatoes make up more than half the world's food supply.

Tips To Reduce Food Waste

a. Pay attention
b. Watch your portions
c. Don't go to the store hungry
d. Go with a list
e. Rotate your food in the fridge
f. Use your freezer
g. Utilize good food protection – tuppers- wrapping.
h. Use a garden

More than <u>60%</u> of food waste could be avoided


TRUCKS
THIS WAY

Reducing food waste

- In the United States, more than **65 billion** pounds of food is thrown away each year.
  - That amounts to about $2,200 per year that the average American household simply throws away.(EPA)
- Food waste is the single largest component of municipal solid waste that ends up in landfills and incinerators.
  - So, what happens when we waste food?
    - Money, energy, water, labor, production costs, produces methane...

    - Organic waste collection systems are coming. (San Francisco)

Tell 3 ways these factors limit world food supplies

Think Big Picture

World population could hit 8 billion by 2030:

- Currently 1 billion people today are undernourished and live with hunger.
- **What is the primary source of world's nutrition? Grain**
  - Only 2 out of 183 industrialized nations are major grain exporters. (Canada and US)

1. **Limited Land**
2. **Soil contamination**
3. **Dwindling water supply**
4. **Pollution**

COMMUNITY

2- Draw a rough sketch, depicting how you would design a sustainable community.

What would your community look like?

- Housing
- Work Locations
- Shops
- Schools
- Transportation
- Pollution
- Energy Sources
- Natural Resources
- Economy
- Water Systems

#5 Designing Sustainable Communities

Efforts

Some cites are having success with sustainability:

- **Reykjavik, Iceland**: Plans to entirely end dependence on fossil fuels by 2050. (Hydrogen, solar, wind, hydropower and geothermal)
- **Vancouver, Canada**: #1 in the world for hydropower.
- **Portland, Oregon**: 92,000 acres of green space with 74 miles of bike/hike trails – plans to get 100% of its energy from renewables.

"Hey Mom, I just cleaned the whole house!"

Community 2b: Interview a local architect, engineer, contractor, or building supplier. Find out the factors that are considered when using sustainable materials in renovating or building a home.

1. **Interview**
   - Discuss

Energy efficiency windows
Energy efficiency appliances
Recycled construction materials
Location of building
Air quality

diyandmore.com

#2 Community (b): Find out the factors that are considered when using sustainable materials in renovating or building a home.

Josh Warner

Interview with an Architect: (Also the Chartered Organization Institution Head for Troop #576)

- **How long have you worked as an architect?** About 6 years.
- **What is the name of your company you work for?** Josh Warner Residential design (JWRD) .

- **How many of your clients request to use sustainable materials?** Maybe 5%-10% request them and about 2.5% use them.
- **What is the biggest reason why people don't use sustainable materials?** Mainly cost.
- **What are the common sustainable products used?** Upgrades on windows, insulation, pre-wiring for solar panels, and ICF concrete walls are used at times.
- **Which company /Product do you recommend?** Amvic is the ICF manufacturer I recommend
- **Are there tax benefits to using sustainable materials?** There are usually minor tax benefits to using them. Often the difficulty of the process deters people.

- **Other Thoughts:**

- Initial cost vs. life cycle cost. Initial cost is how much to put the material in. Life cycle cost is how long will it take to recover that cost also how long will the new material last.
- The main way it affects me is needing to constantly stay up to date on what is possible. As far a my work load it is negligible.

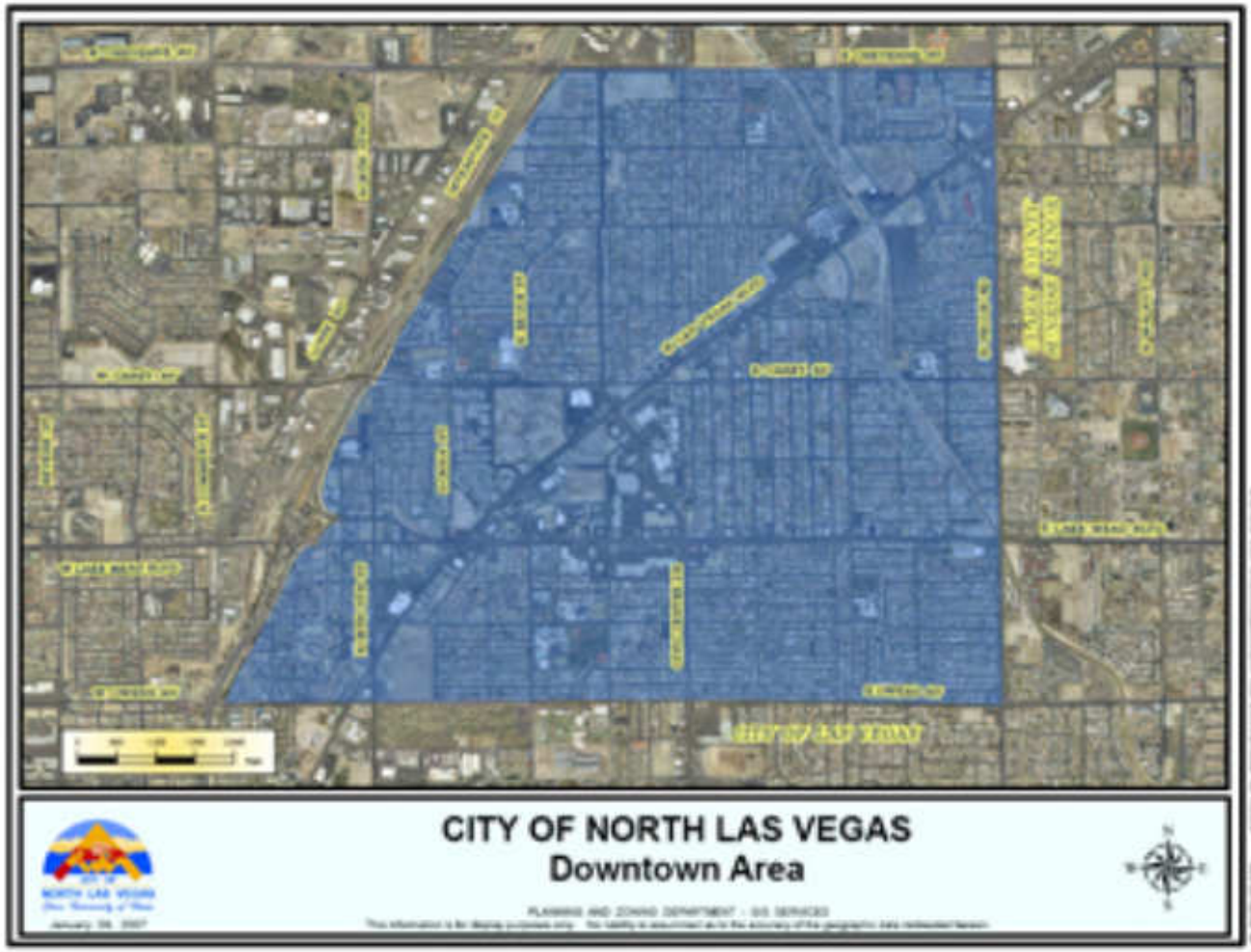
HOUSING NEEDS

Gives you a better understanding of:

- rental housing,
- affordable homes,
- senior housing,
- special needs housing

Helps to identify issues that may need to be addressed such as urban blight or foreclosure.

