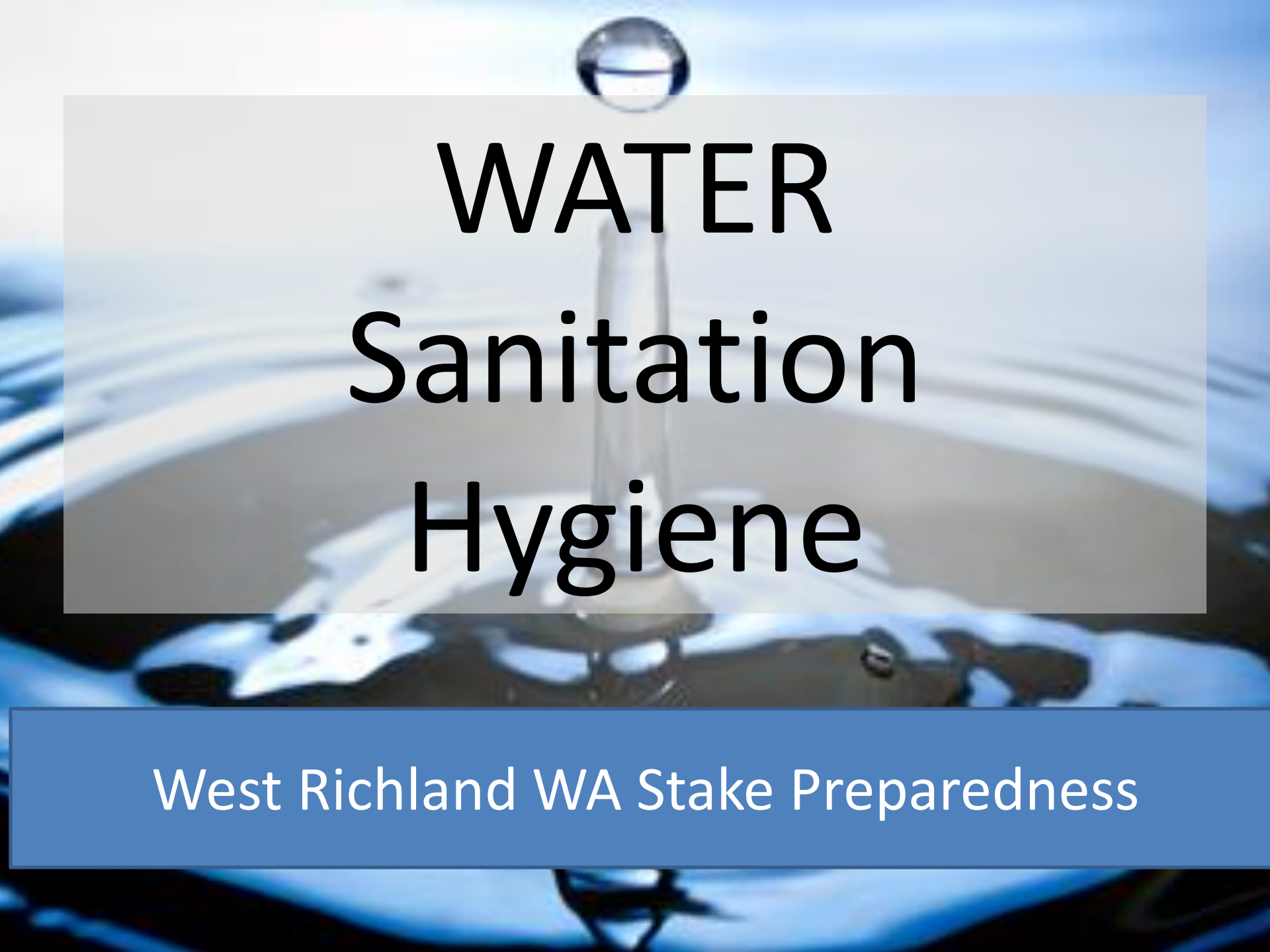


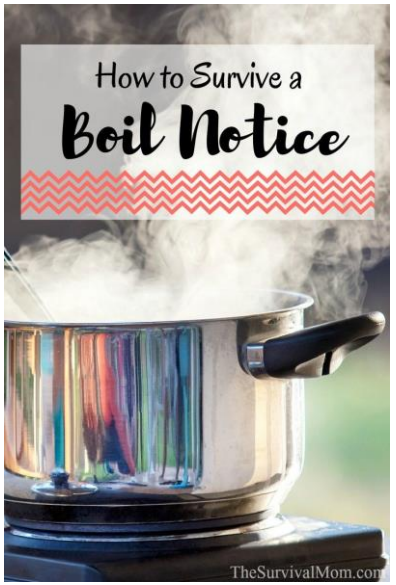
WATER
Sanitation
Hygiene

West Richland WA Stake Preparedness

Water Safety

A. What will you do when tap water is not drinkable?
   - Contamination, boil notice, etc.

B. What will you do when tap water is not available?
   - Loss of electricity
   - Prolonged supply problem
   - You run out or failed to store H_2O



Water Safety

A: When tap water is not drinkable

- Sediment / cloudy
- Chemicals / agents
- Microorganisms: E.coli, Giardia, Cryptosporidium
- Radiation

- Bathing, hygiene, teeth brushing
- Cooking, dish washing, laundry
- Pets
- Potable & gray water
- Radioactive contamination (think Columbia River)
- The only safe water is purified by you or is bottled water

Household Rules for a Boil Notice

- Do not drink or use water from any faucet
- Brush teeth with bottled or treated water
- Use hand sanitizer in place of soap and water
- Sponge baths
- Combination water treatment
  - Bleach AND Boiling

Household Tips – Boil Notice cont.

- Tape up or disable faucets – make kid-proof
- Use no-rinse bathing wipes
- Store one case bottled water per day for each day of a possible boil notice
- Fill empty containers, jugs, bleach bottles
- Have supply of paper plates, cups, utensils

Contaminants

Agents

- Hexavalent Chromium
- Fluoride
- Arsenic
- Lead
- Bad Bacteria
- Viruses
- Parasitic Protozoa
- Parasitic Worms
- Chemicals & Pharmaceuticals

Natural Contaminants

- Toxic Plants, Algae
- Dead Animals
- Animal Feces
- Minerals
- Turbidity

Radioactive Contaminants

- Direct exposure
- Particulates settle
- Downwind / downriver

Preparing Water

- Filter
  - Distill, Reverse Osmosis, Gravity filter (Berkey, ceramic, biologic), Lifestraw, etc.
- Chemical Tx
  - Chlorine bleach (8 drops/gal); chlorine granules
  - Iodine drops
- Heat
  - Boil for 3 min
  - Can in water bath canner or pressure canner

Water Treatment

- Clarify - Filtration
  - Cloudy/dirty water - remove debris and particulates
  - Filter (filter paper, cloth, 3-stage biologic filter, settle-decant, etc.)
