

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:

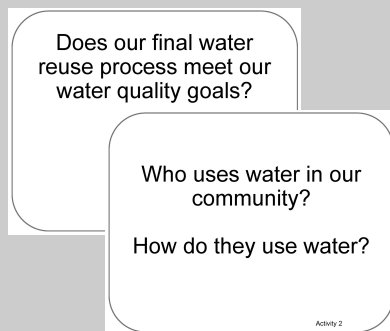
- **Poster Pages** to build the poster (pages numbered in lower right corner with corresponding adventure(s))
- **Poster Pages** with examples are for educator reference only and not intended to print.
- **Blank Pages** for more space or to build your own poster
- **Blank ¼ page cards** for learners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

Setup

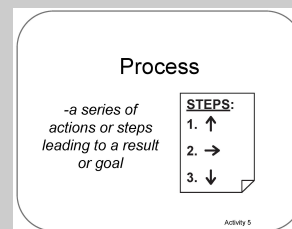
To set up the poster space, you will need a wall or whiteboard area of about **80" Length x 60" Height**

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

Poster Pages

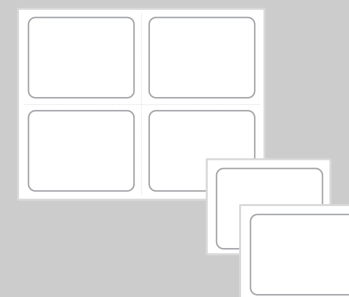


Term Cards



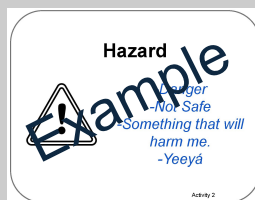
Term + icon

Blank ¼ page cards

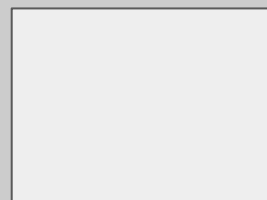


Intended for learner responses

Poster Pages with Examples



Blank Pages



For reference only,
Do not print.

Other Materials:



Scissors



Masking
Tape



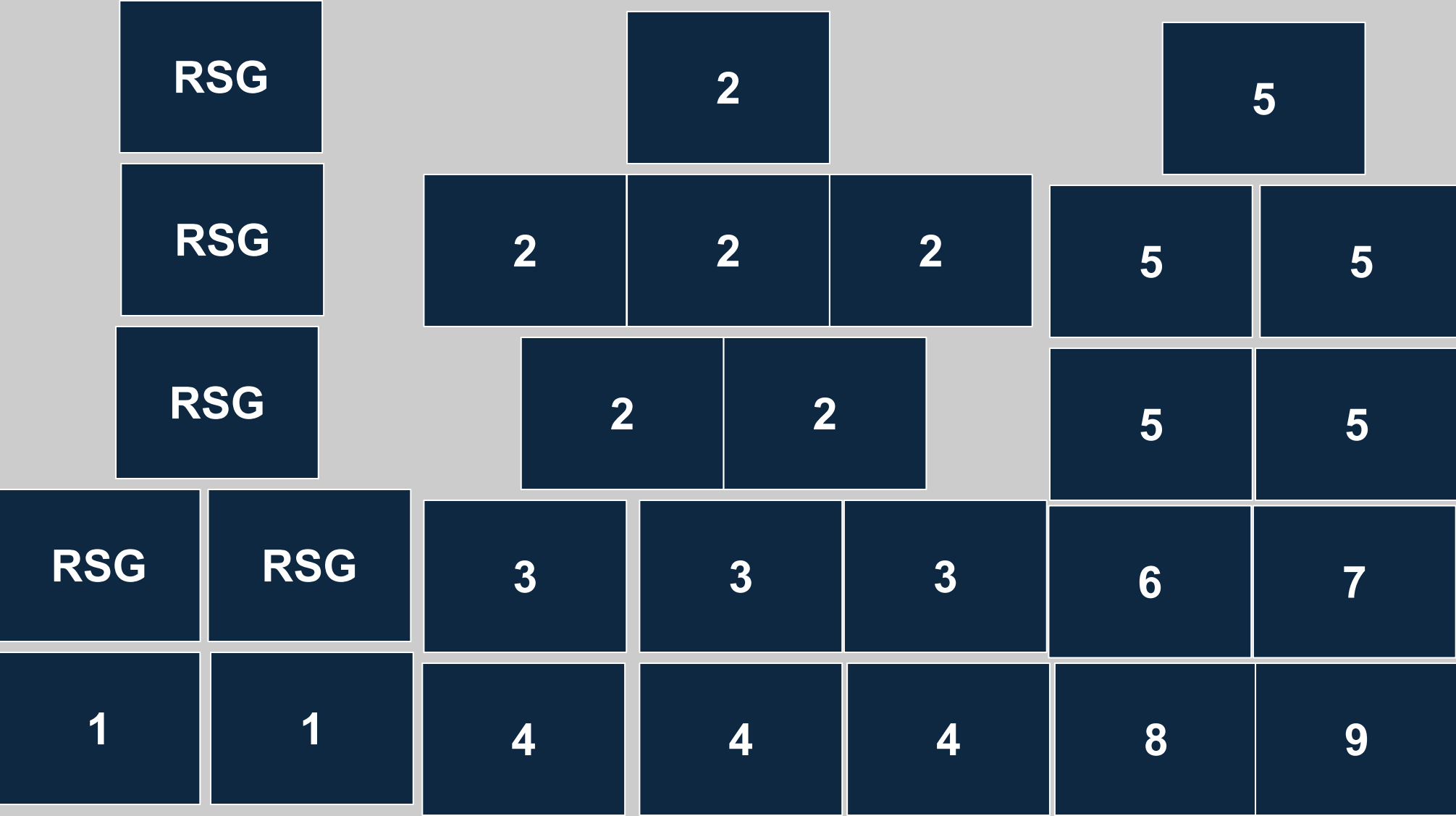
Tape



Markers

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

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

Farmer's residents firefighters
City Planners Landscapers

Add learner's index cards here

Activity 2

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

Water for cows Water for plants for golf courses
Showers toilet Free-drying time Car washes
garden plants to cool with and feed cooking Ornamental landscape plants