Click here for a full copy of the Downtown Master Plan



Local Involvement—primer packet

- City of Las Vegas
  - Sustaining Las Vegas
    http://www.lasvegasnevada.gov/sustaininglasvegas/default.htm
- Clark County
  - Eco-County Initiative
    http://www.accessclarkcounty.com/depts/clark_county/Eco/Pages/default.aspx
- City of Henderson
  - http://www.cityofhenderson.com/sustainability/sustainability_links.php

Other Organizations/Agencies:

- Southern Nevada Water Authority
- Boulder City
- RTC
- EMBARQ
- Southwest Gas
- Nevada Power
- UNLV

ENERGY

ENERGY- 2(A): Learn about the sustainability of different energy sources, including fossil fuels, solar, wind, nuclear, hydropower, and geothermal.

FOSSIL FUELS

- Petroleum
- Coal
- Natural Gas

*Come from the accumulated remains of ancient plants and animals.

*Burning fossil fuels releases carbon dioxide and other greenhouse gases.

Clean
Solar, Wind, Nuclear, Hydropower, Geothermal

When you turn on a light at home, by what means did that power get generated?

NVEnergy.

nvenergy.com

ACCOUNT NUMBER: 300011056931[redacted]

Service Address: [redacted]
NORTH LAS VEGAS,NV 89031

Customer	001105[redacted]
Premises	193[redacted]

8/27/2013

A20 B20

Next Meter Read Date	Due Date	TOTAL AMOUNT DUE
Sep 24, 2013	Sep 13, 2013	$283.94

PREVIOUS BALANCE	PAYMENTS	ADJUSTMENTS	BALANCE FORWARD	CURRENT CHARGES
$340.73	$340.73CR	$.00	$.00	$283.94

IMPORTANT MESSAGE: A deposit may be assessed after 3 late charges in 12 consecutive months, if a payment is returned, or if service has been disconnected for non-payment. The deposit is based on the actual usage of the account. For further information visit our website at nvenergy.com/rule13south.

Don't forget to sign up for Paperless Billing. Enroll in MyAccount at nvenergy.com.

Notice of General Consumer Sessions

Customers of Nevada Power Company d/b/a NV Energy are invited to a General Consumer Session conducted by the Public Utilities Commission of Nevada (PUCN). Customers are given an opportunity to appear and be heard on any topic concerning a public utility regulated by the Commission. Public comments may be limited to two (2) minutes per person at the discretion of the Commission. If within 15 minutes after the start of the Consumer Session, no member of the public has appeared to participate or comment, the Consumer Session may be adjourned at the discretion of the Commission. The sessions will be held in Southern Nevada: Monday, September 16, 2013, 1:00 p.m. and 6:00 p.m., Hearing Room A, Public Utilities Commission of Nevada, 9075 West Diablo, Suite 250, Las Vegas, Nevada 89148. Representatives of the utilities and the PUCN will be available to answer questions. For details, call the PUCN at 702 486.2600.

The Energy Assistance Program (EAP) may help pay your bill. Call (702) 486-1404 or visit dwss.nv.gov to see if you qualify.

Thank you for maintaining an excellent payment record. We look forward to serving you in the future.

ELECTRIC - RESIDENTIAL SERVICE

Meter Number	Service Category	Service Period From	To	Bill Days	Meter Readings Previous	Current	Meter Multiplier	Billing Usage
CC029065758	KWH	Jul 24	Aug 23	30	34601	36822	1	2,221

NVEnergy.
nvenergy.com

ACCOUNT NUMBER: 3000110569319359 Page 2 of 2

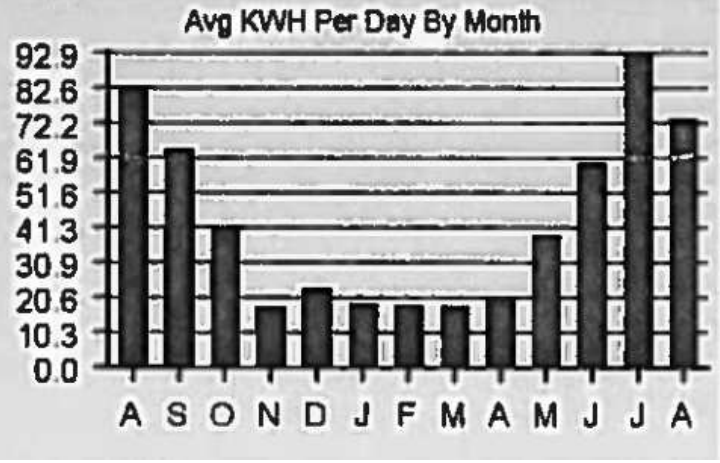
Service Address: [redacted] DR
NORTH LAS VEGAS NV 89031

