



Volume 1, Issue 1

Teacher Guide

Many illustrations in Space Salad contain one or more elements related to Math and Science. Below are the page numbers and a brief description of the Math and Science content that informed the illustrations.

Cover - Ever rushed home from work to fix dinner for guests only to have something go horribly wrong – like the gravity generator shorting out? This is not specific to Math or Science, but everyday events set within a non-existent yet scientifically plausible (or mostly plausible!) scenario are a common motif in *science fiction* that help turn the ordinary into the extraordinary.

Page 1: *Creating curiosity* - What tells you this is Buffalo Park besides the text? Does everyone know where Buffalo Park is? What year do you think it is? What does this illustration tell you about what's going on in this world?

Page 2: *Rain water harvesting* - This built watershed is analogous to a natural watershed: the roof is a high point like a mountain; the gutters are like rivers and streams; the tank is an aquifer; the spigot is an ephemeral spring; the overflow is a flood that ends up in a flood plain or a marsh where it slowly sinks in and/or evaporates. How are the walls of the hanger looking? What would cause that erosion?

Page 3: *Following a recipe* - How many ingredients are in the coffee? In the top panel, what part of the recipe is Juliette on? What the heck is a rusk? The first appearance of a grow tower: How is this one similar to the one the students interact with? How is it different?

Page 4: *Astronomy* - Roufus' ceiling model represents the inner solar system. The light bulb represents the Sun, the terrestrial planets (Mercury, Venus, Earth, Mars) and their moons are suspended in their orbits. "Places I've Been" are really places Roufus hopes to travel to. Where has he been so far?

Bonus activity: Count/compare the sizes, shapes and colors of the water bottle collection.

Page 5: *Fractions* - Students can look at the colorful, neatly folded stacks of clothing on Roufus' shelf. How many pieces of clothing are in a stack? How many of them are yellow, blue, or gray and how can that be represented as a fraction? And seriously. What is a rusk?

Page 6: *Astronomy – Time and distance* - The holo-map of the inner solar system shows how long the trip will be in the Terra BIRDS spaceship; the distance to Mars changes, but the average distance, according to NASA, is 140 million miles. The holo-map also shows the Goldilocks Zone, or habitable zone, where the range of distance from the Sun allows water to remain liquid. Habitability is also governed by individual planetary atmospheres. For example, Venus and Mars are technically in the Goldilocks Zone, but neither of the planets are habitable because

of their atmospheres. The holo-map also shows the slingshot path of a comet coming into the system. The gas and dust forming the tail of the comet points away from the star.

Page 7: Astronomy - Here is a close up map of Earth and Mars with their moons. Rufous is holding a device capturing an image of their destination. Students can discover where they are headed if they can decipher the words that are written backwards on Rufous' screen.

Page 8: Math - Roufus and Juliette are shopping at the market. Students can look at the arrays of produce and other items for Math related activities, including: counting, addition/subtraction, multiplication/division, and representing how many cells of each array are empty vs. full via fractions. Note: Gnat Paste comes in small, medium, and large!

Page 9: Fractions - The fuel tanks to the left of the spaceship are marked in quarters or thirds. Students can come up with fractions to represent how full or empty each tank is.

Page 10: Counting - Juliette and Roufus are bringing in all of their supplies from the market. Students can count boxes. They can also observe that Roufus is placing plants in their Growbot and compare it with their experience planting in their grow towers. Bonus: Can students read the cursive writing on the box of Kennebec potatoes?

Page 11: Data tracking - Three months is an average cycle for a school grow tower. The panel in the upper left shows months one through three along the bottom of the x axis with the voyage from Earth to Mars represented along the top. Students can observe that the crew is going to rely mostly on fresh vegetables they purchase at the market during the first month, supplemented with the dreaded Space Sludge, while they wait for their seedlings to mature. During the next two months, the grow tower will be producing lots of greens. Other information panels track pH, nutrients, and care tasks for the plants. How can students track this data in the classroom? What other data can they collect and track?

Page 12: Math - Weight, size and mass.

Each of the nine cargo pallets is a scale. The color bars on the side indicate how much weight is on each pallet. The difference in size and weight show that big things can be light and small things can be heavy. Note: Beware of the visual typo in the nearest pallet. It has eleven light bars instead of ten, but the scale remains as indicating 'six' bars of weight.

Page 13: Math. There is a 3x3 array in the loading ramp. The middle three squares of the array are divided in half.

Page 14: Instruments to read.

Various gauges and displays inside the ship are used to read ambient temperature, how much water they have, and air pressure in the ship. The air pressure reads as 11.3 PSI which is the air pressure of Flagstaff at 7200 feet. Sea level is 14.7 PSI.

Page 15: Meteorology.

What kind of clouds are those? What direction are they moving? Can this direction be inferred by comparing the picture on page 15 with the picture on page 1?

Page 16: Astronomy.

Shown here are the celestial objects we can see from Earth including: our moon with its craters, a comet, the Sun, and the three inner planets. The ship left during the day, but the Earth is facing away from the sun which means traveling just that far probably took them a while.

Page 17: Ornithology. What kind of bird is on the Terra BIRDS logo?