Engineering Water in Extreme Environments RSG & Activities 1-9 Our Ideas Poster

Prep & Setup Guide

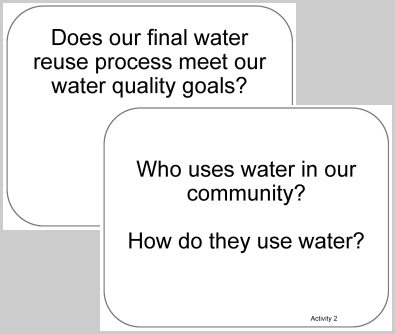
Poster Components

All poster components can be printed on **8.5 x 11” paper**

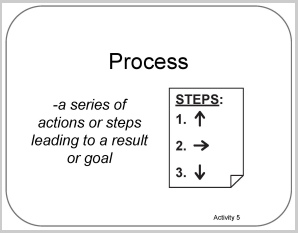
There are PDFs for:

- **Poster Pages** to build the poster (pages numbered in lower right corner with corresponding adventure(s))
- **Poster Pages** with examples are for educator reference only and not intended to print.
- **Blank Pages** for more space or to build your own poster
- **Blank ¼ page cards** for learners to add additional terms, drawings, ideas
- **Term cards**:
  - Icon-only
  - Term + icon

Poster Pages

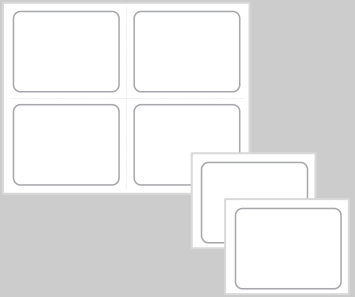


Term Cards



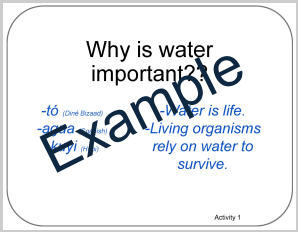
Term + icon

Blank ¼ page cards



Intended for learner responses

Poster Pages With Examples



For reference only, Do not print.

Blank Pages

Setup

To set up the poster space, you will need a wall or whiteboard area of about **80” Length x 60” Height**

» Please see the following pages for setup examples. You may choose alternative layouts to fit your learning environment.

Other Materials:

- Scissors
- Masking Tape
- Tape
- Markers

icons: Flaticon.com

Poster Setup (by number)

Our Ideas about
Water in Extreme Environments
Engineering

Poster Setup (with Example)

Our Ideas about Water in Extreme Environments Engineering

How can we identify where there is water?
How can we get it?

RSG

-We can make observations by sound, smell, and feeling. We can use what we know about water and other substances.

-We can design devices that help us collect it.

RSG

Scientist

-Test things out
-Make observations & measurements

?

-Ask questions
-Gather evidence to answer questions.

RSG

Engineer

-Design things to solve problems
-Build things
-Design technologies

RSG

Technology

-The solution to the problem.
-Material to protect a spacecraft
-Spacecrafts built safely to bring astronauts home.
-writing utensils
-bikes

RSG

Why is water important??

-tó (Diné Bizaad)
-agua (Spanish)
-kuyi (Hopi)

-Water is life.
-Living organisms rely on water to survive.

Activity 1

Activity 1

How can we reuse water in a place where water is hard to get?

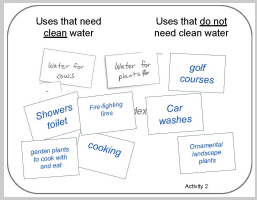
Activity 2

Who uses water in our community?

How do they use water?

Activity 2

Activity 2



Activity 2

Environments	Measurement
-Where is water hard to get? -Who uses the water? -How do people use water in different places?	-How can we tell if water is safe to reuse? -How can we measure contamination in water? -What can we measure and what can't we measure?
Filtering	**Reuse**
-How can we clean water? -How can we remove contaminants from water? -Can we turn contaminated water back into clean water?	-How clean does the water need to be for reuse? -How can groups in the community reuse water? -What is the best order to reuse water? -How many times can water be reused?

