This presentation premiered at WaterSmart Innovations

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INNOVATIONS

Growing Up Green

Incorporating Conservation into
Upper Grade STEM Lessons

Why Work With Upper Grades?

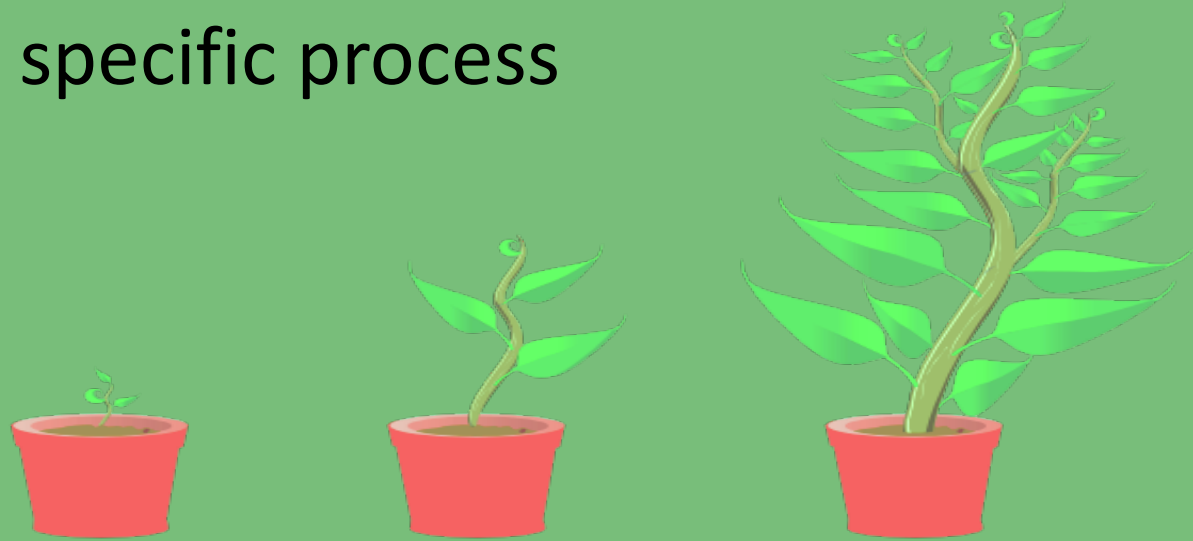
- Water conservation viewed as elementary topic
- Create a lasting conservation ethic
- More background, deeper understanding
- Introduce careers in the water profession

