

## Science PBL working with NASA

Can we and how could we colonize a planet or the moon?

Standers:

Science

S 3.5 LSA

S 3.5 ET.2

S 3.5 ET.3

S 3.5 PS.13

Math

4.M.1

3.M.3

3.M.4

4.M.2

4. M.3

4.M.4

Language Arts

LA.3.w.2

LA.3W.9

LA.3W.10

LA.3.W.11

LA.4.W.2

LA.4.W.5

LA.4.W.6

LA.4.W.7

LA.4.W.9

LA.4.W.11

LA.3.SL.1

LA.3.SL.3

LA.3.SL.4

LA.3.SL.6

LA.4.SL.1

LA.4.SL.3

## Day 1-4

Have each student make a book on the eight planets and the moon.

Check list for what you need to have in your book.

- A) Distance from the sun
- B) Diameter in Kilometers, and miles
- C) Temperature
- D) Number of rings
- E) Number of satellites
- F) Is it an inner or outer planet
- G) Give one interesting fact about the planet

Check list for writing in your planet book and in your note book

- A) Do I have a topic sentence
- B) Did I use transition words
- C) Does my writing make sense
- D) I used correct grammar
- E) Did I use lively verbs and adverbs
- F) Did I use precise nouns
- G) Are my paragraphs indented
- H) Did I use complete sentences
- I) Is my spelling correct
- J) Did I use correct punctuation
- K) Is my final copy typed and organized

In your book you need to draw and color the planets.

You must conference with me before you type up your final copy

Book must be complete on day 5

## Day 6 (30-45 min)

1. As a class list the basic things that people on Earth need in order to live?
2. What do people need in order to build on Earth?

(Put the list on the board)

3. On the board put the name of all the planets. Mark the ones that have a solid surface to build on.
4. Put your students in groups
  - A) Each group needs to choose a planet to colonize
  - B) Now tell them about the project and who they are going to be partnering with (NASA)
  - C) Hand out notebooks.
    1. Put names in notebooks
    2. Write down the name of your planet
    3. Write down the basic things people need to live on Earth

Day 7 (30-45 min)

Make a patch for your think tank

For Ideas go to:

- A) NASA mission patches
- B) Space mission patches
- C) Shop NASA.com (missproducts)

Day 8 (30-45 min)

Meet with your mission control:

In your notebook write down the things we need in order to colonize a planet

1. Oxygen
2. Shelter
3. Water
4. Food
5. Energy

Now get into your groups (think tanks) and research your planet. Look for things like

1. What kinds of gasses
2. What kind of landforms
3. How much gravity
4. How is it alike/different from Earth
5. Does your planet have evidence of water/volcanic action

Day 9 (30-45 min)

Meet with mission control

Do a science lab on how to find water

Make a below ground still. Each group needs to make one.

In notebook write down what was used to make the below ground still and how it will work.

Get into your think tank group and answer the questions.

1. Could a below ground still work on your planet?
2. How could you build this below ground still?
3. Can your group come up with a different way of collecting water?

Day 10 (30-45 min)

Meet with mission control

Give report on how you are going to collect water.

Get into your think tank groups:

1. Write up a report in your notebook to give to NASA by video.
  - a) How are you going to get water for your colony
  - b) Explain how by writing
  - c) Draw a diagram of your water system (give the size of the system)
  - d) How are you going to store the water and send it to the spaces it needs to go
  - e) List the materials that you will need

Day 11 (30-45 min)

Make videos

Day 12 (30-45 min)

Meet with mission control

Go over what makes up water (2 parts hydrogen 1 part oxygen) talk about molecules and can they be broken apart. Do science lab on separating hydrogen and oxygen. Have each think tank group do this lab. In their notebook write down what they observed. And what part of the

battery (+ or – produces the Oxygen and what part produces the hydrogen) discuss how this worked.

Day 13 (30-45 min)

Meet with mission control

Go over what we discussed about separating hydrogen and oxygen.