Customer	00110
Premises	19359

ELECTRIC - RESIDENTIAL SERVICE - Continued

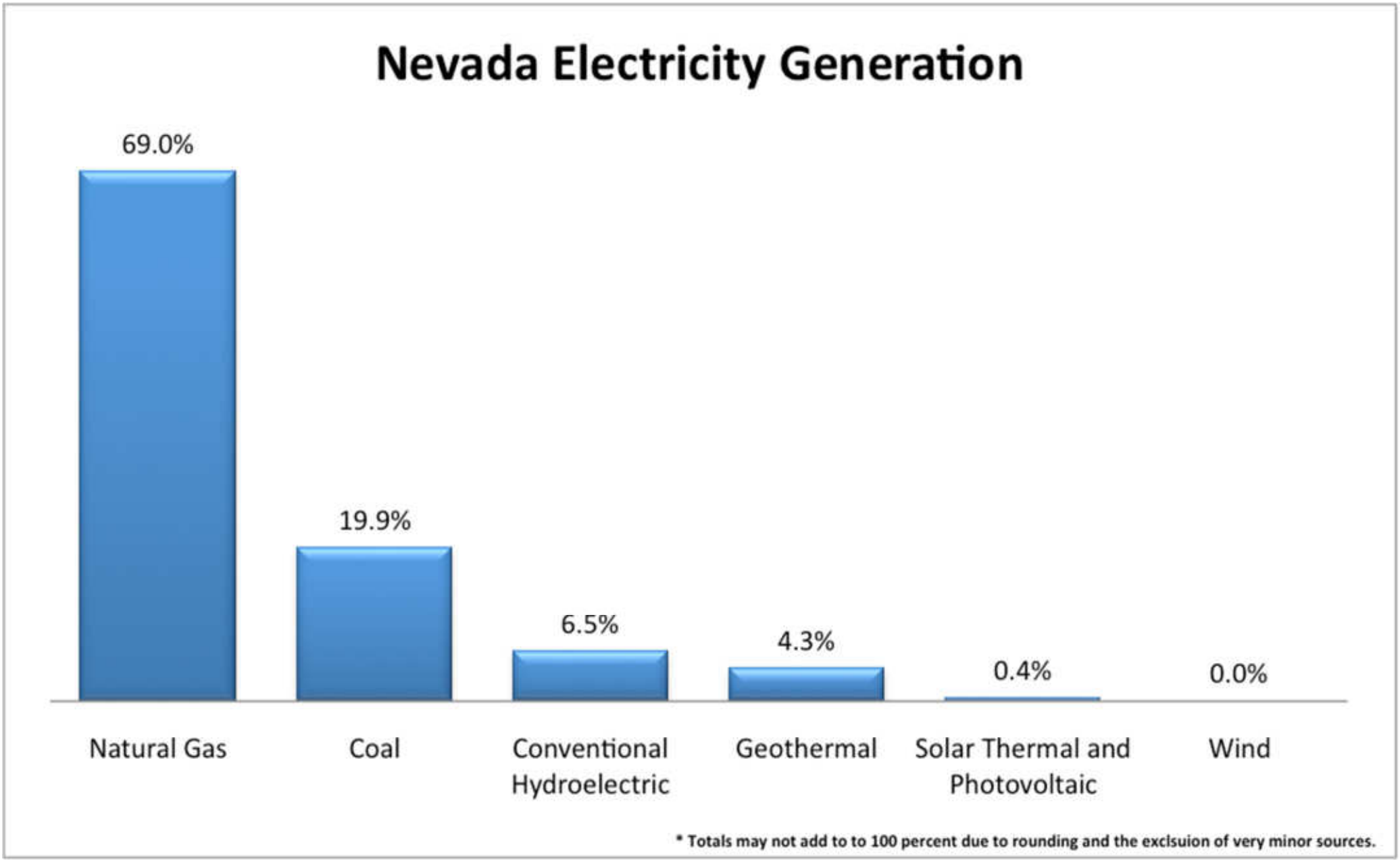
ELECTRIC CONSUMPTION	2,221.000	KWH	x	.11427	253.79
DEFERRED ENERGY ADJUSTMENT	2,221.000	KWH	x	.00326CR	7.24 CR
TEMP GREEN POWER FINANCING (TRED)	2,221.000	KWH	x	.00071	1.58
RENEWABLE ENERGY PROGRAM (REPR)	2,221.000	KWH	x	.00180	4.00
ENERGY EFFICIENCY (EE) CHARGE	2,221.000	KWH	x	.00336	7.46
BASIC SERVICE CHARGE					10.00
LOCAL GOVERNMENT FEE				5%	13.48
UNIVERSAL ENERGY CHARGE	2,221.000	KWH	x	.00039	.87
TOTAL ELECTRIC SERVICE AMOUNT					**$283.94**

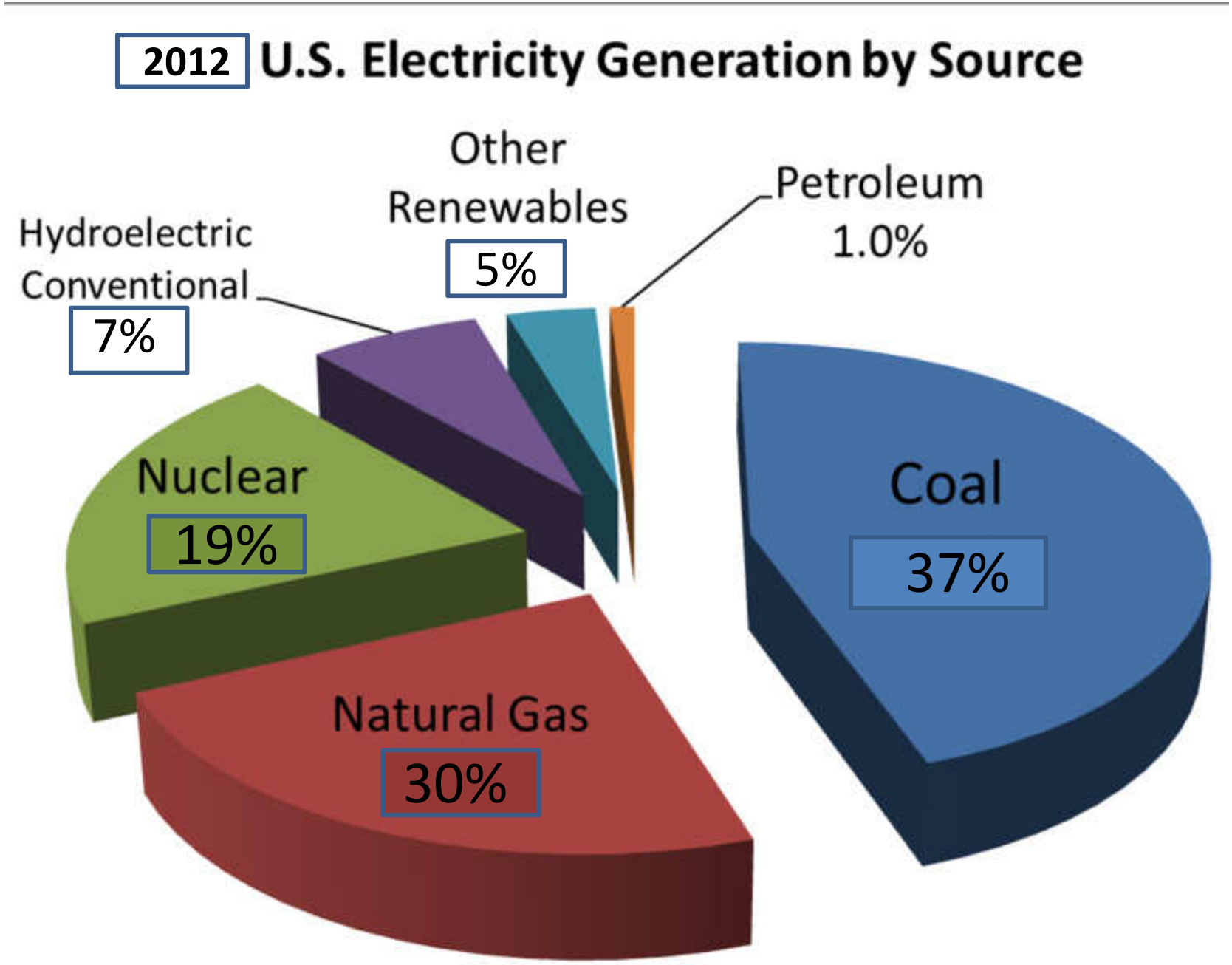
USAGE HISTORY	NO. DAYS	KWH	AVG KWH PER DAY	AVG COST PER DAY
THIS MONTH	30	2,221	74.0	9.46
LAST MONTH	29	2,695	92.9	
LAST YEAR	29	2,425	83.6	



My September bill was $257.

When you turn the light switch on, how was that electricity generated here in Nevada?