Activity 2

Learner vocabulary

-dirt
-murky
-soap
-yellow
-contaminated
-contaminants
-cleaner
-more contaminated
-order
-steps
-process
-Clearness
-transparency
-translucency
-opacity
-clarity
-acid
-acidic
-base
-basic
-Neutral
-pH

Activity 2, 3, 5

How can we tell if water is safe to reuse?

-We can measure clarity, color, pH, smell, and texture.
-Water with bad quality is probably not safe to reuse.

Activity 3

What are some ways we can measure how clean or contaminated water is?

-We can measure how clear it is
-if there are things in it
-if it smells bad
-if it has chemicals in it
- what color it is

Activity 3

Water Quality

Variables to help determine water quality:

-Clarity
-Color
-pH
-smell
-texture

Activity 3

How can we improve water quality?

-Different filter materials can remove different types of contaminants from water.

Activity 4

Add learner's sticky notes here

Activity 4

Filter

-a technology that removes some kinds of contaminants from water

Activity 4

In what orders can water be reused?

Activity 5

Criteria

Things your design needs to do

Activity 5

Constraints

Limits on a design

Activity 5

Process

-a series of actions or steps leading to a result or goal

STEPS:
1. ↑
2. →
3. ↓

Activity 5

Learner vocabulary

-process
-criteria
-constraints

Activity 5

Does our final water reuse process meet our water quality goals?

Activity 6

How can we improve our water reuse processes?

-We can improve the filters and adjust the order to make the water reuse process better.

Activity 7

What design recommendations do we have for water reuse processes?

Activity 8

How can we share our water reuse process recommendations with others?

Activity 9

Poster Setup (blank)

Our Ideas about
Water in Extreme Environments
Engineering

How can we identify where there is water?
How can we get it?

RSG

RSG

Scientist

RSG

How can we reuse water in a place where water is hard to get?

Activity 2

In what orders can water be reused?

Activity 5

Who uses water in our community?

How do they use water?

Activity 2

Add learner's index cards here

Activity 2

Uses that need clean water | Uses that do not need clean water

Add learner's index cards here

Activity 2

Criteria

Things your design needs to do

Activity 5

Constraints

You cannot move the container or touch it directly.

Limits on a design

Activity 5

Environments | Measurement

Filtering | Reuse

Activity 2

Learner vocabulary

Activity 2, 3, 5

Process

-a series of actions or steps leading to a result or goal

STEPS:
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Activity 5

Learner vocabulary

Activity 5

Engineer

RSG

Technology

RSG

How can we tell if water is safe to reuse?

Activity 3

What are some ways we can measure how clean or contaminated water is?

Activity 3

Water Quality

Activity 3

Does our final water reuse process meet our water quality goals?

Activity 6

How can we improve our water reuse processes?

Activity 7

Why is water important??

Activity 1

Activity 1

How can we improve water quality?

Activity 4

Add learner's sticky notes here

Activity 4

Filter

Activity 4

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How can we share our water reuse process recommendations with others?

Activity 9

Water in Extreme Environments - Engineering

RSG & Activities 1-9

Our Ideas Poster

How can we identify where there is water?

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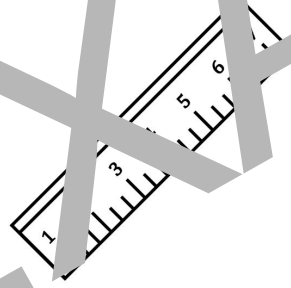
We can use what we know about water and other substances.

-We can design devices that help us collect it.

Scientist

-Test things out
-Make observations & measurements



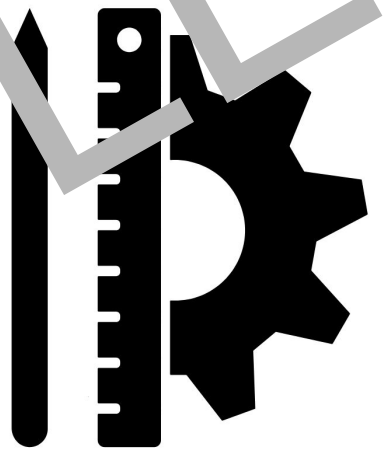
-Ask questions
-Gather evidence to answer questions.

Engineer

-Design things to solve problems

-Build things

-Design technologies



Technology

-The solution to the problem.
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Why is water important??

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-Water is life.