- Disinfect – Purification
  - Objective: remove microorganisms, toxic chemicals, heavy metals
  - Boiling
  - Chemical (chlorine, iodine)
  - Microfiltration

It is best to combine methods and have redundancies when dealing with water filtration, purification & storage.

Purification & Filtration

Purification

- Boiling - heat
  - Does not neutralize chemicals or radioactive particles
- Chemical Tx: Drops / Tablets
- Activated Charcoal Filters
- Ultraviolet Light
- Pumps / MicroFilters (Lifestraw, etc.)
- Distillation

Filtration

- Debris
- Sediment & particulates
- Biologic – bacteria, protozoa, viruses

It is best to combine methods and have redundancies when dealing with water filtration, purification & storage.

Liquid Chlorine Bleach

- Sodium hypochlorite - liquid
- Kills bacteria and viruses (Not effective against all protozoa)
- 2 drops of bleach per quart / 8 drops per gallon. Increase for cloudy water.
- Use unscented; no additives
- Does not neutralize harmful chemicals or radioactive particles
- Shorter shelf life <6 months

Dry Chlorine Bleach / Granules

- Calcium hypochlorite: Shock treatment used in pools
- Kills bacteria and viruses (not effective against all protozoa)
- Does not neutralize harmful chemicals or radioactive particles
- 65-70%; no added fungicides, algaecides, or stabilizers (cyanuric acid, clarifiers, etc.)
- Stable in dry form (10 years shelf life)
- Store properly – highly corrosive
  - Sealed, chemical-resistant container
- Compact & lightweight
  - One pound bag can disinfect tens of thousands of gallons
  - CDC and EPA endorse it for emergency Tx

Dry Chlorine Bleach / Granules

- Create Stock ‘Bleach’ Solution:
  - Dissolve one heaping teaspoon in 2 gallons water = ~5.25% liquid bleach solution
  - Label: “Disinfectant Solution” – store in plastic or glass
  - Use fresh solution, 1 Tbl/gallon; like sodium hypochlorite bleach
- Direct use: Pinch between thumb and finger per 1 gallon water; wait one hour, smell faint chlorine, if no smell, repeat.