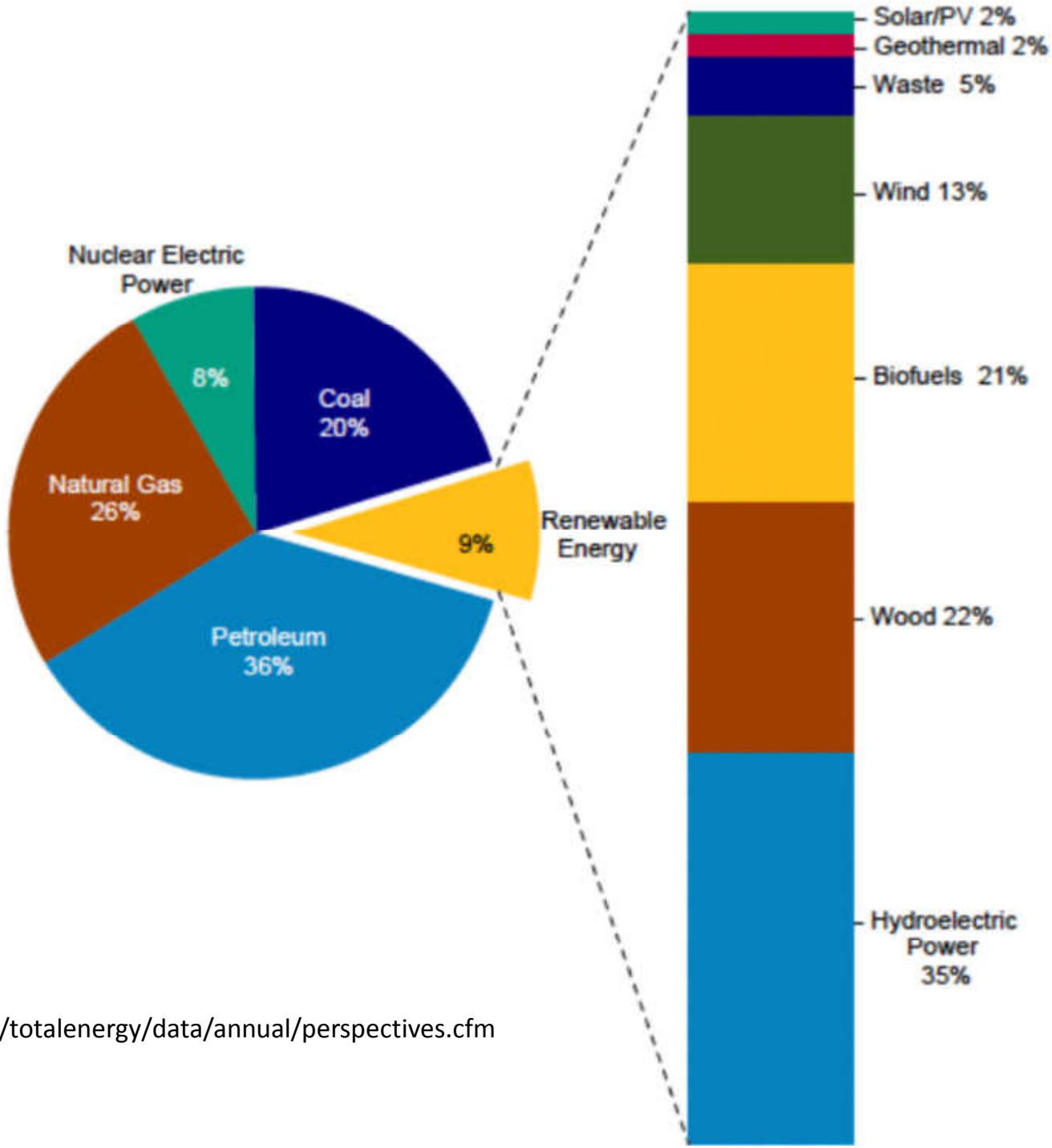

Nevada Electricity Generation
69.0%
19.9%
6.5%
4.3%
0.4%
0.0%
Natural Gas
Coal
Conventional Hydroelectric
Geothermal
Solar Thermal and Photovoltaic
Wind
* Totals may not add to to 100 percent due to rounding and the exclsuion of very minor sources.



Source: Energy Department_ AP_ President kicks off climate change fight_ August 2013

Renewable Energy as Share of Total Primary Energy Consumption, 2011

UNITED STATES



http://www.eia.gov/totalenergy/data/annual/perspectives.cfm

ENERGY CARBON FOOTPRINT

Your carbon footprint:

Travelling to school	216 kgs CO_2 a year
Watching television	182 kgs CO_2 a year
Leaving TV on standby	11 kgs CO_2 a year
Using the computer	21 kgs CO_2 a year
Lights in the bedroom	83 kgs CO_2 a year
Showers	200 kgs CO_2 a year
Baths	0 kgs CO_2 a year
Home total	496 kgs CO_2 a year
Going on holiday	1377 kgs CO_2 a year
Your total	2089 kgs CO_2 a year (2.1 tonnes)

CARBON FOOTPRINT

- the amount of greenhouse gases and specifically carbon dioxide emitted by something (as a person's activities or a product's manufacture and transport) during a given period
- refers to the amount of carbon dioxide emissions that our everyday activities release into the atmosphere.
- We all have a carbon footprint and most of us should look at ways of reducing our own.

Renewable Energy: Energy that comes from resources that are continually replenished such as sunlight, wind, rain, tides, waves, and geothermal heat.

#2(A) Learn about the sustainability of different energy sources: Coal

COAL

COAL

*Coal is our most abundant and lowest cost fuel for making electricity.

*New technology is making it cleaner. "Clean Coal"

1. **Where is the Coal?**:

   Beneath the frozen plains of eastern Montana and Wyoming lie the largest coal deposits in the world.—enough to last the US more than a century at the nation's current burn rate.

   [AP_Coal plants checked by envro campaigns, costs_09-03-09]

Nevada is steering away from coal

QUOTE:

"As long as I am CEO, we will not be building any new coal-fired generation," NV Energy President and CEO Michael Yackira 12/14/2009

*Reid-Gardner plant to shut down soon.

EAGLE REQUIRED

#2(A) Learn about the sustainability of different energy sources: Natural Gas

Natural Gas

NATURAL GAS

*Natural gas is an energy source often used for heating, cooking, and electricity generation.

*Naturally occurring- found in deep underground rock formations.

