This presentation premiered at WaterSmart Innovations

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Enhancing Homeowner Skills for Improving Landscape Irrigation Efficiency

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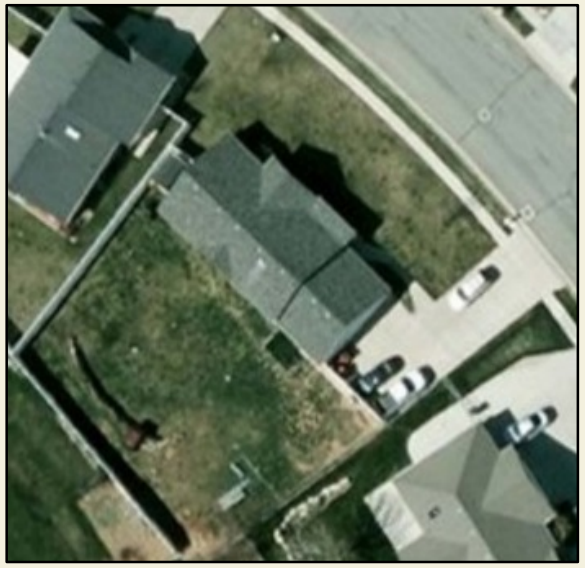
Water Checks or Audits:

- Salt Lake City is a Utah leader in implementing this type of conservation program (started in the 1990s; currently provided with USU Extension)
- Thorough and professional evaluation of irrigation system effectiveness
- Program provides customers with recommended irrigation schedules and other landscape conservation information and suggested actions

WATERCHECK
A USU EXTENSION PROGRAM

Conservation Opportunities



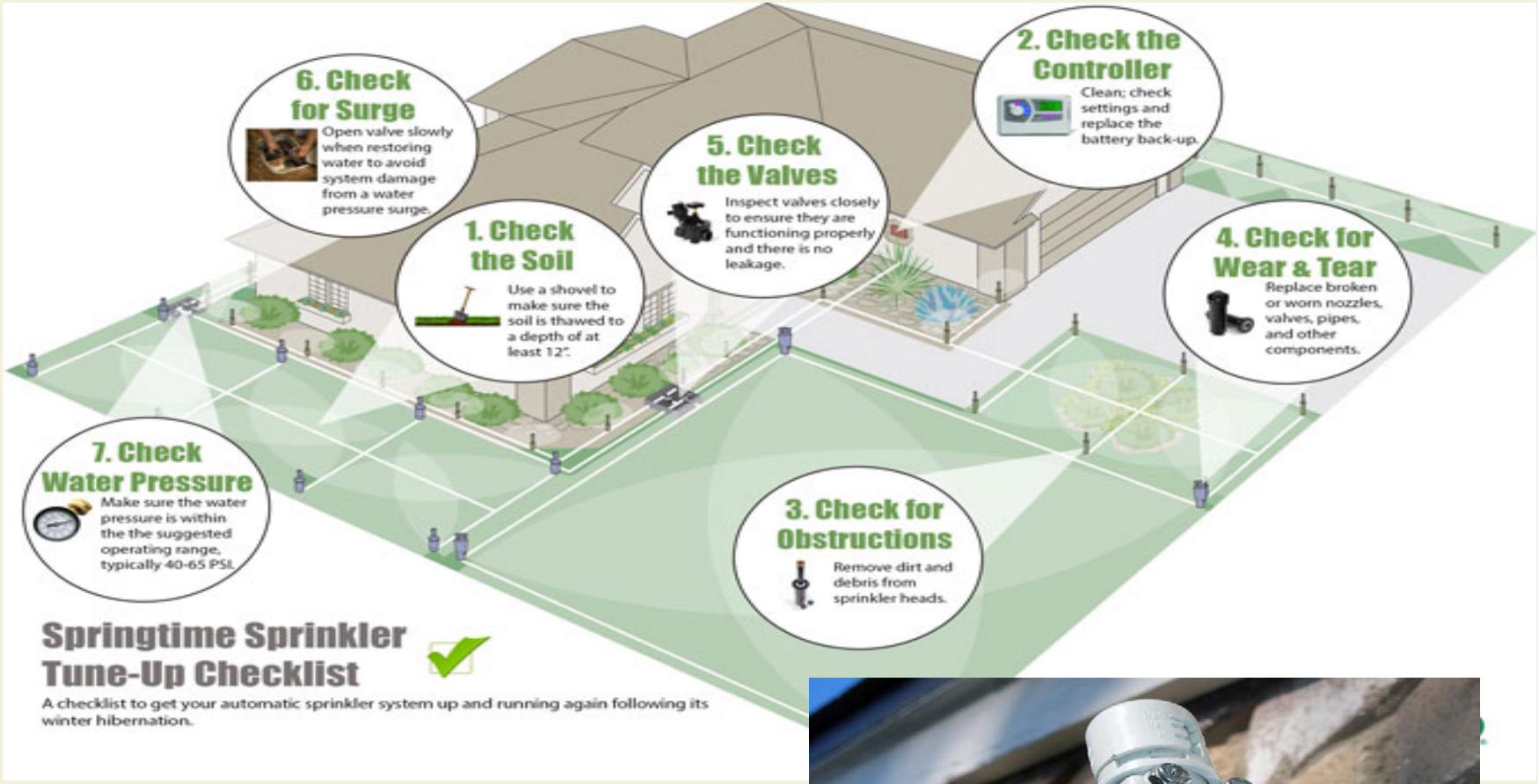
Greater efficiency on existing landscapes