Dry Chlorine Bleach / Granules

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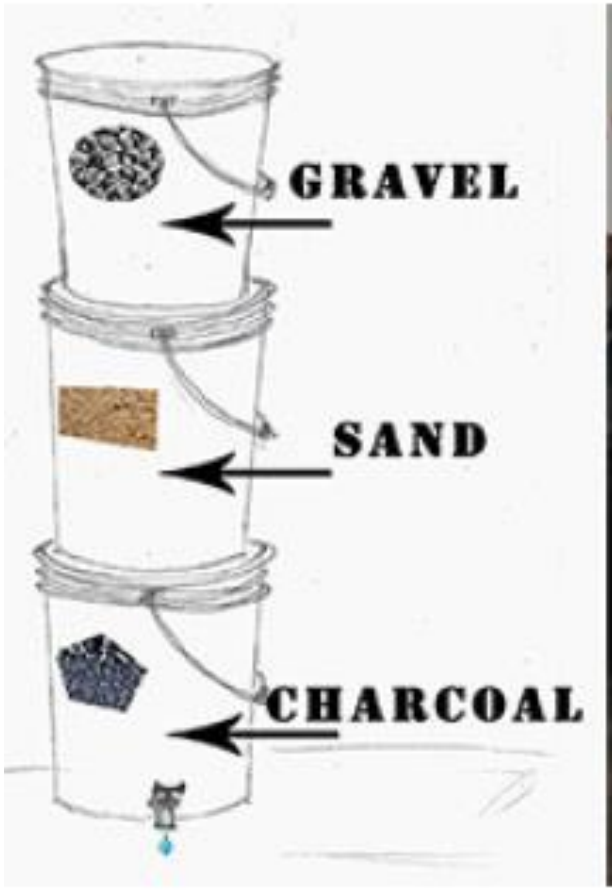
Berkey Water Filters