***Shale gas in the U.S. is rapidly increasing as a source of natural gas. Led by new applications of hydraulic fracturing technology and horizontal drilling, development of new sources of shale gas has led to major increases in reserves of US natural gas.**

Nevada uses natural gas to generate power

Around 70% of the electricity generation in Nevada comes from Natural Gas

Silver Hawk Gas Power Plant

EAGLE REQUIRED

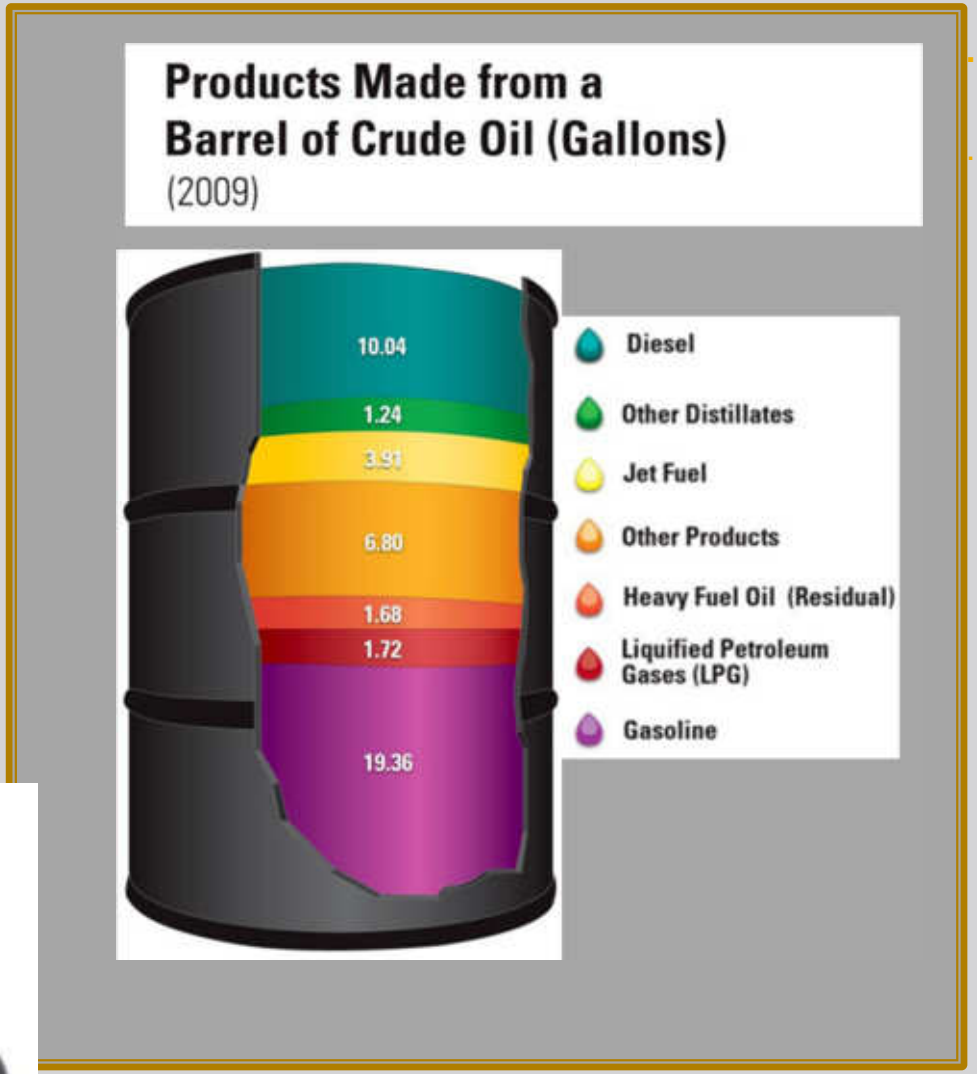
#2(A) Learn about the sustainability of different energy sources: Petroleum

PETROLEUM

PETROLEUM

*Petroleum covers both naturally occurring unprocessed crude oils and petroleum products that are made up of refined crude oil.

*Flammable
*recovered mostly through oil drilling
*Gas/fuel
*Clean-up



Petroleum

NOTE:

All plastic start out as petroleum.

*It is estimated that the world consumes about 90 million barrels each day.

EAGLE REQUIRED

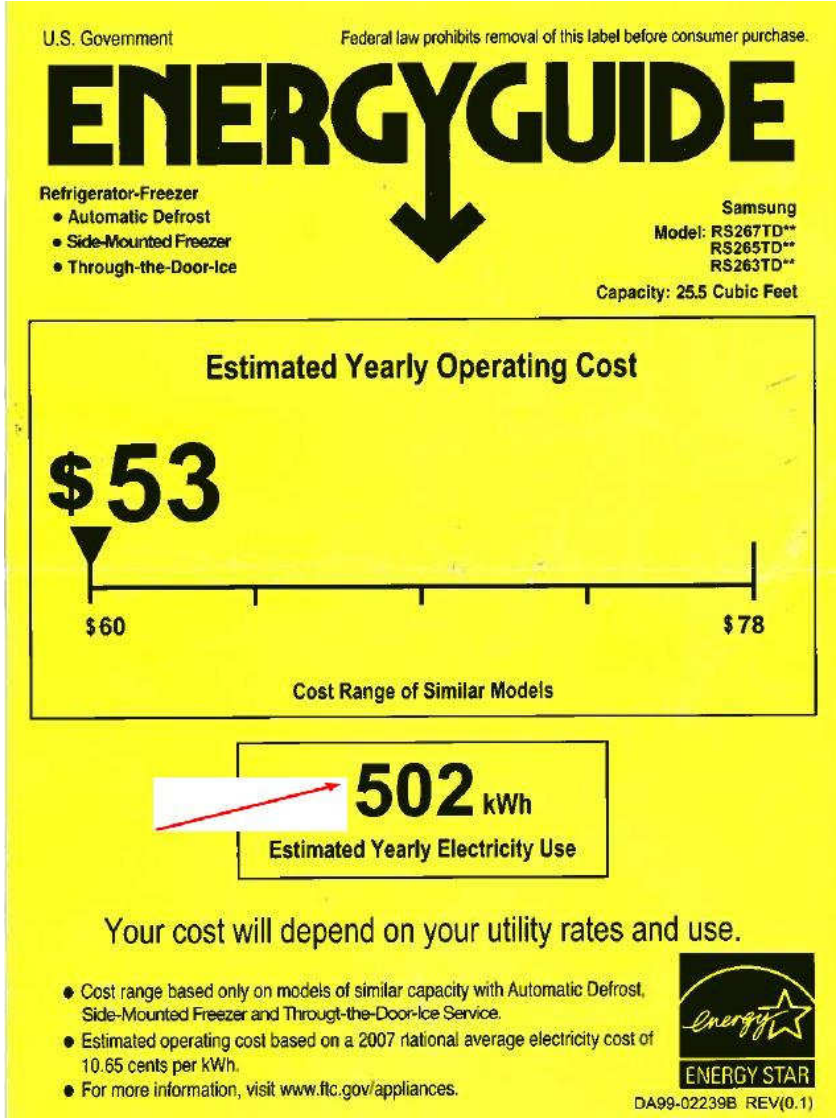
"The easiest mess to clean up is the mess that is never made."