Overcoming Barriers

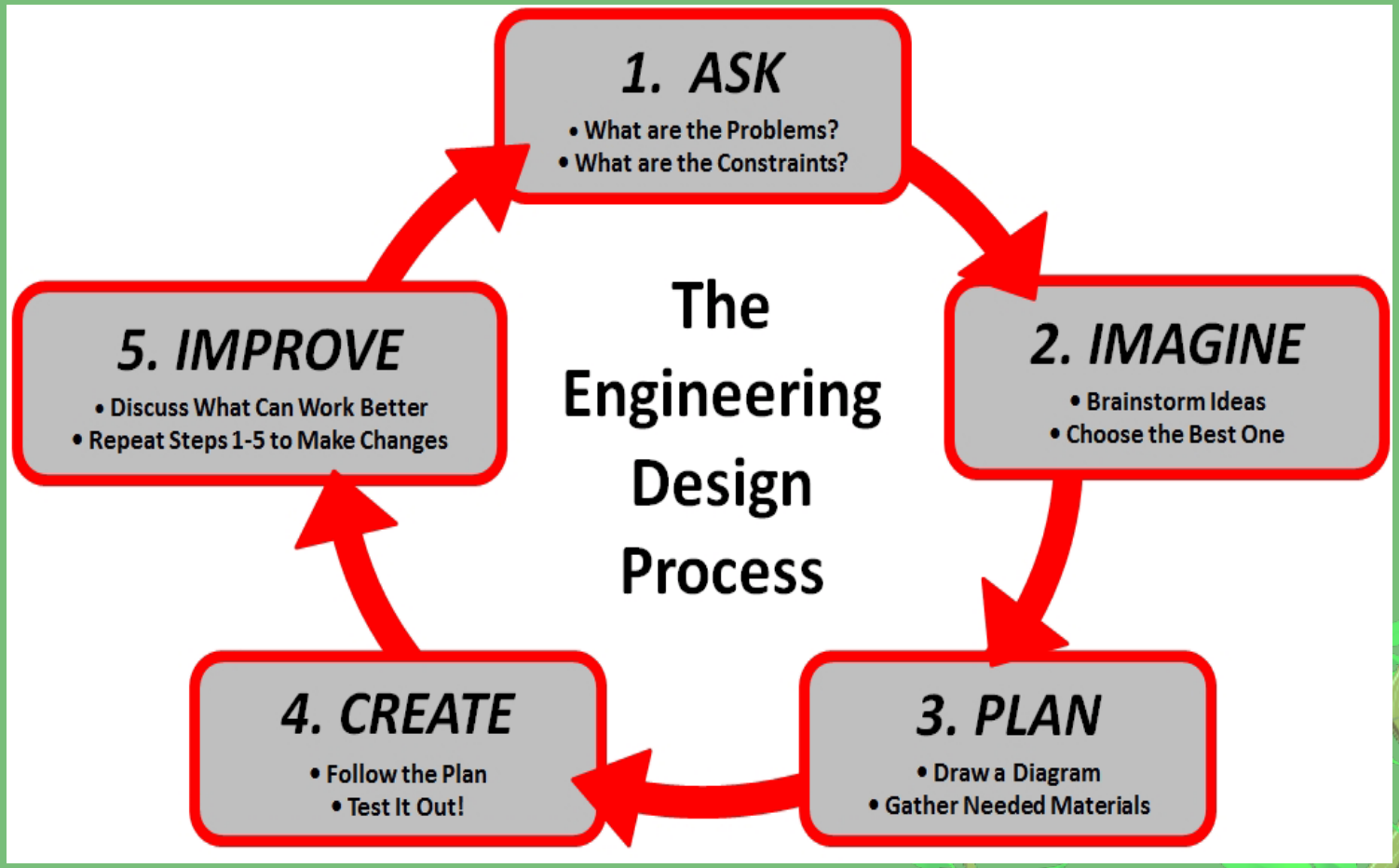
- Meaningful program in short time frame
- Make programs interactive
- Align programs to educational standards
- Align programs to school's institutional goals

What is STEM?

- STEM, STEAM, STREAM
- Interdisciplinary, project-based learning
- Teamwork and critical thinking
- Projects follow a specific process



The process


1. ASK
• What are the Problems?
• What are the Constraints?
2. IMAGINE
• Brainstorm Ideas
• Choose the Best One
3. PLAN
• Draw a Diagram
• Gather Needed Materials
4. CREATE
• Follow the Plan
• Test It Out!
5. IMPROVE
• Discuss What Can Work Better
• Repeat Steps 1-5 to Make Changes
The Engineering Design Process

STEM Program Development

- Reviewed Georgia Performance Standards for Science and Math
- Chose water topics that fit both the standards and our goals as the Water Efficiency Office
- Created projects based on the engineering design process
- Edited and redesigned lessons to fit into one class period

Filtration Station

- Observe and describe untreated water
- Examine materials available for filtration
- Work as a team to design and build a filter
- Test the filter
- Evaluate the filter’s performance
- Suggest alternative designs and materials

Filtration Station - Materials

- 50 clear plastic cups
- Sand and gravel
- Cloth bandanas
- Coffee filters
- Potting soil
- Pitcher
- Worksheets