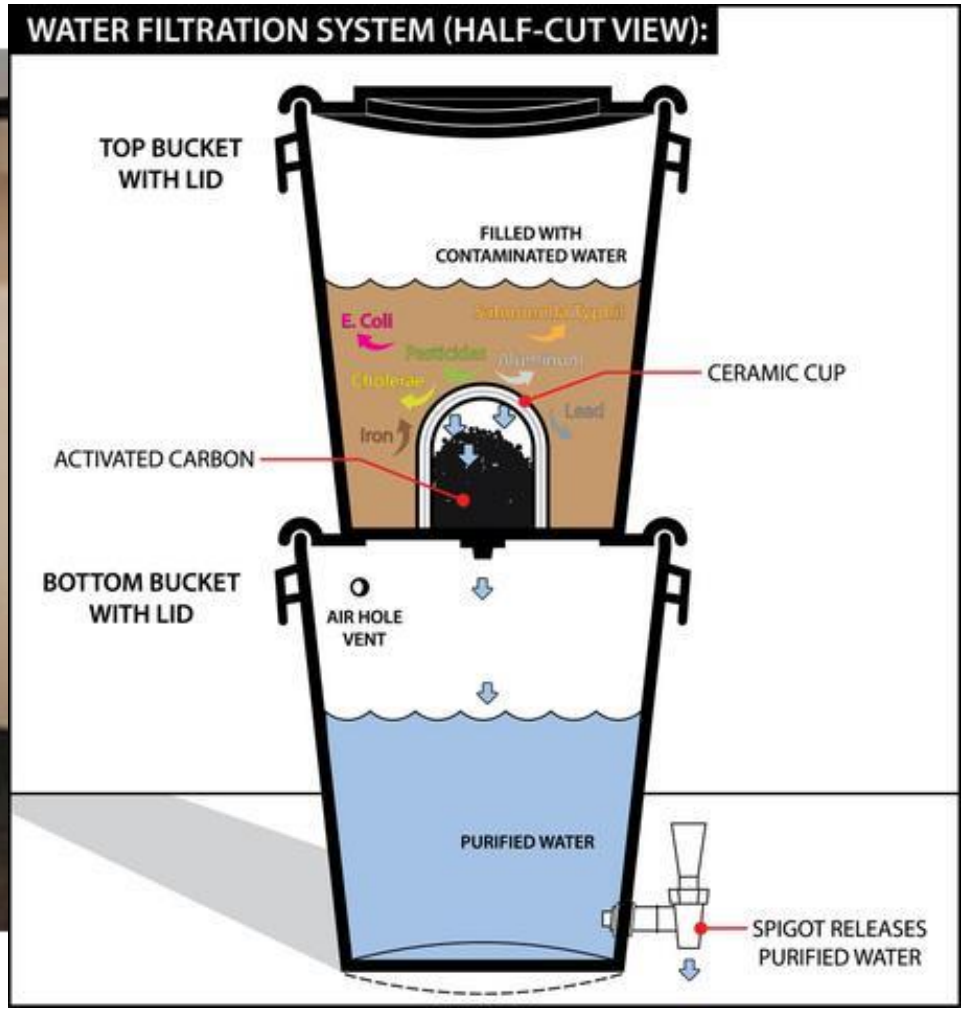
Gravity Filter - Homemade


Heavy Duty
5
IGLOO
5-GAL DRINKING WATER

Bio-Filter


GRAVEL
SAND
CHARCOAL


GRAVEL
SAND
CHARCOAL


WATER FILTRATION SYSTEM (HALF-CUT VIEW):
TOP BUCKET WITH LID
FILLED WITH CONTAMINATED WATER
E. Coli
Pesticides
Cholerae
Iron
Lead
CERAMIC CUP
ACTIVATED CARBON
BOTTOM BUCKET WITH LID
AIR HOLE VENT
PURIFIED WATER
SPIGOT RELEASES PURIFIED WATER

Water Storage

B: What will you do when tap water is not available?

- Storage
  - PETE food-grade containers – cleaned and sanitized (no milk jugs)
  - Rotated and refreshed periodically
  - Away from heat & light; protect from freezing
  - 8 drops liquid chlorine bleach per one gallon water; increase if cloudy or challenged

It is best to combine methods and have redundancies when dealing with water filtration, purification & storage.

Water Storage

Preparing water for storage

- No need to treat if using commercially treated water from a utility.
- If you use filtered water that removes chlorine, or if your water comes straight from a well, treat with water preservative.
- Treat/filter water taken from questionable storage containers that weren't properly cleaned.

It is best to combine methods and have redundancies when dealing with water filtration, purification & storage.

THE CHURCH OF
JESUS CHRIST
OF LATTER-DAY SAINTS

Drinking Water Guidelines

Water Storage

Commercially bottled water in PETE (or PET) plastic containers may be purchased. Follow the container's "best if used by" dates as a rotation guideline. Avoid plastic containers that are not PETE plastic.

If you choose to package water yourself, consider the following guidelines:

Containers

Use only food-grade containers. Smaller containers made of PETE plastic or heavier plastic buckets or drums work well.

https://www.lds.org/topics/food-storage/drinking-water-guidelines?lang=eng&old=true

Water Storage

- How much?
  - FEMA
    - 1 gallon/person for 3 days - minimum
  - Crisis Preparedness Handbook
    - 20-30 gal/person for 2-3 weeks

Source:
www.ready.gov/water

Containers & Storage

- Both portable & fixed (1 gallon H_2O = 8 lbs)
- Use food-grade containers
- Rotated – periodically emptied and refilled
- Don’t use containers previously used for non-food products
- Protect from light, heat, freezing
  - Black plastic bag over (white) barrels
- Use potable water hoses (RV) for large tank filling
  - Garden hoses contain lead, BPA, chemicals (phthalates)
- Don’t use plastic milk jugs

Containers & Storage

Containers & Storage

- Survival Pouch
- 5 gal Bottle
- 5 gal Box
- Waterbrick
- 5 gal Stackable
- 55 gal Barrel
- 250 gal ‘Super Tankertank
- 250 gal Water Bladder
- 750 gal Tank








Containers & Storage

Containers & Storage

- Bottled water
- Soda bottles
- Mason jars
- PETE bottles
- Bathtubs, sinks, buckets
  - WaterBob, AquaPod
- Garbage can / trash bag
- Rain barrels