Transitioning to
low-water landscapes

Importance of proper design, maintenance and operation of irrigation systems for water conservation and efficiency

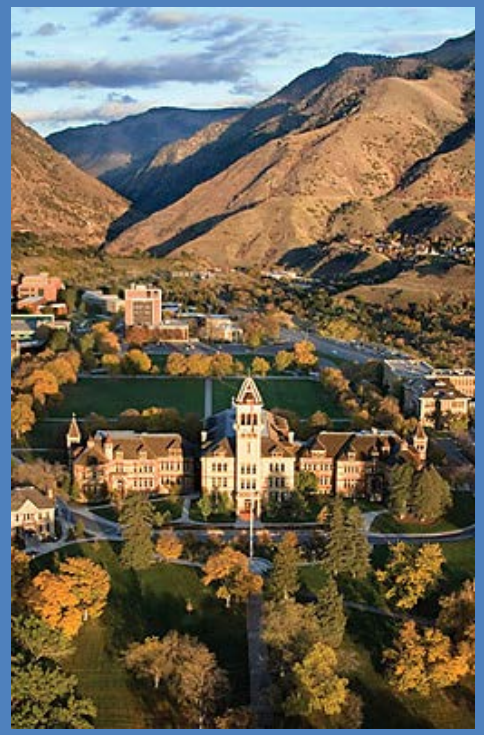
http://www.delta-t.co.uk/imagesMCL/mcl-02-02-2011-10-21-56.jpg