Total cost: Approximately $50 for 3,000 students

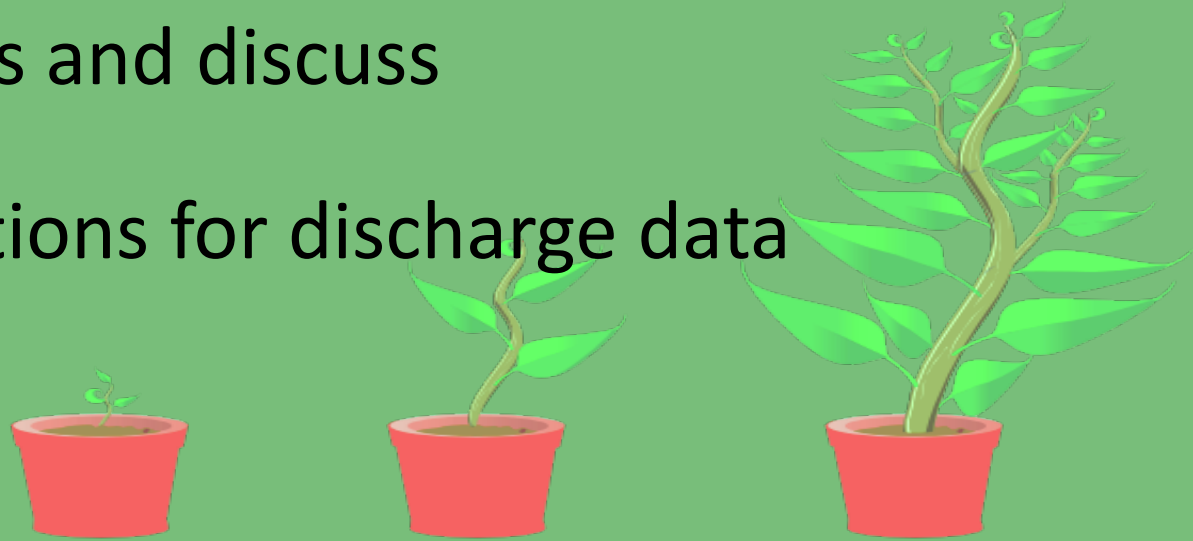
Filtration Station

Filtration Station

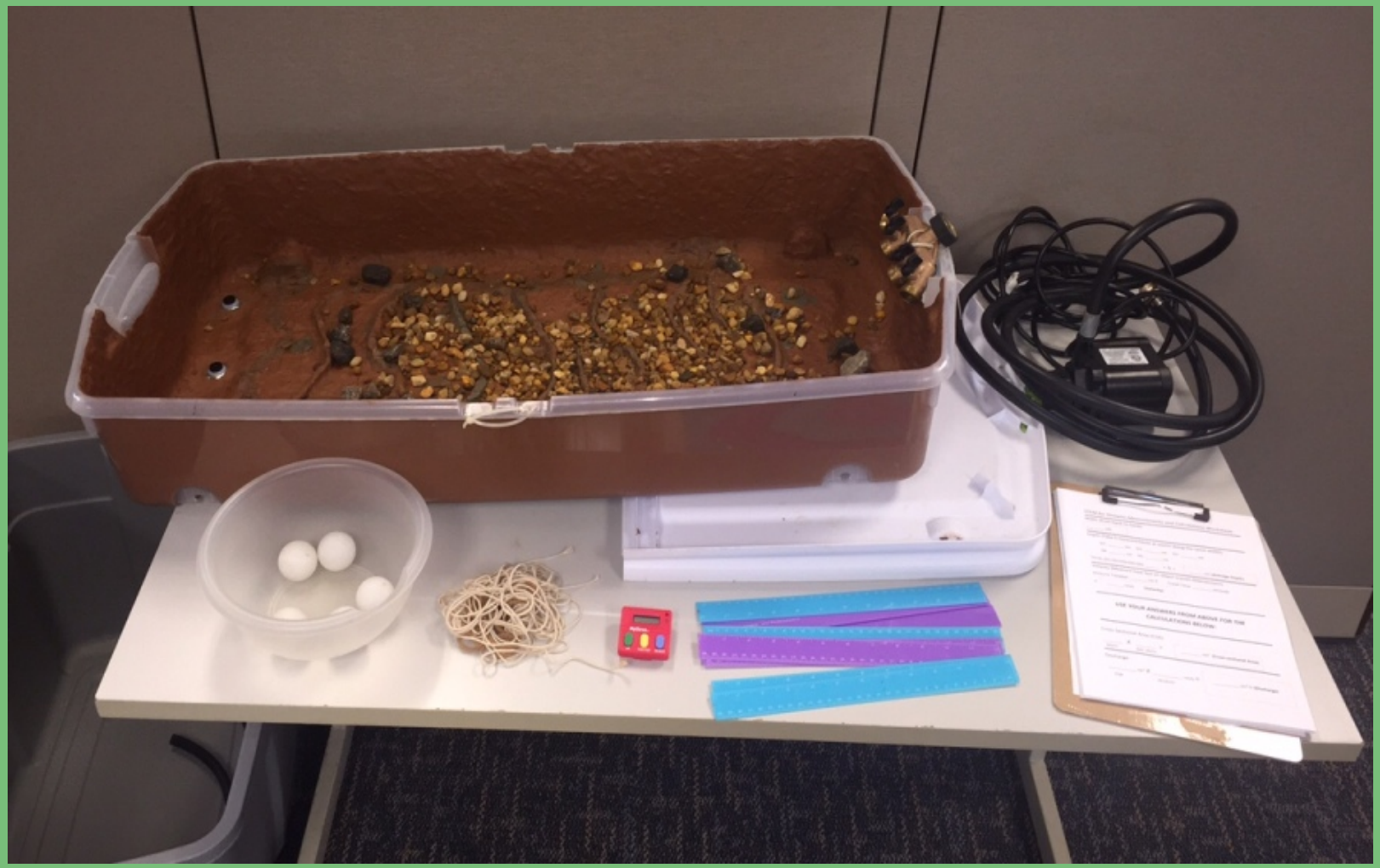
Filtration Station

STEM for Streams

- Define discharge and break down equation
- View materials available for data collection
- Brainstorm best methods for measurements
- Compare results and discuss
- Discuss applications for discharge data