WISE


EMERGENCY
WATER STORAGE
TREATMENT KIT
Treats up to 300 gallons
COPPER & SILVER ION
WATER STORAGE TREATMENT
Calcium Hypochlorite
Tablets
Contains: 12 Tablets
COPPER
TEST

Containers & Storage

Have a layered and redundant water storage strategy

- Short term use; Quick access
- Long term storage
- Portable
- Potable & gray water
- Multiple sources for acquisition
- Multiple modalities for purification
- Rotated supply and supplies

Water Conservation

1. Sanitation
   - hand sanitizer
   - surface disinfection – bleach, HOCL, H_2O_2, etc.
2. Toilet
   - bag in bucket & toilet
   - outdoor use or latrine
   - absorbent kitty litter, etc.)
3. Hygiene
   - sponge baths, wipes
   - tooth brushing,
4. Cooking
   - canned meals
5. Gray water re-purposing

Water Conservation

6. Disposables
   - Diapers & pull-ups, paper plates, utensils, towels, napkins, etc.
7. Laundry
   - Minimize laundry needs with underwear liners, body odor control
8. Reduce activity levels and stay cool; limit hot daytime activity
9. Avoid dehydration
   - Beverages that dehydrate (caffeine or alcohol)
   - ‘Yellow vs clear pee’
   - Rehydration electrolytes
10. Don’t ration water unless authorities order

Hygiene & Sanitation

- Prevention – death and disease
  - Clean hands/bodies/living conditions
- Household sanitation
  - Surface and food disinfection
  - Body wastes (solid & liquid)
  - Garbage and refuse
  - Contingencies & 'What-ifs'
    - Utility services (power, water, sewer)
    - Pandemics, sickness, quarantine, disease, body fluids…
- Hygiene
  - Women's hygiene
  - Baby hygiene
  - Elderly hygiene
  - Pet hygiene


Bar or
liquid soap
Clean,
warm water
(100° - 120°F)
Paper towels
and dispenser
Spigot faucet
(no push buttons)
Trash can
Catch
basin


#1
#2
Kitty
Litter
Hand
Sanitizer

Hygiene & Sanitation

- Hygiene
  - Women's hygiene
  - Baby hygiene
  - Elderly hygiene
  - Pet hygiene

- Women's hygiene
  - Menstrual products
  - Cleansing products
  - Disposal plan
  - Alternative & Back up
  - Pain relief
  - Yeast infection
  - Pregnancy

Hygiene & Sanitation

- Hygiene
  - Women's hygiene
  - Baby hygiene
  - Elderly hygiene
  - Pet hygiene

- Baby hygiene
  - Diapers (cloth); rubber pants
  - Pails
  - Bed liners / pads
  - Cleaning products
  - Disposal plan
  - Alternative & Back up
  - Diaper rash

Hygiene & Sanitation

- Hygiene
  - Women's hygiene
  - Baby hygiene
  - Elderly hygiene
  - Pet hygiene
- Elderly hygiene
  - Diapers (Depends)
  - Incontinence
  - Bed liners / pads
  - Cleaning products
  - Disposal plan
  - Alternative & Back up
  - Mobility
  - Portable commodes
  - Bathing & oral care

Hygiene & Sanitation

- Hygiene
  - Women's hygiene
  - Baby hygiene
  - Elderly hygiene
  - Pet hygiene
- Pet hygiene
  - Waste products
  - Bags and liter boxes
  - Disposal plan
  - Absorbent pads
  - Cleaning products
  - Alternative & Back up
  - Grooming

Emergency Hygiene Kit Checklist

- Wipes
- Sanitizer
- Soap, shampoo, detergent
- Oral care – Tb, Tp, Floss
- Baking soda
- Bucket toilet
- Liners – bags
- Kitty litter absorbent
- Feminine hygiene
- Disinfectants
  - Bleach, vinegar, H2O2
- Toilet paper
- Paper Towels
- Washcloths
- Nail clippers
- Deodorant
- Gloves
- Etc.

The Twin Bucket EMERGENCY TOILET System

Make a kit today

www.PreparednessMama.com

What's in your kit?

Include
HYGIENE and
SANITATION
items like:

- Soap
- Toothbrush
- Tooth paste
- TP
- Hand sanitizer