http://www.sprinklertalk.com/Sprinkler_School/images/adjusting_spray2.jpg



http://www.rainbird.com/homeowner/images/Infographic-RainBirdSprinklerTuneUp.jpg

http://blog.taylorirrigation.com/wp-content/uploads/2011/10/rain-sensor.jpg



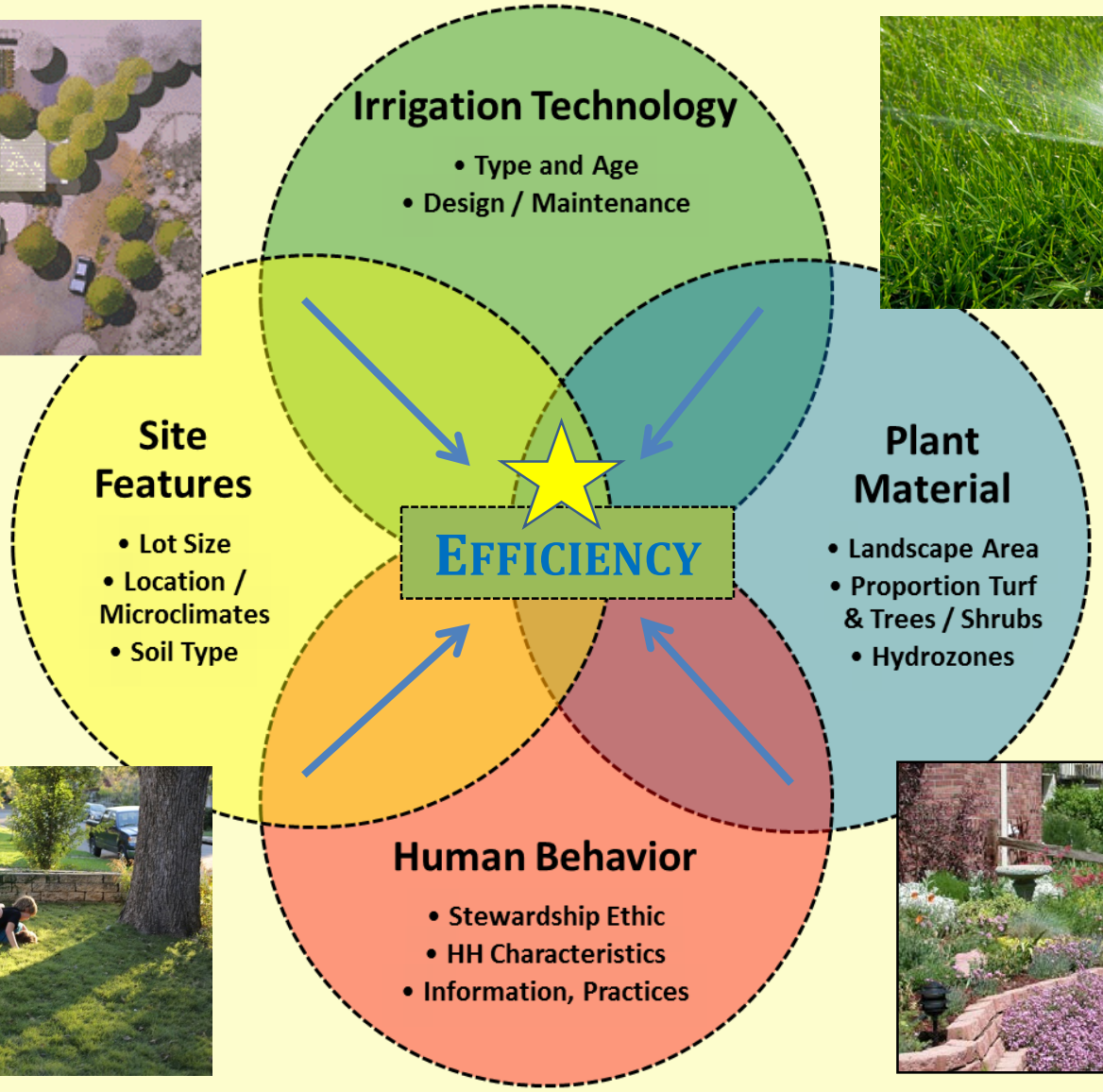
Collaborative Pilot Research Project

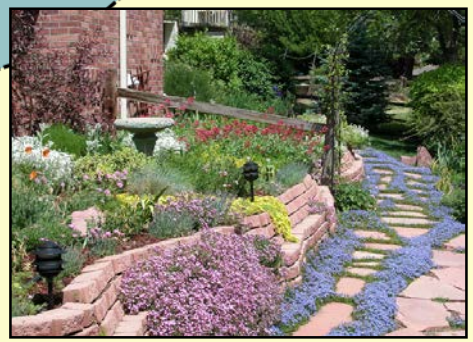
- Salt Lake City Department of Public Utilities *and* Utah State University CWEL researchers
- Designed to evaluate and enhance residential customers' irrigation management skills
- Conducted research in connection with delivery of Water Checks (2013). Primary research questions:
  - *What types of irrigation system repairs have the greatest effect on system efficiency?*
  - *How do Water Check participants see and understand their irrigation system problems?*
  - *Are water check participants willing to allow the Water Check Program to repair system inefficiencies?*

Pilot Project Data Collection

- Water Checks (delivered throughout Salt Lake City)
  - Landscape measurements
  - Irrigation system tests
  - Walk-through site evaluation by water check team
- Interviews (in connection with Water Checks=84)
  - Walk-through site evaluation interview with homeowner
  - Questions pertained to:
    - water use and their yard
    - specific water problems they were having
    - design, installation and maintenance of their sprinkler system
    - willingness to have repairs done to the system

Greater efficiency is not as easily engineered in outdoor water use.





Requires understanding the human-technology interface between water users/customers and their irrigation systems

2012 average LIR = 1.26
(average savings = 56,583 gal)