STEM for Streams



STEM for Streams

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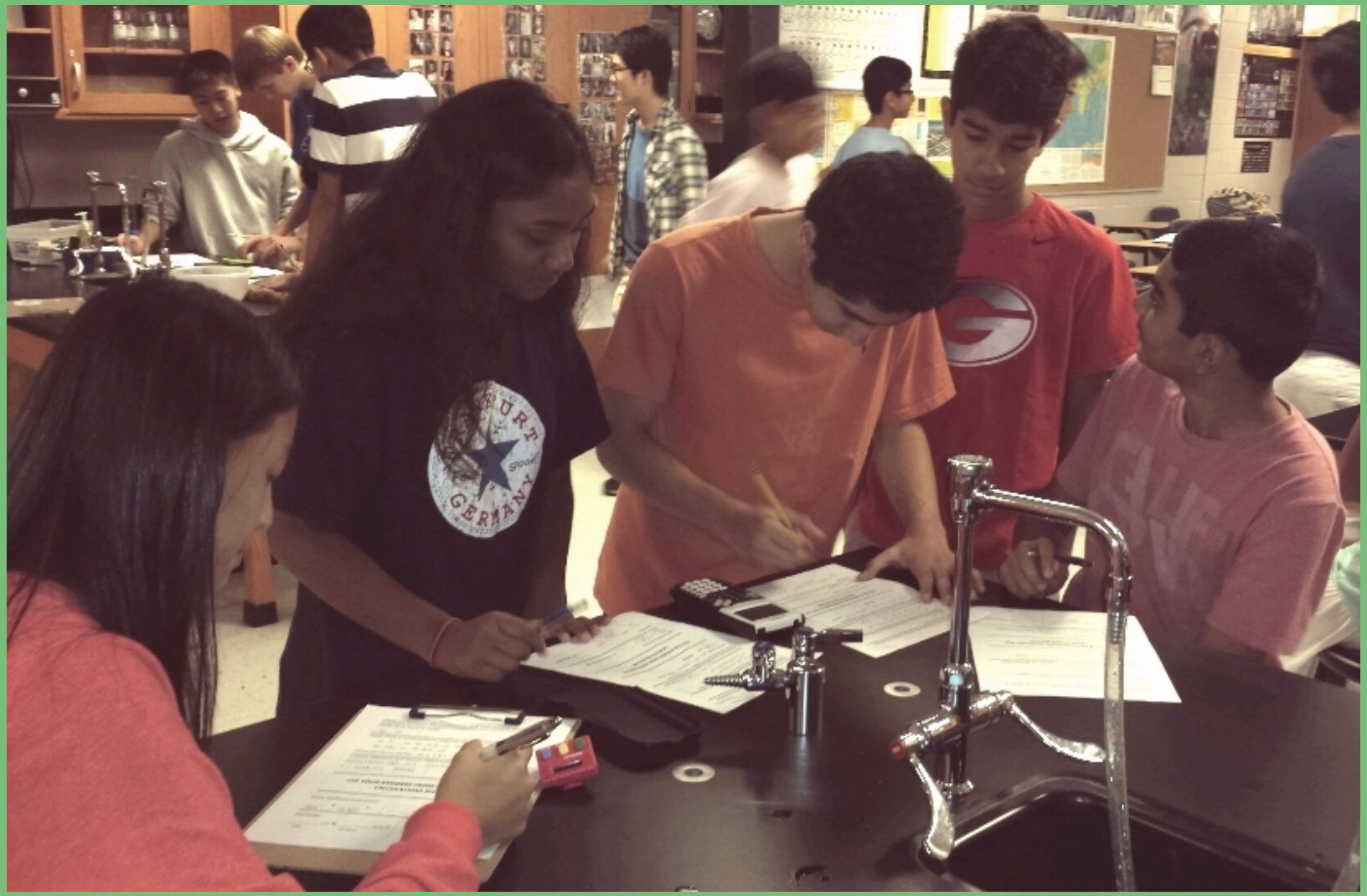
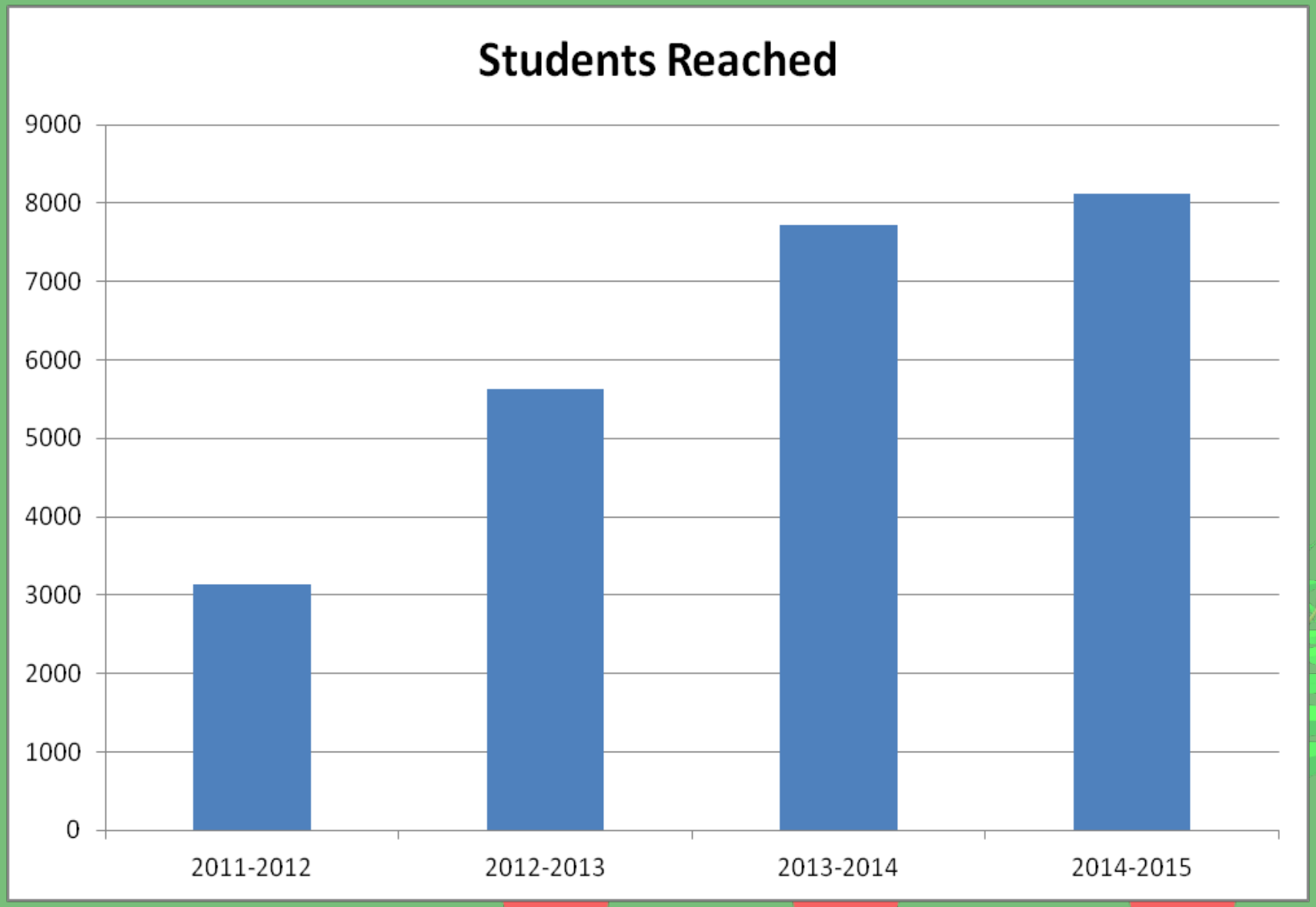