Energy General

- **Over 1/3 of the world's population doesn't have electricity today.** History Channel Modern Marvels- Power Plants_0806

- **"Americans spend more on potato chips than we spend on clean-energy research and development". "The total amount we're spending on clean-energy research and development programs is right around $5 billion".**
- {SOURCE: Harry Reid_LVRJ_National clean energy summit 3.0: Clean-energy summit engages multiple topics}

- **The U.S. has 5% of the world's population, yet consumes 25% of its energy supply** History Channel Modern Marvels- Power Plants_0806



#2(A) Learn about the sustainability of different energy sources: Solar energy

SOLAR ENERGY

1. **SOLAR**

STAT: Nevada law requires 25% of state's power to come from renewable resources by 2025. (6% coming from solar by 2016)
[Source: LVRJ 6/30/2009]

*Starting to see an emergence of solar.
-Roofs, parking lots, big solar on the way to California.

The *Solar Energy Industries Association* ranked Nevada as the No. 1 state in the country for installed solar energy capacity.

#2(A) Learn about the sustainability of different energy sources: Wind Energy

WIND

WIND

Wind energy is renewable and clean and produces no green-house emissions

- CONS:
- some people find wind turbines unsightly or noisy
- They are O.K. but not in my backyard attitude
- Can hurt bats, birds etc.

*Nevada is not among the top states in wind energy potential--- Its ranked 21st in the nation. –would need billions in new transmission lines [LV SUN_Wind power's potential in peril?_09-02-15]

#2(A) Learn about the sustainability of different energy sources: Hydropower

HYDROPOWER

HYDRO (AKA) WATER POWER

Comes from the energy of falling and running water, which can be harnessed for generating electricity.

Until 1954, NPC depended solely on dam power- Then there was growth…

*[EIA] "…just **3%** of the nation's more than 82,000 dams generate electricity."

#2(A) Learn about the sustainability of different energy sources: Nuclear Energy

NUCLEAR

NUCLEAR

Nuclear energy is carbon-free

- CONS:
- Leaks (Japan Example)
- Water intensive
- Potential to do great harm

Yucca Mountain

Produced by a fission reaction that splits the uranium nucleus, creating heat.
The heat is used to turn water into steam; the steam drives a turbine, spinning a generator to produce electricity.

- There are currently 104 nuclear reactors in the US.

*Nevada <u>does not</u> have its own nuclear power plant- but NV Energy does potentially import power from CA and AZ where nuclear power is generated.

#2(A) Learn about the sustainability of different energy sources: Bioenergy

1. **BIOENERGY**

Generated from biomass: trees, crops, algae, animal dung, or plant material that is left over from agricultural and forestry operations.

- Carbon neutral fuel
- Biofuels
- Electric vehicle
- Green vehicle
- Plug-in hybrid
- Bioethanol

EAGLE REQUIRED

STUFF #2(A) & (C): Keep a log of the "stuff" your family purchases for two weeks. In your log, categorize each purchase as an essential need or a desirable want (exclude food)

STUFF

- Discuss family purchases log

Discuss Items of need VS items of necessity

How does having too much stuff affect you and others?

Discuss Impacts:

- Financial
- Time spent
- Maintenance
- Health
- Storage
- Waste

STUFF #2(B): Plan a project that involves the participation of your family to identify the "stuff" your family no longer needs. Complete your project by donating, repurposing, or recycling these items.

STUFF

- Donating
- Repurposing
- Recycling

What practices can be used to avoid getting too much stuff?

Discuss Impacts:

TBD

#4 Recycling.

Play the recycle challenge game

NOTES:

*On average, each American produces about **4.3 pounds of trash per day**.

Nevada's 2012 recycling rate exceeds goals

By ED VOGEL
LAS VEGAS REVIEW-JOURNAL CAPITAL BUREAU

CARSON CITY — The recycling rate in Nevada reached a record 28.8 percent in 2012 in the six counties required by law to track that information, the state Division of Environmental Protection reported Wednesday.

A 1991 state law set a recycling goal of at least 25 percent for municipal solid waste in counties of more than 45,000 people.

The state first reached that goal in 2011 and then climbed slightly again last year to the new record rate. Metals, paper, glass, plastics and organic materials are among the items that are recycled.

Clark County's recycling rate was 27.5 percent in 2012. As recently as 2009, the countywide recycle rate was 17.4 percent.

LOOKING TO RECYCLE?

To find recycling locations, visit nevadarecycles.gov or call the recycling hotline at 1-800-597-5366.

Jo Ann Kittrell, a spokeswoman for the division, attributed the increase to the increased availability of curbside recycling in Henderson and North Las Vegas. Clark and Washoe counties are required to provide residential curbside recycling. Carson City and Elko also offer this service, although it's not required in those smaller communities.

In hopes of increasing the recycling rate more, the agency's Nevada Recycles Program has developed an online map to inform residents of recycling locations, materials that can be recycled and businesses that accept items.

"So many people want to recycle, but don't know where to bring particular recyclables," said Nicole Goehring, the Northern Nevada recycling coordinator. "Whether it is a Christmas tree or computer, appliance or antifreeze, the map specifies where to take it for recycling."

Douglas County, at 54 percent, has the highest recycling rate in the state by far. Nevada Recycles attributes that to the Northern Nevada county's biofuel and composting businesses that collect organic wastes from businesses, supermarkets and residents.

One business, Bently Biofuels, collects used cooking oils from restaurants. Their fuel is available for motor vehicles at a Minden station, with several stations in the San Francisco Bay Area.

Contact Capital Bureau Chief Ed Vogel at evogel@reviewjournal.com or 775-687-3901.

- The energy and resources required to make 1 new aluminum soda can could be used to make 20 cans from recycled aluminum.
(Source: Can manufactures Institute)