Get into your think tank groups. Write in your notebooks

1. How are you going to create oxygen/store it (give the size)
2. Draw a diagram on how you will get oxygen to the spaces in your colony (give the size)
3. List the materials that you will need
4. List ways that you could use the hydrogen

Day 14 (30-45min)

Meet with mission control

Go over how your group would create and store oxygen

Get into you think tank groups: Work on your report and diagram to video to NASA

Day 15 (30-45min)

Make video to go to NASA

Day 16 (30-45min)

Meet with mission control

Do science lab: Make a mason jar solar light

Get into your think tank groups to answer the question: How are you going to create and store power?

In your notebook

1. What resources do you have on your planet that you can use to create power
2. Draw a diagram on what your power source and storage will look like (give the size)
3. List the materials that you will need

Day 17 (30-45 min)

Meet with mission control

Do science lab: Make a solar oven and cook nachos

Day 18 (30-45min)

Meet with mission control

How would you use solar energy?

Meet in your think tank groups

Explain how you are going to use solar energy

1. In your note books explain how you are going to supply energy to your food source
2. Explain how you will supply energy to your living spaces
3. Draw a diagram of your solar plant and storage plant ( give the size)
4. List the materials that you will need

Day 19 (30-45 min)

Work on your report and diagram to video to send to NASA

Day 20 (30-45)

Make videos

Day 21 (30-45min)

Meet with mission control

The question for today. How are you going to supply food for your colony?

1. Green houses
2. Hydroponic plants
3. Green house on the space station (Lunar plant growth chamber)

Meet with your think tank group

What are you going to do? Do research on your project

Day 22 (30-45min)

Meet with mission control

Give report on what you are going to do for a food source

Meet with your think tank group

1. Write in your notebook, how are you going to supply food for your colony
2. Explain how you will do this
3. Draw a diagram to show how you will supply food (give size)
4. List materials that you will need

Day 23 (30-45min)

Work on your reports and diagrams to send a video to NASA

Day 24 (30-45min)

Make video

Day 25 (30-445min)

Meet with mission control

Question: How will you build shelter for your colonist?

1. Supplies from Earth
2. Craters
3. Lava shoots
4. Rocks from planet

Meet with your think tank group

1. Write in your notebook, how you are going to make homes
2. Explain how you will do this
3. Draw a diagram to show how you will do this (give size)
4. List materials that you will need

Day 26, 27, 28 (30-45min)

Build your space colony

Day 29, 30 (30-45min)

Present to the class your final project

Day 31, 32 (30-45min)

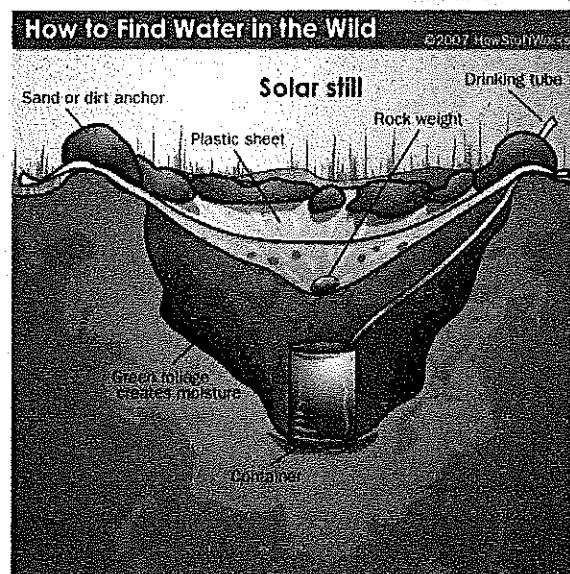
Make final video presentation to NASA along with your notebook



## How to Find Water in the Wild

BY CHARLES W. BRYANT    ADVENTURE | WILDERNESS SURVIVAL

### Water Collection Techniques



HOWSTUFFWORKS 2008

If you're stranded and there isn't a fresh **water** source around, then you need to get to work on collecting water. There are a few techniques to do this, and it doesn't hurt to set up more than one system. The more water you can collect, the better your chances of survival.

One pretty basic way you can collect water is to make a **belowground still**. To do this, you'll need some **plastic** sheeting, a digging tool, a container, a drinking tube and a rock.