-Living organisms rely on water to survive.

My Water Story

Water is important to me because it gives us life.

We use water to water plants that nurture and feed us.

All of our water in our watershed we use to drink, enjoy, use in our household and enjoy for the future.

Who uses water in our community?

How do they use water?

residents

firefighters

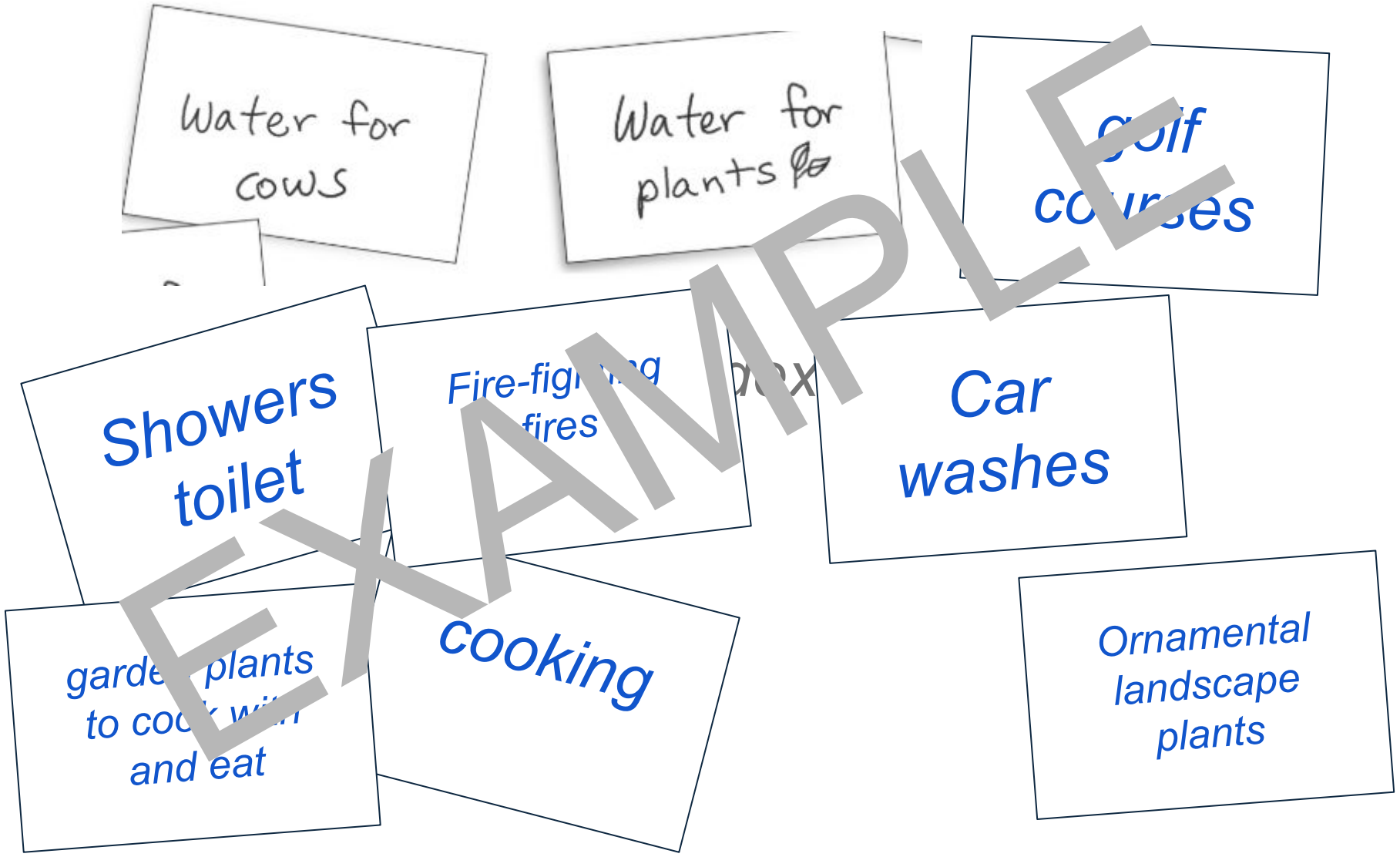
Add learners' index cards here

City Planners

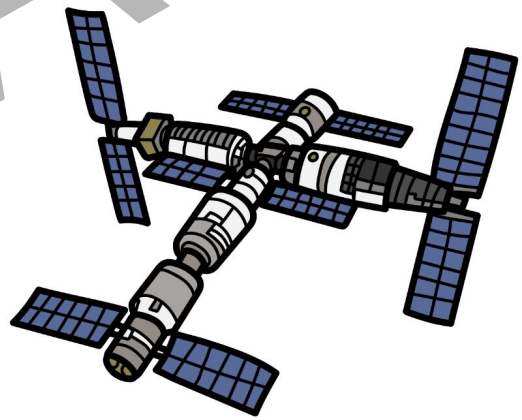
Landscapers

Uses that need clean water

Uses that do not need clean water



How can we reuse water in a place where water is hard to get?



Environments