*Reusable water-bottles
*Bottle-water more expensive than gas

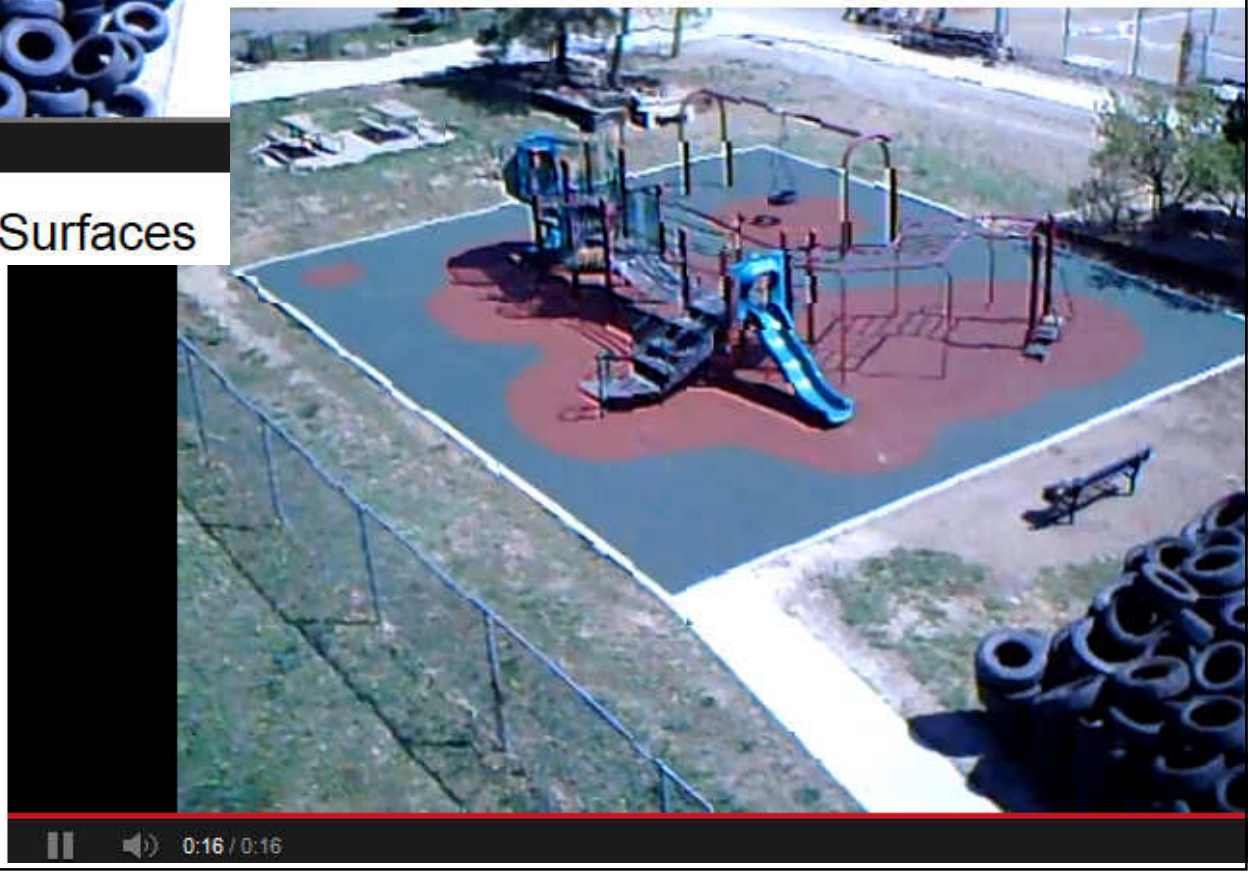
[Link to recycling plastics understanding the number system
http://www.dec.ny.gov/docs/materials_minerals_pdf/plasticpam.pdf](http://www.dec.ny.gov/docs/materials_minerals_pdf/plasticpam.pdf)


TRASH
BEVERAGES
PAPER

Old Tires Recycled into Playground Surfaces

Tires to play grounds

http://www.youtube.com/watch?v=OShr1inOeEg



#6 Learn out career opportunities in the sustainability field. Pick one and find out the education, training and experience required. Discuss what you have learned with your counselor and explain why this career might interest you.

- 1: No set career path
- 2: BLS does not have wage data specifically for sustainability occupations.
- 3: Personal satisfaction
- 4: Some work outdoors

- *TBD. http://www.bls.gov/green/sustainability/sustainability.htm

6 (Continued) Sustainability officer???

Scientists, Environmental Consultants, Natural Resource Managers, Ecologists, mathematicians, statisticians, Sociologists, chemists, Biologists, Park Rangers, Psychologists, Foresters, Geologists, Geophysicists, Hydrologists, Oceanographers, Marine Scientists, Meteorologists, Environmental and Soil Scientists, Civil Engineers, ETC…

Selected science occupations	Median annual wages, May 2011[1]
Atmospheric and space scientists	$89,790
Biochemists and biophysicists	79,230
Chemists	69,760
Conservation scientists	59,530
Environmental scientists and specialists, including health	62,920
Materials scientists	84,600
Microbiologists	65,230
Natural sciences managers	114,770
Soil and plant scientists	58,940

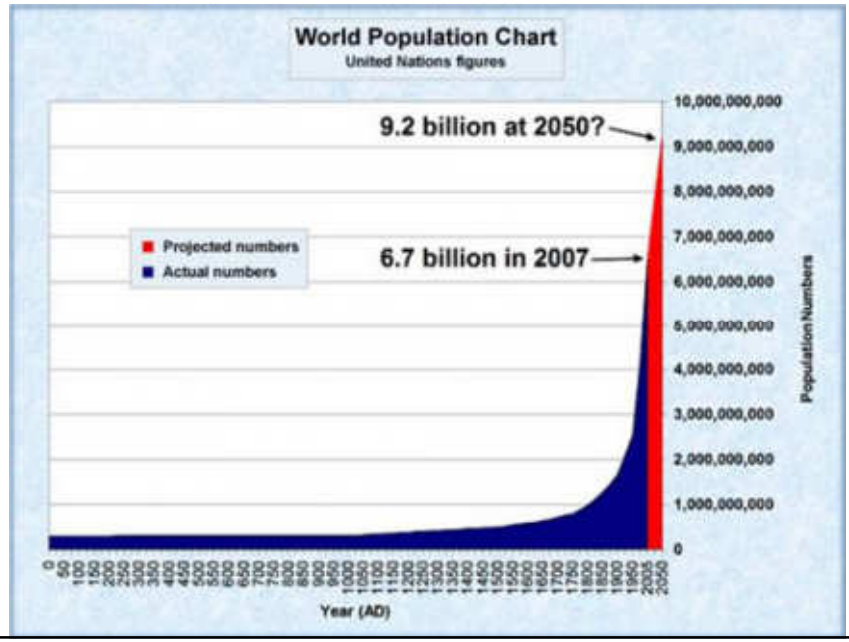
Footnotes:
(1) Occupational Employment Statistics data are available at www.bls.gov/oes/. The data do not include benefits.

Selected engineering occupations	Median annual wages, May 2011[1]
Chemical engineers	$92,930
Civil engineers	77,990
Environmental engineers	79,050
Health and safety engineers, except mining safety engineers and inspectors	75,470
Industrial engineers	77,240

Footnotes:
(1) Occupational Employment Statistics data are available at www.bls.gov/oes/. The data do not include benefits.

E-Waste

- Try counting the electronic gadgets your family has. How many?
  - Computers, televisions, stereos, CD players, cell phones, digital cambers,
  - Americans now own an **average of 24 electronic gadgets**
  - All electronic waste may contain contaminants such as lead, cadmium, and beryllium. These heavy metals can leak into our environment in landfills and spew into the atmosphere.
  - Consumer electronics now make up1 to 2 percent of all solid waste.


World Population Chart
United Nations figures
9.2 billion at 2050?
6.7 billion in 2007
Projected numbers
Actual numbers
10,000,000,000
9,000,000,000
8,000,000,000
7,000,000,000
6,000,000,000
5,000,000,000
4,000,000,000
3,000,000,000
2,000,000,000
1,000,000,000
0
Population Numbers
Year (AD)

Composter

- Video of composting
- http://www.bing.com/videos/search?q=how+compposters+work&view=detail&mid=803ADFCB4B8FA71F3B89803ADFCB4B8FA71F3B89&first=0&FORM=NVPFVR
- Natures way of recycling

- What can be composted?
- #1 table scraps, fruits and vegetables scraps, eggshells, leaves, grass clippings, straw, weeds, dryer lint, wood chips.

  - **Composting**: For food to compost properly, it needs light and air. In a landfill (dump), it would get neither.