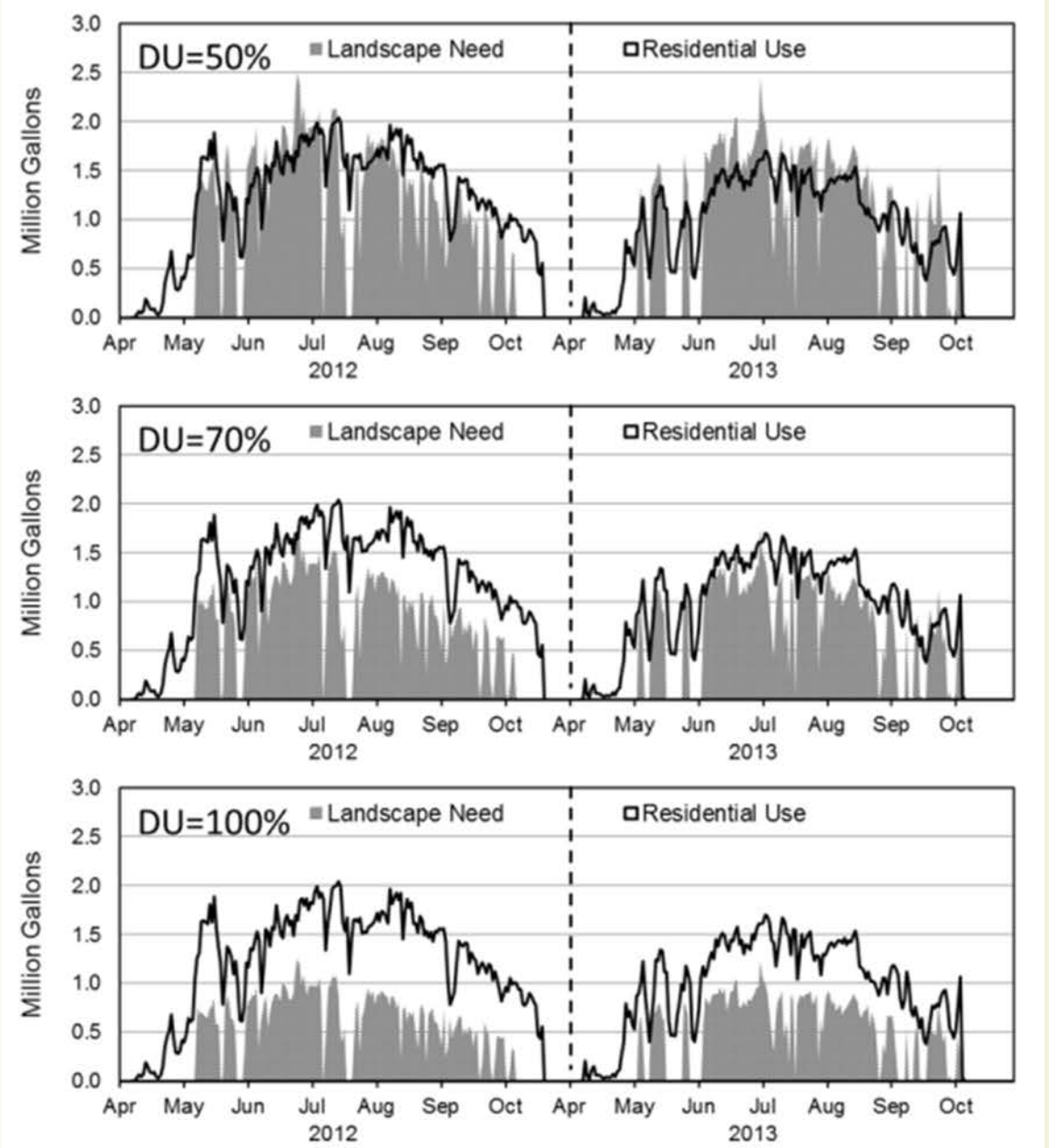
2013 average LIR = 1.06
(average savings = 11,780 gal)

2012 average LIR = 1.89
(average savings = 129,703 gal)

2013 average LIR = 1.59
(average savings = 75,973 gal)

2012 average LIR = 2.52
(average savings = 166,213 gal)

2013 average LIR = 2.12
(average savings = 108,069 gal)



Increasing irrigation system efficiency increases conservation potential

Interview Results:

Why were you interested in participating in the Water Check Program?

Wanted to decrease their water use, be more efficient and conserve water	62%
Stated they had high water bills and wanted to save money	41%
Wanted help and recommendations from an expert: - new homeowners wanted to learn how to operate & maintain their sprinkler systems - new Utah residents wanted to know how to care for their landscapes in this climate	31%
Said they didn't know how long or when to water	28%
Experienced problems applying water, wanted sprinkler systems evaluated	23%
Had Water Checks in the past and wanted to check their progress	23%
Mentioned their responsibility to be good stewards	16%

Note: responses were volunteered (not answers to forced-choice questions); more than one answer is possible

Interview Results:

What issues are you dealing with to maintain your landscape?

Lot characteristics	slope, aspect, wind, sun/shade, soil	31%
Sprinkler system issues	problems/challenges applying water	49%
Plant issues	establishing/maturing landscapes, pruning	55%
People issues	lack of knowledge/skills, household disagreements, time, money, personal health	37%
Weather issues	2013 heat wave, too much/too little rain	12%
Legacy issues	dealing with prior residents' decisions, empty houses, uncared for yards, pet damage	17%
Miscellaneous problems	various	2%

Note: responses were volunteered (not answers to forced-choice questions); more than one answer is possible

Interview Results:

How do you know how much water the various plants in your landscape need?