Activity 2

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

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? -What can we measure and what can't we measure?
Filtering -How can we clean water? -How can we remove contaminants from water? -Can we turn contaminated water back into clean water?	Reuse -How clear does the water need to be for reuse? -How can people 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

-Cleaness
-transparency
-translucency
-opacity
-clarity
-acid
-acidic
-base
-basic
-Neutral
-pH

Activity 2, 3, 5

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

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

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

Why is water important??

-tō (Ond Board)
-agua (Spanish)
-kuyi (Hopi)

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

Activity 1

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 for our neighborhood will be used to drink, enjoy, use in our household and enjoy for the future.

EXAMPLE

Activity 1

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

What design recommendations do we have for water reuse processes?

Activity 8

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

Activity 8

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

RSG

Scientist

RSG

Engineer

RSG

Technology

RSG

Why is water
important??

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

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

Environments	Measurement
Filtering	Reuse

Activity 2

Learner vocabulary

Activity 2, 3, 5

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

How can we improve
water quality?

Activity 4

Add learner's sticky notes here

Activity 4

Filter



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



You cannot move the container or
touch it directly.

Activity 5

Process

-a series of
actions or steps
leading to a result
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STEPS:
1. ↑
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3. ↓

Activity 5

Learner vocabulary

Activity 5

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

Activity 6

How can we improve our
water reuse processes?

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

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

How can we identify
where there is
water?

How can we get it?

RSG

Scientist

Engineer

Technology

Why is water important??

Activity 1

Who uses water in our
community?

How do they use water?

Add learners' index cards here

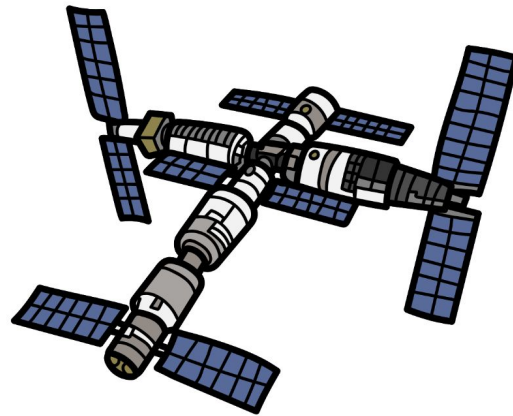
Uses that need
clean water

Uses that do not
need clean water

Add learners' index cards here



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



Environments

Measurement

Filtering

Reuse

Learner vocabulary

How can we tell if water
is safe to reuse?

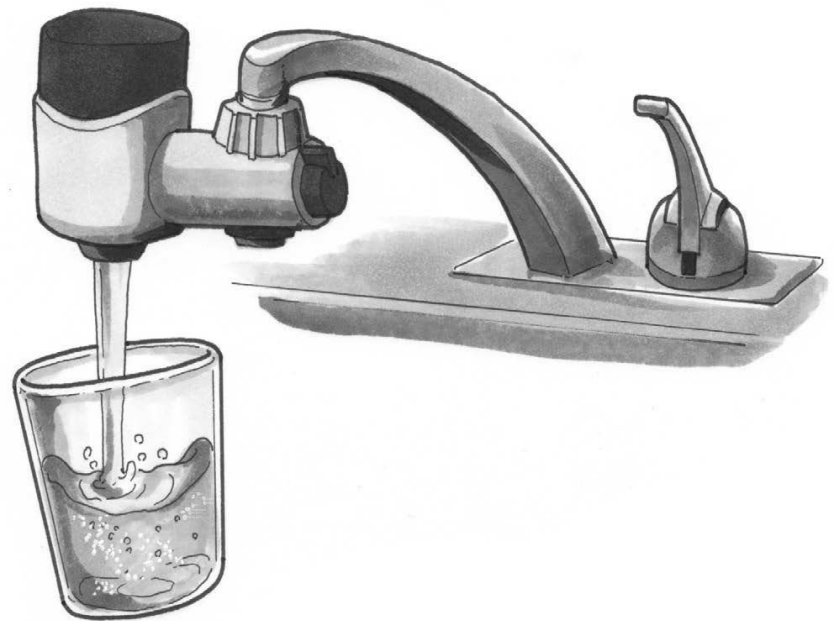
**What are some ways we
can measure how clean
or contaminated water
is?**

Water Quality

How can we improve water quality?

Add learner's sticky notes here

Filter



**In what orders can water
be reused?**

Criteria

*Things your
design
needs to do*



Constraints



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Limits on a design

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*-a series of
actions or steps
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Learner vocabulary

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

How can we improve our water reuse processes?

**What design
recommendations do we
have for water reuse
processes?**

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