  - Composting turns food waste into a usable product that enriches the soil and reduces the need for water, fertilizer, and pesticides.

Requirement # 5
(POST) Family Meeting

Species Decline

- “the tortoise population has declined from 200 per square mile in 1950 to a range of about six to 60 per square mile today.”

Big Bend Conservation Area

Terms…

- **Graywater:** water that drains from sinks and showers.
- **Blackwater:** water that is flushed down toilets and urinals.
- **Stormwater:** water which runs off roofs, roadways, and paved areas
- **Ecological Overshoot:** Individuals in the U.S. consume more water, more food, more goods- than most people in other parts of the world. That rate of consumption has increased so much that we now are using more resources faster than those resources can be replenished by nature. This is called overshoot.

Global Issues…

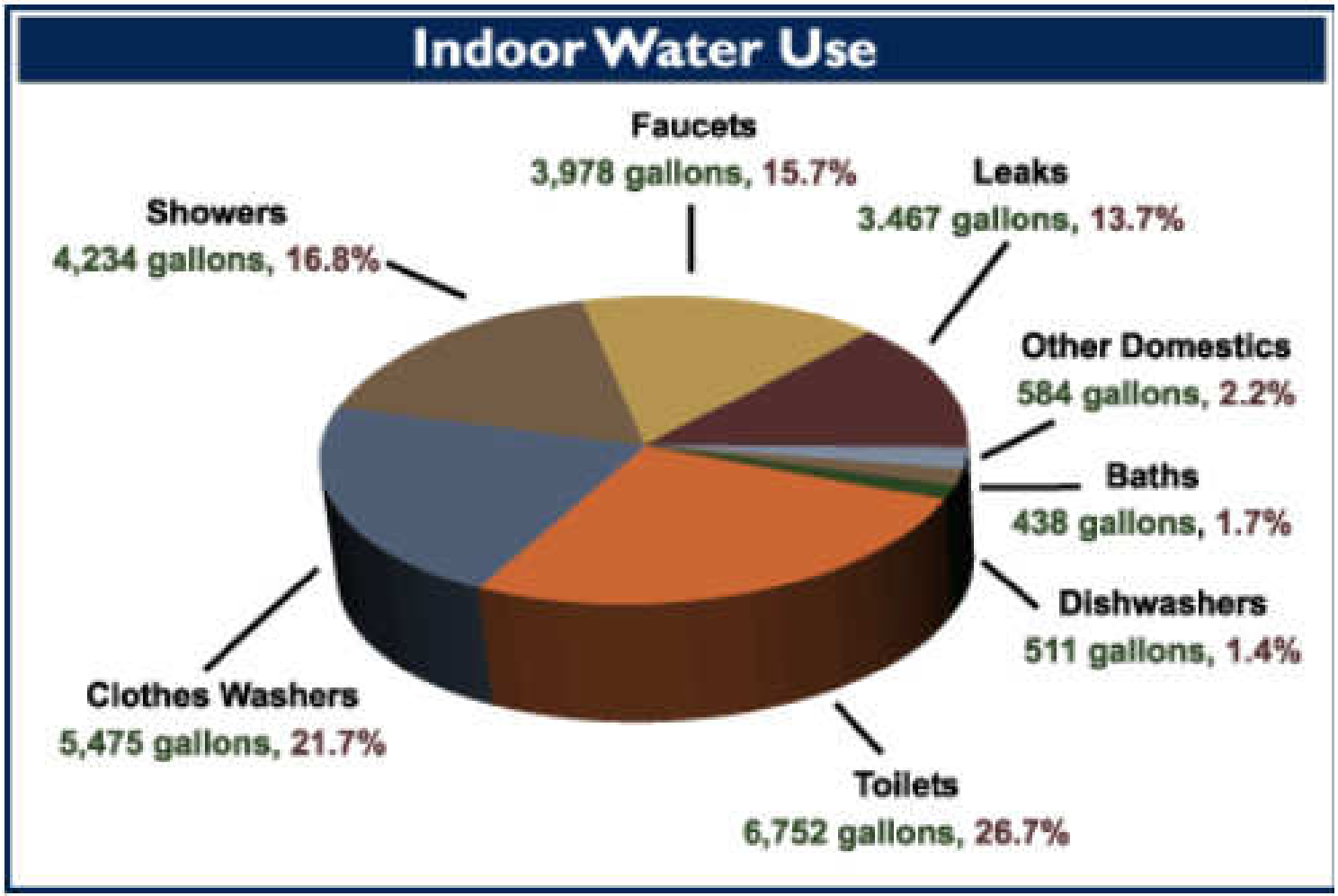
- Climate Change
- Energy Resource Depletion
- Deforestation/ Habitat loss
- Pollution
- Population
- Limited Resources

QUESTIONS

WHAT USES THE MOST WATER IN YOUR HOUSE?

#1) Toilets = 6,752 Gallons 26.7%
#2) Clothes Washers = 5, 475 Gallons 21.7%
#3) Showers/Baths = 4,672 Gallons 18.5%
#4) Faucets = 3,978 Gallons 15.7%
#5) Leaks = 3,467 Gallons 13.7%
#6) Dishwashers = 511 Gallons 1.4%

http://www.snwa.com/consv/indoor.html



TOILETS

*Toilets consume about **27 percent** of the water used inside the home.

- Upgrade to a high-efficiency toilet.
- You can save water and money by checking your toilets for leaks, replacing your flapper
- Look at new devices. Different flush levels for #1's than #2's

*Don't use them as trash cans

A high-efficiency toilet can save more than **4,000 gallons of water per person each year**

Not advocating…"If it's yellow, let it mellow, if it's brown, flush it down."

Washing Machines

Laundry consumes about **<u>22 percent</u>** of water used inside the home.

*A traditional washing machine will use **40** to **47** gallons of water per cycle.

*High efficiency washing machines use **11** to **32** gallons per cycle.

*The majority of high efficiency washers are front loading. These machines use about 40 percent less water and put less wear-and-tear on your clothes.

Showers and Baths

About **19 percent** of the water used in your home is from showers and baths

*Make sure the showers in your home are water efficient.
*Limit the length of your showers to 5 minutes or less.
*Take more showers than baths.

If you take a 10 Minute shower every day, how many gallons of water per year would you be using?

7,300 gallons per year *

A family of four taking daily 5-minute showers with a high-efficiency showerhead can save more than 20,000 gallons of water each year.

Faucets

About **16 percent** of the water used in your home is from faucets

Washing hands, brushing teeth, shaving, grapes. etc…

*Installing low-flow faucet aerators can reduce the amount of water coming out of your faucet by 50 percent, saving about 2,000 gallons of water annually for two faucets.

About **14 percent** of the water used in your home is from Leaks

Dishwashers

About 1 to **2 percent** of the water used in your home is from dishwashers.

- Only run dishwashers and washing machines when they are completely full.
- Purchase high-efficiency appliances and reduce your water and energy use by as much as 50 percent.
- Adjust the water-level settings for the most efficient run.

When used properly, dishwashers can actually be more efficient than hand washing.