-Where is water hard to get?
-Who uses the water?
-How do people use water in different places?

Measurement

-How can we tell if water is safe to reuse?
-How can we measure contamination in water?
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Filtering

-How can we clean water?
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Reuse

-How clean does the water need to be for reuse?
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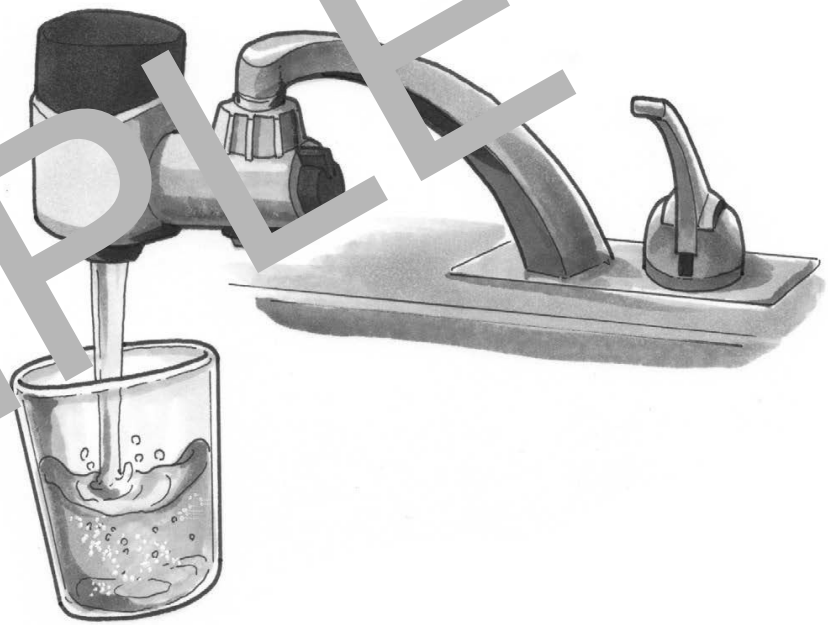

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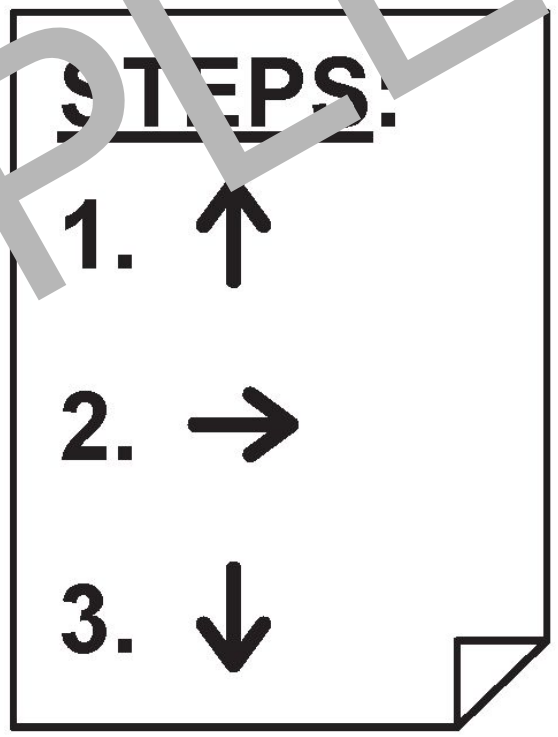

Learner vocabulary

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