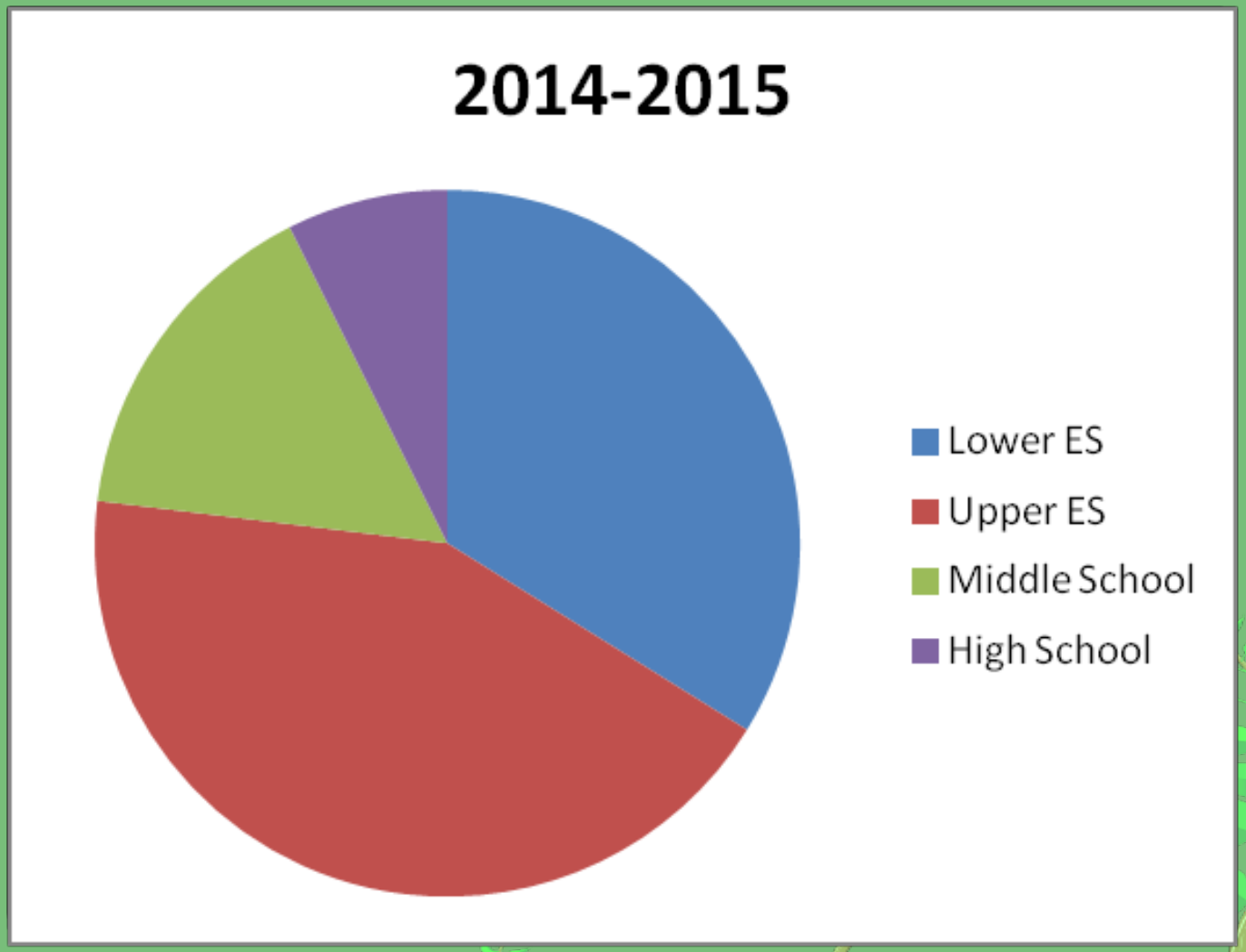
Results

- Increased participation in programs
- Greater diversity of ages/grades participating
- Positive feedback from teachers and administrators – and students!

Increase in Program Participation



Increases in Grade-level Diversity



Why Does it Matter?

- MS/HS students are closer to choosing a major / career
- Helps them develop a more well-rounded understanding of the value of water (creating more knowledgeable customers)
- Reinforces concepts introduced at a younger age (developing a stronger conservation ethic)

Next Steps

- Identify ways to continue expanding MS/HS programs while maintaining ES programs
- Develop assessment tools
- Build partnerships with school feeder systems to help us reach the same students at various grade levels

Questions?

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