"I don't know"	54%
People who mentioned how they know (and what they said):	46%
Visual observation of the plants	34%
Trial and error (guess, experiment)	17%
Awareness of differing needs	27%
Recommendations (research, plant tags, service providers, Water Check, USU Extension information)	16%
Miscellaneous	5%

Note: responses were volunteered (not answers to forced-choice questions); more than one answer is possible

Interview Results:

How do you decide when to water the different areas (lawn, shrub beds, garden) of your landscape?

Visual observation of plants, soil, weather, sun exposure	36%
It isn't a decision, I just run the controller	24%
Zones are not separated for plant water requirements (water all the same)	22%
Personal scheduling convenience (not related to plant water requirements)	12%
Conservation recommendations	12%
Family, friend, neighbor recommendations	9%

Are you comfortable programming your irrigation controller?

Not comfortable programming their irrigation controller	26%

Note: responses were volunteered (not answers to forced-choice questions); more than one answer is possible

Interview Results:

What is your routine maintenance schedule?

Their routine irrigation system maintenance schedule:	
As needed – “I fix it when it breaks.”	43%
Seasonal schedule (spring/fall)	28%
None	24%
Routine throughout the irrigation season	5%

Interview Results:

How often do you observe each zone of your sprinkler system running?

Observations per irrigation season (4/1 through 10/31)	
0	20%
1-3 (includes “irregularly” and “when I am around”)	28%
4-8	26%
9-16	9%
Every time it runs	8%
Don’t know	9%

Comparison Results and Program Implications:

What specific watering problems are you having?

Problems Identified	*% Participants Mentioned*	*% Water Check Evaluation*
No problems mentioned	14%	0%
Problem Indicators:		
Dry/brown spots	44%	36%
Overspray	7%	28%
Irrigation System Design Issues:		
Head type, mismatched types on zone	6%	40%
Low head drainage	1%	17%
Valves not separated for plant water requirement	4%	67%
Pressure too high or low	8%	62%

Note: responses were volunteered (not answers to forced-choice questions); more than one answer is possible

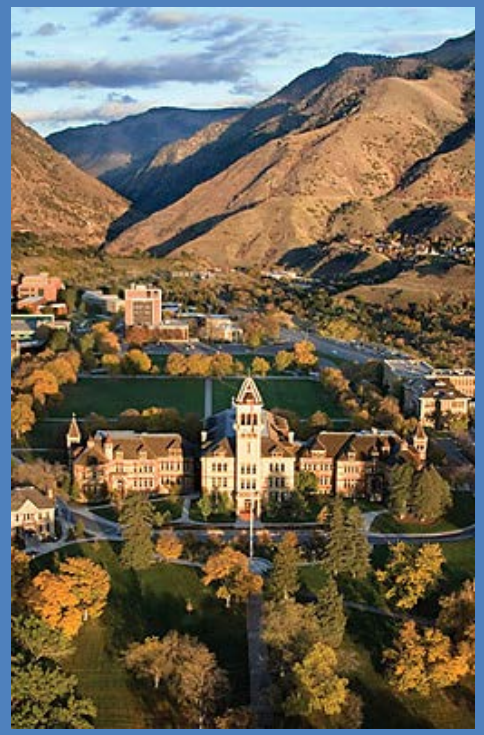
Comparison Results and Program Implications:

What specific watering problems are you having?

Problems Identified	*% Participants Mentioned*	*% Water Check Evaluation*
Landscape Layout:		
Incomplete coverage (head-to-head)	24%	33%
Maintenance Items:		
Broken/leaking/clogged valve, pipe, head, nozzle	33%	58%
Misdirected or blocked head	17%	52%
Sunken or tilted heads	1%	59%
Wrong spray patterns	3%	16%
Miscellaneous sprinkler system problems	10%	N/A

How can we use this applied scientific information to inform the practice of water conservation programming?

Note: responses were volunteered (not answers to forced-choice questions); more than one answer is possible



Conclusions and Discussion

- *Need to better understand and manage the human-technology interface between customers and their irrigation systems*
- *Knowledge gaps:*
  - *in residents' abilities to recognize and respond to irrigation system problems*
  - *in conservation program coordinators/managers' understanding of how their customers' see and understand their conservation challenges*
- *Can enhance water demand management science and practice through more focus on the role people play in urban water systems*

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